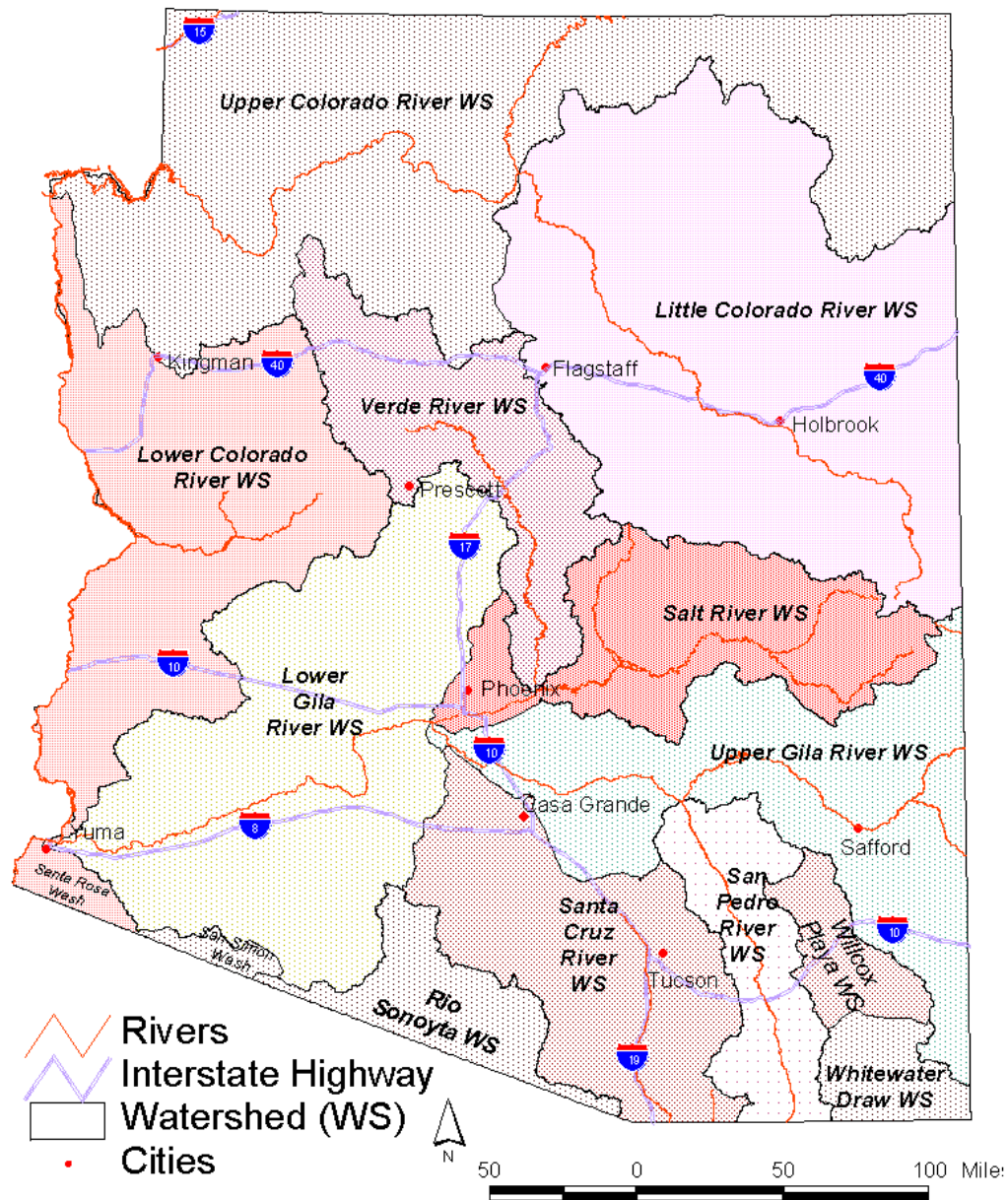


**Arizona Water Protection Fund
Application Cover Page
FY 2019**

Title of Project: Little Colorado River Valley Conservation Area Restoration Project											
Type of Project: <input checked="" type="checkbox"/> Capital or Other <input type="checkbox"/> Water Conservation <input type="checkbox"/> Research	Stream Type: <input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral										
Your level of commitment to maintenance of project benefits and capital improvements: <input type="checkbox"/> < 5 years <input type="checkbox"/> 5-10 years <input type="checkbox"/> 11-15 years <input checked="" type="checkbox"/> 16-20 years											
Applicant Information: Name/Organization: Landsward Foundation Address 1: Post Office Box 520 Address 2: City: Flagstaff State: Arizona ZIP Code: 86002-0520 Phone: 928-774-6199 Fax: 928-774-6241 Tax ID No.: XXXXXXXXXX	Inside an AMA: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, which AMA: <input type="checkbox"/> Phoenix <input type="checkbox"/> Tucson <input type="checkbox"/> Prescott <input type="checkbox"/> Pinal <input type="checkbox"/> Santa Cruz Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation										
Contact Person: Name: William C. Cordasco Title: President Phone: 928-774-6199 Fax: 928-774-6241 e-mail: cobar@babbitranches.com	Any Previous AWPFF Grants: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, please provide Grant #(s):										
Arizona Water Protection Fund Grant Amount Requested: \$300,912.00 If the application is funded, will the Grantee intend to request an advance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Matching Funds Obtained and Secured:</th> </tr> <tr> <th style="text-align: left;"><u>Applicant/Agency/Organization:</u></th> <th style="text-align: right;"><u>Amount (\$):</u></th> </tr> </thead> <tbody> <tr> <td>1. Applicant (Landsward Foundation)</td> <td style="text-align: right;">\$52,00.00</td> </tr> <tr> <td>2. Babbitt Ranches</td> <td style="text-align: right;">\$400.00</td> </tr> <tr> <td style="text-align: right;">Total:</td> <td style="text-align: right;">\$56,000.00 \$52,400.00</td> </tr> </tbody> </table>	Matching Funds Obtained and Secured:		<u>Applicant/Agency/Organization:</u>	<u>Amount (\$):</u>	1. Applicant (Landsward Foundation)	\$52,00.00	2. Babbitt Ranches	\$400.00	Total:	\$56,000.00 \$52,400.00
Matching Funds Obtained and Secured:											
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2. Babbitt Ranches	\$400.00										
Total:	\$56,000.00 \$52,400.00										
Has your legal counsel or contracting authority reviewed and accepted the Grant Award Contract General Provisions? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A											
Signature of the undersigned certifies understanding and compliance with all terms, conditions and specifications in the attached application. Additionally, signature certifies that all information provided by the applicant is true and accurate. The undersigned acknowledges that intentional presentation of any false or fraudulent information, or knowingly concealing a material fact regarding this application is subject to criminal penalties as provided in A.R.S. Title 13. The Arizona Water Protection Fund Commission may approve Grant Awards with modifications to scope items, methodology, schedule, final products and/or budget.											
William C. Cordasco Typed Name of Applicant or Applicant's Authorized Representative	President, 928-774-6199 Title and Telephone Number										
 Signature	9/6/18 Date Signed										

Arizona Watershed Map FY 2019



Title of Project: Little Colorado River Valley Conservation Area Restoration Project

Location (include UTM's): Little Colorado River Watershed. North Unit is located in T27N, R10E, Section 3; UTM 3956448 mN 470984 mE. South Unit is located in T27N, R10E, Section 15; UTM 3953627 mN 471175 mE.



Little Colorado River Valley Conservation Area Restoration Project

EXECUTIVE SUMMARY

Landward Foundation is partnering with *Babbitt Ranches*, *American Conservation Experience*, *Applied Ecological Consulting*, *Arizona Department of Forestry and Fire Management*, and *Natural Channel Design, Inc.*, to enhance the Lower Little Colorado River Watershed by decreasing negative impacts of non-native species to riparian areas through restoration of eight riparian acres at two project sites.

We aim to provide direct benefits to the intermittent Lower Little Colorado River, by replacing invasive plant dominance with native cottonwoods, willows, and native forb and grass seed. By improving the health of this vital riparian ecosystem, we hope to sustain high biodiversity of plant and animal species, while providing and protecting important native wildlife habitat.

Near-term (February 2019 – January 2024) targets are:

- a) Utilize cut-stump and basal bark herbicide methods to release old-growth Fremont cottonwood (*Populus fremontii*) galleries from wildfire danger and direct resource (water and sunlight) competition with thick, monotypic stands of salt cedar (*Tamarix spp.*)
- b) Control Russian knapweed (*Acroptilon repens*) and camelthorn (*Alhagi maurorum*) infestations with herbicides within cottonwood understory to open up opportunity for successful natural and supplementary revegetation to occur
- c) Revegetate cleared cottonwood understory with native vegetation using irrigationless methods and native plants that compete against future invasive weed invasion to create refugia for native avian species, since riparian habitats are critical for migrating and breeding birds and are currently in decline in the Southwest
- d) Protect project sites from further invasive plant invasion, while assessing whether restoration tasks are successful and determining the causes of success or failure
- e) Create a successful, replicable riparian restoration model that can be utilized by land owners and agencies within nearby/adjacent reaches of the Lower Little Colorado River Valley



Little Colorado River Valley Conservation Area Restoration Project

PROJECT OVERVIEW

Background

Our project will be conducted on eight acres of riparian habitat within CO Bar Ranch in Northern Arizona in an active floodplain of the Lower Little Colorado River. Two project sites are on small parcels of private land; one is owned Babbitt Ranches, while the other falls within a checkerboard parcel not owned by Babbitt Ranches that is accessed via a conservation easement that was attained in the fall of 2015 by Babbitt Ranches and gifted to the Landward Foundation. This 161-acre easement for scientific research and conservation purposes enabled the establishment of the 16-mile long, 16,842-acre Little Colorado River Valley Conservation Area (see *Project Location within Watershed Map*) and continues as a servitude running in perpetuity with the property. It houses a number of studies and conservation actions. It is located along the Little Colorado River. A plethora of wildlife rely upon this threatened riparian habitat, which has been seriously degraded by ongoing climate change, resulting in high mortality of native plant species, particularly cottonwoods and willows, promoting the spread of invasive plants along this boundary of the Colorado Plateau.

Goals

In partnership with *Babbitt Ranches, American Conservation Experience, Applied Ecological Consulting, Arizona Department of Forestry and Fire Management, Natural Channel Design, Inc.*, and numerous other partners (see *Letters of Community Support*), we intend to improve the health of this vital riparian ecosystem, thereby sustaining high biodiversity of plant and animal species and providing important wildlife habitat such as food, shelter, relief and travel corridors, through these **Little Colorado River**

Valley Conservation Area Restoration Project goals:

- 1) Protect Lower Little Colorado River native riparian vegetation and habitat by decreasing negative impacts of non-native species to riparian areas
- 2) Protect and restore Lower Little Colorado River habitat needs for native wildlife
- 3) Maintain proposed enhancements
- 4) Provide direct benefits to the intermittent Lower Little Colorado River (which typically runs annually, during snowmelt and monsoon seasons)

Objectives

Our measurable project outcomes are as follows:

- 1) *Utilize cut-stump and basal bark herbicide methods to release old-growth Fremont cottonwood (*Populus fremontii*) galleries from wildfire danger and direct resource (water and sunlight) competition with thick, monotypic stands of salt cedar (*Tamarix spp.*) by February 2021*
- 2) *Control Russian knapweed (*Acroptilon repens*) and camelthorn (*Alhagi maurorum*) infestations with herbicides within cottonwood understory to open up opportunity for successful natural and supplementary revegetation to occur by September 2021*

- 3) *Revegetate cleared cottonwood understory with native vegetation using irrigationless methods and native plants that compete against future invasive weed invasion to create refugia for native avian species, since riparian habitats are critical for migrating and breeding birds and are currently in decline in the Southwest by November 2021*
- 4) *Protect project sites from further invasive plant invasion, while assessing whether restoration tasks are successful and determining the causes of success or failure by January 2024*
- 5) *Create a successful, replicable riparian restoration model that can be utilized by Landward and neighboring land owners and agencies within nearby/adjacent reaches of the Lower Little Colorado River Valley by September 2020*

Statement of Problems/Causes

Rates of climate change are among the highest in the world in the Southwest, where perennial rivers are converting to intermittent streams, with significant replacement of native plant species by invasive exotics that provide poor habitat for wildlife. With climate warming and the invasion of tamarisk and camelthorn, the Little Colorado River is one of the most degraded rivers in our region. The current practice of planting only local stock is no longer viable, as the environment has dramatically changed due to climate-driven alterations in stream flows, invasive species, drought, and growing season length. Additionally, soil changes caused by non-native plant species results in loss of beneficial microbes upon which native plants depend.

Statement of Solutions

While our project will not result in water conservation, it will show land managers/owners and policy makers an innovative approach to restoring degraded riparian habitat along eight acres of the Lower Little Colorado River. We will restore eight riparian acres dominated by invasive plants with native cottonwoods lower elevations adapted to hotter, drier environments, as well as locally-sourced willows. Previous restoration work (via other statewide entities) has focused primarily upon the Upper Little Colorado River, where water flows year-round; to our knowledge, no restoration work has been done on the Lower Little Colorado River (south of Cameron and north of Holbrook, both in Arizona). We are therefore excited to address this distinct Arizona ecosystem.

Statement of Project Years of Benefit to the Resources and General Public

Project-related benefits will continue into perpetuity. Data gathered and analyzed through monitoring efforts will inform our methods, ensuring success by fortifying strategies that are working, while proactively dealing with challenges. The banks of the Little Colorado River provide habitat to nesting and migrating songbirds, Golden Eagle (*Aquila chrysaetos*), Ferruginous Hawk (*Buteo regalis*), American Pronghorn (*Antilocapra americana*), Gunnison's Prairie Dog (*Cynomys gunnisoni*), Mule Deer (*Odocoileus hemionus*), Bald Eagle (*Haliaeetus leucocephalus*), Porcupine (*Erethizon dorsatum*), and many other species. It has extraordinary conservation value, making it an ideal demonstration site. We will create a demonstration project that shows planting of non-local genotypes of native plant species adapted to warm and dry conditions improves restoration of riparian habitat. We will plant native Fremont Cottonwood stock from wild, lower-elevation populations that are adapted to very warm, dry conditions now present along the Little Colorado River, as well as locally-sourced Coyote Willow (*Salix exigua*), and a variety of native forb and grass seed. Project outcomes will be shared through the annual Landward Discovery Community Expo, hosted in conjunction with the Flagstaff Festival of Science, to increase the adoption of adaptive restoration practices among landowners/managers and policy-makers.

Project Location & Environmental Contaminant Information FY 2019

Project Location Information			
1. County: Coconino	2. Section(s): 3, 15	3. Township: 27N	4. Range: 10E
<p>5. Watershed: Little Colorado River</p> <p>6. 8 or 10 Digit Hydrologic Unit Code (HUC): 15020016</p> <p>7. Name of USGS Topographic Map where project area is located: Wupatki NE, Cameron SE</p> <p>8. State Legislative District: 7</p> <p>9. Land ownership of project area: The North Unit is owned by Babbitt Ranches, whereas the South Unit is owned by the Landsward Foundation, via a Deed of Conservation Easement</p> <p>10. Current land use of project area: The North Unit is agriculture (owned by Babbitt Ranches), whereas the South Unit falls within the Little Colorado River Valley Conservation Area (owned by the Landsward Foundation)</p> <p>11. Size of project area (in acres): 8 acres</p> <p>12. Stream Name: Little Colorado River</p> <p>13. Length of stream through project area: 16 miles</p> <p>14. Miles of stream benefited: 0.5 miles</p> <p>15. Acres of riparian habitat: 8 acres will be:</p> <div style="margin-left: 400px;"> <input checked="" type="checkbox"/> Enhanced <input checked="" type="checkbox"/> Maintained <input checked="" type="checkbox"/> Restored <input type="checkbox"/> Created </div>			
<p>16. General description and/or delineation for the area of impact of the project within the watershed. Fully restore 7.98 acres (in two sites along the Little Colorado River) by utilizing eight-person hand crews to remove invasive salt cedar, camelthorn, and Russian knapweed, in addition to building fences and revegetating these parcels with native willow, cottonwood and grasses that compete against future invasive weed invasion and create refugia for native avian species, since riparian habitats are critical for migrating and breeding birds that are currently in decline in the Southwest.</p>			
<p>17. Provide directions to the project site from the nearest city or town. List any special access requirements: From the Flagstaff Mall (on the east end of town), drive 42 miles north on US Route 89 to mile marker 461. Turn right (east) on Black Mesa Pump Station Road (dirt). Drive for 10 miles to the Little Colorado River Valley Conservation Area. This road is rough in places but passable without a 4 x 4; however, postpone any trips if there have been recent monsoons or heavy snows, to allow the road and washes to dry out.</p>			
Environmental Contaminant Location Information			

1. Does your project site contain known environmental contaminants? ☐ YES ☒ NO If yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: _____
2. Are there known environmental contaminants in the project vicinity? ☒ YES ☐ NO f yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: Uranium contamination from an abandoned mine circa 1960s in T27N, R10E, Section 9 exists. The section 9 survey report is: Cultural Resources Survey of the Babbitt Ranches, LLC, Milestone Hawaii Stewardship Project (Section 9 Lease Abandoned Uranium Mine) Coconino County, AZ.
3. Are you asking for Arizona Water Protection Fund monies to identify whether or not environmental contaminants are present? ☐ YES ☒ NO



Little Colorado River Valley Conservation Area
Restoration Project

SCOPE OF WORK

February 2019 – January 2024

PROJECT GOALS

- 1) **Protect Lower Little Colorado River native riparian vegetation and habitat by decreasing negative impacts of non-native species to riparian areas**

OBJECTIVE 1

*Utilize cut-stump and basal bark herbicide methods to release old-growth Fremont cottonwood (*Populus fremontii*) galleries from direct resource (water and sunlight) competition with thick, monotypic stands of salt cedar (*Tamarix spp.*)*

TASK 1: Permits, Authorizations, Clearances and Agreements

Task Description: Obtain and submit to the Project Manager Landward Foundation's Deed of Perpetual Conservation Easement and Memoranda of Understanding with Babbitt Ranches, authorizing the following entities to access and conduct scope of work tasks within the Little Colorado River Valley Conservation Area: Landward Foundation, American Conservation Experience, Applied Ecological Consulting, Arizona Department of Forestry and Fire Management, and Natural Channel Design, Inc.; seek State Historic Preservation Office clearance, as well as seek an open burning permit from the Arizona Department of Environmental Quality

Task Purpose: To comply with all local, state, and federal permit requirements and environmental laws and obtain legal access to project area

Responsible Personnel: William C. Cordasco, Landward Foundation President/Babbitt Ranches President and General Manager

Deliverable Description: Copies of all approved permits, authorizations, clearances and agreements

Deliverable Due Date: February 2019 (prior to any ground-disturbing activities)

Task Cost: \$400

TASK 2: Project Planning

Task Description: Meet with subject matter specialists, to determine project requirements and needs at two project sites (spanning 8 acres)

Task Purpose: To ensure that tasks are realistic, conducted efficiently and effectively, and that project deliverables are scheduled appropriately

Responsible Personnel: Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: Invasive Plant Control Plan (detailing control of invasive salt cedar through fall, winter cut-stump and basal bark herbicide treatments, and salt cedar slash biomass that will be piled and burned in winter months)

Deliverable Due Date: February 2019 (prior to any ground-disturbing activities)

Task Cost: \$0

TASK 3: Invasive Plant Control

Task Description: Control populations of invasive plant species (8-person hand crew with chainsaw and herbicide applications)

Task Purpose: To enact salt cedar control around old growth cottonwood trees for:

- Protection against wildfire by mitigating tamarisk-driven wildfire danger/damage to riparian native plant species and subsequent wildfire-caused soil loss by creating strategic fuel breaks around established native plant colonies
- Decreasing invasive species resource (water and sunlight) competition
- Creating open spaces for native vegetation recruitment
- Establishing wildlife refugia

Responsible Personnel:

- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience on-the-ground restoration crews

Deliverable Descriptions:

- North Unit – 3.3 acres of cut-stump tamarisk
- South Unit – 4.7 acres of cut-stump tamarisk

Deliverable Due Dates:

- North Unit – February 2021
- South Unit – February 2020

Task Costs:

- North Unit – \$39,243
- South Unit – \$52,636

Task 4: Biomass removal

Task Description: Attain open burning permit from the Arizona Department of Environmental Quality (see “Fire Permitting Process” in Supplemental Materials for explanation of why this is not being obtained prior to other ground-disturbing activities) and burn piles of cut tamarisk slash

Task Purpose/Objective: To clear debris from work site, prevent debris from traveling downstream in case of flood, eliminate salt cedar allelopathic leaf litter, and return nutrients to soil (piles will be: no larger than 8-foot x 8-foot x 6-foot tall, at least 20 feet apart – to separate them and allow for control of ignition operations, and kept at least 20 feet away from any improvements, fences, water lines. No piles will be within: 2 chains (132 feet) of the remaining tamarisk, 1 chain of stream course, and 2 chains of any identified fire-sensitive archaeological sites)

Responsible Personnel:

- Aaron Green, Northern District Manager, Arizona Department of Forestry and Fire Management
- Yet-to-be-determined inmates (20), engaged through the Arizona Department of Forestry and Fire Management

Deliverable Description: Approximately 120 tamarisk debris piles (from both sites) burned to the ground and safely extinguished

Deliverable Due Date: January 2021

Task Cost: \$4,965

OBJECTIVE 2

*Control Russian knapweed (*Acroptilon repens*) and camelthorn (*Alhagi maurorum*) infestations with herbicides within cottonwood understory to open up opportunity for successful natural and supplementary revegetation to occur*

TASK 1: Project Planning

Task Description: Meet with subject matter specialists, to determine project requirements and needs at two project sites

Task Purpose: To ensure that tasks are realistic, conducted efficiently and effectively, and that project deliverables are scheduled appropriately

Responsible Personnel: Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: Invasive plant control plan (detailing control of invasive camelthorn and Russian knapweed that will occur during summer/fall season, when plants are actively growing, with foliar herbicide treatments)

Deliverable Due Date: (Prior to any ground-disturbing activities) February 2019

Task Cost: \$0

TASK 2: Invasive Plant Control

Task Description: Control populations of invasive plant species (via herbicide applications with backpack and tank sprayers)

Task Purpose: To enact Russian knapweed and camelthorn control within tamarisk-treated and proposed revegetation, to eliminate competition of resources

Responsible Personnel:

- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience on-the-ground restoration crews

Deliverable Descriptions:

- North Unit – 3.3 acres of foliar herbicide treatments on herbaceous weeds
- South Unit – 4.7 acres of foliar herbicide treatments on herbaceous weeds

Deliverable Due Dates:

- North Unit – September 2021
- South Unit – September 2020

Task Costs:

- North Unit – \$2,473
- South Unit – \$2,975

2) Protect and restore Lower Little Colorado River habitat needs for native wildlife

OBJECTIVE 1

Revegetate cleared cottonwood understory with native vegetation using irrigationless methods and native plants that compete against future invasive weed invasion to create refugia for native avian species, since riparian habitats are critical for migrating and breeding birds and are currently in decline in the Southwest

TASK 1: Project Planning

Task Description: Meet with subject matter specialists, to determine project requirements and needs at both project sites

Task Purpose: To ensure that tasks are realistic, conducted efficiently and effectively, and that project deliverables are scheduled appropriately

Responsible Personnel:

- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Allen Haden, Aquatic Ecologist, Natural Channel Design, Inc.
- Mark Wirtanen, Riparian Specialist, Natural Channel Design, Inc.
- Jake Fleishman, GIS Specialist, Natural Channel Design, Inc.
- Yet-to-be-hired Botany Technician, Natural Channel Design, Inc
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience revegetation labor force

Deliverable Descriptions:

- Fencing (to encase two project sites that are 6,600 feet in distance, as well as four easy-access gates, to meet Natural Resources Conservation Service wildlife-friendly specifics
(https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_026480.pdf) and revegetation (detailing native planting techniques that work along the Little Colorado River, such as vegetation species types to propagate and collect seed, and locations for plantings) plans
- *Revegetation Plan* (we will research appropriate native species that are adapted to this harsh environment to be seeded, since our site has very little precipitation and saline soils; species we may include are fourwing saltbush (*Atriplex canescens*), rubber rabbitbrush (*Ericameria nauseosa*), big sacaton (*Sporobolus wrightii*) and saltgrass (*Distichlis spicate*) – our plan will adhere to Arizona Water Protection Fund Guidelines)
- *Monitoring Plan* (adhering to Arizona Water Protection Fund Guidelines)
- *Photographic Monitoring Plan* (adhering to Arizona Water Protection Fund Guidelines)

Deliverable Due Dates:

- Fencing – February 2019
- Revegetation Plan – September 2019
- Monitoring Plan – February 2019
- Photographic Monitoring Plan – February 2019

Task Costs:

- Fencing – \$0
- Revegetation Plan – \$20,626
- Monitoring Plan – \$0
- Photographic Monitoring Plan – \$0

TASK 2: Fencing

Task Description: Construct fencing to enclose designated revegetation area

Task Purpose: To keep cattle, wild horses, and vehicles from trampling and/or eating new revegetation installations

Responsible Personnel:

- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience revegetation labor force

Deliverable Descriptions:

- North Unit – Installation of 2,600 feet of wildlife-safe fencing, gates and braces
- South Unit – Installation of 4,000 feet of wildlife-safe fencing, gates and braces

Deliverable Due Dates:

- North Unit – April 2021
- South Unit – April 2020

Task Costs:

- North Unit – \$8,740
- South Unit – \$12,106

TASK 3: Propagation of Cottonwoods

Task Description: Consult with Northern Arizona University Merriam-Powell Center for Environmental Research cottonwood experts to determine appropriate genotypes for the site and purchase saplings from Northern Arizona University Research Greenhouse Complex (after they collect cuttings and grow them out for one year)

Task Purpose: To supply saplings sufficient for an estimated 8 acres of native plant revegetation

Responsible Personnel:

- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Allen Haden, Aquatic Ecologist, Natural Channel Design, Inc.

Deliverable Descriptions:

- North Unit – 265 cottonwood saplings
- South Unit – 400 cottonwood saplings

Deliverable Due Dates:

- North Unit – November 2021
- South Unit – November 2020

Task Costs:

- North Unit – \$4,032
- South Unit – \$5,832

TASK 4: Revegetation

Task Description: Collect native willow revegetation stock, likely coyote willow (*Salix exigua*), on-site and install willow pole cuttings, Fremont cottonwoods (*Populus fremontii*), narrowleaf cottonwood (*Populus angustifolia*) or their hybrids saplings (grown out ahead-of-time), and native seeds within constructed fences, where initial invasive plant control was conducted (note: while we plan to seed the full 8 acres, we are allotting for an extra 4.5 acres of re-seeding in the budget)

Task Purpose: To fast-track restoration process by establishing native plant sources that offer natural competition against invasive plant species, therein providing wildlife forage and habitat

Responsible Personnel:

- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Allen Haden, Aquatic Ecologist, Natural Channel Design, Inc.
- Mark Wirtanen, Riparian Specialist, Natural Channel Design, Inc.
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience revegetation labor force

Deliverable Descriptions:

- North Unit – 3.3-acre site sown with native seeds, willow pole plantings and cottonwood saplings
- South Unit – 4.7-acre site sown with native seeds, willow pole plantings and cottonwood saplings

Deliverable Due Dates:

- North Unit – November 2021
- South Unit – November 2020

Task Costs:

- North Unit – \$23,230
- South Unit – \$25,961

3) Maintain proposed enhancements

OBJECTIVE 1

Protect project sites from further invasive plant invasion, while assessing whether restoration tasks are successful and determining the causes of success or failure

TASK 1: Site Maintenance

Task Description: Conduct periodic site visits to maintain fencing and control new invasive weed infestations in previously-treated project sites

Task Purpose: To keep revegetated sites intact and assist in establishment of flora/wildlife refugia

Responsible Personnel:

- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager
- American Conservation Experience on-the-ground restoration crews

Deliverable Descriptions:

- Retreated tamarisk re-sprouts and/or seedlings
- Treated new Russian knapweed or camelthorn invasions
- Repaired fencing

Deliverable Due Dates:

- January 2021 (*tamarisk for both sites*)
- August 2021 (*camelthorn & Russian knapweed for both sites*)
- January 2022 (*tamarisk & fencing for both sites*)
- August 2022 (*camelthorn & Russian knapweed for both sites*)
- January 2023 (*tamarisk & fencing for both sites*)
- August 2023 (*camelthorn & Russian knapweed for both sites*)

Task Costs:

- January 2021: \$8,012
- August 2021: \$2,900
- January 2022: \$6,193
- August 2022: \$2,345
- January 2023: \$5,283
- August 2023: \$2,067

TASK 2: Photographic Monitoring

Task Description: Install 20 permanent photo points

Task Purpose: To qualitatively monitor vegetation via photography that captures benefits to plant and avian communities by establishing a baseline, standardizing the direction of photos, and taking one photo per year throughout the duration of the restoration effort

Responsible Personnel: Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting

Deliverable Description: Photographic evidence of changes during and after on-the-ground restoration efforts for all five project sites

Deliverable Due Dates:

- August 2019
- August 2020
- August 2021
- August 2022
- August 2023

Task Costs:

- August 2019: \$1,390
- August 2020: \$1,000
- August 2021: \$1,000
- August 2022: \$1,000
- August 2023: \$1,000

TASK 3: Plant Surveys

Task Description: Use 40 nested, 11.3meter-radius circular vegetation plots that correspond to avian community observation points (commonly used in monitoring efforts because they capture both large-scale, community-level patterns as well as finer scale, species-level patterns); within each randomly-placed vegetation plot, estimate plant abundance and percentage cover; and count the number of individual trees, woody shrubs, and forbs within predetermined height classes; and estimate the percentage cover of each species within each height class

Task Purpose: To monitor changes in vegetation communities over time via vegetation surveys, in order to evaluate the effectiveness of invasive plant control and revegetation efforts

Responsible Personnel:

- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Yet-to-be-hired Field Biologists (3), Applied Ecological Consulting

Deliverable Description: Scientific reports detailing quantitative and qualitative vegetation changes due to non-native plant management and revegetation of native species, including invasive plant mortality and native plant revegetation survivorship

Deliverable Due Dates:

- August 2019
- August 2020
- August 2021
- August 2022
- August 2023

Task Costs:

- August 2019: \$4,800
- August 2020: \$4,725
- August 2021: \$4,725
- August 2022: \$4,725
- August 2023: \$4,725

TASK 4: Avian Surveys

Task Description: Establish 40 randomly-placed point count stations throughout project sites to estimate bird density and abundance via presence/absence surveys; at each point count station, record all individual birds seen or heard and measure the distance to each bird using laser range finders so that population estimates and densities can be calculated

Task Purpose: To monitor bird communities before, during and after restoration efforts, to ascertain whether non-native management and native revegetation benefits native wildlife

Responsible Personnel:

- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Yet-to-be-hired Field Biologists (3), Applied Ecological Consulting

Deliverable Description: Scientific reports summarizing bird communities before, during, and after non-native plant management and native revegetation

Deliverable Due Dates:

- August 2019
- August 2020
- August 2021
- August 2022
- August 2023

Task Costs:

- August 2019: \$13,370
- August 2020: \$6,385
- August 2021: \$6,385
- August 2022: \$6,385
- August 2023: \$6,385

TASK 5: Final Report

Task Description: Compile final report

Task Purpose: To summarize project (including inventories, metrics monitored, and overall success) and share final results with Arizona Water Protection Fund Commission, as well as hold project partners accountable and showcase work completed

Responsible Personnel:

- William C. Cordasco, Landsward Foundation President/Babbitt Ranches President and General Manager
- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: Written report and formal, in-person oral presentation

Deliverable Due Date: January 2024

Task Cost: \$3,000

4) Provide direct benefits to the intermittent Lower Little Colorado River (which typically runs annually, during snowmelt and monsoon seasons)

OBJECTIVE 1

Create a successful, replicable riparian restoration model that can be utilized by Landsward and neighboring land owners and agencies within nearby/adjacent reaches of the Lower Little Colorado River Valley

TASK 1: Template Components

Task Description: Identify restoration components that comprise Lower Little Colorado River restoration template

Task Purpose: To create a template that is easily-replicated by land owners

Responsible Personnel:

- William C. Cordasco, Landsward Foundation President/Babbitt Ranches President and General Manager
- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: Completion of template framework

Deliverable Due Date: June 2020

Task Cost: \$348

TASK 2: Restoration Target Audience

Task Description: Identify neighboring entities along the Lower Little Colorado River who could benefit from restoration model (such as the Navajo Nation, Wupatki National Monument, Cameron, and Winslow – all in Arizona)

Task Purpose: To identify partners who could benefit from embracing model, by learning more about on-the-ground restoration that works best regionally

Responsible Personnel:

- William C. Cordasco, Landsward Foundation President/Babbitt Ranches President and General Manager
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: List of adjacent landowners who invited to all project sites

Deliverable Due Date: July 2020

Task Cost: \$0

TASK 3: Community Showcase

Task Description: Host Landward Discovery Community Expo in conjunction with the annual Flagstaff Festival of Science, wherein model is revealed, described, and celebrated

Task Purpose: To inspire neighboring land owners to implement restoration model by ensuring they understand and have access to our model, through offering free tours of demonstration sites to community members, as well as distributing hard copy summaries of successful model

Responsible Personnel:

- William C. Cordasco, Landsward Foundation President/Babbitt Ranches President and General Manager
- Sean M. Mahoney, Senior Scientist, Applied Ecological Consulting
- Cathy Scudieri, Restoration Ecologist, Natural Channel Design, Inc.
- Ian Torrence, American Conservation Experience National Restoration Director/Project Manager

Deliverable Description: Easily-replicable restoration model

Deliverable Due Dates:

- September 2020
- September 2021
- September 2022
- September 2023

Task Costs:

- 2020 Landward Discovery Community Expo: \$500
- 2021 Landward Discovery Community Expo: \$500
- 2022 Landward Discovery Community Expo: \$500
- 2023 Landward Discovery Community Expo: \$500



Little Colorado River Valley Conservation Area Restoration Project

DETAILED BUDGET BREAKDOWN

February 2019 – January 2024

NOTE: There are **no** Direct Labor nor Administrative Costs (further line details available upon request)

Outside Service Costs

Other Direct Costs

Capital Outlay and Equipment Costs

GOAL 1, OBJECTIVE 1, TASK 3:

Invasive Plant Control 8-person ACE Crew (\$7,138/week for 12 weeks): \$85,656	Garlon 4 Ultra (\$85/gallon x 16 gallons): \$1,360
	Paraffin Oil (\$42/gallon x 64 gallons): \$2,690
	Dye (\$40/gallon x 9.8 gallons): \$393

GOAL 1, OBJECTIVE 1, Task 4:

Inmates (\$1.50 for 20 hours x 20 inmates): \$600	Crew buggy gas (\$1.04/mile x 1,000 miles): \$1,040	Crew buggy rental (\$86.08/day x 2 days x 2 buggies): \$344
---	---	---

Supervision and support staff
(\$6.50/hour x 338 hours): \$2,200

3/4-ton truck gas (.55/mile x 250 miles):
\$138

3/4-ton truck rental (\$35/day x 2
days): \$70

GOAL 1, OBJECTIVE 2, TASK 2:

Milestone (\$450/gallon x 0.5 gallons): \$225

8-person ACE Crew (\$1,785/10-
hour day x 2 days): \$3,570

2,4-D (\$45/gallon x 4.6 gallons): \$207

Surfactant (\$50/gallon x 4.5 gallons): \$225

Dye (\$40/gallon x 7 gallons): \$280

GOAL 2, OBJECTIVE 1, TASK

Aquatic Ecologist (\$100/hour for
12 hours): \$1,200

Restoration Ecologist (\$94/hour
for 104 hours): \$9,776

Riparian Specialist (\$83/hour for
84 hours): \$6,972

Botany Technician (\$45/hour for
10 hours): \$450

GIS Specialist (\$72/hour for 16
hours): \$1,152

Gas (to/from project site at \$.55/mile x 220
miles): \$121

Groundwater testing (\$30/test x 3 tests):
\$90

Soil testing (\$65/test x 9 tests): \$585

GPS rental (\$28/hour for 10 hours):
\$280

GOAL 2, OBJECTIVE

8-person ACE Crew (\$1,785/10-hour day x 7 days): \$12,495

Fencing supplies (barbed + smooth wire, braces, hinges, stays, clips, and t-posts)(\$1/foot x 6,600 feet): \$6,600

Swing gates (\$120/per gate x 4 gates): \$480

Utility task vehicle rental (\$90/day x 7 days): \$630

Gas-powered auger rental (\$60/day x 7 days): \$420

Mechanical post-pounder rental (\$32/day x 7 days): \$224

GOAL 2, OBJECTIVE 1, TASK 3: Propaga

Cottonwood saplings (\$14.83/sapling x 665 saplings): \$9,864

GOAL 2, OBJECTIVE 1, TA

8-person ACE Crew (\$7,138/week for 2 weeks): \$14,276

Gas for hauling mini-excavators (\$1/mile x 130 miles x 2 mini-excators x 2 years): \$520

Mini-excavator rental (\$200/day x 4 days x 2 mini-excavators): \$1,600

2 x mini-ex operators for 4-10 hour days: (\$27/each/day): \$2,160

Auger bit rental (for 4 days: \$30/day x 4 days x 2 auger bits): \$240

GOAL 2, OBJECTIVE 1, TA

Aquatic Ecologist (\$100/hour for 36 hours): \$3,600

Gas (to/from project site at \$.55/mile x 990 miles): \$545

All-terrain vehicle rental (\$200/day for 8 days): \$1,600

Restoration Ecologist (\$94/hour for 94 hours): \$8,836

Seeds (\$163/acre x 12.5 acres): \$2,038

Crimper rental (\$800/day for 2 days):

Riparian Specialist (\$83/hour for 94 hours): \$7,802

Straw mulch (\$10.50/bale x 240 bales): \$2,520

Crimper rental (\$800/day for 2 days): \$1,600

GOAL 3, OBJECTIVE 1, TASK

Milestone (\$450/gallon x 0.9 gallons): \$397

8-person ACE Crew (\$1,785/10-hour day x 9 days): \$16,065

2,4-D (\$45/gallon x 8 gallons): \$360
Surfactant (\$50/gallon x 8 gallons): \$400
Dye (\$40/gallon x 30 gallons): \$1,200
Garlon 4 Ultra (\$85/gallon x 28 gallons): \$2,380
Paraffin Oil (\$42/gallon x 112 gallons): \$4,707

Fencing repair materials (barbed + smooth wire, braces, hinges, stays, clips, and t-posts)(\$1/foot x 1,000 feet): \$1,000

GOAL 3, OBJECTIVE 1, TASK 2: Phot

Field Crew (\$50/photo point for 100 photos): \$5000

Canon Rebel Camera: \$390

GOAL 3, OBJECTIVE 1, TA

Field Biologists (\$20/hour for 300 hours x 3 staff): \$18,000

Per diem (\$25/day for 75 days x 3 Field Biologists): \$5,625

Vegetation plots (custom-built sampling frames sampling frames, reused at each plot – \$25/frame x 3 frames): \$75

GOAL 3, OBJECTIVE 1, TAS

Field Biologists (\$20/hour for 300 hours x 3 staff): \$18,000

Per diem (\$25/day for 75 days x 3 Field Biologists): \$5,625

GPS units (Garmin GPSMAP 64st at \$350/unit x 3 units): \$1,050

Laser range finder (\$170/finder x 3 finders): \$510

Binoculars (Eagle Optics Ranger ED at \$340/pair x 3 pairs): \$1,020

Senior Scientist (\$80/hour for 85 hours): \$6,800

Supplies (pens, paper, clipboards, batteries): \$1,500

Computer equipment (for data entry and storage): \$655

All-terrain vehicle rental: (\$50/day for 75 days): \$3,750

GOAL 3, OBJECTIVE 1, T.

Senior Scientist (\$80/hour for 16 hours): \$1,280

Supplies (to print and bind final report – toner, paper, etc.): \$216

Restoration Ecologist (\$94/hour

GOAL 4, OBJECTIVE 1, TASK 1: Te

Senior Scientist (\$80/hour for 2 hours): \$160

Restoration Ecologist (\$94/hour for 2 hours): \$188

GOAL 4, OBJECTIVE 1, TASK 3: Cc

Advertising (\$500/year x 5 years): \$2,000

request)

**Total AWP
Request**

Invasive Plant Control

\$91,879

1: Biomass Removal

\$4,965

Invasive Plant Control

\$5,448

1: Project Planning

\$20,626

1, TASK 2: Fencing

\$20,846

tion of Cottonwoods

\$9,864

ISK 4: Revegetation

\$18,886

ISK 4: Revegetation

\$28,541

1: Site Maintenance

\$26,509

Topographic Monitoring

\$5,390

SK 3: Plant Surveys

\$23,700

SK 4: Avian Surveys

\$38,910

ASK 5: Final Report

\$3,000

Template Components

\$348

Community Showcase

\$2,000

\$300,912



Little Colorado River Valley Conservation Area Restoration Project

DETAILED BUDGET BREAKDOWN

February 2019 – January 2024

NOTE: There are **no** Direct Costs, Other Direct Costs, Capital Outlay and Equipment Costs, nor Administrative Costs

Direct Labor	Outside Service Costs	Total AWP Request
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GOAL 1, OBJECTIVE 1, TASK 1: Permits, Authorizations, Clearances and Agreements

Landward President (estimated \$100/hour for volunteer director for 2 hours/week x 52 weeks/year x 5 years): \$52,00		\$52,00
---	--	---------

GOAL 1, OBJECTIVE 1, TASK 1: Permits, Authorizations, Clearances and Agreements

Attorney (\$200/hour x 2 hours, to draw up specified agreements): \$400	\$400
--	-------

\$52,400



AMERICAN CONSERVATION EXPERIENCE
2900 N Fort Valley Rd, Flagstaff
AZ 86001, USA

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 4th, 2018

Dear Mr. Teran,

The Arizona Water Protection Fund Grant requires that all permits be gathered and approved for grant acceptance. We will be burning tamarisk slash piles created by the cut stump method of invasive plant control. I'm submitting this document to explain the absence of a burn permit with our grant. Burn permits, which include an air impact statement, smoke modeling, and burn plan, are renewed each year. According to our project timeline slash burning will occur more than a year from now.

Furthermore, we do not yet know the amount of tamarisk slash that we'll accumulate during the cut stump portion of this project (this will directly affect the burn plan and the amount of particulate matter we'll create). Therefore, we will submit our request once we have all available and up-to-date slash pile accumulation information. We'll submit our burn request to the Arizona Department of Environmental Quality (ADEQ). The process is as follows:

- 1) Arizona Department of Forestry and Fire Management (ADFFM) will create our burn plan once we've establish the amount of slash and number of piles created.
- 2) ADFFM will then submit the plan to ADEQ.
- 3) ADFFM will then request permission from ADEQ to burn the day before.
- 4) ADFFM will receive approval from ADEQ the morning of the burn.
- 5) ADFFM will then submit an accomplishment report to ADEQ for evaluation.

Thank you,

Ian Torrence
National Restoration Director
American Conservation Experience



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**Cultural Resources Survey of the
Babbitt Ranches, LLC, Milestone
Hawaii Stewardship Project,
(Section 9 Lease Abandoned Uranium Mine)
Coconino County, Arizona**

Prepared for

Babbitt Ranches, LLC

Prepared by

SWCA Environmental Consultants

December 2016 (Revised April 2017)



**CULTURAL RESOURCES SURVEY
OF THE BABBITT RANCHES, LLC,
MILESTONE HAWAII STEWARDSHIP PROJECT
(SECTION 9 LEASE ABANDONED URANIUM MINE)
COCONINO COUNTY, ARIZONA**

Prepared for

Babbitt Ranches, LLC
113 North San Francisco Street, Suite 212
Flagstaff, Arizona 86001

Prepared by

Annie J. Lutes, Daniel Garcia, Andrew Larsen,
Jacqueline Muehlbauer, and Dorothy House

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SWCA Project No. 28406

SWCA Cultural Resources Report No. 16-699

December 2016 (Revised April 2017)

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LIST OF ACRONYMS

AC	artifact concentration
ACHP	Advisory Council on Historic Preservation
ALARA	As low as reasonably achievable
A/NRHP	Arizona and National Registers of Historic Places (collectively)
AOC	Administrative Settlement Agreement and Order on Consent
APE	area of potential effects
ARHP	Arizona Register of Historic Places
ARPA	Archaeological Resource Protection Act of 1979
ARS	Arizona Revised Statutes
ASM	Arizona State Museum
ATV	all-terrain vehicle
AUM	abandoned uranium mine
CCS	cryptocrystalline silicate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
GLO	General Land Office
I-	Interstate
IO	isolated occurrence
MNA	Museum of Northern Arizona
MOA	Memorandum of Agreement
NAD	North American Datum
NAU	Northern Arizona University
NHPA	National Historic Preservation Act of 1966
NNHPD	Navajo Nation Historic Preservation Department
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OU	observation unit
PL	point-located (artifact)

Reclamation	U.S. Bureau of Reclamation
RSE	removal site evaluation
SHPO	State Historic Preservation Office (Arizona)
SWCA	SWCA Environmental Consultants
SWReGAP	Southwest Regional Gap Analysis Project
TCP	Traditional Cultural Property
USC	United States Code
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

ABSTRACT

Title: Cultural Resources Survey of the Babbitt Ranches, LLC, Milestone Hawaii Stewardship Project, (Section 9 Lease Abandoned Uranium Mine) Coconino County, Arizona

Date: December 22, 2016; Revised April 2017

Project Name: Babbitt Ranches, LLC Milestone Hawaii Stewardship Project

Project Location: The project area is located immediately west of the Little Colorado River and immediately south of the Navajo Nation, approximately 15 miles southeast of Cameron, Coconino County, Arizona

Locator UTM: 0469135 meters (m) East (E); 3955440 m North (N), Universal Transverse Mercator (UTM) Zone 12 North, North American Datum (NAD) of 1983

Sponsor: Babbitt Ranches, LLC

Sponsor Project Number(s): Not Applicable

Lead Agency: U.S. Environmental Protection Agency (EPA), Region 9

Agency Project Name/Number: Babbitt Ranches, LLC, Milestone Hawaii Stewardship Project, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Docket 2016-13

Other Agencies: U.S. Bureau of Reclamation (Reclamation), Arizona State Land Department, Arizona Department of Environmental Quality, Navajo Nation, Hopi Tribe, Chemehuevi Tribe, Pueblo of Zuni, Kaibab Paiute Tribe, Hualapai Tribe, Havasupai Tribe, and Yavapai Apache Nation

Regulatory Context: Federal permitting and oversight requires compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (54 United States Code [USC] 300101 *et seq.*) and its implementing regulations (36 Code of Federal Regulations [CFR] Part 800)

Funding: Private

ASLD ROW Application Number: Not applicable

Description of the Project/Undertaking: C.O. Bar, Inc., and Babbitt Ranches, LLC, in cooperation with the EPA and other federal and state agencies, are conducting an evaluation of abandoned historic-age uranium mines situated on privately owned portions of the CO Bar Ranch and neighboring federal land managed by Reclamation. The project will investigate the extent of contamination related to uranium mining activities conducted during the late 1950s and early 1960s and will consist of three phases: Phase I includes this cultural resources survey as well as biological documentation and installation of warning signs; Phase II involves radiation scanning and soil sampling; Phase III requires additional surface and subsurface soil sampling involving minor ground-disturbing drilling or test pit activities. The current undertaking is limited to the scope of the Administrative Settlement Agreement and Order on Consent (AOC). Removal of contamination at the site is not considered to be part of the current undertaking; however, it is anticipated that extensive ground disturbance will eventually be required, which will be part of a future undertaking under separate Section 106 consultation.

Project Area/Area of Potential Effects: The area of potential effects (APE) for this undertaking is limited to the area of direct impacts described above, amounting to 501.6 acres of private and Reclamation lands in Sections 9, 10, and 15, Township 27 North, Ranch 10 East. No lasting auditory, visual, atmospheric, or other indirect impacts are anticipated as a result of the interim removal action and removal site evaluation.

Legal Description: The project area is in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$, NE $\frac{1}{4}$ of the NW $\frac{1}{4}$, SE $\frac{1}{4}$ of the NW $\frac{1}{4}$, E $\frac{1}{2}$ of the SW $\frac{1}{4}$, and E $\frac{1}{2}$ of Section 9; the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of Section 10; and the NW $\frac{1}{4}$ of Section 15,

Township 27 North, Range 10 East, as measured from the Gila and Salt River Baseline and Meridian, on the U.S. Geological Survey Wupatki NE, Arizona, 7.5-minute quadrangle.

Land Jurisdiction(s): Private (Sections 9 and 15), Reclamation (Section 10)

Total Acres: 501.6

Acres Previously Surveyed: 182.1

Acres Surveyed 241.4 (231.1 acres of private lands; 10.3 acres of Reclamation lands)

Acres Not Surveyed: 78.1 (31.5 acres of private lands; 46.6 acres of Reclamation lands)

Consultant: SWCA Environmental Consultants (SWCA)

Project Number: 28406

Permit Number(s): Permit BOR-PXAO-2016-009, issued by Reclamation

Date(s) of Fieldwork: November 29 through December 8, 2016

Number of IOs Recorded: 25

Number of Sites Recorded: 11

Eligible Sites 2—NA 14,300; 28406-06

Ineligible Sites: 9—AUM 458; NA 14,295 (Milestone Hawaii Upgrader); NA 14,299; 28406-01; 28406-02; 28406-03; 28406-05; 28406-06; and 28406-07

Unevaluated Sites: None

Previous Sites Not Located: None

Site Summary Table

Site Number	Newly/ Previously Recorded	Land Jurisdiction	Site Type	Cultural/Temporal Affiliation	Eligibility Status (Criterion)*	Treatment Recommendation(s)
NA 14,295 (AUM 457) <i>Milestone Hawaii Upgrader</i>	Previously recorded	Private	Uranium mining	Late Historic Euro-American (early 1960s)	Not eligible	None
NA 14,299	Previously recorded	Private	Limited activity site (artifact scatter)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1065)	Not eligible	None
NA 14,300	Previously recorded	Private	Rock art	Prehistoric Kayenta (A.D. 900–1065) Protohistoric indigenous (A.D. 1425–1550s)	Eligible (Criterion D)	Avoid—If avoidance is not possible, data recovery is recommended prior to project implementation
			Sheep camp	Late Historic–Recent Navajo (A.D. 1900+)		
AUM 458	Newly Recorded	Private	Uranium mine site	Late Historic Euro-American (A.D. 1950s–1960s)	Not eligible	None

Site Summary Table (Continued)

Site Number	Newly/ Previously Recorded	Land Jurisdiction	Site Type	Cultural/Temporal Affiliation	Eligibility Status (Criterion)*	Treatment Recommendation(s)
28406-01	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-02	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-03	Newly recorded	Private	Passive accumulation	Unknown Indigenous	Not eligible	None
28406-04	Newly recorded	Private	Sheep camp	Late Historic–Recent Navajo (A.D. 1900+)	Eligible (Criterion D)	Avoid—If avoidance is not possible, data recovery is recommended prior to project implementation
28406-05	Newly recorded	Private	Passive accumulation	Prehistoric Kayenta (A.D. 1000–1250) Late Historic unknown (A.D. 1880s–1920s)	Not eligible	None
28406-06	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-07	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None

* Recorder's recommendation.

Comments: In 1976, the Museum of Northern Arizona (MNA), on behalf of Western Nuclear, conducted an approximately 182-acre archaeological survey of portions of Sections 9 and 10 within the project area in the vicinity of abandoned uranium mine (AUM) 457, 458, and 459 (MNA Project A75-204; AZSITE Project 1953; Keller and Mason 1976). The Keller and Mason (1976) survey is more than 10 years old; however, SWCA recommends that this report meets the minimum adequacy standards outlined by Arizona State Historic Preservation Office (SHPO) Guidance Point 5. A complete copy of this report is included in Appendix F of this document.

Two historic-era uranium-mining sites in the APE—AUM 458 and NA 14,295 (AUM 457), Milestone Hawaii Upgrader—are recommended *not eligible* under Arizona and National Register of Historic Places (A/NRHP) eligibility criteria. Neither site is associated with an important theme in the history of the region (Criterion A, event), neither site is associated with a significant person (Criterion B, person), neither site embodies a distinctive characteristic of a type or period (Criterion C, design), and neither site has the potential to yield information (Criterion D, information).

NA 14,300 is a rock art site with associated storage features and artifacts that may have been used by Kayenta, Navajo, and other indigenous groups from A.D. 900 to 1950. The site has the potential to yield information important to understanding pre-Contact, protohistoric, and historic indigenous use of the area and is recommended *eligible* for the NRHP under Criterion D.

Site 28406-04 consists of several dry-stacked walls and a small, enclosed, dry-stacked structure. Based on similar sites known in the area, the site likely functioned as a historic-era Navajo sheep camp, with the small structure plausibly serving as a lambing pen. Due to erosional processes resulting in sediment deposition in and around the features, 28406-04 has the potential to yield information important to the understanding of historic indigenous use of the area and is recommended *eligible* for the NRHP under Criterion D.

The remaining archaeological sites do not have the potential to yield information important to prehistory, and are recommended *not eligible* for the A/NRHP.

The 25 isolated occurrences recorded during the survey, which largely consist of indigenous lithic artifacts and a few historic-era items, are not considered significant cultural resources and are *not eligible* for inclusion in the A/NRHP.

We recommend that sites NA 14,300 and 28406-04 be avoided during project activities. No avoidance is recommended for the remaining cultural resources. To ensure avoidance, the boundaries of sites NA 14,300 and 28406-04 will be flagged or otherwise marked for avoidance during field activities associated with the AOC. To ensure avoidance, the proponent has committed to avoiding all ground disturbance, including but not limited to, excavation, drilling, soil sampling, and operating motor vehicles or all-terrain vehicles, within 50 feet of an avoidance area. Maps of avoidance areas will be provided to all personnel, and site markings will be periodically inspected and remarked as necessary. If activities must occur within 50 feet but outside the boundary of a historic property, the proponent will arrange for a qualified archaeological monitor to be present during such activity to ensure that contributing elements of the property are not affected. Only non-ground-disturbing activity is permissible within the boundary of a historic property, including walking for the purposes of collecting handheld or backpack mounted sensor data.

Sites NA 14,300 and 28406-04 will be avoided during project activities. Since no historic properties would be affected by the undertaking, a finding of “no historic properties affected” is appropriate in accordance with Section 106 of the NHPA and 36 CFR 800.

In the event that sites NA 14,300 and 28406-04 cannot be avoided by planned or future project activities and the historic properties would be adversely affected, a finding of “adverse effect” would be appropriate. In accordance with 36 CFR 800, the EPA would develop and implement a memorandum of agreement (MOA) between SHPO and federal agencies, concurring state agencies, and interested Native American groups. The MOA would stipulate measures for the documentation, data recovery, or other mitigation measures to minimize the adverse effects of the undertaking.

In the event that previously unreported cultural resources are encountered during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) until a qualified archaeologist has documented the discovery and evaluated its eligibility for the A/NRHP in consultation with the EPA, Reclamation, SHPO, and Tribes, as appropriate. Work must not resume in this area without approval of the EPA.

The unanticipated discovery of human remains is unlikely. If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) of the discovery and the area must be secured. For private lands, the Arizona State Museum (ASM) must be notified of the discovery in accordance with Arizona Revised Statutes 41-865. For Reclamation lands, the agency must be notified of the discovery and the provisions of the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 USC 3001–3013) will be followed. Work must not resume in the vicinity of human remains without authorization from ASM or Reclamation, as appropriate, and the EPA.

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INTRODUCTION

C.O. Bar, Inc., and Babbitt Ranches, LLC, entered into an Administrative Settlement Agreement and Order of Consent (AOC) with the U.S. Environmental Protection Agency (EPA), Region 9, which was finalized on October 25, 2016, to perform an interim removal action and removal site evaluation (RSE) related to historic uranium mining activities on land currently owned by C.O. Bar, Inc., and Babbitt Ranches, LLC. The project will investigate the extent of contamination related to uranium mining activities conducted during the late 1950s and early 1960s and will consist of three phases: Phase I includes this cultural resources survey as well as biological documentation and installation of warning signs; Phase II involves radiation scanning and background radiation studies; Phase III requires surface and subsurface soil sampling involving minor ground-disturbing drilling or test pit activities. The current undertaking is limited to the scope of the AOC, as outlined above. Removal of contamination from the site is not considered to be part of the current undertaking; however, it is anticipated that extensive ground disturbance would eventually be required, which will be part of a future undertaking, under separate Section 106 consultation.

Sources of uranium contamination include both naturally occurring uranium deposits and features related to historical uranium mining conducted area during the late 1950s and early 1960s. EPA has identified three abandoned uranium mines (AUMs) within the project area:

- AUM 457 is an abandoned mine pit, associated waste rock piles, water storage area, and concrete structural ruins of the Milestone Hawaii Upgrader, a facility intended to increase the concentration of uranium in waste rock.
- AUM 458 is an abandoned mine pit and associated waste rock piles situated 0.5 mile south of AUM 457 and 0.25 mile west of the Little Colorado River.
- A small portion of AUM 459, which is primarily located on Arizona State Trust lands adjacent to the project area, is 0.25 mile southeast of AUM 458.¹

Phase I fieldwork will involve installation of radiation warning signs at pedestrian access points to AUMs 457, 458, and 459. These signs will be mounted on a single signpost driven or set into a small concrete foundation.

Phase II fieldwork will involve gamma radiation scanning and soil sampling. These studies would generally be conducted using all-terrain vehicles (ATVs), where possible. Pedestrian-based scans would be conducted within other areas where ATV use is impractical (for instance, in areas of dense vegetation or topographic relief) or where pedestrian methods are required to avoid impacts to sensitive areas (for instance, within historic properties). A Gamma Scan-Soil Concentration Correlation Study also would be conducted to measure correlation among scan data and physical sample data. Soil and sediment samples would be obtained via hand auger, and sampling locations would be distributed throughout a range of measured gamma concentrations, soil types, topographic features, and built features.

Phase III fieldwork will involve surface and subsurface soil sampling related to the RSE throughout the project area. Excavations will either involve mechanical methods, including backhoe test-pit or drill rig excavations, or in some areas may be accomplished via manually operated instruments, such as a hand augers. Excavation equipment will be wheeled or tracked and will require off-road operation to access sampling locations. The precise number and placement of these investigations will be dependent on the results of Phase II sampling efforts, but sufficient flexibility exists to avoid historic properties or other designated sensitive areas. Excavated material and drill cuttings will be retained on-site following lab analyses.

¹ The small portion of AUM 459 located in Section 9 is within the project area; the majority of the mine, including all mining features, are on State Trust Land beyond the limits of this project. While AUM 459 is a historic-era uranium-mining site, no inventory was conducted, and further discussion of AUM 459 is not included in the list of sites discussed herein.

Project Description

Babbitt Ranches, LLC, in cooperation with the EPA and other federal and state agencies, is conducting an interim removal action and RSEs of three abandoned historic-age uranium mines situated on privately owned portions of the CO Bar Ranch and neighboring federal land managed by the U.S. Bureau of Reclamation (Reclamation), near the unincorporated community of Gray Mountain, in Coconino County, Arizona (Figure 1).

In response to Phase I of the settlement agreement, Babbitt Ranches, LLC, has retained SWCA Environmental Consultants (SWCA) to conduct a survey of the areas subject to RSE field investigations. The object of the survey was to identify any cultural resources that may be present and affected by RSE field operations, as well as to provide baseline cultural resource information for any future restoration or mitigation in conjunction with future actions. As a result of the survey, SWCA rerecorded two prehistoric archaeological sites (NA 14,299 and NA 14,300) and documented structural ruins associated with the historic AUM 457 and the Milestone Hawaii Upgrader (NA 14,295), all three of which were previously recorded in 1976 by the Museum of Northern Arizona (MNA) (Keller and Mason 1976). AUM 458 also is recognized as a historic-era uranium mine and discussed. In addition to these four known cultural resources, SWCA identified and documented seven new archaeological sites and recorded 25 isolated occurrences (IOs) of cultural material.

Project Location

The project area is located within the Little Colorado River Valley, east of Gray Mountain, Coconino County, Arizona. Specifically, the project area is in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$, NE $\frac{1}{4}$ of the NW $\frac{1}{4}$, SE $\frac{1}{4}$ of the NW $\frac{1}{4}$, E $\frac{1}{2}$ of the SW $\frac{1}{4}$, and E $\frac{1}{2}$ of Section 9; the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of Section 10; and the NW $\frac{1}{4}$ of Section 15, Township 27 North, Range 10 East, as measured from the Gila and Salt River Baseline and Meridian and as depicted on the 1980 Wupatki NE, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (see Figure 1; Figures 2 and 3). The Locator Universal Transverse Mercator (UTM) for the project is 0469135 meters (m) East (E), 3955440 m North (N) Zone 12 North, North American Datum (NAD) of 1983.

The boundary between the Navajo Nation and adjacent lands in the project vicinity is defined as the channel of the Little Colorado River by the Treaty of 1900 between the United States of America and the *Diné* or Navajo People (Walker and Bufkin 1979; refer to Figures 2 and 3). The project area is located 15 feet west of the centerline of the river as depicted on the 1968 USGS topographic quadrangle. No work is proposed east of this centerline or east of the Little Colorado River channel itself; thus, Navajo Nation lands are not included in the project area.

The project area includes the maximum limits of Phase I, Phase II, and Phase III field investigations described above, in addition to three non-contiguous background areas identified by the EPA. The background areas are located on private lands in the SW $\frac{1}{4}$ of Section 9 and NW $\frac{1}{4}$ of Section 15 as described above (refer to Figures 2 and 3). Additional background areas may be added during implementation of Phase II and III Work Plans. Any additional background areas are anticipated to be within the current project area, and as such, maintain flexibility in associated measurements, with the ability to avoid any identified significant cultural resources.

The project area is entirely within the boundary of CO Bar Ranch, which is operated by Babbitt Ranches, LLC. Land ownership within CO Bar Ranch is a checkerboard of private, state, and federal land (Table 1).

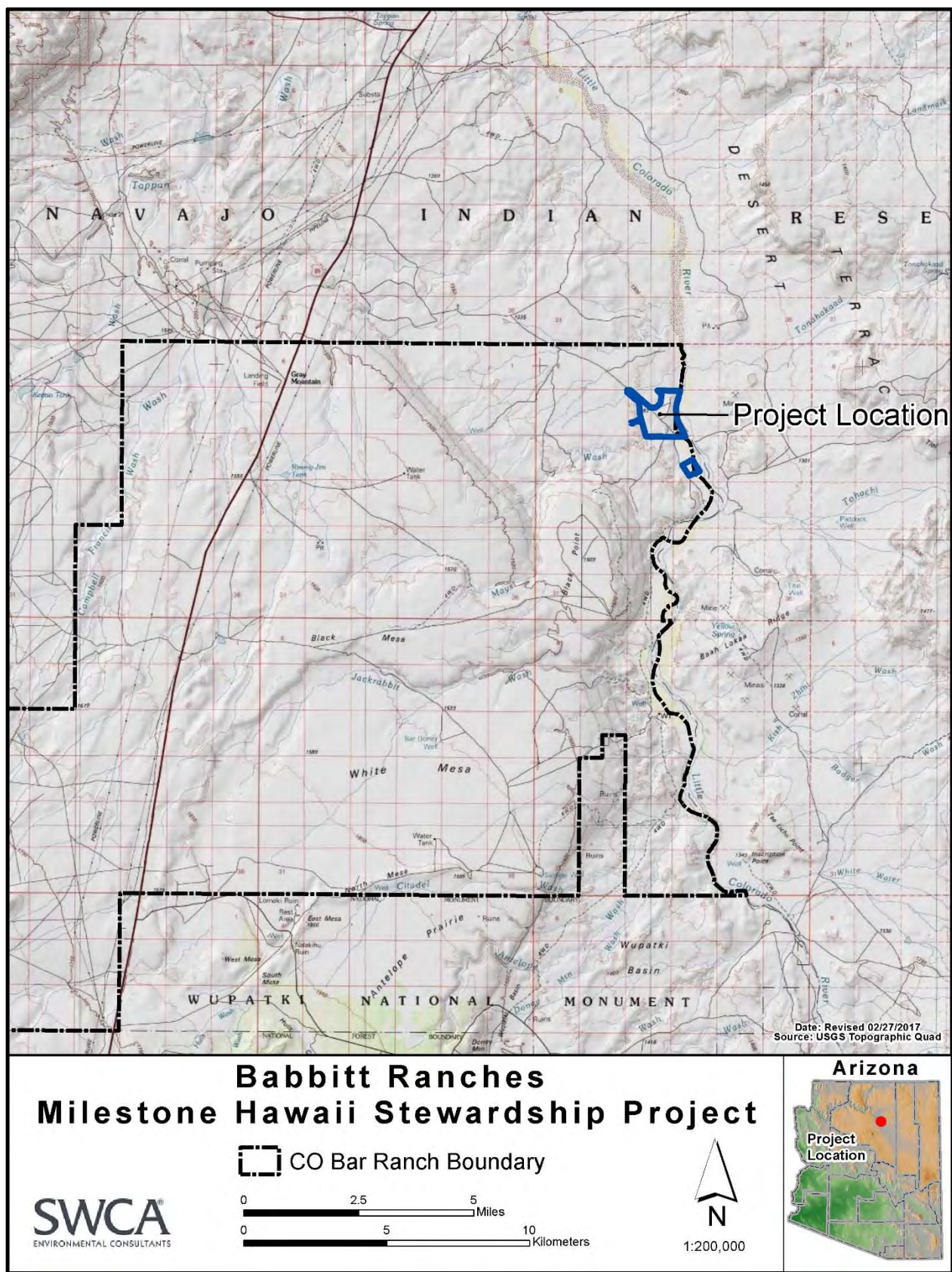


Figure 1. Project vicinity, near Gray Mountain, Coconino County, Arizona.

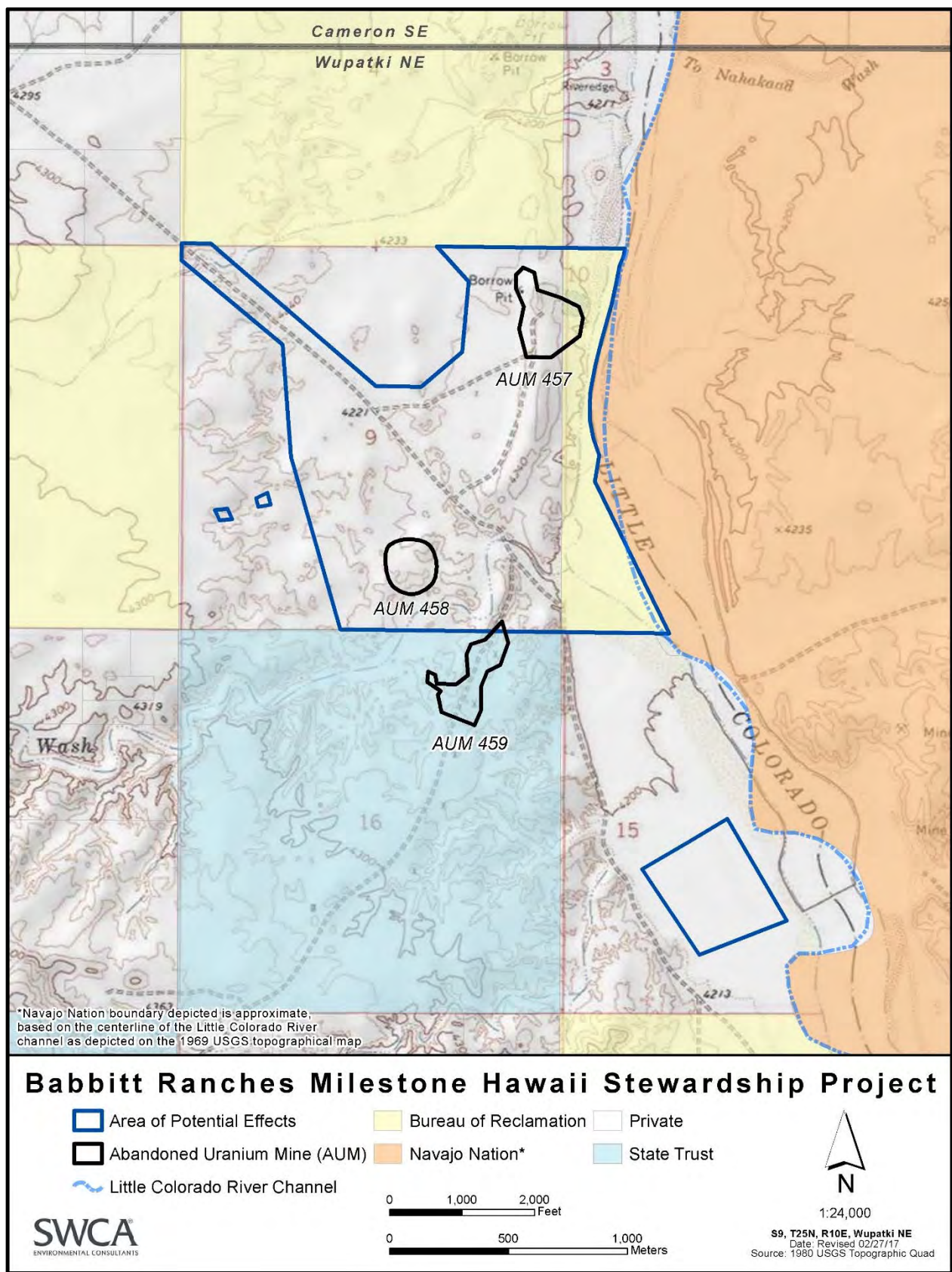


Figure 2. Project location, USGS topographic series (scale=1:24,000).

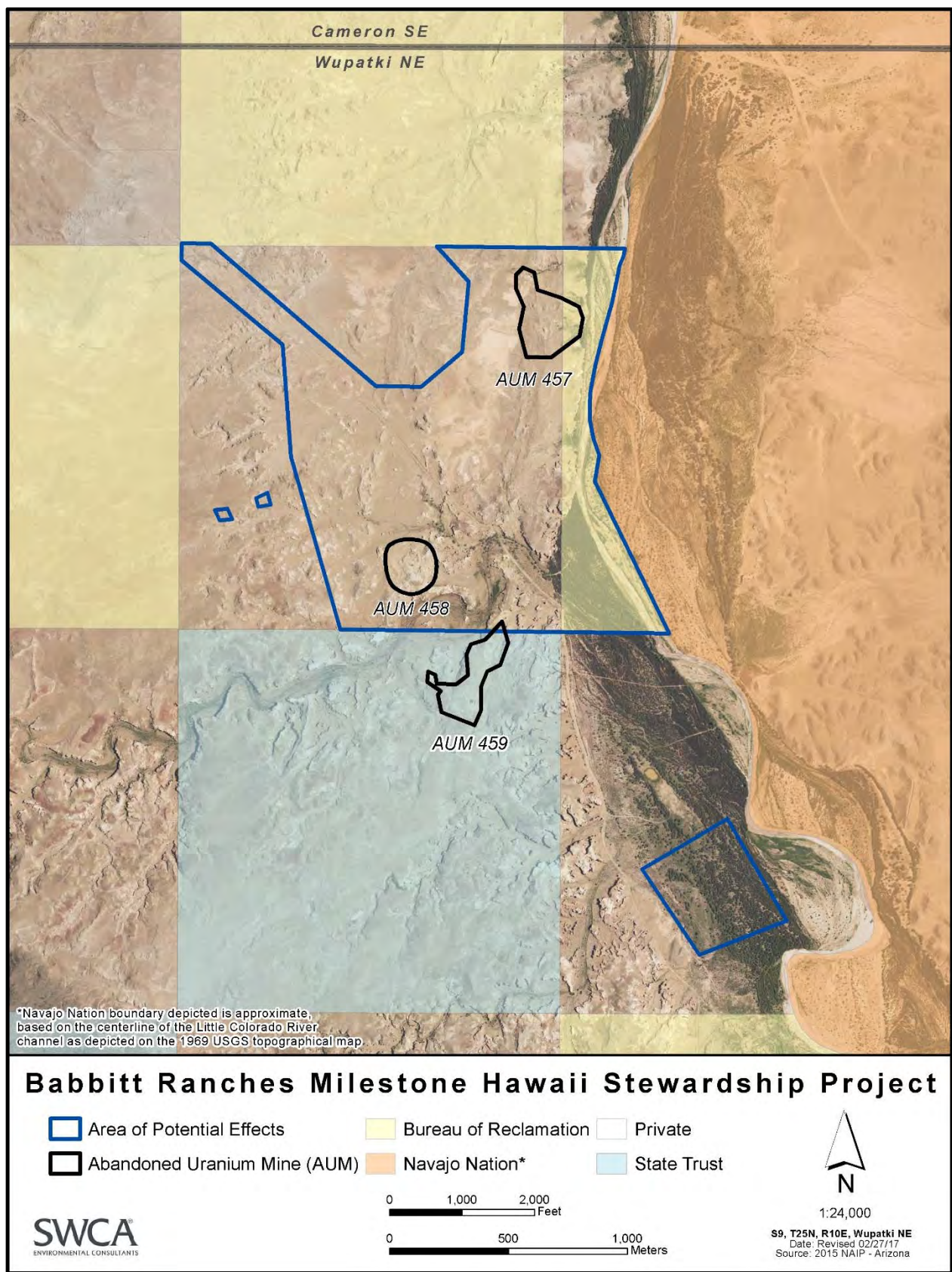


Figure 3. Project location, aerial photograph.

Table 1. Project Location and Survey Areas by Jurisdiction

Section*	Jurisdiction	Acres Surveyed	Acres Not Surveyed	Justification
9	Private	213.3	3.3	Vegetation density along the river corridor precluded access.
10	Reclamation	10.3	46.6	Vegetation density along the river corridor and the active river channel precluded access.
15	Private	17.8	28.2	Vegetation density along the river corridor precluded access.
Total		241.4	78.1	–

* All sections are in Township 27 North, Range 10 East. Acreage does not include the areas of the area of potential effects (APE) previously surveyed by Keller and Mason (1976), and only includes 2016 survey areas.

The portions of Sections 9 and 15 within the project area are privately owned. Section 9 is owned by Babbitt Ranches, LLC. Approximately 200 acres of the riparian corridor in Section 15, which includes the project area, is held by Babbitt Ranches, LLC, under a conservation easement. The portion of Section 10 within the project area is leased federal land under the jurisdiction of Reclamation.

An approximately 182-acre portion of the project area has been previously surveyed for cultural resources (Keller and Mason 1976) in the vicinity of AUM 457, AUM 458, and AUM 459. The Keller and Mason (1976) survey is more than 10 years old; however, SWCA recommends that this report meets the minimum adequacy standards outlined by Arizona State Historic Preservation Office (SHPO) Guidance Point 5. A complete copy of this report is included in Appendix F of this document. Accordingly, the area surveyed by SWCA does not completely coincide with the project area.

Area of Potential Effects

Pursuant to Title 36 Code of Federal Regulations (CFR) Part 800.16, the area of potential effects (APE) is the geographic area where the project has the potential to directly or indirectly impact any significant cultural resources that may be present. The APE for this undertaking is limited to the area of direct impacts related to the interim removal action and RSE, amounting to 501.6 acres of private and Reclamation lands in Sections 9, 10, and 15, Township 27 North, Ranch 10 East. No lasting auditory, visual, atmospheric, or other indirect impacts are anticipated as a result of the interim removal action and RSE.

Regulatory Context

Babbitt Ranches, LLC, and the EPA entered into a Settlement Agreement and Administrative Order on Consent, which was finalized on October 25, 2016. The AOC, which requires the performance of the interim removal action and RSE, is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended, Sections 104, 106(a), 107 and 122 (Title 42 United States Code [USC] Sections 9604, 9606(a), 9607, and 9622). EPA administration and oversight of the AOC constitutes a federal undertaking pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665; 54 USC 300101 *et seq.*), and implementing regulations promulgated by the Advisory Council on Historic Preservation (ACHP), codified under 36 CFR 800.

Additionally, Reclamation is a federal agency with jurisdiction over Section 10 of the project area. Reclamation has designated the EPA to act as the lead federal agency for compliance with Section 106 of the NHPA. Therefore, the EPA will consult with Reclamation during the Section 106 process. On lands managed by Reclamation, substantive provisions of the Archaeological Resource Protection Act of 1979

(ARPA) (16 USC 470aa-mm), and its implementing regulations promulgated at 43 CFR 7, are applicable, prohibiting excavation, removal, damage, alteration, or defacement of eligible archaeological resources absent an exception or a permit. Pursuant to Section 101 of the NHPA (54 USC 302303), the EPA will consult Native American groups that attach religious and cultural significance to historic properties that may be affected by the undertaking. In consultation with SHPO, EPA has identified the following Native American groups: the Navajo Nation, the Hopi Tribe, the Chemehuevi Tribe, the Pueblo of Zuni, the Kaibab Paiute Tribe, the Hualapai Tribe, the Havasupai Tribe, and the Yavapai Apache Nation on this project.

Cultural Resource Definitions

As no established standard applies to private lands, archaeological resources were evaluated according to criteria established by the Arizona State Museum (ASM) for cultural resources on State lands. These criteria also are acceptable to most federal land managers in the state of Arizona, including Reclamation. The criteria recognize two classes of archaeological remains: the site and the isolated occurrence (IO). The archaeological site is defined under rules adopted for the administration of the Arizona Antiquities Act:

“Archaeological site” means any area with material remains of past Indian or non-Indian life or activities that are of archaeological interest, including without limitation, historic or prehistoric ruins, burial grounds, and inscriptions made by human agency. (Arizona Antiquities Act, Arizona Revised Statutes [ARS] 41-841, *et seq.*, Chapter 8-201, A.3)

As interpreted by the ASM, “remains of archaeological interest” may include “purposeful constructions” or simply concentrations of materials more than 50 years old. Additionally, sites should consist of at least one of the following:

- 30+ artifacts of a single class (i.e., 30 sherds, 30 tin cans) within an area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (i.e., one ceramic pot, one core, one glass bottle);
- 20+ artifacts which include at least 2 classes of artifact types (i.e., sherds, groundstone, nails, glass) within an area 15 meters (50 feet) in diameter;
- One or more archaeological features in temporal association with any number of artifacts;
- Two or more temporally associated archaeological features without artifacts.

Non-linear, isolated features without associated artifacts may be recorded at the discretion of the archaeologists. An “isolated feature” is defined as a feature that does not have any other features within a 100 meter (325 feet) diameter. This might include isolated rock piles. Mine shafts, prospecting pits or unidentified depressions without associated artifact associations. (ASM 1995).

An archaeological occurrence meeting these minimum criteria is recorded as a site. An occurrence not meeting these criteria is generally classified as an IO, although under exceptional circumstances an occurrence may be judgmentally classified as a site.

Arizona and National Register Criteria for Evaluation

Four criteria are applied in the evaluation of cultural properties for inclusion in the National Register of Historic Places (NRHP) (36 CFR 60.4). The same criteria are used to evaluate properties for inclusion in the Arizona Register of Historic Places (ARHP) (Arizona Administrative Code Section R12-8-302). In general, a significant property must be at least 50 years old and meet at least one of these four criteria to be considered eligible for listing in the Arizona and National Registers of Historic Places (A/NRHP).

According to the A/NRHP criteria, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

In addition to demonstrating significance in one or more categories cited above, a property must demonstrate integrity. The historic property must convey its significance, as evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric use (National Park Service [NPS] 2002). Integrity is evaluated in terms of seven qualities: association, location, materials, setting, feeling, design, and workmanship. These qualities are useful for analyzing the types of integrity that a resource might possess.

Evaluation of A/NRHP eligibility for archaeological resources identified during the survey is based on the guidance provided in *National Register Bulletin 36—Guidelines for Evaluating and Registering Archeological Properties* (NPS 2000).

BACKGROUND

This section of the report presents a context for the environment and history of the project area vicinity.

Natural Environment

The project area is situated within the arid Little Colorado River valley at elevations ranging from approximately 4,200 to 4,250 feet above mean sea level. The river, situated immediately east of the project area, is a 356-mile-long, spatially intermittent stream with a low-gradient, meandering, unstable, often braided channel (Graf et al. 1996). For much of the river's length, surface water flow is ephemeral, occurring only in response to snowmelt and precipitation events. Groundwater is present in an alluvial aquifer adjacent to the Little Colorado River. The project area is north of Black Point, a prominent basaltic lava flow located about 3 miles to the south. The Painted Desert is located 15 miles to the east of the project, and the Coconino Plateau is located about the same distance to the west.

Bedrock in the project area consists of Late Triassic (245- to 208-million-year-old) Chinle Formation deposits (Kamilli and Richard 1998). Chenoweth (1993) maps all of Section 9 in the Shinarump member of the Chinle Formation and specifically places the mines in Shinarump. Billingsley (2007) maps Section 9 in two members of the Chinle: 60 percent in the Shinarump member and 40 percent in the Petrified Forest member. Surface geology of the project area includes bedrock outcroppings and heavily eroded alluvium deposits composed of pebbles, cobbles, and boulders (Billingsley et al. 2007). Portions of the project area near AUM 457 are situated on a Quaternary (1.6-million-year-old to present) stream terrace that parallels the Little Colorado River. Shinarump conglomerate sandstone (basal member of the Chinle Formation) underlies the terrace and outcrops to the surface in several places. Elsewhere, terrace substrate consists of poorly sorted fluvial gravel, pebbles, and cobbles partly consolidated in a matrix of mud and sand cemented with calcium and gypsum. Playa areas to the west of AUM 457 are composed of ponded sediments (clay, silt, sand, and lenses of gravel) partly consolidated by calcite and/or gypsum cement. The hardpan surfaces of these areas are covered with pebbles and cobbles and virtually devoid of vegetation. The current

floodplain of the Little Colorado River is composed of clay, silt, sand, and some gravel partly consolidated by gypsum and calcite cement. The floodplain is subject to stream-channel erosion, overbank flooding, and temporary ponding. Floodplain thickness (depth) along the Little Colorado River ranges from 6 to 30 feet.

Both the Shinarump and Petrified Forest members of the Chinle Formation contain naturally occurring radioactive materials such as radium, uranium, thorium, potassium, and their radioactive decay products. The systematic array of trenching through the Quaternary terrace deposits in Section 9 and surrounding areas suggests that mineral exploration followed the geologic contact between the two members.

Upland soils on the area are broadly classified as well-drained Badland-Torriorthents complex, moderately steep (National Resources Conservation Service [NRCS] 2016). This classification is 55 percent Badland and 25 percent Torriorthents and similar soils. Badland is defined by the NRCS as landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes with narrow interfluvies. Badlands develop on surfaces with little or no vegetative cover, overlying unconsolidated or poorly cemented materials (clays, silts, or in some cases sandstones) (NRCS 2016). Torriorthents are dry Entisols that lack pedogenic horizon development because they occur on eroded parts of the landscape. The upland plant communities in the APE indicate alkaline, saline soils. On the floodplain, soils are classified as somewhat poorly drained Torrifluvents, saline. Within the Little Colorado River channel, soils are mapped as Torrifluvents, saline and Riverwash, which is unstabilized sandy, silty, clayey, or gravelly sediment that is flooded, washed, and reworked frequently by rivers (NRCS 2016).

Brown and Lowe (1980) mapped upland habitat in the APE as Great Basin Desertscrub. Plant species diversity is characteristically low in this biome (Turner 1994). The Southwest Regional Gap Analysis Project (SWReGAP) mapped most of the upland habitat in the APE as Inter-Mountain Basins Greasewood Flat. This landcover class typically occurs near drainages on stream terraces and flats and forms rings around unvegetated playas. Soils are typically saline; bare ground is common. Vegetation consists mostly of scattered, low, small-leaved shrubs with few or no trees. The herbaceous layer, if present, is usually dominated by graminoids, including alkali sacaton (*Sporobolus airoides*) (Colorado Natural Heritage Program 2005). Additional SWReGAP landcover types mapped in the APE include bedrock, badlands, and semi-desert shrublands.

Vegetation is dominated by small native and non-native shrubs and bunchgrasses. The most common native shrubs are *Atriplex* spp. and broom snakeweed (*Gutierrezia microcephala*). The most common grass genus is *Sporobolus*, with some specimens identified as *S. airoides* and *S. cryptandrus*. Two non-native, invasive shrub species—camelthorn (*Alhagi maurorum*) and Russian thistle (*Salsola tragus*)—are widespread. Camelthorn and sometimes non-native tamarisk (*Tamarix* sp.) delineate small drainages. Riparian habitat occurs on the Little Colorado River floodplain bordering the eastern project area. The riparian ecological community is dominated by tamarisk and camelthorn, which account for the majority of the ecosystem's biomass. Several cottonwood trees were observed on the floodplain.

Built Environment

This portion of Coconino County is very sparsely populated. One rough, unmaintained dirt road traverses Section 9 from the northwest to the southeast, passing between AUM 457 and 458. Smaller tracks branch off from the road. Access to the road is not gated at the ranch's northern border, and judging by tire tracks and road condition, vehicles sporadically use the road to reach state, private, and Reclamation land on the ranch south of Section 9. Historically, the road was used to support uranium and gravel mining on CO Bar Ranch, but mining no longer occurs anywhere in the vicinity. Shallow mine pits (less than 20 feet deep), waste-rock piles, mine access roads, and concrete foundations of mine structures remain on the ground surface in areas where mining took place. The Navajo Nation borders the project area to the east.

Diné Bahane'

The history of *Diné*, or the Navajo People, begins with the emergence of the earth-spirit people. The earth-spirit people, as a result of misconduct, are forced to travel upward through several worlds until they reach this, the Glittering World, where the Diné were placed between four mountains: *Sisnaajini*, *Tsoodzil*, *Dook'o'osłíid*, and *Dibé Nitsaa* (Blanca Peak, Mount Taylor, San Francisco Peaks, and Mount Hesperus) (Iverson 2002). Along their travels, the earth-spirit people encounter the Holy People, intelligent beings who can perform magic and travel by sunray (Zolbrod 1984:48). The Holy People are responsible for the creation of First Man and First Woman, who in turn, create the first hogan and sweat lodge. First Man and First Woman also attend the ceremony during which the Holy People create Changing Woman/White Shell Woman. Fathered by the Sun, Changing Woman/White Shell Woman gives birth to twin boys, Monster Slayer and Born for Water. The brave Monster Slayer, variously assisted by his mother, father, and brother, proceeds to kill the monsters, which had been created in a previous world. The slaying of the monsters had restored safety and order to the world, but by this time the population had been almost decimated by the ravenous monsters. In a sympathetic effort to relieve Changing Woman/White Shell Woman's loneliness, the Holy People created the first five-fingered earth-surface people (mortals), a man and a woman. It is said that this marks the emergence of the Diné. Changing Woman/White Shell Woman created the first four Navajo clans by rubbing skin on various parts of her body (Kelley and Francis 1994:24). Some clans are thought to be direct descendants of the first mortals created by the Holy People (Zolbrod 1984:289).

Archaeological Background

The following discussion is the culture history of the region prior to contact between Native Americans and European-American explorers as constructed by archaeologists. This synthesis is provided as a context for evaluating the pre-Contact cultural resources identified within the project area. Following Willey and Phillips (1958), archaeologists discuss the pre-Contact American Southwest in terms of four epochs that represent broad adaptations and significant changes in past lifeways. These are the Paleoindian (before 6500 B.C.), Archaic (6500 B.C.–A.D. 500), Formative (A.D. 500–1450), and Protohistoric (A.D. 1450–1540). The Navajo, Hopi, and other Native American groups are directly descended from and claim affiliation to the pre-Contact peoples of the region. To the Navajo, these ancestors are the *Anasazi*, while the Hopi refer to the same people as *Hisat'sinom*; both terms are objectionable to the other, and neither is repeated here. Figure 4 presents a cultural chronology for northeastern Arizona as synthesized in the sections below.

First Peoples

Archaeological evidence suggests that the first human inhabitants of the Southwest were highly mobile Paleoindian hunter-gatherers who relied largely on now-extinct Pleistocene megafauna (Cordell 1997:97–100). During the Paleoindian period, people lived in highly mobile family groups traveling in search of game such as bison and mammoth. This period is generally divided into the Clovis (10,000–9000 B.C.), Folsom (9000–8000 B.C.), and Plano/Cody (8000–6500 B.C.) complexes, based on changes in projectile point technology and the primary big-game species exploited. The Clovis complex is characterized by large, fluted points with overshot flaking and basal grinding that have been found associated with the remains of Columbian mammoth (*Mammuthus columbi*). The Folsom complex is characterized by well-made points with concave bases that have been deeply fluted on both sides in the final stage of production. Folsom points have been found associated with extinct long-horned bison (*Bison antiquus*). The Plano/Cody complexes are characterized by a variety of lanceolate projectile point forms exhibiting parallel flaking (such as Midland, Plainview, Eden, Scottsbluff, Belen, and Angostura), as well as Cody knives. These projectile point types have been found associated with the remains of modern bison (*Bison bison*). Evidence for Paleoindian use of the region is extremely rare, and none of the sites have been identified in this area, let alone excavated. Hence, almost nothing is known of the Paleoindian use of the

area, other than that Paleoindians were present. Any evidence of Paleoindian use of the region is thus extremely important, even when it consists solely of isolated Paleoindian projectile points.

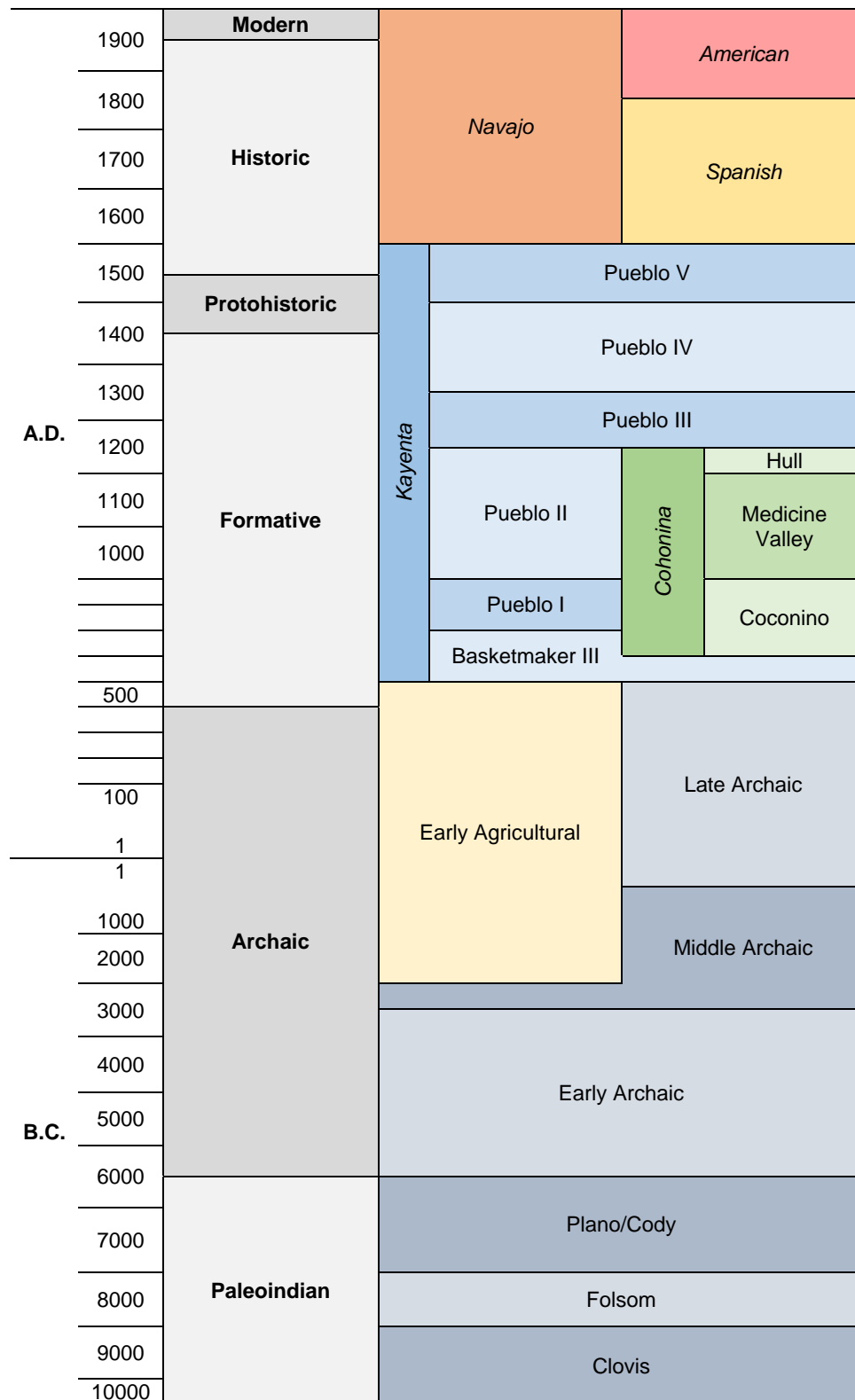


Figure 4. Comparative chronology for the APE vicinity.

A handful of known isolated Paleoindian projectile points collectively indicate that the region was used by Paleoindian big-game hunters between 9,000 and 11,900 years ago. It is likely that this early use of the region focused on obsidian sources located in the San Francisco and Mt. Floyd Volcanic Fields. Nearby documented sources of Paleoindian projectile points found include Government Mountain, which is about 15 miles south of CO Bar Ranch, and Black Tank, which is about 38 miles west of CO Bar Ranch and just west of Espee Ranch (Lyndon 2005). A Paleoindian Clovis point fashioned from Black Tank obsidian was found near the Citadel Sink, within 2 miles of the CO Bar Ranch boundary (Downum 1993).

Hunters and Gatherers

In response to a drying climate and loss of the Pleistocene megafauna that followed the end of the Ice Age, the indigenous people of the region began to concentrate in areas with readily available water, becoming increasingly less mobile than their Paleoindian forebearers. The Archaic period commenced with a shift to a subsistence strategy dominated by extensive seasonal mobility and hunting of smaller game animals and the exploitation of a variety of economically important wild plants (Huckell 1996). For the purposes of this document, the Archaic period refers to the time between the Paleoindian period and before the introduction of cultigens, when inhabitants practiced broad-spectrum hunting and gathering. The appearance of maize agriculture is considered the end of the Archaic Period (Huffman and Warburton 1999:10–11; Smiley 2002a:28). With this means of subsistence, emphasis was placed on plant seed resources, while small- and large-game animals alike were hunted.

This period is generally regarded as the time when people became increasingly familiar with regionally available Holocene species and began to use a wider range of plants and animals. Regional traditions of flint knapping, rock art, and basketry emerged, indicating the localization of populations.

The long span of the Archaic has been divided into three phases based on changes in material culture, primarily projectile point forms. The Archaic has been divided into three periods primarily based on projectile point forms (Huckell 1996): the Early Archaic extends from 6000 to 3500 B.C., which includes Jay, Bajada, and Pinto points, the Middle Archaic period from 3500 to 500 B.C., which includes Gypsum, San Jose, and several varieties of corner-notched points, and the Late Archaic from 500 B.C. to A.D. 500, which includes corner-notched points and the introduction of cultigens.

The Early Archaic (6000–3500 B.C.) is characterized by the appearance of new projectile forms, an increase in ground stone milling tools, and the absence of megafaunal remains (Mabry 1998), although in some areas of North America, Early Archaic and Late Paleoindian period occupations may overlap.

On the Colorado Plateau of northern Arizona, tapering stem, Pinto Basin, and notched projectile points appear. According to Matson (1991), during the Early Archaic in the Southwest, projectile points are found in greater numbers at higher elevations and milling/grinding stones in greater numbers at lower elevations. He suggests that hunting was more prevalent at higher elevations and gathering was more prevalent at lower elevations. Following Matson (1991) and based on the distribution of sites in Arizona, Mabry (1998) believes that hunting was the main subsistence activity on the Colorado Plateau and seed processing was the main subsistence activity in areas of lower elevations such as the Lower Colorado River valley.

In the archaeological record of the Middle Archaic in the Southwest (ca. 3500–500 B.C.), an increased number of grinding tools are identified, as well as roasting and storage pits, but there is an overall decrease in the number of sites. The number of grinding tools suggests increased reliance on plant food by Archaic people during this middle period. Elko Corner-notched points greatly increase in number in the southwestern Great Basin (Holmer 1986) and also appear in greater numbers in Arizona. Stemmed points, such as Oshara tradition Bajada points (Irwin-Williams 1967), and expanding stem points are also represented at Middle Archaic sites.

In the archaeological record of the Late Archaic (ca. 500 B.C.–A.D. 500), there is a significant increase in the number of sites in the Southwest and in the number of features associated with less-mobile populations, such as pit structures and trash middens (Mabry 1998). Several new projectile points appear at this time, including Elko Eared and Gypsum points. These new points often share geographic ranges but represent separate phases in the Late Archaic (Holmer 1986; Matson 1991).

Archaeological evidence for the Archaic is quite sparse in many areas and is often concentrated in a few favored locations, such as rockshelters. In most areas, the most abundant evidence of Archaic occupation or land use comes in the form of isolated artifacts, usually diagnostic projectile points. An Archaic presence can also be detected through the discovery of distinctive styles of rock art, such as the Glen Canyon Linear style, which is found in parts of the northern Southwest (Schaafsma 1980:72–76; Turner 1963, 1971). Artifacts and sites dating from Archaic period have been found both north and south of CO Bar Ranch (Lyndon 2005), and probable Archaic artifacts have been documented on the Ranch itself (Brown and Downum 1997).

The Tolchaco Complex

It is common for archaeologists to assume, implicitly or explicitly, that aceramic sites (that is, archaeological sites lacking later Formative ceramic artifacts) date to the earlier Paleoindian or Archaic stages. Along the Little Colorado River between Holbrook and Cameron, one can find a ubiquitous series of extensive Pleistocene gravel and cobble deposits that include high-grade tractable chert tool stone raw material and, unsurprisingly, are also archaeological lithic scatters containing abundant evidence of human modification (Keller 1984:7). These loci, first recognized as Tolchaco Complex sites by Katherine Bartlett (1942, 1943), are generally described as low-density scatters of lithic core and shatter materials with occasional bifacial tools and scrapers, very few other artifacts, and no archaeological features or datable contexts. Thus, Tolchaco sites have never been securely placed in time. These site types have variously been described as dating to the Paleolithic or pre-Paleoindian (Krieger 1962, 1964), Paleoindian or Archaic periods (Bartlett 1942, 1943; Keller 1984), to the full Paleoindian through Protohistoric sequence (Sharrock 1966). Keller (1984) argues that the sites clearly functioned as lithic quarries, since there is a paucity of usable flakes, and abundance of exhausted cores, and because identical raw materials can be found at many prehistoric archaeological sites in the region.

Early Agriculturalists

The term Early Agricultural (Huckell 1995) pertains to a somewhat new concept, introduced as a chronological marker defined as “the interval during which agriculture was first practiced but ceramics were not in use” (Geib 1996:54). In general, the Early Agricultural period on the Colorado Plateau spans 2000 B.C.–A.D. 500 (Smiley 2002b). The Early Agricultural period in the southwestern United States, and the northern Southwest in particular, involves the introduction of domestic cultigens such as maize and squash into the diets of prehistoric populations through primary crop acquisition (Minnis 1992). Identifying the arrival of domesticated plants in the northern Southwest remains elusive due to the paucity of accurately dated early sites containing domesticates. Early researchers placed the arrival of maize into the northern Southwest at approximately A.D. 1 (Matson 1991). Later work involving more precise dating methods and a more thorough understanding of these methods pushed the earliest dates for a reliance on domesticated plants back to at least 600 B.C. (Matson 1991). Continuous work to refine the chronometric resolution of domesticated plants in the Southwest has produced accelerator mass spectrometry (AMS) dates on annual plants, namely maize, indicating the introduction of domesticates occurred as early as 2000 B.C. (Gilpin 1994; Smiley 1994, 2002b).

Currently, there is much debate about the origins and transmission of cultigens into the northern Southwest. Debate concerning the origins of agriculture on the Colorado Plateau involve three major models. The in situ model posits hunter-gatherers occupying the region adopted agriculture from an outside source

(Irwin-Williams 1973, 1979; Kidder 1927). The migration model proposes that agriculturalists from the south migrated into the region, bringing cultigens along (Berry and Berry 1986). The third and most recent hypothesis, the two-source model, posits a combination of the in situ and migration models (Matson 1991). In the two-source model, migrants brought cultigens into the Four Corners area, where endemic hunter-gatherer populations later adopted agriculture. Further complicating the matter concerns how rapidly domesticates were integrated into the diet and to what extent early agriculturists relied on cultigens. Some researchers argue for a rapid introduction and adoption of domesticated plants (Smiley 1994), while others argue for a much slower paced transition from wild resources to a reliance on cultigens (Wills 1988). Recent carbon-isotope research suggests a rapid adoption and dependence on domesticated plants (Chisholm and Matson 1994; Coltrain et al. 2006; Matson and Chisholm 1991). Regardless of the timing and pace of cultigen adoption, or the contemporaneous occupation by hunter-gatherers and early agriculturalists, the shift from hunting and gathering to farming involves substantial changes in social structure, settlement patterns, land use, ideology, and ultimately material culture.

The recently proposed Early Agricultural Period encompasses the Basketmaker II concept. Basketmaker II originally referred to a cultural group defined by an array of material culture, including feature types, skeletal morphology and burial practices, a lack of masonry houses and ceramics, the presence of early cultigens, the atlatl and dart, and finely crafted baskets (Pepper 1902). Later, the term “Basketmaker” became a temporal period applied to the early portion of the indigenous development of Puebloan groups (Guernsey and Kidder 1921; Kidder and Guernsey 1919). Over time, the term has become amorphous, as exhibited by Tipps’ observation of “whether it is a stage, a constellation of traits, a time period, a lifeway, an ethnic group, a geographic area, or some combination of the above” (Tipps 1995:143). For our purposes, the term Basketmaker II is applied to early agriculturalists with distinctive material culture and architecture who occupied areas of the Colorado Plateau.

Cohonina and Kayenta

After A.D. 500, the people of the Colorado Plateau begin to manufacture ceramic artifacts, marking the beginning of the Formative. *Cohonina* and *Kayenta* are neutral terms for archaeologically defined cultures who inhabited this portion of the Colorado Plateau during the Formative Epoch. Both groups practiced similar lifestyles, manufactured ceramics, lived in subterranean pit houses in the earliest phases, and aggregated into masonry pueblo villages in the late phases. While the Kayenta were sedentary agriculturalists that grew corn, beans, squash, and cotton in the arid soils of the region (Cordell 1997; Downum 1992), the Cohonina were likely seasonally mobile hunter-gatherers early on, but developed a more sedentary lifeway later that focused on hunting with less agriculture (Bone 2002; Cartledge 1979; Hanson et al. 1988).

COHONINA

The term *Cohonina* was coined by Harold Colton (1938, 1939) and colleagues to describe the prehistoric inhabitants of the area west of the San Francisco Peaks that manufactured San Francisco Mountain Gray Ware ceramics. The name is derived from Hopi, and means “the people who live west of the peaks” and is also their word for the modern Havasupai peoples. The material remains of the archaeologically defined Cohonina culture are confined, for the most part, to the Coconino Plateau—the area north of the Mogollon Rim, west of the Little Colorado River and south of the Grand Canyon, including the Upper Basin and excluding the San Francisco Peaks (Chronis 1983:177; Hanson et al. 1988:4,6). Hanson et al. (1988:4) and Hanson (1996:110) describe the Cohonina as a highly adaptable group with several types of habitations, spanning several environments, and subsisting on hunting, gathering, and horticulture. The Cohonina likely lived in seasonal cycles, and may have moved from habitations in the piñon-juniper zone (where they built smaller 1- to 3-room habitation structures) to the ponderosa pine zone (where they built clustered pit house villages) between summer and winter (Horn-Wilson 1997:15; Samples 1992). Cohonina culture history, as described by Hanson et al. (1988) is discussed in terms of three accepted periods: the Coconino phase,

which dates from A.D. 700 to 900; the Medicine Valley phase, which dates from A.D. 900 to 1100; and the speculative Hull phase, which dates from A.D. 1100 to 1150. The Cohonina culture area west of the San Francisco Peaks appears to have been depopulated by the mid-1100s.

The paste of San Francisco Gray Ware is sedimentary clay, which is tempered with fine quartz and feldspar sand, angular to subrounded, with some mica. The relatively thin pottery is ring-built (formed by adding thick coils to a base slab), scraped, and thinned using a paddle and anvil. Pottery types are Floyd Gray, Floyd Black-on-gray, Deadmans Gray, Deadmans Fugitive Red, Deadmans Black-on-gray, Kirkland Gray, and Bill Williams Gray. The Cohonina practiced limited agriculture, but primarily relied on gathering wild plants and hunting. The Cohonina are known for their serrated projectile points, although the Cohonina used several types of project points that were not serrated (Lyndon 2005).

During the Coconino phase, agriculture became more widely used although in a limited sense throughout the Cohonina occupation. They primarily relied on gathering wild plants and hunting. For example, sites on the headwaters of the Big Sandy River (Bair and Stoker 1994), provided information on Cohonina subsistence practices. Pollen samples yielded pollen of pine, cheno-ams, beeweed, purslane, Umbelliferae (parsley family), cholla, and maize. Flotation samples yielded wood of juniper, pine, saltbush/greasewood, and Apache plume. Maize was the only cultigen present. Wild plants and nuts represented in the flotation samples included seeds of juniper, dropseed, clammyweed, cheno-ams (including goosefoot), purslane, sunflower, panic grass, Deschampsia, and yucca, as well as pinyon nuts. Faunal bone from the sites represented a wide range of taxa: large mammals (including medium-sized ungulates, artiodactyls, pronghorn, deer, and bighorn sheep), medium-sized mammals (gray wolf, coyote/dog, bobcat), rabbit-sized mammals (cottontail and jackrabbit), rodent-sized mammals (prairie dog, Botta's pocket gopher, pocket mouse, grasshopper mouse, kangaroo rat, woodrat), birds (including northern flicker and roadrunner), lizards, snakes, and turtles/tortoises (including snapping turtle).

Cohonina architecture included masonry pueblos and pit houses, but no kivas. Bone (2002) investigated Cohonina public architecture ("forts," plazas and long rooms, and ball courts) on the Coconino Plateau. He divided his study area into a northern area (bounded by State Route 180 on the north and east, Interstate [I-] 40 on the south, and State Route 64 on the west) and a southern area (south of I-40 between I-40 and the Mogollon Rim). More than 200 habitation sites were present in the northern area, along with seven "forts" and five plaza sites or sites with long rooms. More than 200 habitation sites were present in the southern area, along with three "forts," one site with a plaza or long room, and four ball courts.

Cartledge (1979, 1986) proposed that the Cohonina lived in communities clustered in the woodlands around the bases of the major mountains of the Coconino Plateau: Kendrick, Sitgreaves, and Bill Williams Mountains. In addition, based on McGregor's (1967) work around Mount Floyd, a community may have surrounded this mountain as well. Most communities apparently consisted of small, single-family residential sites clustering around the bases of these mountains (Cartledge 1979, 1986; Samples 1992; Wilcox et al. 1996). Within each cluster are several types of public architecture: "forts," sites with large plazas, sites with long rooms, and ball courts (Bone 2002).

Horn-Wilson's (1997) analysis of projectile points from different clusters of excavated sites on the Coconino Plateau indicated that settlement locations may have shifted over time. Early Cohonina (A.D. 600–900) projectile points were found in four areas: Red Butte, Medicine Valley, Baker Ranch, and Mount Floyd. Late Cohonina (A.D. 900–1100) points were found in four areas: Red Butte, Medicine Valley, Sitgreaves Mountain, and Red Lake. Very late Cohonina (A.D. 1100–1150) points were found in only two areas: Red Lake and Medicine Valley. Thus, only Medicine Valley was probably occupied throughout the Formative period, Red Butte was probably occupied in the early and late periods, Red Lake was probably occupied in the late and very late periods, Brown Ranch and Mount Floyd were probably occupied only in the early period, Sitgreaves Mountain was probably occupied only during the late period, and Mesa Butte yielded no projectile points dating to any of the three periods.

The Hull Phase witnesses a gradual “percolation” of Cohonina from the Coconino Plateau heartland to areas north and east of the San Francisco Peaks, where perhaps the Cohonina joined with neighboring Kayenta groups (Cartledge 1986, 1987; Hanson 1996:112). It is interesting to note that the apparent abandonment of the Cohonina area also coincides with a period of environmental uncertainty and major drought throughout Colorado Plateau (Dean 1992). Perhaps the Cohonina had moved to the Coconino Plateau in response to a period of degradation (A.D. 750–900), stayed for the period of increased precipitation, and abandoned the Plateau with the coming of the next degradation and drought. The effects of the environmental fluctuation from A.D. 1130 to 1180 are not confined to the Cohonina territory, but are believed to have forced populations throughout the Southwest to migrate and aggregate into areas of environmental reliability (Garcia 2004).

KAYENTA

Kayenta is neutral term used here to describe the pre-Contact peoples who generally lived east of the Cohonina and along the Little Colorado River valley in the vicinity of the project area. Ferguson and Rohn (1986:4) describe several archaeological signatures that define Kayenta: the use of decorated black-on-white pottery with corrugated gray utilitarian pots, the construction of two architectural forms—the subterranean ceremonial room (popularly called by the Hopi word *kiva*, although Navajo prefer to refer to most ceremonial constructions as *hogan*), and the standardized unit habitation (popularly referred to by the Spanish word *pueblo*), and interment of the dead in flexed inhumation burials. The Kayenta, for the most part, lacked the large villages that were characteristic of people living in Chaco Canyon and Mesa Verde, and tended to live in smaller communities (Gumerman and Dean 1989:104). Habitations were often constructed from simpler materials, replacing the elaborate masonry of the east with *jacal* or wattle-and-daub structures (Dean 1992:29). Additionally, the Kayenta built characteristic granary structures, incorporated “entry box” living room-type structures into their habitations, used pit houses for much of their sequence, and after Basketmaker III never built large subterranean rooms but built a variety of smaller subterranean ceremonial forms.

During the first Pecos Conference in 1927, A. V. Kidder proposed what has come to be known as the “Pecos Classification”—a systematic method of describing past temporal stages (Kidder 1927; Woodbury 1981). The Formative Pecos Classification consists of the Basketmaker III, Pueblo I, Pueblo II, Pueblo III, Pueblo IV, and Pueblo V stages (Basketmaker II is discussed above as part of the Early Agricultural period). This scheme continues to be widely used by archaeologists and is the temporal scheme used in this discussion.

In the Kayenta culture area, the earliest ceramics are sand-tempered grayware pottery that dates to about A.D. 500, marking the beginning of the Basketmaker III period (Nichols 2002). During Basketmaker III times (A.D. 500–850), habitation sites become larger, with formalized site layouts appearing by the end of the Basketmaker III period. Large subterranean ceremonial or community structures were first used near the end of the period. Basketmaker III pit houses were excavated deeper into the ground than those constructed during the preceding Early Agricultural period (Nichols 2002:69). Typical residential structures were slab-lined, with an antechamber and central fire pit with low wing walls extending to the structure perimeter (Huffman and Warburton 1999:12). This period also witnessed the appearance of the bow and arrow, with a corresponding decrease in the size of projectile points.

The appearance of aboveground masonry storage rooms and the site configuration termed the *unit pueblo* marked the beginning of the Pueblo I period (A.D. 850–1050), which is when Kayenta-affiliated sites begin to appear along the Little Colorado River (Garcia 2004; Powell 2002). The unit pueblo is generally described as a series of masonry storage rooms, flanked by *jacal* (wattle and daub) living quarters. A pit structure was sometimes located in the plaza created by the pueblo (Powell 2002). In the Pueblo I period, neck-banded ceramic decoration replaced the plain gray pottery vessels typical of the Basketmaker III period (Powell 2002). Additional ceramic types characteristic of the Pueblo I period include Kana-a Black-

on-white and San Juan Red Ware traded from the Mesa Verde region (Huffman and Warburton 1999:12). The Pueblo I period marks the beginning of the Kayenta expansion, which resulted in smaller, dispersed settlements scattered over wide areas. The Pueblo II period (A.D. 1050–1150) witnessed continuing trends from the Pueblo I period. Neck-banded ceramics were replaced by all-over corrugation, and Tsegi Orange Ware and Tusayan White Ware ceramic types were introduced.

During the Pueblo III period (A.D. 1150–1275), the settlement pattern shifted from dispersed, comparatively small and autonomous settlements to larger population centers with aggregated, hierarchically related, outlying settlements (Dean 2002). Pueblo III sites tend to be located in or adjacent to major drainages, which, presumably, provided a reliable source of water. There was also a significant increase in the number of agricultural constructions within the Kayenta area during Pueblo III times, suggesting that agriculture was becoming more intensive and more important (Dean 2002). At the end of the Pueblo III period, much of the region appears to have been depopulated, perhaps a result of the Great Drought, which began in A.D. 1276 (Dean 2002:124). The trend of aggregation continued into the Pueblo IV period (A.D. 1275–1400), with populations centered along large drainages such the Little Colorado River. By 1400, much of the Colorado Plateau was uninhabited, with groups largely migrating to areas with permanent sources of water (Benson et al. 2007; Dean 2002; Peregrine and Ember 2001).

Reflecting the distribution of cultural resources at Wupatki National Monument (Anderson 1990), prehistoric remains in the western portions of CO Bar Ranch are likely to be affiliated with the Cohonina, whereas those in the eastern portions are likely to be affiliated with the Kayenta. This pattern is supported by limited archaeological surveys conducted on the Ranch. In the Little Wild Bill Tank and Dog Knobs areas, Hoffman (2004a, 2004b, 2005a, 2005b) found lithic and sherd scatters thought to be left by Cohonina hunters and gatherers. In the eastern CO Bar Ranch, Brown and Downum (1997) conducted an intensive survey of 3 square miles bordering Wupatki National Monument. Of the 146 prehistoric sites documented during that survey, 62 were identified as Kayenta. The remainder were of undetermined affiliation (i.e., contained no diagnostic ceramics). What appeared to be agriculture-related features dominated the assemblage, with 38 field houses, 14 rock alignments believed to delineate cleared fields, 26 miscellaneous enclosures, and 1 catchment. A total of 48 structures contained from two to more than 20 rooms each.

Navajo and Hopi

CO Bar Ranch falls within the traditional use areas of four Native American groups—Navajo, Hopi, Havasupai, and Yavapai. Occupation of the area between the fifteenth and eighteenth centuries is poorly understood, but archaeological evidence supports continued if sparse use by indigenous groups.

The Navajo share a close linguistic affinity with the larger group of Athabaskan speakers (Linford 2000). At some point the Athabaskans split into northern and southern linguistic groups, the Apaches and Navajos belonging to the latter. Some researchers (Brown 1996:68; Iverson 2002:16; Warburton and Begay 2002:164) assert that the Southern Athabaskans emerged in the Southwest long before the Spanish, and narratives found among the Navajo oral history repertoire are believed to support this. While the exact dates and route of Athabaskan migration into this region are currently contested; it is known that these people admixed with Cohonina and Kayenta descendants based on recent analysis of mitochondrial DNA diversity (Malhi et al. 2003).

Based on historical and archaeological evidence, what we now know as the Navajo way of life emerged in the Gobernador-Largo-Blanco District south of the San Juan River in northwestern New Mexico. This area, *Dinétaah*, is the origin and home of Changing Woman/White Shell Woman, the mother of the Navajo people and creator of the first four of the Navajo clans. The generally accepted boundaries of *Dinétaah* extend west from the Continental Divide to the intersection of the San Juan River and Canyon Largo, and north from Canyon Largo to just north of what is now the Colorado state line (Linford 2000:201). Navajo expansion

west of the Dinétah is believed to have occurred at least by the late seventeenth century (Gilpin 1996), and possibly earlier (Begay and Roberts 1996). A small number of early Navajo sites have been investigated west of the Chuska Mountains; these studies have resulted in the identification of four general site types: 1) pueblitos and defensive, 2) habitations, 3) limited activity, and 4) rock art (Gilpin 1996). Data collected from pueblito sites indicates an earliest occupation date of around 1760 (Gilpin 1996:195). Historical and ethnohistorical data collected by the Navajo Nation for the Glen Canyon Environmental Studies-Navajo Cultural Resources Project (GCES-NCRP) support Navajo use of the Grand Canyon region by the end of the seventeenth century (Begay and Roberts 1996:199).

The Hopi claim descent from the inhabitants of the Wupatki pueblos and continued to visit and travel through the area long after the pueblos were abandoned. Notably, Hopis have identified two ancestral trails that crossed the Little Colorado River just south of Black Point and traversed portions of the CO Bar Ranch. One trail turned north immediately after the crossing, passed between the western bank of the river and Black Point, cut across the northeastern corner of the Ranch, and headed north to the Desert View area of Grand Canyon (Ferguson et al. 2004). The second route continued westward after the crossing, passed south of Black Mesa (probably along Jackrabbit Wash), headed northwestward toward Red Butte (probably along Lockwood Canyon), and terminated in Havasu Canyon (Colton 1964). This trail directly connected the Hopi and Havasupai, long-time trading partners who visited each other's settlements and probably met and traded goods at designated points along the trail. Use of the CO Bar country by these two groups for hunting and gathering would likely have adhered closely to the established trade route. Yavapai may have occasionally passed through the CO Bar area while hunting or to raid Havasupai camps, but their presence would have been infrequent. This area was at the northeastern periphery of their range, which was concentrated south of the Mogollon Rim (Cleeland et al. 1992).

Post-Contact Historical Background

After conquering Mexico, the Spanish traveled north into the American Southwest. The first major Spanish exploration into this region was led by Coronado, who visited Zuni Pueblo between 1540 and 1542. The following years were characterized by colonization, conversion, warfare, and slavery. In 1629, Spanish Franciscans established mission settlements at the Hopi villages of Oraibi, Shungopovi, and Awatovi (Walker and Bufkin 1986); they also introduced sheep and other livestock to the region around this time. Spanish attempts to convert groups to Christianity were hampered by conflicts among Spaniards, Navajos, Puebloan, Apache, and other cultural groups (Towner and Dean 1996). Spanish and Mexican government officials provided ample documentation of their military campaigns against the Navajo (Kluckhohn and Leighton 1974).

Conflict and subsequent slave trading by the Spanish and Mexicans precluded any possibility of peace between the groups. During this time of upheaval, an alliance was formed between the Navajo and Puebloan groups. This alliance eventually led to an unsuccessful attempt to overthrow the Spanish (Iverson 2002). The Pueblo Revolt of 1680 temporarily arrested Spanish-Mexican campaigns against the Navajo and facilitated new alliances between various Puebloan groups and the Navajo (Kluckhohn and Leighton 1974). The Spanish-Mexican administration returned to the region in 1692, however, resuming their oppressive efforts. In the 1720s, a Spanish reform program effectively curtailed the attacks (Iverson 2002). With fewer efforts being expended on defense, the Navajo were able to expand westward.

Occupation of the CO Bar/Wupatki area by members of the Navajo Tribe dates from the early 1800s. Following the Mexican-American War and the Treaty of Guadalupe-Hidalgo in 1848, north-central Arizona became a territory of the United States. During this period, the U.S. waged war on the Navajo people. In much the same way as had been the case with the previous occupation, this period was alternately punctuated by an extensive series of U.S. military campaigns and Navajo response. Over the course of the next 20 years, several treaties were signed (although not ratified) by the U.S. and the Navajo, to no avail. War continued to escalate between the two groups until 1863, when Colonel Kit Carson

systematically destroyed Navajo fields and livestock, and proceeded in 1866 to march 8,000 Navajo groups on the “Long Walk” to Fort Sumner in New Mexico (Iverson 2002; Kluckhohn and Leighton 1974; Walker and Bufkin 1986). After a long period of marked suffering, the Navajo finally were released from captivity in 1868 and permitted to resume occupation within a reservation that had been established by the United States. Subsequent to their release, the Navajo showed their fortitude through the expansion of territory and population (Rocek 1995:18–20; Towner and Dean 1996). Euro-American traders proliferated starting in the 1870s. Generally the result of Executive Orders issued between 1868 and 1934, the Navajo Reservation boundaries expanded and contracted several times over the years. Today, the Navajo Nation encompasses 25,000 square miles; as of 2002, the population totaled over 290,000 people (Iverson 2002).

Early Navajo settlers of the CO Bar were forced out of the region 1866, but the family of Peshlakai Etsidi and other Navajos returned by 1870 to occupy Black Point, Antelope Prairie, and neighboring areas (Stoutamire 2013). There the Navajos raised corn and sheep in peace until Euro-American stockmen began moving cattle and sheep into the area onto what they considered open range. By the 1890s, serious conflicts arose between the two groups, particularly over limited water sources. In an attempt to resolve the issue, President Theodore Roosevelt expanded the Navajo Reservation westward in 1901 to include land occupied by the Navajo families west of the Little Colorado River. Because of the checkerboard of railroad land grants, however, only the even-numbered sections within what was called the “Leupp Extension” could be set aside for Navajo allotments. About one-half the land remained open to grazing by ranchers under leases with the railroad. In 1908, Peshlakai received six 160-acre allotments (960 acres total) in Antelope Prairie within what is now CO Bar Ranch, all in even-numbered sections. But after the Babbitts bought the surrounding odd-numbered sections from the railroad in 1921, this arrangement proved untenable. Enclosure within the range of the CO Bar rendered these allotments all but useless to the Peshlakais (see Figure 2). In about 1929, Peshlakai and his extended family abandoned the Antelope Prairie allotments, but their descendants still hold title to the land and have right of access (Stoutamire 2013).

Ranching

Prior to 1880 in Arizona, ranching, specifically cattle ranching, was limited due to ongoing Native American conflicts (Collins 2002). Ranching increased in Arizona in the 1880s as demand for livestock and livestock products increased in the Southwest and California, but was affected by a series of droughts and general economic decline beginning in 1885 (Collins 2002). After the 1890s, ranchers began limiting the amount of cattle they grazed and began to make more improvements to the land to increase the land’s carrying capacity for livestock. Although the Stockraising Homestead Act of 1916 allowed ranchers to patent up to 640 acres at a time for ranching, most ranchers in the West needed additional land to feed their livestock (Collins 2002). Ranchers fulfilled this need by grazing their livestock on public lands. Concern over the degradation of public lands due to overgrazing led to the Taylor Grazing Act of 1934, which provides for a permitting or leasing system for grazing on public lands. This legislation was intended to prevent overgrazing and soil deterioration; to provide for the orderly use of the public lands; and to stabilize the livestock industry, which depended on the public range. Because ranchers were now leasing land for long periods of time, they could invest money and time into constructing facilities for livestock and other improvements (Collins 2002).

Because it changed the way the government managed federal land, the Taylor Grazing Act of 1934 was probably the most significant federal legislation the West has seen to date. For one, it essentially ended the Homestead Act, and for the first time, the federal government asserted authority over the “public domain.” In the years leading up to this legislation, state and federal interests debated how to use and control western lands. This legislation ended that debate. One result of this legislation was that livestock associations were encouraged to organize and seek local oversight.

When American ranchers first moved their livestock onto what is now CO Bar Ranch is lost to history. It has been assumed that livestock belonging to Mormon pioneer Lot Smith were in the Wupatki area in the

1880s (Anderson 1990; Stoutamire 2013), and according to Stoutamire (2013), Dean Smith in 1989 claimed that Lot Smith had a ranch that extended from Tuba City down to Mormon Lake, southeast of Flagstaff, a region that brackets CO Bar Ranch. This is almost certainly an overstatement. Lot Smith (and the Mormon United Order he controlled) did have a dairy herd at Mormon Lake when Smith lived near the present site of Winslow, Arizona, in 1876–1888, and he did have a cattle ranch near Tuba City after 1888 (Peterson 1970). It is unclear, however, to what degree those two operations overlapped temporally, and it is difficult to believe his livestock “roamed” over the hundreds of square miles of country that separate the two areas as claimed by Stoutamire (2013). It is likely, however, that Lot Smith drove livestock through the CO Bar area during the 1880s and early 1890s, moving cattle between his holdings or delivering livestock to the railroad at Flagstaff. Lot Smith was killed in an altercation with Navajos over a breach of his fence line in 1892, and the Babbitt family acquired his Circle S brand and holdings at some point after that (Cline 2006). There is no evidence that the Babbitt family gained title to any land within the CO Bar Ranch boundary as part of that acquisition.

The earliest deed on file with Coconino County for the CO Bar Ranch area relates to Cedar Ranch. In 1887, Philip Hull, Jr. sold 160 acres surrounding west Cedar Spring in Sections 17, 18, and 20, T25N R6E, to Charles C. Goven, an officer of the Arizona Cattle Company (Coconino County Recorder 1887). Two years later, in 1889, Philip Hull, Sr., sold an adjoining or nearby parcel, also to the Arizona Cattle Company. This latter parcel contained east Cedar Spring, also called Hull Spring, which gained fame as a rest stop for passengers traveling by stagecoach between Flagstaff and Grand Canyon in the 1890s (Mangum and Mangum 1999). While the two Hulls, father and son, may have homesteaded the two parcels (Mangum and Mangum 1999), they apparently never held clear title, because in 1896, three men associated with the Arizona Cattle Company obtained patents for portions of the same land. The patents were for three parcels in the N½ of Section 20, totaling 160 acres. The patent holders were Frank Bevin (for Section 20, N½ of the N¼); John De La Vegne (for Section 20, SW¼ of the NW¼); and John Rhoads (for Section 20, NE¼ of NE¼) (Coconino County Recorder 1896a, 1896b, 1896c). In 1890, the Arizona Cattle Company expanded their holdings at Cedar Ranch with the purchase of the adjoining Section 17 from the Santa Fe Pacific Railroad (Coconino County Recorder 1890). For more than a decade, Cedar Ranch served as the Arizona Cattle Company’s winter camp, but by 1899 the company was dissolving (Collins 2002). In that year, Section 17 and the three Section 20 parcels were sold to William Baker, Trustee of the Saginaw and Manistee Lumber Company (Coconino County Recorder 1899), which held onto the land until 1902. In that year, Section 17 went to the United States, while the three parcels in Section 20 were sold to David Babbitt (Coconino County Recorder 1902a, 1902b). The Babbitts eventually acquired the rest of the N½ of Section 20, the S½ of Section 17, and the SW¼ of Section 18 from Coconino National Forest in a land exchange (personal communication, William Cordasco, Babbitt Ranches, LLC).

All of these transactions concern only Cedar Ranch, a tiny part of what is now CO Bar Ranch. The early and intense interest in the property is not surprising; it contained a rare and prized resource: perennial water. The early ranching history of the bulk of CO Bar Ranch is hazier. Certainly sheepmen and cattlemen were grazing livestock in the area by the 1890s and into the early twentieth century (Stoutamire 2013), but there are few records. Several stockmen, including the Babbitts, started establishing water rights (mostly to dammed washes) in the area around 1912 (Stoutamire 2013). The Babbitts developed a number of water features around that time, including Slim Dam in 1912; Spider Web Tank No. 2, Hupmobile Tank, and Red Horse Wash Tank in 1915; and Mays Tank in 1916 (Northern Arizona University [NAU] 1880–1999; Stoutamire 2013). The Babbitts purchased the Heiser Ranch and spring, now part of Wupatki National Monument, in 1915. Finally, on August 8, 1921, the Babbitts bought nearly all the odd-numbered parcels in what is now CO Bar Ranch from the Santa Fe Pacific Railroad (Coconino County Recorder 1921). At that point, the general configuration of CO Bar Ranch came into being. Over the following years, some land has been added or sold, but the changes have been minor.

Uranium

Following the conclusion of World War II, the United States encouraged uranium mining production and stockpiling to fuel the nuclear arms race with the Soviet Union. After its initial dependence on foreign sources, the U.S. Atomic Energy Commission announced in 1948 that it would guarantee a price for and purchase all uranium ore that was mined in the United States (Brugge and Goble 2002). This initiated a mining “boom” on the Colorado Plateau, including large portions of the Navajo Nation and adjacent lands.

Uranium was first reported near Cameron, Arizona, in 1950 (Bollin and Kerr 1958). Mining began in 1951, but the first discovery of commercial importance in the Cameron District was not made until 1952 (Chenoweth and Malan 1973). Uranium production peaked in the Cameron District in 1956 and then declined until 1963 when the last shipment from the district was recorded (Chenoweth 1993). Chenoweth (1993) reported approximately 100 producing “properties” in the Cameron District. Most the mines were developed via open pit.

Uranium mining within the project area occurred between February 1, 1955, and March 1962. Uranium ore was identified in the area from mineral exploration in the 1950s and shipped to the Tuba City Mill. From February 1955 to June 1960, CO Bar Livestock Company entered into leasing agreements with Arrowhead Uranium/Rare Metals (1955; 18 tons mined), C.L. Rankin (1958; 322 tons mined), and Murchison Ventures (1959; 0 tons mined).

In 1959, Murchison Ventures constructed the “Benson Upgrader,” one of three such devices at the center of a fraudulent scheme masterminded by Murchison Ventures owner John Milton Addison (note, the Benson Upgrader was entirely replaced by the later Milestone Hawaii Upgrader, described below, and the remains of which are present today). Addison told investors the machine could upgrade low-grade, unmarketable uranium deposits to high-grade yellow cake uranium, producing millions of dollars in profits per year. In reality, the Benson Upgrader did not work. As later documented by the Texas House of Representatives, “The Benson Upgrader has never operated successfully and it is the opinion of people who have tried it that it is physically impossible for it to ever work” (Finding of fact, Texas House of Representatives, General Legislative Investigating Committee 1961). In December 1959, Addison was indicted in a federal fraud case. He was subsequently tried and convicted of mail fraud, conspiracy, and federal security-law violations and sentenced to serve 15 years in prison and pay fines totaling \$36,000 (House 2016).

In October 1960, a group of Addison’s investors incorporated as Milestone Hawaii to assume control over the Section 9 Lease and the Murchison Ventures operation. In 1961, the Milestone Hawaii owners demolished the original Benson Upgrader, replaced it with a larger, more elaborate uranium upgrading mechanism (the remains of which are present on the site today), and shipped 23.93 tons in March 1962 (House 2016).

Previous Research

Prior to fieldwork, the cultural resource records of the AZSITE Online Cultural Resource Database, MNA, and Navajo Nation Historic Preservation Department (NNHPD) were consulted for prior cultural resource projects and reported resources within 1 mile of the project area. One prior project, nine prehistoric archaeological sites, and one historic-era site (the Milestone Hawaii Upgrader) were identified as a result of the AZSITE and MNA records search (Table 2). No prior projects or reported resources were identified by the NNHPD search.

Table 2. Cultural Resources within a 1-Mile Radius of the APE

Site Designation	Affiliation	Resource Type	Eligibility Status	Reference
NA 7,398 AZ I:7:7(MNA)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1065)	Large habitation (perhaps by several groups or families) consisting of masonry structures, kiva, and associated artifact scatter	Recommended not eligible*	Keller and Mason (1976)
NA 10,526	Unknown	Unknown	Unknown	MNA quad map
NA 14,295 AZ I:7:5(MNA)	Historic Euro-American (A.D. 1961–1962)	AUM 457–Milestone Hawaii upgrader ruins and associated debris	Unevaluated	Keller and Mason (1976)
NA 14,296 AZ I:7:6(MNA)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1100)	Limited activity site consisting of a ceramic and flaked stone scatter	Recommended not eligible*	Keller and Mason (1976)
NA 14,298 AZ I:7:8(MNA)	Prehistoric unknown	Limited activity site consisting of a flaked stone scatter ("Tolchaco quarry/workshop site")	Recommended not eligible*	Keller and Mason (1976)
NA 14,299 AZ I:7:9(MNA)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1065)	Limited activity site– artifact scatter	Recommended not eligible*	Keller and Mason (1976)
NA 14,300 AZ I:7:10(MNA)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1065)	Rock art, structural remains, and associated artifact scatter	Recommended not eligible*	Keller and Mason (1976)
NA 14,301 AZ I:7:11(MNA)	Prehistoric unknown	Limited activity site consisting of a flaked stone scatter ("Tolchaco quarry/workshop site")	Recommended not eligible*	Keller and Mason (1976)
NA 14,302 AZ I:7:12(MNA)	Prehistoric unknown	Limited activity site consisting of a flaked stone scatter ("Tolchaco quarry/workshop site")	Recommended not eligible*	Keller and Mason (1976)
NA 14,303 AZ I:7:13(MNA)	Prehistoric unknown	Limited activity site consisting of a flaked stone scatter ("Tolchaco quarry/workshop site")	Recommended not eligible*	Keller and Mason (1976)

Note: **Bold text** indicates that the site is located in the APE.

* Keller and Mason (1976) recommend that none of the sites in the APE are NRHP eligible. However, they also state that "all of the sites in the survey area, however, are felt to be of significance in terms of archaeological research and potential contribution to the body of knowledge of the prehistory of this region and to archaeological methodology in general" (Keller and Mason 1976:47). SWCA interprets these comments to mean that the sites are eligible under Criterion D.

AZSITE and MNA both report the same previous archaeological survey. In 1976, MNA, on behalf of Western Nuclear, conducted an archaeological survey of portions of Sections 9 and 10 within the project area (AZSITE Project 1953; MNA Project A75-204; Keller and Mason 1976). A complete copy of this report is included in Appendix F of this document. Ten cultural resources were reported, three of which are within the APE (Figures A-1 and A-2; see Table 2). All previously recorded sites identified in the APE were visited during fieldwork and are further described in the results section, below.

Ethnographic Research

SWCA requested that the NNHPD Traditional Cultural Program office consult the Traditional Cultural Property (TCP) records within 1 mile of the project area. One TCP, Black Point (TCP No. 521), was identified during the records search; however, it may have been misplotted (see Figure A-1). Black Point is a large basaltic lava flow located approximately 1.3 miles south-southwest of the APE (see Figure A-1). Van Valkenburg (1974) was also consulted for any published information on Black Point as a Navajo sacred place. Known to the Navajo people as *Chezhindesa* (No. 79), Black Point is described as a traditional stopping place for the Western Water clans traveling between the Hopi Buttes and Navajo Mountain (Van Valkenburg 1974:183). Numerous Navajo sites are reported to be in the area.

National Register of Historic Places—Listed Properties

The NPS's National Register of Historic Places database was searched to identify properties listed in the NRHP that are located in or within 1 mile of the survey area. No NRHP-listed properties were identified within the search area.

Historic-era Map Research

Historical maps were consulted to identify historic-era properties that were present, and may still be present, in the search area. The 1916 General Land Office (GLO) map of Township 26 North, Range 10 East, filed in 1919, depicts a northwest/southeast-trending road through Sections 9 and 15 (Figure 5). This road is present today. The map does not show any other cultural features in the vicinity (Bureau of Land Management 1919).

In addition to the GLO map, USGS historical topographic maps were also consulted. The 1886, 1891, 1894, 1899 San Francisco Mountains 1:250,000-series topographic maps depict the same road shown on the GLO map (USGS 1886, 1891, 1894, 1899). No other cultural features are depicted in the vicinity.

INVENTORY RESULTS

As a result of the survey, SWCA rerecorded two prehistoric archaeological sites (NA 14,299 and NA 14,300) and documented structural ruins associated with the historic AUM 457 and the Milestone Hawaii Upgrader (NA 14,295), all three of which were previously recorded in 1976 by the MNA (Keller and Mason 1976). AUM 458 also is recognized as a historic-era uranium mine and discussed. In addition to these known cultural resources, SWCA identified and documented seven new archaeological sites and recorded 25 IOs of cultural material.

1976 MNA Survey

As described above, an approximately 182-acre portion of the project area has been previously surveyed for cultural resources. In 1976, MNA, on behalf of Western Nuclear, conducted an archaeological survey of portions of Section 9 and 10 within the APE (AZSITE Project 1953; MNA Project A75-204; Keller and Mason 1976). A complete copy of this report is included in Appendix F of this document.

The Keller and Mason (1976) survey is more than 10 years old and warrants evaluation as described in Arizona SHPO Guidance Point 5, *SHPO Position on Relying on Old Archaeological Survey Data* (April 2004), which presents a series of questions aimed at determining the adequacy of an older report. In our opinion, the 1976 report meets the minimum adequacy standards outlined by SHPO:

- Survey pedestrian transects were spaced 10 m apart, which exceeds current standards.
- 100 percent of the previous survey area was surveyed by foot.
- Site and isolate documentation followed established MNA criteria, which are acceptable by today's standards.
- Sites were accurately plotted on detailed topographic maps generated for this project. Site locations within the APE were confirmed to be near original plotted locations.
- Site numbers were assigned to all sites.
- NRHP eligibility recommendations are outmoded, but were offered.

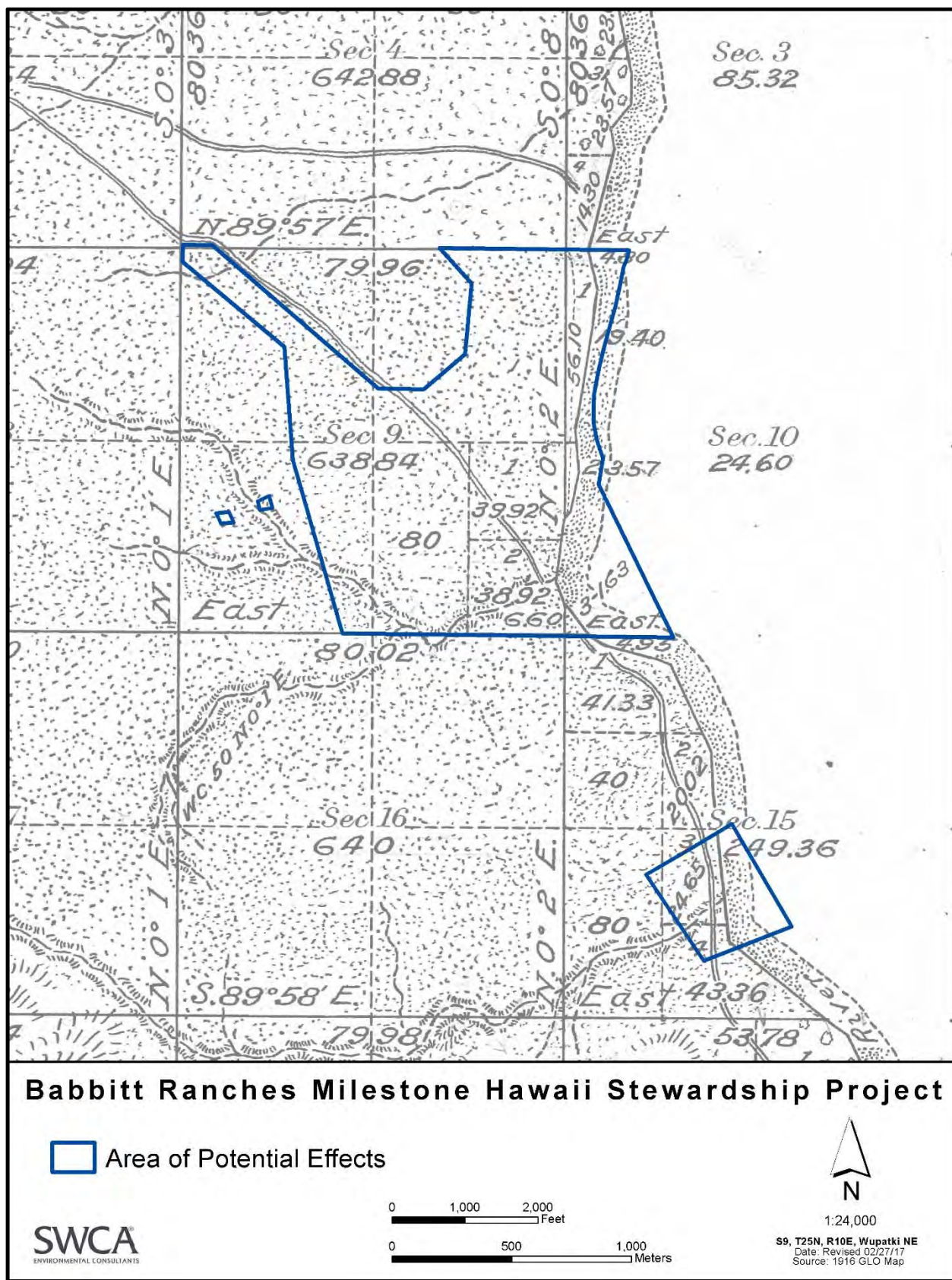


Figure 5. APE depicted on the General Land Office map filed in 1919.

- The principal surveyor, Don Keller, was and is a well-respected, published, professional archaeologist with a demonstrated scientific expertise in the area.
- Authors made an attempt to document resources that were not yet 50 years old in order to present the data to future archaeologists.

In summary, the Keller and Mason (1976) report is more than 10 years old; however, SWCA recommends that this report meets the minimum adequacy standards outlined by SHPO Guidance Point 5—i.e., 100 percent of the survey area was surveyed to standards acceptable today by well-qualified personnel and results of the survey were positively verified by SWCA crew. Accordingly, the 182.1 acres previously surveyed in 1976 was not systematically resurveyed as part of the present study.

New Survey

The remaining 297.4 acres of the APE were subject to new Class III (intensive pedestrian) cultural resource survey. Survey was conducted from November 29 through December 2, 2016, and from December 5 through 8, 2016. SWCA Archaeologist Annie J. Lutes directed the field crew, assisted by SWCA archaeologists Andrew Larsen, Heather West, and Jacqueline Muehlbauer. Daniel Garcia served as the project Principal Investigator. No permits were required to conduct survey on private lands in Section 9 and 15. Survey on Reclamation land in Section 10 was accomplished under the authority of Permit BOR-PXAO-2016-009, issued by Reclamation.

The survey was conducted using standard archaeological techniques following ASM guidelines for survey coverage and site recording methodologies. According to the standards for pedestrian survey established by ASM, a person conducting a pedestrian survey can achieve 100 percent coverage of a parcel by walking a series of systematic transects spaced no more than 20 m (66 feet) apart. The survey entailed systematically walking the 297.4-acre survey area in parallel transects spaced no more than 20 m apart.

All fieldwork was conducted in accordance with the Radiation Safety Program and Health and Safety Plan developed by Babbitt Ranches, LLC, in response to the AOC. The program and plan were developed in accordance with the *as low as reasonably achievable* (ALARA) safety principle, which is designed to expose field workers to radiation levels as low as reasonably achievable. Because the previously surveyed areas also were previous mining areas in the vicinity of the three AUMs, crew exposure time was limited to confirmation and brief documentation of previously documented sites. The archaeologists sought evidence for cultural resources in the form of artifacts (e.g., ceramics, lithics, historical metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric or historical structures, or other cultural anomalies). In addition to searching for archaeological remains, the archaeologists included in their survey in-use properties (e.g., buildings, roads, corrals) greater than 50 years old.

Once a site was identified, the crew then proceeded to mark the locations of artifacts and features with pin flags. Next, individual crewmembers began his or her assigned tasks. Tasks included completing the site form, conducting artifact inventories, completing feature descriptions, taking photographs, and mapping the site with a handheld Trimble Geo 7x sub-meter GPS unit. GPS data were reported in UTM coordinates projected using NAD 83. No artifacts were collected. Site flagging was left in place for avoidance by the proposed Phase I, II, and III work, described above.

Archaeological remains designated as IOs were point located and recorded using a handheld GPS unit. When culturally diagnostic or unusual items constituted IOs, they were photographed.

In general, ground surface visibility within surveyable portions of the survey area was excellent, with 85 to 100 percent of the ground surface unobscured by vegetation. Observed disturbances noted within the survey area include the network of unmaintained dirt roads that crisscross the survey area, mechanical disturbance related to historic-era uranium mining at the AUM locations, and off-road vehicles driving throughout the area.

As part of the program and plan, all field staff completed an 8-hour radiation safety certification course and a 2-hour site-specific radiation training class given by the project Radiation Safety Officer. Field crews were equipped with a Ludlum Model 19, which is a highly sensitive gamma radiation safety meter that offers real-time exposure levels. The Model 19 was used in all survey areas, and crews abbreviated field time in areas with elevated readings.

In all, a total of 241.4 acres of the 319.5-acre survey area was surveyed during fieldwork. Figure 6 presents the areas surveyed for the proposed project, as well as those areas unable to be investigated due to dense tamarisk and other vegetation growing along the river corridor. Figures 7 and 8 provide representative photographs of the survey area, showing the overall ground surface visibility and typical terrain encountered during fieldwork. Figure 9 depicts part of the southern portion of the survey area that was more difficult to survey because of dense brush, while Figure 10 documents the conditions in approximately 78.1 acres of the survey area that precluded access because of extremely dense tamarisk as well as the active river channel of the Little Colorado River (these areas were inspected, but not subject to systematic survey). Figure 11 is a photograph taken from a helicopter of the APE during project-related field reconnaissance, showing the variation in vegetation cover and terrain.

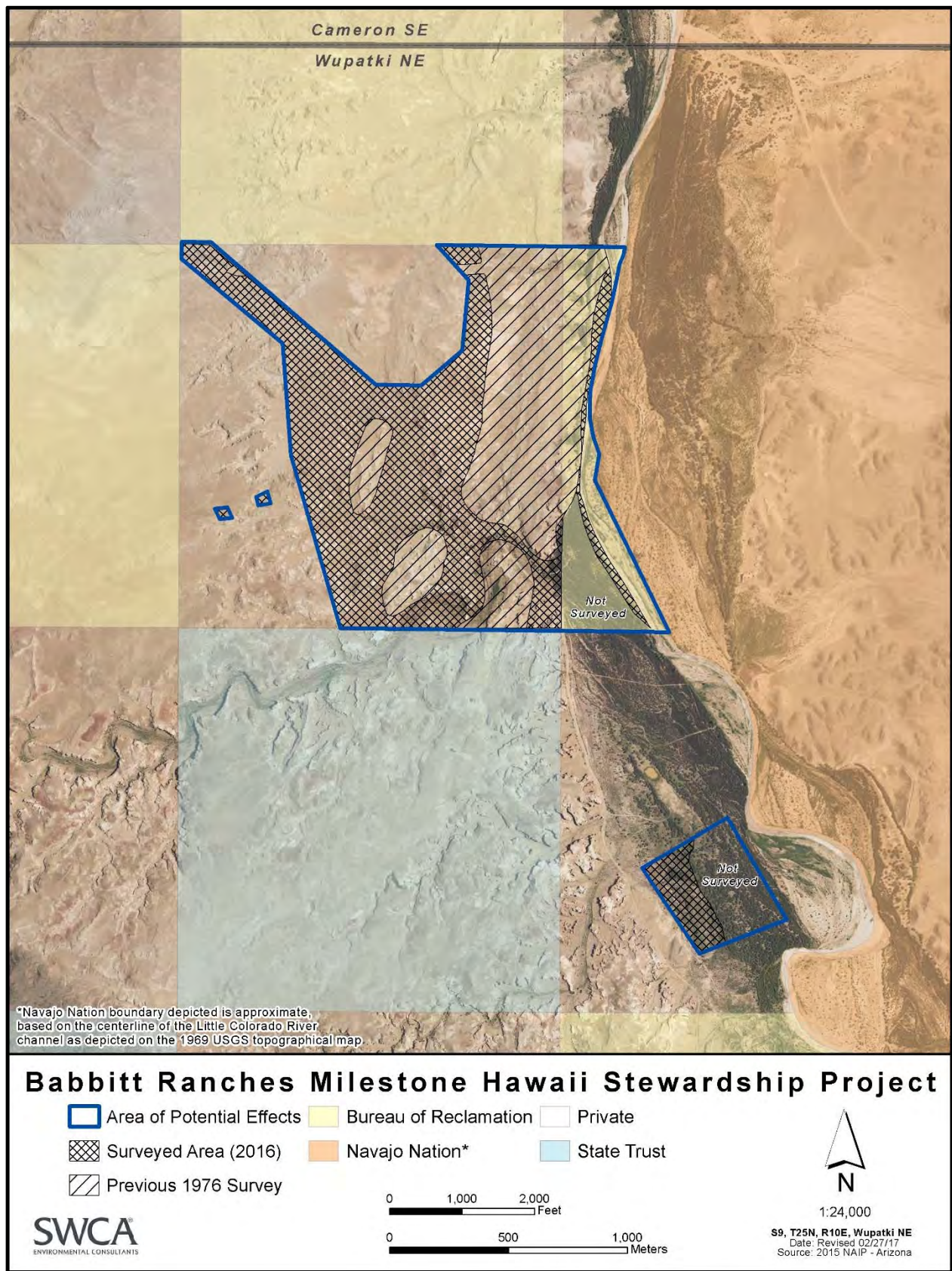


Figure 6. Map depicting previous 1976 survey, and surveyed and unsurveyed areas within the APE.



Figure 7. Overview of northwest portion of survey area; facing east-southeast.



Figure 8. Overview of northwest portion of survey area; facing south.



Figure 9. Representative photo of dense vegetation in portion of the survey area; facing west.



Figure 10. Representative photo of the not-surveyed southeast portion of APE with dense tamarisk vegetation; facing north.



Figure 11. Aerial view of the APE, with the primary access road and the Little Colorado River in the distance; facing southeast.

Previously Recorded Archaeological Sites

NA 14,295 – The Milestone Hawaii Upgrader and AUM 457

Resource Type: Historic-era uranium mine and upgrader structure

Dimensions/Area: 792 × 212 m (128,285 square meters [m²] [31.7 acres])

Cultural Affiliation and Age: Euro-American Late Historic (A.D. 1955–1962)

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

NA 14,295 (AZ I:7:5 [MNA]) is a previously recorded historic-era uranium-mining site located in the northeast portion of the APE (Figures 12 and 13). The site was originally documented by Keller and Mason (1976:52) as the presumed remains of a ca. 1950s uranium drilling, mining, and milling operation. The remains were only about 25 years old when documented, and the authors state, “The information given here is for documentation of the mining operation’s remains and to make its existence known to interested parties.” Despite not qualifying as an archaeological site at the time, the property was described as the remains of a mining mill, consisting of a foundation and retaining walls, associated mining debris, a trash scatter, and several abandoned truck or rolling equipment chassis, which Keller and Mason (1976) date to between 1951 and 1957. No usable equipment was noted. The trash consisted of a moderate scatter of discarded rubber tires, engine parts, pipe, wood, and fire brick. Keller and Mason (1976) suggest that a perceived lack of mill tailings and moderate trash scatter suggest that only small-scale, limited uranium mining activity took place here.

NA 14,295 also was designated by the EPA as AUM 457. The site, as described by Weston Solutions, LLC (Weston), amounts to approximately 16.5 acres, is located just west of the Little Colorado River, and is characterized by a small pit; uranium waste-rock piles; a berm feature believed to be a former water storage area; and concrete remnants (slabs and walls) of the Milestone Hawaii Upgrader, a facility intended to increase the concentration of uranium in waste rock. Mining-related debris is scattered throughout the AUM (Weston 2014).

SWCA visited NA 14,295, the Milestone Hawaii Upgrader site, on December 8, 2016. In accordance with the Radiation Safety Program, Health and Safety Plan, and ALARA principles, SWCA's field documentation of the upgrader site was limited to a brief visit to obtain ground-level photographs of the upgrader remains (Figures 14 and 15). Additional photographs of the site, acquired by the project team through site visits and aerial reconnaissance, also were examined. No attempts were made to measure or map the ruins. No artifact inventory or sampling was conducted. Figures D-1A and D-1B in Appendix D provides a site map of the Milestone Hawaii Upgrader at NA 14,295.



Figure 12. Aerial view of NA 14,295, the Milestone Hawaii Upgrader site; facing southwest.



Figure 13. Aerial view of the upgrader site, with the Little Colorado River corridor in the distance; facing west.

SITE HISTORY

The history of the site presented here is largely repeated from the background section above, which was summarized from the AOC and other historical sources. As explained above, uranium mining occurred at AUM 457 and 458 between February 1, 1955, and March 1962. In 1959, Murchison Ventures, which had succeeded C.L. Rankin's lease, constructed the "Benson Upgrader," one of three such alleged uranium concentrating devices at the center of a fraudulent scheme masterminded by Murchison Ventures owner John Milton Addison. Addison told investors the machine could upgrade low-grade, unmarketable uranium deposits to high-grade yellow cake uranium, producing millions of dollars in profits per year. In reality, the Benson Upgrader did not work, and Addison was indicted, tried, and convicted of mail fraud, conspiracy, and federal security-law violations (House 2016). In October 1960, a group of Addison's investors incorporated as Milestone Hawaii to assume control over the lease. Milestone Hawaii owners demolished the original Benson Upgrader in 1961 and replaced it with a larger, more elaborate uranium upgrading mechanism, the remains of which are present on the site today (House 2016).

FEATURES

The most prominent feature of NA 14,295 is the ruined structure of the Milestone Upgrader (refer to Figures 14, 15, and D-1A and D-1B). As described by Weston (2014:10), the upgrader feature consists of concrete foundations and associated retaining walls located in the center of AUM 457. The foundation has two levels, each measuring approximately 115 feet north-south and 65 feet east-west. The upper level is situated immediately west of and 30 feet above the lower level. Other associated elements include several partially intact retaining walls depicted in Figure D-1A. Two chutes, which pose a fall hazard, are visible between the levels.

Weston (2014:10–11) documented additional mining features and artifacts at AUM 457 (Figure D-1B):

- The former borrow pit area in the northern portion of the AUM is no longer visible, but a large volume of waste rock surrounded the pit area.
- A former pond area in the northeastern portion of the site no longer contained any water, but a dirt berm surrounding most of the pond was still partially intact.
- Two smaller 20 × 20-foot concrete foundations were observed approximately 150 feet north and 150 feet south of the plant foundation.
- Various pieces of metal and wood debris were found throughout the site.
- Marking stakes and hollow pipes (potential monitoring wells) were observed surrounding the site.
- Unreclaimed mining-related uranium waste rock was piled on the site, primarily conglomerated along the western portion of the site, and through the central-eastern portion.
- Piles of a light-colored, fine, sandy material surrounded the plant foundation.

ARTIFACTS

As described above, no artifact inventory or sampling was conducted in accordance with the Radiation Safety Program, Health and Safety Plan, and ALARA principles. The brief field visit did confirm that the site contains an extensive scatter of structural debris, including thousands of fragments of glass, metal, asbestos tile, and other materials. Surface artifact density was not quantified, but is in excess of 1 artifact per square meter (artifact/m²).



Figure 14. Overview of the upgrader foundations; facing west.



Figure 15. Overview of the upgrader foundations; facing southwest.

SITE CONDITION AND SUBSURFACE POTENTIAL

The site is in poor condition. Mechanical portions of the Milestone Hawaii upgrader were removed and salvaged prior to MNA's documentation in 1976. All that remains of the upgrader facility are foundations, waste rock, and features described above. The site overall has been substantially impacted by wind and water erosion, as well as cattle grazing activity. The sandy sediments have eroded downhill and over portions of the upgrader site. While there does appear to be some soil accumulation due to shifting and eroding sandy sediments, deposits appear to be relatively shallow, as evidenced by the abundance of artifacts and features evident on the site surface.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

NA 14,295 is the remains of the Milestone Hawaii Upgrader. This facility was not in operation very long, having been built in September 1961 and decommissioned 7 months later in March 1962. Most of the original materials of the upgrader have been hauled off-site, with only the concrete foundations and associated structural debris and mining features remaining. Overall, while NA 14,295 is associated with Cameron District uranium-mining operations occurring in the early 1960s, the upgrader did not significantly contribute to those operations.

We recommend that NA 14,295 is not individually significant under any NRHP Criteria. Under Criterion A, the site would only be significant if it were associated with significant events. While the site may be associated with the theme of Cold War Uranium Mining in Arizona, we know that the mine and upgrader never produced a significant quantity of weapons-grade uranium to support an association under Criterion A.

It is tempting to evaluate the significance of the upgrader site for its association with John Milton Addison. The NRHP criteria for eligibility state that association with a "person significant in our past" on a national, state, or local level warrants consideration under Criterion B. Without an established context for Cold War

Uranium Mining in Arizona, it is debatable whether Addison constitutes an important person or not. Nonetheless, there is no association between the present ruins of the Milestone Hawaii Upgrader, built in 1961, and John Milton Addison's long-gone Benson Upgrader built in 1959 and dismantled in 1961. The structural ruins seen today have no association with Addison and are not significant under Criterion B.

Under Criterion C, the site could qualify for significance if it embodies a distinctive characteristic of a type, period, or method of construction. There are no known photographs of the Milestone Hawaii Upgrader, and it would be difficult to assess whether the architecture of the facility was in any way unique. Nonetheless, the integrity of the structure is severely diminished to the point that would preclude eligibility under Criterion C. It is also possible for the site to qualify for eligibility under Criterion C as a component of a district of Navajoland Cold War Uranium Mines; however, a context for evaluating the 500+ AUMs throughout Navajoland and northern Arizona has yet to be established.

Finally, as subsurface archaeological deposits are likely not present and the structural debris and features are observable from the modern ground surface, the site itself has little potential to yield information that would contribute to a broader understanding of uranium-mining history of the area. Thus the site is not eligible under Criterion D.

Accordingly, the Milestone Hawaii Upgrader (NA 14,295 [AUM 457]) is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance is recommended for the site.

NA 14,299

Resource Type: Artifact scatter (flaked stone and ceramic)

Dimensions/Area: 210 × 184 m (18,818 m² [4.7 acres])

Average Artifact Density: <0.01 artifact/m²

Cultural Affiliation and Age: Kayenta–Early Pueblo II (A.D. 900–1065)

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

NA 14,299 (AZ I:7:9 [MNA]) is a previously recorded artifact scatter located in the northeastern portion of the APE, adjacent to the Milestone Hawaii Upgrader (NA 14,295). The site was originally recorded by Keller and Mason (1976:54–55) as a scatter of 500 to 1,000 ceramic, flaked stone, and ground stone artifacts situated on a sandy saddle slope between a ridge and the Little Colorado River floodplain. The authors note that prior to 1976, a small amount of architecture (field house, storage, or hearth) was rumored to have been present on the ridge; however, mining activity destroyed any traces before the site was documented. Observed artifacts include undescribed Kayenta ceramics dating to the Pueblo II period, large numbers of stone cortex and waste flakes, chopper tools, and pounding (hammer) stones, and several ground stone manos. The site, which may be refuse from a small habitation, was interpreted as a limited-use area focused on processing food. Keller and Mason (1976:47) recommend that the site is not NRHP eligible. They also state that “all of the sites in the survey area, however, are felt to be of significance in terms of archaeological research and potential contribution to the body of knowledge of the prehistory of this region and to archaeological methodology in general.” We interpret these comments to mean the site was considered eligible under Criterion D. The site could not be avoided by proposed mining activity in 1976, and the authors recommend that the entire site artifact assemblage be systematically collected and that subsurface testing be undertaken. Archived site records on file at MNA suggest that the artifacts were collected in February 1976.

SWCA visited the site on December 8, 2016 (Figure 16 and 17). Due to the brief summary provided in the 1976 report and on the site card, it is unclear how artifacts were recorded and collected in 1976. SWCA

flagged visible artifacts, noting that the location of the site as recorded during the 2016 field effort is quite different than what was recorded in 1976. SWCA has updated the site boundary; Figure D-2 in Appendix D presents a site map for NA 14,299.

The density of artifacts when first recorded in 1976 is unknown, as are the exact quantities and types of artifacts present when the site was originally recorded, as merely a sample of lithics and ceramics was collected. Keller and Mason (1976) further recommended that additional systematic collection and testing be completed, as NA 14,299 would be directly impacted by a proposed road that would be used during the proposed mining operations.

Based on SWCA's rerecording of the site, the average artifact density at NA 14,299 is less than 0.01 artifact/m² and, as recorded, the site does not meet current the current ASM site definition. The road was subsequently constructed, and today, it bisects the site (see Figure D-2), so it is assumed that the systematic collection, and possibly archaeological testing, was carried out prior to road construction. This would explain the extremely low average artifact density and perhaps even the fact that the distribution of artifacts is so different from what was originally recorded in 1976.



Figure 16. Site overview from north end of NA 14,299 looking toward Little Colorado River; facing south-southeast.



Figure 17. Site overview with road (constructed sometime after 1976 survey) that now bisects site; facing north.

SITE CONDITION AND SUBSURFACE POTENTIAL

The site has been substantially impacted by past mining activities, including construction of a road through the site. Additionally, artifacts have translocated downslope to the east toward the Little Colorado River, perhaps due to mechanical disturbance and/or vehicular traffic through the site. Waste rock and mechanical disturbance was noted along the western boundary that parallels the main road to AUM 457 (NA 14,295, the Milestone Hawaii Upgrader) to the north. Impacts have likely affected the distribution of artifacts, and the site boundary is significantly different today than it was in 1976.

Site condition has affected the potential for subsurface archaeological deposits. As in 1976, no evidence of architecture or subsurface features was observed. Where the site appears to remain intact on the ridgetop, away from the road, soil deposition is very shallow (0–5 centimeters [cm]), so there is no potential for subsurface deposits in these locations.

SITE INTERPRETATION

Systematic site collection has removed much of the original artifact assemblage. It is estimated that only 150 artifacts, out of an original assemblage of 500 to 1,000 artifacts, remain at the site today. As such, SWCA does not have any additional information on NA 14,299 as interpreted by Keller and Mason (1976).

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

As originally recorded, NA 14,299 is a prehistoric limited activity site that may have functioned as an indigenous food-processing site. Due to the scant number of artifacts present, SWCA's rerecording of the site did not identify any further information on the temporal or cultural affiliation of the site. Therefore, it is assumed that the 1976 interpretation is correct, and the site is likely associated with the Kayenta tradition during the Early Pueblo II period (A.D. 900–1065).

Due to past mechanical disturbance and the systematic collection, NA 14,299 has lost its integrity and is not considered a significant site under the NRHP criteria. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event) and it is not associated with a significant person (Criterion B, person). Additionally, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Past mining activities and other impacts have largely destroyed the original context of the site, and the artifact assemblage as recorded during the 2016 field effort appears to be restricted to the modern ground surface. Therefore, the information potential of NA 14,299 has been exhausted, and the site lacks the potential to yield important information that would contribute to a broader understanding of prehistory or history of the area, beyond what has already been documented during this survey (Criterion D, information).

Accordingly, NA 14,299 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.

NA 14,300

Resource Type: Rock art site, artifact scatter, and sheep camp

Dimensions/Area: 84 × 59 m (2,590 m² [0.6 acre])

Average Artifact Density: 14.5 artifacts/m² (adjacent to outcrop); <0.1 artifact/m² throughout the rest of the site

Cultural Affiliation and Age: Prehistoric Kayenta–Early Pueblo II (A.D. 900–1065); possible Protohistoric (A.D. 1425–1550s); and historic-era Navajo (A.D. 1900+)

A/NRHP Eligibility: Recommended *eligible*

SITE OVERVIEW

NA 14,300 (AZ I:7:10 [MNA]) is an artifact scatter and rock art site. The site was first documented by Keller and Mason (1976:55–56) as a 25 × 50-m scatter of 100 to 500 Kayenta ceramics, flaked stone tools and debris, pounding (hammer) stones, and several rock art panels situated at and around a shallow rock overhang. A hearth, presumed by the authors to be modern and associated with shepherding, was also noted at the site. The rock art is described as carved into the rock wall of the overhanging shelter and consisting of human, mountain sheep, hand, dog, a “1966” inscription, and abstract design elements and was attributed to the Pueblo II design style. Keller and Mason (1976:47) recommend that the site is not NRHP eligible. They also state that “all of the sites in the survey area, however, are felt to be of significance in terms of archaeological research and potential contribution to the body of knowledge of the prehistory of this region and to archaeological methodology in general.” We interpret these comments to mean the sites were considered eligible under Criterion D. The site could not be avoided by proposed mining activity in 1976, and the authors recommend that the entire site artifact assemblage be systematically collected and that subsurface testing be undertaken. Archived site records on file at MNA suggest that a sample of artifacts was collected in February 1976.

SWCA visited the site on December 5, 2016 (Figures 18–32). Much like NA 14,299 above, the brief summary provided in the 1976 report and on the site card are unclear how many panels and elements were recorded in 1976. For purposes of documentation the rock art at the site, SWCA defined each group of elements into separate panels, identifying seven separate panels (Panels A–F) with several elements contained within each.

The hearth was not identified during the 2016 field effort; however, this feature may be buried in place under sediments that have been deposited around the base of the outcrop due to wind and water erosion. SWCA also identified two additional features, a sandstone-and-mortar storage feature and a small, dry-stacked rock wall. Figure D-3 in Appendix D presents a site map for NA 14,300.

ARTIFACTS

Bearing in mind that the site was partially collected in 1976, a complete inventory of two observation units (OUs) and a general sample of the rest of the site was conducted in order to estimate the number and density of artifacts across the site. OUs were defined as a 1×10 -m swath. OU 1 was placed in the northern portion of the site where artifacts were of greatest density, while OU 2 was placed to the southwest, at the base of the slope below Panels E and F (see Figure D-3). The average artifact density immediately around the outcrop, adjacent to the rock art panels, is 14.5 artifacts/m². The remaining portions of the site average less than 0.1 artifact/m².

OU 1 consists of 132 flaked stone and ceramic artifacts (13.2 artifacts/m²). The lithic materials include a variety of chert colors (red, brown, gray, white, and butterscotch-colored), as well artifacts manufactured from red/black/colorless-banded chalcedony locally available throughout the APE. Chert comprises approximately 71 percent (n=51) of the flake assemblage in this OU, with approximately 25 percent (n=18) red/black/colorless-banded chalcedony. The remaining 4 percent of the flake assemblage consists of two obsidian flakes, two fine-grained volcanic flakes, and one quartzite flake. One colorless chalcedony multidirectional core was also recorded in OU 1. Approximately 85 percent of the flakes inventoried in this unit were non-cortical, measuring mostly from 0 to 2 cm long.

The ceramic artifacts in OU 1 consist of primarily unidentifiable Tusayan Gray Ware (n=49), unidentifiable Tsegi Orange Ware (n=9), and unidentifiable Tusayan White Ware (n=2).



Figure 18. Site overview of NA 14,300 looking towards outcrop with archaeologist at Panel E; facing north-northwest.



Figure 19. Site overview of NA 14,300 with F1 at left of frame and F2 and right of frame; facing west-southwest.



Figure 20. Site overview of NA 14,300 from northern portion of site looking towards center of site; view to the south.

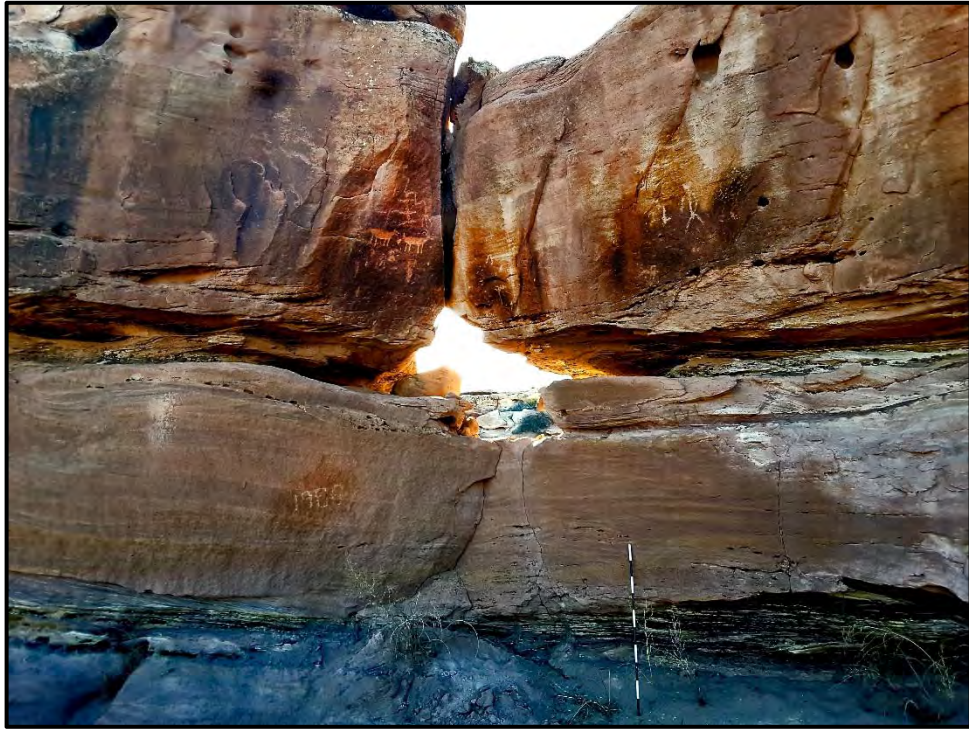


Figure 21. Overview of Panels A, B, C, and D (image enhanced to show petroglyph elements); view to the west-southwest.



Figure 22. Detail of Panel A (image enhanced to show petroglyph elements).



Figure 23. Detail of Panel C (image enhanced to show petroglyph elements).



Figure 24. Detail of Panel D (image enhanced to show petroglyph elements).

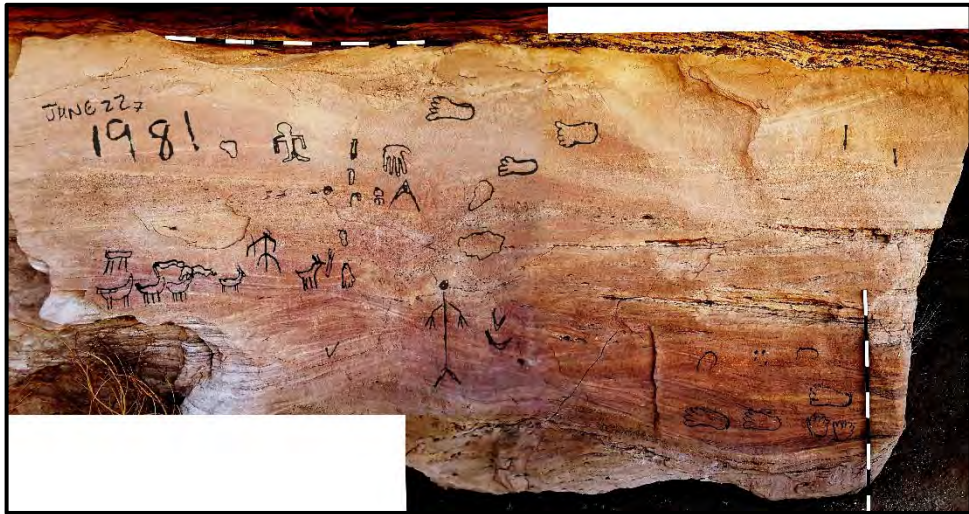


Figure 25. Detail of Panel E (combination of two images, enhanced and outlined to show petroglyph elements).

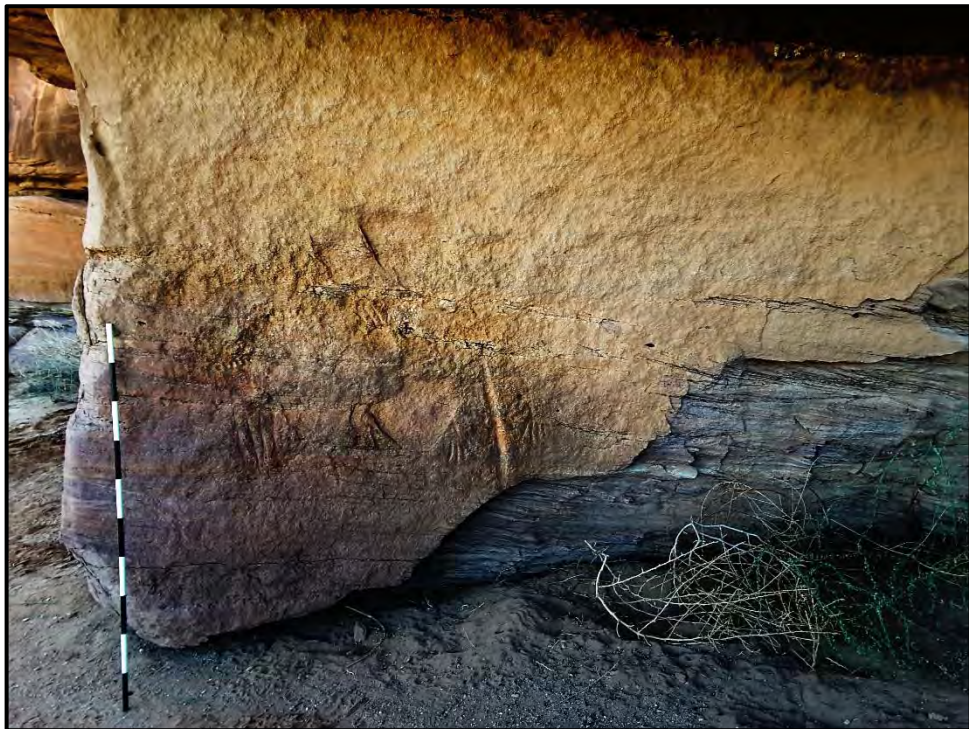


Figure 26. Detail of Panel F (image enhanced to show petroglyph elements).



Figure 27. Feature 1, outside of north wall in foreground with inside of south wall in background; view facing southwest.



Figure 28. Feature 1 overview; facing west-southwest.



Figure 29. Feature 1, detail of outside of north wall.



Figure 30. Feature 1, detail of inside of south wall.



Figure 31. Overview of Feature 2 and outcrop; facing south.



Figure 32. Overview of Feature 2 wall alignment; facing southeast.

OU 2 consists of 157 flaked stone and ceramic artifacts (15.7 artifacts/m²). The lithic materials include a variety of chert colors (red, brown, gray, white, and butterscotch-colored), as well artifacts manufactured from red/black/colorless-banded chalcedony locally available throughout the APE. Chert comprises

approximately 64 percent (n=82) of the flake assemblage in this OU, with approximately 33 percent (n=43) red/black/colorless-banded chalcedony. The remaining 3 percent of the flake assemblage consists of five quartzite flakes. One brown chert multidirectional core was also recorded in OU 2. Approximately 48 percent of the flakes (n=62) inventoried in this unit were non-cortical, measuring mostly from 1 to 4 cm long. Twenty-two percent of the flakes (n=28) had less than 50 percent cortex, with approximately 14 percent (n=18) with more than 50 percent cortex.

OU 2 had a significantly fewer number of ceramic artifacts, consisting of 24 unidentifiable Tusayan Gray Ware sherds.

Three artifacts were point-located at NA 14,300. PL 1 is a brown quartzite expedited chopper tool ($7.6 \times 7.69 \times 3.4$ cm) located in OU 2. The remaining point-located artifacts (PLs 2 and 3) consist of a Medicine Black-on-red sherd (Tsegi Orange Ware), a post-eruptive type in the Flagstaff area (A.D. 1065–1125 [NAU 2013]) and a Kana'a Black-on-white (A.D. 825–1025 in the Flagstaff area [NAU 2013]), respectively.

ROCK ART PANELS

Panel A is located to the top left of the opening in the rock wall above Panel B. It is the southernmost panel on the rock face and also the highest off the ground. Panel A consists of six distinct elements: two snakes, three bighorn sheep, one anthropomorph, as well as a collection of abstract peck marks and designs.

Panel B is below Panel A and to the bottom left of the opening in the rock face. It consists of one element; a historic inscription of 1966.

Panel C is to the left of Panel D and the right of Panel A directly above the opening in the rock face. It is roughly the same height as Panel A. Panel C consists of five distinct elements: an unknown animal, one element resembling a plant, and abstract designs.

Panel D is to the right of Panel C at roughly the same height. It is in the center of the rock face to the top and right of the opening in the rock face. It consists of three distinct elements: one anthropomorph, one possible zoomorph, and a collection of abstract designs.

Panel E is the largest of the panels and is located below and to the right of Panel D and around the corner from Panel F. It consists of about 20 elements in a range of sizes. One modern inscription is also present: JUNE 22, 1981. Elements include anthropomorphs, zoomorphs, handprints, footprints, abstract designs, and unknown peck marks.

Panel F is located around the corner from Panel E under an overhang. It is the northernmost panel. Panel F consists of about five elements consisting of a deep straight scratch with handprints on either side, which may be indicative of protohistoric occupation based on elements at known protohistoric sites, one handprint, a collection of peck marks in an abstract configuration, and large pecked holes with vertical lines.

FEATURES

Feature 1 is a small semicircular storage bin located near the southwestern boundary of the site under a low overhang about 70 cm above modern ground surface. Feature 1 is mostly collapsed and consists of wet-laid tabular sandstone with smaller chinking stones present in the northern portion. The southern portion of the wall has no chinking and appears to be constructed differently using larger, uniform tabular stones with no chinking and different-colored mortar. Tabular architectural stones average 25×5 cm and chinking stones average 5×2 cm. the middle portion of the bin has collapsed, but the northern and southern portions where the features meet the alcove wall remain intact. Based on the intact portions, the overall dimensions of the

features are inferred to measure 1.8 m north-south (N-S) \times 1 m east-west (E-W). The overhang has collapsed slightly, and a 70 \times 40-cm piece of sandstone is resting on the feature. The alcove bottom has a slope of about 10 degrees, and sediment from above has washed into the alcove. Feature 1 has a maximum of eight courses and a minimum of four courses remaining. Mortar stuck to the alcove wall indicated that the feature was originally at least 90 cm tall. Feature 1 is located at the top of a 10-degree slope, and artifacts are present about 15 millimeters (mm) to the northeast, where the sandy slope fades out and the more deflated ground surface is visible. Feature 1 may be related to the prehistoric component, but it may also be a later manifestation or refurbished by the later occupation.

Feature 2 is a low wall segment located at the back of a large open alcove near the southern boundary of the site, at the top of a sandy slope about 15 m southeast of Feature 1. The wall appears mostly collapsed and consists of 10 unshaped blocky sandstone boulders ranging from 20 \times 10 cm to 50 \times 30 cm in a dry-laid linear alignment. Feature 2 is 2 m long and blocks off a small sloping gap between two low cliff faces that leads out of the alcove. Feature 2 is similar to the alcove sheep pen feature at site 28406-04. It is likely that this open-air alcove was also a livestock pen with a brush or other perishable front.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of NA 14,300 is fair, and the site has been impacted by wind erosion and freeze/thaw spalling of overhanging areas. The area to the north of the rock art panels is a steep sandy slope of sediments deposited from the mesa above as well as blown up against the rock face. This slope is where the previously recorded hearth was located, indicating that sediment has likely deposited on top of the hearth and has also covered additional cultural material. Similar erosion from mesa tops and deposition below is located within the alcove.

The site is located against the side of a low mesa/rock outcrop with a large amount of sediment accumulation in areas against the rock face and less sediment accumulation away from the rock walls (up to 30 cm). Steep slopes of sand have formed against the rock walls, and there is likely additional cultural materials buried in these areas. Very few artifacts are present on these slopes, compared with the areas in front of the rock art overhang and in the center of the alcove.

SITE INTERPRETATION

NA 14,300 is a multicomponent Kayenta and Navajo site located against the first rock terrace west of the Little Colorado River. The corridor between the edge of the terrace and the riparian vegetation zone would have been heavily traveled by people moving along the river, and the rock art is located in an area that would have been visible to anyone travel the river corridor on the west side, including prehistoric populations and nomadic sheep herders. Keller and Mason (1976:56) describe the Pueblo II prehistoric component and document one hearth, stating, "The hearth and some of the other material present appears to be recent. This probably reflects sheepherding activities here in modern times." The hearth was not identified during the 2016 field effort, but the previously undocumented Feature 2 supports the Navajo component; however, there is no evidence to distinguish whether the Navajo component is historic or modern.

The density of artifacts when first recorded is unknown, as is the exact quantity and type of artifact collected, as merely a sample of lithics and ceramics from in front of the overhang was collected. Appendix II of Keller and Mason (1976) records ceramic type and number within "Loc. 1" at NA 14,300: Tsegi Orange Ware (2); Kana'a Black-on-white (2); Lino/Medicine Gray (1); Moenkopi Gray (1); Tusayan Corrugated (1); and unidentified ware (2). Again, the report does not state whether these numbers reflect the total ceramic artifact count at NA 14,300, if it was a sample inventory, or if these artifacts were part of the sample collection taken at that time.

Equally unclear is whether the systematic collection of the entire artifact assemblage and testing occurred after the 1976 site recording. These mitigation measures were recommended in the event proposed mining activities above the site (on top of the outcrop), such as the mechanical displacement of overburden, were to directly impact the site below (Keller and Mason 1976:56). No evidence of mining overburden at the site or on top of the outcrop was observed during the 2016 field effort, so it is plausible that systematic collection and testing was not needed and that the site was avoided. Notwithstanding, it is important to note that average artifact densities as documented by SWCA in 2016 do not reflect the artifact densities and distribution of the site as originally recorded. However, unlike for NA 14,299, there is still a substantial number of artifacts present immediately around the outcrop adjacent to the rock art panels.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

NA 14,300 is a Pueblo II rock art site with a substantial artifact assemblage and a later historic-era Navajo sheep camp that was possibly used during the Protohistoric period. The site is located in an area that would have been heavily trafficked prehistorically and historically and displays an assemblage and rock art panels consistent with repeated seasonal occupation or continued occupation. Because of the likelihood of long-term, repeated occupation, along with heavy and consistent sediment deposition because of the morphological characters of the landform, the presence of intact subsurface deposits and possibly stratified subsurface deposits within overhanging areas is likely.

NA 14,300 is not considered a significant site under NRHP Criterion A, under Criterion B, or under Criterion C. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event) and it is not associated with a significant person (Criterion B, person). NA 14,300 cannot be associated with a specific time period, or with a known cultural tradition; the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Previously documented features, which presently seem to be located under soil deposits, confirm that buried subsurface deposits are present in the area north of the rock art panel. Similar areas within the alcove are also likely to contain buried deposits, as well as within and below Feature 1, the storage bin. In addition to the potential for additional information provided by buried cultural deposits, the rock art panels also retain additional information within their interpretations.

SWCA recommends NA 14,300 *eligible* for the A/NRHP under Criterion D. Unlike nearby site NA 14,299, where past mechanical disturbance has impacted site integrity and systematic collection occurred to the extent that the resource no longer meets the ASM site definition, NA 14,300 retains the potential to yield additional information regarding prehistoric historic and possibly protohistoric lifeways. NA 14,300 should be avoided by all project activities. Any ground-disturbing work within the site may impact subsurface deposits and features. If avoidance is not possible, data recovery is recommended to mitigate adverse effects on the site resulting from project implementation.

Newly Recorded Archaeological Sites

Site 28406-01

Resource Type: Artifact scatter (flaked stone)

Dimensions/Area: 56 × 35 m (1,457 m² [0.4 acre])

Average Artifact Density: 0.1 artifact/m² (rounded)

Cultural Affiliation and Age: Unknown cultural affiliation and unknown age

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

Site 28406-01 is a newly recorded flaked stone scatter located in the northwest portion of the APE, approximately 10 m south of the road on private land in Section 9. The site is situated on a low, variegated sandstone terrace characterized by a surface of cryptocrystalline silicate (CCS) cobbles and gravels on light tan sandy loam sediments, with sparsely interspersed small shrubs and forbs (Figure 33).

The artifact scatter consists of flaked stone debitage characteristic of lithic procurement and reduction; no features were observed. Figure D-4 in Appendix D presents the site map for 28406-01.

ARTIFACTS

Excluding flaked stone shatter, a complete inventory of archaeological materials was conducted. Archaeologists documented 179 artifacts in total, resulting in a surface artifact density of approximately 0.1 artifact/m². The assemblage consists of flaked stone artifacts of chert, chalcedony, petrified wood, and quartzite. The most prevalent natural lithic material available immediately at the site is a red/black/colorless-banded chalcedony, with a smaller number of gray/tan-colored chert cobbles. The abundance of these readily available materials is reflected in the assemblage, with 83 percent of the artifacts (n=143) made of the banded chalcedony and 9 percent (n=16) of the gray/tan chert naturally occurring at the site. Other artifact materials include white chert, petrified wood, quartzite, and a butterscotch-colored chert that, while not observed immediately at the site, are locally available in the area.

Of the overall assemblage, eight early-stage biface tools, 16 expended cores, and five tested cobbles of red/black/colorless-banded chalcedony were identified. Additionally, five quartzite hammer stones, one tested cobble of gray/tan chert, and one expended core of butterscotch-colored chert were also recorded.

No diagnostic artifacts were observed during site recording.

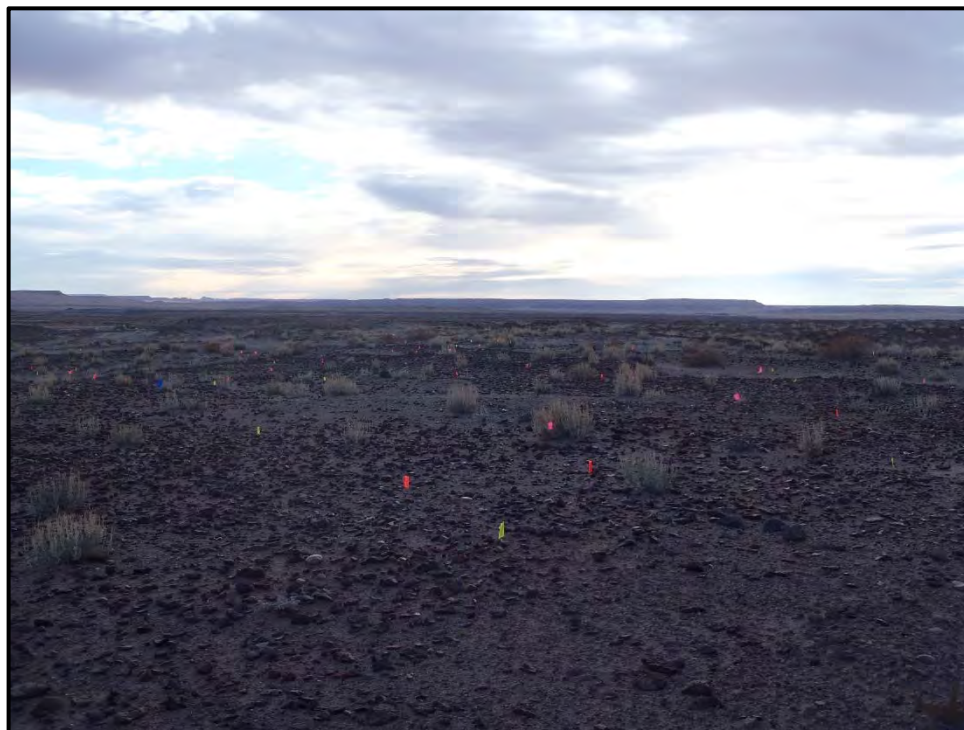


Figure 33. Overview of site 28406-01; facing east-southeast.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-01 is good and the site has been minimally impacted by wind erosion and freeze/thaw spalling. A small degree of inter-rill erosion on the site surface was observed, with more substantial water erosion occurring on the edges of the site, bounded by very shallow rills that contour the terrace.

The site is located on a low sandstone terrace with very little soil depth (less than 10 cm). The skeletal characteristics of the soils present at the site, combined with the shallow soils and eroding sandstone bedrock, indicate that no subsurface archaeological deposits are present and that artifacts are limited to the modern ground surface.

SITE INTERPRETATION

Excluding expended cores, only 12 percent (21 artifacts) of the artifacts inventoried were completely devoid of cortex. The abundance of shatter (approximately 75 percent of which was cortical), along with the presence of expended cores, tested cobbles, and cortical flakes, suggests that the site is likely the result of limited procurement activities (i.e., a quarry) and early-stage reduction of lithic materials. The informal tools that were identified at the site are the result of expedient manufacture, rather than intensive technological modification often found in formal tool production. No ground stone was recorded; therefore, it is difficult to ascertain whether activities related to the processing of plants or other food sources occurred at the site.

As no diagnostic artifacts were recorded, the age and cultural affiliation of 28406-01 are indeterminate.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-01 is a surficial, limited activity site that may have functioned as an indigenous procurement and processing site of lithic materials. As discussed above, Bartlett (1942, 1943) describes Tolchaco sites as low-density scatters of lithic core and shatter materials, with occasional informal tools. In relation to this somewhat equivocal definition, 28406-01 is relatively dense in terms of the artifact assemblage, particularly when considering the substantial quantity of shatter present. Comparatively, bifacial tools and hammer stones are also well represented at the site. Overall, it is not clear whether the site can be considered characteristic of the conceptual *Tolchaco complex*; 28406-01 may more simply represent local pre-Formative occupation. However, the absence of ceramic artifacts does not preclude association with later periods of occupation, including prehistoric Kayenta or Cohonina traditions, or even later Protohistoric use. No clear indicators of site age or affiliation were identified; therefore, 28406-01 remains an aceramic flaked stone scatter of indeterminate age and of unknown cultural association.

Site 28406-01 is not considered a significant site under the NRHP criteria. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). As 28406-01 cannot be associated with a specific time period, or with a known cultural tradition, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage appears to be restricted to the artifacts recorded on modern ground surface during survey, the information potential of site 28406-01 has been exhausted, and the site lacks the potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, 28406-01 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.

Site 28406-02

Resource Type: Artifact scatter (flaked stone and ceramic)

Dimensions/Area: 41 × 36 m (931 m² [0.2 acre])

Average Artifact Density: 0.1 artifact/m² (rounded)

Cultural Affiliation and Age: Possible Kayenta tradition of an unknown age

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

Site 28406-02 is a newly recorded artifact scatter located in the western part of the APE, near a portion of the 1976 MNA survey (Keller and Mason 1976), on private land in Section 9. The site is situated on a low, crescent-shaped, variegated sandstone terrace characterized by a surface of CCS cobbles and gravels on tan sandy sediments, bounded by shallow drainages to the north and south (Figure 34). The artifact scatter consists of a small number of ceramic artifacts as well as flaked stone debitage, the latter characteristic of lithic procurement and reduction. One artifact concentration was recorded, and no features were observed. Figure D-5 in Appendix D presents the site map for 28406-02.



Figure 34. Overview of site 28406-02; facing west.

ARTIFACTS

A complete inventory of archaeological materials was conducted. Archaeologists documented 131 artifacts in total, resulting in an average surface artifact density of approximately 0.1 artifact/m² across the extent of the site. Overall, the site assemblage consists of flaked stone artifacts of chert, chalcedony, fine-grained volcanic, and quartzite. Approximately 66 percent of the assemblage (n=87), consisting of the red/black chert material, 11 percent (n=14) gray chert, and 6 percent (n=8) tan/orange-colored chert. Other artifact

materials include gray chalcedony, tan and gray quartzite, and fine-grained volcanic material. These additional colors of chert, chalcedony, and quartzite, while not observed immediately at the site, are locally available in the area. The fine-grained volcanic material may have been imported from a nearby source, as it does not appear in the immediate vicinity.

Most of the artifacts (n=87, or approximately 66 percent of the overall site assemblage) are concentrated in the northwestern portion of the site. Artifact Concentration 1 (AC 1) was approximately 7×6 m in size (34 m^2), resulting in an artifact density of approximately 2.6 artifacts/ m^2 . Approximately 94 percent of the flaked stone in AC 1 consists of red/black chert debitage, exhibiting no cortex (n=37 or 43%) or less than 50 percent cortex (n=36 or 41%), mostly ranging in size from 2 to 4 cm long. In addition to one gray quartzite flake (no cortex) and one tan chert flake (<50% cortex), one red/black biface chopper tool ($12.2 \times 7.9 \times 3.5$ cm) and one red/black chert biface tool ($10.6 \times 5.9 \times 2.4$ cm) were also recorded within AC 1.

Outside AC 1, one quartzite chopper ($7.7 \times 5.1 \times 2.2$ cm) and one red/black “keel-shaped” biface tool (PL 1), measuring $14.9 \times 7.2 \times 1.7$ cm in size (Figures 35 and 36), were identified, as well as five tested cobbles of gray chert and one tan/orange chert core. No other flaked stone artifacts, such as other informal tools or hammer stones, were recorded. Six unidentifiable Tusayan White Ware sherds and four unidentifiable Tusayan Gray Ware sherds were also recorded outside AC 1.

No diagnostic artifacts were observed during site recording.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-02 is good, and the site has been minimally impacted by wind erosion and freeze/thaw spalling. A small degree of inter-rill erosion on the site surface was observed, with more substantial water erosion occurring on the edges of the site, bounded by very shallow rills that contour the terrace to the north and south.

The site is located on a low, sandstone terrace with very little soil depth (less than 10 cm). The skeletal characteristics of the soils present at the site, combined with the shallow soils and eroding sandstone bedrock, indicate that no subsurface archaeological deposits are present and that artifacts are limited to the modern ground surface.

SITE INTERPRETATION

Unlike 28406-01, site 28406-02 exhibits a broader range of reduction activity, with a higher quantity of non-cortical flakes, suggesting mid-stage manufacturing of stone tools took place here. Additionally, the site contains only one core and a small number of tested cobbles. The number and size of non-cortical flakes may indicate that the site functioned more as a mid-stage lithic reduction site, with a relatively low occurrence of material procurement, as evidenced by the tested cobbles. The informal tools that were identified at the site are the result of expedient manufacture, rather than the intensive technological modification often found in formal tool production. No ground stone was recorded; therefore, it is difficult to ascertain whether activities related to the processing of plants or other food sources occurred at the site.

A small number of ceramic artifacts (Tusayan White Ware and Tusayan Gray Ware) were also recorded at the site; however, none of these are able to be assigned to a specific period or phase. The presence of these Tusayan wares may be the result of an overall Kayenta occupation; however, these ceramics could also represent an outside intrusion into an aceramic site. As no diagnostic artifacts were recorded, the age of 28406-02 is indeterminate.



Figure 35. PL 1, keel-shaped scraper, side A.



Figure 36. PL 1, keel-shaped scraper, side B.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-02 is a surficial, limited activity site that may have functioned as an indigenous processing site of lithic materials. As discussed above, Bartlett (1942, 1943) describes Tolchaco sites as low-density scatters of lithic core and shatter materials, with occasional informal tools. Keller and Mason (1976) note that Bartlett also describes occurrences of distinctly “keel-shaped” knives associated with these types of sites, of which one (PL 1) was recorded at 28406-02 based on this description. When taken in consideration with the small number of ceramic artifacts present, 28406-02 represents a discrete concentration of artifacts, rather than a large diffuse scatter of cultural material, and fails to possess even the most basic characteristics of the *Tolchaco complex* as vaguely identified by Bartlett.

Overall, 28406-02 cannot definitely be associated with a specific temporal or even cultural affiliation, and the site may represent an amalgamation of past activities. The presence of Tusayan utility wares does not decisively associate the site with the Kayenta tradition, as similar flaked stone artifacts observed at the site have been identified at sites ranging from pre-ceramic (Archaic) to even Protohistoric occupation in the region. No clear indicators of site age or affiliation were identified; therefore, 28406-02 remains an artifact scatter of indeterminate age, possibly associated with the Kayenta tradition of the Four Corners region.

Site 28406-02 is not considered a significant site under the NRHP criteria. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). As 28406-02 cannot be associated with a specific temporal or cultural affiliation, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage appears to be restricted to the artifacts recorded on modern ground surface during survey, the information potential of site 28406-02 has been exhausted. The site lacks potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, site 28406-02 is recommended ***not eligible*** for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.

Site 28406-03

Resource Type: Artifact scatter (flaked stone and ceramic)

Dimensions/Area: 58 × 46 m (1,983 m² [0.5 acre])

Average Artifact Density: <0.1 artifact/m² (rounded)

Cultural Affiliation and Age: Unknown affiliation and unknown age

A/NRHP Eligibility: Recommended ***not eligible***

SITE OVERVIEW

Site 28406-03 is a newly recorded artifact scatter located in the western part of the APE, adjacent to the 1976 MNA survey (Keller and Mason 1976), on private land in Section 9. The site is situated along two gentle swales below a low, variegated sandstone terrace with a surface of CCS gravels on light tan sandy sediments (Figure 37). Vegetation is sparse within the site boundary due to topographical characteristics as precipitation runoff is directed down from the neighboring terraces into the lower-lying areas of the site. The artifact scatter consists of a small number of ceramic artifacts as well as flaked stone debitage, the latter characteristic of lithic procurement and reduction. No features were recorded. Figure D-6 in Appendix D presents the site map for 28406-03.

ARTIFACTS

A complete inventory of archaeological materials was conducted, 108 artifacts in total, resulting in an average surface artifact density of approximately <0.1 artifact/m² across the site. Overall, the site assemblage consists of 89 flaked stone artifacts of various colors of chert, chalcedony, fine-grained volcanic, and quartzite, representing primarily mid-stage reduction activities (non-cortical and $<50\%$ cortex flakes, ranging mostly from 2–4 cm long). Five flakes and one piece of angular shatter exhibited use wear and/or possible modification. In addition to the flaked stone debitage, five tested chert cobbles were also recorded.

In all, seven expedient, informal tools were noted and five of these were point-located. PL 1 is a gray coarse-grained volcanic informal tool ($11.5 \times 9.1 \times 2.4$ cm), bifacially flaked around 75 percent of the lateral edge (Figures 38 and 39). PL 2 is a tan/orange-colored triangular chert biface tool ($3.2 \times 1.3 \times 0.3$ cm) that exhibits pressure flaking around the lateral edges. PL 3 is a large red chert biface chopper ($17.2 \times 11.1 \times 3.0$ cm), worked along 75 percent of the lateral edge. PL 4 is a mid-to-late-stage red chert biface tool ($4.5 \times 1.8 \times 0.7$ cm) and PL 5 is an early-stage, unimarginal gray chert biface ($5.5 \times 4.0 \times 1.7$ cm). Informal tools not point-located include one early-stage gray chert biface ($3.0 \times 2.4 \times 0.9$ cm), with less than 50 percent cortex and one gray chert unifacial informal tool ($5.1 \times 3.9 \times 2.2$ cm).

Additionally, 19 ceramic artifacts were also recorded: 15 unidentifiable Tusayan Gray Ware sherds; two unidentifiable Tusayan White Ware sherds; and two sherds that appear to be Cerbat Brown sherds (Tizon Brown Ware produced by Pai cultures in the region roughly from A.D. 1100–1890 (NAU 2004).

No diagnostic artifacts were observed during site recording.



Figure 37. Overview of site 28406-03; facing west.



Figure 38. PL 1, biface, side A.



Figure 39. PL 1, biface, side B.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-03 is poor and the concentration of artifacts, located in the shallow swales, is due to passive accumulation of cultural materials resulting from water runoff coming off the low sandstone terraces surrounding the site. The sandy sediments in these swales are eroded from the sandstone parent materials forming the low outcrops and terraces that characterize the local terrain. There is no original context to the site, and the artifacts are not where they were initially deposited. Additionally, there is very little soil depth (less than 15 cm) in the swales. Combined with the skeletal characteristics of the sandy sediments, there are no intact, subsurface archaeological deposits present at the site.

SITE INTERPRETATION

Site 28406-03 exhibits a broader range of reduction activity, with the assemblage suggesting mid-stage reduction. As the site is the result of passive accumulation of cultural materials, it is difficult to determine how the site functioned, since the artifacts are not within any original context from which to deduce what type or extent of cultural activities that may have taken place in the past. Based on similarities with 28406-02, the composition of the flaked stone assemblage (e.g., expedient, informal tools, mid-stage debitage) is most likely the result of nearby lithic reduction activity, perhaps initiated on top of the nearby, low sandstone terraces. The presence of ceramic artifacts may indicate the site is associated with an overall Kayenta occupation, or could represent a separate component that has since intermixed with a separate flaked stone assemblage due to water erosion. Due to an absence of undisturbed context and, as no diagnostic artifacts were recorded, the age and cultural affiliation of 28406-03 is indeterminate.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-03 is a passively accumulated amalgamation of flaked stone and ceramic artifacts that may be the remains of part of an indigenous lithic processing site. As the site fails to retain its integrity and is not located within its original context, it would be unproductive to discuss the site in relation to the *Tolchaco complex* as described by Bartlett (1942, 1943). Overall, 28406-03 cannot definitively be associated with a specific temporal or cultural affiliation. No clear indicators of site age or affiliation were identified; therefore, 28406-03 remains a passive accumulation of artifacts of indeterminate origin.

Site 28406-03 is not considered a significant site under the NRHP criteria. The site cannot be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). Additionally, as 28406-03 is the result of passive translocation of cultural materials resulting from water runoff and cannot be associated with a specific temporal or cultural affiliation, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage is restricted to the eroded sediments accumulating in the swales, the information potential of site 28406-03 has been exhausted. The site lacks the potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, site 28406-03 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.

Site 28406-04

Resource Type: Sheep camp

Dimensions/Area: 59 × 47 m (2,185 m² [0.5 acre])

Artifact Density: Not applicable

Cultural Affiliation and Age: Late Historic to recent Navajo or Euro-American (A.D. 1900+)

A/NRHP Eligibility: Recommended *eligible (Criterion D)*

SITE OVERVIEW

Site 28406-04 is a newly recorded site consisting of two livestock-related stone wall features and a sparse artifact assemblage located in the southwestern portion of the APE, approximately 900 feet southwest of the road on private land in Section 9. The site is primarily situated against the east side of a low sandstone outcrop with part of the artifact assemblage located on top of the outcrop (Figure 40). The site is characterized by a surface of tan sandy loam sediments with low amounts of CCS cobbles and gravels with sparsely interspersed small shrubs and forbs. Figure D-7 in Appendix D presents the site map for 28406-04.

FEATURES

Feature 1 is a semicircular alignment of dry-laid sandstone boulders measuring 10 feet N-S × 3 feet E-W (Figure 41). The feature abuts the sandstone outcrop, where a low overhang is present in the southern portion of the site. Five courses of rock form the alignment that arches over to meet the outcrop, forming a roof that has partially collapsed. The interior of the of the features measures 6 × 4 × 3 feet and has a small opening measuring 1 × 1 foot; this may be an intentional opening or may represent a space where an architectural stone has slumped out of place. Sediment buildup around the exterior, and especially in the interior, may be obscuring the original size of the feature. The small size of Feature 1 may indicate it functioned as a lambing pen or possibly a storage cist.

Feature 2 is a large open alcove measuring 30 feet N-S × 30 feet E-W. It has three stacked rock wall segments along the back and sides, forming an animal pen that would have likely had a brush front (Figures 42–46). No evidence of the brush front remains; however, the three disconnected wall segments, which function to extend and plug up gaps or low spots in the alcove, suggest that the feature would have been fully enclosed. The wall segment on the north side of the feature is eight courses tall and a single course wide, measuring 10 feet 6 inches long × 3 feet high. This wall segment protrudes perpendicular from the outcrop to extend the length of the pen (see Figures 42 and 44). The south side of the pen is a large boulder disconnected from the main outcrop with a small gap between the boulder and the outcrop. This gap is about 2 feet wide and has been plugged with stacked rocks which appear in an 8-inch-tall pile with little to no remaining coursing (see Figure 43). The third wall segment is located at the back of the alcove on top of a low portion of the outcrop, which is potentially low enough for livestock to escape. It is four courses (2 feet) tall and 16 feet long in a semicircular shape contouring the back of the alcove (see Figures 45 and 46). A 7-foot portion of the alignment has collapsed into the alcove, where the alcove wall is a slope rather than a low cliff.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-04 is fair, and the site has been impacted by wind and water erosion and colluvial collapse of portions of the rock alignments. No drainages are present within the site, but slope wash from the top of the outcrop has washed out a portion of Feature 2.



Figure 40. Overview of site 28406-04 with Feature 1 at left of frame and Feature 2 at right of frame near person; facing west.



Figure 41. Overview of Feature 1; facing west.



Figure 42. Overview Feature 2 showing north wall and wall at back of alcove; facing northwest.



Figure 43. Overview of Feature 2 with northern wall segment in foreground and south wall segment in background; facing south.



Figure 44. Feature 2, detail of northern wall segment; facing north.



Figure 45. Feature 2, close-up of wall segment at back of alcove; facing northwest.



Figure 46. Feature 2, close-up wall segment at back of alcove and alcove interior; facing east.

The site is located on and against a low sandstone outcrop with little to no soil depth on top of the outcrop (less than 5 cm) and moderate soil depth on the ground surface below the outcrop (estimated up to 20 cm). Sediment deposition has occurred as sediments eroding from the top of the outcrop washed down and deposited at the base of the outcrop and from blowing sand from the surrounding open desert collecting against the side of the outcrop. These depositional sources have led to increased soil depth in the areas of the site containing the features, as evident from sediment buildup at the base and within rock alignments. Much of the ground surface surrounding the site appears highly deflated and is characterized areas of exposed alluvial gravels and cobbles between low ephemeral drainages. The absence of exposed gravels indicates a buildup of eolian and alluvially deposited sediments, which may have buried additional cultural material.

SITE INTERPRETATION

Feature types present are not indicative of long-term occupation, but rather represent temporary or seasonal locations for migrating livestock herds. Stone and brush corrals that incorporate natural rock formations are typical of Navajo herding practices, but no evidence exists that directly affiliates the site to a Navajo occupation, and a Euro-American affiliation cannot completely be ruled out. The limited artifact assemblage consisting of cooking and camping artifacts, along with the livestock-related feature types, indicate that the site was used seasonally or temporarily as a sheep camp.

Although the assemblage does not provide a distinct cultural affiliation, the RAWLEIGH'S TRADEMARK bottle fragment can provide a rough temporal designation. W.T. Rawleigh of Freeport, Illinois, operated ca. 1889 to 1989. Although a bottle base with a maker's mark was not observed, Illinois Glass Company or Owens-Illinois Glass company commonly manufactured Rawleigh's bottles, which were popular between the 1920s and 1940s (Glass Bottle Marks 2016). While an exact occupation date cannot be made, an early to mid-twentieth century temporal designation fits with the overall character of the site, including the condition and types of the features and sediment buildup.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-04 is a sheep camp with a limited artifact assemblage. The site dates to the early to mid-twentieth century and is Navajo or possibly a Euro-American occupation. No definitive evidence was noted to distinguish between the two possible cultural affiliations.

Site 28406-04 is not considered a significant site under NRHP Criteria A through C. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). As 28406-01 cannot be associated with a specific time period, or with a known cultural tradition, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Moderate sediment deposition around and within features is present, as well as along the base of the outcrop. Sediment deposition may have buried additional important information that would possibly clarify the cultural affiliation of the site.

Accordingly, 28406-04 is recommended *eligible* for the A/NRHP under Criterion D. Ground-disturbing work within the site may impact the features or subsurface deposits, and archaeological testing or data recovery would be warranted should the site be adversely affected. The site should be avoided by all construction activities.

Site 28406-05

Resource Type: Artifact scatter (flaked stone and ceramic)

Dimensions/Area: 24 × 21 m (283 m² [<0.1 acre])

Average Artifact Density: 0.3 artifact/m² (rounded)

Cultural Affiliation and Age: Prehistoric Kayenta (Late Pueblo II–Early Pueblo III [A.D. 1000–1250]) and Late Historic of unknown affiliation (A.D. 1880s–1920s)

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

Site 28406-05 is a small, newly recorded multicomponent artifact scatter located in the central portion of the APE, adjacent to and south of the road on private land in Section 9. The artifact scatter, which consists of a small number of flaked stone artifacts with a larger ceramic artifact component, is a passive accumulation of artifacts in a low-lying area between a large, variegated sandstone outcrop and a smaller, eroded outcrop of the same parent material (Figure 47). A small number of historic-era artifacts were also noted. No features were observed. Figure D-8 in Appendix D provides the site map for 28406-05.

ARTIFACTS

A complete inventory of archaeological materials was conducted. Archaeologists documented 88 artifacts in total, resulting in an average surface artifact density of approximately <0.3 artifact/m² across the site. Overall, the site assemblage consists of 58 prehistoric ceramic sherds, 24 flakes, and one core fragment of various colors of chert, chalcedony, fine-grained volcanic, and quartzite. No angular shatter, complete cores, or tested cobbles were identified. One artifact, an expedient, informal biface chopper tool (PL 1) was point-located. PL 1, measuring 10.5 × 9.5 × 7.5 cm in size, is an expedient quartzite informal tool (Figures 48 and 49).



Figure 47. Overview of site 28406-05; facing south.



Figure 48. PL 1, chopper, side A.



Figure 49. PL 1, chopper, side B.

The ceramic assemblage represents approximately 66 percent of the assemblage (n=58), consisting primarily of unidentifiable Tusayan Gray Ware (n=35) and unidentifiable Tusayan White Ware (n=16). Four sherds of unidentifiable Cibola White Ware (sand/sherd temper with mineral paint) and one Cerbat Brown (Tizon Brown Ware), one Black Mesa Black-on-white (A.D. 1025–1140 in the Flagstaff area [NAU 2013]), and one Flagstaff Black-on-white (A.D. 1140–1225 in the Flagstaff area [NAU 2013]) were also recorded.

Six historic-era artifacts were identified at the site: one piece of metal rebar; two wire-cut nails; one sanitary can fragment; one crushed hole-in-cap can (A.D. 1880s–1920s); and one fragment of aqua glass (ca. A.D. 1880–1920s).

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-05 is poor, and the concentration of artifacts is the result of passive accumulation of cultural materials collecting via water runoff coming off the eroding sandstone outcrops on either side of the site. The sandy sediments in this low-lying area are eroded from the sandstone parent materials forming the low outcrops and terraces that characterize the local terrain. There is no original context to the site, and the prehistoric artifacts are not where they were initially deposited (the historic-era component, adjacent to a road, may have been dumped in this location).

Additionally, there is very little soil depth (less than 15 cm) and, combined with the skeletal characteristics of the sandy sediments and substantial degree of erosion, there are no intact, subsurface archaeological deposits present at the site.

SITE INTERPRETATION

The flaked stone assemblage identified at 28406-05, due to the low quantity of material, cannot definitely be described to be of any particular relative stage. As the site is the result of passive accumulation of

cultural materials, it is difficult to determine how the site functioned, since the prehistoric artifacts are not within any original context from which to deduce the type and extent of cultural activities that may have taken place in the past. The mix of ceramic and flaked stone artifacts may represent the remains of an artifact scatter associated with an overall Kayenta occupation within the Late Pueblo II–Early Pueblo III periods (A.D. 1000–1250). Based on proximity to the road, the historic-era artifacts may have been deposited at this location, intruding on the earlier, translocated prehistoric component. Furthermore, as NA 14,300 and 28406-04 demonstrate, the historic-era component could be the result of historic use of the area by the Navajo for sheepherding activities.

Due to an absence of undisturbed context and, as no diagnostic artifacts were recorded, the age and cultural affiliation of 28406-03 is indeterminate.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-05 is a passively accumulated amalgamation of flaked stone and ceramic artifacts that may be the remains of a prehistoric artifact scatter, with an additional historic-era component. While the source of the prehistoric artifacts is unknown, the location and extent of the prehistoric component is clearly the result of secondary deposition. As the prehistoric component fails to retain its integrity and is not located within its original context, framing the site within the concept of the *Tolchaco complex* as described by Bartlett (1942, 1943) would be inconsequential. As a secondary deposition of artifacts, 28406-05 may represent the remains of limited Kayenta activity in the area from Pueblo II–Pueblo III periods (A.D. 900–1350). The historic-era component, a small number of discarded items, likely dates to the Late Historic period (A.D. 1800s–1920s); however, there is no clear indication of a cultural affiliation for these later artifacts.

Site 28406-05 is not considered a significant site under the NRHP Criteria. Neither the prehistoric or historic-era components can be associated with broad patterns of history in the region (Criterion A, event), nor are they associated with a significant person (Criterion B, person). While the historic-era artifacts may be as originally deposited, the prehistoric component of 28406-03 is the result of passive translocation of cultural materials resulting from water runoff. Overall, this multicomponent site does not embody a distinctive characteristic of a type or particular period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage is restricted to the eroded sediments accumulating in low-lying area between the eroded sandstone outcrops, the information potential of site 28406-05 has been exhausted, and the site lacks potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, site 28406-05 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.

Site 28406-06

Resource Type: Artifact scatter (flaked stone)

Dimensions/Area: 117 × 91 m (6,799 m² [1.7 acres])

Average Artifact Density: 9.9 artifact/m² (rounded)

Affiliation and Age: Unknown cultural affiliation and unknown age

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

Site 28406-06 is a large, newly recorded flaked stone scatter located in the northern portion of the APE, northwest of NA 14,295 (AUM 457, the Milestone Hawaii Upgrader) on private land in Section 9.

The site is situated on a broad, low, variegated sandstone terrace characterized by a surface of CCS cobbles and gravels on sandy loam sediments. Vegetation is sparse with interspersed small shrubs and forbs and surrounding dunes (Figure 50). The artifact scatter consists of flaked stone debitage characteristic of lithic procurement and reduction, and no features were observed. Figure D-9 in Appendix D presents the site map for 28406-06.



Figure 50. Overview of site 28406-06; facing northwest.

ARTIFACTS

A complete inventory of two observation units was conducted in order to estimate the number and density of artifacts across the site. OUs were defined as 2×2 -m squares (4 m^2 in size). OU 1 was placed in the eastern portion of the site, where artifacts were of a greater density, while OU 2 was placed in the western portion of the site, where density dropped off (see Figure D-9). Overall, the most prevalent natural lithic material available immediately at the site is the same red/black/colorless-banded chalcedony identified at 28406-01 and 28406-07 (the latter is discussed below). Based on the inventories of the OUs, the estimated average density of artifacts for 28406-06 is $9.9 \text{ artifacts/m}^2$.

OU 1 consists of 55 flaked stone artifacts ($13.8 \text{ artifacts/m}^2$). The dominant lithic type for this unit is a red/black/colorless-banded chalcedony (91%, $n=50$), with a small amount of tan and butterscotch-colored chert, and a coarse-grained brown chert. Approximately 47 percent ($n=26$) of the artifacts inventoried in OU 1 are mid-stage reduction flakes (<50% cortex). Approximately 29 percent ($n=16$) of the artifacts consist of non-cortical shatter, 16 percent ($n=8$) are cortical shatter, approximately 6 percent ($n=3$) are flakes with over 50 percent cortex, and 2 percent ($n=1$) are non-cortical flakes.

OU 2 consists of 24 flaked stone artifacts (6 artifacts/m^2). Again, the majority of the material in this unit is the same red/black/colorless-banded chalcedony (96%, $n=23$), with one red/tan chert flake. Approximately 46 percent ($n=11$) of the artifacts inventoried are mid-stage reduction flakes (<50% cortex), 25 percent ($n=6$) cortical shatter, 17 percent ($n=4$) non-cortical flakes, 8 percent ($n=2$) non-cortical shatter, and 4 percent ($n=1$) with over 50 percent cortex.

In all, seven expedient, informal tools were point-located (see Figure D-9). PL 1 is a brown, coarse-grained bifacial chert tool ($6.3 \times 5.1 \times 1.8$ cm) with evidence of use wear. PL 2 is a red/black/colorless-banded chalcedony biface tool ($8.5 \times 5.4 \times 3.4$ cm), flaked around the entire edge. PL 3 is a red/brown-colored, keel-shaped biface tool ($13.5 \times 8.4 \times 4.2$ cm), and PL 4 is a biface tool ($9.1 \times 6.3 \times 3.1$ cm) of the same red/brown chert (Figures 51 and 52). PL 5 is a fine-grained volcanic cobble ($9.6 \times 4.4 \times 4.0$ cm), bifacially flaked on one end of the lateral margin and battered on the opposite end, which likely functioned as a chopper/hammer stone (Figure 53). PLs 6 and 7 are a dark gray quartzite biface tool ($9.8 \times 9.1 \times 4.5$ cm) and a gray quartzite biface tool ($8.9 \times 7.1 \times 2.5$ cm), respectively.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-06 is fair, and the site has been minimally impacted by wind erosion and freeze/thaw spalling. A small degree of inter-rill erosion on the site surface was observed, with more substantial water erosion occurring on the northwest site of the site, which is bounded by very shallow rills that contour the terrace.

The site is located on a low, broad sandstone terrace with very little soil depth (less than 10 cm). The skeletal characteristics of the soils present at the site, combined with the shallow soils and eroding sandstone bedrock, indicate that no subsurface archaeological deposits are present and that artifacts are limited to the modern ground surface.

SITE INTERPRETATION

Similar to 28406-03, 28406-06 exhibits a broader range of reduction activity, with a higher quantity of flakes with less than 50 percent cortex suggesting mid-stage. Overall, the artifacts suggest that the site is likely the result of some procurement activities and mid-stage reduction of lithic materials. The informal tools that were identified at the site are the result of expedient manufacture, rather than intensive technological modification often found in formal tool production. No ground stone was recorded; therefore, it is difficult to ascertain whether activities related to the processing of plants or other food sources occurred at the site.

As no diagnostic artifacts were recorded, the age and cultural affiliation of 28406-06 are indeterminate.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-06 is a surficial, limited activity site that may have functioned as an indigenous procurement and processing site of lithic materials. As discussed above, Bartlett (1942, 1943) describes Tolchaco sites as low-density scatters of lithic core and shatter materials, with occasional informal tools. In relation to this somewhat equivocal definition, 28406-06 is very dense in terms of the artifact assemblage (9.9 artifacts/ m^2). Comparatively, bifacial tools that largely appear to have functioned as choppers, as well as one hammer stone, are also well represented at the site. Overall, it is not clear whether the site can be considered characteristic of the conceptual *Tolchaco complex*; 28406-06 may more simply represent local pre-Formative occupation. However, the absence of ceramic artifacts does not preclude association with later periods of occupation, including prehistoric Kayenta or Sinagua traditions, or even later Protohistoric use. No clear indicators of site age or affiliation were identified; therefore, 28406-06 remains an aceramic flaked stone scatter of indeterminate age and of unknown cultural association.

Site 28406-06 is not considered a significant site under the NRHP Criteria. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). As 28406-06 cannot be associated with a specific time period, or with a known cultural tradition, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage appears to be restricted to the artifacts recorded on modern ground surface during survey,

the information potential of site 28406-06 has been exhausted. The site lacks the potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, 28406-06 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.



Figure 51. PL 3, keel-shaped biface tool.



Figure 52. PL 4, biface tool.



Figure 53. PL 5, cobble tool.

Site 28406-07

Resource Type: Artifact scatter (flaked stone and ceramic)

Dimensions/Area: 442 × 309 m (71,670 m² [17.7 acres])

Average Artifact Density: 6.2 artifacts/m² (rounded)

Affiliation and Age: Unknown cultural affiliation and unknown age

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

Site 28406-07 is a very large, newly recorded artifact scatter located in the northern portion of the APE, west of NA 14,295 (AUM 457, the Milestone Hawaii Upgrader) on private land in Section 9. The site is situated on a wide, expansive mudflat (playa) with large swathes of CCS cobbles and gravels on a surface of mud-clay sediments. Vegetation is sparse with interspersed small shrubs and forbs (Figures 54 and 55). The artifact scatter consists of flaked stone debitage characteristic of lithic procurement and reduction, and a small number of ceramic artifacts. No features were observed. Figure D-10 in Appendix D presents the site map for 28406-07.

ARTIFACTS

A complete inventory of four observation units was conducted in order to estimate the number and density of artifacts across the site. OUs were defined as 2 × 2-m squares (4 m² in size). OUs 1 and 2 were placed in the western and northern portions of the site, respectively, where artifacts were of a lower density, while OUs 3 and 4 were placed in the southwestern and southern portions of the site, where density increased (see Figure D-9). Overall, the most prevalent natural lithic material available immediately at the site is the same red/black/colorless-banded chalcedony identified at 28406-01 and 28406-06. Naturally occurring

petrified wood occurs across the extent of the site, concentrated in the central portion, south of the open area of the mudflat. While none was identified within the OUs, Tusayan Gray Ware (unidentifiable) is present in very minute quantities in relation to the flaked stone assemblage at 28406-07. These sherds were observed in the southwest area of the site at the base of a large sandstone outcrop. No additional artifacts were identified on the top of that outcrop; however, it is plausible, considering topography, that the ceramic artifacts (and quite possibly the flaked stone artifacts in the immediate vicinity) may have eroded down the slope and onto the edge of the mudflat. Based on the inventories of the OUs, the estimated average density of artifacts for 28406-07 is 6.2 artifacts/m².

OU 1 consists of 20 flaked stone artifacts (5 artifacts/m²). One hundred percent of the artifacts inventoried in this unit consisted of red/black/colorless-banded chalcedony. Approximately 35 percent (n=7) of the artifacts inventoried in OU 1 consist of cortical shatter, while approximately 30 percent (n=6) of the artifacts recorded exhibited cortex of 50 percent or less. Additionally, approximately 20 percent (n=4) of the artifacts consist of non-cortical shatter, 10 percent (n=2) are flakes with over 50 percent cortex, and 5 percent (n=1) are non-cortical flakes.

OU 2 consists of 14 flaked stone artifacts (3.5 artifacts/m²). Again, 100 percent of the material in this unit is the same red/black/colorless-banded chalcedony. Approximately 64 percent (n=9) of the artifacts inventoried are mid-stage reduction flakes (<50% cortex), while approximately 22 percent (n=3) of the assemblage consists of cortical shatter. Additionally, one non-cortical flake (7%) and one flake with over 50 percent cortex (7%) were recorded.

OU 3 consists of 33 flaked stone artifacts (8.3 artifacts/m²). Similar to OUs 1 and 2, 100 percent of the material in OU 3 is the red/black/colorless-banded chalcedony. Approximately 33 percent (n=11) of the artifacts inventoried are mid-stage reduction flakes (<50% cortex), while 31 percent (n=10) have over 50 percent cortex. Approximately 18 percent (n=6) of the artifacts consisting of cortical shatter, 12 percent (n=4) non-cortical shatter, and 6 percent (n=2) are non-cortical flakes.

OU 4 consists of 31 flaked stone artifacts (7.8 artifacts/m²). This unit is the only unit to contain a second material type, petrified wood, other than the red/black/colorless-banded chert that dominates the artifact assemblage across the site. Approximately 97 percent (n=30) of the artifacts are chalcedony, with one single fragment of cortical shatter of petrified wood. Overall, 42 percent (n=13) of the assemblage consists of cortical shatter, while 26 percent (n=8) of the artifacts are flakes with less than 50 percent cortex. Sixteen percent (n=5) are non-cortical flakes, while 13 percent (n=4) of the assemblage is non-cortical shatter. One single flake (3%) exhibits over 50 percent cortex.

Because of the substantial size of the site, only three artifacts were point-located (see Figure D-10). PL 1 is a unifacial, keel-shaped tool (16.8 × 11.6 × 2.5 cm) manufactured from a coarse-grained chert (Figures 56 and 57). PL 2 is a chalcedony biface (5.1 × 3.6 × 2.3 cm) made of the same locally available chalcedony described above, flaked around the entire lateral margin on both sides. PL 3 is what appears to be a double-ended chopper (10.7 × 8.4 × 3.3 cm) of a coarse-grained chert/chalcedony.

SITE CONDITION AND SUBSURFACE POTENTIAL

The condition of 28406-07 is fair and the site has been impacted by wind erosion and freeze/thaw spalling. The entire site is contained within a large, broad mudflat/playa that is characterized by thick, cracked mud-clay surface, which likely allows for pools of water to accumulate during precipitation events. The sandstone outcrops that outline the western boundary are eroding into the site as well.

As the site is located on a mudflat/playa, it is highly unlikely that subsurface cultural deposits are present due to the mud-clay soils that make up the first 10 to 20 cm of the surface. As a result, it appears that artifacts are limited to the modern ground surface.



Figure 54. Aerial view of 28406-07, located on mudflat/playa; view to the south.



Figure 55. Site overview of 28406-07; facing west-northwest.

SITE INTERPRETATION

Similar to 28406-06, 28406-07 exhibits a broad range of reduction activity, likely reflecting both lithic material procurement and reduction. Based on field observations, it is estimated that there are thousands of pieces of both cortical and non-cortical shatter. The informal tools that were identified at the site are the result of expedient manufacture, rather than the intensive technological modification often found in formal tool production. No ground stone was recorded; therefore, it is difficult to ascertain whether activities related to the processing of plants or other food sources occurred at the site.

The substantially small number of ceramic artifacts (Tusayan Gray Ware) were also recorded at the site; however, none of these are able to be assigned to a specific period or phase. The presence of these Tusayan wares may be the result of an overall Kayenta occupation; however, these ceramics could also represent an outside intrusion into an aceramic site.

Overall, the sheer quantity of flaked stone debitage and the substantial size of the site may reflect multiple periods of use a long period of time. However, as no diagnostic artifacts were recorded, the age of 28406-07 is indeterminate.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Site 28406-07 is a very large, surficial, limited activity site that may have functioned as an indigenous procurement and processing site of lithic materials. As discussed above, Bartlett (1942, 1943) describes Tolchaco sites as low-density scatters of lithic core and shatter materials, with occasional informal tools. Comparatively, 28406-07 is similarly as large, but relatively much more dense in terms of the artifact assemblage, particularly when considering the considerable quantity of shatter present. Comparatively, bifacial tools and hammer stones are also well represented at the site. Therefore, again, similar to other sites discussed above, it is not clear whether the site can be considered characteristic of the conceptual *Tolchaco complex*.

Overall, 28406-07 cannot definitively be associated with a specific temporal or even cultural affiliation, and, when considering its expansive site, the site could be simply a manifestation of an amalgamation of past activities that occurred over time. The presence of Tusayan Gray Ware does not decisively associate the site with the Kayenta tradition, as similar flaked stone artifacts observed at the site have been identified at sites ranging from pre-ceramic (Archaic) to even Protohistoric occupation in the region.

No clear indicators of site age or affiliation were identified; therefore, 28406-07 remains an artifact scatter of indeterminate age, possibly associated with the Kayenta tradition of the Four Corners region.

Site 28406-07 is not considered a significant site under the NRHP criteria. The site cannot definitively be associated with broad patterns of history in the region (Criterion A, event), and it is not associated with a significant person (Criterion B, person). As 28406-07 cannot be associated with a specific time period, or with a known cultural tradition, the site does not embody a distinctive characteristic of a type or period (Criterion C, design). Finally, as subsurface archaeological deposits are not present and the artifact assemblage appears to be restricted to the artifacts recorded on modern ground surface during survey, the information potential of site 28406-07 has been exhausted. The site lacks potential to yield important information that would contribute to a broader understanding of prehistory or history of the area beyond what has already been documented during this survey (Criterion D, information).

Accordingly, 28406-07 is recommended *not eligible* for the A/NRHP. No further archaeological work or avoidance during project activity is recommended for the site.



Figure 56. PL 1, keel-shaped chopper, side A.



Figure 57. PL 1, keel-shaped chopper, side B.

AUM 458

Resource Type: Historic-era uranium mine

Dimensions/Area: 212 × 232 m (36,907 m² [9.1 acres])

Cultural Affiliation and Age: Euro-American Late Historic (A.D. 1955–1962)

A/NRHP Eligibility: Recommended *not eligible*

SITE OVERVIEW

AUM 458 is an abandoned historic-age uranium mine amounting to 9.3 acres and located approximately 0.5 mile south of NA 14,295 (Figures 58 and 59). The site was not revisited or rerecorded during survey in accordance with the Radiation Safety Program, Health and Safety Plan, and ALARA principles. According to the AOC, the mine was periodically worked between 1957 and 1962.

FEATURES

The site as described by Weston (2014:11) includes a central pit rimmed by uranium waste rock piles and some mining-related debris:

- Unreclaimed mining-related uranium waste rock covered a majority of the central portion of the site, with peaks of 45 feet at the north and south ends, and a central depression area.
- Small waste piles are scattered throughout the central waste area.
- The recessed pit/depression in the center of the waste area contained standing water and vegetation.
- Various pieces of metal and wood debris were found throughout the site.



Figure 58. Overview of AUM 458 showing central pit; facing southwest.



Figure 59. A waste rock pile at AUM 458; view facing north.

A/NRHP ELIGIBILITY AND MANAGEMENT RECOMMENDATION

Similar to NA 14,295 discussed above, AUM 458 does not possess any quality of significance to American history, architecture, archaeology, engineering, or culture. It is not associated with significant events on the local or national level, is not associated with significant persons, is not a distinctive type or work of a master, and does not have the potential to yield information important to understanding the past.

Accordingly, AUM 458 is recommended ***not eligible*** under any A/NRHP evaluation criteria. No further archaeological work or avoidance is recommended for the site.

ISOLATED OCCURRENCES

A total of 25 IOs of cultural material (isolated single artifacts and isolated artifact scatters) was identified during the survey (Table 3). Table E-1 in Appendix E and Figure C-1 show IOs. The IOs largely consist of indigenous lithic artifacts, with a few historic-era artifacts recorded as well. The IOs are not considered significant cultural resources and are ***not eligible*** for inclusion in the A/NRHP. Table E-1 in Appendix E presents locational information for the IOs.

Table 3. Isolated Occurrences

IO No.	IO Description	Area of Dispersal (m)
1	Small scatter consisting of 3 flakes: 1 chalcedony and 2 chert (all <50% cortex)	20 × 5
2	Small scatter consisting of 1 quartzite tested cobble; 1 chalcedony flake (<50% cortex); and 1-colored butterscotch chert (10% cortex)	15 × 10
3	Small scatter consisting of 1 expedient informal tool of mahogany-banded obsidian and 1 tan chert biface core	3 × 3
4	1 modified white chert flake (<5% cortex)	—

Table 3. Isolated Occurrences (Continued)

IO No.	IO Description	Area of Dispersal (m)
5	1 chert biface core	--
6	Small scatter consisting of 1 light orange-colored chert multidirectional core; 15 non-cortical chalcedony and chert flakes; and 1 modified chert flake	50 × 50
7	Small scatter consisting of 1 obsidian worked flake and 4 non-cortical chert flakes	5 × 5
8	Small scatter consisting of 1 informal coarse-grained chert tool, slightly worked on dorsal side, and 2 tested chalcedony cobbles in dune blowout area	4 × 4
9	Small scatter consisting of 10 non-cortical chert and chalcedony flakes and 1 informal gray chert tool preform worked on one side	20 × 20
10	Small scatter consisting of 2 fragments of chalcedony cortical shatter, 1 tested chert cobble, and 3 non-cortical chalcedony flakes	10 × 15
11	Small scatter consisting of 1 obsidian utilized flake, 3 cortical flakes, and 2 non-cortical chalcedony flakes	4 × 4
12	Small scatter consisting of 2 cortical chert flakes (<50% cortex), 1 modified chert flake, and 2 expedient flaked stone tools	1 × 1
13	3 aqua glass body fragments, imprinted NON-ALCOHOLIC, IMITATION PUNCH, ARTIFICIAL	2 × 2
14	Intact aqua bottle, marked ROMA WINE MG on base (Maywood Glass Company, A.D. 1930–1961)	1 × 1
15	Survey marker (brass cap) stamped “1916” at the section boundary of S9/S19	–
16	1 small metal oil can and 1 small crimped-seam can	20 × 10
17	8 intact colorless glass alcohol bottles DURAGLAS mark (1941–1963), 1 rubber tape, 1 steel wheel, 3 crushed sanitary food cans, 1 small metal oil can, and 1 kerosene can	30 × 15
18	1 expedient informal chalcedony tool (unifacial), 1 expedient informal chert tool (bifacial), 1 multi-directional chalcedony core on a sandstone outcrop	3 × 3
19	1 brown/white mottled utilized chert flake (<50% cortex)	–
20	1 brown utilized chert flake (<50% cortex)	–
21	1 unidentifiable Tusayan Gray Ware sherd	–
22	1 unidentifiable Tusayan Gray Ware sherd (corrugated), 1 Tusayan Gray Ware sherd (non-corrugated), and 1 unidentifiable Tusayan White Ware sherd	15 × 10
23	1 cortical chert flake	–
24	1 steel-sided, aluminum-top pull-tab beverage can (ca. A.D. 1950s+)	–
25	Small scatter consisting of 1 gray chert multi-directional core, 3 large cortical flakes, and 2 non-cortical flakes on the edge of a sandstone outcrop	1 × 1

SUMMARY

Babbitt Ranches, LLC, in cooperation with the EPA and other federal and state agencies, is conducting an interim removal action and RSEs of abandoned historic-age uranium mines on privately owned portions of the CO Bar Ranch and neighboring federal land managed by Reclamation, near the unincorporated community of Gray Mountain, in Coconino County, Arizona. Babbitt Ranches, LLC, retained SWCA to conduct a cultural resources inventory of the APE. The APE for this undertaking is limited to the area of direct impacts related to the interim removal action and RSE, amounting to 501.6 acres of private and Reclamation lands in Sections 9, 10, and 15, Township 27 North, Ranch 10 East. No lasting auditory, visual, atmospheric, or other indirect impacts are anticipated as a result of the interim removal action and RSE.

In 1976, MNA, on behalf of Western Nuclear, conducted an approximately 182-acre archaeological survey of portions of Section 9 and 10 within the project area in the vicinity of AUMs 457, 458, and 459 (AZSITE

Project 1953; MNA Project A75-204; Keller and Mason 1976). The Keller and Mason (1976) survey is more than 10 years old; however, SWCA recommends that this report meets the minimum adequacy standards outlined by SHPO Guidance Point 5. A complete copy of this report is included in Appendix F of this document. The previously surveyed areas were **not** systematically resurveyed as part of the current study.

The remaining 319.5 acres of the APE were subject to new Class III (intensive pedestrian) cultural resource survey from November 29 through December 8, 2016. Survey on Reclamation land in Section 10 was accomplished under the authority of Permit BOR-PXAO-2016-009, issued by Reclamation. In all, 241.4 acres of the 319.5-acre survey area were surveyed during fieldwork; the remaining 78.1 acres were unsurveyable because of impenetrable vegetation and the active river channel.

As a result of the survey (Table 4), SWCA rerecorded two prehistoric archaeological sites (NA 14,299 and NA 14,300) and documented structural ruins associated with the historic the Milestone Hawaii Upgrader (NA 14,295) at AUM 457, all three of which were previously recorded in 1976 by the MNA (Keller and Mason 1976). AUM 458 also is recognized as a historic-era uranium mine and discussed. In addition to these known cultural resources, SWCA identified and documented seven new archaeological sites and recorded 25 IOs of cultural material.

Table 4. Site Management Summary

Site Number	Newly/ Previously Recorded	Land Jurisdiction	Site Type	Cultural/Temporal Affiliation	Eligibility Status (Criterion)*	Treatment Recommendation(s)
NA 14,295 (AUM 457) <i>Milestone Hawaii Upgrader</i>	Previously recorded	Private	Uranium mining	Late Historic Euro-American (early 1960s)	Not eligible	None
NA 14,299	Previously recorded	Private	Limited activity site (artifact scatter)	Prehistoric Kayenta Early Pueblo II (A.D. 900–1065)	Not eligible	None
NA 14,300	Previously recorded	Private	Rock art	Prehistoric Kayenta (A.D. 900–1065) Protohistoric indigenous (A.D. 1425–1550s)	Eligible (Criterion D)	Avoid—if avoidance is not possible, data recovery is recommended prior to project implementation
			Sheep camp	Late Historic–Recent Navajo (A.D. 1900+)		
AUM 458	Newly Recorded	Private	Uranium mine site	Late Historic Euro-American (A.D. 1950s–1960s)	Not eligible	None
28406-01	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-02	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-03	Newly recorded	Private	Passive accumulation	Unknown Indigenous	Not eligible	None

Table 4. Site Management Summary (Continued)

Site Number	Newly/ Previously Recorded	Land Jurisdiction	Site Type	Cultural/Temporal Affiliation	Eligibility Status (Criterion)*	Treatment Recommendation(s)
28406-04	Newly recorded	Private	Sheep camp	Late Historic–Recent Navajo (A.D. 1900+)	Eligible (Criterion D)	Avoid—if avoidance is not possible, data recovery is recommended prior to project implementation
28406-05	Newly recorded	Private	Passive accumulation	Prehistoric Kayenta (A.D. 1000–1250) Late Historic unknown (A.D. 1880s–1920s)	Not eligible	None
28406-06	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None
28406-07	Newly recorded	Private	Limited activity site (lithic material procurement and reduction)	Unknown Indigenous	Not eligible	None

Two historic-era uranium-mining sites in the APE—AUM 458 and NA 14,295 (AUM 457), Milestone Hawaii Upgrader—are recommended *not eligible* under A/NRHP eligibility criteria. Neither site is associated with an important theme in the history of the region (Criterion A, event), neither site is associated with a significant person (Criterion B, person), neither site embodies a distinctive characteristic of a type or period (Criterion C, design), and neither site has the potential to yield information (Criterion D, information).

NA 14,300 is a rock art site with associated storage features and artifacts that may have been used by Kayenta, Navajo, and other indigenous groups from A.D. 900 to 1950. The site has the potential to yield information important to understanding pre-Contact, protohistoric, and historic indigenous use of the area and is recommended *eligible* for the NRHP under Criterion D.

Site 28406-04 consists of several dry-stacked walls and a small, enclosed, dry-stacked structure. Based on similar sites known in the area, the site likely functioned as a historic-era Navajo sheep camp, with the small structure plausibly serving as a lambing pen. Due to erosional processes resulting in sediment deposition in and around the features, 28406-04 has the potential to yield information important to the understanding of historic indigenous use of the area and is recommended *eligible* for the NRHP under Criterion D.

The remaining archaeological sites (NA 14,299, 28406-01, 28406-02, 28406-03, 28406-05, 28406-06, and 28406-07) do not have the potential to yield information important to prehistory, and are recommended *not eligible* for the A/NRHP.

The 25 IOs recorded during the survey, which largely consist of indigenous lithic artifacts and a few historic-era items, are not considered significant cultural resources and are *not eligible* for inclusion in the A/NRHP.

Recommendations

We recommend that sites NA 14,300 and 28406-04 be avoided by project activities. No avoidance is recommended for the remaining cultural resources. To ensure avoidance, the boundaries of sites NA 14,300 and 28406-04 will be flagged or otherwise marked for avoidance during field activities associated with the AOC. To ensure avoidance, the proponent has committed to avoiding all ground disturbance, including but not limited to, excavation, drilling, soil sampling, and operating motor vehicles or all-terrain vehicles, within 50 feet of an avoidance area. Maps of avoidance areas will be provided to all personnel, and site markings will be periodically inspected and remarked as necessary. If activities must occur within 50 feet but outside the boundary of a historic property, the proponent will arrange for a qualified archaeological monitor to be present during such activity to ensure that contributing elements of the property are not affected. Only non-ground disturbing activity is permissible within the boundary of a historic property, including walking for the purposes of collecting handheld or backpack-mounted sensor data.

Sites NA 14,300 and 28406-04 will be avoided during project activities. Since no historic properties would be affected by the undertaking, a finding of “no historic properties affected” is appropriate in accordance with Section 106 of NHPA and 36 CFR 800.

In the event that sites NA 14,300 and 28406-04 cannot be avoided by planned or future project activities and the historic properties would be adversely affected, a finding of “adverse effect” would be appropriate. In accordance with 36 CFR 800, the EPA would develop and implement a memorandum of agreement (MOA) between SHPO and federal agencies, concurring state agencies, and interested Native American groups. The MOA would stipulate measures for the documentation, data recovery, or other mitigation measures to minimize the adverse effects of the undertaking.

Discovery Clause

In the event that previously unreported cultural resources are encountered during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) until a qualified archaeologist has documented the discovery and evaluated its eligibility for the A/NRHP in consultation with the EPA, Reclamation, SHPO, and Tribes, as appropriate. Work must not resume in this area without approval of the EPA.

The unanticipated discovery of human remains is unlikely. If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 m (100 feet) of the discovery, and the area must be secured. For private lands, ASM must be notified of the discovery in accordance with ARS 41-865. For Reclamation lands, the agency must be notified of the discovery, and the provisions of the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 USC 3001–3013) will be followed. Work must not resume in the vicinity of human remains without authorization from ASM or Reclamation, as appropriate, and the EPA.

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Little Colorado River Valley Conservation Area Restoration Project

POTENTIAL IMPACTS OF THE PROJECT ON HISTORIC PROPERTIES

There are no known historic properties at either of our project sites, nor in the vicinity of the proposed restoration.

A handwritten signature in black ink, appearing to read 'William C. Cordasco', is written over a horizontal line. The signature is stylized with several loops and a long horizontal stroke at the end.

William C. Cordasco – President

September 6, 2018



Little Colorado River Valley Conservation Area Restoration Project

PROJECT SITE PHOTOGRAPHS



Looking NORTH

This aerial image depicts ponds and the Little Colorado River, which are a focal point for wildlife. The project's South Unit is in the upper grouping of tamarisk (above and to the right of the ponds) – you can just make out the white old growth cottonwood tree stringers that this project focuses on protecting. The project's North Unit is further north and not visible in this photo.



Looking NORTH

The project is located along the intermittent Little Colorado River, within the Little Colorado River Valley Conservation Area. This view of the river is from the project's South Unit (on the left bank – the Navajo Nation has a similar landscape across the river, including old growth cottonwood, on the right bank).



Looking WEST

Surviving cottonwoods (tallest trees) emerge from a sea of invasive tamarisk at the project's South Unit. This project includes removing the tamarisk understory to protect these native trees from wildfire hazards and freeing them from competition for vital resources (like water and sunlight).

STATE HISTORIC PRESERVATION OFFICE

Review Form

In accordance with the State Historic Preservation Act (SHPO), A.R.S. 41-861 *et seq*, effective July 24, 1982, each State agency must consider the potential of activities or projects to impact significant cultural resources. Also, each State agency is required to consult with the State Historic Preservation Officer with regard to those activities or projects that may impact cultural resources. Therefore, it is understood that recipients of state funds are required to comply with this law throughout the project period. All projects that affect the ground-surface that are funded by AWPf require SHPO clearance, including those on private and federal lands.

The State Historic Preservation Office (SHPO) must review each grant application recommended for funding in order to determine the effect, if any, a proposed project may have on archaeological or cultural resources. To assist the SHPO in this review, the following information **MUST** be submitted with each application for funding assistance:

- A completed copy of this form, and
 - A United States Geological Survey (USGS) 7.5 minute map
 - A copy of the cultural resources survey report if a survey of the property has been conducted, and
 - A copy of any comments of the land managing agency/landowner (i.e., state, federal, county, municipal) on potential impacts of the project on historic properties.
- NOTE: If a federal agency is involved, the agency must consult with SHPO pursuant to the National Historic Preservation Act (NHPA); a state agency must consult with SHPO pursuant to the State Historic Preservation Act (SHPA), **OR**
- A copy of SHPO comments if the survey report has already been reviewed by SHPO.

Please answer the following questions:

1. Grant Program: Arizona Water Protection Fund Commission Fiscal Year 2019 Funding Cycle
2. Project Title: Little Colorado River Valley Conservation Area Restoration Project
3. Applicant Name and Address: Landsward Foundation, Post Office Box 520, Flagstaff, Arizona 86002-0520
4. Current Land Owner/Manager(s): Babbitt Ranches/Landsward Foundation
5. Project Location, including Township, Range, Section: T27N, R10E, Sections 3 and 15
6. Total Project Area in Acres (or total miles if trail): 8
7. Does the proposed project have the potential to disturb the surface and/or subsurface of the ground?
☒ YES ☐ NO
8. Please provide a brief description of the proposed project and specifically identify any surface or subsurface impacts that are expected:

Hand crews using chainsaws will utilize cut-stump and basal bark herbicide methods to release old-growth Fremont cottonwood (*Populus fremontii*) galleries from direct resource (water and sunlight) competition with thick, monotypic stands of salt cedar (*Tamarix spp.*). 8-foot x 8-foot x 6-foot tall piles of tamarisk slash will be burned. Hand crews will control Russian knapweed (*Acroptilon repens*) and camelthorn (*Alhagi maurorum*) infestations with herbicides within cottonwood understory to open up opportunity for successful natural and supplementary revegetation to occur. Hand crews will construct fencing to

enclose/protect designated revegetation area. Crews will revegetate cleared cottonwood understory with native vegetation using irrigationless methods. Gas-powered hand augers and a mini-excavator with a 1-foot backhoe will be used to dig holes/trenches to install native plant pole plantings are 4-5-foot depths.

9. Describe the condition of the current ground surface within the entire project boundary area (for example, is the ground in a natural undisturbed condition, or has it been bladed, paved, graded, etc.). Estimate horizontal and vertical extent of existing disturbance. Also, attach photographs of project area to document condition:

Both project site parcels occur on the floodplain (riparian zone consisting of tamarisk, cottonwood, and camelthorn) of the Little Colorado River, which is occasionally disturbed by high-flow events. Wild cattle and horse have churned the soil in many areas and developed a grid of crisscrossing paths. Ground disturbance is extremely high in and around these project sites. Please see attached photographs have been appended "Project Site Photographs."

10. Are there any known prehistoric and/or historic archaeological sites in or near the project area? ☒ YES
☐ NO
11. Has the project area been previously surveyed for cultural resources by a qualified archaeologist? ☐ YES
☒ NO ☐ UNKNOWN

If YES, submit a copy of the survey report. Please attach any comments on the survey report made by the managing agency and/or SHPO.

12. Are there any buildings or structures (including mines, bridges, dams, canals, etc.), which are 50-years or older in or adjacent to the project area? ☐ YES ☒ NO

If YES, complete an Arizona Historic Property Inventory Form for each building or structure, attach it to this form and submit it with your application.

13. Is your project area within or near a historic district? ☐ YES ☒ NO

If YES, name of the district:

Please sign on the line below certifying all information provided for this application is accurate to the best of your knowledge.

Applicant Signature

/Date

William C. Cordasco
Applicant Printed Name

FOR SHPO USE ONLY

SHPO Finding:

- ☐ Funding this project will not affect historic properties.
- ☐ Survey necessary – further GRANTS/SHPO consultation required (*grant funds will not be released until consultation has been completed*)
- ☐ Cultural resources present – further GRANTS/SHPO consultation required (*grant funds will not be released until consultation has been completed*)

SHPO Comments:

For State Historic Preservation Office:

Date:

**STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM**

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. North, South Unit Survey Area: _____

Historic Names (*enter the name(s), if any that best reflect the property's historic importance*): Not applicable

Address: Not applicable

City or Town: Unincorporated Coconino County ☐ Vicinity County: Coconino

Tax Parcel No.: 30215015, 30215002

Township: 27N Range: 10E Section: 3, 15 Quarters: _____ Acreage: 8

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference – Zone: 12 Easting: 471175 Northing: 3953627 Easting: 470984 Northing: 3956448

USGS 7.5' quadrangle map: Cameron SE, Wupatki NE, AZ

ARCHITECT: Not applicable ☐ not determined ☐ known Source: _____

BUILDER: Not applicable ☐ not determined ☐ known Source: _____

CONSTRUCTION DATE: Not applicable ☐ known ☐ estimated Source: _____

STRUCTURAL CONDITION

- ☐ Good (*well maintained; no serious problems apparent*)
- ☐ Fair (*some problems apparent*) Describe: _____
- ☐ Poor (*major problems; imminent threat*) Describe: _____
- ☐ Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: Not applicable

Sources: Not applicable

PHOTO INFORMATION

Date of photo: _____

View Direction (looking towards): _____

Attach a recent photograph of property in this space. While this is not applicable, additional photographs have been appended (please see "Project Site Photographs").

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – *Describe any historic events/trends associated with the property:* Not applicable

B. PERSONS – *List and describe persons with an important association with the building:* Not applicable

C. ARCHITECTURE – Style: Not applicable ☐ no style

Stories: Not applicable ☐ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: Not applicable

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - ☐ Original Site ☐ Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: Not applicable

MATERIALS

Describe the materials used in the following elements of the property:

Walls (structure): Not applicable

Walls (sheathing): Not applicable

Windows: Not applicable

Roof: Not applicable

Foundation: Not applicable

SETTING

Describe the natural and/or built environment around the property: Riparian vegetation, active floodplain of the Little Colorado River

How has the environment changed since the property was constructed? Not applicable

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: Not applicable

NATIONAL REGISTER STATUS (if listed, check the appropriate box)

☐ Individually Listed; ☐ Contributor; ☐ Non-contributor to _____ Historic District

Date Listed: _____ ☐ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

Property ☐ is ☐ is not eligible individually.

Property ☐ is ☐ is not eligible as a contributor to a listed or potential historic district.

☐ More information needed to evaluate.

If not considered eligible, state reason: _____



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September 6, 2018

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

Re: Little Colorado River Valley Conservation Area Restoration Project – Summary of the 2016 Archaeological Investigation of the Adjacent Milestone Hawaii Stewardship Project

Dear Mr. Teran:

The CO Bar Ranch, located north of Wupatki, is characterized by a rich cultural history spanning thousands of years. SWCA conducted a large archaeological survey in November and December 2016 in Sections 9 and 15 on behalf of CO Bar and Babbitt Ranches. The 2016 project area is in close proximity to the South Unit in Section 15 of the Little Colorado River Valley Conservation Area Restoration Project located along the banks of the Little Colorado River corridor. With the exception of a survey conducted in 1976 ahead of proposed uranium mining, there has been relatively little cultural resource survey in this area of the Little Colorado River. Therefore, the 2016 survey serves as the first extensive archaeological investigation in 40 years.

Perhaps one of the most important aspects of the 2016 survey was that the project area was situated within the traditional use areas of four Native American groups – Navajo, Hopi, Havasupai, and Yavapai. Occupation of the CO Bar between the fifteenth and eighteenth centuries is poorly understood; however, past archaeological evidence found in the region supports continued, if sparse use by indigenous groups. The Hopi have identified two ancestral trails that cross the Little Colorado River just south of Black Point, traversing portions of the CO Bar Ranch. One trail turned north immediately after the crossing, passing between the western bank of the river and Black Point to cut across the northeastern corner of the Ranch before heading north to the Desert View area of Grand Canyon. The existing road that parallels the river and is situated to the west of South Unit may follow this important travel and trade route. Additionally, one of the most interesting sites within the 2016 project area is located along this road. Consisting a Navajo sheep camp established next to an extensive artifact scatter and rock art site depicting both prehistoric Kayenta motifs and protohistoric and historic-era indigenous etchings, this remarkable archaeological site represents over 1,000 years of cultural presence along the Little Colorado River.

SWCA also had the exciting opportunity to investigate the conceptual Tolchaco Complex, which may represent a unique, local manifestation of prehistoric and possibly protohistoric indigenous lifeways. It is common for archaeologists to assume, implicitly or explicitly, that aceramic sites (that is, archaeological sites lacking later Formative ceramic artifacts) date to the earlier Paleoindian or Archaic stages. Along the Little Colorado River between Holbrook and Cameron, one can find an abundance of Pleistocene gravel and cobble deposits that include high-grade tractable chert conducive for stone stool manufacture. Unsurprisingly, amid the raw material are archaeological lithic scatters containing substantial evidence of human modification. First recognized by Katherine Bartlett in the early 1940s, Tolchaco Complex sites are generally described as highly dispersed scatters of stone core and shatter materials with occasional bifacial tools and scrapers, very few other artifacts,



and no archaeological features or datable contexts. Thus, Tolchaco Complex sites have never been securely placed in time.

SWCA identified four newly-recorded limited activity sites (representing lithic material procurement and reduction) during the 2016 field effort. While these archaeological materials did not contain any clues as to cultural or temporal affiliation, nor did they confirm the validity of the conceptual Tolchaco Complex, SWCA was able to observe areas of procurement activities and various stages of reduction of lithic material across the landscape. Although none of the artifact assemblages represented intensive technological modification often found in formal tool production, the recording and evaluation of these widely-dispersed lithic scatters nevertheless contributed additional data about the types of activities –including raw material procurement and expedient, informal tool manufacture – that occurred along the Little Colorado River over hundreds of years.

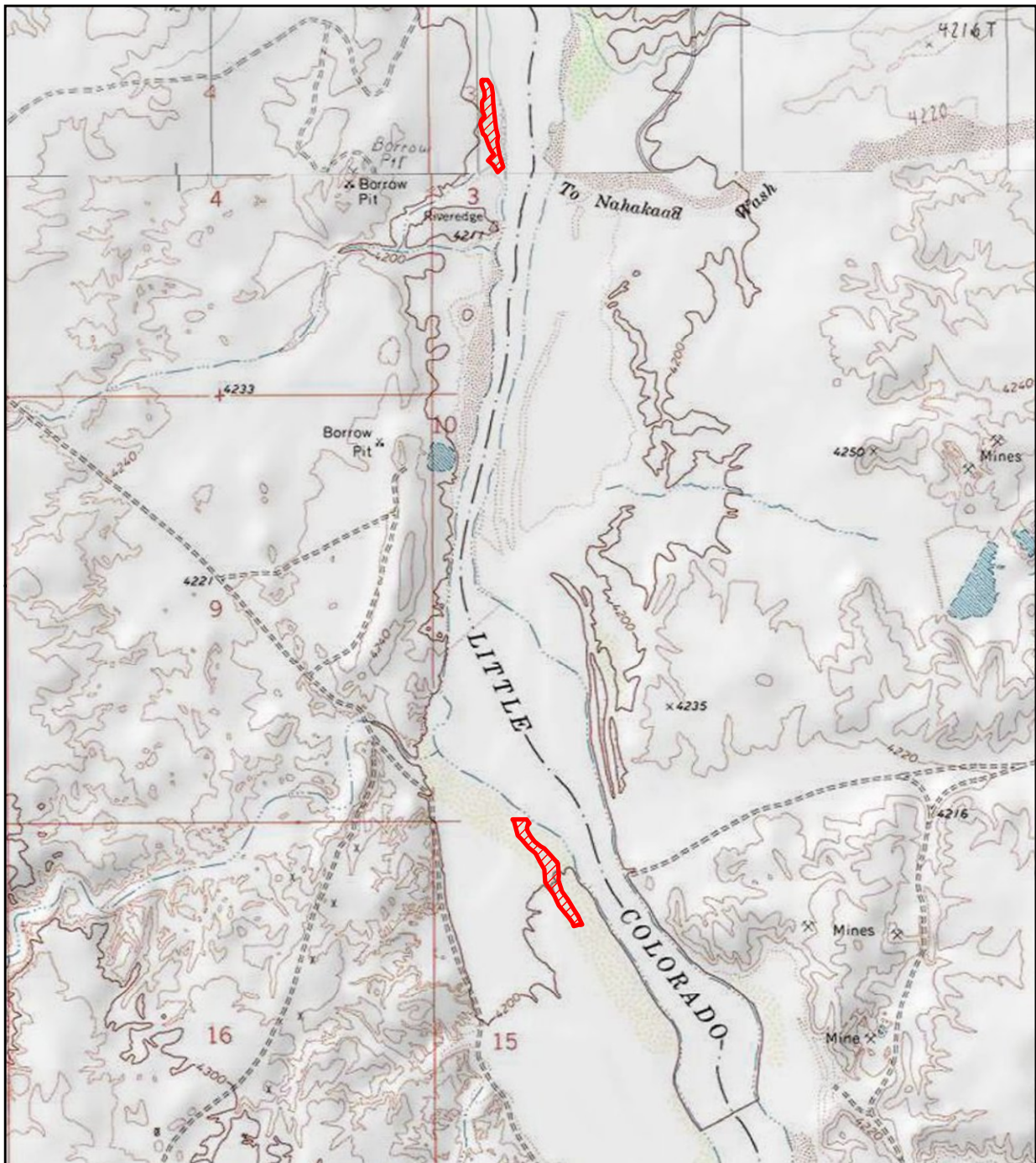
The two sites comprising the Little Colorado River Valley Conservation Area Restoration Project are located in dense tamarisk and other vegetation growing along the river corridor. Because the 2016 survey included portions of the conservation area as well as other stretches immediately along the Little Colorado River, we have a good understanding of the proposed restoration sites. The overall ground surface visibility encountered in these areas in 2016 was extremely low due to dense vegetation, most of which was impenetrable, and field inspection revealed a dynamic river, ever-changing river that has continually shaped the terrain along its banks. No archaeological materials or other cultural resources were found in the surveyed areas along the river. While it is true that poor ground visibility was a contributing factor and dense tamarisk made systematic survey difficult, if not impossible, the active channel of the Little Colorado River and its constant migration over time makes it highly unlikely that cultural resources are present within the restoration project area.

Please find attached to this letter the report titled *Cultural Resources Survey of the Babbitt Ranches, LLC, Milestone Hawaii Stewardship Project (Section 9 Lease Abandoned Uranium Mine), Coconino County, Arizona* which summarizes the methods and results of the archaeological investigation conducted in 2016 on adjacent lands in Section 9 and 15.

Sincerely,

A handwritten signature in blue ink that reads "Annie J Lutes". The signature is fluid and cursive, with a large loop at the end of the last name.

Annie J Lutes, M.A., M.S.
Flagstaff Office Archaeologist

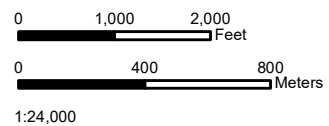


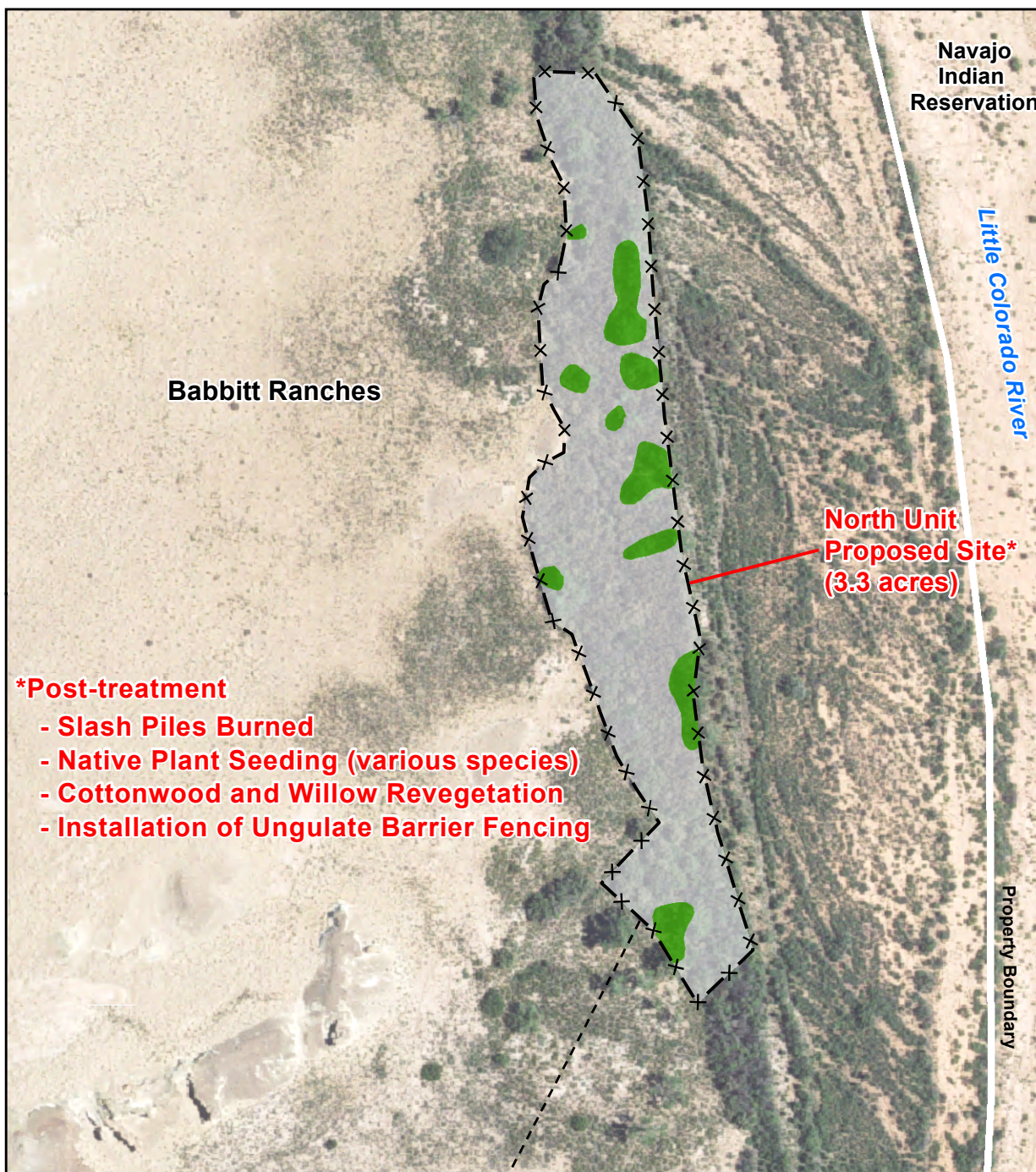
LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

Date: 9/5/2018

 **Proposed Restoration Site**

USGS 7.5' Quad:
Cameron SE, AZ & Wupatki NE, AZ





LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

--- Overland Access

x— Fence

Existing Cottonwood Tree



0 100 200 Feet

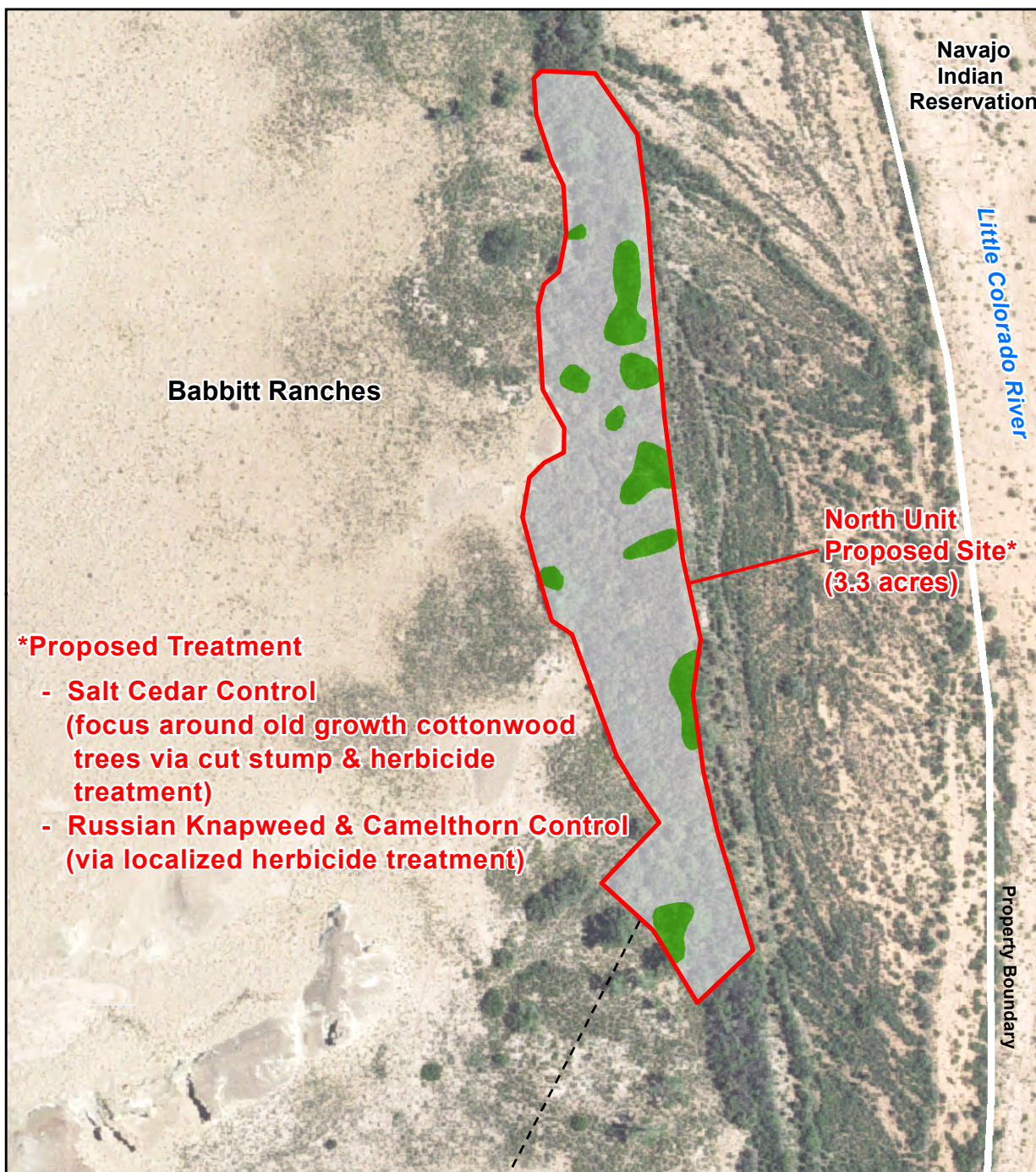
0 50 100 Meters

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Date: 9/6/2018



T27N, R10E, Section 3
Background Image: NAIP 2017



LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

- Overland Access
- Proposed Restoration Site

■ Existing Cottonwood Tree



0 100 200
Feet

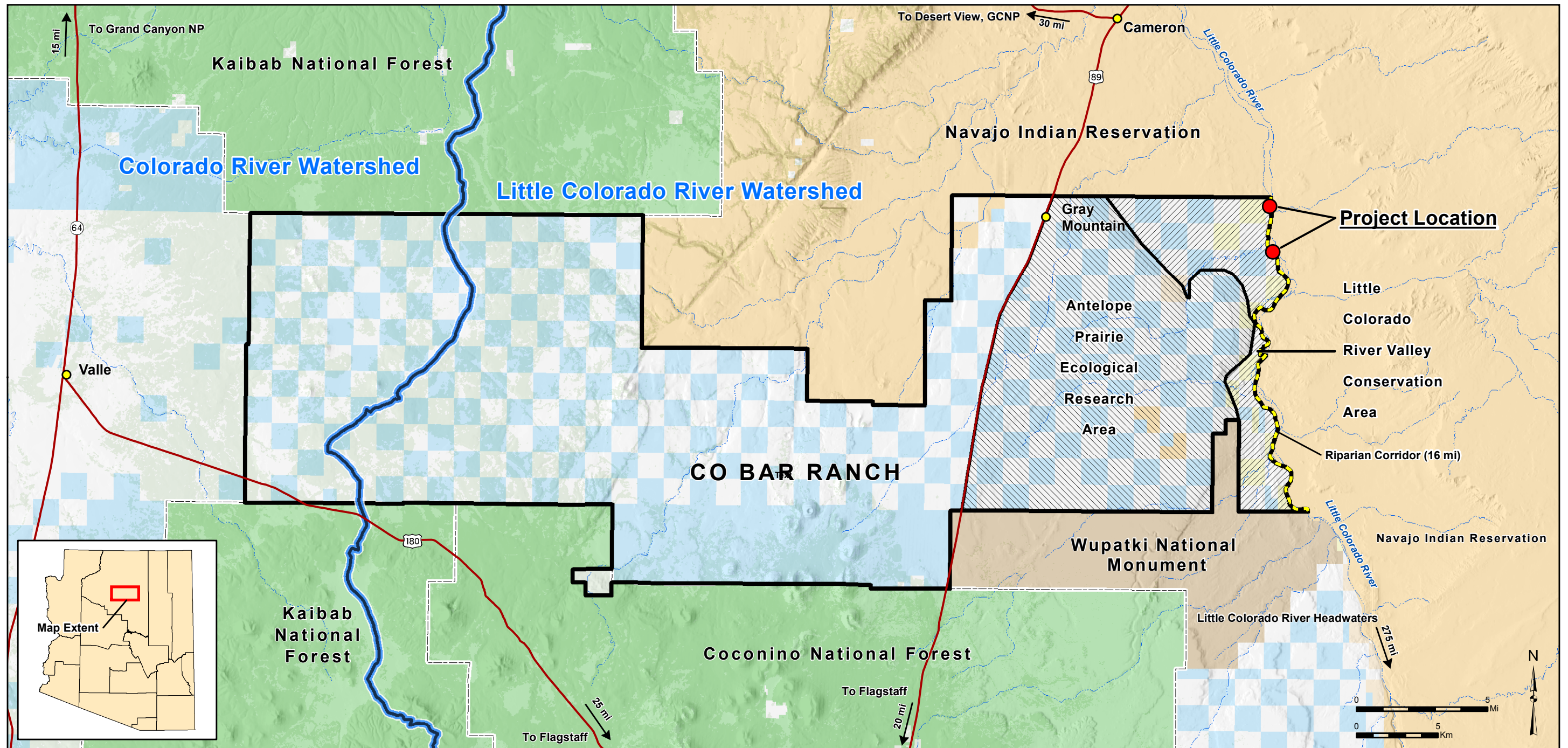
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Date: 9/4/2018



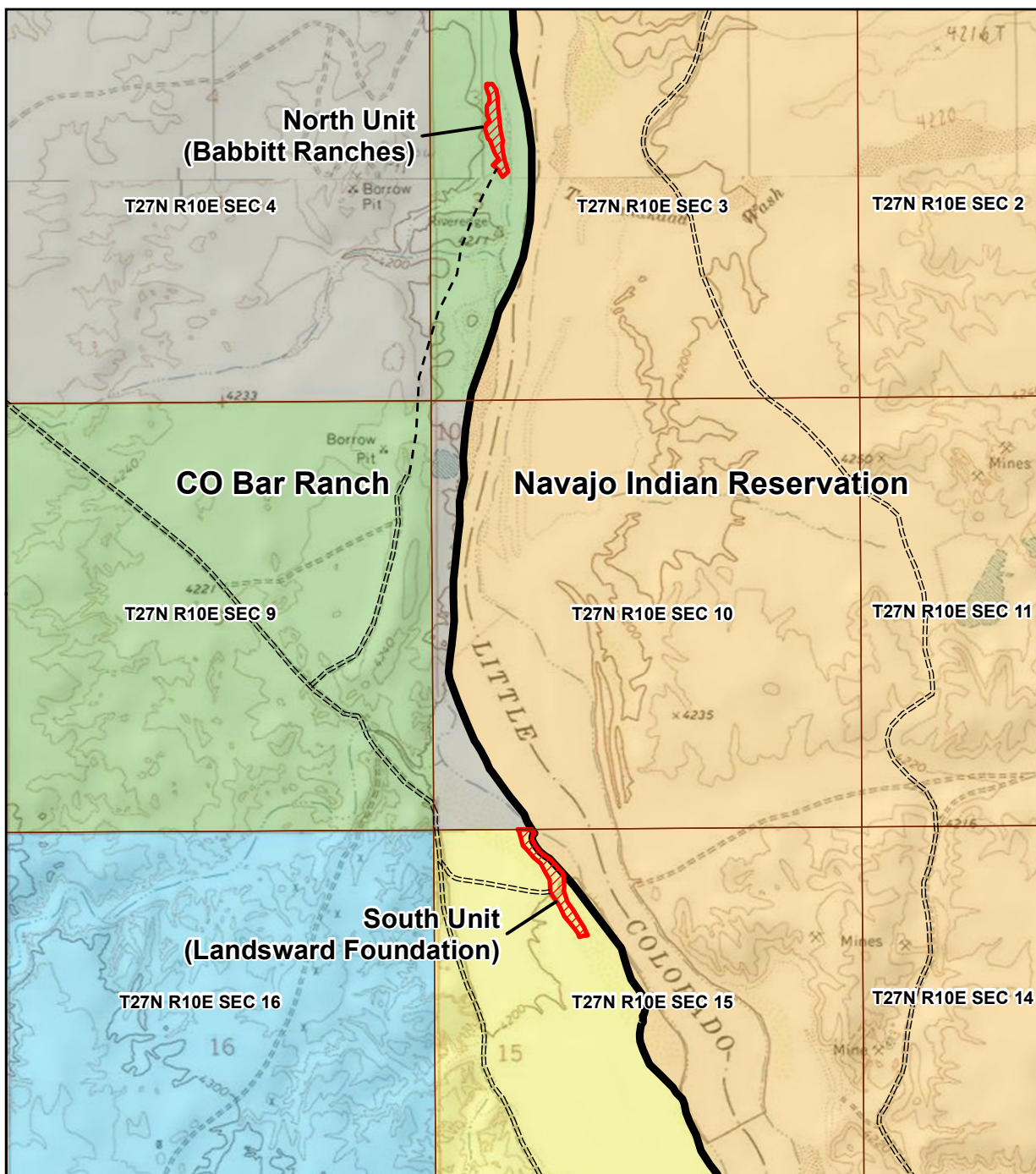
T27N, R10E, Section 3
Background Image: NAIP 2017



LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

- | | | | | |
|---|--|--|--|--|
| ● Project Location | Watershed Boundary | Bureau of Land Management | Private (no color) | ● Town |
| CO Bar Ranch Boundary | Antelope Prairie Research Area | Bureau of Reclamation | State Lands | — River Channel / Wash |
| - - - Riparian Corridor | LCR Valley Conservation Area | Indian Lands | U.S. Forest Service | — Highway |
| | | National Park Service | | |

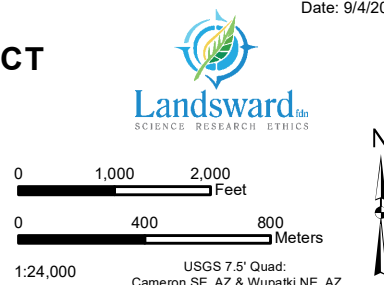
Date: 9/4/2018
T27N R10E Sections 3, 15
Coconino County, AZ

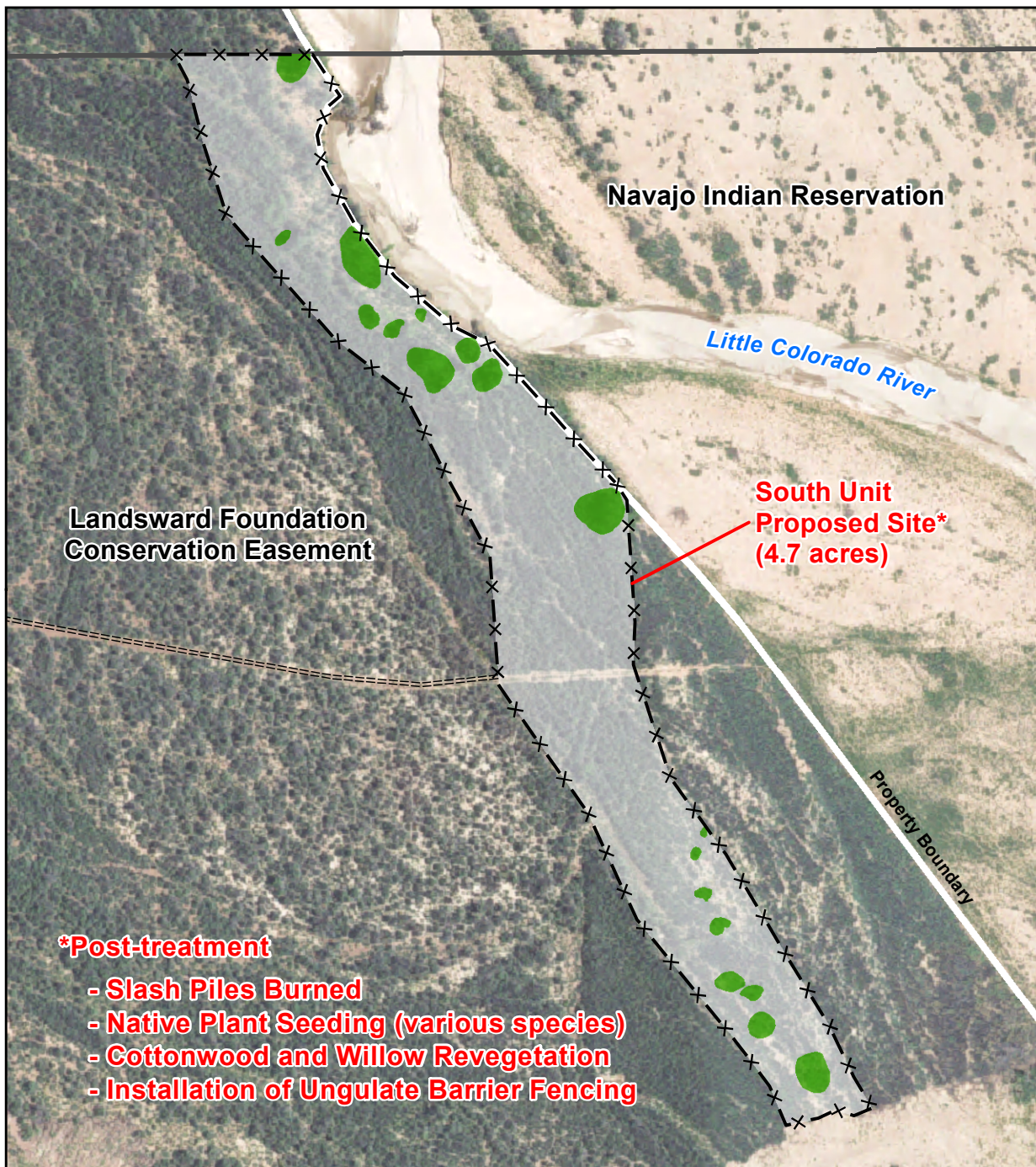


LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

Date: 9/4/2018

- | | |
|---------------------------|---------------------------|
| CO Bar Boundary | Babbitt Ranches |
| Proposed Restoration Site | Landward Foundation |
| Section Line | Bureau of Reclamation |
| Overland Access | Navajo Indian Reservation |
| Dirt Road/Two-track | State Land |





LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

— Section Line

x— Fence

==== Site Access

● Existing Cottonwood Tree

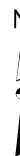


0 100 200 Feet

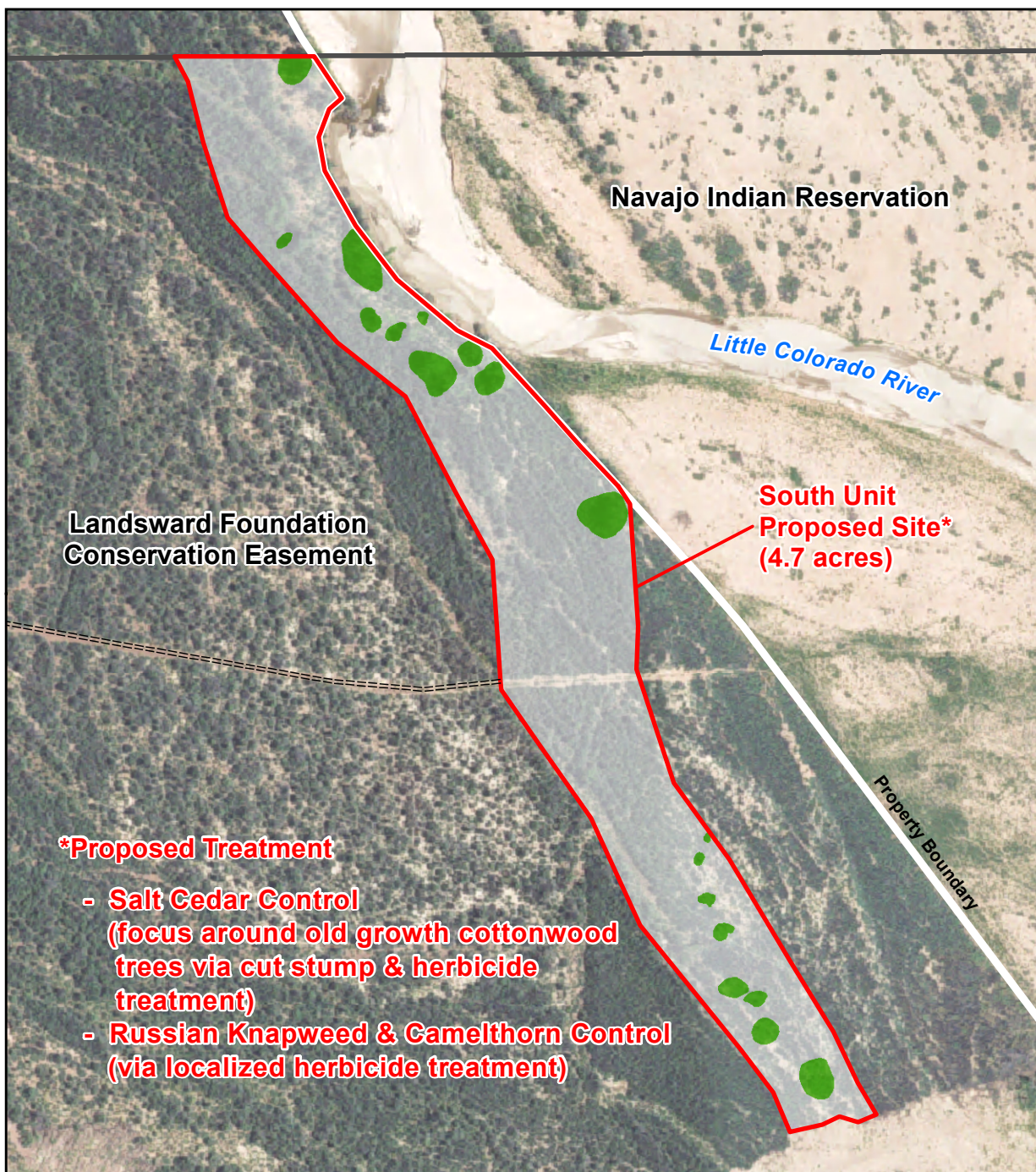
0 50 100 Meters

1:2,400

Date: 9/4/2018



T27N, R10E, Section 15
Background Image: NAIP 2017



LITTLE COLORADO RIVER VALLEY CONSERVATION AREA RESTORATION PROJECT

— Section Line

□ Proposed Restoration Site

==== Site Access

● Existing Cottonwood Tree



0 100 200 Feet

0 50 100 Meters

1:2,400

Date: 9/4/2018



T27N, R10E, Section 15
Background Image: NAIP 2017



Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 6, 2018

Dear Mr. Teran,

As the private landowner of the *Little Colorado River Valley Conservation Area Restoration Project North Unit* project site, I grant full permission to the Landsward Foundation, American Conservation Experience, Applied Ecological Consulting, Arizona Department of Forestry and Fire Management, Natural Channel Design, Inc., and associated partners to carry out *Little Colorado River Valley Conservation Area Restoration Project Scope of Work* tasks and activities on my property, including unrestricted site access and data collection. Babbitt Ranches will draw up formal agreements to this prior to any ground-disturbing activities occur (in early 2019).

Feel free to contact me anytime at 928-774-6199 or cobar@babbitranches.com.

Best wishes,

William C. Cordasco – President and General
Manager

When recorded mail to:
Michael E.J. Mongini
Hufford, Horstman, Mongini, Parnell & Tucker
120 N. Beaver Street
Flagstaff, AZ 86001


LEASE TERMINATION

WHEREAS, the Oil and Gas Lease dated April 9, 2008, and recorded April 18, 2008, at Instrument Number 3483336, Records of Coconino County, Arizona has been terminated on the effective date of August 30, 2010.

NOW, THEREFORE, Lessor Babbitt Ranches, LLC, an Arizona limited liability company, terminates the Lease on the effective date of August 30, 2010 pursuant to the terms of the Lease.


Date this 29th day of October, 2015

Lessor


William C. Cordasco, President of
CO Bar, Inc., Manager of Babbitt Ranches,
L.L.C., an Arizona limited liability company

STATE OF ARIZONA)
) ss.
County of Coconino)

On this 29th day of October, 2015, before me personally appeared William C. Cordasco, , whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that he executed the same.


Notary Public



When Recorded Return to:
Michael E.J. Mongini
Hufford, Horstman, et al.
120 N. Beaver Street
Flagstaff, AZ 86001

70500117-jrk

DEED OF CONSERVATION EASEMENT

This Deed of Conservation Easement is conveyed this 23 day of October, 2015, by Harold H. Coghlan and Rhoda R. Coghlan, Trustees of the Bode-Coghlan Family Trust dated 6/20/1996, P.O. Box 26884, Scottsdale, Arizona, 85255, hereinafter "GRANTOR", to Landsward Foundation, is an Arizona 501(c)(3) non profit corporation, and is a qualified holder of a Conservation Easement under A.R.S. Section 33-271, *et seq.*, hereinafter "HOLDER".

Disclosure of Beneficiaries pursuant to A.R.S. Section 33-404:

Brian M. Bockelman, 963 Edgecliffe Dr., #24, Los Angeles, CA 90026
Julie Ann Coghlan-Halagan, 8612 W. Village, Peoria, AZ 85382
Trudy Lynn Coghlan-Halagan, 4660 E. Amber, Prescott, AZ 86301

EXEMPT UNDER
ARS 11-1134-A2

RECITALS

WHEREAS, the GRANTOR is the sole owner in fee simple of certain lands situated in Coconino County, Arizona, more specifically described in Exhibit B, and B-1 attached hereto and incorporated herein as the "PROPERTY".

WHEREAS, HOLDER is desirous of preservation, enhancement, and/or restoration of the riparian wetlands, or upland lands, to further HOLDER's desire to prevent adverse impacts to water quality, natural resources, fish, wildlife, and habitat for biological and scientific purposes.

WHEREAS, GRANTOR is willing to grant this Conservation Easement to HOLDER, its successors and assigns, for the desired purposes and all others as set forth in this Conservation Easement.

NOW, THEREFORE, in consideration of the above Recitals, which are incorporated herein by reference, and the mutual covenants, terms, conditions, and restrictions contained herein, together with other good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, GRANTOR hereby voluntarily grants and conveys a perpetual Conservation Easement, as defined in Arizona Revised Statutes, Section 33-271, *et. Seq.*, for and in favor of the HOLDER, upon the PROPERTY which shall run with the land and be binding upon GRANTOR, and shall remain in full force and effect.

The scope, nature and character of this Conservation Easement shall be as follows:

1. Purpose. The purpose of this Conservation Easement is for the land and water areas, riparian wetlands, or upland lands, to be preserved, restored, and enhanced to benefit HOLDER's habitat for fish, plants or wildlife.

2. Rights of Holder. To carry out this purpose, the following rights are conveyed to HOLDER by this Conservation Easement.

A. The right to take action to restore, preserve, and protect the environmental value of the Property;

B. The right to any and all development whatsoever on the PROPERTY, whether above or below the land surface.

C. The right to perform and permit on the PROPERTY conservation purposes as outlined in A.R.S. Section 33-271; including but without limitation, as follows:

(i) Preserving land areas for outdoor recreation by the general public, or the education of the public;

(ii) Protecting the relatively natural habitat of fish, wildlife, or plants or similar ecosystems;

(iii) Allowing the PROPERTY to participate in any delineated federal, state or local governmental conservation programs that are part of a governmental delineated policy;

(iv) The right to perform and permit scientific research on the property, without limitation;

(v) The right to preserve, remove, and enhance the structural integrity or physical appearance of historical architectural, archeological, or any other man-made or natural features of the PROPERTY.

D. The right to, and the right to prevent any activity on or use of the PROPERTY that is inconsistent with the terms and conditions of this Conservation Easement, and to require the restoration of areas or features of the Property that may be damaged by any current or past activity inconsistent with the terms and conditions of this Conservation Easement.

E. The right to enter upon and inspect the Property in a reasonable manner and at reasonable times, including the right to use vehicles and all necessary equipment, as HOLDER determines reasonable, to determine if GRANTOR, or its successors and assigns are complying with the covenants and prohibitions, contained in this Conservation Easement, or to further progress consistent with this Conservation Easement.

F. The right to enforce this Conservation Easement by injunction or proceed at law or in equity to enforce the provisions of this Conservation Easement and the covenants set forth herein, to prevent the occurrence of any of the prohibited activities hereinafter set forth, and the right to require GRANTOR to restore such areas or features of the PROPERTY that may be damaged by any inconsistent activity or use.

G. Planting or seeding of plants, as part of riparian wetlands, or wildlife habitat, or scientific research projects.

H. Fire-fighting or fire suppression activities.

I. Machine clearing of fire lines/fire breaks as part of controlled burn activities, fire fighting, or fire suppression;

J. Installation of fences for cattle, land management or habitat protection purposes;

K. Removal of fences for cattle, land management or habitat protection purposes.

L. Hunting of deer, quail or other indigenous animal species pursuant to properly issued hunting permits only where consistent with Arizona Game & Fish, and as approved by and on file with the HOLDER.

M. Installation of signs for land management, facilitating passive recreation or habitat protection purposes.

N. Maintenance of unpaved nature trails.

O. Installation of interpretive signs for nature trails, or scientific research areas or plots.

P. The restoration, enhancement, maintenance and monitoring activities allowed by the provisions of this Section 2, without limitation.

Q. Public right of access or the limitation of such right by HOLDER.

R. HOLDER is granted all rights in the property and uses that are not permitted to GRANTOR, and that are consistent with this Conservation Easement.

S. The right and power to require that all mineral, air, and water rights, as HOLDER deems necessary, to preserve and protect the biological resources and conservation values of the PROPERTY, shall remain as part of the and be put to beneficiary use upon the PROPERTY, consistent with the purposes of this Conservation Easement.

T. HOLDER is free to use any points on-site, or create ponds for restoration, enhancement, and maintenance of habitat or riparian area.

3. Prohibited Uses by GRANTOR. Grantor shall not create any building structures on the Property, or any disturbance on the Property unless authorized by HOLDER, consistent with this Conservation Easement, and HOLDER's overall management and conservation activities along the Little Colorado River; and the following activities and uses are expressly prohibited, except for the following:

A. Pedestrian access across the PROPERTY through established gated areas, as reasonably agreed by HOLDER.

B. All activities of GRANTOR unless permitted by the US Army Corp of Engineers, US Environmental Protection Agency, or any other Federal or State Agency that has regulatory enforcement for any violation of any State or Federal rule or regulation by GRANTOR, as property owner. Written notice shall be given to HOLDER, for comment within at least thirty (30) days prior to any activity unless an emergency is determined by the regulating State or Federal Agency and then only written notice shall be sent describing the emergency and activity.

4. Other Rights of HOLDER.

A. GRANTOR further grants and conveys to HOLDER, all rights of GRANTOR to further encumber the PROPERTY with Conservation Easements, consistent with a local, state or federal program to enhance, protect, bank, and preserve fish, plant and/or wildlife, and other ranching activities. This grant includes an irrevocable limited Power of Attorney coupled with an interest to allow HOLDER to execute any and all documents, or additional Conservation Easements, from time to time, as are necessary in HOLDER's sole discretion to further HOLDER's desires for the conservation of the PROPERTY.

B. GRANTOR hereby grants and reserves a non-exclusive easement for ingress and egress, both public and private, as GRANTOR or HOLDER may determine from time to time, over and across the Easement described in Exhibit A and A-1, attached hereto.

5. Taxes. GRANTOR shall take responsibility for payment of the property taxes, as part of the adjacent property owned by GRANTOR. GRANTOR, or HOLDER may each in their discretion, create a separate Coconino County Assessor Parcel Number for the Conservation Area.

6. Liability. HOLDER shall not assume any liability for any injury or damage to the person or property of GRANTOR or third parties which may occur on the PROPERTY, except to the extent caused by HOLDER or its employees or agents. Neither GRANTOR, its successors or assigns, nor any person or entity claiming by or through GRANTOR, its successors or assigns, shall hold HOLDER liable for any damage or injury to persons or personal property which may occur on the PROPERTY, except to the extent caused solely by HOLDER, or its employees or agents.

7. Enforcement Discretion. Enforcement of the terms, provisions and restrictions of this Conservation Easement shall be at the reasonable discretion of HOLDER, and any forbearance

on behalf of HOLDER to exercise its rights hereunder in the event of any breach by GRANTOR, shall not be deemed or construed to be a waiver of HOLDER's rights.

8. Venue and Enforcement Costs. Venue to enforce the terms of this Conservation Easement shall be in Coconino County, Arizona.

9. Assignment of Rights. HOLDER will hold this Conservation Easement for scientific research and conservation purposes. HOLDER may assign its rights and obligations under this Conservation Easement to another organization qualified to hold such interests under applicable state or federal laws.

10. Recording in Land Records. HOLDER is authorized to record this Conservation Easement and any amendments hereto in a timely fashion in the Official Records of Coconino County, Arizona. HOLDER shall pay all recording costs necessary to record this Conservation Easement in the public records.

11. Successors. The covenants, terms, conditions and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors and assigns and shall continue as a servitude running in perpetuity with the PROPERTY.

12. Notices. All notices, consents, approvals, or other communications hereunder shall be in writing and shall be deemed properly given if sent by United States certified mail, return receipt requested, addressed to the appropriate party or successor-in-interest.

13. Severability. If any provision of this conservation easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this Conservation Easement shall not be affected thereby, as long as the purpose of the Conservation Easement is preserved.

14. Alteration or Revocation. This conservation easement may only be amended, altered, released or revoked, except as set forth in Article 4, Other Rights of HOLDER, only by Agreement modification as necessary and written agreement between the parties hereto or their heirs, assigns, or successors-in-interest, which shall be filed in public records in Coconino County, Arizona.


15. Controlling Law. The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of Arizona.

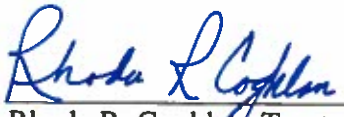
TO HAVE AND TO HOLD unto HOLDER forever. The covenants, terms, conditions, restrictions and purpose imposed with this Conservation Easement shall be binding upon GRANTOR, and shall continue as a servitude running in perpetuity with the PROPERTY.

GRANTOR, hereby covenants with said HOLDER that GRANTOR is lawfully seized of PROPERTY in fee simple; that the PROPERTY is free and clear of all encumbrances that are inconsistent with the terms of this Conservation Easement and all mortgages have been joined or

subordinated; that GRANTOR has good right and lawful authority to convey this Conservation Easement; and that it hereby fully warrants and defends the title to the Conservation Easement hereby conveyed against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the GRANTOR has executed this Conservation Easement on the day and year first above written.


Harold H. Coghlan, Trustee of the
Bode-Coghlan Family Trust, dated
6/20/1996
Landward Foundation


Rhoda R. Coghlan, Trustee of the
Bode-Coghlan Family Trust, dated
6/20/1996

Greg Goodwin

STATE OF ARIZONA)
) ss.
County of Coconino)

On this 23 day of October, 2015, before me personally appeared Harold H. Coghlan, Trustee of the Bode-Coghlan Family Trust, dated 6/20/1996, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that he executed the same.



Notary Public



STATE OF ARIZONA)
) ss.
County of Coconino)

On this 23 day of October, 2015, before me personally appeared Rhoda R. Coghlan, Trustee of the Bode-Coghlan Family Trust, dated 6/20/1996, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that she executed the same.



Notary Public




subordinated; that GRANTOR has good right and lawful authority to convey this Conservation Easement; and that it hereby fully warrants and defends the title to the Conservation Easement hereby conveyed against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the GRANTOR has executed this Conservation Easement on the day and year first above written.

Harold H. Coghlan, Trustee of the
Bode-Coghlan Family Trust, dated
6/20/1996
Landward Foundation

Rhoda R. Coghlan, Trustee of the
Bode-Coghlan Family Trust, dated
6/20/1996



Greg Goodwin

STATE OF ARIZONA)
) ss.
County of Coconino)

On this ____ day of _____, 2015, before me personally appeared Harold H. Coghlan, Trustee of the Bode-Coghlan Family Trust, dated 6/20/1996, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that he executed the same.

Notary Public

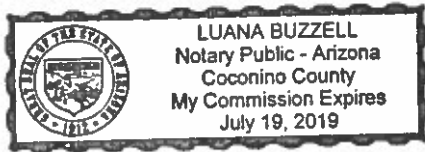
STATE OF ARIZONA)
) ss.
County of Coconino)

On this ____ day of _____, 2015, before me personally appeared Rhoda R. Coghlan, Trustee of the Bode-Coghlan Family Trust, dated 6/20/1996, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that she executed the same.

Notary Public

STATE OF ARIZONA)
) ss.
County of Coconino)

On this 27th day of October, 2015, before me personally appeared Greg Goodwin, Signor for Landsward Foundation, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that she executed the same.



Luana Buzzell
Notary Public

EXHIBIT A
LEGAL DESCRIPTION OF CENTERLINE OF HAUL ROAD

A strip of land, 30.00 feet in width, across Section 15, Township 27 North, Range 10 East of the Gila and Salt River Base and Meridian in Coconino County, Arizona, the centerline of which is described as follows:

COMMENCING, for reference, at the West quarter corner of said Section 15, a found 1 inch pipe with GLO brass cap dated 1916 lying alongside, from which the Northwest corner of Section 9 of Township 27 North Range 10 East, a found 1 inch iron pipe in a mound of stone, bears North 00°04'56" East a distance of 7919.95 feet away (Basis of Bearing is by GPS RTK Observation);

THENCE South 35°35'12" East, from said West quarter corner, a distance of 3248.34 feet, more or less, to the intersection of the centerline of the haul road with the South line of Section 15 and the TRUE POINT OF BEGINNING of this description:

THENCE North 06°14'35" East a distance of 105.11 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 290.05 feet through, a central angle of 55°23'46", the radius of said curve is 300.00 feet, the chord of which bears North 21°27'18" West for 278.89 feet;

THENCE North 49°09'10" West a distance of 227.39 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 442.77 feet, through a central angle of 25°22'08", the radius of said curve is 1000.00 feet, the chord of which bears North 36°28'06" West for 439.16 feet;

THENCE North 23°47'02" West a distance of 130.01 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 151.54 feet, through a central angle of 08°40'57", the radius of said curve is 1000.00 feet, the chord of which bears North 28°07'31" West for 151.39 feet;

THENCE North 32°28'00" West a distance of 366.91 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.71 feet, through a central angle of 11°56'59", the radius of said curve is 200.00 feet, the chord of which bears North 26°29'30" West for 41.64 feet;

THENCE North 20°31'01" West a distance of 219.12 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.08 feet, through a central angle of $11^{\circ}46'10''$, the radius of said curve is 200.00 feet, the chord of which bears North $14^{\circ}37'56''$ West for 41.01 feet;

THENCE North $08^{\circ}44'51''$ West a distance of 94.66 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 106.36 feet, through a central angle of $30^{\circ}28'16''$, the radius of said curve is 200.00 feet, the chord of which bears North $23^{\circ}58'59''$ West for 105.12 feet;

THENCE North $39^{\circ}13'07''$ West a distance of 290.52 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 467.66 feet, through a central angle of $47^{\circ}25'29''$, the radius of said curve is 565.00 feet, the chord of which bears North $15^{\circ}30'22''$ West for 454.42 feet;

THENCE North $08^{\circ}12'22''$ East a distance of 98.50 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 129.85 feet, through a central angle of $19^{\circ}50'22''$, the radius of said curve is 375.00 feet, the chord of which bears North $01^{\circ}42'49''$ West for 129.20 feet;

THENCE North $11^{\circ}38'00''$ West a distance of 267.34 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 172.61 feet, through a central angle of $19^{\circ}46'49''$, the radius of said curve is 500.00 feet, the chord of which bears North $21^{\circ}31'24''$ West for 171.76 feet;

THENCE North $31^{\circ}24'48''$ West a distance of 108.26 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 123.05 feet, through a central angle of $14^{\circ}06'00''$, the radius of said curve is 500.00 feet, the chord of which bears North $24^{\circ}21'48''$ West for 122.74 feet;

THENCE North $17^{\circ}18'48''$ West a distance of 578.93 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 65.54 feet, through a central angle of $03^{\circ}45'19''$, the radius of said curve is 1000.00 feet, the chord of which bears North $15^{\circ}26'09''$ West for 65.53 feet;

THENCE North $13^{\circ}33'29''$ West a distance of 364.06 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 107.01 feet, through a central angle of $12^{\circ}15'45''$, the radius of said curve is 500.00 feet, the chord of which bears North $07^{\circ}25'36''$ West for 106.81 feet;

THENCE North $01^{\circ}17'44''$ West a distance of 297.51 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 104.98 feet, through a central angle of $06^{\circ}00'54''$, the radius of said curve is 1000.00 feet, the chord of which bears North $04^{\circ}18'11''$ West for 104.94 feet;

THENCE North $07^{\circ}18'38''$ West a distance of 391.86 feet, more or less, to the intersection of the centerline of the haul road with the North line of said Section 15.

EXHIBIT B
LEGAL DESCRIPTION OF CONSERVATION EASEMENT

PARCEL 1:

All that portion of Government Lots 1, 2, 3, and 4 AND the Southwest quarter of the Northwest quarter, AND the West half of the Southwest quarter of Section 15, Township 27 North, Range 10 East of the Gila and Salt River Base and Meridian in Coconino County, Arizona, lying East of the East line of a 30.00 foot wide strip of land, the centerline of said strip is described as follows:

COMMENCING, for reference, at the West quarter corner of said Section 15, a found 1 inch pipe with GLO brass cap dated 1916 lying alongside, from which the Northwest corner of Section 9 of Township 27 North Range 10 East, a found 1 inch iron pipe in a mound of stone, bears North 00°04'56" East a distance of 7919.95 feet away (Basis of Bearing is by GPS RTK Observation);

THENCE South 35°35'12" East, from said West quarter corner, a distance of 3248.34 feet, more or less, to the intersection of the centerline of the haul road with the South line of Section 15 and the TRUE POINT OF BEGINNING of this description:

THENCE North 06°14'35" East a distance of 105.11 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 290.05 feet through, a central angle of 55°23'46", the radius of said curve is 300.00 feet, the chord of which bears North 21°27'18" West for 278.89 feet;

THENCE North 49°09'10" West a distance of 227.39 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 442.77 feet, through a central angle of 25°22'08", the radius of said curve is 1000.00 feet, the chord of which bears North 36°28'06" West for 439.16 feet;

THENCE North 23°47'02" West a distance of 130.01 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 151.54 feet, through a central angle of 08°40'57", the radius of said curve is 1000.00 feet, the chord of which bears North 28°07'31" West for 151.39 feet;

THENCE North 32°28'00" West a distance of 366.91 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.71 feet, through a central angle of 11°56'59", the radius of said curve is 200.00 feet, the chord of which bears North 26°29'30" West for 41.64 feet;

THENCE North 20°31'01" West a distance of 219.12 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.08 feet, through a central angle of 11°46'10", the radius of said curve is 200.00 feet, the chord of which bears North 14°37'56" West for 41.01 feet;

THENCE North 08°44'51" West a distance of 94.66 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 106.36 feet, through a central angle of 30°28'16", the radius of said curve is 200.00 feet, the chord of which bears North 23°58'59" West for 105.12 feet;

THENCE North 39°13'07" West a distance of 290.52 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 467.66 feet, through a central angle of 47°25'29", the radius of said curve is 565.00 feet, the chord of which bears North 15°30'22" West for 454.42 feet;

THENCE North 08°12'22" East a distance of 98.50 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 129.85 feet, through a central angle of 19°50'22", the radius of said curve is 375.00 feet, the chord of which bears North 01°42'49" West for 129.20 feet;

THENCE North 11°38'00" West a distance of 267.34 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 172.61 feet, through a central angle of 19°46'49", the radius of said curve is 500.00 feet, the chord of which bears North 21°31'24" West for 171.76 feet;

THENCE North 31°24'48" West a distance of 108.26 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 123.05 feet, through a central angle of 14°06'00", the radius of said curve is 500.00 feet, the chord of which bears North 24°21'48" West for 122.74 feet;

THENCE North 17°18'48" West a distance of 578.93 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 65.54 feet, through a central angle of 03°45'19", the radius of said curve is 1000.00 feet, the chord of which bears North 15°26'09" West for 65.53 feet;

THENCE North 13°33'29" West a distance of 364.06 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 107.01 feet, through a central angle of 12°15'45", the radius of said curve is 500.00 feet, the chord of which bears North 07°25'36" West for 106.81 feet;

THENCE North 01°17'44" West a distance of 297.51 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 104.98 feet, through a central angle of 06°00'54", the radius of said curve is 1000.00 feet, the chord of which bears North 04°18'11" West for 104.94 feet;

THENCE North 07°18'38" West a distance of 391.86 feet, more or less, to the intersection of the centerline of the haul road with the North line of said Section 15.

The area of the Conservation Easement is 161.44 acres, more or less.

AND

Parcel 2:

In addition to the aforementioned Parcel 1, Grantor includes as part of the Easement, the meanderlands lying east of Parcel 1, and West of the Left (West) bank of the Little Colorado River.

When recorded return to:
Michael E.J. Mongini
Hufford, Horstman, Mongini, Parnell & Tucker
120 N. Beaver St.
Flagstaff, AZ 86001

QUIT CLAIM DEED
Affidavit exempt pursuant to A.R.S. § 11-1134(B)(5)

Effective Date: <u>October</u> <u>23</u> , 2015	County and State where property is located: Coconino County, Arizona
GRANTOR (Name, Address and Zip): Harold H. Coghlan and Rhoda R. Coghlan, Trustees of the Bode-Coghlan Family Trust dated 6/20/19 96 ⁹⁶ , as amended 9/18/2013 P.O. Box 26884 Scottsdale, AZ 85255	GRANTEE (Name, Address and Zip): Landsward Foundation, an Arizona non-profit corporation P.O. Box 520 Flagstaff, AZ 86002

Subject Real Property (Legal Description):

See the Legal Description, attached hereto as Exhibit A

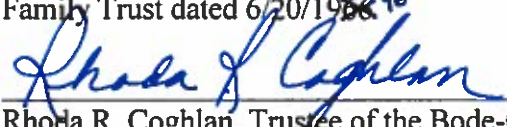
Disclosure Beneficiaries pursuant to A.R.S. §33-404:

Brian M. Bockelman, 963 Edgecliffe Dr., #24, Los Angeles, CA 90026
Julie Ann Coghlan-Halagan, 8612 W. Village, Peoria, AZ 85382
Trudy Lynn Coghlan-Halagan, 4660 E. Amber, Prescott, AZ 86301

For and in consideration of Five Dollars (\$5.00) and other valuable consideration, Grantor quit claims to Grantee all right, title and interest of Grantor in all oil, gas and mineral rights on the subject real property on the effective date.



Harold H. Coghlan, Trustee of the Bode-Coghlan
Family Trust dated 6/20/19~~96~~⁹⁶



Rhoda R. Coghlan, Trustee of the Bode-Coghlan
Family Trust dated 6/20/19~~96~~⁹⁶

STATE OF ARIZONA)
) ss.
County of Coconino)

On this 23 day of October, 2015, before me personally appeared Harold H. Coghlan, Trustee of the Bode-Coghlan Family Trust dated 6/20/1986, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that he executed the same.



Notary Public



STATE OF ARIZONA)
) ss.
County of Coconino)

On this 23 day of October, 2015, before me personally appeared Rhonda R. Coghlan, Trustee of the Bode-Coghlan Family Trust dated 6/20/1986, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that she executed the same.



Notary Public



EXHIBIT A

All oil, gas, and mineral rights on the following described property:

All that portion of Government Lots 1, 2, 3, and 4 AND the Southwest quarter of the Northwest quarter, AND the West half of the Southwest quarter of Section 15, Township 27 North, Range 10 East of the Gila and Salt River Base and Meridian in Coconino County, Arizona, lying East of the East line of a 30.00 foot wide strip of land, the centerline of said strip is described as follows:

COMMENCING, for reference, at the West quarter corner of said Section 15, a found 1 inch pipe with GLO brass cap dated 1916 lying alongside, from which the Northwest corner of Section 9 of Township 27 North Range 10 East, a found 1 inch iron pipe in a mound of stone, bears North $00^{\circ}04'56''$ East a distance of 7919.95 feet away (Basis of Bearing is by GPS RTK Observation);

THENCE South $35^{\circ}35'12''$ East, from said West quarter corner, a distance of 3248.34 feet, more or less, to the intersection of the centerline of the haul road with the South line of Section 15 and the TRUE POINT OF BEGINNING of this description:

THENCE North $06^{\circ}14'35''$ East a distance of 105.11 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 290.05 feet through, a central angle of $55^{\circ}23'46''$, the radius of said curve is 300.00 feet, the chord of which bears North $21^{\circ}27'18''$ West for 278.89 feet;

THENCE North $49^{\circ}09'10''$ West a distance of 227.39 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 442.77 feet, through a central angle of $25^{\circ}22'08''$, the radius of said curve is 1000.00 feet, the chord of which bears North $36^{\circ}28'06''$ West for 439.16 feet;

THENCE North $23^{\circ}47'02''$ West a distance of 130.01 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 151.54 feet, through a central angle of $08^{\circ}40'57''$, the radius of said curve is 1000.00 feet, the chord of which bears North $28^{\circ}07'31''$ West for 151.39 feet;

THENCE North $32^{\circ}28'00''$ West a distance of 366.91 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.71 feet, through a central angle of $11^{\circ}56'59''$, the radius of said curve is 200.00 feet, the chord of which bears North $26^{\circ}29'30''$ West for 41.64 feet;

Page 1 of 3

THENCE North $20^{\circ}31'01''$ West a distance of 219.12 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 41.08 feet, through a central angle of $11^{\circ}46'10''$, the radius of said curve is 200.00 feet, the chord of which bears North $14^{\circ}37'56''$ West for 41.01 feet;

THENCE North $08^{\circ}44'51''$ West a distance of 94.66 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 106.36 feet, through a central angle of $30^{\circ}28'16''$, the radius of said curve is 200.00 feet, the chord of which bears North $23^{\circ}58'59''$ West for 105.12 feet;

THENCE North $39^{\circ}13'07''$ West a distance of 290.52 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 467.66 feet, through a central angle of $47^{\circ}25'29''$, the radius of said curve is 565.00 feet, the chord of which bears North $15^{\circ}30'22''$ West for 454.42 feet;

THENCE North $08^{\circ}12'22''$ East a distance of 98.50 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 129.85 feet, through a central angle of $19^{\circ}50'22''$, the radius of said curve is 375.00 feet, the chord of which bears North $01^{\circ}42'49''$ West for 129.20 feet;

THENCE North $11^{\circ}38'00''$ West a distance of 267.34 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 172.61 feet, through a central angle of $19^{\circ}46'49''$, the radius of said curve is 500.00 feet, the chord of which bears North $21^{\circ}31'24''$ West for 171.76 feet;

THENCE North $31^{\circ}24'48''$ West a distance of 108.26 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 123.05 feet, through a central angle of $14^{\circ}06'00''$, the radius of said curve is 500.00 feet, the chord of which bears North $24^{\circ}21'48''$ West for 122.74 feet;

THENCE North $17^{\circ}18'48''$ West a distance of 578.93 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 65.54 feet, through a central angle of $03^{\circ}45'19''$, the radius of said curve is 1000.00 feet, the chord of which bears North $15^{\circ}26'09''$ West for 65.53 feet;

Page 2 of 3

THENCE North $13^{\circ}33'29''$ West a distance of 364.06 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 107.01 feet, through a central angle of $12^{\circ}15'45''$, the radius of said curve is 500.00 feet, the chord of which bears North $07^{\circ}25'36''$ West for 106.81 feet;

THENCE North $01^{\circ}17'44''$ West a distance of 297.51 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 104.98 feet, through a central angle of $06^{\circ}00'54''$, the radius of said curve is 1000.00 feet, the chord of which bears North $04^{\circ}18'11''$ West for 104.94 feet;

THENCE North $07^{\circ}18'38''$ West a distance of 391.86 feet, more or less, to the intersection of the centerline of the haul road with the North line of said Section 15.

The area of the Conservation Easement is 161.44 acres, more or less.

When recorded return to:
Michael E.J. Mongini
Hufford, Horstman, Mongini, Parnell & Tucker
120 N. Beaver St.
Flagstaff, AZ 86001

QUIT CLAIM DEED
Affidavit exempt pursuant to A.R.S. § 11-1134(B)(5)

Effective Date: <u>October</u> <u>28</u> , 2015	County and State where property is located: Coconino County, Arizona
GRANTOR (Name, Address and Zip): Babbitt Ranches, LLC P.O. Box 520 Flagstaff, AZ 86002	GRANTEE (Name, Address and Zip): Harold H. Coghlan and Rhoda R. Coghlan, Trustees of the Bode-Coghlan Family Trust, Dated 6/20/1976, as amended 9/18/2013 P.O. Box 26884 Scottsdale, AZ 85255

Subject Real Property (Legal Description):

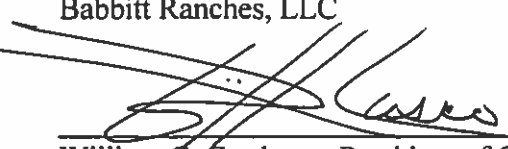
See Legal Description, attached hereto as Exhibit A.

Disclosure Beneficiaries pursuant to A.R.S. §33-404:

Brian M. Bockelman, 963 Edgecliffe Dr., #24, Los Angeles, CA 90026
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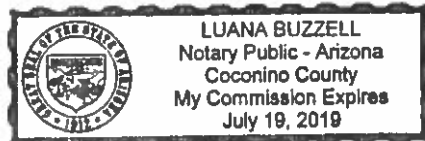
For and in consideration of Five Dollars (\$5.00) and other valuable consideration, Grantor quit claims to Grantee all right, title and interest of Grantor in all oil, gas, and mineral rights on the subject real property.

Babbitt Ranches, LLC


William C. Cordasco, President of CO Bar, Inc.,
Manager of Babbitt Ranches, LLC

STATE OF ARIZONA)
) ss.
County of Coconino)

On this 28th day of October, 2015, before me personally appeared William C. Cordasco, President of CO Bar, Inc., Manager of Babbitt Ranches, LLC, whose identity was proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that he executed the same.



Luana Buzzell
Notary Public

EXHIBIT A

PARCEL NO. 1:

All oil, gas, and mineral rights on that part of Section 15, Township 27 North, Range 10 East of the Gila and Salt River Base and Meridian, Coconino County, Arizona lying West of the Little Colorado River.

PARCEL NO. 2:

All oil, gas, and mineral rights on the West half of the Northeast Quarter, the West half of the Southeast quarter, the East half of the Northwest quarter, the Northeast quarter of the Northeast quarter of the Southwest quarter of Section 21, Township 21 North, Range 10 East of the Gila and Salt River Base and Meridian, Coconino County, Arizona.

EXCEPTING FROM PARCEL NO 1 above all that portion of Government Lots 1, 2, 3, and 4 AND the Southwest quarter of the Northwest quarter, AND the West half of the Southwest quarter of Section 15, Township 27 North, Range 10 East of the Gila and Salt River Base and Meridian in Coconino County, Arizona, lying East of the East line of a 30.00 foot wide strip of land, the centerline of said strip is described as follows:

COMMENCING, for reference, at the West quarter corner of said Section 15, a found 1 inch pipe with GLO brass cap dated 1916 lying alongside, from which the Northwest corner of Section 9 of Township 27 North Range 10 East, a found 1 inch iron pipe in a mound of stone, bears North 00°04'56" East a distance of 7919.95 feet away (Basis of Bearing is by GPS RTK Observation);

THENCE South 35°35'12" East, from said West quarter corner, a distance of 3248.34 feet, more or less, to the intersection of the centerline of the haul road with the South line of Section 15 and the TRUE POINT OF BEGINNING of this description:

THENCE North 06°14'35" East a distance of 105.11 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 290.05 feet through, a central angle of 55°23'46", the radius of said curve is 300.00 feet, the chord of which bears North 21°27'18" West for 278.89 feet;

THENCE North 49°09'10" West a distance of 227.39 feet to the beginning of a curve to the right;

THENCE Northwesterly along said curve with an arc length of 442.77 feet, through a central angle of 25°22'08", the radius of said curve is 1000.00 feet, the chord of which bears North 36°28'06" West for 439.16 feet;

THENCE North 23°47'02" West a distance of 130.01 feet to the beginning of a curve to the left;

THENCE Northwesterly along said curve with an arc length of 151.54 feet, through a central angle of $08^{\circ}40'57''$, the radius of said curve is 1000.00 feet, the chord of which bears North $28^{\circ}07'31''$ West for 151.39 feet;

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THENCE North $20^{\circ}31'01''$ West a distance of 219.12 feet to the beginning of a curve to the right;

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THENCE North $07^{\circ}18'38''$ West a distance of 391.86 feet, more or less, to the intersection of the centerline of the haul road with the North line of said Section 15.

The Remaining area is 88.08 acres, more or less.



Little Colorado River Valley Conservation Area Restoration Project

EVIDENCE OF CONTROL AND TENURE OF LAND INCLUDING LEGAL ACCESS

We have two project sites. The North Unit is owned by Babbitt Ranches and the South Unit falls within the Little Colorado River Valley Conservation Area (which is owned by the Landward Foundation, via a Deed of Conservation Easement). Landward Foundation has legal and physical access and authority to manage the area wherein scope of work activities will be performed. All contractors will be granted legal access to the project site, and granted data collection permission, via Memoranda of Understanding which will be executed prior to any ground-disturbing activities.

Attached please find:

- ❖ Coghlan Conservation Easement (depicting that the Landward Foundation has ownership of the South Unit project site)
- ❖ Letter from Babbitt Ranches, verifying ownership of the North Unit project site that allows Landward Foundation and all project contractors to access to the site and collect relevant data
- ❖ Letter from Landward Foundation, verifying ownership of the North Unit project site that allows Landward Foundation and all project contractors to access to the site and collect relevant data



Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 6, 2018

Dear Mr. Teran,

As the private landowner of the *Little Colorado River Valley Conservation Area Restoration Project South Unit* project site, I grant full permission to Babbitt Ranches, American Conservation Experience, Applied Ecological Consulting, Arizona Department of Forestry and Fire Management, Natural Channel Design, Inc., and associated partners to carry out *Little Colorado River Valley Conservation Area Restoration Project* Scope of Work tasks and activities on my property, including unrestricted site access and data collection. Babbitt Ranches will draw up formal agreements to this prior to any ground-disturbing activities occur (in early 2019).

Feel free to contact me anytime at 928-774-6199 or cobar@babbitranches.com.

Respectfully,

William C. Cordasco – President

Integrated Weed Management Practices

(Babbitt Ranches Noxious and Invasive Weed Strategic Plan 2013)

Introduction

This plan has been adopted and modified to fit the need of the Babbitt Ranches from the Integrated Weed Management Practices for the Coconino and Kaibab National Forests.

Preventing the introduction and spread of noxious weeds is one objective of integrated weed management programs on Babbitt Ranch lands. This guide to integrated weed management practices provides a comprehensive directory for use in planning resource management activities and operations. This guide will help managers and cooperators identify weed management practices that mitigate identified risks of weed introduction and spread for a project or program.

Supporting Direction

This plan identifies prevention of the introduction and establishment of noxious weed infestations as an Babbitt Ranch objective. This plan directs the Babbitt Ranches to: (1) determine the factors that favor establishment and spread of noxious weeds, (2) analyze weed risks in resource management projects, and (3) design management practices to reduce these risks. The Babbitt Ranches Noxious Weed Strategy identifies development of practices for prevention and mitigation during ground-disturbing activities as a long-term emphasis item.

This guide uses the term “*weed*” to include the National Invasive Species Council definition of all plants exotic to the relevant ecosystem that have the potential to cause economic or ecological harm.

General Integrated Weed Management Practices for All Site-disturbing Projects and Maintenance Programs

Objective	Best Known Practice
1. Incorporate weed prevention and control into project layout, design, and project decisions.	1.1 – Analyze potential treatment of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs, including the use of herbicides if needed, at the onset of project planning. 1.2 – Coordinate with other working partners and adjacent landowners to prevent and control weeds.
2. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.	2.1 – Before ground-disturbing activities begin, inventory and prioritize treatment of invasive weeds in project operating areas and along access routes, or within reasonably expected potential invasion vicinity. Do a risk assessment accordingly; control weeds as necessary. 2.2 – After completing “Practice 2.1” above, reduce risk of spreading and creating weed infestations. Plan operating areas and access routes to avoid heavy infestation areas, plan closure of access routes at finish of project, and/or begin project operations in uninfested areas before operating in weed-infested areas. Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules are least likely. Equipment Washing – The following recommendations are highly emphasized prior to project start dates on Babbitt Ranch lands. 2.3 – Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Clean all equipment before entering Babbitt Ranch lands.
3. Prevent the	3.1 – Inspect material sources on site annually, and ensure that they are weed-free before use

Objective	Best Known Practice
introduction and spread of weeds caused by moving infested sand, gravel, borrow, and fill material in Babbitt Ranches, contractor and cooperator operations.	<p>and transport. Treat weed-infested sources for eradication, and strip, stockpile, and treat contaminated material before using pit materials. This may be done in cooperation with other entities (government, private business, etc...).</p> <p>3.2 – Inspect and document the areas where materials are used (including those from treated weed-infested sources) annually for at least 3 years after project completion to ensure that any weeds transported to the site are promptly detected and controlled.</p> <p>3.3 – Maintain stockpiled, uninfested material in a weed-free condition.</p> <p>3.4 – Work with the responsible transportation agencies to adopt these practices for maintenance of roads that cross Babbitt Ranch lands.</p>
4. Avoid creating soil conditions that promote weed germination and establishment.	4.1 – Minimize soil disturbance to the extent practical, consistent with project objectives.
5. Where project disturbance creates bare ground, establish vegetation to minimize favorable conditions for weeds.	<p>5.1 – Treat disturbed soil (except surfaced projects) in a manner that optimizes native plant establishment for that specific site. Define for each project what constitutes disturbed soil and objectives for plant cover revegetation.</p> <p>5.2 – Revegetation may include native seedbank promotion, planting, seeding, fertilization, and/or weed seed-free mulching as necessary. Use local native material where appropriate and feasible.</p> <p>5.3 – Use local seeding guidelines to determine detailed procedures and appropriate mixes.</p> <p>5.4 – Monitor and document all limited term ground-disturbing operations near weed infested areas.</p>
6. Improve effectiveness of prevention practices through weed awareness and education.	6.1 – Provide information, training and appropriate weed identification materials to people potentially involved in weed introduction, establishment, and spread

Integrated Weed Management Practices for Land Stewardship and Fire Management Projects

Objective	Best Known Practice
RANGE MANAGEMENT	
Grazing	
RM-1. Consider weed prevention and control practices in the management of grazing.	<p>1.1 – For each ranch containing existing weed infestations, include prevention practices focused on preventing weed. Prevention practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • Maintaining healthy vegetation • Preventing weed seed transportation • Minimize potential ground disturbance - altering season of use or exclusion • Weed control methods • Revegetation • Inspection and Monitoring • Reporting • Education
RM-2. Maintain healthy, desirable vegetation that is resistant to weed establishment.	2.1 – manage the timing, intensity (utilization), duration, and frequency of livestock activities associated with harvest of forage and browse resources to maintain the vigor of desirable plant species and retain live plant cover and litter.
RM-3. Minimize ground disturbances.	3.1 – Inspect known areas of concentrated livestock use for weed invasion. Inventory and manage new infestations.

Prescribed Fire	
FM-4. Manage fire as an aid in control of weeds to prevent new weed infestations and the spread of existing weeds.	<p>4.1 – Pre-inventory project area and evaluate weeds present with regard to the effects on the weed spread relative to the fire prescription. Remove weeds (live plants and seed sources) before project initiation.</p> <p>4.2 – Plan to avoid or remove existing sources of weed seed and propagules. Avoid ignition and burning in areas at high risk for weed establishment or spread due to burn aftereffects. Treat weeds that establish or spread because of unplanned burning of weed infestations.</p>
FM-5. Avoid creating soil conditions that promote weed germination and establishment.	<p>5.1 – Time burns to promote native species and to hinder weed species germination.</p> <p>5.2 – Consult weed species specific information and consider effects of current local conditions on species growth.</p>



Officers & Directors:

William C. Cordasco, Director, President
Norman J. Sharber, Director, Vice-President
Michael R. D'Mura, Director, Secretary

Darren Talayumtewa, Director
Greg Goodwin, Director
Cheri Lynn Martin, Director

STATE OF ARIZONA



Office of the CORPORATION COMMISSION

CERTIFICATE OF GOOD STANDING

To all to whom these presents shall come, greeting:

I, Ted Vogt, Executive Director of the Arizona Corporation Commission, do hereby certify that

*****LANDSWARD FOUNDATION*****

a domestic nonprofit corporation organized under the laws of the State of Arizona, did incorporate on March 29 1999.

I further certify that according to the records of the Arizona Corporation Commission, as of the date set forth hereunder, the said corporation is not administratively dissolved for failure to comply with the provisions of the Arizona Nonprofit Corporation Act; and that its most recent Annual Report, subject to the provisions of A.R.S. sections 10-3122, 10-3123, 10-3125, & 10-11622, has been delivered to the Arizona Corporation Commission for filing; and that the said corporation has not filed Articles of Dissolution as of the date of this certificate.

This certificate relates only to the legal existence of the above named entity as of the date issued. This certificate is not to be construed as an endorsement, recommendation, or notice of approval of the entity's condition or business activities and practices.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Arizona Corporation Commission. Done at Phoenix, the Capital, this 19th day of January, 2018, A. D.





Ted Vogt, Executive Director

By: _____ 1812273



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

01/30/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER NFP Property & Casualty Services, Inc P.O. Box 1000 420 N. Humphreys Flagstaff AZ 86002	CONTACT NAME: Bunny Alderete PHONE (A/C, No, Ext): (928)774-3345 E-MAIL ADDRESS: bunny.alderete@nfp.com FAX (A/C, No): (928)779-4561														
INSURED Landward Foundation 113 N San Francisco Suite 212 Flagstaff AZ 86001	<table><tr><th>INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr><tr><td>INSURER A: Underwriters At Lloyds</td><td></td></tr><tr><td>INSURER B:</td><td></td></tr><tr><td>INSURER C:</td><td></td></tr><tr><td>INSURER D:</td><td></td></tr><tr><td>INSURER E:</td><td></td></tr><tr><td>INSURER F:</td><td></td></tr></table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Underwriters At Lloyds		INSURER B:		INSURER C:		INSURER D:		INSURER E:		INSURER F:	
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INSURER D:															
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INSURER F:															

COVERAGES**CERTIFICATE NUMBER:** 17/18 MASTER**REVISION NUMBER:**

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DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

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**CO BAR RANCH
LAND USE AND
CONSERVATION OVERVIEW
COCONINO COUNTY, ARIZONA**



**CO BAR RANCH
LAND USE AND CONSERVATION OVERVIEW
COCONINO COUNTY, ARIZONA**

Prepared for

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SWCA Project No. 28406

May 2, 2014

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Conservation Philosophy of Babbitt Ranches

While the meaning of the word “conservation” may appear to be self-evident, to the people of Babbitt Ranches it signifies something more complex than the simple act of “preserving.” The term “conservation” encapsulates a relationship with the land that has developed out of more than 125 years of working on, and with, the natural world.

This relationship is a process, which takes place within each of us and must begin with an *awareness* of the land and its ecological processes and a desire to understand and appreciate land’s essential values. This *awareness* then promotes a sense of *responsibility* and *obligation* to acknowledge these values and to be *accountable* for our actions as those actions affect the plant, wildlife and other land communities and the land's productivity to meet human needs.

Recognizing our place within the land community, we become willing to further embrace these values; the result is good land stewardship. The process is circular. The more we interact with and understand the land, the more we value the land’s complex ecological processes. This relationship is what is meant by “conservation.”

THE CONSERVATION PROCESS



*Through our efforts of learning and understanding,
we are better able to join, share and to be a part....*
(Article I, Constitution of the Babbitt Ranches)

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1.0 INTRODUCTION

CO Bar Ranch is a 264,683-acre working cattle and American Quarter Horse ranch in Coconino County, Arizona (Figure 1). The ranch is owned and operated by Babbitt Ranches, a multi-faceted family business and pioneering land company that raises livestock, pursues other land-based enterprises, manages natural resources, and actively participates in the broader social and economic community of northern Arizona. Babbitt Ranches also promotes and provides direct support for the generation and utilization of science-based knowledge and technologies to support sound stewardship of the region's land and natural resources.

CO Bar Ranch is the largest, oldest, and most accessible of three ranches owned by Babbitt Ranches. The other two ranches, Espee (142,946 acres) and Cataract (177,119 acres), are located a few miles west and northwest of CO Bar Ranch (see Figure 1). In operation since 1886, Babbitt Ranches is at its core a business with fiduciary responsibilities to its shareholders, but the company acknowledges multiple bottom lines and incorporates not only economic but community and ecological values into all its decision-making processes. Inseparable from its business enterprises is a commitment to work cooperatively with others to promote and respect regional ecological continuity, wildlife habitat, diverse vegetation, watersheds, historic sites, cultural resources, and access for recreationists and scientists.

Babbitt Ranches has long worked hard at balancing sound business and conservation considerations when making land use decisions. That effort has probably never been more important than it is now. As Babbitt Ranches approaches its 130th anniversary in 2016, it must safely navigate through troubling climate changes, a fitful economy, and population growth into once remote rural areas.

The purpose of this document is to help Babbitt Ranches meet these challenges. It is intended to facilitate ongoing and future land use planning for CO Bar Ranch by listing some factors that would be helpful to consider when making decisions about specific land uses; by presenting baseline information about the Ranch's cultural, physical, and biological resources; by identifying a range of land use possibilities that may be worth evaluating; and by discussing conservation issues to be taken into account when evaluating land use options.

2.0 FACTORS TO CONSIDER WHEN MAKING LAND USE DECISIONS

2.1 Tradition and Values

Of all the Babbitt's currently and formerly owned properties, CO Bar Ranch is the one most associated with the Babbitt family and their long history of ranching in northern Arizona. The CO Bar carries the name of the family's first and longest held livestock brand, a brand that directly and uniquely speaks to the family's original migration into this part of the world from Cincinnati, Ohio. CO Bar Ranch is deeply tied to the family's ranching tradition. Its owners honor that tradition. This said, the financial costs of owning, maintaining, and operating the CO Bar are real and substantial. Income must be generated to meet these expenses, and all feasible income-producing land uses, not just ranching, warrant evaluation. As directed by the company's constitution (attached as Appendix A), Babbitt Ranches considers "the range" of business opportunities for all its properties, including CO Bar Ranch. All reasonable land use options are indeed evaluated, but that evaluation takes place through the lens of family tradition and within the context of an articulated land use ethic.

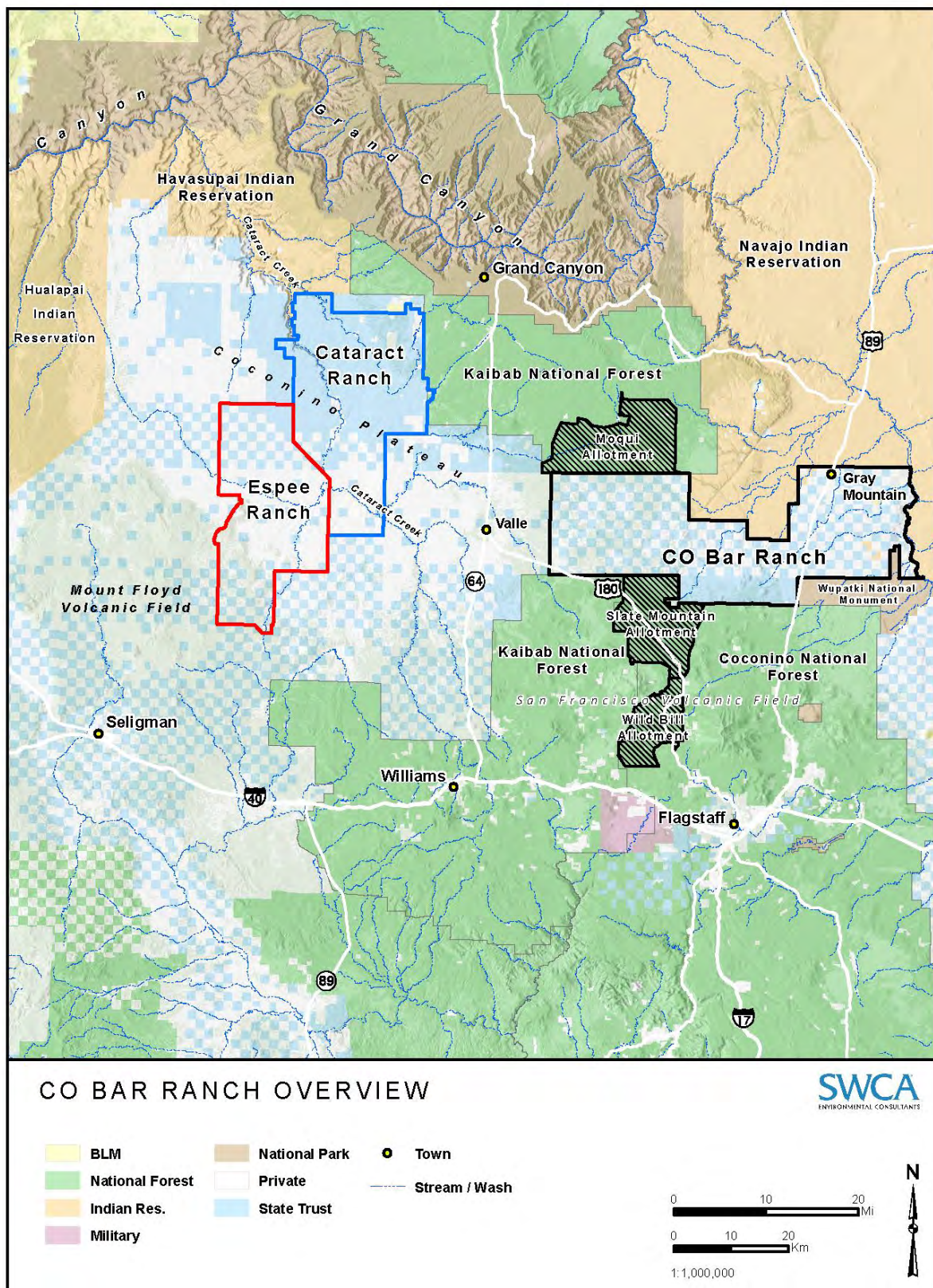


Figure 1. Location of CO Bar Ranch.

According to the Babbitt Ranches constitution, the guiding land use ethic at Babbitt Ranches “reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity” (Article 5, Section 3).

Some existing and potential land uses on CO Bar Ranch are an easy fit with this ethic. Other uses, however, are consumptive of natural resources and have the potential to impede the land’s capacity for self-renewal. It may be challenging to implement such uses in a way that is consistent with the conservation framework as defined by Babbitt Ranches.

2.2 Land Use Planning

Formal land use planning is typically done for fairly large geopolitical areas (e.g., counties or expanding metropolitan areas) that face change and land use issues associated with that change (e.g., the encroachment of urban development on productive agricultural land). Published land use planning guidelines (e.g., Food and Agriculture Organization of the United Nations 1993) generally recommend some variation of the following steps for preparing and executing a land use plan:

- a baseline appraisal of the situation, including problems to be overcome;
- identification and evaluation of natural and cultural resources within the planning area;
- identification of institutional constraints;
- establishment of goals;
- identification of opportunities and land use options for meeting the goals;
- evaluation of each land use option in terms of land suitability;
- legal, regulatory, and economic constraints;
- environmental, economic, and social impacts;
- selection of the best land use options;
- preparation of a written land use plan that describes the selected options and provides practical details of plan implementation, including logistics, costs, and timing;
- implementation of the plan; and
- revision of the plan as needed in light of changing circumstances and new knowledge.

While formal land use planning that culminates in a written plan with a timetable for implementing stipulated actions is likely too rigid and impractical for CO Bar Ranch, establishing a framework for guiding future land use decisions may be in order. Steps common to land use planning that could be helpful in developing such a framework include the following:

1. *Identification of natural and cultural resources.* This document represents movement in that direction.
2. *A baseline appraisal of the situation, including problems to be overcome.* This means taking a comprehensive look at: (a) CO Bar Ranch within the context of Babbitt Ranches as a business venture; (b) the state of internal natural resources and infrastructure on the Ranch; and c) external factors such as demographic and socioeconomic trends in northern Arizona, relevant national and even international markets, and natural phenomenon such as climate change that may affect future land productivity.

3. *Identification of institutional constraints and establishment of goals.* Institutional constraints for Babbitt Ranches would include provisions of the firm's bylaws and constitution. Such documents carry both legal and moral force and necessarily inform the framing of land use goals for CO Bar Ranch. Developing a statement of goals requires the Babbitt Ranches leadership to take a hard look at what CO Bar Ranch means to them and to the other owners. What do they want and need from this land? What do they value about it? How important is maintaining the Babbitt family ranching tradition? What attributes of the Ranch do they most want to conserve and at what cost? What are they willing to change? What, if anything, do they *want* to change? What potential uses, if any, are off the table and why?

When developing goals for CO Bar Ranch, one approach that may be considered is the designation of zones for certain types of land use. This practice is common in land use planning but may or may not be appropriate or even practical for CO Bar Ranch. Examples of what might be done on the Ranch include restricting crushed aggregate operations or future residential/commercial development to designated areas, or identifying areas to be set aside for wildlife or to protect cultural resources.

4. *Identification of opportunities and land use options for meeting articulated goals.* Babbitt Ranches has been active in exploring a wide range of possible land use options for CO Bar Ranch. A number of these are listed in Section 7.0 of this document. Additional potential land uses are likely to present themselves opportunistically, and Babbitt Ranches must remain flexible and open to new possibilities.
5. *Evaluation of each land use option in terms of legal, regulatory, and economic constraints.* Included in the information needed by Babbitt Ranches when making land use decisions is a full understanding of surface and subsurface landownership for all property within the CO Bar Ranch borders. For convenience, comprehensive information about current surface landownership is provided in Appendix B. Babbitt Ranches also needs to be cognizant of any federally listed or candidate species on CO Bar Ranch (currently only one, the Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*), is known to occur there) and ensure that the firm is protected against any possible Endangered Species Act Section 9 violations.
6. *Evaluation of each land use option in terms of potential environmental, economic, and social impacts.*

3.0 CO BAR RANCH LANDOWNERSHIP

The boundary of CO Bar Ranch as shown in Figure 2 defines the area of interest for this document. This boundary encompasses approximately 264,683 acres, of which 118,610 acres are owned by Babbitt Ranches, 3,518 by Antelope Springs Land Co. (which is Babbitt owned), 131,946 acres by the State of Arizona (State Trust Lands), 4,389 acres by the U.S. Bureau of Reclamation, 640 acres by the U.S. Bureau of Land Management, and 3,267 acres by other private landowners. Indian Allotments total 2,080 acres, and highways account for the balance, about 233 acres. Included in the Babbitt Ranches-owned land is the approximately 629-acre Cedar Springs parcel, which is held as a conservation easement by Coconino County (see Figure 2). The few private inholdings (i.e., owned by parties other than the Babbitts) include the commercial area of Gray Mountain along U.S. Highway 89 (US 89) and scattered parcels. Most of these parcels are located in the northeastern part of the Ranch, apparently acquired for their uranium potential. For the most part landownership occurs in a checkerboard pattern, with the even-numbered sections being state and federal and the odd-numbered sections being private.

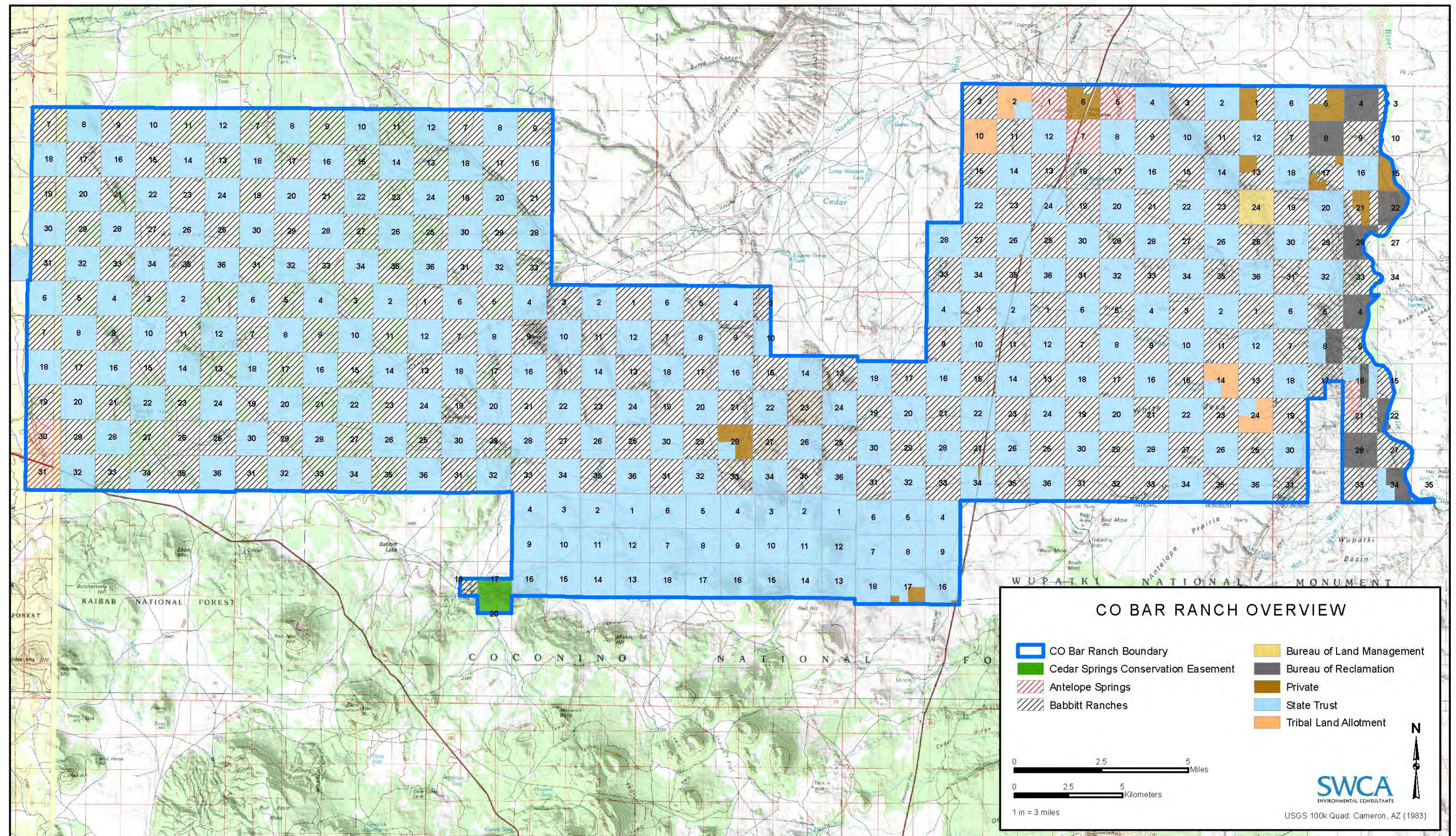


Figure 2. CO Bar Ranch landownership.

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The state and federal lands within CO Bar boundaries are leased for grazing by Babbitt Ranches. In addition, Babbitt Ranches leases three adjacent grazing allotments from the U.S. Forest Service. Totalling 127,692 acres, the three allotments are the 55,250-acre Moqui Allotment, which abuts the Ranch to the north in the Kaibab National Forest, and the 46,115-acre Slate Mountain and 26,327-acre Wild Bill Allotments, which lie to the south in the Coconino National Forest (see Figure 1). In total, CO Bar livestock can utilize some 390,000 acres of mixed grassland, shrubland, juniper woodland, and ponderosa forest.

CO Bar Ranch is bordered to the south by Kaibab National Forest (Williams Ranger District), Coconino National Forest (Flagstaff Ranger District), and Wupatki National Monument. The Navajo Nation lies both to the east of the Ranch and to the north of the eastern two-thirds of the Ranch. The Kaibab National Forest (Tusayan Ranger District) lies to the north of the western third. West of the Ranch, nine of the eleven bordering sections are private and two are State Trust Lands. The private property is part of a large-lot rural subdivision, but very little of it has been developed.

4.0 HISTORY OF CO BAR RANCH

4.1 Prehistoric Period (Before 1300)

A handful of isolated Paleoindian projectile points on the Coconino Plateau collectively indicate that the region was utilized by Paleoindian big-game hunters between 9,000 and 11,900 years ago. It is likely that this early use of the region focused on obsidian sources located in the San Francisco and Mt. Floyd Volcanic Fields. Documented sources of Paleoindian projectile points found on the Coconino Plateau include Government Mountain, which is about 15 miles south of CO Bar Ranch, and Black Tank, which is about 38 miles west of CO Bar Ranch and just west of Espee Ranch (Lyndon 2005). A Paleoindian Clovis point fashioned from Black Tank obsidian was found near the Citadel Sink, within 2 miles of the CO Bar Ranch boundary (Downum 1993).

Artifacts and sites dating from the pre-agricultural Archaic period (2,400–9,000 years ago) have been found both north and south of CO Bar Ranch (Lyndon 2005), and probable Archaic artifacts have been documented on the Ranch itself (Brown and Downum 1997). In response to a drying climate and loss of the Pleistocene megafauna that followed the end of the Ice Age, the indigenous people of the region began to concentrate in areas with readily available water, becoming increasingly less mobile than their Paleoindian forbearers. With decreased mobility came an increased specialization in hunting smaller game and an increased dependence on local plant materials for subsistence. At the end of the Archaic period, people in the Coconino Plateau region slowly began to supplement hunting and gathering with maize horticulture. By the year 400, pottery and pit houses had made an appearance, and around 700, aboveground masonry, multi-room structures began to be built (Cordell 1984, Lyndon 2005).

In the period 900–1,000, the people who inhabited the area that now includes the CO Bar predominantly belonged to two groups: the Cohonina and the Sinagua (Anderson 1990). The center of the Cohonina culture was to the west of the CO Bar region, while the center of the Sinagua culture was to the south, in the area around the San Francisco Peaks and southward into the Verde Valley (Colton 1939, Sullivan 1986). The CO Bar/Wupatki region was on the periphery of both cultures, and settlements were likely few in number and sparsely distributed; at least this was the case until Sunset Crater erupted, temporarily depopulating the area and altering the environment. Soon after the eruption—which recent analysis suggests occurred in or around 1085 (Elson et al. 2011)—people repopulated the CO Bar/Wupatki region in much larger numbers than had existed before. The post-eruptive period was dominated by the Sinagua and even more so by a new group, the Kayenta Anasazi, who moved in from the northeast. The returning and new settlers took advantage of wetter, warmer conditions and the mulch provided by the new layer of

volcanic ash to extensively farm the area and build the pueblos in Wupatki National Monument. Population peaked in 1130–1160, but the area was slowly abandoned during the mid to late 1200s (Neff et al. 2011, Anderson 1990). Postulated causes of the abandonment include drying climatic conditions, exhausted soil nutrients, eroded ash cover, depletion of game animals, malnutrition due to iron deficiency and insufficient animal protein, and internal aggression (Anderson 1990, Sullivan 1994, Turner and Turner 1990).

Reflecting the distribution of cultural resources at Wupatki National Monument (Anderson 1990), prehistoric remains in the western portions CO Bar Ranch are likely to be Cohonina in origin, while those in the eastern portions are likely to be affiliated with the Kayenta Anasazi. This pattern is supported by limited archaeological surveys conducted on the Ranch. In the Little Wild Bill Tank and Dog Knobs areas, Hoffman (2004a, 2004b, 2005a, 2005b) found lithic and sherd scatters thought to be left by Cohonina hunters and gatherers. In the eastern CO Bar, Brown and Downum (1997) conducted an intensive survey of 3 square miles bordering Wupatki National Monument. Of the 146 prehistoric sites documented during that survey, 62 were identified as Kayenta Anasazi and 3 as Sinagua. The remainder were of undetermined affiliation (i.e., contained no diagnostic ceramics). What appeared to be agriculture-related features dominated the assemblage, with 38 field houses, 14 rock alignments believed to delineate cleared fields, 26 miscellaneous enclosures, and one catchment. A total of 48 structures contained from 2 to more than 20 rooms each.

4.2 Native American Occupation (1300–Present)

CO Bar Ranch falls within the traditional use areas of four Native American tribes (the Hopi, Havasupai, Yavapai, and Navaho). Predecessors of the Hopi,

Havasupai, and Yavapai occupied portions of the Coconino Plateau since at least 1300. The Hopi claim descent from the inhabitants of the Wupatki pueblos and continued to visit and travel through the area long after the pueblos were abandoned. Notably, Hopis have identified two ancestral trails that crossed the Little Colorado River just south of Black Point and traversed portions of CO Bar. One trail turned north immediately after the crossing, passed between the western bank of the river and Black Point, cut across the northeastern corner of the Ranch, and headed north to the Desert View area of Grand Canyon (Ferguson et al. 2004). The second route continued westward after the crossing, passed south of Black Mesa (probably along jackrabbit Wash), headed northwestward toward Red Butte (probably along Lockwood Canyon), and terminated in Havasu Canyon (Colton 1964). This trail directly connected the Hopi and Havasupai, long-time trading partners who visited each other's settlements and probably met and traded goods at designated points along the trail. Use of the CO Bar country by these two groups for hunting and gathering would likely have adhered closely to the established trade route. Yavapais may have occasionally passed through the CO Bar area while hunting or to raid Havasupai camps, but their presence would have been infrequent. This area was at the northeastern periphery of their range, which was concentrated south of the Mogollon Rim (Cleeland et al. 1992).

Occupation of the CO Bar/Wupatki area by members of the Navajo Tribe dates from the early 1800s. These early settlers were forced out of the region by the U.S. military in 1866 for the Long Walk to Fort Sumner, but the family of Peshlakai Etsidi and other Navajos returned by 1870 to occupy Black Point, Antelope Prairie, and neighboring areas (Stoutamire 2013). There the Navajos raised corn and sheep in peace until Anglo stockmen began moving cattle and sheep into the area onto what they considered open range. By the 1890s, serious conflicts arose between the two groups, particularly over limited water sources. In an attempt to resolve the issue, the President Theodore Roosevelt expanded the Navajo Reservation westward in 1901 to include land occupied by the Navajo families west of the Little Colorado River. Because of the checkerboard of railroad land grants, however, only the even-numbered sections within what was called the "Leupp Extension" could be set aside for Navajo allotments. About half the

land remained open to grazing by ranchers under leases with the railroad. In 1908, Peshlakai received six 160-acre allotments (960 acres total) in Antelope Prairie within what is now CO Bar Ranch, all in even-numbered sections. But after the Babbitts bought the surrounding odd-numbered sections from the railroad in 1921, this arrangement proved untenable. Enclosure within the range of the CO Bar rendered these allotments all but useless to the Peshlakai (see Figure 2). In about 1929, Peshlakai and his extended family abandoned the Antelope Prairie allotments, but their descendants still hold title to the land and have right of access (Stoutamire 2013).

4.3 History of Ranching in the CO Bar Area

When Euro-American ranchers first moved their livestock onto to what is now CO Bar Ranch is lost to history. It has been assumed that livestock belonging to Mormon pioneer Lot Smith were in the Wupatki area in the 1880s (Anderson 1990, Stoutamire 2013), and Dean Smith (1989) claims that Lot Smith had a ranch that extended from Tuba City down to Mormon Lake, southeast of Flagstaff, a region that brackets CO Bar Ranch. This is almost certainly an overstatement. Lot Smith (and the Mormon United Order he controlled) did have a dairy herd at Mormon Lake when Smith lived near the present site of Winslow, Arizona, in 1876–1888, and he did have a cattle ranch near Tuba City after 1888 (Peterson 1970). It is unclear, however, to what degree those two operations overlapped temporally, and it is difficult to believe his livestock “roamed” over the hundreds of square miles of country that separate the two areas as claimed by Stoutamire (2013). It is likely, however, that Lot Smith drove livestock through the CO Bar area during the 1880s and early 1890s, moving cattle between his holdings or delivering livestock to the railroad at Flagstaff. Lot Smith was killed in an altercation with Navajos over a breach of his fenceline in 1892, and the Babbitts acquired his Circle S brand and holdings at some point after that (Dean 1989; Babbitt Times Review, August 2006). There is no evidence that the Babbitts gained title to any land within the CO Bar Ranch boundary as part of that acquisition.

The earliest deed on file with Coconino County for the CO Bar Ranch area relates to Cedar Ranch. In 1887, Philip Hull, Jr. sold 160 acres surrounding west Cedar Spring in T25N R6E, Sections 17, 18, and 20 to Charles C. Goven, an officer of the Arizona Cattle Company (Coconino County Recorder 1887). Two years later, in 1889, Philip Hull, Sr. sold an adjoining or nearby parcel, also to the Arizona Cattle Company. This latter parcel contained east Cedar Spring, also called Hull Spring, which gained fame as a rest stop for passengers traveling by stagecoach between Flagstaff and Grand Canyon in the 1890s (Mangum and Mangum 1999). While the two Hulls, father and son, may have homesteaded the two parcels (Mangum and Mangum 1999), they apparently never held clear title, because in 1896, three men associated with the Arizona Cattle Company obtained patents for portions of the same land. The patents were for three parcels in the north half of Section 20 totaling 160 acres. The patent holders were Frank Bevin (for Section 20, N½N¼); John De La Vegne (for Section 20, SW¼NW¼); and John Rhoads (for Section 20, NE¼NE¼) (Coconino County Recorder 1896a,b,c). In 1890, the Arizona Cattle Company expanded their holdings at Cedar Ranch with the purchase of the adjoining Section 17 from the Santa Fe Pacific Railroad (Coconino County Recorder 1890). For more than a decade, Cedar Ranch served as the Arizona Cattle Company’s winter camp, but by 1899 the company was dissolving (Collins 2002). In that year, Section 17 and the three Section 20 parcels were sold to William Baker, Trustee of the Saginaw and Manistee Lumber Company (Coconino County Recorder 1899), which held onto the land until 1902. In that year, Section 17 went to the United States, while the three parcels in Section 20 were sold to David Babbitt (Coconino County Recorder 1902a,b). The Babbitts eventually acquired the rest of the northern half of Section 20, the southern half of Section 17, and the southwestern quarter of Section 18 from Coconino National Forest in a land exchange (Pers. comm., William Cordasco, Babbitt Ranches).

All of these transactions concern only Cedar Ranch, a tiny part of what is now CO Bar Ranch. The early and intense interest in the property is not surprising; it contained a rare and prized resource: perennial water. The early ranching history of the bulk of CO Bar Ranch is hazier. Certainly sheepmen and

cattlemen were grazing livestock in the area by the 1890s and into the early 20th century (Stoutamire 2013), but there are few records. Several stockmen, including the Babbitts, started establishing water rights (mostly to dammed washes) in the area around 1912 (Coconino County Tract Books). The Babbitts developed a number of water features around that time, including Slim Dam in 1912; Spider Web Tank No. 2, Hupmobile Tank, and Red Horse Wash Tank in 1915; and Mays Tank in 1916 (Stoutamire 2013, Babbitt Brothers Trading Company Collection, NAU.MS.83). The Babbitts purchased the Heiser Ranch and spring, now part of Wupatki National Monument, in 1915. Finally, on August 8, 1921, the Babbitts bought nearly all the odd numbered parcels in what is now CO Bar Ranch from the Santa Fe Pacific Railroad (Coconino County Recorder 1921). At that point, the general configuration of CO Bar Ranch came into being. Over the following years, some land has been added or sold, but the changes have been minor.

5.0 GEOGRAPHIC CHARACTERISTICS

CO Bar Ranch, which stretches 40 miles from east to west, can be subdivided into three physiographic areas: the Coconino Plateau, west of the Black Point Monocline, the Little Colorado River Valley, east of the Black Point Monocline, and the San Francisco Volcanic Field, which covers portions of the other two physiographic areas (Figure 3).

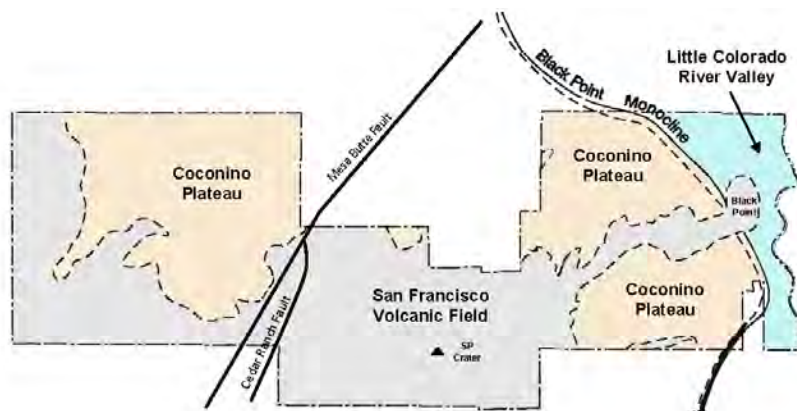


Figure 3. CO Bar Ranch physiographic areas: Coconino Plateau (tan), San Francisco Volcanic Field (gray), and Little Colorado River Valley (blue).

Two major northeast-trending faults (the Mesa Butte and Cedar Ranch Faults) and their escarpments divide the higher western third of the Ranch from the lower eastern two-thirds. East of the faults, the land slopes downward in a northeastwardly and eastwardly direction toward the Little Colorado River. Elevations generally range from 6,600 to 6,400 feet in the western part of the Ranch, 6,200 to 5,600 feet in the mid section, and 5,600 to about 5,000 feet in the east before dipping precipitously to the bottom of the Little Colorado River Valley at 4,200 feet. More than a score of cinder cones rise anywhere from 300 to 900 feet above the surrounding terrain, with the highest cones reaching 7,000 feet elevation and above. The landscape of CO Bar is a complex mosaic of juniper woodland, open grasslands, shrub-studded painted desert, plains, playas, incised canyons, grabens, escarpments, mesas, lava flows, and cinder cones.



SP Crater and lava flow. USGS photo.

Well-known landmarks include the wonderfully symmetrical SP Crater and the Black Point lava flow (Black Mesa), which is 12 miles long, 3 miles wide, and terminates at Black Point, a 600-foot-high promontory overlooking the Little Colorado River.

CO Bar Ranch is bisected by US 89, the primary north-south route between Interstate 40 in Flagstaff and the Utah border. The stretch of road that crosses the Ranch is a two-lane undivided highway with a posted speed limit of 65 miles per hour. Classified as a Rural Principal Arterial highway by the Arizona Department of Transportation (ADOT), US 89 averages 7,500 vehicles per day (Theimer et al. 2012) and is projected to carry 10,000 vehicles per day by 2025 (ADOT 2002). To accommodate the projected increase, ADOT plans to widen the section through CO Bar Ranch (MP 445.4 to MP 456.0) to four lanes divided by a 84-foot-wide median (ADOT 2006).

A second highway, US 180, cuts across the southwestern corner of CO Bar Ranch. Classed as a Major Collector road, US 180 is the primary route between Flagstaff and Grand Canyon National Park. It is an undivided, two-lane highway averaging 1,900 vehicles per day with a posted speed limit of 65 mph.

Flagstaff, the regional metropolitan center (population: 66,000), is less than an hour's drive from CO Bar Ranch by either US 89 or US 180. Flagstaff is a transportation hub at the junction of two Interstate Highways.

5.1 Climate and Climate Change

The climate at CO Bar Ranch is generally warm and dry throughout, but varies along a gradient west to east relative to elevation. Conditions are coolest and wettest in the western portions of the Ranch and warmest and driest in the easternmost portions. Summer daytime high temperatures typically reach the low to mid-90s in the west but regularly exceed 100 degrees along the Little Colorado River in the east. In the depth of winter, average nighttime lows dip into the 20s, with extremes dropping below zero. Average annual precipitation ranges from 18 inches or more in the west down to 8 inches or less in the east. About half of the annual precipitation falls in July through September. Summer rains develop in the afternoons when warm, moisture-laden air from the Gulf of Mexico rises and cools over the Colorado Plateau, typically falling in short, heavy downpours and funneling down the otherwise dry washes. Winter precipitation results from storms moving in from the Pacific Ocean and falls mostly as day-long rains or relatively light snowfalls. May and June are the driest months, with very little precipitation occurring most years (Thybonny and Thomas 1998).

The Lower Colorado River Basin, which includes northern Arizona and all three Babbitt ranches, has experienced a long-term warming trend through the 20th and early 21st centuries (U.S. Bureau of Reclamation 2011), with near steady increasing mean temperatures since 1970 (Western Climate Mapping Initiative 2012). Precipitation levels have demonstrated multi-decade variability in the area, with an extended drought beginning in the 1990s (Hamlet et al. 2005). In general, there has been a decline in spring snowpack, reduced winter precipitation falling as snow, and earlier snowmelt runoff (U.S. Bureau of Reclamation 2011). Droughts have become increasingly severe (Andreadis and Lettenmaier 2006).

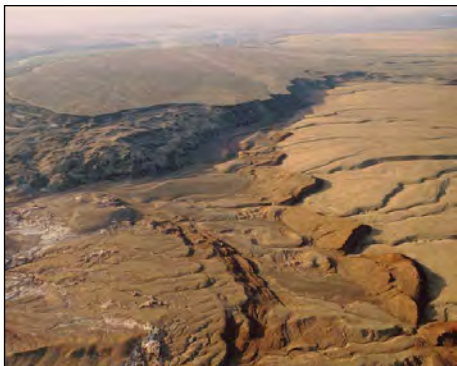
Numerous models of climate change predict that these warming and drying trends are likely to continue into the indefinite future (Christensen et al. 2007, Seager et al. 2007). Climate modeling for the Lower Colorado River Basin suggests a tendency toward less annual precipitation, reduced basinwide runoff, decreased soil moisture, and increased evapotranspiration (Cayan et al. 2010, Gutzler and Robbins 2010,

Milly et al. 2005). According to Seager et al. (2007:1181) “...there is a broad consensus among climate models that this region [the American Southwest] will dry in the 21st century and that the transition to a more arid climate should already be under way.”

5.2 Geology

5.2.1 Geologic Structure

The topography of CO Bar Ranch is strongly influenced by three major structural features: the Mesa Butte Fault, the Cedar Ranch Fault, and the Black Point Monocline (see Figure 3 and Figure 4). The northeast-trending Mesa Butte and Cedar Ranch Faults separate the western portion of CO Bar Ranch from the central portion. While the two faults generally run parallel to each other, at its northern end the Cedar Ranch Fault hooks sharply northwestward to intersect the Mesa Butte Fault under the Mesa Butte cinder cone. Displacement along the Cedar Ranch Fault has resulted in a long, hooked, east-facing escarpment that breaks in the vicinity of Tubb Ranch Camp (Figure 5). The escarpment is most precipitous south of the break, reaching a height of 300 feet or more. More modest escarpments mark the path of the Mesa Butte Fault. As a result of vertical displacement along these two faults, from west to east, the surface of CO Bar Ranch generally steps down 100 feet at the Mesa Butte Fault, and another 100–200 feet at the Cedar Ranch Fault. These two large faults are associated with many smaller faults, many of which—particularly those west of the big faults—run to the northwest (see Figure 4). These smaller fractures often occur in parallel pairs, forming shallow valleys or grabens (down-dropped blocks of land between parallel faults). The most prominent of the parallel fault zones created Lockwood Canyon, but there are several other obvious examples, including the long wash that contains Pearl Harbor Tank. The many faults on CO Bar Ranch are part of the Mesa Butte Fault System, which extends southwestward approximately 124 miles from the Cameron area, through CO Bar Ranch, down to Chino Valley. Prominent volcanic features associated with this system include Shadow Mountain, Mesa Butte, and Red Mountain, to name but three of the better-known cinder cones, and the dacite domes of Kendrick Peak, Sitgreaves Peak, and Bill Williams Mountain. The Mesa Butte Fault System is seismically active (Shoemaker et al. 1978).



Kaibab limestone bends over the axis of the Black Point Monocline on the right. Note the “flatirons” of red Moenkopi rock eroding down the face of the monocline. Chinle badlands cover the Little Colorado River Valley on the left at the base of Black Point. From Billingsley et al. 2007; Photo by Michael Collier.

The Black Point Monocline curves through the eastern portion of CO Bar Ranch and defines the boundary between the Coconino Plateau on the west and the Little Colorado River Valley on the east (see Figure 3 and Figure 4). The monocline was created an estimated 50–90 million years ago when tectonic compression forced the horizontal layers of sedimentary rock that covered this region to bend upward along the west side of a deeply buried, northwest-trending fault. The softer layers of sedimentary rock have been mostly eroded from the uplifted side of the monocline (the Coconino Plateau), leaving a surface of hard Kaibab limestone. As a result of the monocline, this limestone surface in the eastern part of the Ranch slopes downhill to the northeast and east, at first gently, then steeply at the axis of the fold. The last remnants of the younger, softer rock layers are now being eroded from the steep limestone face of the monocline, but these younger rocks persist east of the fold in the Little Colorado River Valley (Bezy 2003, Billingsley et al. 2007).

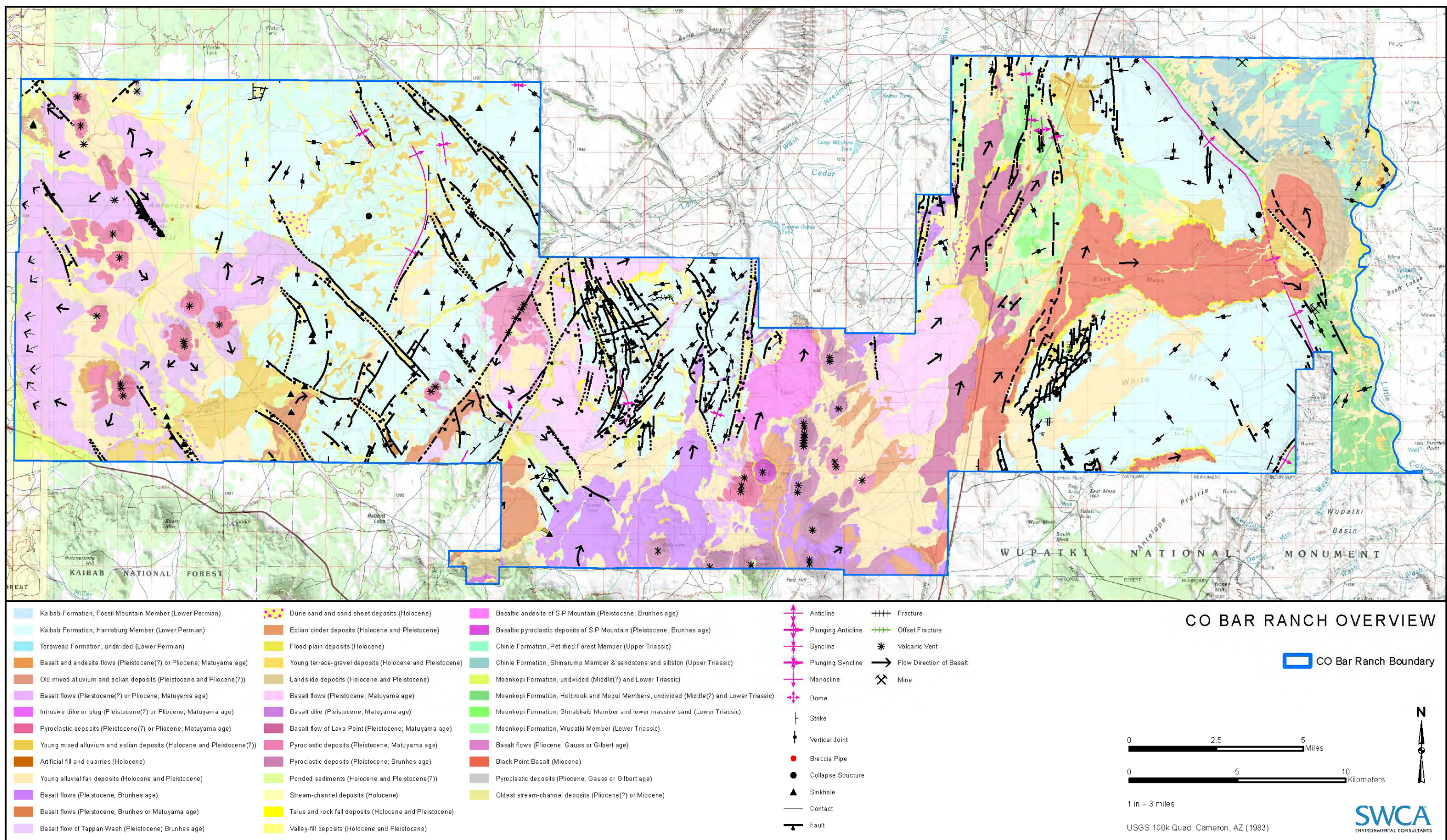


Figure 4. Geologic map of CO Bar Ranch

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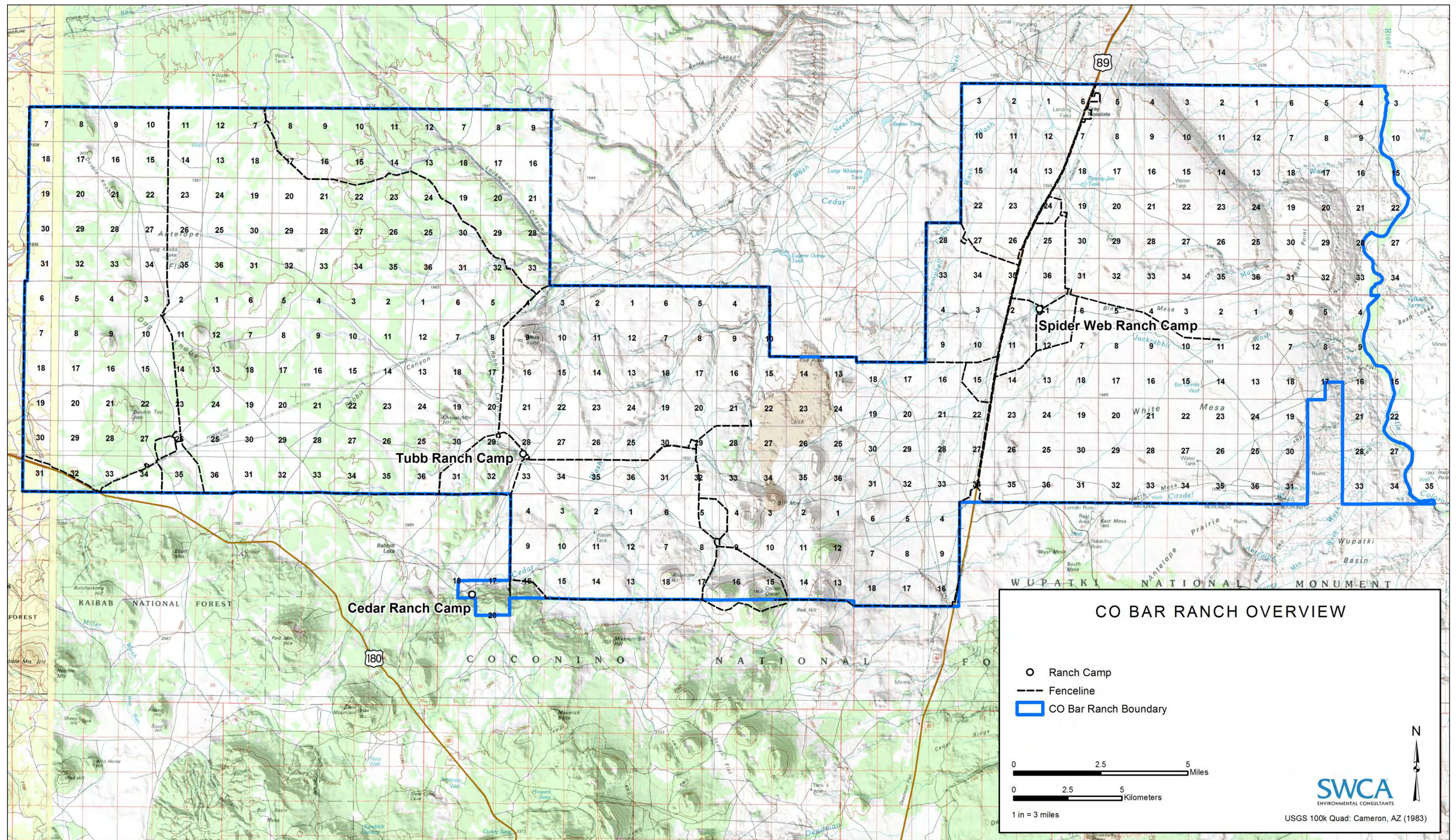


Figure 5. Topographic map of CO Bar Ranch showing ranch camps and fencelines.

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5.2.2 Sedimentary Stratigraphy

The pale gray limestone of the Kaibab Formation (dating from the late Paleozoic Era, ca. 250 million years ago) underlies all of CO Bar Ranch, although it constitutes the surface bedrock only west of the Black Point Monocline and only on about 40 percent of the Ranch (colored light blue in Figure 4). On the rest of the Ranch, the limestone is buried under 1) a few residual areas of younger (Mesozoic-aged) sedimentary rock; 2) much younger volcanic rock; or 3) even younger surface deposits (e.g., alluvium and eolian, alluvial fan, ponded sediment, dune sand and sand sheet, landslide, talus and rock fall, valley-fill, floodplain, and young terrace-gravel deposits) (Billingsley et al. 2007).

In ancient times, Mesozoic-aged rocks of the Moenkopi and Chinle Formations covered the Kaibab Formation over the entire CO Bar Ranch area, but now remnants persist only in the eastern portion of the Ranch. The rest has long since eroded away. Moenkopi rocks date from 251–237 million years ago, and the somewhat younger Chinle dates from 229–200 million years ago. The red and reddish-brown rocks of the Moenkopi Formation are exposed west and north of the Black Point lava flow in the Spider Web Camp area and northward. In this area, erosion of the relatively soft claystone, siltstone, and sandstone of the Moenkopi has been mitigated by the shielding effects of hard, mesa-forming lava flows to the south and west. Moenkopi is also exposed as a string of “flatirons” along the Black Point Monocline north of Black Point, and Moenkopi outcrops in the Little Colorado River Valley south of Black Point. Chinle is the dominant formation in the Little Colorado River Valley north of Black Point. The Chinle is divided into two distinct members: the Shinarump Member and the Petrified Forest Member. The Shinarump Member (colored purplish blue in Figure 4) is a light brown or light yellowish, cliff-forming sandstone. The Petrified Forest Member (colored turquoise blue in Figure 4) forms the colorful badlands topography of the Painted Desert. It is a purple, blue, light-red, reddish-purple, or grayish-blue, slope-forming mudstone and siltstone, sometimes combined with white sandstone (Billingsley et al. 2007). The Shinarump and the Petrified Forest Members contain uranium-bearing ores and were the targets of the uranium boom of the 1950s.

5.2.3 Volcanic Field

Volcanic material (colored pink, purple, and orange in Figure 4) covers somewhat less than half of CO Bar Ranch. It erupted from numerous vents located both on the Ranch and to the south. The volcanic material comprises once-viscous, mesa-capping lava flows and cinder cone-forming pyroclastic material, including dark-gray to red cinders, spatter, and tear-shaped volcanic bombs. Cinder, or scoria, cones are found in the western and central portions of CO Bar Ranch. They were formed when airborne fragments of lava were explosively ejected from a vent. The fragments cooled rapidly and built up around the vent, forming a crater at the summit. In some cases, streams of lava issued from a vent and flowed across the landscape. Lava flows are found in the far western, central, and eastern portions of the Ranch. The Black Point flow, which forms Black Mesa and ends in Black Point overlooking the Little Colorado River, is the largest and most prominent flow on the Ranch. The Black Point flow, like most of the volcanic features on CO Bar Ranch are composed of basalt, but a few features, notably SP Crater and its lava flow, are basaltic andesite in composition, meaning they contain relatively more silica and less iron than basalt (Billingsley et al. 2007). Researchers agree that SP Crater and its lava flow resulted from the most recent volcanic activity to occur on CO Bar Ranch, although different dating techniques have produced very different ages. Dates in peer-reviewed literature have placed the SP eruption in the vicinity of 70,000 years ago (Reynolds et al. 1986), but more recently developed techniques have produced an age of only 5.5–6 thousand years ago (Rittenour et al. 2012). The younger date is more consistent with the non-weathered geomorphic character of both the cinder cone and the lava flow, but the newer findings have yet to be peer reviewed. At the opposite end of the age span for volcanic activity on CO Bar Ranch is the Black Point basalt flow, which has been dated to 2.43 million years ago (Billingsley et al. 2007).

5.3 Soil Types

A total of 48 soil types (i.e., Natural Resources Conservation Service Map Units) were mapped within CO Bar Ranch boundaries (see the soils report for CO Bar Ranch attached as Appendix C). West of the Black Point Monocline (see Figure 3), soils tend to be somewhat shallow, well-drained, limy, nonsaline loams over Kaibab limestone, or deeper, well-drained, limy, nonsaline loam/clay/cinder mixes derived from basalt and pyroclastics in the San Francisco Volcanic Field. East of the monocline, soils are derived from sandstone and shale. They tend to be less well drained and slightly saline, and can be gypsiferous.

As shown in Appendix C, most of the 48 soil types are represented in small amounts, each accounting for 5 percent or less of all soils on the Ranch. Major exceptions are soils of the Winona Series (24% of all soils) and the Deama Series (15% of all soils). In addition, a single soils type—Tuweep very gravelly loam, 0 to 15 percent slopes—accounts for 10 percent of all soils, and another soil type—Ashfork gravelly clay loam, 1 to 15 percent slopes—accounts for 9 percent of all soils.

Soils of the Winona Series occur in convex areas of plateaus and mesas (U.S. Soil Conservation Service 1983). They are very shallow to shallow (6 to 20 inches deep) and well drained. Winona soils formed in alluvial and eolian deposits derived dominantly from limestone and calcareous sandstone. They are limy, gravelly loam and generally underlain by Kaibab limestone (see Figure 4 for the occurrence of limestone bedrock). Deama soils are similar to Winona soils, except they are found on hillsides and are very cobbly loam (U.S. Soil Conservation Service 1983).

Tuweep and Ashfork soils, like many of the other soil types on CO Bar Ranch, are formed from basalt and pyroclastics and occur within the San Francisco Volcanic Field. Tuweep soils are found on plateaus and mesas, are deep (60 inches or more), and well drained. Ashfork soils are found on hillsides, are moderately deep (30 inches), and well drained. Tuweep and Ashfork soils are both limy.

5.4 Hydrology

The western edge of CO Bar Ranch drains to the west and falls within the watershed of Cataract Creek. Most of the rest of the Ranch drains to the north, northeast, and east into the lower Little Colorado River, although internal drainage basins characterize much of the western portion of the Ranch (i.e., in the Dog Knobs area).

The U.S. Geological Survey (USGS) named the entire 2,933-square-mile Cataract Creek drainage basin the “Havasupai Canyon Watershed” and assigned it the 8-digit Hydrologic Unit Code (HUC) 15010004. The USGS then divided this watershed into 11 sub-watersheds, each with a 10-digit HUC (Natural Resources Conservation Service and University of Arizona Water Resources Research Center 2010). CO Bar Ranch falls within 2 of these 11 sub-watersheds (Figure 6). The names, total area, and 10-digit HUCs of these sub-watersheds are:

Red Horse Wash Watershed (239 sq mi): HUC 1501000403

Miller Wash Watershed (251 sq mi): HUC 1501000404

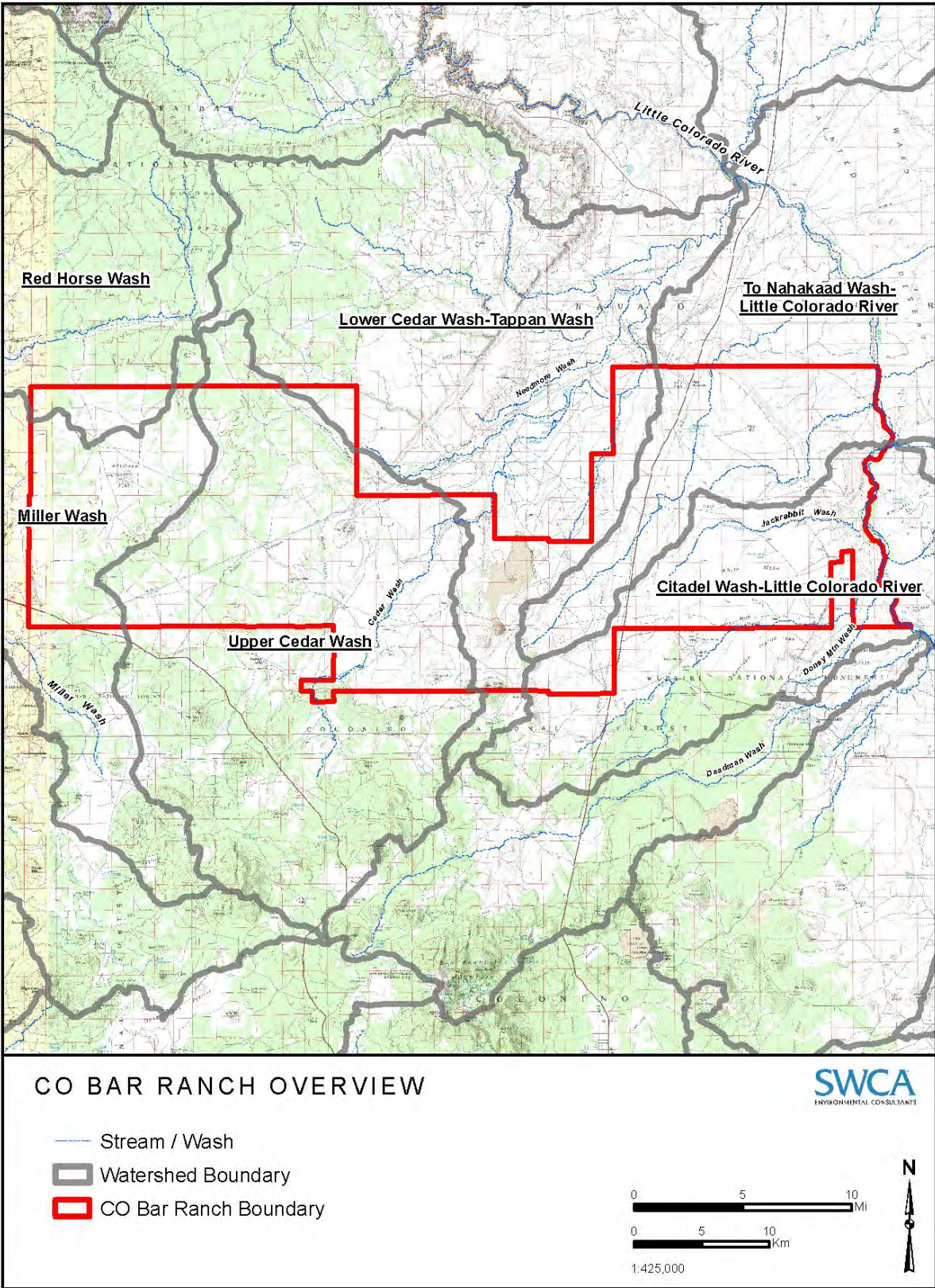


Figure 6. CO Bar Ranch watersheds.

The 2,390-square-mile Lower Little Colorado River Watershed (8-digit HUC 15010006) is divided into 10 sub-watersheds (Parra et al. 2006). CO Bar Ranch falls within 4 of these 10 sub-watersheds (Figure 6). The names, total area, and 10-digit HUCs of these sub-watersheds are:

Citadel Wash (210 sq mi): HUC 1502001605

Upper Cedar Wash (298 sq mi): HUC 1502001606

Lower Cedar Wash (322 sq mi): HUC 1502001607

Tonahakaad Wash (322 sq mi): HUC 1502001608

All watercourses on CO Bar Ranch, including the Little Colorado River, are ephemeral, flowing only as a result of snowmelt or heavy precipitation events. Average annual discharge in the Little Colorado River is about 260 cubic feet per second (Thomas 2003), but flow is extremely variable, fluctuating between 0 and 6,000 cubic feet per second in recent years (Figure 7). Water quality in the Little Colorado River is poor in some regards. Water samples collected from the Little Colorado River at Wupatki National Monument in 2001–2002 had high concentrations of aluminum, antimony, arsenic, and iron relative to U.S. Environmental Protection Agency Primary and Secondary Maximum Contaminant Levels. Primary Maximum Contaminant Levels for were exceeded for antimony and arsenic (Thomas 2003).

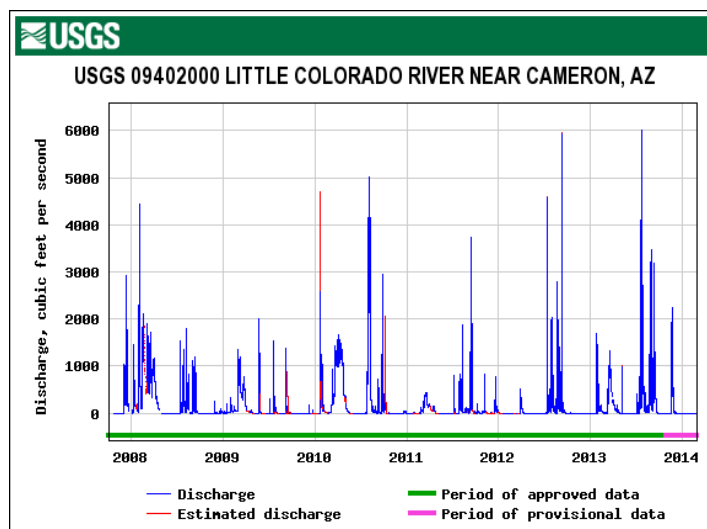


Figure 7. Discharge of the Little Colorado River near Cameron, Arizona, 2008–2014.

Principal drainages on the Ranch are Cedar Wash and Campbell Francis Wash, which flow northward through the center of the Ranch; Mays Wash and Jackrabbit Wash, which flow eastward across the western portion of the Ranch; and Citadel Wash, which flows eastward along the southern boundary of the Ranch with Wupatki National Monument. Dog Knobs “lake” in Antelope Flats is a large playa that holds water under wet conditions. The only natural permanent surface water occurs at small springs at Cedar Ranch that discharge water, apparently from a shallow perched aquifer.

Earthen stock tanks have been excavated at various places on the Ranch, and small dams have been built on washes. These catchment features are designed to retain water runoff for use by livestock and wildlife. Water wells provide a reliable source of water, and a system of main and feeder pipelines transports water from the wells to storage tanks and drinkers strategically located throughout the Ranch (Figure 8).

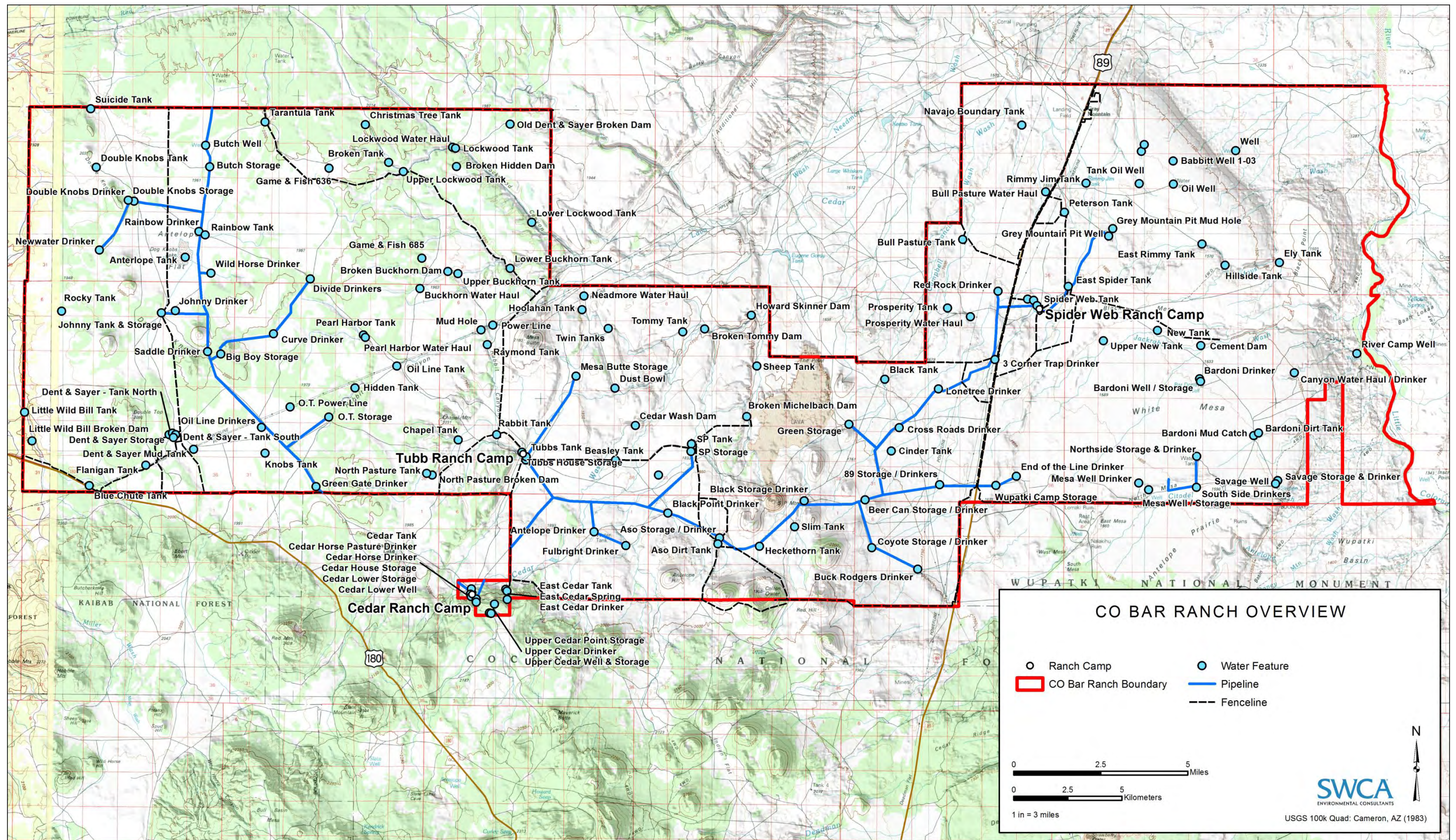


Figure 8. Water distribution system and fences on CO Bar Ranch.

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The major groundwater aquifers in the region are the C-Aquifer (east of the Mesa Butte Fault) and the deeper Redwall-Muav Aquifer (west of the Mesa Butte Fault) (see Figure 3 for the location of the fault). The C-Aquifer comprises a sequence of sedimentary rock units between the top of the Kaibab Formation down through the Coconino Sandstone to the upper Supai Group. The Coconino Sandstone is the primary aquifer unit, hence the name “C-Aquifer.” Productive wells in this aquifer in the CO Bar area are on the order of 1,600 to 1,800 feet deep. The C-Aquifer is partly to fully saturated east of the Mesa Butte Fault and unsaturated west of the fault (U.S. Bureau of Reclamation 2006). C-Aquifer groundwater in the Wupatki area is more than 5,000 years old (Bills et al. 2000).

As the name indicates, the Redwall-Muav Aquifer primarily comprises the Redwall and Muav Limestone formations. Productive water wells west of the Mesa Butte Fault, such as those at Valle and Tusayan, tap into the Redwall-Muav Aquifer at depths greater than 3,000 feet below land surface (Barbie Drilling Inc. no date).

Existing water wells in the northeastern portion of CO Bar Ranch produce water at 1,700–1,800 feet below land surface (Clayton Williams Energy 2003, Masters et al. 2013), suggesting they draw from the C-Aquifer. A water well at the Gray Mountain gravel pit in T27N R9E, Section 29 averages 30,000 gallons of water per day at a rate of 75 gallons per minute (Masters et al. 2013).

Recent exploratory gas wells drilled in the same area encountered significant water flows at much greater depths (Clayton Williams Energy 2003, McCabe Energy 2005). Clayton Williams Energy (2003) reported water flow in Cambrian-age Tapeats sand at 3,170–3,480 and 3,524–3,534 feet, and in the Precambrian Kwagunt Formation below 3,900 feet. At another exploratory well site, McCabe Energy (2005) reported picking up 25 barrel per hour (bph) water flow at 3,429 feet, which increased to 150 bph at 3,445.

Two wells at Cedar Ranch are 120 and 300–400 feet deep, respectively, and produce water at a rate of 18 and 5 gallons per minute, respectively (Masters et al. 2013). They likely tap into a perched aquifer.

6.0 BIOLOGICAL CHARACTERISTICS

6.1 Vegetation Communities

According to GIS data provided by the Southwest Regional Gap Analysis Project (SWReGAP), approximately 60 percent of the cover on CO Bar Ranch consists of grassland/shrub-steppe; 27 percent consists of woodland vegetation; 10 percent consists of shrubland and scrub; and 4 percent is bare rock, cinders, and shale badlands (SWReGAP 2014). The distribution of vegetation communities differs markedly between the western, middle, and eastern sections of CO Bar Ranch as shown in Figure 9 and Table 1. The eastern section comprises all the land east of US 89 and is made up of the Antelope Prairie Ecological Research Area (see Section 8.1.3) and the Little Colorado River Valley Conservation Area (see Section 8.1.4).

The largest vegetation community in the western section is woodland (58%), overwhelmingly pinyon-juniper but with some ponderosa pine (*Pinus ponderosa*) at the highest elevations in the northern and southern extremities. Moving eastward across the Ranch and dropping in elevation, the proportion of woodland decreases substantially in the middle section (14%), and virtually vanishes in the east (<1%). At the same time, the proportion of grassland/shrub-steppe, which is composed of native short grasses and scattered low shrubs, increases from west (41%) to middle and east (both 71%).

Table 1. Proportions of vegetation communities in the western, middle, and eastern sections of CO Bar Ranch.

Cover	Western Section (acres)	% of Total	Middle Section (acres)	% of Total	Eastern Section (acres)	% of Total
Grassland/Shrub-steppe	41,412	41	60,129	71	55,741	71
Woodland	59,084	58	12,089	14	38	<1
Shrubland and Scrub	1,453	1	7,945	9	14,747	19
Bare rock, Cinders, Shale Badlands	4	<1	4,036	5	6,310	8
Other	30	<1	52	<1	1,610	2
TOTAL	101,985	100	84,251	100	78,447	100

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

Shrubland and scrub are not well represented in the west (1%) and middle (10%), but account for a fifth of all cover types in the east (19%). Dominate shrub species there vary depending on local conditions and may be saltbush (*Artemisia* spp.), blackbrush (*Coleogyne ramosissima*), Mormon tea (*Ephedra* spp.), greasewood (*Sarcobatus vermiculatus*), or sagebrush (*Artemisia* spp.). Bare rock, cinder, and shale badlands are much more prevalent in the middle and eastern areas of the Ranch, reflecting the presence of the SP lava flow, young cinder cones, exposed rock along the Black Point Monocline, and outcrops of Chinle in the Little Colorado River Valley.

The vegetation assemblage in the Cedar Ranch area is unique for CO Bar because of the area's relatively high elevation; a steep, north-facing gradient that provides cool, shaded conditions; and near-surface groundwater. In addition to pinyon-juniper woodland and grassland, vegetation at Cedar Ranch includes mixed conifer and aspen (*Populus tremuloides*) forest, old-growth ponderosa, and spring-fed riparian habitat (see more at Section 8.1.1).

Twenty-three different Southwest Regional Gap Analysis Project (SWReGAP) land cover types occur on CO Bar Ranch (Table 2 and Figure 9). Three of these types account for 85 percent of the vegetation on the Ranch. In order of prevalence, they are Inter-mountain Basins Semi-Desert Shrub-Steppe (32%), Inter-mountain Basins Semi-desert Grassland (28%), and Colorado Plateau Pinyon-juniper Woodland (26%). Each of these cover types is described in Table 3.

The SWReGAP is the most recent and technologically sophisticated attempt at mapping vegetation communities in the Southwest, but an earlier classification system by Brown and Lowe (1974) and refined by Brown (1994) is imbedded in most of the commonly used ecoregion and province classifications for Arizona (AGFD 2012a). According to maps produced by Brown (1994), 60 percent of CO Bar Ranch falls within the Plains and Great Basin Grasslands Biotic Community, which consists primarily of short native bunch grasses interspersed with low shrubs. Another 25 percent of the Ranch is Great Basin Conifer Woodland, which consists primarily of pinyon pine and juniper trees with a grass and shrub understory. The equivalency of the SWReGAP and Brown classifications is presented in Table 3.

A list of plant species that have been documented on portions of CO Bar Ranch can be found in Appendix D.

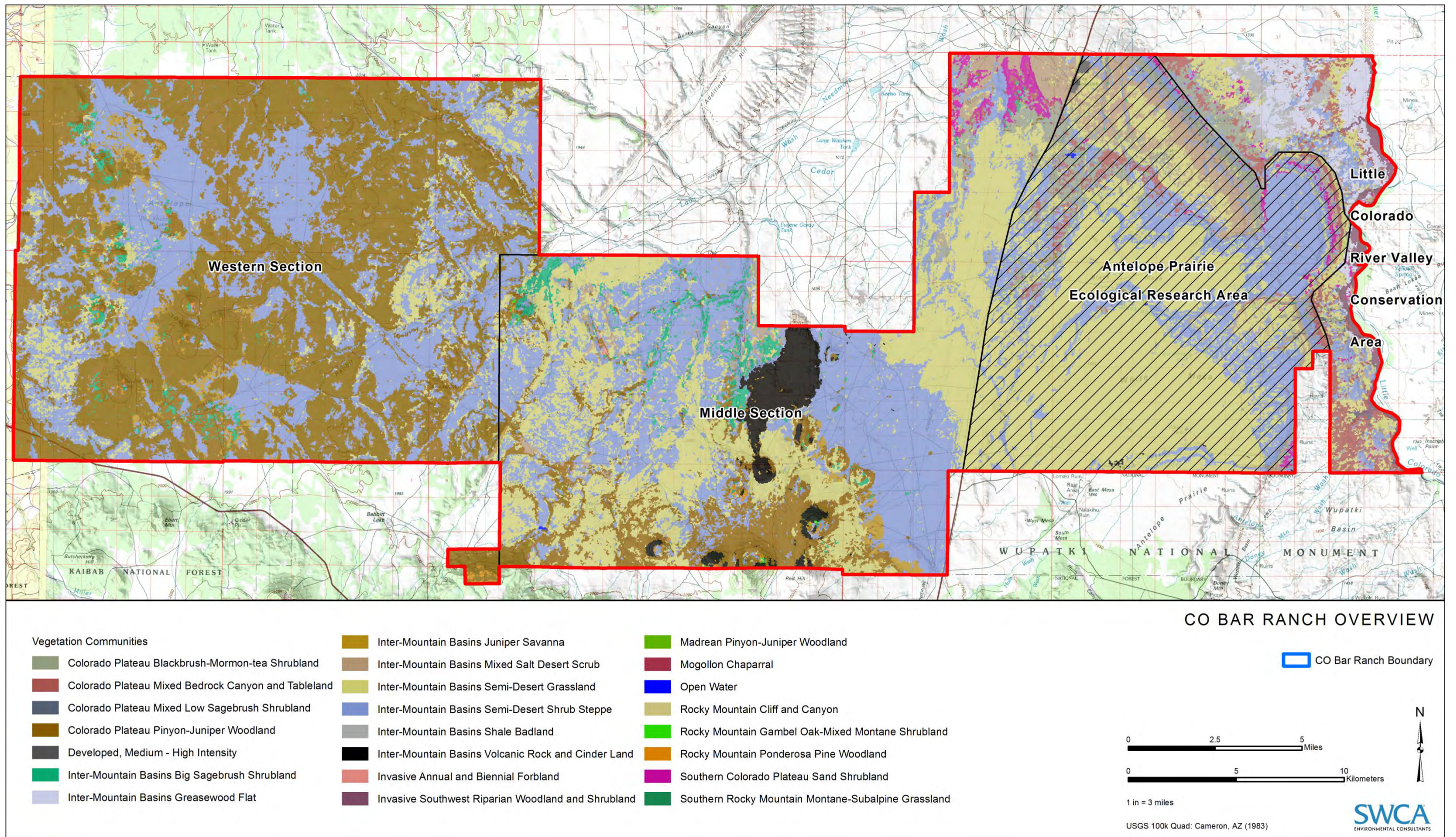


Figure 9. CO Bar Ranch vegetation communities

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Table 2. Acres and percent of Southwest Regional Gap Analysis Project (SWReGAP) cover classes on CO Bar Ranch.

Cover Class	Total Acres	% of Total
Grassland/shrub-steppe		
Inter-Mountain Basins Semi-Desert Shrub-Steppe	84,090	31.8
Inter-Mountain Basins Semi-Desert Grassland	73,164	27.6
Southern Rocky Mountain Montane-Subalpine Grassland	26	0.0
Subtotal	157,280	59.4
Woodland		
Rocky Mountain Ponderosa Pine Woodland	294	0.1
Colorado Plateau Pinyon-Juniper Woodland	67,520	25.5
Rocky Mountain Gambel Oak-Mixed Montane	38	0.0
Inter-Mountain Basins Juniper Savanna	3,355	1.3
Madrean Pinyon-Juniper Woodland	4	0.0
Subtotal	71,211	26.9
Shrubland and Scrub		
Inter-Mountain Basins Big Sagebrush	3,679	1.4
Colorado Plateau Mixed Low Sagebrush	141	0.1
Mogollon Chaparral	2	0.0
Colorado Plateau Blackbrush-Mormon Tea	6,676	2.5
Inter-Mountain Basins Mixed Salt Desert	7,986	3.0
Inter-Mountain Basins Greasewood Flat	3,738	1.4
Southern Colorado Plateau Sand Shrubland	1,925	0.7
Subtotal	24,147	9.2
Bare rock, cinders, badlands		
Rocky Mountain Cliff and Canyon	1	0.0
Colorado Plateau Mixed Bedrock Canyon and Tableland	4,794	1.8
Inter-Mountain Basins Shale Badland	1,807	0.7
Inter-Mountain Basins Volcanic Rock and Cinder Land	3,750	1.4
Subtotal	10,352	3.9
Other		
Invasive Southwest Riparian Woodland and Shrubland	1,472	0.6
Invasive Annual and Biennial Forbland	64	0.0
Developed, Medium-High Intensity	119	0.0
Open water	38	0.0
Subtotal	1,693	0.6
TOTAL	264,683	100.0

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

Table 3. Dominant vegetation communities on CO Bar Ranch (together comprising approximately 85 percent of total land cover).

SWReGAP Cover Class (acres and % on Ranch)	Vegetation Community Overview	Characteristic Species	Brown (1994) Equivalent
Inter-mountain Basins Semi-Desert Shrub Steppe (84,090 acres, 32%)	Typically dominated by grass species (>25% cover) with an open shrub layer (often a mixture of shrubs and dwarf-shrubs). Forbs are generally of low occurrence and are highly variable across the range. Typically occurs at lower elevations on alluvial fans and flats.	Dominant grasses include blue grama (<i>Bouteloua gracilis</i>), Indian ricegrass (<i>Achnatherum hymenoides</i>), needle and thread (<i>Hesperostipa comata</i>), James' galleta (<i>Pleuraphis jamesii</i>), and alkali sacaton (<i>Sporobolus airoides</i>). Annual grasses, especially the exotics Japanese brome (<i>Bromus japonicas</i>) and cheatgrass (<i>B. tectorum</i>), may be present. Dominant shrubs include Green's rabbitbrush (<i>Chrysothamnus Greenei</i>), four-wing saltbush (<i>Atriplex canescens</i>), big sagebrush (<i>Artemisia tridentata</i>), Mormon tea, broom snakeweed (<i>Gutierrezia sarothrae</i>), and winterfat (<i>Krascheninnikovia lanata</i>).	Plains and Great Basin Grasslands
Inter-mountain Basins Semi-Desert Grassland (73,164 acres, 28%)	Characterized by a sparse to moderately dense herbaceous layer dominated by medium-tall and short bunch grasses, often in a sod-forming growth. May occupy swales, playas, mesa tops, plateau parks, alluvial flats, and plains. Dominant perennial bunch grasses and shrubs very drought-resistant. Dominant grasses develop a dense network of roots concentrated in the upper parts of the soil where rainfall penetrates most frequently.	Dominated or co-dominated by the grass species threeawn (<i>Aristida</i> spp.), ring muhly (<i>Muhlenbergia torreyi</i>), Indian ricegrass, blue grama, needle and thread, or James' galleta, and may include scattered shrubs and dwarf-shrubs of species of sagebrush, saltbush, Mormon tea, snakeweed, and winterfat.	Plains and Great Basin Grasslands
Colorado Plateau Pinyon-juniper Woodland (67,520 acres, 26%)	Characterized by stands with 25–60% canopy cover of trees typically 10–30 ft in height. Understory ranges from a relatively rich mixture of evergreen and/or deciduous shrubs, to a sparse to moderately dense herbaceous layer dominated by perennial grasses, to no vegetation. Occurs on warm, dry sites on mountain slopes, mesas, plateaus, and ridges.	Typically co-dominated by Utah juniper (<i>Juniperus osteosperma</i>)—or other <i>Juniperus</i> species—and pinyon pine (<i>Pinus edulis</i>), with juniper dominant in lower elevations. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated understory species typically include mountain mahogany (<i>Cercocarpus</i> spp.), cliffrose (<i>Purshia stansburiana</i>), blue grama, James' galleta, or mutton grass.	Great Basin Conifer Woodland

Sources: AGFD (2012a), Colorado Natural Heritage Program (2005), Comer et al. (2012), SWReGAP (2005)

6.1.1 Vegetation Community Dynamics

The grasslands and shrub-steppes of northern Arizona were once naturally maintained by large-scale ecological processes such as lightning-caused fire and grazing by native herbivores. Since Euro-American settlement, however, the suppression of fire and unsustainable ranching practices, particularly in the late 19th and early 20th centuries, have allowed shrubs and trees to encroach upon and degrade native grasslands (Ecological Monitoring & Assessment Program and Foundation 2005). Woody vegetation can be removed mechanically to restore more natural grasslands, but the reintroduction of fire is problematic. The widespread invasion of nonnative annual grasses, particularly cheatgrass, has altered the dynamics of the system, and fire often results in cheatgrass dominance. Cheatgrass becomes dry and highly flammable early in the growing season and encourages more fire, which leads to further domination by cheatgrass.

According to SWReGAP data, non-native invasive grasses and forbs cover a total of approximately 64 acres, or 0.02 percent of CO Bar Ranch, a small amount. The bulk of invasive species on the Ranch (covering approximately 1,500 acres) are woody riparian plants—specifically tamarisk (*Tamarix* spp.)—that grow mostly along the Little Colorado River, along some washes, and around some stock tanks. Whether tamarisk will endure on CO Bar Ranch is now open to question. Within the last two years, the tamarisk leaf beetle (*Diorhabda carinulata*), a non-native insect introduced into the American West to control tamarisk, has disseminated into the Little Colorado River drainage and are presently defoliating tamarisk trees on the Ranch. The beetles typically defoliate a tamarisk tree over several annual cycles, with the plant losing its leaves and turning brown each year, only to sprout new leaves later in the season or in the following season. Over the long term the plant may die, but results vary (Nagler et al. 2011).

While not classed as an invasive species, junipers can become invasive and encroach into grasslands under grazing pressure. CO Bar's rangeland has been grazed for well over a hundred years, and juniper encroachment has been a problem in the western portion of the Ranch. Recognizing the need for action, Babbitt Ranches embarked upon a program of juniper removal and restored more than 30,000 acres of grassland between 2004 and 2013 (see Section 8.1.2 for details).

6.1.2 Potential Effects of Predicted Climate Change

Computer modeling has projected a shift in plant community composition on the Coconino Plateau over the next 80 years, assuming the regional climate becomes warmer and drier as commonly forecast (Friggens et al. 2012). This modeling—which uses the Brown (1994) vegetation classification—predicts that the Plains and Great Basin Grasslands community will gradually fragment and by the end of the century be displaced by conditions more typical of the Semidesert Grassland community (Figure 10). Expressed in terms of the SWReGAP classification, the Inter-mountain Basins Semi-Desert Shrub Steppe community is predicted to be displaced by the Apacherian-Chihuahuan Semi-Desert Grassland and Steppe.

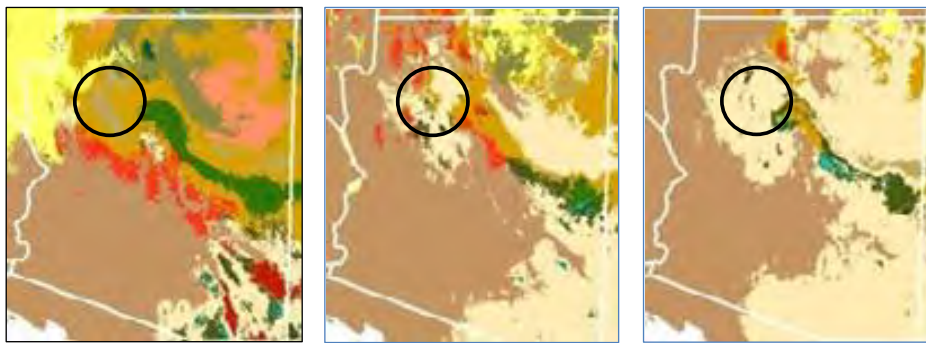


Figure 10. Modeled changes in the vegetation communities of Arizona in response to predicted climate change from 2010 (left), to 2060 (center), to 2090 (right). Major trends are the northward expansions of Sonoran Desertscrub (dark tan) and Semidesert Grassland (buff) communities into areas now occupied by a more diverse mosaic of temperate grasslands, shrublands, and woodlands. Espee Ranch falls within the circled area. From Fig. 1-4 in Friggens et al. (2012).

Compared to the Plains and Great Basin Grasslands, the Semidesert Grassland is characterized by more drought-tolerant grass species; more areas of bare ground; and a greater representation of shrubby species, succulents, and cacti (Brown 1994). Tobosa (*Hilaria mutica*) and black grama (*Bouteloua eriopoda*) are diagnostic grass species rather than blue grama and Indian ricegrass, while mesquite (*Prosopis* spp.) and catclaw acacia (*Acacia greggii*) are typical shrub species rather than rabbitbrush, winterfat, and sagebrush.

6.2 Wildlife

The CO Bar Ranch supports an assemblage of wildlife resources predominantly associated with the vegetation communities described in Table 2. Lists of mammal, bird, and reptile species known or likely to be present on the Ranch are provided in Appendix E. Common mammal species include pronghorn antelope (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), black-tailed jack rabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*). Rocky mountain elk (*Cervus canadensis nelsoni*) are found in the higher elevations of the Ranch. Gunnison's prairie dog is present (*Cynomys gunnisoni*), as are several species of ground squirrels, mice, pocket mice, woodrats, and bats. Predator y mammal species known or likely to occur on the Ranch include coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and American badger (*Taxidea taxus*). Black bears (*Ursus americanus*) may occur in the more heavily wooded areas adjacent to national forest land.

Scores of bird species have been documented in and near CO Bar Ranch (see Tables E-3 and E-4 in Appendix E). Most of the species are those associated with grasslands and pinyon/juniper woodlands, but waterbirds have been observed at stock tanks (Email comm., Joe Edward Crouse, Ecological Restoration Institute, NAU). Table 4 lists some of the most commonly observed bird species, and Table 5 lists raptor species recorded from CO Bar Ranch. Potential substrate for raptor nests is provided by trees, tree snags, and a transmission line in the western portion of the Ranch, and by rock ledges associated with cinder cones, mesas, and in canyons throughout the Ranch. Forage resources required for most large raptors or that could attract raptors are present (Pers. obs., Allen Graber, SWCA Environmental Consultants).

Table 4. Commonly observed bird species on and near CO Bar Ranch.

Common Name	Scientific Name
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Brewer's sparrow	<i>Spizella breweri</i>
Chipping sparrow	<i>Spizella passerine</i>
Common raven	<i>Corvus corax</i>
Eastern meadowlark	<i>Sturnella magna</i>
Horned lark	<i>Eremophila alpestris</i>
Juniper titmouse	<i>Baeolophus ridgwayi</i>
Lark sparrow	<i>Chondestes grammacus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Mountain bluebird	<i>Sialia currucoides</i>
Mourning dove	<i>Zenaida macroura</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Vesper sparrow	<i>Pooecetes gramineus</i>

Source: SWCA Environmental Consultants, unpublished data; Holmes and Johnson 2012, 2013

Table 5. Raptor species observed on CO Bar Ranch.

Common Name	Scientific Name
American kestrel	<i>Falco sparverius</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Cooper's hawk	<i>Accipiter cooperi</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Merlin	<i>Falco columbarius</i>
Northern harrier	<i>Circus cyaneus</i>
Peregrine falcon	<i>Falco peregrines</i>
Prairie falcon	<i>Falco mexicanus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Turkey vulture	<i>Cathartes aura</i>

Source: SWCA Environmental Consultants, unpublished data

Amphibian and reptile species expected to be common on CO Bar Ranch include Mexican spadefoot (*Spea multiplicata*) toad, side-blotched lizard (*Uta stansburiana*), western whiptail lizard (*Cnemidophorus tigris*), Great Basin gopher snake (*Pituophis catenifer deserticola*), and western rattlesnake (*Crotalus viridis*). See Table E-5 in Appendix E for a species list.

While the Little Colorado River is often completely dry in the CO Bar reach, fish endure in isolated pools and are carried downstream during flood flows. When the river is flowing, the fish assemblage is expected to be composed primarily of warmwater, non-native species, such as red shiner (*Cyprinella lutrensis*), green sunfish (*Lepomis cyanellus*), fathead minnow (*Pimephales promelas*), common carp (*Cyprinus carpio*), plains killifish (*Fundulus zebrinus*), and black bullhead (*Ameiurus melas*) (Stone et al. 2007).

6.2.1 Wildlife Corridors

According to the Arizona Game and Fish Department (AGFD (2011c), CO Bar Ranch is located within the north-south oriented Wildlife Linkage 12 (South Rim – San Francisco Peaks – Woody Ridge/Bellemont Area). Wildlife species identified to use this linkage corridor include mule deer, elk, and Gunnison's prairie dog. Historically, the Ranch also functioned as an important east-west corridor for the migration of pronghorn. Unfortunately, the development of Highway 89 into a heavily traveled, high-speed highway has severely restricted pronghorn movement along this traditional corridor (see Section 8.2.2.5 for more information).

6.3 Special Status Species

Categories of special-status species potentially occurring on CO Bar Ranch include: 1) species listed, proposed for listing, or delisted and monitored by the USFWS under the Endangered Species Act of 1973 (ESA; 16 USC 1531 et seq.); 2) birds not federally listed but considered "Birds of Conservation Concern" (BCC) by the USFWS; 3) birds protected under the Bald and Golden Eagle Protection Act (BGEPA; 16 USC 668–668d); and 4) species considered "Species of Greatest Conservation Need" (SGCN) in Arizona by the AGFD.

Endangered Species Act. Section 9 of the ESA makes it illegal for any person to "take" any listed endangered species of fish or wildlife within the United States or the territorial sea of the United States or upon the high seas. This prohibition of takings of endangered species has been extended to threatened species of wildlife by USFWS regulations. Federally listed plant species are protected under the ESA only if federal lands, funds, or permits are involved in the action or if the action occurs in violation of state laws. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532(19)). Harm is defined in USFWS regulations as "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding and sheltering" (50 CFR 17.3 (2005)).

Birds of Conservation Concern. The 1988 amendment to the Fish and Wildlife Conservation Act of 1980 (16 USC 2901–2911) requires USFWS to identify non-listed bird species that, without additional conservation actions, are likely to become candidates for listing under the ESA. Included are federal candidate, proposed, endangered, threatened, and recently delisted species. The BCC program merely identifies bird species that may be imperiled; it provides no protection for them.

Bald and Golden Eagle Protection Act. The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The BGEPA defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." In context of the BGEPA, "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease

in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

Species of Greatest Conservation Need. These are wildlife species considered by the AGFD to be vulnerable and most in need of conservation actions. Inclusion on the list affords recognition to these species but provides no legal protection. Wildlife species are included on the list if they meet one or more of the following criteria:

1. Extirpated from Arizona
2. Listed endangered or threatened or candidate for listing or no open season in Arizona or has a signed Candidate Conservation Agreement or Candidate Conservation Agreement with Assurances
3. Population declining by at least 30 percent
4. Population disjunct or isolated
5. Demographically challenged (i.e., low birth rates or high death rates combined with small population size)
6. Colonial species (i.e., found in a limited number of groups at high concentration for all, much, or a critical portion of their life cycle)
7. Within Arizona, fragmentation has resulted in populations that are small and isolated from one another
8. Occur only or primarily in Arizona

Sources consulted to identify special-status species potentially occurring on CO Bar Ranch include the AGFD’s Heritage Data Management System, which tracks state records for federal and state special-status species,¹ and the AGFD’s HabiMap web-based mapping tool,² which maps the distribution of Species of Greatest Conservation Need in Arizona relative to delineated project areas. Species of Greatest Conservation Need are also identified in Arizona’s *State Wildlife Action Plan: 2012–2022* (AGFD 2012a). Additional sources of information consulted for this section include the Birds of Conservation Concern 2008 (USFWS 2008a).

Special-status species known to occur in the grassland, shrub-steppe, and juniper woodland habitats of northern Arizona may occur on CO Bar Ranch. They are listed in Table 6. All bird species named in the table receive legal protection under the federal Migratory Bird Treaty Act (16 USC 703–712). This act generally makes it unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.

¹ Lists of special-status species by Arizona county are provided online by the AGFD at http://www.azgfd.gov/w_c/edits/hdms_species_lists.shtml, and plant and animal abstracts, distribution maps, and illustrations are provided online by the AGFD at http://www.azgfd.gov/w_c/edits/hdms_abstracts.shtml.

² Distribution of Species of Greatest Conservation Need in Arizona can be mapped relative to a delineated project area using AGFD’s HabiMap at <http://www.habimap.org/>.

Table 6. Species highly or moderately likely to occur on CO Bar. Includes only species federally listed under the ESA, considered Birds of Conservation Concern by the USFWS, and wildlife species considered to be of greatest conservation need by the state.

Common Name	Scientific Name	Federal Status	AZ SGCN	AZ Native Plant Status
<i>Amphibians</i>				
Arizona tiger salamander	<i>Ambystoma mavortium nebulosum</i>	–	1B	
<i>Birds</i>				
American peregrine falcon	<i>Falco peregrines anatum</i>	DM, BCC	1A	
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA, DM, BCC	1A	
Bendire's thrasher	<i>Toxostoma bendirei</i>	BCC	1C	
Black-chinned sparrow	<i>Spizella atrogularis</i>	BCC	1C	
Black-throated gray warbler	<i>Dendroica nigrescens</i>	BCC	1C	
California condor	<i>Gymnogyps californianus</i>	E, XN	1A	
Common nighthawk	<i>Chordeiles minor</i>		1B	
Ferruginous hawk	<i>Buteo regalis</i>	BCC	1B	
Golden eagle	<i>Aquila chrysaetos</i>	BGEPA, BCC	1B	
Lincoln's sparrow	<i>Melospiza lincolni</i>		1B	
Northern goshawk	<i>Accipiter gentilis</i>		1B	
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	BCC	1B	
Prairie falcon	<i>Falco mexicanus</i>	BCC	1C	
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BCC	1B	
<i>Mammals</i>				
Allen's big-eared bat	<i>Idionycteris phyllotis</i>		1B	
American pronghorn	<i>Antilocapra americana americana</i>		1B	
Arizona myotis	<i>Myotis occultus</i>		1B	
Arizona pocket mouse	<i>Perognathus amplus</i>		1B	
Gray-collared chipmunk	<i>Tamias cinereicollis</i>		1B	
Greater western mastiff bat	<i>Eumops perotis californicus</i>		1B	
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>		1B	
Long-eared myotis	<i>Myotis evotis</i>		1C	
Long-tailed vole	<i>Microtus longicaudus</i>		1B	
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>		1B	
Mexican vole	<i>Microtus mexicanus</i>		1B	
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>		1B	
Spotted bat	<i>Euderma maculatum</i>		1B	
Stephens' woodrat	<i>Neotoma stephensi</i>		1B	
Western red bat	<i>Lasiurus blossevillei</i>		1B	
Wupatki Arizona pocket mouse	<i>Perognathus amplus cineris</i>		1B	
Yuma myotis	<i>Myotis yumanensis</i>		1B	

Table 6, continued. Species highly or moderately likely to occur on CO Bar. Includes only species federally listed under the ESA, considered Birds of Conservation Concern by the USFWS, and wildlife species considered to be of greatest conservation need by the state.

Common Name	Scientific Name	Federal Status	AZ SGCN	AZ Native Plant Status
<i>Reptiles</i>				
Arizona black rattlesnake	<i>Crotalus cerberus</i>		1B	
Pai striped whiptail	<i>Aspidoscelis pai</i>		1B	
<i>Plants</i>				
Fickeisen plains cactus		E		HS

Federal Status

BCC = Birds of Conservation Concern

BGEPA = Bald and Golden Eagle Protection Act

ESA Listing: DM = Delisted Monitored; E = Endangered; PE = Proposed Endangered; T = Threatened; XN = Experimental Nonessential population;

Arizona Status

SGCN = Species of Greatest Conservation Need

1A = Vulnerable species (score of "1") in at least one of eight categories and for which AGFD has entered into an agreement, or has legal or other contractual obligations, or has determined species to be a closed season species. The eight categories are: Extirpated from Arizona, Federal or State Status, Declining Status, Disjunct Status, Demographic Status, Concentration Status, Fragmentation Status, and Distribution Status.

1B = Vulnerable species in at least one of the eight categories, but no agreements, contractual obligations, or restrictions exist

1C = Insufficient data to determine vulnerability by the AGFD

HS = Highly Safeguarded native plant: no collection allowed

Table 6 is broad in nature, including species that *may* occur on CO Bar Ranch rather than just those that are *known* to occur or are *likely* to occur. Given that individual animals (particularly birds) may occasionally visit areas well outside of their species' conventional ranges, and that the ranch is located in a sparsely populated area that has not been systematically surveyed, the list errs (if at all) on the side of inclusion. For example, it is not known whether the Arizona tiger salamander (*Ambystoma mavortium nebulosum*) occurs on the Ranch, and there is little potential salamander habitat on the property. However, CO Bar is well within this salamander's range, and the species has been found in isolated stock tanks similar to those present on the Ranch.

7.0 EXISTING AND POTENTIAL LAND USES

The primary existing use of CO Bar Ranch is the raising of cattle and American Quarter Horses for sale. Additional income-producing uses include the quarrying and production of crushed aggregate (gravel) for asphalt, exploration for gas and oil, and providing a location for cellular phone towers. Non-income-producing uses include recreation (e.g., hunting, biking, hiking, photography), conservation activities (e.g., grassland restoration), and scientific research (e.g., testing of NASA planetary vehicles). New uses of CO Bar land may include wind and solar energy production. Natural gas, oil, and renewed uranium extraction cannot be entirely ruled out.

7.1 Livestock Production

Cattle ranching has been the primary revenue-generating activity of Babbitt Ranches since the firm's inception in 1886, and the Babbitts have grazed cattle and horses on portions of what is now CO Bar Ranch for more than a century. Continuing livestock production into the future depends upon many variables (e.g., market for beef and registered American Quarter Horses). Water availability and range health are perhaps the most critical factors, and the projected long-term drying trend and increased

incidence of drought in the region are a concern. Water is needed to supply stock tanks and drinkers on the Ranch, and adequate precipitation is needed to maintain soil moisture and rangeland forage.

Increased pumping of groundwater from regional aquifers can compensate for diminished surface runoff to some degree. As noted above in Section 5.4, depth to groundwater is considerable on the Ranch, and increased reliance on the pumping and delivery of groundwater incurs costs that must be balanced by revenues. Currently, wells are located in the Cedar Ranch area and in the western portions of the Ranch. Water depths in at least some of these wells reach 1,800 feet below land surface (Clayton Williams Energy 2003), and recent exploratory drilling for gas at two sites encountered significant water flow at various depths from 3,170 to over 3,900 feet below land surface (see Section 7.2.5). The two exploratory wells came up dry for natural gas but potentially could be modified for water production if the quality of that water is suitable for consumption by livestock.

Maintaining adequate production of rangeland grass and other forage plant for livestock in the face of prolonged drought is problematic. Rangeland already in good or excellent condition is less adversely affected by drought and recovers more quickly than rangeland in poor condition. Babbitt Ranches has long experience in managing the intensity, frequency, and timing of grazing to promote a healthy range. Nonetheless, protracted drought necessarily impacts livestock operations.

7.2 Mineral Extraction and Inert Landfill

7.2.1 Crushed Aggregate

Babbitt Ranches began leasing land on CO Bar Ranch for gravel pit operations in the 1990s. The pit is located south of Gray Mountain in T27N R9E, Section 29. Currently, the lessee is CEMEX, an international building materials company and supplier of aggregate to ADOT. Royalties from the lease, which are based on the number of tons of aggregate taken from the Ranch, have increased steadily over the years and provide a stable source of revenue for Babbitt Ranches (Majure no date).

At the gravel pit, basalt from the Black Point lava flow is quarried and crushed to produce aggregate for asphalt. The process involves scraping off 3 to 10 feet of soil overburden, then blasting out the exposed volcanic bedrock, crushing it into workable aggregate, and transporting it from the site by truck. An ADOT maintenance yard is located at Gray Mountain just 5 miles north of the pit. After the aggregate is removed, the contractor is required to reclaim the area by spreading the soil back over the excavated area (Babbitt Ranches newsletter, July 2004). The footprint of the Gray Mountain gravel pit operation now covers over 100 acres. All rangeland values—including soil formation and productivity, plant communities, livestock forage, and wildlife habitat—within that footprint have been lost until such time as the land is reclaimed and natural physical and biological processes recover. Such recovery in an arid environment is slow. A gravel pit and crushing plant also have significant adverse aesthetic impacts while in operation, and those visual impacts are long-term unless the site is properly reclaimed. The operation also consumes substantial amounts of water that must be pumped from deep wells. At the existing gravel pit, an average of 30,000 gallons of water is pumped per day (Masters et al. 2013). CO Bar Ranch contains a vast amount of volcanic rock suitable for crushed aggregate production; however, if expansion is considered these environmental impacts must be taken into account.

7.2.2 Inert Landfill

Babbitt Ranches generates income by allowing CEMEX to operate the Gray Mountain gravel pit as an inert material landfill site. The operation is authorized by a Conditional Use Permit from Coconino County. Inert materials are those that do not adversely affect other matter with which they come into contact and are not likely to pollute the environment or harm human health. Examples of inert landfill

include some types of construction waste (e.g., concrete, bricks, wood); land-clearing debris (e.g., brush, stumps, limbs); and earth materials (e.g., dirt, rock). Accepting inert landfill not only generates income for Babbitt Ranches; it aids in the reclamation of pits created by the crushed aggregate operation. If managed correctly, and the surface is properly restored, an inert landfill site should not result in environmental damage or long-term adverse visual impacts.

7.2.3 Volcanic Cinders

CO Bar Ranch is not mined for volcanic cinders (or “scoria”), although several cinder cones occur on the property. A number of cinder cones in the San Francisco Volcanic Field outside of the Ranch have been or are currently being excavated. Volcanic cinders are used primarily for aggregate, horticulture mixes, road deicing, leach fields, and decorative rocks (Nations and Phillips 1997), and there may be potential for processing them for precious metals (Anonymous 2005). Mining cinders permanently destroys the portion of cinder cone excavated and with it any associated habitat. Because of the highly conspicuous nature of cinder cones, cinder mining has substantial adverse aesthetic impacts on the landscape.

7.2.4 Uranium

Uranium has been mined on CO Bar Ranch in the past. The Ranch is located at the southern edge of the Cameron uranium mining district, which was active during the uranium boom years from 1951 to 1963. During that period, 100 properties in the district produced and shipped uranium ore to the Tuba City mill. The principal host rocks mined for the uranium deposits in the Cameron district were sandstone lenses in the lower part of the Petrified Forest Member of the Chinle Formation, although some deposits were also mined in the underlying Shinarump Member. One mine was located in a breccia pipe collared in the Moenkopi Formation. Most of the mining in the district was by open pits, which ranged in size from a shallow trench containing a single mineralized fossil log to pits as deep as 130 feet. Four mines, including the single breccia pipe, were serviced by vertical shafts.

The Petrified Forest and Shinarump Members of the Chinle Formation occur in northeastern CO Bar Ranch (see Figure 4), and uranium deposits in both members were mined on the Ranch in the 1950s, all by open pit (Chenoweth 1993). The single breccia pipe mine in the Cameron Mining District is located on federally owned land (Bureau of Reclamation) within CO Bar Ranch boundaries. All mines on CO Bar have been abandoned for decades, and it is unknown whether uranium deposits of sufficient quality and quantity to profitably mine still exist on the Ranch. When discussing mineral resources in the eastern CO Bar Ranch, the U.S. Bureau of Land Management (BLM; 2013:33) stated that, “past exploration did not test the identified uranium bearing host rocks of the Cameron Mineral District at depth, but the possibility exists that such targets could generate future prospecting interest. Potential lower grade ores that were once overlooked could become productive with more advanced technologies and emerging markets.” However, mining uranium involves unique hazards and liabilities, and any reactivation of such mining on CO Bar must be undertaken with care.

7.2.5 Oil and Gas

Four oil and gas exploratory wells have been drilled on CO Bar Ranch under the auspices of Babbitt Ranches; all were unsuccessful. Information about the four wells is presented in Table 7 and Figure 11.

Table 7. Unsuccessful exploratory oil and gas wells on CO Bar Ranch, 1948–2005.

Well Name	Year	Location	Depth (ft)	Terminal Formation	State Permit #
Barron-Steele 1 Babbitt	1948	T27N R9E Sec. 15	2,165	Permian Supai	AZOGCC:03-03
L M Lockhart 1 Babbitt	1949	T27N R9E Sec. 21	3,624	Precambrian Sixty-mile?	AZOGCC:03-04
Clayton Williams 1 Babbitt	2003	T27N R9E Sec. 15	4,350	Precambrian Granite	AZOGCC:0914
McCabe Energy 1 Babbitt	2005	T27N R9E Sec. 9	3,445	Cambrian Tapeats	AZOGCC:0922

Source: Arizona Oil and Gas Wells Conservation Commission, online at <http://welldata.azogcc.az.gov/>.

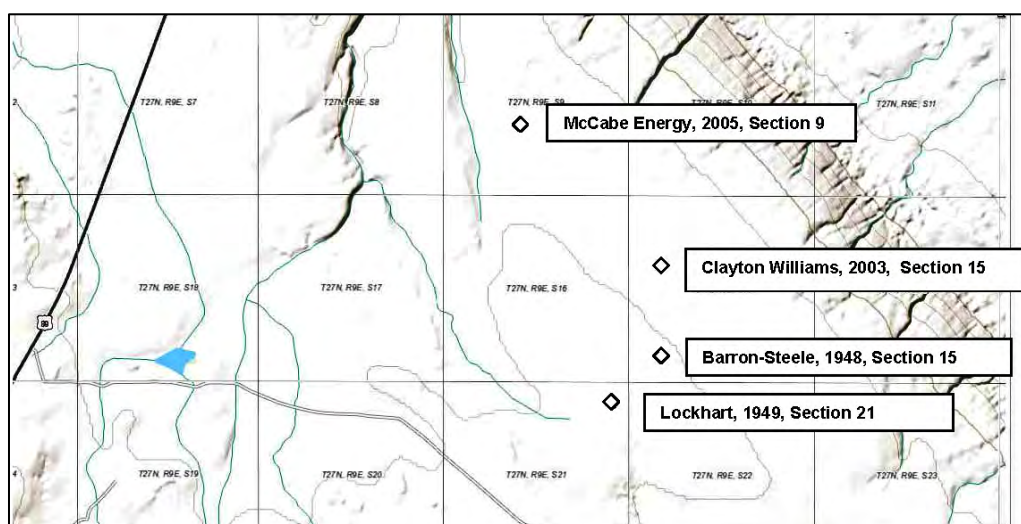


Figure 11. Location of exploratory oil and gas wells on CO Bar Ranch in T27N R9E.

Despite the failure of these wells to play out, petroleum geologists still believe there is potential for producing oil or gas wells on CO Bar Ranch. Geochemical surveys for near-surface migrated hydrocarbons and surveys for gravitational anomalies were conducted in townships T26N R8E and R9E and T27N R8E and R9E. The results of those surveys indicate a sufficiently high probability of petroleum source rock to justify additional exploratory drilling (Communication from Read & Stevens, Inc. on-file at Babbitt Ranches). Babbitt Ranches owns the subsurface rights for odd-numbered sections and can lease those properties for mineral extraction. The Federal Government owns the subsurface rights to even-numbered sections, and leases to explore and drill for gas and oil on those sections are let by the BLM regardless of surface ownership.

On February 14, 2013, the BLM (2014) sold an oil and gas lease for 8,887 acres in 14 sections in two townships on the Ranch. The townships and sections are:

- T27N R8E: All of Sections 12, 14, 22, 26, 34, and all of Section 24 except NE $\frac{1}{4}$, SE $\frac{1}{4}$, a quarter section for which Babbitt Ranches owns both surface and subsurface rights.
- T27N R9E: All of Sections 4, 8, 10, 14, 18, 28, 30, and 34.

All the leased properties are split estate, with the Federal Government owning all subsurface mineral rights. Surface rights are owned by the State of Arizona for all the properties except Section 18 in T27N R9E, which is owned by Babbitt Ranches.

The lease was issued to Monte Vista Exploration Company, Inc. of Albuquerque, New Mexico, for a period of 10 years, and will continue for as long thereafter as oil or gas is produced in paying quantities. If the lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, ownership of the minerals leased will revert to the Federal Government, and the lease can be resold. Drilling of wells on a lease cannot be permitted until the lessee secures approval of a drilling permit and a surface use plan (BLM 2013).

According to the BLM (2013), the Cambrian-age Tapeats Sandstone is the likely target of any oil and gas development within the leased parcels, although the Precambrian-age Walcott Member of the Chuar Group has been found to contain as much as 5 percent Total Organic Content and is therefore believed to be good to excellent petroleum source rock.

7.3 Renewable Energy Production

7.3.1 Wind

In 2005, Sustainable Energy Solutions, a part of Northern Arizona University's Department of Civil and Environmental Engineering, installed wind anemometers on CO Bar Ranch that measure and record wind speeds at various locations and elevations to assess the economic viability of wind energy production (Houk and Lynn 2004). Results of that study showed that, on average, most of the Ranch west of US 89 falls within the "Fair" Wind Power Class and sizeable areas rate as "Good," with Wind Power Density ratings of 400 watts per square meter or better (Northern Arizona University, Institute for Sustainable Energy Solutions 2014a). "Wind Power Density" is a term used to describe the wind power available per unit area swept by wind turbine blades. Suitability for wind energy development on CO Bar Ranch varies with topography and application.

Recently, NextEra Energy Resources, LLC conducted a more focused assessment of the property's wind energy potential and expressed interest in constructing a 64-turbine wind farm in the western portion of CO Bar Ranch contingent upon power market conditions. In addition to suitable wind resources, the proposed site provides proximity to the 500-kV transmission line that crosses the site. SWCA Environmental Consultants has conducted numerous site screening studies for the proposed CO Bar wind energy facility between 2010 and 2014. They include:

- Small and large bird use surveys
- Raptor migration surveys
- Eagle use surveys
- Eagle and other raptor nest surveys
- Golden eagle telemetry studies
- Bat acoustic monitoring

Wind-energy facilities have relatively few adverse impacts on the natural resources, and to the extent the energy they produce replaces carbon-based forms, they reduce greenhouse gas emissions and the effects of such emissions on climate change. The major environmental concern with inland wind turbines is bat and raptor (particularly golden eagle) mortality. No federally protected bat species have been detected on CO Bar Ranch. Golden eagles and other raptor species forage and nest on the Ranch, but no nests have

been found closer than 3.5 miles from the proposed site (SWCA Environmental Consultants, unpublished data). See Section 6.2, above, and Appendix E for lists of avian species likely to occur on or near the Ranch.

7.3.2 Solar

Like most of Arizona, CO Bar Ranch is rich in solar resource potential, falling within the range of 5.0 to 7.0 kWh/m²/day (Northern Arizona University, Institute for Sustainable Energy Solutions 2014b). The Gray Mountain gravel pit site, for example, experiences 6.0–6.5 kWh/m²/day (Masters et al. 2013). While solar radiation is abundant on the Ranch, a utility-scale solar energy facility has a large footprint, and all natural resources within that footprint are lost until the facility is removed and the site restored. Solar energy facilities also can require large amounts of water for both construction and operation. Klise et al. (2013) of Sandia National Laboratories report estimated water use is 0.2–7.0 acre-feet/megawatt (AF/MW) for construction of a utility-scale solar energy facility, 0.23–2.16 AF/MW/yr for operation of a dry-cooled system, and 1.63–21.48 AF/MW/yr for a wet-cooled system. Water availability is limited on CO Bar Ranch.

7.3.3 Geothermal

While there is little potential for geothermal energy production on CO Bar Ranch, it is interesting to note that the eastern San Francisco Volcanic Field is an ongoing target for geothermal exploration because of the volume and youth of silicic volcanic rocks in the area (Morgan et al. 2010). The presence of young silicic volcanic rocks at the surface implies an equally young magma reservoir in the underlying crust and is a first-order guide in exploring an area for geothermal-energy potential. After investigating the geothermal potential in the vicinity of O’Leary Peak, just north of Sunset Crater, Morgan et al. (2010:33) concluded that “there is ample evidence from the ages of silicic volcanic rocks, the very young basaltic event at Sunset Crater to the south of our study area, and the evidence for mixing of magmatic fluids with the groundwater, that a contemporary hydrothermal system exists.” They recommend drilling an exploratory well near O’Leary Peak to test their conclusion. While most of the volcanic rock on CO Bar Ranch is basaltic rather than silicic and relatively old, the SP flow is an exception. It appears to be very young (5.5–6 thousand years) and is basaltic andesite in composition; andesite is silicic rock. At depth, the SP vent may be tied into an existing hydrothermal system. Data derived from deep drilling to the northeast of SP (see Section 7.2.5) may inform this possibility.

7.4 Other Existing and Potential Commercial Land Uses

Other existing land uses on CO Bar Ranch include two cell phone towers, one at Gray Mountain and another on the 500kV power line access road approximately 1.5 mile from US 180. Babbitt Ranches leases the land for the Gray Mountain tower to Alltel Communications Southwest Holdings, Inc. (License ID #: 13223). The power line tower site is leased to SBA Towers V, LLC (FCC Registration No. 1277244). Opportunities for additional communication towers on CO Bar land may arise in the future.

There also may be opportunities for some level of commercial and/or residential development on the Ranch. The most likely places would be along US 89 at or near Gray Mountain or near Wupatki National Monument. Gray Mountain is a small community built along both sides of US 89 and consists of a service station, motel, ADOT maintenance yard, Arizona Department of Public Safety Office, mission, and scattered dwellings. A historic stone building (ca. 1938/1939) that once housed a trading post and later a tourist store and restaurant has been empty since 2009 (Kelley and Francis 2014). Gray Mountain is located on private land parcels surrounded by CO Bar Ranch and the Navajo Nation.

Some potential also exists for development on US 180 on the western side of CO Bar Ranch. A small stretch of US 180 crosses the southwestern corner of the Ranch, approximately 8 miles from the community of Valle at the intersection of US 180 and State Highway 64 (see Figure 1). All of the private property between CO Bar Ranch and State Highway 64, some 50,000 acres, has been subdivided for commercial and residential development. Few of the thousands of lots have structures on them, but Valle appears to be expanding with a new hotel, service station, and store serviced by two new 3,000-foot-deep water wells. Given the huge supply of unoccupied residential lots adjacent to CO Bar Ranch, there appears to be little point in adding to that supply by subdividing land on the Ranch. Some type of commercial development on US 180 may be reasonable, but the only reliable source of water in that area is deep wells or water hauling.

7.5 Recreation

Babbitt Ranches has always welcomed the general public to use its ranches for hunting, hiking, mountain biking, photography, and other recreational activities. Babbitt Ranches takes seriously its responsibility to the people and communities of the region, and allowing unfettered access to the expanse of lands over which it has control is one of the ways Babbitt Ranches demonstrates that sense of responsibility. But Babbitt Ranches, its ranchlands, and the people of northern Arizona are also part of a larger ecological community. The welfares of humans, wildlife, and vegetation communities are all intertwined and dependent on soil, water, climate, and other physical processes. All must be balanced in an ever-changing dynamic of give and take. To better manage this balance, Babbitt Ranches, in cooperation with the AGFD, has decided to designate the portion of CO Bar Ranch east of US 89 as a research area closed to the general public for the period 2014–2019. Recreationists are still welcome on the CO Bar west of the highway and on the other Babbitt ranches.

Overall, recreational use of CO Bar Ranch is light. The Ranch is in a sparsely populated area, some distance from Flagstaff, and the region abounds with other opportunities for outdoor recreation. In particular, the CO Bar is bracketed by hundreds of square miles of national forest land, is adjacent to a national monument, and is near several other national parks and monuments.

The types of recreation that take place on CO Bar Ranch tend to have few adverse impacts. However, there are potential concerns, including wildfire from campfires, trailing on popular cinder cones, damage from off-road vehicles, disturbance to livestock and wildlife, vandalism, and litter.

7.5.1 Hunting and Recreational Shooting

All of CO Bar Ranch has been open for legal hunting in the past, but, as noted above, beginning in 2014 the portion of the Ranch east of US 89 has been designated a research area and will be closed to hunting and recreational shooting until 2019. The portion of the Ranch west of the highway remains open to legal hunting and recreational shooting. CO Bar falls within three AGFD game management units (Figure 12). All of the Ranch east of the Moenkopi-Yavapai 500-kV transmission line is in Game Management Unit 7E; a small area south of US 180 in the southwestern corner of the Ranch is in Game Management Unit 7W; and the part of the Ranch north of US 180 and northwest of the 500-kV line is in Game Management Unit 9. Game animals hunted on the Co Bar include pronghorn, mule deer, and elk. Increasingly ranch owners in northern Arizona are closing their properties to hunting by the general public and instead are providing guided hunting for a fee. To date, Babbitt Ranches has chosen not to follow suit.

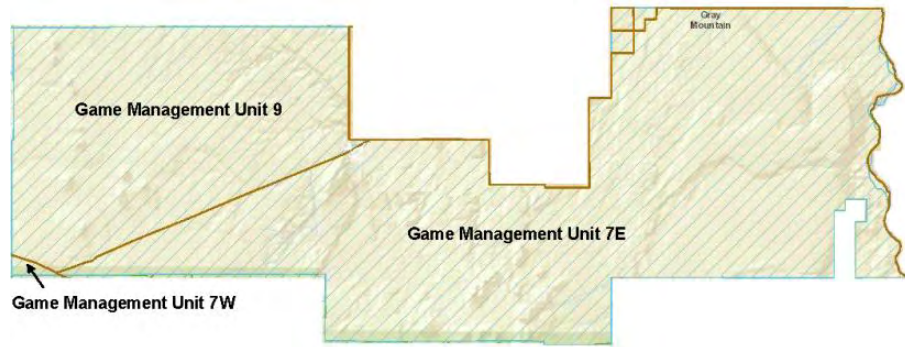


Figure 12. AGFD Game Management Units 7E, 7W, and 9 on CO Bar Ranch.

The two species of wildlife most likely to be shot on CO Bar for reasons other than meat or trophy are prairie dogs and coyotes. Both species are widely considered “varmints.” Recreational shooting of prairie dogs is known to occur on CO Bar Ranch; shooting of coyotes may occur. A valid hunting license is needed in Arizona to shoot prairie dogs and predatory mammals, including coyotes. Prairie dogs can be shot from January 1 to March 31 and from June 16 to December 31. Coyotes can be shot year round.

While Babbitt Ranches generally welcomes hunters to CO Bar Ranch, concerns include hunting during pronghorn breeding season (see Section 8.2.2.5), using lead ammunition (see Section 8.2.2.1), and decreasing prairie dog populations (see Section 8.2.2.3).

7.5.2 Other Recreational Uses

Hikers, runners, and mountain bikers visit the Ranch, as do photographers and artists who are attracted by the scenic landscape and romantic appeal of a working cattle ranch. Off-road enthusiasts drive Forest Service and ranch roads. A segment of the Arizona Trail, which traverses the length of the state, passes through the Ranch. It is used by backpackers, long distance runners, and mountain bikers. The trail enters CO Bar Ranch just east of the Cedar Ranch area where FR 417 and FR 9008A intersect, then follows a road north to Tubb Ranch Camp. Once past Tubb Ranch, the route goes west towards Chapel Mountain and passes under the 500-kV transmission line. The route then travels north to Upper Lockwood Tank, then turns northeast to the Lower Lockwood Tank, and then northwest before reaching the Kaibab National Forest boundary.

Hikers frequently climb SP Crater, and to a lesser extent, other cinder cones on the Ranch. Some diffused camping also occurs. Recently, Babbitt Ranches hosted large, organized recreational events on CO Bar Ranch. The Flagstaff to Grand Canyon Stagecoach Line 100 Mile Ultra & Relay running event was inaugurated in October 2013, and the SP Crater Marathon, Half Marathon, 10K and 5K run was inaugurated in March 2014. These events are likely to be repeated annually.

7.6 Research Activities

A wide range of research activities have taken place on CO Bar Ranch over the last several decades. Some of these activities are ongoing. For example:

- Babbitt Ranches has opened CO Bar Ranch to NAU faculty and staff to study a multitude of subjects, including juniper encroachment on grasslands, volcanic flow dates, pocket mice distribution, pronghorn genetics, and archaeological resources on land adjacent to Wupatki National Monument.

- Babbitt Ranches has partnered with NAU and other agencies and organizations to implement the Southwest Experimental Garden Array (SEGA) project. Ten research gardens representing a range of natural habitats are being set up in northern Arizona and will be used in future studies to examine how climate change affects the ecology and evolution of plants and ecosystems. Two of the sites are on CO Bar Ranch: one in grassland northeast of Spider Web Camp and south of the Gray Mountain gravel pit (Black Point Garden Site) and the other in pinyon-juniper woodland along the 500 kV transmission line off US 180 (Blue Chute Garden Site).
- The U.S. Natural Resources Conservation Service (NRCS) Soil Survey is installing four soil climate stations on CO Bar Ranch at the following locations: Site 1 – The SEGA Black Point Garden Site; Site 2 – East of SP Lava Flow; Site 3 – Base of Mesa Butte; and Site 4 – In Lockwood Canyon. The purpose of the stations is to measure soil moisture availability, migration, and retention in the soil type present at each station. The data collected will allow the NRCS to build a soil-specific model that can be used in the future to estimate soil climate at similar sites in other locations. Data will be collected at the four soil climate stations on CO Bar Ranch for five years, with the option to renew for an additional five years.
- AGFD conducted telemetry studies of pronghorn movement across northern Arizona, 1992–2010. Resulting data revealed critically important information about the segregation of pronghorn into subpopulations. Babbitt Ranches also worked with AGFD staff to prepare a long-term pronghorn succession plan for CO Bar, Espee, Cataract, and Ranches (deVos and Cordasco 2009, attached as Appendix G).
- In 2011 and 2013, SWCA Consultants under contract to NextEra Energy Resources, LLC, conducted aerial surveys in northern Arizona for golden eagle and other raptor nests. The survey area included western CO Bar Ranch (see Figure 19 in Section 9.1.1.1). One eagle was captured on the Ranch and equipped with a transmitter (see Section 8.2.2.1 for more information).
- In 1968, the USGS Center of Astrogeology blasted craters in the Black Point lava flow to simulate an impact crater field on the lunar surface in preparation for NASA's manned Apollo Moon missions (Schaber 2005). Forty years later, Black Point lava flow was designated an analogue test site for NASA's Desert RATS (short for Research and Technology Studies). In October 2008 several 1- and 3-day simulations of lunar missions were conducted along the western and southwestern portions of the flow. The site was used again to simulate a 14-day lunar mission in September 2009. In 2010, the analogue site was expanded to the west to include SP Crater and lava flow. Mission simulations in 2010 included using Space Exploration Vehicles and other assets to simulate a 28-day mission to the Moon (Lunar and Planetary Institute undated). In 2011, the Desert RATS field tests on CO Bar Ranch focused on asteroid exploration and testing of a space truck, a robotic rover assistant, and deep space communication systems.



Left: Space Exploration Vehicle tested near SP Crater, 2010. *Center:* Unpressurized rover during a lunar mission simulation exercise on Black Point lava flow, 2008. *Right:* Apollo Moon Mission blast to create a test crater on Black Point lava flow, 1968. Photos from NASA (undated), Garry et al. (2009), and Schaber (2005), respectively.

CO Bar Ranch's potential as a site for future scientific research is limited only by the willingness of Babbitt Ranches to participate in such efforts. As with all potential future uses of CO Bar Ranch, Babbitt Ranches will evaluate opportunities for fostering research on the Ranch within the context of conserving natural and cultural resources. Likely areas of future research related to conservation objectives are addressed in the following sections.

8.0 CONSERVATION: THE BABBITT RANCHES LAND USE ETHIC IN ACTION

As noted in the introduction of this document, the guiding land use ethic at Babbitt Ranches “reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity” (Article 5, Section 3, Constitution of Babbitt Ranches).

The commitment of Babbitt Ranches to living this land use ethic is evidenced by numerous conservation efforts, including: 1) applying livestock management practices aimed at sustaining rangeland health over the long term; 2) establishing conservation easements Babbitt ranchlands totaling over 41,000 acres; 3) sponsoring a biological assessment of the Coconino Plateau that provides an overview of the biotic and abiotic environment of the region (Thybony and Thomas 1998); 4) supporting studies of wildlife populations on the Babbitt ranchlands and implementing actions designed to benefit those populations; 5) supporting studies of range conditions on the ranches and implementing measures to improve and preserve those habitats; 6) proactively seeking opportunities to work cooperatively with a wide spectrum of government agencies, educational institutions, environmental organizations, and other area ranchers to better understand, enhance, and conserve the natural landscape, not only on Babbitt Ranches properties, but throughout northern Arizona.

To support and facilitate future conservation work on Babbitt ranch properties and the surrounding region, Babbitt Ranches established the Landward Foundation in 2013. Created as an independent, non-profit, 501(c)(3), organization, the Landward Foundation serves as a liaison between the owners of Babbitt Ranches and the broader resource management and scientific communities. Its stated purpose is to “develop and disseminate scientific information that will increase awareness and understanding of ecological processes, and to facilitate and advance land use management based on a land use ethic that places the long-term ecological health of the land as a primary objective and takes into account the intimate relationships that exist between people and the natural world” (Landward Foundation 2014:3).

As a non-profit organization, the Landward Foundation allows Babbitt Ranches to participate in and acquire funding from conservation programs not open to for-profit entities, so long as the results of doing so advance knowledge of and benefit the natural resources on and around Babbitt lands.

8.1 Conservation on CO Bar Ranch: Laying the Foundation

Notable conservation actions completed on CO Bar Ranch include multiyear studies of pronghorn movement patterns and modification of fences to facilitate that movement (see Section 8.2.2.5); creation of the Cedar Springs Forest Legacy Project, a 640-acre conservation easement at Cedar Ranch (see Section 8.1.1); and a major program of grassland restoration to increase the amount and quality of habitat for pronghorn and other grassland species (see Section 8.1.2). In the coming years, Babbitt Ranches intends to extend and build on these accomplishments. Important steps in this direction are the establishment of the Antelope Prairie Ecological Research Area and the Little Colorado River Valley Conservation Area in the eastern section of CO Bar Ranch (see Sections 8.1.3 and 8.1.4).

8.1.1 Cedar Springs Forest Legacy Project (Conservation Easement)

The Cedar Springs Forest Legacy Project is a conservation easement granted by Babbitt Ranches and held by Coconino County as part of the national Forest Legacy Program. Granted in 2007, the conservation easement comprises the south half of Section 17 and north half of Section 20 in T25N R6E. It totals approximately 640 acres (629.34 acres according to Coconino County Assessor records) and includes all but a quarter section of historic Cedar Ranch, a rest stop along the old Grand Canyon–Flagstaff stagecoach line (Peterson and Gatewood 2007, attached as Appendix F). Funding to establish the Cedar Springs conservation easement was provided by the U.S. Forest Service (75%) and Babbitt Ranches (25%) (The Trust for Public Lands 2014).

The Forest Legacy Program is a federal program administered in partnership with state agencies, local governments, land trust organizations, and private landowners. It is designed to protect private forest lands from conversion to non-forest uses. Goals of the program include preservation of forest wildlife, habitat, biodiversity, and riparian areas (U.S. Forest Service 2014). Cedar Springs, Arizona's first and to date only Forest Legacy Program project, is distinguished by its ecological diversity and riparian habitat. Starting at the property's south end, the land steps down from a level plateau to a north-facing basalt cliff, then down a fairly steep slope to another flatland at the north end. The elevation from south to north ranges from a high of 7,018 feet to a low of about 6,322 feet. The variable elevation, aspect, and groundwater discharge result in several different ecosystem types within a relatively small area. Pinyon-juniper woodlands occupy the plateau at the south end of the property and the slopes below the cliff face. Old-growth ponderosa pine, aspen, Douglas fir (*Pseudotsuga menzeisii* var. *glauca*), and Arizona walnut (*Juglans major*) grow in cooler, shaded areas at the base of the north-facing cliff faces. Grasslands occur at the lowest elevations, and several riparian habitats line south-to-north oriented washes (Peterson and Gatewood 2007). The largest riparian community borders Cedar Wash, which runs southward along the western edge of the property. Two springs, located on the east and west sides of the conservation easement, respectively, support small areas of riparian habitat, while seeps along the slope at the elevation of the springs support willow (*Salix* spp.), narrowleaf cottonwood (*Populus angustifolia*), Arizona rose (*Rosa arizonica*), and New-Mexican locust (*Robinia neomexicana*). The availability of water and diverse vegetation communities support a large and diverse assemblage of wildlife (Peterson and Gatewood 2007).

8.1.2 Grassland Restoration

On CO Bar Ranch, juniper woodlands have slowly encroached upon several thousands of acres of grassland/shrub-steppe habitat in the western section of the Ranch. Junipers reduce the vigor of native grasses, take up water and nutrients, reduce forage for grassland wildlife species, and reduce visibility for those species that depend upon it. Pronghorn in particular rely upon open fields of vision—as well as their speed—to protect themselves from predation by coyotes, eagles and lions (Babbitt Ranches newsletter, July 2004). In a major effort to reverse the effects of juniper encroachment on CO Bar Ranch, Babbitt Ranches began a grassland restoration program in 2004. In the years since, over 30,000 acres of grassland/shrub-steppe habitat in six townships have been restored on the Ranch (Table 8; Figure 13).

Table 8. Acres of grasslands and shrub-steppes restored on CO Bar Ranch, 2004–2013 [incomplete list – data are still being assembled].

Year	2004	2005	2006	2007	2008	2009	2011	2012	2013	TOTAL
Acres	823	2,820	351	3,453	9,192	7,191	1,134	3,556	351	28,871

Source: Stephen Cassady, AGFD

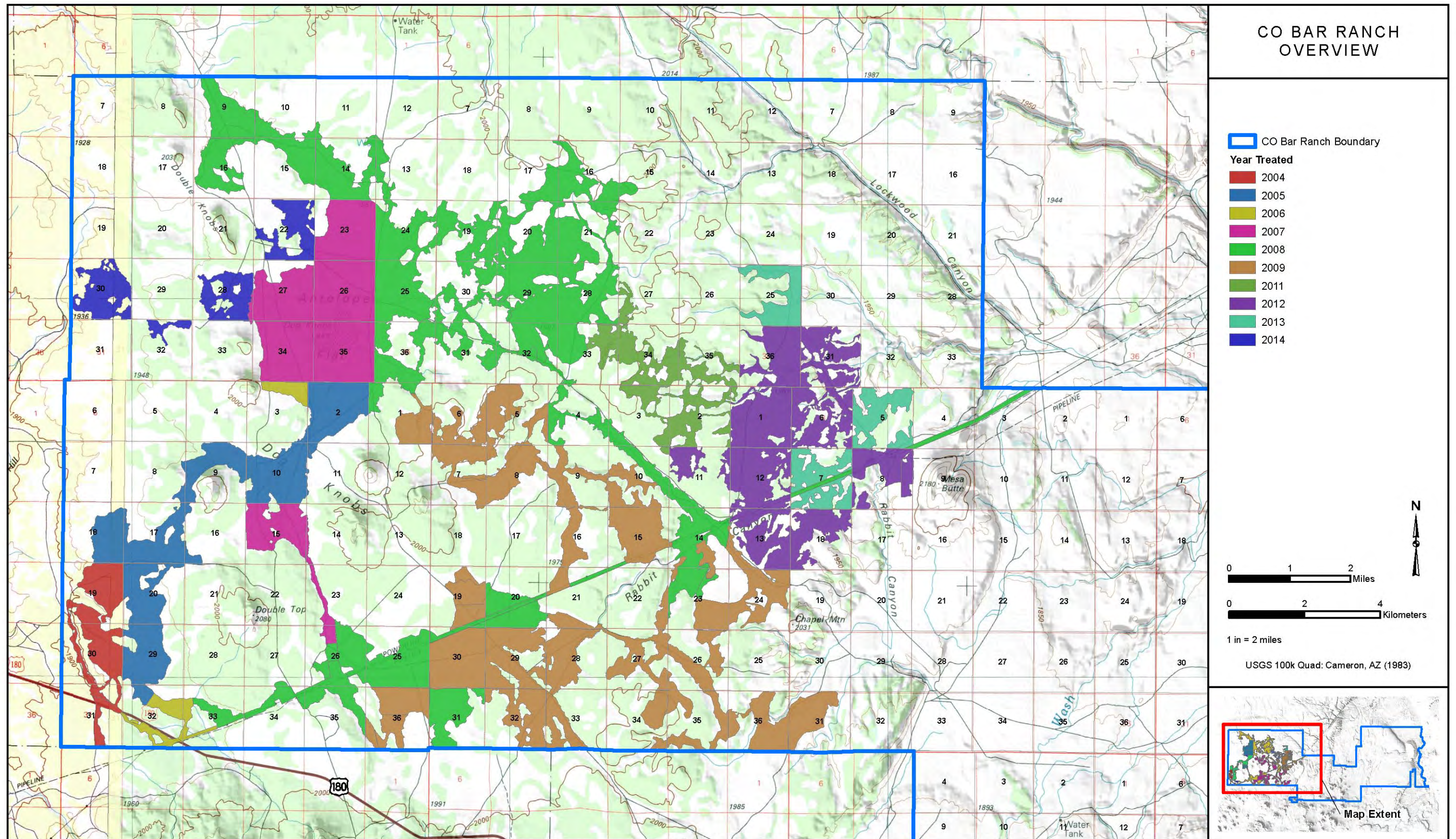


Figure 13. Grassland restoration projects on CO Bar Ranch, 2004–2013.

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In the grassland restoration process, woody vegetation is removed by hand crews with chainsaws and ground into mulch. The mulch is then left in situ to enhance the growth of native grasses, forbs, and shrubs used by pronghorn and other wildlife, as well as by livestock. The projects were funded primarily by grants from the USFWS's Landowner Incentive Program, which in Arizona is administered by the AGFD, and by the NRCS's Wildlife Habitat Incentive Program. Additional funding sources include the Arizona Department of Agriculture's Livestock and Crop Conservation Grant Program, the USFWS's Partners for Fish and Wildlife Program, and Babbitt Ranches. Arizona Public Service also cleared junipers from their 500-kV transmission line right-of-way (Stephen Cassady, AGFD, unpublished data).

Conserving and restoring the native grassland/shrub-steppe ecosystems of northern Arizona is of paramount importance. Grasslands provide essential ecological services, including soil formation, erosion control, dust retention, water quality protection, watershed health, nutrient cycling, storage of atmospheric carbon dioxide in biomass, and maintenance of biodiversity. Grasslands support comparatively high wildlife density and species diversity; they provide food, cover, breeding habitat, and seasonal ranges for an assemblage of wildlife species adapted to that biome (Finch 2004). Unfortunately, native grasslands nationwide have dwindled, and the remnant grasslands are imperiled. Over half of the critically endangered ecosystems in the United States are grasslands (Noss et al. 1995), and native grasslands may now be one of the rarest ecosystems in the Southwest (Grahame and Sisk 2002). In Arizona, grasslands with low shrub cover are now found on less than 7 million acres, comprising 31% of current and former grasslands in the state. According to The Nature Conservancy (2012), the grasslands of the Coconino Plateau, which include those of the Babbitt ranches, are part of the largest block of contiguous, open, native grassland left in Arizona and represent a critical and unique conservation opportunity.

8.1.3 Antelope Prairie Ecological Research Area

In 2014, Babbitt Ranches established the Antelope Prairie Ecological Research Area, which encompasses all of CO Bar Ranch east of US 89 and west of the Little Colorado River Valley (Figure 14). This area totals approximately 61,612 acres. The Antelope Prairie Ecological Research Area will serve as the geographic focus for studies and conservation actions related to the preservation of key grassland species. To facilitate studies and future conservation programs in the Research Area, the AGFD has agreed to close the area to hunting for the period 2014–2019, and Babbitt Ranches is restricting access to researchers only.

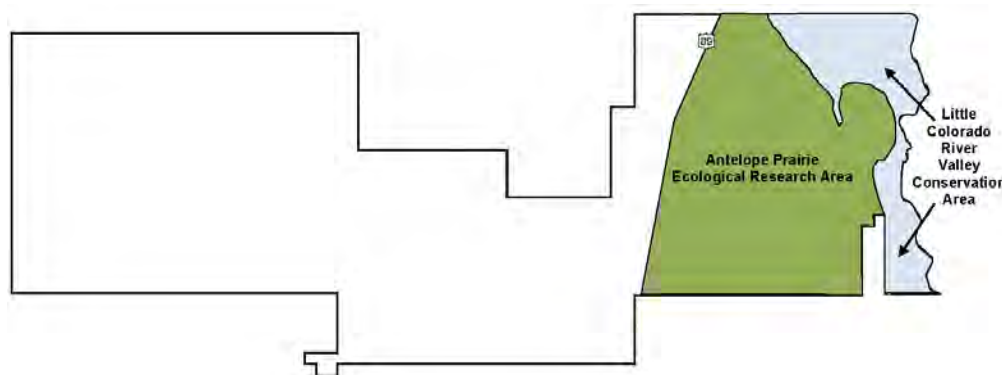


Figure 14. Location of the Antelope Prairie Ecological Research Area and the Little Colorado River Valley Conservation Area.

Vegetation communities and other SWReGAP cover classes within the Antelope Prairie Ecological Research Area are listed in Table 9.

Table 9. Acres and percent of Southwest Regional Gap Analysis Project (SWReGAP) cover classes within the Antelope Prairie Ecological Research Area.

Cover Class	Acres	% of Total
Grassland/shrub-steppe	50,536	82.1
Woodland	38	0.1
Shrubland and Scrub	9,234	15.0
Colorado Plateau Mixed Bedrock Canyon and Tableland	1,558	2.5
Inter-Mountain Basins Shale Badland	66	0.1
Inter-Mountain Basins Volcanic Rock and Cinder Land	37	0.1
Invasive Southwest Riparian Woodland and Shrubland	6	0.0
Developed, Medium-High Intensity	114	0.2
Open water	23	0.0
TOTAL	61,612	100.1

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

The Antelope Prairie Ecological Research Area largely consists of grassland/shrub-steppe habitat (82%). Species of particular interest within the Research Area include, but are not limited to, pronghorn, golden eagles, prairie dogs, and the endangered Fickeisen plains cactus. The SEGA Black Point site and the NRCS's Black Point soil climate station are located within the Research Area, and studies and conservation actions relating to pronghorn and golden eagles are in the planning stages. Other research and conservation possibilities (for example, the introduction of endangered black-footed ferrets and reburial of exposed archaeological sites) are being considered. A population of Fickeisen plains cactus in the Research Area may be a candidate for a monitoring program, and the Rimmy Jim stock tank is being considered for native riparian habitat restoration following destruction of the existing non-native tamarisk habitat by the tamarisk leaf beetle (see Section 6.1.1). A list of possible conservation strategies for key grassland species can be found in Section 9.0. Some of these strategies may lend themselves to structured studies within the Antelope Prairie Ecological Research Area.

8.1.4 Little Colorado River Valley Conservation Area

Babbitt Ranches is planning establishment of the Little Colorado River Valley Conservation Area along the approximately 16-mile-long reach of the Little Colorado River (see Figure 14, above). Landownership within the 16,826-acre Conservation Area is shown in Figure 15 and listed below. Bordering the river, the odd-numbered sections are owned by Babbitt Ranches, and the even-numbered sections are owned by the Bureau of Reclamation. Land east of the river belongs to the Navajo Nation.

Landowner	Acres
Babbitt Ranches	6,990
Antelope Springs	318
State Trust	3,832
Bureau of Reclamation	3,967
Bureau of Land Management	119
Other Private	1,600

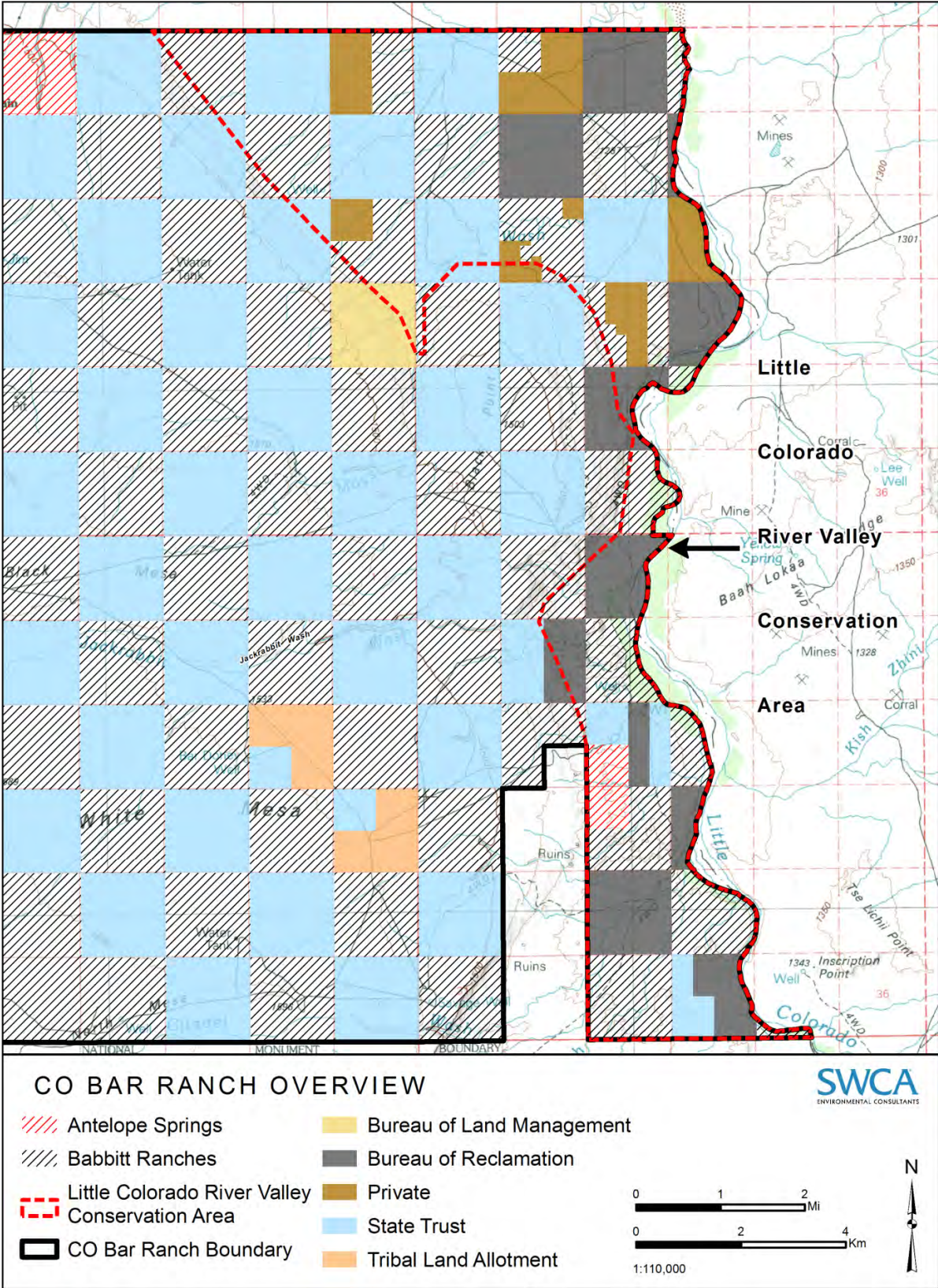


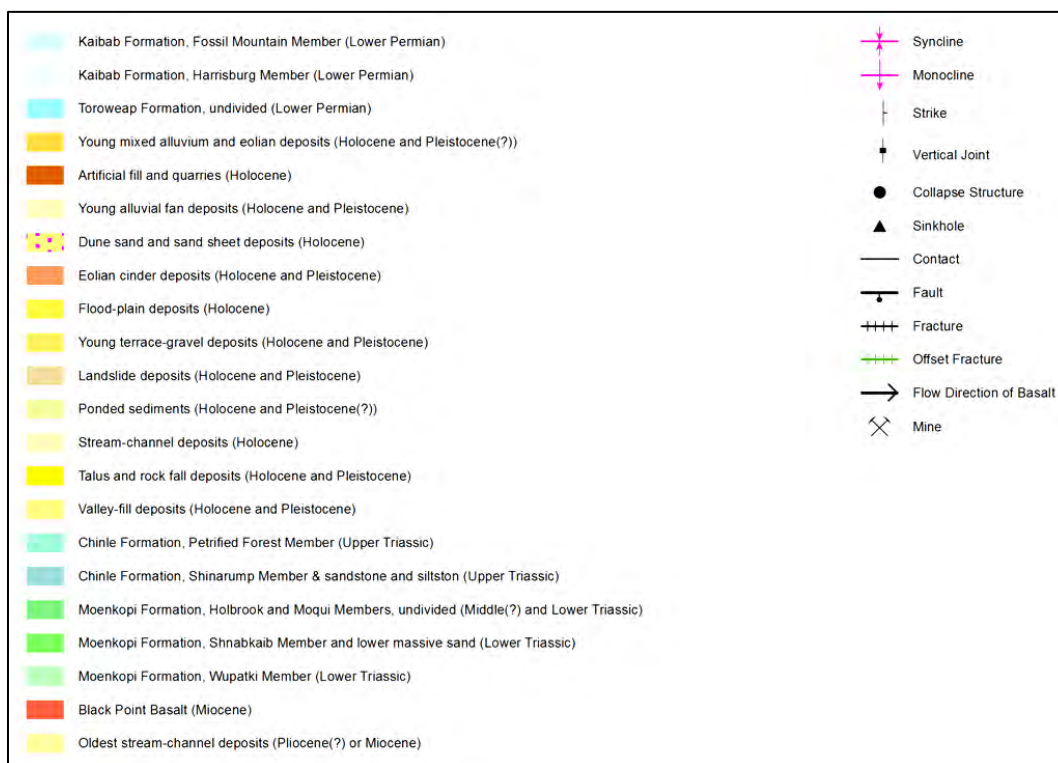
Figure 15. Little Colorado River Valley Conservation Area: landownership map.

8.1.4.1 Hydrology and Geology

The Little Colorado River is ephemeral in this reach. It is frequently dry, flowing only in response to seasonal snowmelt and precipitation events (see the hydrograph in Figure 7). The river channel is sinuous, braided, and unstable, shifting across the sandy floodplain during sporadic flood flows. In prehistoric times the Little Colorado River was a perennial stream, though perhaps intermittent seasonally where its flow was absorbed in sand deposits (Northern Arizona University, Anthropology Laboratories 2014).

The Little Colorado River carries a heavy load of silt and dissolved solids, including salt. To a considerable extent, this is natural. Large areas of erodible surficial material, sparse vegetation characteristic of arid climates, and intense rainstorms produce very high suspended-sediment concentrations in runoff (Graf et al 1996). Erosion rates in the Little Colorado River watershed have always been high, but they have increased in historic times due to human activities. Since the 1880s, overgrazing by domestic sheep and cattle have led to a higher percentage of bare soil in much of the watershed, and this in turn has increased sediment deposition into an already silty river (Abruzzi 1995). The mineral composition of sediment delivered to the river reflects the mineral composition of the soil and rock being eroded. For example, Little Colorado River water is saline because the river and its tributaries drain large areas of salt-bearing soils and bedrock. Levels of uranium, radium, beryllium, copper, lead, manganese, and nickel are high for the same reason. The concentrations of these minerals in river water are proportional to sediment loads (Wirt 1994). The more turbid the conditions, the higher the mineral concentrations.

The geology of the Little Colorado River Valley Conservation Area is depicted in Figure 16, and the key to rock formations, surface deposits, and structural features is provided below. Bedrock is dominated by the Chinle Formation in the northern part of the Conservation Area and by the Moenkopi Formation in the southern part. The Chinle forms the colorful badlands topography of the Painted Desert and contains uranium-bearing ores (see Sections 5.2.2 and 7.2.4 for more information).



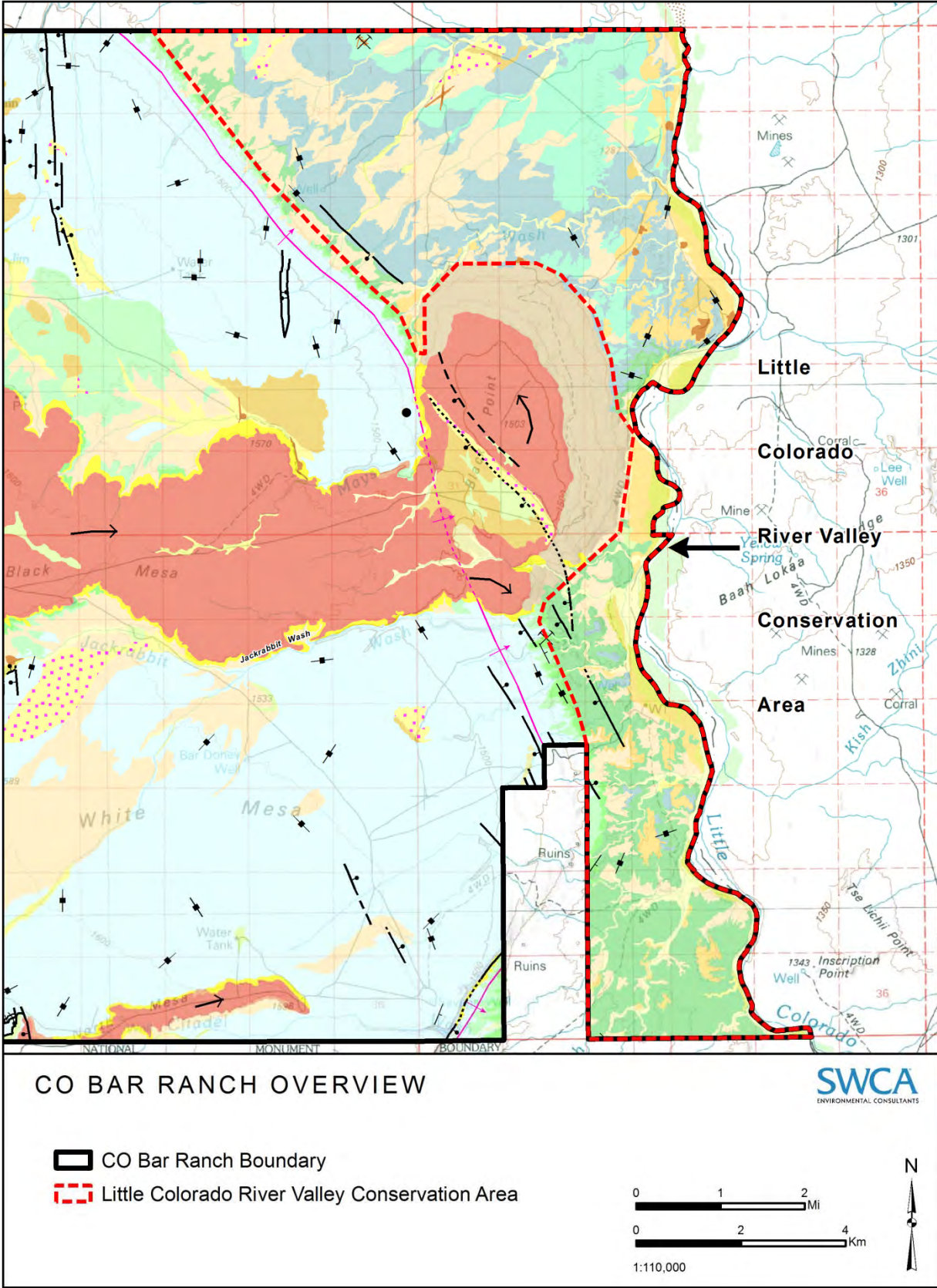


Figure 16. Little Colorado River Valley Conservation Area: geologic map.

During the 1950s and 1960s, uranium was mined at several locations in the Little Colorado River basin, including locations on CO Bar Ranch. When the mines were abandoned, waste rock containing elevated concentrations of radionuclides and metals were generally left behind. Concerns about abandoned mine sites include, but are not limited to, stormwater runoff carrying unnaturally high levels of uranium-bearing sediment to watercourses. While this is a concern, Wirt (1994) found the differences in the radioactivity of sediment samples taken from the Little Colorado River to be related to geographical differences in geology rather than to the proximity of upstream uranium mines.

Uranium mining took place in the Little Colorado River Valley within the boundaries of CO Bar Ranch. Mined sites occur on land owned by Babbitt Ranches, the federal Bureau of Reclamation, the State of Arizona, and other private entities. The actual mining was conducted under various leases by a number of mining companies (Chenoweth 1993). The level of threat posed by these mined areas to the Little Colorado River and other resources is unclear and warrants study.

8.1.4.2 Vegetation

Vegetation communities and other SWReGAP cover classes within the Little Colorado River Valley Conservation Area are listed in Table 10 and shown in Figure 17.

Table 10. Acres and percent of Southwest Regional Gap Analysis Project (SWReGAP) cover classes within the Little Colorado River Valley Conservation Area.

Cover Class	Acres	% of Total
Grassland/shrub-steppe	5,204	30.9
Shrubland and Scrub	5,511	32.7
Colorado Plateau Mixed Bedrock Canyon and Tableland	2,905	17.3
Inter-Mountain Basins Shale Badland	1,739	10.3
Inter-Mountain Basins Volcanic Rock and Cinder Land	2	0.0
Invasive Southwest Riparian Woodland and Shrubland	1,465	8.7
TOTAL	16,826	100.0

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

The SWReGAP analysis shows only invasive (i.e., non-native) riparian vegetation along the Little Colorado River. This invasion is a recent occurrence. What the riparian corridor looked like in the CO Bar reach back when the river flow was perennial is unknown. In other reaches of the river, however, native riparian vegetation such as willows and cottonwoods grew in areas where the banks were high enough to be spared the scouring effects of floods. Those patches of vegetation largely died out when Euro-American settlers diverted and impounded most of the streamflow in the upper reaches of the river (Webb et al. 2007). Over time, non-native species like tamarisk and Russian olive (*Elaeagnus angustifolia*) spread all through the Little Colorado River Valley. While dense growths of tamarisk alter natural ecosystems, and native vegetation is preferred, tamarisk often occupies ground that would otherwise be bare, and tamarisk leaves, flowers, and seeds attract insects and birds (Cohn 2005). Some species of birds, including the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), build nests in the cool shade of tamarisk branches. Currently, the introduced tamarisk leaf beetle is defoliating tamarisk trees along the Little Colorado River.

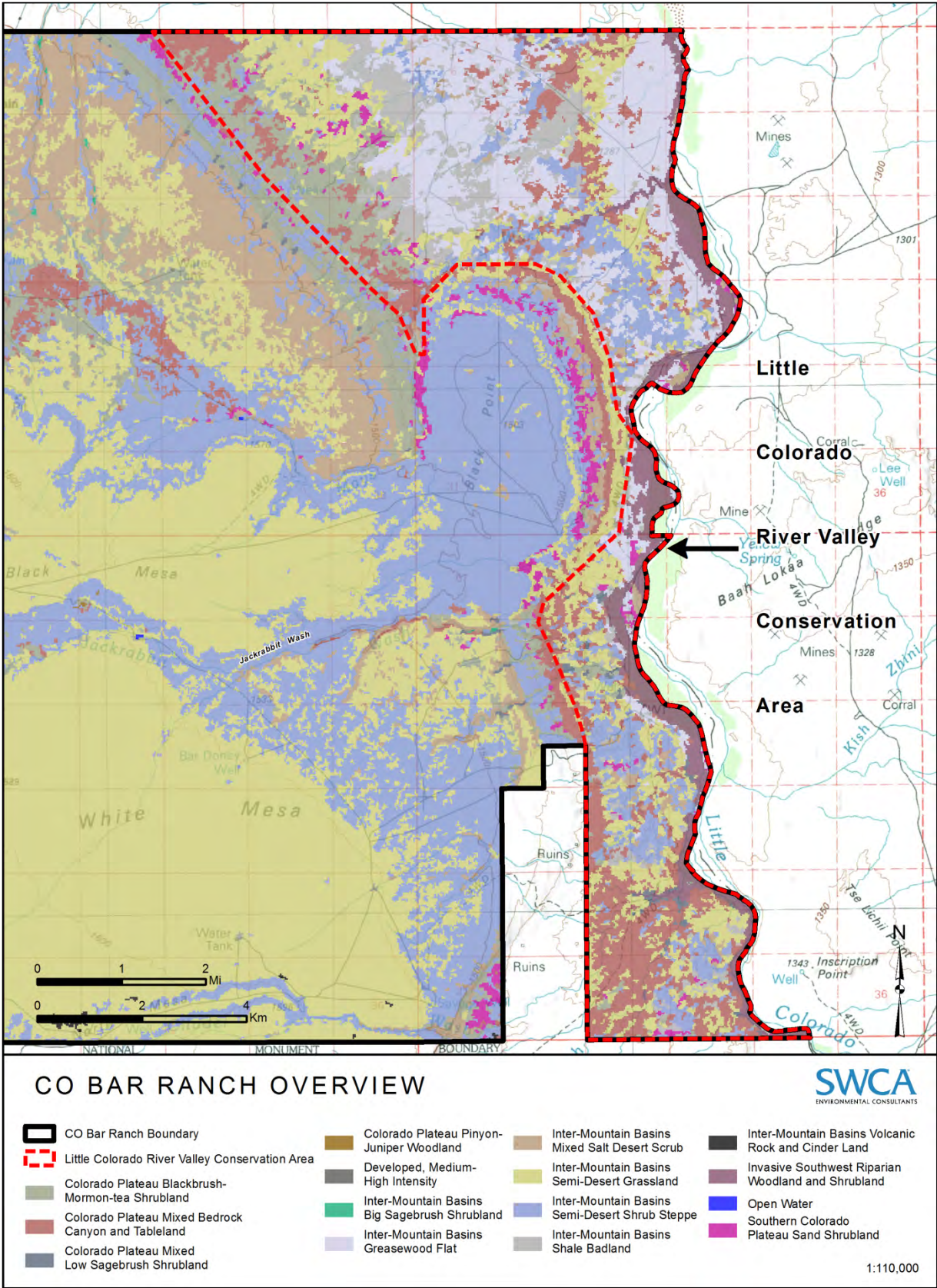


Figure 17. Little Colorado River Valley Conservation Area: vegetation map.

The Little Colorado River and its riparian habitat are much modified from presettlement conditions, but they still represent an invaluable resource. Because of the greater water availability relative to adjacent terrestrial uplands, riparian areas support greater vegetative and wildlife diversity. In fact, riparian areas are considered the most productive habitats in North America (Zaimes 2007). The National Research Council (2002) recommended that the restoration of riparian areas be a national goal with protection of these areas as a major focus. Babbitt Ranches is in full agreement with this position and believes there is a need to better understand the following: 1) the ecological processes at work in the lower Little Colorado River corridor; 2) the existing functions and values of the river's aquatic and riparian systems; 3) the nature of the threats to those functions and values; 4) opportunities to reduce those threats; and 5) the feasibility and advisability of restoring the riparian corridor to more natural conditions.

8.2 Species of Special Interest on CO Bar Ranch

While Babbitt Ranches values all native wildlife and plant species on CO Bar Ranch, some are of special interest. Terrestrial predator species are included in this category because current state management of these species, particularly the coyote, is open to question and warrants reconsideration. Also included in this category are seven "target species": golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Gunnison's prairie dog (*Cynomys gunnisoni*), black-footed ferret (*Mustela nigripes*), American pronghorn (*Antilocapra americana americana*), mule deer (*Odocoileus hemionus*), and Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*).

These species are of special interest for various reasons: some are officially classified as endangered; others have declining populations; all could benefit from conservation actions on CO Bar Ranch. Specifically, selection of the target species for possible conservation efforts was based on an evaluation of at least five factors: 1) the occurrence of the species and/or suitable habitat on CO Bar Ranch; 2) the species' role and importance in the Ranch's ecosystems; 3) the conservation needs of the species; 4) the conservation potential for the species on the Ranch; and 5) potential funding opportunities for conserving the species. Parties consulted in the selection process included Babbitt Ranches personnel, independent wildlife biologists, and federal and state agency personnel. Target species profiles are provided in Section 8.2.2, and conservation goals and possible conservation strategies for the species are listed in Section 9.0.

8.2.1 Predator Species

Common predator species on CO Bar Ranch include coyote, bobcat, golden eagle, and several hawk and falcon species (see Table 5). Less common predators include gray fox, kit fox, badger, and possibly black bear in the small stands of ponderosa pine.

Societal views of predators and how they should be managed are ambivalent, complicated, and often contentious. This has not always been the case. For most of human history, people have been united in their persecution of predators, particularly "apex" predators like the wolves, grizzly bears, and mountain lions, the species that once sat atop the food chain in much of North America. In this country, management of species such as these has long been termed "predator control," meaning population reduction by trapping, shooting, and poisoning. Until recently, predator control was practiced widely and without restraint (Prugh et al. 2009). As a result, wolves and grizzly bears, and to a lesser extent mountain lions, have been eradicated from most of their range in the lower 48 states. State and federal government-sponsored predator control programs are still in place today, but they are increasingly restrained by a growing understanding and appreciation of ecological processes and the importance of predators to those processes.

Predators appear to play a critical role in structuring ecological communities in a "top-down" fashion. Predators at the top of the food chain generally eat herbivores, which are situated one trophic (i.e.,

nutrient) level down. Herbivores consume vegetation, and vegetation supports a multitude of other organisms, and so on in a vast interdependent network. Because of these intricate relationships, a change in the abundance of predators in an ecological system can result in a “trophic cascade,” effects that reverberate throughout the food web (Estes et al. 2001). Trophic relationships within ecosystems are poorly understood; as a result, human manipulation of predator populations can have surprising consequences. For example, returning wolves to Yellowstone National Park has changed the distribution of habitats used by elk. This released aspen and willow from herbivory and increased their abundance, which has provided more habitat for songbirds, beavers, and other species (Boyce and Byrne 2007). More wolves resulted in more beavers. This was not expected, nor was a four-fold increase in pronghorn fawn survival at sites used by wolves. Apparently, wolves have reduced the abundance of transient coyotes (which are vulnerable to predation by wolves and avoid wolf territories), and coyotes are the principal predator of pronghorn fawns in Yellowstone (Berger et al. 2008).

The developments at Yellowstone are consistent with the concept of “mesopredator release,” which maintains that the loss of large, apex predators from terrestrial systems has resulted in the proliferation of moderate-sized, or mid-ranking, mesopredators (Estes et al. 2001). Historically, wolves were an apex predator at Yellowstone and through a combination of competition and direct predation likely limited the population size of coyotes, a mesopredator. But after wolves were eradicated, that suppression effect was released. Coyote populations expanded and threatened the persistence of pronghorn populations by preying on fawns and limiting recruitment. Evidence suggests that the reintroduction of wolves has reversed this process (Berger et al. 2008).

The eradication of wolves from most of the continental United States in the late 1800s and early 1900s appears to have allowed coyotes to enter regions they did not formerly occupy and coyote abundance to increase in areas, like northern Arizona, which they did historically occupy (Estes et al. 2001, (Ripple et al. 2013). Mesopredators, such as coyotes, typically are efficient hunters that have the capacity to switch among prey species. As a result, released mesopredators often achieve densities that are high and persistent (Ripple et al. 2013). Currently, coyote populations in the grasslands of northern Arizona are large, and predation by coyotes is seen as a serious threat to pronghorn populations (AGFD 2011b). To reduce this threat, the AGFD pursues a policy of aggressive predator control. Between 2010 and 2012 alone, the AGFD in collaboration with the Arizona Department of Agriculture killed 699 coyotes in a circumscribed area west of CO Bar Ranch (Betz 2013).

Removing coyotes from an ecosystem, or radically reducing their population, may seem like a good idea when the focus is on the effects to a single species, in this case, pronghorn. But that may be short sighted. Coyote removal results in its own trophic cascade and can completely change the composition of an entire community. For example, large-scale aerial gunning of coyotes has been shown to radically reduce rodent species diversity, increase rodent density, and increase the abundance of other predators, including badgers, foxes, and raccoons (Henke 2001). These effects then have other effects. The consequences of predator reduction on ecological systems are difficult to predict, and undesirable consequence can be difficult, if not impossible, to reverse or even mitigate.

“Predator control” as a management strategy reflects an ingrained view of predators *simply* as harmful animals that need to be “controlled”; that is, systematically suppressed or destroyed to further human interests, primarily recreational hunting and livestock raising. This is a distinctly anthropocentric view. Babbitt Ranches supports a balanced, ecologically oriented approach to predator management, where each predator species, like every other native wildlife species, is valued for its role in the larger ecological matrix of which humans are a part and only a part. As Aldo Leopold (1949) wrote: “If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard

seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.” If tinker we must, then let us tinker intelligently.

8.2.2 Target Species Profiles

The following sections profile each of the species targeted for conservation consideration: golden eagle, ferruginous hawk, Gunnison’s prairie dog, black-footed ferret, American pronghorn, mule deer, and Fickeisen plains cactus. Information is provided on the species’ regulatory status, distribution, habitat requirements, pertinent biological characteristics, and threats. Information is also provided about the species’ habitat and known population status on CO Bar Ranch.

Climate change is not mentioned in the species profiles, but if the regional climate changes as predicted all the target species on CO Bar Ranch will be affected to some unknown degree. Because of the high degree of uncertainty involved in long-term climate predictions and environmental responses, only a general conservation goal relative to climate change is being identified in this document. That goal is for Babbitt Ranches to stay vigilant and flexible, employ the best tools available to assess natural resource vulnerability and responses to an evolving climate, and adaptively manage CO Bar Ranch to maintain ecosystem health and sustainability within the context of changing conditions.

8.2.2.1 Golden Eagle

The golden eagle is protected under the BGEPA. It is a USFWS Bird of Conservation Concern in several Bird Conservation Regions (BCRs), including BCR 16. Bird Conservation Regions are the basic geographic units within which the USFWS plans and evaluates all-bird conservation efforts. Bird Conservation Region 16 essentially coincides with the Colorado Plateau and includes northern Arizona and the Babbitt ranches. The golden eagle is also listed as a Species of Greatest Conservation Need in Arizona (AGFD 2012a).

Golden eagles are found throughout the Northern Hemisphere, including North America. Within Arizona, their range covers the entire state, and resident populations are augmented in winter with the arrival of migrants from more northern breeding areas. Golden eagles that breed in the northern latitudes tend to migrate to areas that are milder in the winter; individuals that breed in more southern latitudes (such as Arizona) tend to be sedentary. Migrating individuals generally fly along north-south oriented cliff lines, ridges, and escarpments, where they are buoyed by uplift. The species frequently hunts while migrating (AGFD 2002, Hawk Mountain undated, USFWS 2011).

The landscape features that are most closely associated with the golden eagle include nest sites, habitats that support its terrestrial prey, and foraging perch availability. Golden eagles prefer undisturbed landscapes in areas that provide open spaces for hunting and cliffs for nesting. Most nests are close to foraging areas and generally allow a good view of the surrounding area. Breeding pairs commonly maintain alternate nests within their territory and often reuse nests (USFWS 2011). Home ranges can be extensive and depend upon the availability of food. If large prey populations exist, home ranges of adjacent pairs can overlap, and breeding densities can be higher (Driscoll 2005). Presence of sizeable shrub (e.g., sagebrush/ rabbitbrush) patches, which provide habitat for prey species, has been identified an essential component of golden eagle home ranges (Marzluff et al. 1997).

In North America, golden eagles most commonly prey on jackrabbits (*Lepus* sp.), cottontail rabbits (*Sylvilagus* spp.), prairie dogs (*Cynomys* spp.), and other small mammals. They also take larger mammals, including pronghorn fawns; hunt birds and reptiles; and feed on carrion (Hawk Mountain undated, Howard 1995). Golden eagles are most efficient predators in open areas where winds and thermal updrafts aid flying, and visibility is good (Tesky 1994). The USFWS (2013a) has identified in their Eagle Conservation Plan Guidance increasing prey availability as compensatory mitigation for siting,

constructing, and operating wind energy facilities, with prairie dogs and pronghorn likely targeted species for prey enhancement should Babbitt Ranches pursue wind energy mitigation opportunities.

Golden Eagle: Range-wide and Regional Threats

The USFWS (2013c) identified the following direct threats to golden eagles in the Southwest:

- Electrocution on electrical distribution lines.
- Direct persecution or permanent removal of key prey species such as prairie dogs.
- Lead poisoning, mainly due to ingesting fragments of lead ammunition from carcasses.
- Intentional and unintentional poisoning by other means.
- Lethal and sub-lethal effects of other environmental contaminants.
- Impacts associated with increasing energy development, such as collision with wind turbines.
- Collisions with vehicles and aircraft.
- Shooting.
- Disturbance to nests and breeding adults, by recreational rock climbers or off-road vehicles.
- Removal or destruction of nests or eggs.

Of particular concern given the amount of hunting that takes place in northern Arizona is the toll taken on golden eagles and other raptors by the use of lead ammunition. These birds are poisoned when they feed on carcasses containing lead shot and bullet fragments (AGFD 2002, Domenech and Langner 2009, Hawk Mountain undated). Ingestion of lead and/or lead poisoning in golden eagles is well documented (Bloom et al. 1989, Cerradello et al. 1992, Clark and Scheuhammer 2003, Craig et al. 1990, Scheuhammer and Norris 1996, Wayland and Bollinger 1999, Wayland et al. 2003). Pattee et al. (1981) found that 2 grams of ingested lead shot is sufficient to kill an adult eagle, and sublethal amounts of lead poisoning can adversely affect survival and reproduction by making afflicted birds more susceptible to disease, starvation and predation, and by increasing probability of death from other causes (Pain 1995, Scheuhammer and Norris 1996). Golden eagles are also poisoned when they visit baited carcasses targeting mammalian predators.

Indirect threats to golden eagles cited by the USFWS (2013c) include decreased quantity and quality of habitat, resulting in decreased availability of prey. Examples include habitat loss and fragmentation due to energy development, conversion to agriculture and urban land use, and replacement of native grass-shrub habitat by cheatgrass. Over the long term, climate change-induced habitat degradation and prey base reduction may be the single greatest threat to golden eagle populations (USFWS 2013c).

Golden Eagle: Habitat and Status on CO Bar Ranch

CO Bar Ranch provides suitable habitat for year-round resident and/or breeding, wintering, and migrating adult golden eagles, as well as sub-adult, floater individuals. The Ranch provides tens of thousands of acres of open grassland/shrub-steppe and pinyon-juniper woodland habitat suitable for foraging. Prey species, including jackrabbits, cottontail rabbits, and prairie dogs, are present; however, little is known about the abundance of prey species, and it is not known whether golden eagle utilization of the Ranch is prey-limited. Mammal surveys conducted at neighboring Wupatki National Monument found cottontail rabbits to be the most numerous medium-sized mammal on the Monument, abundant at times, particularly in grassland habitats (Persons 2001). Jackrabbits are also found in some abundance on the Monument, but primarily in juniper and juniper savanna habitats. Golden eagle foraging habitat on CO Bar Ranch (i.e.,

grassland/ shrub-steppe) is essentially healthy and stable, but opportunities exist for enhancing the suitability and carrying capacity of that habitat for eagle prey species.

Potential nesting habitat for golden eagles on CO Bar Ranch is provided by rocky ledges and crevices in cliff faces associated with cinder cones, mesas, and canyons throughout the Ranch. Potential nesting sites are also afforded by electrical transmission line towers and by a smattering of ponderosa pine trees near the southwestern and northwestern borders of the Ranch (Pers. obs., Allen Graber, SWCA Environmental Consultants). Under contract to NextEra Energy Resources, LLC., SWCA aerially surveyed total of 127,749 and 13,112 acres in and around western CO Bar in 2011 and 2013, respectively. Ten golden eagle nests were observed during the flights. One 3-year-old subadult male was captured at a nest in 2011 and equipped with a transmitter. This bird (eagle 491) was tracked from April 2011 to Oct 2013, when the transmitter apparently failed. Telemetry data points (yellow dots) for 2013 are shown in Figure 18. The red circle on the figure denotes the area where eagle 491 concentrated 85% of its time, and the brown circles denote the areas where the eagle concentrated 50% of its time. This eagle's home range, where it did most of its foraging in 2013, was concentrated in the area surrounding western CO Bar Ranch, where the bird was captured in 2011.



Golden eagle nest site typical of those found on CO Bar Ranch.

As shown in Figure 18, eagle 491 exhibited a notable breeding season movement outside of its home range, flying to the Utah-Wyoming border and back between May 13 and July 5, 2013. Such far-ranging flights are typical of golden eagles.

The eastern half of the Ranch has not been surveyed for golden eagles, but nesting habitat is present and eagles are known to nest in adjacent Wupatki National Monument near the Ranch's southeastern border (Britten 2001).

CO Bar Ranch generally presents few risks to the golden eagles that nest and forage there. No land development projects are planned that would adversely affect the amount or quality of eagle habitat. Poisons and pesticides are not used on the Ranch; ranch roads are low speed and lightly traveled; and much of the Ranch is remote and little visited. Still, threats to golden eagles do exist. They include:

- **Lead ammunition used for hunting and recreational shooting of prairie dogs and coyotes.** Hunting and recreational shooting occur on CO Bar Ranch, and the use of lead ammunition is permitted and common in the State of Arizona; therefore, it is assumed that lead ammunition is used on the Ranch. Hunters and recreational shooters may also opportunistically shoot eagles.
- **Collisions with vehicles on highways.** Eagles may be killed while feeding on road kill on US 89 and US 180.
- **Illegal collecting of eaglets from nests for use in Hopi religious ceremonies.** "Wupatki and the surrounding area is an important eagle-gathering area to the Hopi" (Britten 2001:78). The extent of this activity on CO Bar is unknown.

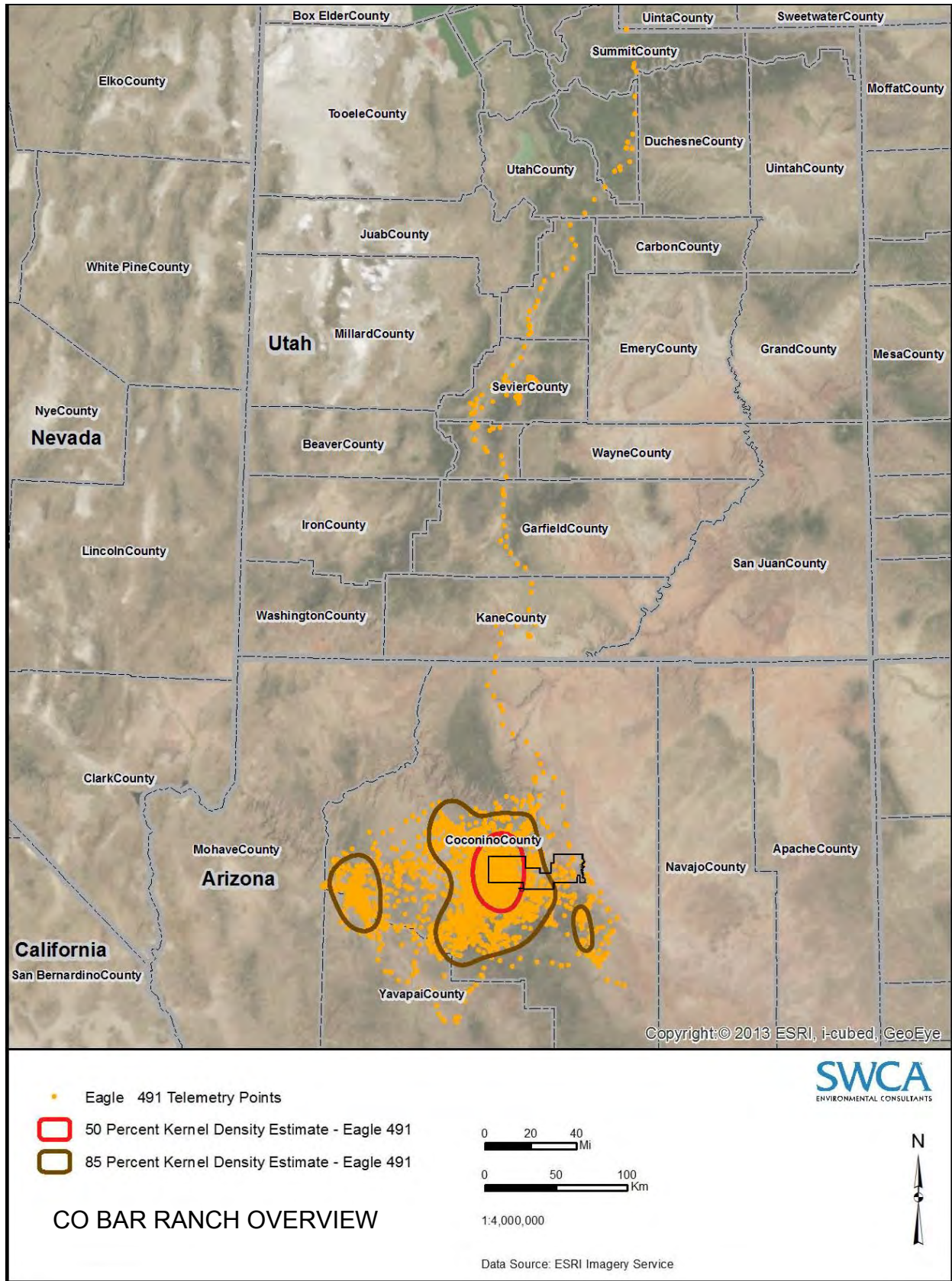


Figure 18. 2013 telemetry data for eagle 491, shown in relation to CO Bar Ranch.

- **Electrocution on power lines.** Two high voltage transmission lines traverse CO Bar Ranch: the Moenkopi-Yavapai 500-kilovolt (kV) transmission line, which crosses western portion of the Ranch, and the Glen Canyon-Flagstaff 345-kV transmission line, which parallels US 89 about one mile to the west. A third, 69-kV, transmission line runs along US 89. In general, high voltage transmission lines like these pose little risk to large raptors like golden eagles. In fact, golden eagles often safely construct nests on transmission line towers, and wildlife biologists have deliberately placed an active eagle nest on such a tower. High voltage transmission lines pose substantially less risk for avian mortality by electrocution than distribution lines because of larger separations between various energized and grounded components.

This said, high voltage transmission lines may still result in the electrocution of eagles, with the degree of risk largely dependent on transmission line design and condition (Avian Powerline Interaction Committee 2006, Burnham 1995). Thus, the presence of the electrical transmission lines on the ranches may pose electrocution risks to golden eagles. The transmission line towers and wires may also pose a collision risk for the birds. Non-energized ground wires, or shield wires, are the transmission lines most associated with bird collisions because they are the highest wire, the smallest in diameter, and the most difficult to see. The ground wire is installed above the larger energized, or phase, wires to protect them from lightning strikes, and birds are thought to rise to the height of the ground wire in an effort to avoid the lower and more visible phase wires (Savareno et al. 1996).

Some distribution lines occur on CO Bar Ranch; for example, one carries power from the 69kV line to ranch headquarters at Spider Web Camp. Until or unless power poles along these smaller lines are adapted to prevent avian electrocutions, they may present a risk to golden eagles.

- **Disturbance of eagle nests by hikers.** Some of the features with known or potential eagle nest sites are readily visible from highways and visited by hikers (e.g., Colton Crater). Should hikers visit sites with nests during breeding season, eagles may choose not to use those nests or may abandon active nests with eggs or chicks.

8.2.2.2 Ferruginous Hawk

The ferruginous hawk is listed as a Species of Greatest Conservation Need by the AGFD (2012a). Ferruginous hawks are primarily found in western North America, from southern Canada down into central Mexico. In Arizona, they breed April–September in the northern part of the state in open scrublands, woodlands, and grasslands. From September to April, they can be seen in virtually any part of Arizona with open environs, particularly in agricultural fields and native grasslands. Nest substrates include cliffs, trees, and utility structures. Hunting areas are typically open grasslands and shrub-steppe, preferably those dotted with short trees, fence posts, and utility poles, which serve as perches. The primary prey of the ferruginous hawk are jackrabbits, cottontail rabbits, ground squirrels (*Spermophilus* spp.), and pocket gophers (*Thomomys* spp.). In the Southwest, limited information suggests prairie dogs are also an important food source. Populations and the reproduction of this hawk can fluctuate with the availability of these prey species (AGFD 2001a). Habitat quality for ferruginous hawks is strongly tied to prey availability (Bechard and Schmutz 1995), and foraging habitat suitability for ferruginous hawks is best when the vegetation occurs at a mix of heights and densities, which optimizes prey abundance and minimizes hunting interference (Jasikoff 1982).

Ferruginous Hawk: Range-wide and Regional Threats

The detrimental effects of human activity on the species include shooting and trapping, egg collecting, pesticides and other contaminants, collisions with stationary or moving objects, disturbance at nest sites, and degradation of habitat through habitat loss and fragmentation (AGFD 2001a).

Ferruginous Hawk: Habitat and Status on CO Bar Ranch

The open grasslands and shrub-steppes of CO Bar Ranch provide ample foraging habitat for ferruginous hawks, and preferred prey species (jackrabbits, cottontail rabbits, prairie dogs, and other small mammals) are present, although nothing is known about prey abundance. Potential nesting habitat is present in trees, transmission line towers, and rocky ledges. Several ferruginous hawk nests were observed on and near CO Bar Ranch during an aerial survey of the Ranch conducted in 2011 by SWCA Environmental Consultants (unpublished data) and funded by NextEra Energy Resources, LLC. Ferruginous hawks have also been seen foraging on CO Bar Ranch (SWCA Environmental Consultant, unpublished data).

Similar to golden eagles, ferruginous hawks on the Ranch are not threatened by loss or fragmentation of habitat or poisons and pesticides (see Section 8.2.2.1). However, as with golden eagles, electrocution and collisions with transmission lines, shooting, and lead poisoning due to the ingestion of lead ammunition pose potential threats.

8.2.2.3 Gunnison's Prairie Dog

Gunnison's prairie dog is listed as a Species of Greatest Conservation Need in Arizona by the AGFD (2012a). The population of Gunnison's prairie dog in central and south-central Colorado and north-central New Mexico was determined to be a candidate for listing under the ESA in 2008 (USFWS 2008b); however, that decision was set aside in federal court on taxonomic grounds, and the USFWS will reconsider listing upon completion of genetic studies (USFWS 2012c). This species occurs in portions of Arizona, New Mexico, Colorado, and Utah. Its habitat includes level to gently sloping grasslands and semi-desert and montane shrublands, at elevations from 6,000 to 12,000 feet amsl. Gunnison's prairie dogs are a colonial species of ground squirrel, historically occurring in large colonies over large areas (USFWS 2012b). These prairie dogs enter a torpor state below ground during winter months and breed in March–April. Pups are born in April or May and emerge from the burrows in June or July. Gunnison's prairie dogs primarily consume grasses and sedges but also eat forbs and insects (AGFD 2011a, Forest Guardians 2004).

In the grassland and shrub-steppe systems of the Southwest, the prairie dog is considered a “keystone” species; i.e., a species that has a large overall effect on the health and functioning of a community or ecosystem disproportionate to its abundance (Merola-Zwartjes 2004). Prairie dogs alter prairie landscapes and provide foraging, shelter, and nesting habitat for an array of species. They serve as prey for numerous predators including black-footed ferrets, raptors, and rattlesnakes. Their burrows provide nest sites and shelter for both vertebrates and invertebrates. Prairie dogs alter plant species composition and vegetation structure, creating open habitats. They also can affect ecosystem processes such as nutrient cycling rates (Kotliar et al. 1999).

Several vertebrate species depend upon prairie dog colonies. One species, the black-footed ferret, is an obligate and would become extinct without prairie dogs to feed upon. Other species are strongly facultative; that is, they have been shown to suffer population declines within the prairie dog's range following declines in prairie dog populations. Examples include mountain plovers (*Charadrius montanus*) and burrowing owls (*Athene cunicularia*). Still other species are weakly facultative; that is, they would probably decline locally following a decline in prairie dogs if alternative prey or habitat were unavailable. Examples include ferruginous hawks, golden eagles, and swift foxes (*Vulpes velox*), horned lark (*Eremophila alpestris*), deer mouse (*Peromyscus maniculatus*), and grasshopper mouse (*Onychomys leucogaster*) (Kotliar et al. 1999). Evidence of dependence upon prairie dogs by ferruginous hawks and golden eagles is indicated by local declines during migration and on wintering grounds in New Mexico and Colorado following prairie dog population declines (Jones 1989, Cully 1991). Pronghorns are also associated with prairie dog colonies. Because forb production is high in the centers of these colonies, it is

speculated that prairie dogs may enhance habitat for pronghorn by consuming grasses and disturbing soils, thereby increasing the abundance and variety of forbs (Yoakum et al. 1996).

Gunnison's Prairie Dog: Range-wide and Regional Threats

Threats to the Gunnison's prairie dog include intentional poisoning, recreational shooting, loss of grassland habitat, and sylvatic plague (Johnson et al. 2010, New Mexico Department of Game and Fish 2006, USFWS 2012b). Poisoning occurs in the region, but little information is available about the scale of that activity. In Arizona, prairie dog shooting is regulated; licensed hunters may shoot Gunnison's prairie dogs year-round except from April 1 to June 15, the period when prairie dog pups are being nursed underground (AGFD 2012b). Statistics on the number of Gunnison's prairie dogs shot each year in Arizona are not readily available, but it has been reported that 265,296 were shot in 2002–2006 (McCain 2008). Shooting not only results in direct mortality, it may decrease colony health and productivity, fragment populations, and delay recovery of colonies affected by sylvatic plague (Luce 2006). Sylvatic plague is considered to be the greatest threat to the Gunnison's prairie dog. This species is highly susceptible to the disease and regularly experiences outbreaks (epizootics), with devastating losses. Entire colonies may be wiped out in a single outbreak. Caused by the bacteria *Yersinia pestis* and transmitted by fleas, sylvatic plague may persist in an enzootic (i.e., low level) state in some prairie dog colonies, contributing to decreased survival of prairie dogs even in the absence of plague epizootics. Efforts to curtail the spread of plague in prairie dog colonies typically rely on dusting individual prairie dog burrows with pesticides such as deltamethrin to kill plague-infected fleas (Linzey et al. 2008, USGS National Wildlife Health Center 2012).

Gunnison's Prairie Dog: Habitat and Status on CO Bar Ranch

Gunnison's prairie dog colonies occur on CO Bar Ranch, and individuals of this species have been relocated to the Ranch from colonies slated for development in the Flagstaff urban area. Prairie dogs have not been studied on CO Bar Ranch, however, and the population status and distribution of the species on the Ranch are unknown. The prevalence of sylvatic plague on CO Bar is also unknown. Recreational shooting of prairie dogs is known to occur on CO Bar Ranch. Shooting prairie dogs may legally take place anytime from January 1 to March 31 and from June 16 to December 31. As noted above, April 1 to June 15 is a closed season in Arizona. Little is known about the volume of prairie dog shooting on CO Bar, and nothing is known about its effect on the Ranch's prairie dog populations. The CO Bar Ranch is very large, and visitors may not be observed by the few Babbitt Ranch employees present at any given time. Some of the other ranches in northern Arizona also allow unrestricted public access, but increasingly ranch owners are prohibiting or controlling hunting and shooting on their property. This trend effectively increases the pressure of such activities on the remaining unrestricted private and public property.

8.2.2.4 Black-footed Ferret

The black-footed ferret was listed as endangered under the ESA in 1967 (32 FR 4001), and is considered one of the most endangered animals in the world (USFWS 2010). It is a Species of Greatest Conservation Need in Arizona (AGFD 2012a). This species was formerly found across the Great Plains from northern Mexico to southern Canada, in Rocky Mountain meadows, and in the semi-arid grasslands of the Southwest. It is reliant upon prairie dogs for its survival, and was extirpated from virtually all its range because of widespread prairie dog eradication programs (primarily poisoning). Black-footed ferrets are now successfully bred in captivity and are being reintroduced into several western states. In Arizona, these ferrets have been released on adjacent Big Boquillas Ranch, where they are officially a nonessential experimental population in accordance with Section 10(j) of the ESA. Black-footed ferrets have also been released on the Babbitt's Espee Ranch, but the reintroduction attempt there coincided with an outbreak of sylvatic plague among prairie dogs and was probably unsuccessful. Habitat for black-footed ferrets

consists of prairie dog colonies in native grasslands. Prairie dogs account for more than 90% of the black-footed ferret diet, and prairie dog burrows provide essential shelter and denning habitat. Black-footed ferrets may prey on other small mammals (e.g., cottontail rabbits, deer mice) when prairie dogs are not available. Primarily nocturnal, these ferrets hunt 2–3 hours after sundown and early in the morning before dawn (AGFD 2001b).

Black-Footed Ferret: Range-wide and Regional Threats

Because of the dependence of black-footed ferrets on prairie dogs, threats to the ferret parallel those to prairie dogs. Threats include intentional prairie dog eradication, loss of native grassland habitat, and sylvatic plague, which afflicts both prairie dogs and ferrets. Canine distemper is also a threat to black-footed ferrets (USFWS 2010).

Black-Footed Ferret: Habitat and Status on CO Bar Ranch

Black-footed ferrets do not occur on CO Bar Ranch, although habitat for the species is present on the Ranch in the form of Gunnison's prairie dog colonies, and black-footed ferrets may have inhabited the area in the past. If so, they were extirpated long ago and are unlikely to return without intentional reintroduction efforts.

8.2.2.5 American Pronghorn

The American pronghorn is listed as a Species of Greatest Conservation Need in Arizona by the AGFD (2012a) and is managed as a big game animal. Annual harvests in Arizona 1990–2010 varied between 500 and 700 bucks (AGFD 2011a). Pronghorn occur from southern Canada to Mexico; west to eastern Oregon and California; and east to mid-state regions of the Dakotas and Texas. In Arizona, this subspecies of pronghorn (*A. americana americana*) is found primarily in the northern plains, but it also inhabits high-elevation meadows between forested areas and semi-desert grasslands (AGFD 2009).

Pronghorn are found on large expanses of open, low rolling terrain in grassland interspersed with low shrubs that provide long-range visibility for protection from predators (Howard 1995). Additional pronghorn habitat needs reported by Ockenfels et al. (1996) include:

- Corridors that allow movement between adjacent areas to ensure the flow of genetic material vital to long-term species survival.
- Vegetation vertical height less than 24 inches in height.
- A diverse vegetative community that provides adequate food resources, often measured in terms of percent grass, forb, and shrub cover. Kindschy et al. (1978) reported preferred pronghorn habitat to be 40–60% grasses, 10–30% forbs, and 5–20% shrub, while Yoakum (2004) suggested that optimal pronghorn habitat consisted of 50–80% grass species, 10–20% forbs, and 5% shrubs.
- Suitable distribution of water sources.

Adult pronghorn use low shrubs for bedding cover, and females select areas with greater than average shrub cover and height for fawning. Fawns under three weeks of age typically stay in their birthing area, using the tallest vegetation in the area for cover (Howard 1995). Over the course of a year, pronghorn consume nearly all available plant species, with forbs preferentially selected when available. When forbs are scarce, pronghorn select the most succulent, high-protein browse or grasses available. Succulent forbs are essential to lactating does and to fawn survival during spring and early summer (Ellis and Travis 1975, Howard 1995, Howard et al. 1990). High-quality browse is critical for winter survival (Yoakum 2004). Beale and Smith (1970) reported that pronghorn were not observed drinking water when forbs

were abundant and forb moisture content was 75% or greater. However, pronghorn consumed free water during extremely dry periods, and sources of water are essential at such times.

Pronghorn are usually seen in mixed herds, except in the spring when the bucks are alone or in small groups with other bucks. In the summer and early fall, bucks compete to collect harems of does. Breeding in northern Arizona occurs in August and September, with bucks defending and marking territories. Born in May and June, pronghorn fawns remain hidden until they are about two–three weeks old and strong enough to travel with the adults. During this time, pronghorn fawns are the most vulnerable to predation (AGFD 2011a, O’Gara and Yoakum 2004). Important pronghorn predators include coyote, domestic dog, bobcat, mountain lion, and golden eagle (Howard 1995). One of the adaptations thought to have evolved in pronghorn to reduce the probability of individual neonatal animals being depredated is birth synchrony (Gregg et al. 2001). Synchronization of fawning dates is thought to reduce predation of newborns through the following mechanisms: 1) “swamping,” whereby large numbers of young born in a short period exceed the nutritional demands of the predator population; 2) group defense, whereby maternal protective instincts are compounded by groups of dams with fawns; and 3) the “confusion” factor, whereby the ability of the predator to select a specific target may be reduced in a group of dams with fawns, rather than isolated doe/fawn pairs (Rutberg 1987).

Pronghorn herds move in response to changing environmental conditions. Some populations in cold-climates regularly migrate from one seasonal-use area to another, but herds in warmer climates seldom migrate over long distances, showing only localized movement (Howard 1995). O’Gara (1978) found that the extent of home and seasonal ranges vary so much with habitat and weather conditions that study results seldom apply to a different area, or even a different year.

American Pronghorn: Range-wide and Regional Threats

Threats to the pronghorn include habitat loss (e.g., from commercial and residential land development, energy development, and mining); habitat fragmentation and barriers to seasonal movement (e.g., fencing, roads, and land development); and competition for forage (e.g., from livestock, feral equines, and elk). Natural threats (although these may be indirectly related to human activities) include drought, severe winters, predation, and diseases and parasites (O’Gara and Yoakum 2004). An additional potential adverse impact on pronghorn populations is the timing of the hunting season. In Arizona, for example, the hunting season for pronghorn (early August through mid-September) coincides with the pronghorn breeding season. Disturbances related to hunting and loss of a herd’s buck may disrupt pronghorn territoriality and breeding hierarchies (Copeland 1980). As a result, fewer does may be impregnated during that breeding season, and breeding may be extended over a longer period, causing fawns to be dropped over a longer period the following spring. Permitting hunting during the breeding season, therefore, has the potential to reduce reproductive success, increase the vulnerability of fawns to predation, lower fawn survivorship, and thus reduce population size.

American Pronghorn: Habitat and Status on CO Bar Ranch

The *Babbitt Ranches Long-term Pronghorn Succession Plan* (deVos and Cordasco 2009, attached as Appendix G), provides detailed information relative to pronghorn on CO Bar, Espee, and Cataract Ranches. As explained in that plan, the pronghorn population in the region has been split into at least three subpopulations by highways. One subpopulation occurs west of State Highway 64; another between State Highway 64 and US 89; and the third east of US 89. Because US 89 bisects CO Bar Ranch, two subpopulations occur on the Ranch, one on each side of the highway. Telemetry data gathered from radio-collared individuals and pictured in Figure 19 clearly show the reluctance of pronghorn to cross US 89. They cluster near the highway but rarely cross. Genetic studies have also demonstrated a consistent population boundary between individuals occupying opposite sides of US 89, with the highway acting as a barrier to gene flow between the two subpopulations (Theimer et al. 2012).

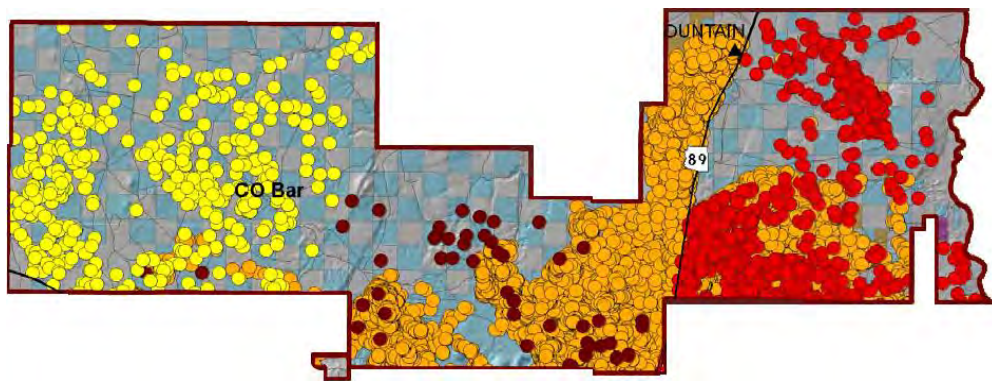


Figure 19. Radiotelemetry data from four studies showing the movement of radio-collared pronghorn on CO Bar Ranch. Red data points are from 1992–1994; yellow from 1997–2000; brown from 2005–2007; and orange from 2007–2009. The 2007–2009 locations represent pronghorn that were collared on both sides of the highway (from deVos and Cordasco 2009).

According to deVos and Cordasco (2009), the subpopulation that occupies areas east of US 89 appears to be primarily migratory, wintering on the lower-elevation CO Bar and Wupatki National Monument areas and summering on higher-elevation Forest Service land. The subpopulation that occupies areas west of US 89 is split between migratory and non-migratory subgroups depending on the biotic community that each subgroup occupies. The non-migratory subgroup occupies lower-elevation areas year-round, while the migratory subgroup occupies higher-elevation areas as far south as Interstate 40 in summer and lower elevations in winter.

As of 2009, the pronghorn subpopulations using CO Bar Ranch were believed to be stable or slowly decreasing. If the subpopulations are indeed decreasing, the reasons for that decline are unclear. DeVos and Cordasco (2009) identified three issues that pose the greatest risk to pronghorn in northern Arizona:

- Substantial areas have been impacted by woody invasion, reducing both forage resources and necessary sight distance.
- Loss of connectivity with other areas where pronghorn exist, which leads to reduced population fitness and increases the risk of loss of this population due to genetic decay or random environmental pressures.
- Low vegetative community diversity; an issue that is key to forage availability and suitability for pronghorn.

As described in Section 8.1.2, substantial progress has been made in removing juniper and other invading woody species from historic grasslands on CO Bar Ranch. This work will continue as needed and as funding is acquired. Although Babbitt Ranches has modified its fences in key areas, connectivity remains a major issue for pronghorn on CO Bar Ranch. As explained above, US 89 impedes pronghorn movement in an east-west direction across the Ranch. ADOT's plans to widen the existing two-lane US 89 to a four-lane divided roadway in the CO Bar/Wupatki reach will exacerbate the effectiveness of the barrier (ADOT 2006). Doubling the number of lanes will also increase the risk of road kill for the few pronghorn that do cross the road. Babbitt Ranches is cooperating with ADOT and the AGFD in their evaluation of the appropriateness of including pronghorn passage structures in the proposed road widening project (Dodd et al. 2010). In their initial assessment, Dodd et al. (2010) of the AGFD recommended constructing passage structures (with integrated fencing and noise reduction measures) at three sites, one of which is on CO Bar Ranch at Mile Post 447.2–447.7. In 2010, when the assessment was published, no wildlife highway crossing structures designed specifically for pronghorn had ever been built; however, two

highway overpasses built for pronghorn in Wyoming in 2012 have been successfully used by thousands of migrating pronghorn (Hardy 2013).

In addition to these three risk factors listed above, Babbitt Ranches is concerned about the possible adverse effects of hunting pronghorn during the breeding season. CO Bar Ranch falls within the AGFD's Game Management Units 7E, 7W, and 9 (see Figure 12), and pronghorn are hunted according to AGFD regulations. Babbitt Ranches has raised this concern with the AGFD, and the agency has agreed to close the portion of CO Bar Ranch east of US 89 (the Antelope Prairie Ecological Research Area) to all pronghorn hunting for the period 2014–2019. During that time, the AGFD will be conducting new pronghorn studies now in the design stage.

Babbitt Ranches has not identified predation by coyotes and other predators as a problem for pronghorn on its ranches; however, AGFD (2011b) believes predation has been excessive and has contributed to pronghorn decline in northern Arizona. Nothing is known about the level or effects of predation on pronghorn on and near CO Bar Ranch, but between 2010 and 2012, the AGFD in collaboration with the Arizona Department of Agriculture killed 669 coyotes in an area west of the Ranch, and the AGFD claims that the pronghorn population in that area quadrupled as a result (Betz 2013).

8.2.2.6 Mule Deer

Mule deer do not receive protection under the Endangered Species Act, nor are they considered a Species of Greatest Conservation Need in Arizona by the AGFD. Mule deer are managed as big game animals throughout their range. Annual hunting harvests in Arizona 1990–2010 varied between 6,222 and 14,926 bucks (AGFD 2011a). A total of 180,541 mule deer were harvested in that period, for an annual average of 8,597. Estimated statewide population of post-hunt adults was 75,000–80,000 in 2009 (AGFD 2012b). Although mule deer are not a special status species, their population trajectory is of concern to Babbitt Ranches; hence, the species is included in this document. Mule deer are found throughout western North America from Alaska and western Canada through the Rocky Mountains and western plains states of the United States south to Baja California and northwestern Mexico (Sanchez Rojas and Gallina Tessaro 2008). In Arizona, the species can be found in most parts of the state, from sparsely vegetated deserts upward into high, forested mountains (AGFD 2012c).

Mule deer require water and grasses, forbs, and shrubs for forage and utilize several plant communities throughout the year; thus, diversity of habitats in close proximity is important (Innes 2013). Seasonal use of plant types varies from high grass use in spring (grazing), high forb use in summer and fall (grazing and browsing), to high shrub use in winter (browsing). Browse items include twigs, bark, buds, leaves, and nuts (AGFD 2012c).

Open areas are important foraging habitats, but mule deer may also require forested areas, dense thickets of shrubs, or other cover for escape, thermal protection, and snow interception. Concealment cover may be any vegetation capable of hiding 90% of a mule deer from human view at a distance ≤ 200 feet, but may also include boulders, washes, irregular topography, and ledges. Because of their needs for both forage and cover, mule deer often prefer edges over open or closed habitats. Habitat selection is also affected by predation risk (e.g., areas with broken terrain and steep slopes are preferred) and proximity to drinking water (Innes 2013). Most mule deer populations migrate seasonally, spending summer in conifer woodlands and forests at higher elevations and winter in lower elevations less affected by snow cover (deVos et al. 2003). Adult male and adult female mule deer tend to select habitats differently and are generally found together only during the fall rut. Female mule deer appear to select habitats with more concealment cover than males, particularly during and soon after fawning. Males are often found at higher elevations than females (Innes 2013).

Mule Deer: Range-wide and Regional Threats

Although mule deer are not legally designated a threatened or endangered species, according to the Mule Deer Working Group of the Western Association of Fish and Wildlife Agencies (deVos undated), mule deer populations throughout their range have declined to levels that are “socially unacceptable.” Suggested causes of this decline include habitat loss and fragmentation due to human population growth and development; climatic changes such as drought and severe winters; and reduced habitat suitability because of fire suppression, invasive plants, and livestock management. In the absence of natural wildland fire, pinyon-juniper woodlands expand into grasslands and shrublands, decreasing the amount of forage available for mule deer. In addition, in the absence of fire, plants grow older, cell walls thicken, and the relative amount of nutritious, annual growth needed by mule deer decreases. The widespread invasion of non-native plant species also reduces the suitability of traditional mule deer habitat. Non-native plant species are often less palatable to deer and less nourishing than the native plant species they replace (Western Association of Fish and Wildlife Agencies, Mule Deer Working Group 2003). Grazing by both livestock and elk can also favor the abundance of less palatable and less nutritious species (Gill 1999, Watkins et al. 2007).

Elk populations have increased substantially throughout the West at the same time mule deer populations have declined, but it is unclear whether, or to what degree, this is a cause-and-effect relationship (Gill 1999). Some studies have shown that mule deer avoid areas used by elk (Flook 1964, Johnson et al. 2000, Martinka 1976, Stewart et al. 2002). The elk’s ability to utilize a greater variety of forage appears to give it a competitive advantage over mule deer (Collins and Urness 1983, Mackie 1970). Deer have more specific forage requirements than elk. Elk appear to be much more adaptable to changing range conditions than deer and will more readily shift their distribution from year to year depending on snow depth, hunting pressure, habitat treatments, and other factors (Watkins et al. 2007). Given an overall reduction in the amount and suitability of habitat used by the two species, elk may crowd out mule deer.

Predation, particularly by coyotes, and excessive deer harvests have also been proposed as factors in the decline of mule deer throughout the West (Gill 1999). Disease, particularly chronic wasting disease and hemorrhagic disease, may also have played a role in the decline of mule deer populations range-wide. To date, no evidence of chronic wasting disease has been found in Arizona’s deer and elk populations, but antibodies for hemorrhagic disease have been documented in the state (AGFD undated).

Mule Deer: Habitat and Status on CO Bar Ranch

CO Bar Ranch provides good foraging and cover habitat for mule deer, particularly in areas of dense shrub and scrub vegetation and pinyon-juniper woodlands. Abundant washes and canyon ledges provide additional cover. Mule deer population numbers on Babbitt ranchlands have noticeably decreased over time, and this decline is of concern to Babbitt Ranches (Pers. obs., William Cordasco, Babbitt Ranches). Elk also use pinyon-juniper woodlands as winter range and may out-compete mule deer in that habitat on CO Bar Ranch.

8.2.2.7 Fickeisen Plains Cactus

The Fickeisen plains cactus was listed as endangered under the Endangered Species Act on October 1, 2013 (78 FR 60607, USFWS 2013b). A final rule on critical habitat is pending, but proposed critical habitat includes two areas on CO Bar Ranch (USFWS 2012a). The Fickeisen plains cactus is found only on the Colorado Plateau in Coconino and Mohave Counties in the State of Arizona. It grows in suitable habitat on both sides of the Colorado River and Grand Canyon. Populations, which are mostly small, are scattered over a broad range and separated by significant topographic features (USFWS 2012a).

The Fickeisen plains cactus is a small globular cactus, difficult to see unless blooming. Stems of mature plants are only 1.0 to 2.4 inches tall and up 2.2 inches in diameter. It is a cold-adapted plant with contractile roots; that is, the plant has the ability to retract into the soil during the winter (cold) and summer (dry) seasons and during drought conditions. Plants may shrink completely under the surface or only until the crown is flush with the surface. With adequate precipitation, plants emerge to flower in mid-April. After flowering, plants set seed in June, then shrink back into the soil. Some plants may re-emerge in the autumn following monsoonal rains (USFWS 2012a).

This cactus is a narrow endemic restricted to exposed layers of Kaibab limestone on the Colorado Plateau. Plants are found in shallow, gravelly loam soils formed from alluvium, colluvium, or aeolian deposits derived from Kaibab limestone and contiguous geological formations. Most populations occur on the margins of canyon rims, on flat terraces or benches, or on the toe of well-drained hills with less than 20 percent slope, at elevations between 4,200 to 5,950 feet amsl (USFWS 2012a).

Fickeisen Plains Cactus: Range-wide and Regional Threats

The USFWS has determined that the following are threats to the Fickeisen plains cactus: 1) trampling and soil compaction from livestock grazing; 2) nonnative, invasive species; 3) uranium mining; 4) road construction and maintenance; 5) ORV use and recreation; 6) commercial development; and 7) drought and climate change. Predation by rodents increases in dry conditions; thus, the USFWS believes that predation is likely to rise to the level of threat to the species as the climate warms, and droughts become more frequent and severe (USFWS 2012a).

Fickeisen Plains Cactus: Habitat and Status on Ranch

Substantial suitable habitat for the Fickeisen plains cactus appears to exist on CO Bar Ranch (Pers. comm., Greg Goodwin, botanist, U.S. Forest Service [retired], to William Cordasco, Babbitt Ranches and SWCA Environmental Consultants staff, April 9, 2013). According to the USFWS (2013b), two small populations of the Fickeisen plains cactus have been documented within ranch boundaries. One population is located east of U.S. 89 near Mays Wash on BLM and privately owned lands. In 1981, researchers found 29 live and 4 dead Fickeisen plains cactus plants at this location. A monitoring plot was established in 1983 on the BLM land, but the USFWS has no information describing those efforts or results. The area was last visited in 1984; four plants were observed at that time (USFWS 2013b). All private land bordering the BLM section is owned by Babbitt Ranches, so presumably some of the plants reported in 1981 were growing on Babbitt land.

The second population is located near a sewage disposal pond west of U.S. 89 near the community of Gray Mountain and the Navajo Nation boundary (USFWS 2013b). This description appears to place the population on land owned by the Clayton Investment Company and outside the jurisdiction of Babbitt Ranches. Four Fickeisen plains cacti were found at this location in 1984, and one plant was relocated in 2013 (USFWS 2013b).

In October 2012, the USFWS (2012a) proposed designating a 1,724-acre patch of critical habitat (Subunit 8a) for the Mays Wash population and a 2,371-acre patch of critical habitat (Subunit 8b) for the Gray Mountain population. As of the writing of this document a Final Rule designating critical habitat for the Fickeisen plains cactus has not been issued.

Livestock graze in the Mays Wash area of CO Bar Ranch, but the probability that a Fickeisen plains cactus plant would be trampled by a horse or cow is low. Forage is sparse on the gravelly benches where this cactus grows so those areas are unlikely to attract livestock. Conversely, the cactus does not grow where livestock congregate (e.g., stock tanks and livestock staging areas). Hunters use off-road vehicles on CO Bar Ranch, but the ranch is vast (264,683 acres), and hunters are relatively few in number. It is

improbable that a hunter would happen to drive over a cactus plant. The greatest threats to the future of Fickeisen plains cactus on CO Bar Ranch appear to be drought and climate change.

To demonstrate its commitment to conserving the Fickeisen plains cactus, Babbitt Ranches in 2013 funded preparation of the Babbitt Ranches Fickeisen Plains Cactus Management Plan, a draft of which is attached as Appendix H. Babbitt Ranches also hosted a workshop on October 24, 2013, of Fickeisen plains cactus experts and agency personnel who have management responsibilities for the cactus. The purpose of the workshop was to discuss draft Fickeisen plains cactus survey and monitoring protocols drafted by SWCA Environmental Consultants. Both the workshop and development of the protocols were funded by a federal ESA Section 6 grant obtained by the Landsward Foundation and SWCA. The draft protocols have been submitted to the funding agency, but as of the writing of this document, they have not been finalized and approved by the USFWS.

9.0 CONSERVATION STRATEGIES FOR THE TARGET SPECIES

A list of conservation goals, objectives, and possible strategies for each of the target species is provided in Table 11. Most of the conservation strategies are applicable to all three Babbitt ranches. In some cases—notably the golden eagle and ferruginous hawk—individuals of the species are wide ranging, and conservation is most effectively approached within a regional context. Several possible conservation strategies are identified for most of the species. Not all of the strategies may prove to be practicable or appropriate as circumstances evolve, and additional actions are likely to be identified through time. Detailed implementation plans for the conservation strategies identified in Table 11 must be developed on a project-by-project basis as priorities are established, specific funding and cooperative opportunities are identified, and specific actions are selected for implementation.

Table 11. Species-specific goals, objectives, and conservation strategies for the target species.

Species and Conservation Goal	Conservation Objectives	Conservation Strategies
Golden Eagle (<i>Aquila chrysaetos</i>) Conservation Goal: Contribute to a stable or increasing golden eagle population within the region encompassing the Babbitt ranches (Bird Conservation Region 16)	Document golden eagle nesting success and productivity	Conduct golden eagle nesting and productivity studies based on annual aerial/helicopter surveys in the region encompassing the Babbitt ranches
	Document golden eagle population numbers, habitat, and foraging resource use on the Babbitt ranches over time	Conduct golden eagle population and habitat and foraging resource use studies on the Babbitt ranches
	Gain a more thorough understanding of golden eagle home range, habitat use, movements, foraging, and behavior of golden eagles that use the Babbitt ranches	Conduct regional golden eagle home range and movement studies using telemetry
	Determine distribution, abundance, and population trends of golden eagle prey species on the Babbitt ranches	Conduct prey base studies on the Babbitt ranches
	Document habitat conditions (including climate) through time on the Babbitt ranches	Conduct habitat condition studies on the Babbitt ranches
	Increase hunting perch opportunities	Erect and monitor artificial perches in strategic locations
	Enhance golden eagle foraging habitat and increase prey base abundance	If prey base studies suggest eagles are prey-limited on the ranches, develop an action plan for increasing jackrabbit and cottontail rabbit population in selected areas; the action plan should include measurable objectives and performance criteria Augment prairie dog populations within suitable habitat Vaccinate prairie dogs against the plague Control, restrict, or prohibit prairie dog shooting on Babbitt ranches; post relevant information at ranch gates and on the Babbitt Ranches Website
	Reduce potential mortality and decreased fitness from ammunition lead poisoning	Control, restrict, or prohibit use of lead ammunition on Babbitt ranches; post relevant information at ranch gates and on the Babbitt Ranches Website
	Reduce potential for mortality or injury from shooting	Post information at ranch gates and on the Babbitt Ranches Website regarding golden eagle protection
	Reduce potential for mortality or injury from transmission line electrocution and strikes	Assess level of threat posed by the Moenkopi–Eldorado transmission line If warranted, evaluate potential measures to reduce risk of electrocution and collisions with the transmission line (e.g., mark the ground wire at strategic locations)

Table 11. Species-specific goals, objectives, and conservation strategies (continued).

Species and Conservation Goal	Conservation Objectives	Conservation Strategies
Ferruginous Hawk (<i>Buteo regalis</i>) Conservation Goal: Contribute to a stable or increasing ferruginous hawk population within the region encompassing the Babbitt ranches (Bird Conservation Region 16)	Increase nesting opportunities	Install artificial nest platforms and monitor
	All remaining objectives are the same as for golden eagles	All remaining strategies are the same as for golden eagles.
Gunnison's Prairie Dog (<i>Cynomys gunnisoni</i>) Conservation Goal: Increase and maintain healthy populations of prairie dogs on the Babbitt ranches	Increase prairie dog abundance on the Babbitt ranches to benefit the species, to meet USFWS (2013a) conservation prey base planning objectives for the golden eagle, and to sustain a viable population of introduced black-footed ferrets on Espee Ranch	Formally coordinate prairie dog management with black-footed ferret management in northern Arizona. Determine desired future rangeland conditions and carrying capacity for prairie dogs; determine desired population targets Develop an action plan for achieving desired future habitat conditions; the action plan will include measurable objectives and performance criteria. Build on the existing AGFD monitoring program to track distribution and abundance of prairie dogs on the ranch Reintroduce prairie dogs within suitable habitat
	Reduce mortality and decreased fitness associated with plague infections on the Babbitt ranches	Vaccinate prairie dogs against the plague Monitor for the presence of plague in predators Reduce the presence of plague-infected fleas through insecticide dusting
	Reduce or eliminate mortality and disturbance from recreational shooting	Ask the public to support conservation and research efforts by refraining from shooting prairie dogs on Babbitt ranches. Post information to this effect at ranch gates and on the Babbitt Ranches Website
Black-footed Ferret (<i>Mustela nigripes</i>) Conservation Goal: Establish additional self-sustaining populations of black-footed ferrets in northern Arizona	Formalize long-term, coordinated management of black-footed ferrets and associated prairie dog colonies in northern Arizona	Encourage the AGFD and USFWS to develop a long-term management plan for black-footed ferrets in Arizona, including reintroduction activities, post-reintroduction monitoring, and prairie dog management
	Establish a population of black-footed ferrets on Espee Ranch	Support efforts by the AGFD to reintroduce and systematically monitor black-footed ferrets on Espee Ranch
	Sustain prairie dog colonies where ferrets are released and subsequently observed	Same as the conservation actions for the Gunnison's prairie dog
	Reduce mortality of ferrets and decreased fitness associated with disease	Support efforts by the AGFD to monitor for the presence of plague and distemper in predators on Espee Ranch

Table 11. Species-specific goals, objectives, and conservation strategies (continued).

Species and Conservation Goal	Conservation Objectives	Conservation Strategies
American Pronghorn <i>(Antilocapra americana americana)</i> Conservation Goal: Maintain a healthy, viable population of American pronghorn on the Babbitt ranches and throughout the region	Improve suitability of pronghorn habitat on the Babbitt ranches	Implement strategies identified in the <i>Babbitt Ranches Long-term Pronghorn Succession Plan</i> (deVos and Cordasco 2009, attached as Appendix E)
	Promote simultaneous fawn dropping to reduce fawn mortality from predation	Work with the AGFD to postpone pronghorn hunting until after the breeding season to maximize and temporally concentrate impregnation of does
	Improve the status of pronghorn subpopulations across the region to benefit pronghorn and to meet USFWS (2013a) conservation planning prey base objectives for the golden eagle	Work with the AGFD to manage each pronghorn subpopulation individually according to each subpopulation's distinct management needs. See Appendix E for lists of issues and concerns pertaining to each subpopulation.
Mule deer <i>(Odocoileus hemionus)</i> Conservation Goal: Increase and maintain a healthy, viable population of mule deer on the Babbitt ranches, with emphasis on Cataract Ranch	Determine distribution, abundance, and population trends of mule deer on Cataract Ranch	Work with the AGFD to increase understanding of mule deer populations in Game Management Units 9 and 10 by facilitating: <ul style="list-style-type: none"> • annual monitoring of mule deer populations to evaluate fawn production, herd composition, and habitat use • annual collection of adult doe and fawn mortality estimates • evaluation of herd size and population trends over time
	Stop and reverse any decline in mule deer populations on Cataract Ranch	Work with the AGFD to establish effective mule deer harvest goals in Game Management Units 9 and 10 to increase and maintain populations
	Minimize potential adverse impacts of excessive elk populations on mule deer on Cataract Ranch	Work with the AGFD to establish effective elk harvest goals in Game Management Units 9 and 10 to minimize competition with mule deer
Fickeisen plains cactus <i>(Pediocactus peeblesianus var. fickeiseniae)</i> Conservation Goal: Maintain and enhance the survival of Fickeisen plains cacti on the Babbitt ranches	Protect existing plants and occupied habitat	Develop a mechanism for educating ranch personnel about the plant and instructing those working on the ranch to avoid ground-disturbing activities in designated areas
		Implement strategies identified in the <i>Babbitt Ranches Fickeisen Plains Management Plan</i> , attached as Appendix F)

9.1 Conservation Strategies for Golden Eagle and Fickeisen Plains Cactus

Two of the target species, the golden eagle and the Fickeisen plains cactus, are singled out in this document for the highest conservation priority at this time. The golden eagle is currently the subject of intense conservation concern in the American West because of the growth of wind energy development and the potential adverse effects of that development on the species. Golden eagles are also uniquely positioned for landscape-level study in northern Arizona. Recent nesting inventories and telemetry studies on and near the Babbitt ranches have laid an excellent foundation upon which to construct a long-term golden eagle monitoring program that encompasses much of the Coconino Plateau. The Fickeisen plains cactus is of particular conservation interest because it is listed as an endangered species under the ESA.

Recommended conservation strategies for the golden eagle and the Fickeisen plains cactus are presented in some detail in Sections 9.1.1 and 9.1.2, below.

9.1.1 Golden Eagle Monitoring Program

Babbitt Ranches is working with SWCA Environmental Consultants and several wildlife management agencies to design and initiate a long-term monitoring program for the golden eagle within the region encompassing all three Babbitt ranches. Biological monitoring serves essential conservation purposes, providing the data needed to assess conservation status, ascertain and predict the effects of habitat (including climate) change, establish conservation priorities, identify management actions, and evaluate the effects of management so it can be adapted to meet conservation objectives.

The monitoring program described here for the golden eagle consists of five study elements:

1. Home Range and Movement Studies Using Telemetry
2. Nesting and Productivity Studies
3. Population Monitoring and Habitat and Foraging Resource Use Studies
4. Prey Base Studies
5. Habitat Condition Studies

All objectives and methods described below have been designed such that results generated from each study supplement and inform results of the other studies, providing a comprehensive data set to inform and guide the long-term golden eagle management needed to meet the conservation goal.

9.1.1.1 Golden Eagle Home Range and Movement Studies Using Telemetry

Study Objectives: Gain a more thorough understanding of golden eagle home range, habitat use, movements, foraging, and behavior of golden eagles that use the Babbitt ranches.

Study Area: Espee, Cataract, and CO Bar Ranches and range of telemetered eagles

Study Duration: As long as transmissions are received

Study Methods: Capture at least seven golden eagles on the Babbitt ranches, with a minimum of one eagle from each ranch, and affix each bird with cellular transmitters. Give primary preference to adults observed breeding within or directly adjacent to the ranches, and give secondary preference to migrants, sub-adults, or floaters. Program transmitters to collect data at 15-minute intervals with batches of data transmitted during a specified time window every 24 hours or when cellular coverage is available. Download cellular tracking data from the manufacturer's Website and import shapefiles into ArcMap 9.3 for analyses. Applications of the data collected include identifying nesting locations; foraging locations, which supplements prey base studies (see Section 9.1.1.4); and winter/communal roosting locations.

9.1.1.2 Golden Eagle Nesting and Productivity Studies

Study Objectives: 1) Document nesting success and productivity, which serve as sensitive barometers of population health, help identify causes of population declines, and allow measurement of specific habitat features and trends associated with local population health (Conway and Martin 2000). 2) Integrate results from this study with data collected by the AGFD for other areas, thus expanding the contiguous area under study and the size and usefulness of the combined data set.

Study Area: The study area for monitoring nesting and productivity should encompass as large an area as practicable. Individual golden eagles range widely, and understanding the status and dynamics of golden eagle reproduction requires data compilation over large regions (Driscoll 2010). It is also desirable to build upon work already done by incorporating areas inventoried in 2011 and 2013 (large, overlapping areas involving portions of Espee and CO Bar Ranches and nearby Perrin Ranch). Therefore, to achieve a high degree of scientific validity and capitalize on an existing data set, it is recommended that the study area for the golden eagle nesting and productivity studies include all three areas inventoried in 2011 and 2013, plus Cataract Ranch (Figure 20). The study area totals 1,768,478 acres, of which 1,317,943 acres have already been inventoried.

Study Duration: As many years as funding permits

Study Methods: 1) Within the portion of the study area not previously inventoried, delineate potential golden eagle nesting habitat via a desktop GIS analysis. 2) During the first year of the study, aerially survey all potentially suitable nesting habitat identified via the desktop analysis and the previously located historical nests/territories. 3) Within each subsequent year of the study, aerially resurvey all identified nests/territories four times as follows:

1. **Survey 1** – Inventory Survey. Conducted in late-winter, a time of courtship and early golden eagle nest occupancy when adults are mobile and conspicuous.
2. **Survey 2** – First Occupancy Survey. Conducted in early spring, a time of peak golden eagle nest occupancy when most adults have engaged in nest construction and/or repair.
3. **Survey 3** – Second Occupancy Survey. Conducted in mid-spring, a cut-off time (specifically, May 1) for determining nest occupancy when most active nests contain incubating adults or young nestlings.
4. **Survey 4** – Productivity Survey. Conducted at a time when most active nests contain nestlings old enough to determine success.

Metrics collected should include: 1) number of occupied and unoccupied nests per unit area; 2) number of occupied and unoccupied territories per unit area; and 3) breeding productivity, nesting success, and mean brood size at fledging.

9.1.1.3 Golden Eagle Population and Habitat and Foraging Resource Use Studies

Study Objectives: 1) Document golden eagle population numbers on the Babbitt ranches over time, including resident and/or breeding adults and sub-adult/floater individuals across seasons. 2) Document golden eagle habitat and foraging resource use on the Babbitt ranches.

Study Area: Espee, Cataract, and CO Bar Ranches

Study Duration: As many years as funding permits

Study Methods: Obtain data via on-the-ground, standardized, long-sit observational surveys, supplemented with data from the aerial home range and nest occupancy studies (see Sections 9.1.1.1 and 9.1.1.2). Conduct long-sit observational surveys with experienced eagle surveyors strategically positioned within the three ranches, sampling across seasons. Sampling sites should include, but not be limited to: 1) topographical features/high points with unobstructed viewsheds, 2) observation points located in close proximity to prairie dog colonies, and 3) observation points located at/near golden eagle foraging locations identified from telemetry studies (see Section 9.1.1.1). Data recorded should include adult or sub-adult status, flight paths, behavior(s), and total number of observed eagle minutes. Note any other information of potential value (e.g., human activity in the area).

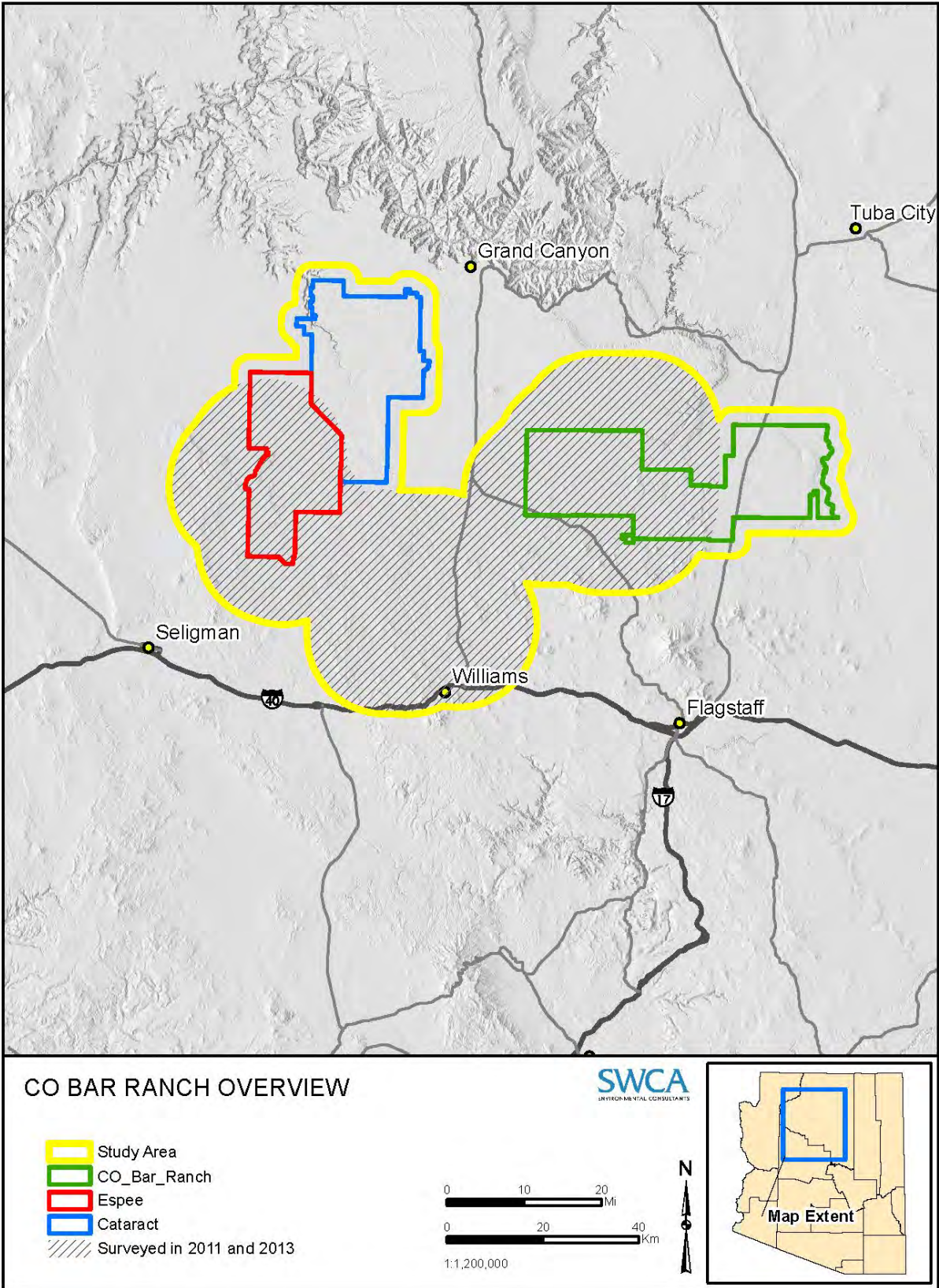


Figure 20. Study area for the golden eagle nesting and productivity studies.

For population monitoring, supplement observational data by staking animal carcasses in strategic locations on the three ranches and monitor them remotely with field cameras. Schedule the carcass/field camera array surveys to best capture activity during four periods: 1) the height of the eagle breeding (February/March), 2) fledging (June/July), 3) migration (October/November), and 4) late season residency and wintering (November-December). Summarize the photo-documentation by creating tabular data of species visiting the carcass, time of photo, and approximate age and sex (if possible) of golden eagles lured to the carcass.

9.1.1.4 Prey Base Studies

Study Objectives: Determine distribution, abundance, and population trends of golden eagle prey species (i.e., Gunnison's prairie dog, black-tailed jackrabbit, and desert cottontail rabbits) on the Babbitt ranches. Data gathered are needed to assess the quality of the golden eagle prey base on the ranches, inform efforts to enhance the prey base, and evaluate the efficacy of such efforts. Long-term monitoring of the prey base allows the study of the effects of climate change on prey populations and relationships between changes in the prey base and golden eagle occupancy, site use, and reproduction.

Study Area: Espee, Cataract, and CO Bar Ranches

Study Duration: As many years as funding permits

Study Methods: Gunnison's prairie dog colonies on Espee Ranch have been monitored annually from 2007 to the present, with the project producing high resolution data on colony densities, population size, and trends. It is anticipated that these studies will continue into the future providing a fundamental portion of baseline prey base data collection.

To estimate jackrabbit and cottontail numbers and distribution, use the spotlight line-transect method of Smith and Nydegger (1985) across the study area in spring and fall annually, with marked transects established through all habitat types present. Estimate species densities using the program DISTANCE (Buckland et al. 1993). Undertake a model building process and analysis to investigate the relationship between prey base availability; climate variables; and golden eagle occupancy, site use, and reproduction.

9.1.1.5 Habitat Condition Studies

Study Objectives: Document habitat conditions (including climate) through time on the Babbitt ranches

Study Area: Espee, Cataract, and CO Bar Ranches

Study Duration: As many years as funding permits

Study Methods: Cooperate with the Landscape Conservation Initiative at Northern Arizona University to gather GIS remote sensing data to conduct model-based analyses of habitat conditions across the survey area and through time. Ground-truth remote sensing data for Cataract and Espee Ranches with information gathered at the NRCS range inventory sited established on those ranches. Incorporate climate data gathered at the U.S. Climate Reference Network (USCRN) station on Cataract Ranch and other regional weather stations. Integrate the habitat and climate data with the results of the other monitoring studies in this program to model how these ecological variables relate to golden eagle breeding, population, and habitat use dynamics.

9.1.2 Fickeisen Plains Cactus Survey and Monitoring Program

As provided for in the Babbitt Ranches Fickeisen Plains Cactus Management Plan (see Appendix H), Babbitt Ranches intends to work with USFWS Arizona Ecological Services staff and other qualified

individuals to develop a monitoring program for Fickeisen plains cactus on Babbitt ranchland. The Mays Wash population may be selected for this effort because a monitoring plot was established there in 1983, and the responsible agency (presumably the BLM) should have useful baseline data to build upon. The BLM may be willing to partner with Babbitt Ranches in this effort. The Mays Wash population also falls within the newly created Antelope Prairie Ecological Research Area, and initiating a Fickeisen plains cactus monitoring program there would be consistent with Babbitt objectives for the area.

9.2 Potential Funding Sources

Various programs that provide funding for conservation efforts are listed in Table 12.

9.3 Conservation Banking

A conservation bank is a parcel of land containing natural resource values that are conserved and managed *in perpetuity*, through a conservation easement held by an entity responsible for enforcing the terms of the easement, for specified listed species and used to offset impacts occurring elsewhere to the same resource values on non-bank lands. Bank parcels are typically large enough to accommodate the mitigation of multiple projects. A project proponent will secure a certain amount of natural resource values within the bank to offset the impacts to those same values offsite. The bank is specifically managed and protected by the banker or designee for the natural resource values. The values of the natural resources are translated into quantified “credits.” Typically, the credit price will include funding for the long-term natural resource management and protection of those values. In general, the credit system for a conservation bank is expressed and measured in the same manner (or units) as the impacts of the development projects that will utilize the bank. The unit traded is most often, but not necessarily, an acre of habitat (USFWS 2003).

As a rule, lands previously designated for conservation purposes through another program are not eligible unless designation as a bank provides an *additional* conservation benefit to the species. Ineligible lands may include:

- those that have benefited from programs that compensate landowners who permanently protect or restore habitat for federally listed species on private agricultural lands,
- easement areas associated with inventory and debt restructure properties,
- lands protected or restored for conservation purposes under fee title transfers,
- lands protected by a habitat management agreement (unless the agreement is extended in perpetuity by a bank agreement), or
- habitats protected by similar programs. For example, lands conserved under the Section 6 habitat conservation plan land acquisition grant program would not be available for conservation bank establishment (USFWS 2003).

Credit values are based upon a number of biological criteria and may vary by habitat types or management activities. When determining credit values, some of the biological criterion that may be considered include habitat quality, habitat quantity, species covered, conservation benefits, including contribution to regional conservation efforts, property location and configuration, and available or prospective resource values.

To obtain approval from the USFWS, landowners must:

- Enter into a Conservation Banking Agreement with the USFWS.

- Grant a conservation easement to an eligible third party, precluding future development of the property and restricting certain land uses.
- Develop a long-term management plan for the conservation bank.
- Provide funding for monitoring and long-term management of the conservation bank through establishment of a non-wasting endowment. The endowment is an interest-bearing account in an amount sufficient to generate enough yearly income to fund the annual management of the conservation bank. Only the interest is available for use and the principal is not withdrawn, providing a perpetual source of funding for management of the conservation bank. The endowment may be funded in full at the time of conservation bank approval or in increments, but should be fully funded within five years (USFWS 2012d).

Table 12. Potential sources of funding for conservation efforts (as of 2013).

Funding Organization	Program	Description	Match Needed
AGFD/ USFWS	ESA Section 6 - Cooperative Endangered Species Conservation Fund	Funds the implementation of conservation projects that benefit federally listed species. Eligible activities include habitat restoration, species status surveys, public education, captive propagation and reintroduction, nesting surveys, genetic studies, and development of management plans. Funded through state agencies	25%
AGFD	Heritage Fund - Identification, Inventory, Acquisition, Protection, and Management	For projects that preserve and enhance Arizona's natural biological diversity. Proposals must be consistent with one or more of AGFD's priority projects to be fully considered.	Encouraged
AGFD/ USFWS	Landowner Incentive Program	Grants to state agencies to enhance at-risk species habitat on private land. Can fund Conservation Easements	36%
AGFD	Special Big Game Tag Fund / Habitat Partnership Committee Habitat Enhancement and Wildlife Management	Habitat improvement for game species. Funding decisions made by AGFD in coordination with the wildlife conservation organizations that sell the Special Big Game Tags.	100%
AGFD	Wildlife Conservation Fund	Conserve, enhance, and restore Arizona's diverse wildlife resources and habitats.	Encouraged
Arizona Department of Agriculture	Livestock and Crop Conservation Grant Program	For landowners and lessees of state or federal lands to implement conservation based management using livestock production/reduction practices to provide wildlife habitat or open space. Can be used as matching funds for certain other grants.	Encouraged
NFWF / USFWS	Landscape Conservation Stewardship Program	Develop community-based partnerships that further the conservation of fish, wildlife, plants and other natural resources in distinct landscapes. Brings together public and private partners to replicate successful community-driven regional landscape conservation coalitions.	Encouraged
NFWF/ NRCS	Conservation on Private Lands Grant	Support high quality projects that engage private landowners, inc. ranchers) in the conservation and enhancement of fish and wildlife and natural resources on their lands. State and local jurisdictions, education institutions, and non-profit organizations are eligible to apply.	200%
NFWF	Conservation Partners Program	Priority areas and species for 2013 cycle do not relevant to Babbitt Ranches. May change in future.	100%
NFWF	ConocoPhillips SPIRIT of Conservation Migratory Bird Program	Funding priorities for this program include protecting, restoring, and/or managing habitats for migratory birds; benefiting declining, threatened or endangered birds; and generating measurable outcomes.	50%
NFWF	Native Plant Conservation Initiative	Conservation projects that protect, enhance, and/or restore native plant communities on public and private lands	100%

Table 12. Potential sources of funding for conservation efforts (as of 2013), continued.

Funding Organization	Program	Description	Match Needed
NFWF	Pulling Together Initiative	Prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships.	100%
Funding Organization	Program	Description	Match Needed
NRCS	Conservation Innovation Grant Program	Funds the use of innovative technologies or approaches to address a natural resource conservation concern or concerns. Will emphasize projects that have a goal of providing benefits over a large geographic area.	50%
NRCS	Conservation Security Program	Provides financial and technical assistance to private landowners for the purpose of promoting the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on working lands in selected watersheds. Identifies watersheds in which to direct funding each fiscal year.	None
NRCS	Conservation Stewardship Program	Provides financial and technical assistance to help land stewards conserve and enhance soil, water, air, and related natural resources on their land. Five-year contracts.	None
NRCS	Conservation of Private Grazing Land Program	Program that provides technical assistance to owners and managers of private grazing land.	None
NRCS	Farm and Ranch Lands Protection Program	Provides matching funds to help acquire perpetual conservation easements to keep productive farm and ranchland in agricultural uses. Private landowners must have a governmental body or NGO apply on their behalf.	50%
NRCS	Environmental Quality Incentives Program	Provides financial and technical assistance of up to 75% for private landowners to apply structural and management conservation practices on agricultural land. Eligible practices include fencing, water development, irrigation systems, wells, or brush management.	?–25%
NRCS	Grassland Reserve Program	Funds 100% of the acquisition of conservation easements on a minimum 40 acres to conserve grasslands from conversion to cropland or other uses, while maintaining grazing. Landowners can choose between perpetual or 30-year conservation easements, rental agreements, or restoration agreements.	None
NRCS	Resource Conservation and Development Program	Provides financial assistance of up to 25% for the protection of agricultural land from conversion to other uses, the protection of farmland, and the protection of fish and wildlife habitats in designated RC&D areas.	75%
NRCS	Wildlife Habitat Incentives Program	Provides technical assistance and financial assistance of up to 75% to private landowners for improvements to wildlife habitat in uplands, wetlands, riparian, and aquatic areas. An emphasis is placed on projects that improve habitat for declining species.	?–25%
NRCS/ NFWF	Conservation on Private Lands Grant	(See NFWF)	–
USFWS/ AGFD	ESA Section 6 - Cooperative Endangered Species Conservation Fund	(See AGFD)	–
USFWS/ AGFD	Landowner Incentive Program	(See AGFD)	–
USFWS	Cooperative Landscape Conservation and Adaptive Science	Funds focused monitoring and assessment efforts to develop and implement strategies that result in measurable fish and wildlife population outcomes.	none
USFWS	Partners for Fish and Wildlife Program	Provides funds to private landowners to protect, enhance and restore wildlife habitat for federally listed threatened or endangered species. The program supports on-the-ground habitat restoration, not planning or research.	yes

Table 12. Potential sources of funding for conservation efforts (as of 2013), continued.

Funding Organization	Program	Description	Match Needed
Wildlife Conservation Society	WCS Climate Adaptation Fund	Grants to 501(c)(3) conservation organizations focused on implementing priority actions and strategies identified in State Wildlife Action Plans. Focused on the functionality of ecosystems.	100%

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APPENDIX A

The Constitution of Babbitt Ranches

The Constitution of Babbitt Ranches



Character, Nature and Community have been bred into Babbitt Ranches since 1886. The values that make the people of Babbitt Ranches who they are and the characteristics that have shaped the organization into a lasting legacy are hereby captured and articulated in **The Constitution of Babbitt Ranches**.

Article I



Philosophy and Multiple Bottom Line

Section 1.

Through our efforts of learning and understanding, we are better able to join, share and be a part of the Babbitt Ranches' organizational, ecological, economical and community decisions.

Article II



Conversation Council Creed

Human conversation is the most ancient and easiest way to cultivate the condition for personal, organizational and community change.

— Margaret J. Wheatley

Section 1.

We commit to learn, to understand, to appreciate and to trust one another while letting go of the need to be right and to leave the past in the past.

Section 2.

We commit to listen with detachment and to speak honestly.

Section 3.

We have the courage to risk change and to make appropriate decisions.

Section 4.

We are interested in each other, and we will think and reflect on our decisions, appreciating that it may be messy at times.

Section 5.

Our character will be demonstrated through our patience, kindness, humility, respectfulness, selflessness, forgiveness, honesty and resilience.

Section 6.

We acknowledge that it is not our differences that may divide us, it is our judgments about each other that do.

Article III



Cowboy Essence

Cowboy Essence is peace of mind that is a direct result of self-satisfaction in knowing you did your best to become the best you are capable of becoming.

— inspired by John Wooden

Section 1.

Industriousness

There is no substitute for work. Worthwhile results come from hard work and careful planning.

Section 2.

Enthusiasm

Enjoyment for what you are doing motivates those with whom you come into contact.

Section 3.

Friendship

Mutual esteem, respect and devotion are the ingredients of an enduring friendship. Like marriage, it must not be taken for granted but requires a joint effort.

Section 4.

Cooperation

Listen if you want to be heard. Be interested in finding the best way, not in having your own way.

Section 5.

Loyalty

Be devoted to yourself and to all those who depend on you. Keep your self-respect.

Section 6.

Self-control

Practice self-discipline and keep emotions under control. Good judgment and common sense are essential.

Section 7.

Alertness

Observe constantly. Stay open-minded. Be eager to learn and improve.

Section 8.

Initiative

Cultivate the ability to make decisions and think alone. Do not be afraid of failure, but learn from it.

Section 9.

Intentness

Set realistic goals. Concentrate on achievement by resisting temptations. Be determined and persistent.

Section 10.

Conditioning

All aspects of our lives must be developed: mental; spiritual; and, physical. Rest, exercise and diet must be considered and moderation must be practiced.

Section 11.

Skill

Be prepared with knowledge and the ability to properly and quickly execute the fundamentals. Cover every little detail.

Section 12.

Ranch Spirit

A genuine consideration for others fosters an eagerness to sacrifice personal interests and glory for the betterment of others. It is not about I but We.

Section 13.

Poise

Be at ease with yourself in any situation.

Section 14.

Confidence

Demonstrate respect without fear. Being prepared and keeping all things in proper perspective creates self-assuredness.

Section 15.

Competitive Greatness

Be at your best when your best is needed. Enjoy a difficult challenge.



Article IV



Cowboy Essence Character Qualities

Section 1.

Ambition

The desire to achieve noble goals.

Section 2.

Sincerity

The genuine earnestness that binds friendship.

Section 3.

Adaptability

The ability to adjust to any situation.

Section 4.

Honesty

Doing the things we know are right.

Section 5.

Resourcefulness

Using our wits, proper judgment and common sense to solve problems.

Section 6.

Reliability

The consistency and trustworthiness that create respect.

Section 7.

Fight

The determined effort to do the very best we can do.

Section 8.

Integrity

Purity of intention.

Section 9.

Patience

The ability to wait and calmly persevere.

Section 10.

Faith

The belief that things will turn out as they should.

Section 11.

Gratitude

The art of being grateful for all things.

Article V



A Land Ethic

An ethical obligation on the part of the private landowner is the only visible remedy for these situations.

— Aldo Leopold

Section 1.

Whatever may be the equation for people and land, it is improbable that we as yet know all its terms. The answer, if there is any, seems to be in a land ethic, or some other force which assigns more obligation to the private landowner.

Section 2.

A land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow members, and also respect for the community as such.

Section 3.

The land ethic then reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity.

Section 4.

It is inconceivable to us that an ethical relation to the land can exist without love and a high regard for its value. By value, we of course mean something far broader than mere economic value; we mean value in the philosophical sense.

Section 5.

A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.

Article VI



Sustainable Community Principles

If we could first know where we are and whither we are tending, we could better judge what to do and how to do it.

— Abraham Lincoln

Babbitt Ranches is a community that:

Section 1.

Defines sustainability as living off interest, not principal;

Section 2.

Appreciates that growth occurs within some limits and is ultimately limited by the carrying capacity of the environment;

Section 3.

Minimizes harm to the natural environment;

Section 4.

Values diversity;

Section 5.

Respects other forms of life and supports biodiversity;

Section 6.

Has defined values amongst the members of the community;

Section 7.

Employs Multiple Bottom Line Decision-Making, which integrates organizational, ecological, economical and community values into all decision-making processes in a thorough, open and flexible manner;

Section 8.

Makes the best use of local efforts and resources, and nurtures solutions at the local level;

Section 9.

Uses renewable and reliable sources of energy;

Section 10.

Fosters activities that use materials in continuous cycles;

Section 11.

Does not compromise the sustainability of other communities;

Section 12.

Does not compromise the sustainability of future generations by its activities.

Section 5.

Practice liquidity concepts.

Section 6.

Develop communication processes.

Article IX



Priceless Values

With yourself, with family and friends, with the community and with the environment, one way or another and in the end, relationships are all there is.

— Bill Cordasco

Section 1.

Organization

Babbitt Ranches, founded in 1886, is rich in history and strengthened through relationships. For as many as six generations, owners, employees and their families have shared in this history and have forged a deep commitment to the health of the land and the organization.

Section 2.

Ecology

Across the high desert landscape of northern Arizona, Babbitt Ranches promotes and respects regional continuity, wildlife habitat, diverse vegetation, watersheds, historic sites, cultural resources and access for recreationists and scientists. Ethics are the standards we employ to determine our actions.

Section 3.

Economy

Babbitt Ranches demonstrates a deep sense of responsibility to the people and communities of the region through more than a century of operation and community participation. The economic well being of the region cannot be separated from the well being of the environment.

Section 4.

Community

Babbitt Ranches is part of a large and diverse community of land owners, communities and organizations who have a responsibility and obligation to the broad regional perspective. It is within this context of community that relationships are formed and quality regional planning can begin.

Article X



Constitution Commitment

Section 1.

We do the very best we know how, the very best we can; and, we mean to keep on doing so until the end.

Section 2.

If the end brings us out all right, then what is said against us won't matter.

Section 3.

If the end brings us out wrong, then ten angels swearing we were right would make no difference.

— Abraham Lincoln

Hereunto set forth this twenty-fourth day of January in the year two thousand and eight the owners and employees of Babbitt Ranches, as witnessed by long-time friends and business associates, hereby proclaim this, **The Constitution of Babbitt Ranches**, the official document adopting the character and values by which the organization was established and shall operate.

APPENDIX B

CO BAR RANCH Landownership BY Township

CO Bar Ranch Land Use and Conservation Overview
Coconino County, Arizona

CO BAR RANCH LANDOWNERSHIP BY TOWNSHIP

Most of the information in this table was taken from the Coconino County Parcel Viewer on line at <https://gismaps.coconino.az.gov/parcelviewer/>. According to the county the contents of the Parcel Viewer “are subject to constant change, and may not be complete, accurate or current. Any specific coordinates may be in error by several hundred feet or more.” This may account for the odd parcel acreage numbers.

The Parcel View was inconsistent about reporting the most recent sale date and price for private parcels owned by others than Babbitt Ranches and Antelope Springs Land Company. When that information was provided, it is reported here.

T27N R4E

Section(s)	County Parcel #	Area (acres)	Owner
7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	50204001	9,611.99	Babbitt Ranches
8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust

T26N R4E

Section(s)	County Parcel #	Area (acres)	Owner
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 26, 27, 29, 33, 34 (E½ and NW¼), 35	50116001A	12,143.20	Babbitt Ranches
30, 31	50116001B	1,306.20	Antelope Springs Land Co.
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 28, 32, 34(SW¼), 36	–	–	Arizona State Trust

T27N R5E

Section(s)	County Parcel #	Area (acres)	Owner
7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	50205001	9,660.86	Babbitt Ranches
8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust

T26N R5E

Section(s)	County Parcel #	Area (acres)	Owner
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	50117001	11,354.02	Babbitt Ranches
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust

T27N R6E

Section(s)	County Parcel #	Area (acres)	Owner
7, 9, 17, 19, 21, 29, 31, 33	30212001	5,146.24	Babbitt Ranches
8,16, 18, 20, 28, 30, 32	–	–	Arizona State Trust

T26N R6E

Section(s)	County Parcel #	Area (acres)	Owner
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	30220001	11,354.02	Babbitt Ranches
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust

T25N R6E

Section(s)	County Parcel #	Area (acres)	Owner
18(SW¼)	30201001B	153.45	Babbitt Ranches
17(S½) and Section 20(N½,N½ and SW¼,NW¼) – Cedar Springs Forest Legacy Project / Coconino County Conservation Easement	30201001C	509.34	Babbitt Ranches
20(SE¼,NW¼ and S½,NE¼) – Cedar Springs Forest Legacy Project / Coconino County Conservation Easement	30201002	120.00	Babbitt Ranches
2–4, 9–12, 13–16	–	–	Arizona State Trust

T26N R7E

Section(s)	County Parcel Number	Area (acres)	Owner	
3(W½), 5, 7, 9, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	30219001	9,791.70	Babbitt Ranches	
4, 6, 8, 10(W½), 14, 16, 18, 20, 22, 24, 26, 28(SW¼), 30, 32, 34, 36	–	–	Arizona State Trust	
Private other than Babbitts				Sale Date
28(N1/2 and SE1/4)	30219002	480.00	Michelbach Investments LTD	1989

T25N R7E

Section(s)	County Parcel #	Area (acres)	Owner
1–18	–	–	Arizona State Trust

T27N R8E

Section(s)	County Parcel #	Area (acres)	Owner
3, 11, 13, 15, 23, 24(NE¼,SE¼), 25, 27, 33, 35	30208001A	5,801.28	Babbitt Ranches
1	30208001AB	640.00	Antelope Springs Land Co.
2(SE¼), 12, 14, 22, 24(W½ and NE¼ and NW¼, SE¼ and S½, SE¼), 26, 28, 34, 36	–	–	Arizona State Trust
2(N½,SW¼) and 10	–	1,120.00	Indian Allotment

T26N R8E

Section(s)	County Parcel #	Area (acres)	Owner
1, 3, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35	30217001A	10,208.68	Babbitt Ranches
2, 4, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust

T25N R8E

Section(s)	County Parcel #	Area (acres)	Owner	
4–9, 16, 17(E½ and NW¼ and E½, SW¼ and NW¼, SW¼), 18	–	–	Arizona State Trust	
Private other than Babbitts				Sale Date
17(SE¼ and SW¼,SW¼) – 40 small parcels	(see Figure 1)	200.00 Total	(see Figure 1)	–
16(S½,SE¼,SE¼)	30202001	11.35	Juniper Peaks LLC	2001
16(S½,SE¼,SE¼)	30202002	7.72	Fisher	–

<div>State Trust Lands</div>		30204004 Young xxxx, \$	30204003 Calley 1995, \$4,250	30204002 Cooper xxxx, \$	30204001 KC Moon xxxx, \$	
		30204005 Helfenstein 1983, \$1,700	30204006 Anderson xxxx, \$	30204007 Stevens xxxx, \$	30204008 Wrede xxxx, \$	
		30204013 Weber xxxx, \$	30204012 McMahon xxx, \$	30204011 McLellen xxxx, \$	30204009	Binkowski 1993, \$2,000
					30204010	Enger 1992, \$2,000
		30204014 Lawton 1994, \$3,500	30204015 Young xxxx, \$	30204016 AJPD xxxx, \$	30204017 Spannuth xxxx, \$	
		30204021 Johnson 2005, \$10,000	30204020 Pickett 2005, \$500	30204019 Savage 2012, \$30,000	30204018 Whitebear 1994, \$4,000	
		30204022 Forrest xxxx, \$	30204023 Forrest xxxx, \$	30204024 Deggendorf 1994, \$4,000	30204025 Vasku 2011, \$93,718	
		30204029A Frazier xxxx, \$	30204028 Childers xxxx, \$	30204027 Chavarria 2009, \$15,000	30204026 Klehmet xxxx, \$	
			30204031 SPetrino xxxx, \$	30204032 Kropp 2000, \$17,000	30204033 Kropp 1991, \$2,500	

Figure 1. T25N R8E, Section 17(S½)

T27N R9E

Section(s)	County Parcel #	Area (acres)	Owner
3, 9, 11, 13(S½), 15, 17, 18, 19, 21, 23, 25, 27, 29, 31, 33, 35	30209005A	9,870.84	Babbitt Ranches
1 – Parcel I in Fig. 2 – Sec. 1(W½,NW¼,NE¼)	30209001B	19.90	Babbitt Ranches
Parcel J in Fig. 2 – Sec. 1(E½,NW¼,NE¼ and E1/2,NE¼ and SW¼,NE¼ and NE¼,SE¼)	30209006A	179.84	Babbitt Ranches
Parcel K in Fig. 2 – Sec. 1(NW¼,SE¼)	30209001F	40.00	Babbitt Ranches
Parcel L in Fig. 2 – Sec. 1(S½,SE¼)	30209009	80.00	Babbitt Ranches
6 – Parcel A in Fig. 3 – Sec. 6(portion of N½,NE¼)	30211001A	44.16	Babbitt Ranches
7 – Parcels A in Fig. 4 – Sec. 7(most of section)	30210003F	611.74	Antelope Springs Land Co.
13(NE¼)	30209002	160.00	Babbitt Ranches
2, 4, 8, 10, 12, 14, 16, 20, 22, 26, 28, 30, 32, 34, 36	–	–	Arizona State Trust
24	–	640.00	BLM

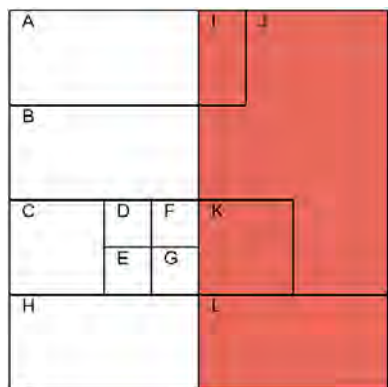


Figure 2. T27N R9E, Section 1

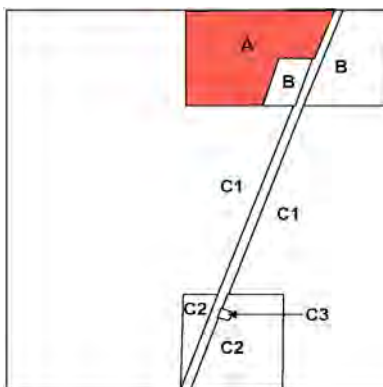


Figure 3. T27N R9E, Section 6

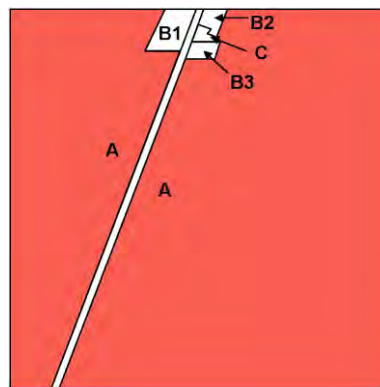


Figure 4. T27N R9E, Section 7

T27N R9E, continued

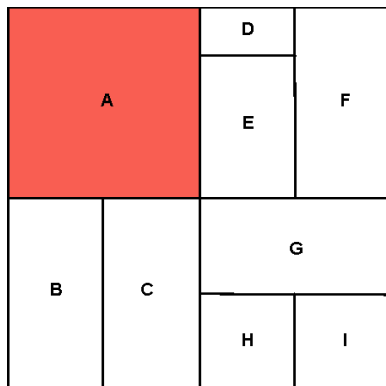
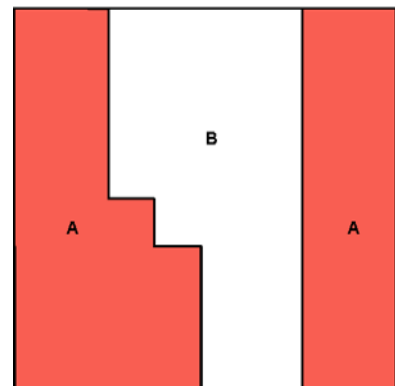
Section(s)	County Parcel #	Area (acres)	Owner	Sale Date, price
Private other than Babbitts				
1				
Parcel A in Fig. 2 – Sec. 1(N $\frac{1}{2}$,NW $\frac{1}{4}$)	30209004	79.22	Akkurt	2004, \$23,000
Parcel B in Fig. 2 – Sec. 1(S $\frac{1}{2}$,NW $\frac{1}{4}$)	30209001C	80.00	Akkurt	2004, \$21,000
Parcel C in Fig. 2 – Sec. 1(NW $\frac{1}{4}$,SW $\frac{1}{4}$)	30209001G	40.04	Akkurt	–
Parcel D in Fig. 2 – Sec. 1(NW $\frac{1}{4}$,NE $\frac{1}{4}$,SW $\frac{1}{4}$)	30209001H	10.00	Swick	2011, \$2,700
Parcel E in Fig. 2 – Sec. 1(SW $\frac{1}{4}$,NE $\frac{1}{4}$,SW $\frac{1}{4}$)	30209001K	10.00	Akkurt	–
Parcel F in Fig. 2 – Sec. 1(NE $\frac{1}{4}$,NE $\frac{1}{4}$,SW $\frac{1}{4}$)	30209001J	10.00	James	2010, \$5,200
Parcel G in Fig. 2 – Sec. 1(SE $\frac{1}{4}$,NE $\frac{1}{4}$,SW $\frac{1}{4}$)	30209001L	10.00	James	2009, \$5,200
Parcel H in Fig. 2 – Sec. 1(S $\frac{1}{2}$,SW $\frac{1}{4}$)	30209001E	80.00	Ariz Title Ins & Trust Co.	–
6				
Parcel B in Fig. 3 – Sec. 6(Portion of N $\frac{1}{2}$,NE $\frac{1}{4}$)	30211001B	29.05	Flagstaff Mission to the Navajos	–
Parcel C1 in Fig. 3 – Sec. 6(Portions of E $\frac{1}{2}$ and W $\frac{1}{2}$)	30211003	501.56	Clayton Investment Co.	2001, \$135,000
Parcel C2 in Fig. 3 – Sec. 6(SW $\frac{1}{4}$,SE $\frac{1}{4}$ less C3)	30211002A	37.23	Clayton Investment Co.	–
Parcel C3 in Fig. 3 – Sec. 6(Portion of SW $\frac{1}{4}$,SE $\frac{1}{4}$)	30211002B	0.48	Clayton Investment Co.	–
7				
Parcel B1 in Fig. 4 – Sec. 7(Portion of NE $\frac{1}{4}$,NW $\frac{1}{4}$)	30210003G	5.96	Clayton Investment Co.	–
Parcel B2 in Fig. 4 – Sec. 7(Portion of NW $\frac{1}{4}$,NE $\frac{1}{4}$)	302100001	2.2	Clayton Investment Co.	1998, \$250,000
Parcel B3 in Fig. 4 – Sec. 7(Portion of NW $\frac{1}{4}$,NE $\frac{1}{4}$)	302100003 E	2.3	Clayton Investment Co.	1993, \$41,000
Parcel C in Fig. 4 – Sec. 7(Portion of NW $\frac{1}{4}$,NE $\frac{1}{4}$)	302100002	1.1	Thriftway Marketing, Corp.	1988, \$220,000
13(NW $\frac{1}{4}$)	30209003	160.00	Solomon	2002, \$3,840

T26N R9E

Section(s)	County Parcel #	Area (acres)	Owner
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 32, 33, 35	30218001	12,132.80	Babbitt Ranches
14(E½ and NW¼) and 24(E½ and SW¼)	–	960.00	Indian Allotment
2, 4, 8, 10, 12, 14(SW¼), 16, 20, 22, 24(NW¼), 26, 28, 30, 34, 36	–	–	Arizona State Trust

T27N R10E

Section(s)	County Parcel #	Area (acres)	Owner
9	30215013	638.84	Babbitt Ranches
19, 29, 31	30215001	1,920.00	Babbitt Ranches
3(west of River)	30215002	85.32	Babbitt Ranches
5(NW¼ – see Parcel A in Fig. 5)	30215003	161.26	Babbitt Ranches
7(E½ and SW¼ and E½,NW¼ and S½,NW¼,NW¼)	30215012A	620.00	Babbitt Ranches
7(N½,NW¼,NW¼)	30215012B	20.00	Babbitt Ranches
17			
Parcel A in Fig. 6) – Sec. 17(NW¼ and SE¼ and NE¼,NE¼,SW¼)	30221001	330.00	Babbitt Ranches
Parcel B in Fig. 6 – Sec. 17(N½,SE¼,NE¼,SW¼ and SW¼,NE¼,SW¼ and S½,NW¼,NE¼,SW¼)	30221005A	20.00	Babbitt Ranches
Parcel C in Fig. 6 – Sec. 17(NW¼,NE¼)	30221002A	40.00	Babbitt Ranches
Parcel D in Fig. 6 – Sec. 17(S½,NE¼)	30221003	80.00	Babbitt Ranches
21	30215016	390.00	Babbitt Ranches
Parcels A in Fig. 7 – Sec. 21(E½,E½ and W½,W½ and SE¼,SW¼ and S½,NE¼,SW¼ and NW¼,NE¼,SW¼)			
27(NW¼,NW¼ northwest of River)	30215017	40.45	Babbitt Ranches
33, 34 (west of River)	30215018	531.75	Babbitt Ranches
6, 16, 18, 20,30, 32	–	–	Arizona State Trust
4, 8, 10(west of River), 22(west of River), 28(west of River)	–	ca. 2,189	Bureau of Reclamation

**Figure 5. T27N R10E, Section 5****Figure 6. T27N R10E, Section 17****Figure 7. T27N R10E, Section 21**

T27N R10E, continued

Section(s)	County Parcel #	Area (acres)	Owner	Sale Date
Private other than Babbitts				
5				
Parcel B in Fig. 5 – Sec. 5(W½,SW¼)	30215004	80.00	Solid Financial	2004, \$10
Parcel C in Fig. 5 – Sec. 5(E½,SW¼)	30215005	80.00	Bebbling	1998, \$23,000
Parcel D in Fig. 5 – Sec. 5(N½,NW¼,NE¼)	30215010	20.67	Solomon	2002, \$248
Parcel E in Fig. 5 – Sec. 5(S½,NW¼,NE¼ and SW¼,NE¼)	30215009	60.00	Hollmann	2006, \$18,500
Parcel F in Fig. 5 – Sec. 5(E½,NE¼)	30215011	80.71	Lussier/Wilkerson	–
Parcel G in Fig. 5 – Sec. 5(N½,SE¼)	3015008	80.00	Ennis	–
Parcel H in Fig. 5 – Sec. 5(SW¼,SE¼)	3015006	40.00	Chieftain Co.	1986, \$3,000
Parcel I in Fig. 5 – Sec. 5(SE¼,SE¼)	3015007	40.00	Chieftain Co.	–
15 (combined with Section 21, below)				
17				
Parcel E in Fig. 6 – Sec. 17 (N½,NW¼,NW¼,SW¼)	30221004	5.00	Arizona Land and Ranch	–
Parcel F in Fig. 6 – Sec. 17 (S½,NW¼,NW¼,SW¼)	30221007	5.00	Reiblein	–
Parcel G in Fig. 6 – Sec. 17 (W½,NE¼,NW¼,NE¼,SW¼ and NW¼,NW¼,NE¼,SW¼)	30221005B	3.75	Clark/Christensen/ Phelps	–
Parcel H in Fig. 6 – Sec. 17 (E½,NE¼,NW¼,NE¼,SW¼)	30221005C	1.25	Teich	–
Parcel I in Fig. 6 – Sec. 17 (S½,SE¼,NE¼,SW¼)	30221006	5.00	Spannuth	1990
Parcel J in Fig. 6 – Sec. 17(NE¼,NW¼,SW¼ and S½,NW¼,SW¼ and S½,SW¼)	30221008C	110.00	Dooley	–
Parcel K in Fig. 6 – Sec. 17(NW¼,NE¼,NE¼ and NW¼,SW¼,NE¼,NE¼)	30221002C	12.50	Spannuth	1986, \$2,500
Parcel L in Fig. 6 – Sec. 17 (S½,S½,NE¼,NE¼ and NE¼,SE¼,NE¼,NE¼ and NE¼,NE¼,NE¼)	30221002D	22.50	Pinal Medical Aid	–
Parcel M in Fig. 6 – Sec. 17 (NE¼,SW¼,NE¼,NE¼ and NW¼,SE¼,NE¼,NE¼)	30221002E	5.00	Brown	–
21				
Parcel B in Fig. 7 – Sec. 21(E½,NW¼ and W½,NE¼ and W½,SE¼ and NE¼,NE¼,SW¼ combined with portion of Section 15 west of River	30215015	499.36	Coughlan	1993, \$5,000

T26N R10E

Section(s)	County Parcel #	Area (acres)	Owner
5, 7, 9(west of River), 15(west of River), 17(N½ and SW¼), 19, 21(S½ and NE¼), 27(west of River), 31, 33, 35(south of river)	30207001A	5,197.18	Babbitt Ranches
16(SW¼), 21(NW¼)	30207001C	320.00	Antelope Springs Land Co
6, 8½, 16(E½, E½ and NW¼), 18, 30, 34(SW¼ and W½, NW¼)	–	–	Arizona State Trust
4(west of River), 8(E½), 16(W½, E½), 22(west of River), 28, 34(E½ west of River and E½, NW¼)	–	ca. 2,200	Bureau of Reclamation

APPENDIX C

**Custom Soil Resource Report
for Coconino County Area, Arizona, Central Part:
CO BAR Ranch**

CO Bar Ranch Land Use and Conservation Overview
Coconino County, Arizona



United States
Department of
Agriculture



NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Coconino County Area, Arizona, Central Part; and Little Colorado River Area, Arizona, Parts of Coconino and Navajo Counties

CO Bar Ranch



March 30, 2014

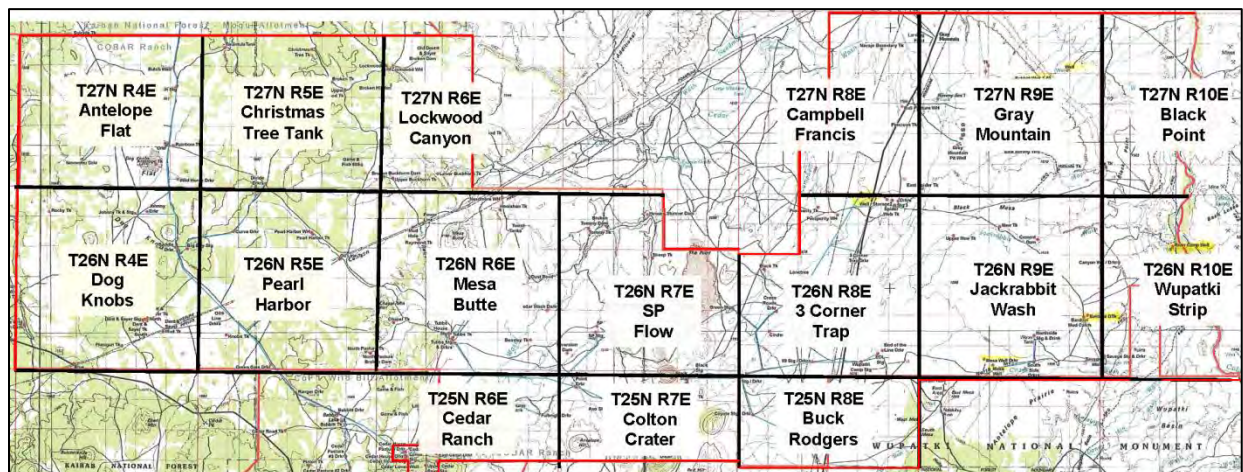
INTRODUCTION

The soils information presented in this report was compiled by SWCA Environmental Consultants¹ using the soil mapping function available from the Natural Resources Conservation Service's Web Soil Survey.² The report is divided into two sections:

Section 1 – Soils on CO Bar Ranch

Section 2 – Soil Type Descriptions

Due to the large size of the ranches, soil information is presented at the township level (16 townships within CO Bar Ranch). Information provided for each township includes a list of soil types found there and a map showing soil type distribution. Because of the Website's limitation on the size of area that can be mapped at one time, most of the township maps are composites of two smaller maps. For ease of reference, each township was assigned an informal name associated with a feature that occurs within that township (e.g., Antelope Flat and jackrabbit Wash).



¹ SWCA Environmental Consultants, Suite 100, 114 N. San Francisco St., Flagstaff, AZ 86001.

² See <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

SOILS ON ESPEE RANCH

A total of 48 soil types (i.e., Natural Resources Conservation Service Map Units) were mapped within CO Bar Ranch boundaries. Those soil types are listed in the table provided below, along with their approximate percentage of the total soils mapped. As shown in the table, most soil types are represented in small amounts, each accounting for 5 percent or less of all soils on the Ranch. Major exceptions are soils of the Winona Series (24% of all soils) and the Deama Series (15% of all soils). In addition, a single soils type—Tuweep very gravelly loam, 0 to 15 percent slopes—accounts for 10 percent of all soils, and another—Ashfork gravelly clay loam, 1 to 15 percent slopes—accounts for 9 percent of all soils.

NRCS Map Unit Number	Map Unit Name	Percent of Total Soils
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	9%
2	Aut gravelly loam, 0 to 8 percent slopes	2%
3	Aut-Cross association, moderately sloping	2%
5	Badland-Torriorthents complex, moderately steep	3%
10	Deama gravelly loam, 2 to 15 percent slopes	<1%
11	Deama stony loam, 1 to 15 percent slopes	5%
12	Deama-Rock outcrop complex, 8 to 30 percent slopes	1%
13	Deama-Toqui complex, 0 to 8 percent slopes	9%
15	Disterheff very gravelly sandy clay loam, 1 to 15 percent slopes	1%
18	Epikom complex, 0 to 15 percent slopes	5%
19	Epikom-Rock outcrop complex, 8 to 60 percent slopes	2%
22	Kopie-Servilleta association, moderately sloping	1%
23	Lava flows	1%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	5%
26	Navajo clay, 0 to 5 percent slopes	<1%
27	Palma sandy loam, 0 to 5 percent slopes	<1%
29	Paymaster-Lynx association, gently sloping	1%
31	Poley gravelly loam, 0 to 8 percent slopes	2%
33	Poley-Tusayan association, gently sloping	1%
34	Purgatory gravelly fine sandy loam, 0 to 8 percent slopes	<1%
35	Quivera very gravelly loam, 0 to 8 percent slopes	<1%
36	Riverwash	<1%
37	Rune silty clay loam, 0 to 8 percent slopes	1%
39	Servilleta fine sandy loam, 1 to 8 percent slopes	<1%
40	Servilleta-Tusayan complex, 1 to 8 percent slopes	<1%
44	Springerville very stony clay, 0 to 8 percent slopes	<1%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	2%
49	Thunderbird-Springerville association, strongly sloping	<1%
50	Torrifluvents, saline	1%
51	Tours silty clay loam, 0 to 8 percent slopes	1%
52	Tours-Ives association, gently sloping	<1%
55	Tusayan-Lynx association, gently sloping	<1%

NRCS Map Unit Number	Map Unit Name	Percent of Total Soils
56	Tuweep very gravelly loam, 0 to 15 percent slopes	10%
57	Valle gravelly silt loam, 0 to 8 percent slopes	<1%
58	Wilaha cindery loam, 2 to 30 percent slopes	<1%
60	Winona gravelly loam, 0 to 8 percent slopes	6%
61	Winona stony loam, 0 to 8 percent slopes	11%
63	Winona-Epikom association, gently sloping	3%
62	Winona-Boysag gravelly loams, 0 to 8 percent slopes	<1%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	1%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	3%
66	Winona-Tusayan association, gently sloping	<1%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	<1%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	2%
69	Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes	2%
70	Ziegler gravelly loam, 0 to 8 percent slopes	1%
71	Ziegler-Cross association, moderately sloping	4%
72	Ziegler-Wilaha association, strongly sloping	1%
73	Water	<1%
		100%

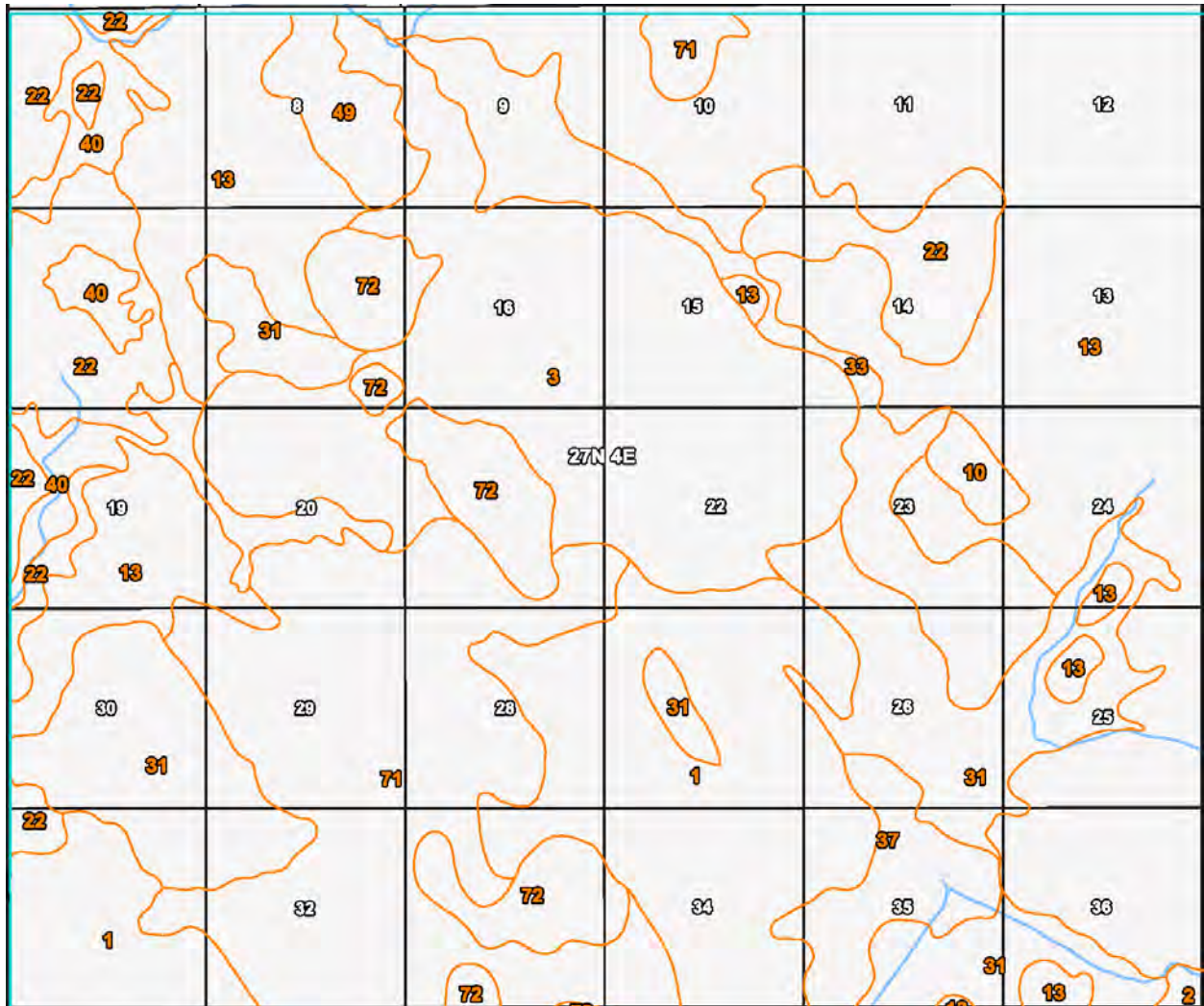
T27N R4E (Antelope Flat)

Soil types within T27N R4E (Antelope Flat) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	12%
2	Aut gravelly loam, 0 to 8 percent slopes	<1%
3	Aut-Cross association, moderately sloping	13%
10	Deama gravelly loam, 2 to 15 percent slopes	<1%
13	Deama-Toqui complex, 0 to 8 percent slopes	30%
22	Kopie-Servilleta association, moderately sloping	6%
31	Poley gravelly loam, 0 to 8 percent slopes	11%
33	Poley-Tusayan association, gently sloping	4%
37	Rune silty clay loam, 0 to 8 percent slopes	2%
40	Servilleta-Tusayan complex, 1 to 8 percent slopes	3%
49	Thunderbird-Springerville association, strongly sloping	1%
71	Ziegler-Cross association, moderately sloping	13%
72	Ziegler-Wilaha association, strongly sloping	4%
Total		100%

T27N R4E (Antelope Flat)

Distribution of Soil Types within T27N R4E (Antelope Flat) on CO Bar Ranch



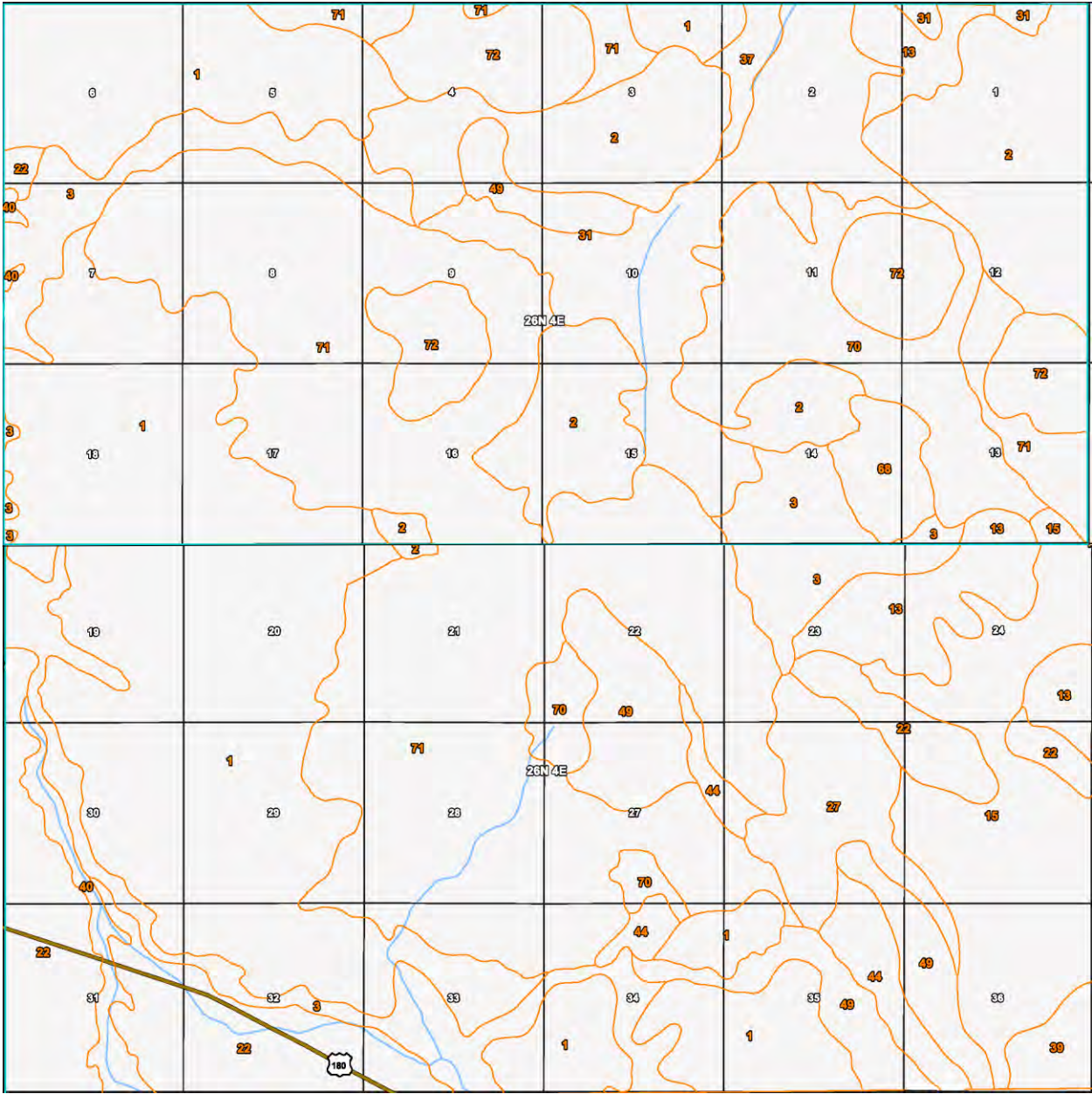
T26N R4E (Dog Knobs)

Soil types within T26N R4E (Dog Knobs) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	24%
2	Aut gravelly loam, 0 to 8 percent slopes	9%
3	Aut-Cross association, moderately sloping	7%
13	Deama-Toqui complex, 0 to 8 percent slopes	3%
15	Disterheff very gravelly sandy clay loam, 1 to 15 percent slopes	5%
22	Kopie-Servilleta association, moderately sloping	6%
27	Palma sandy loam, 0 to 5 percent slopes	2%
31	Poley gravelly loam, 0 to 8 percent slopes	5%
37	Rune silty clay loam, 0 to 8 percent slopes	<1%
39	Servilleta fine sandy loam, 1 to 8 percent slopes	1%
40	Servilleta-Tusayan complex, 1 to 8 percent slopes	1%
44	Springerville very stony clay, 0 to 8 percent slopes	1%
49	Thunderbird-Springerville association, strongly sloping	4%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	1%
70	Ziegler gravelly loam, 0 to 8 percent slopes	5%
71	Ziegler-Cross association, moderately sloping	22%
72	Ziegler-Wilaha association, strongly sloping	4%
Total		100%

T26N R4E (Dog Knobs)

Distribution of Soil Types within T26N R4E (Dog Knobs) on CO Bar Ranch



T27N R5E (Christmas Tree Tank)

Soil types within T27N R5E (Christmas Tree Tank) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
2	Aut gravelly loam, 0 to 8 percent slopes	3%
11	Deama stony loam, 1 to 15 percent slopes	32%
12	Deama-Rock outcrop complex, 8 to 30 percent slopes	3%
13	Deama-Toqui complex, 0 to 8 percent slopes	54%
22	Kopie-Servilleta association, moderately sloping	<1%
33	Poley-Tusayan association, gently sloping	<1%
37	Rune silty clay loam, 0 to 8 percent slopes	<1%
61	Winona stony loam, 0 to 8 percent slopes	<1%
62	Winona-Boysag gravelly loams, 0 to 8 percent slopes	7%
Total		100%

T27N R5E (Christmas Tree Tank)

Distribution of Soil Types within T27N R5E (Christmas Tree Tank) on CO Bar Ranch



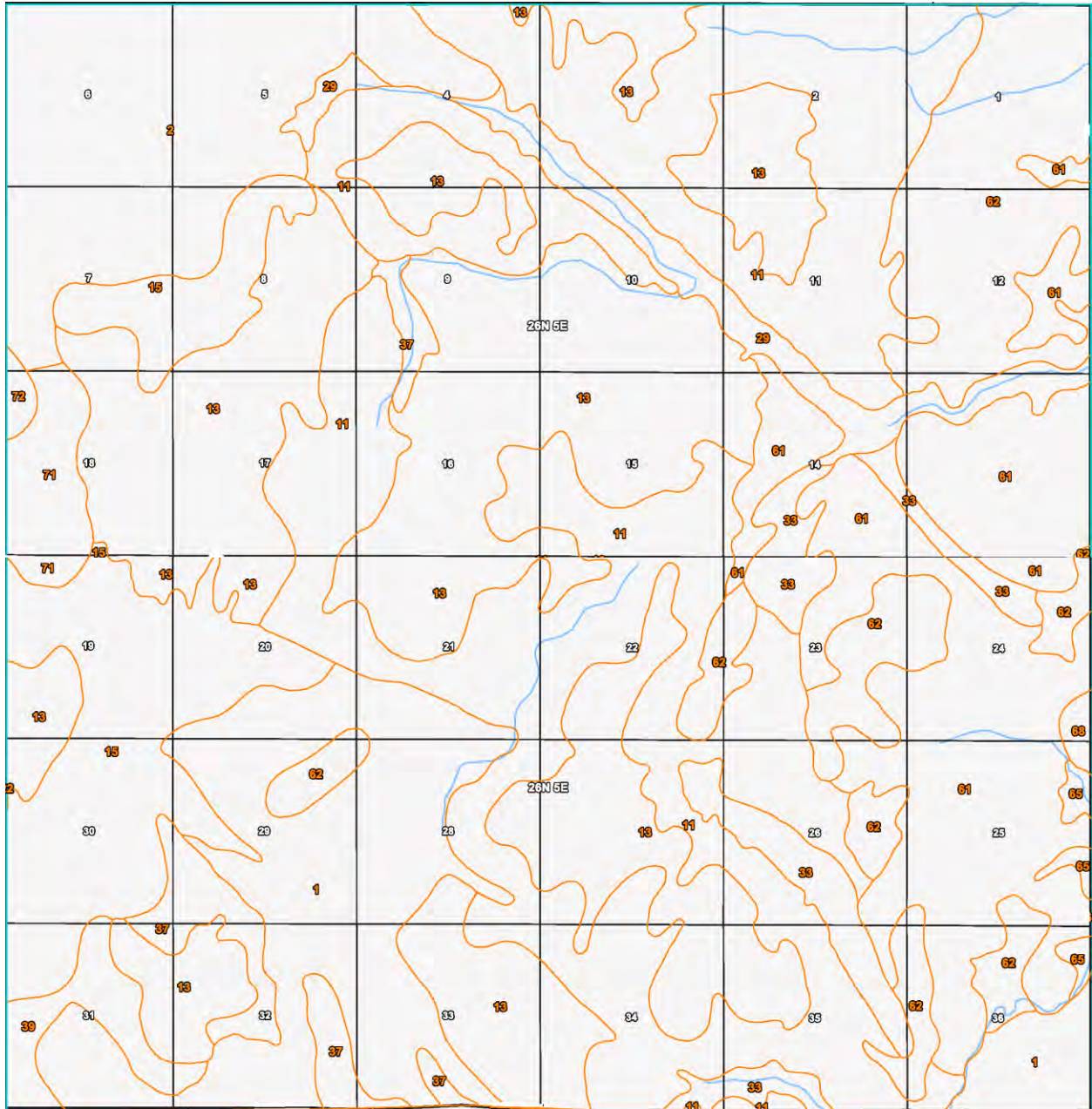
T26N R5E (Pearl Harbor Tank)

Soil types within T26N R5E (Pearl Harbor Tank) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	9%
2	Aut gravelly loam, 0 to 8 percent slopes	7%
11	Deama stony loam, 1 to 15 percent slopes	23%
13	Deama-Toqui complex, 0 to 8 percent slopes	24%
15	Disterheff very gravelly sandy clay loam, 1 to 15 percent slopes	7%
22	Kopie-Servilleta association, moderately sloping	<1%
29	Paymaster-Lynx association, gently sloping	2%
33	Poley-Tusayan association, gently sloping	3%
37	Rune silty clay loam, 0 to 8 percent slopes	2%
39	Servilleta fine sandy loam, 1 to 8 percent slopes	1%
61	Winona stony loam, 0 to 8 percent slopes	11%
62	Winona-Boysag gravelly loams, 0 to 8 percent slopes	8%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	<1%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	<1%
Total		100%

T26N R5E (Pearl Harbor Tank)

Distribution of Soil Types within T26N R5E (Pearl Harbor Tank) on CO Bar Ranch

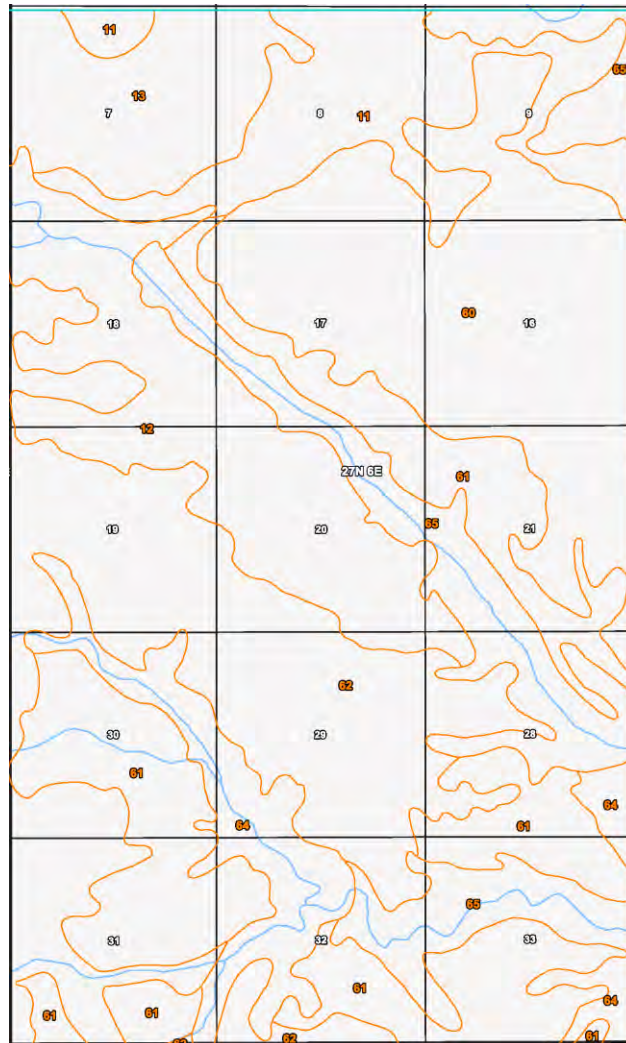


T27N R6E (Lockwood Canyon)

Soil types within T27N R6E (Lockwood Canyon) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
11	Deama stony loam, 1 to 15 percent slopes	8%
12	Deama-Rock outcrop complex, 8 to 30 percent slopes	11%
13	Deama-Toqui complex, 0 to 8 percent slopes	6%
60	Winona gravelly loam, 0 to 8 percent slopes	17%
61	Winona stony loam, 0 to 8 percent slopes	19%
62	Winona-Boysag gravelly loams, 0 to 8 percent slopes	21%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	6%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	11%
Total		100%

Distribution of Soil Types within T27N R6E (Lockwood Canyon) on CO Bar Ranch



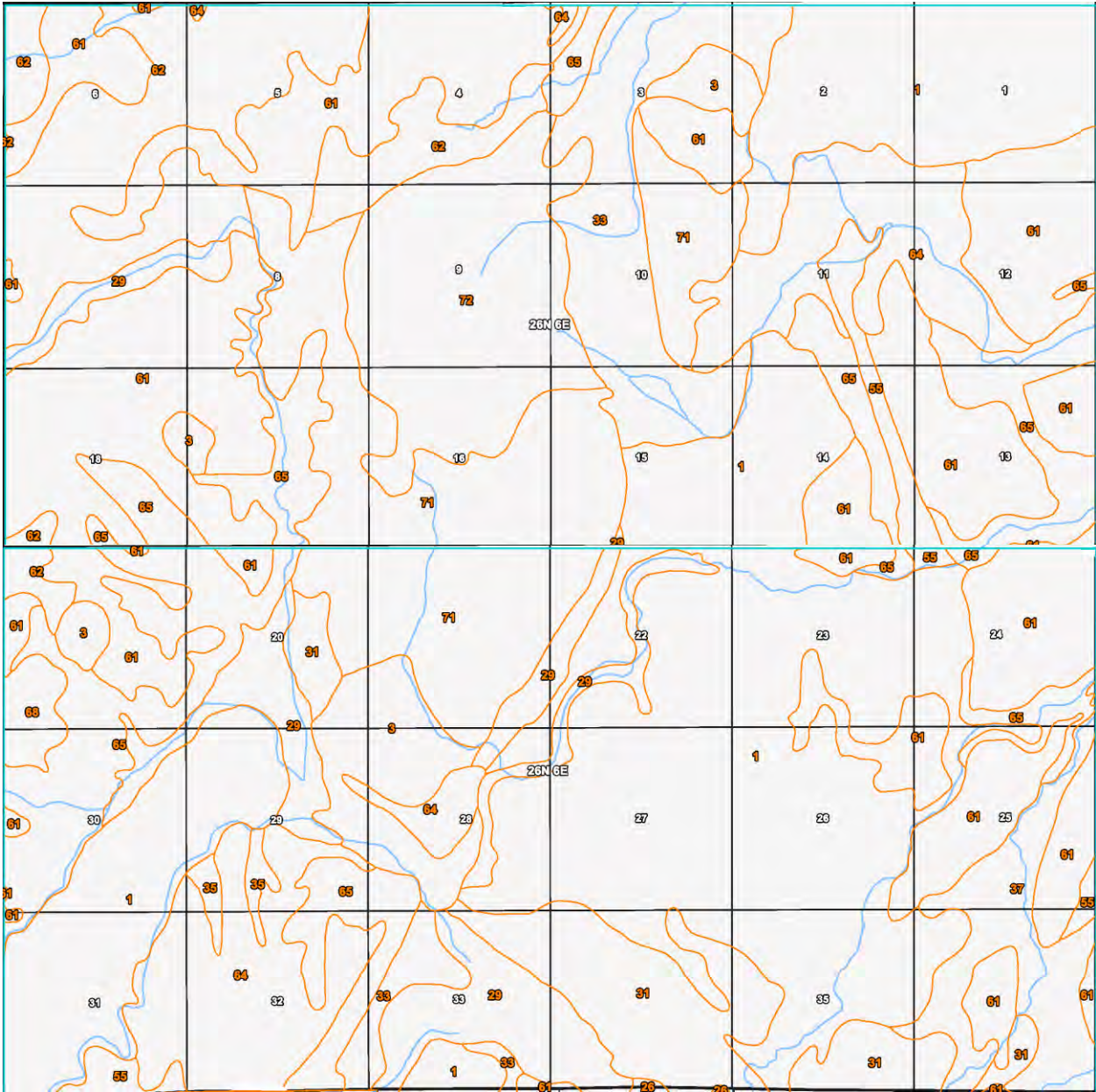
T26N R6E (Mesa Butte)

Soil types within T26N R6E (Mesa Butte) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	25%
3	Aut-Cross association, moderately sloping	3%
26	Navajo clay, 0 to 5 percent slopes	<1%
29	Paymaster-Lynx association, gently sloping	5%
31	Poley gravelly loam, 0 to 8 percent slopes	4%
33	Poley-Tusayan association, gently sloping	4%
35	Quivera very gravelly loam, 0 to 8 percent slopes	<1%
37	Rune silty clay loam, 0 to 8 percent slopes	2%
55	Tusayan-Lynx association, gently sloping	1%
61	Winona stony loam, 0 to 8 percent slopes	20%
62	Winona-Boysag gravelly loams, 0 to 8 percent slopes	6%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	7%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	9%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	1%
71	Ziegler-Cross association, moderately sloping	9%
72	Ziegler-Wilaha association, strongly sloping	5%
Total		100%

T26N R6E (Mesa Butte)

Distribution of Soil Types within T26N R6E (Mesa Butte) on CO Bar Ranch



T25N R6E (Cedar Ranch)

Soil types within T25N R6E (Cedar Ranch) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	58%
19	Epikom-Rock outcrop complex, 8 to 60 percent slopes	<1%
26	Navajo clay, 0 to 5 percent slopes	5%
29	Paymaster-Lynx association, gently sloping	<1%
31	Poley gravelly loam, 0 to 8 percent slopes	5%
33	Poley-Tusayan association, gently sloping	2%
37	Rune silty clay loam, 0 to 8 percent slopes	3%
44	Springerville very stony clay, 0 to 8 percent slopes	1%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	3%
52	Tours-Ives association, gently sloping	1%
61	Winona stony loam, 0 to 8 percent slopes	7%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	4%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	2%
NOTCOM	Not Completed (no data)	10%
Total		100%

T25N R6E (Cedar Ranch)

Distribution of Soil Types within T25N R6E (Cedar Ranch) on CO Bar Ranch

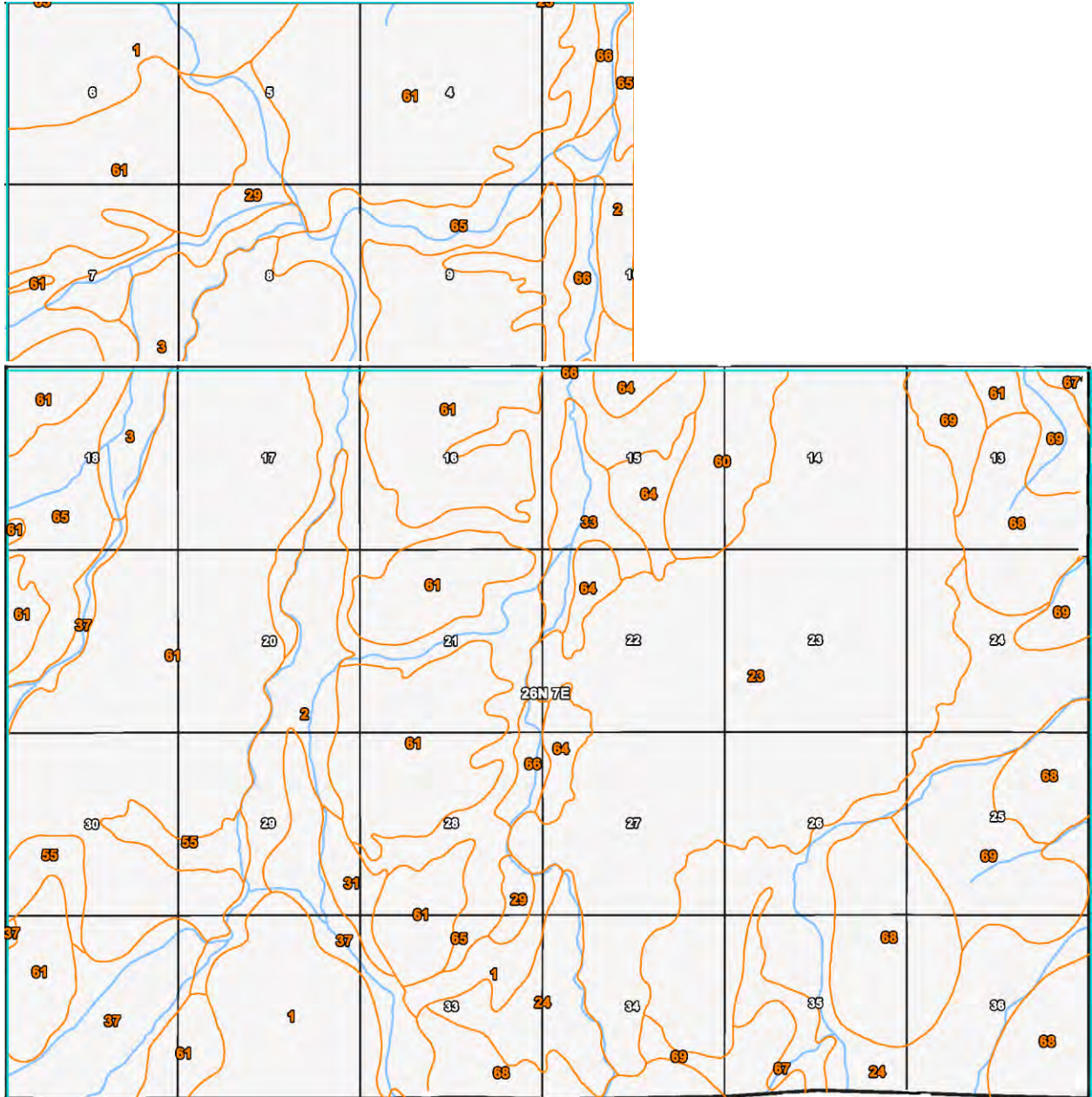


T26N R7E (SP Flow)

Soil types within T26N R7E (SP Flow) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	6%
2	Aut gravelly loam, 0 to 8 percent slopes	3%
3	Aut-Cross association, moderately sloping	2%
23	Lava flows	15%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	8%
29	Paymaster-Lynx association, gently sloping	2%
31	Poley gravelly loam, 0 to 8 percent slopes	<1%
33	Poley-Tusayan association, gently sloping	1%
37	Rune silty clay loam, 0 to 8 percent slopes	4%
51	Tours silty clay loam, 0 to 8 percent slopes	<1%
55	Tusayan-Lynx association, gently sloping	1%
60	Winona gravelly loam, 0 to 8 percent slopes	1%
61	Winona stony loam, 0 to 8 percent slopes	32%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	2%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	11%
66	Winona-Tusayan association, gently sloping	1%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	1%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	7%
69	Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes	4%
Total		100%

Distribution of Soil Types within T26N R7E (SP Flow) on CO Bar Ranch



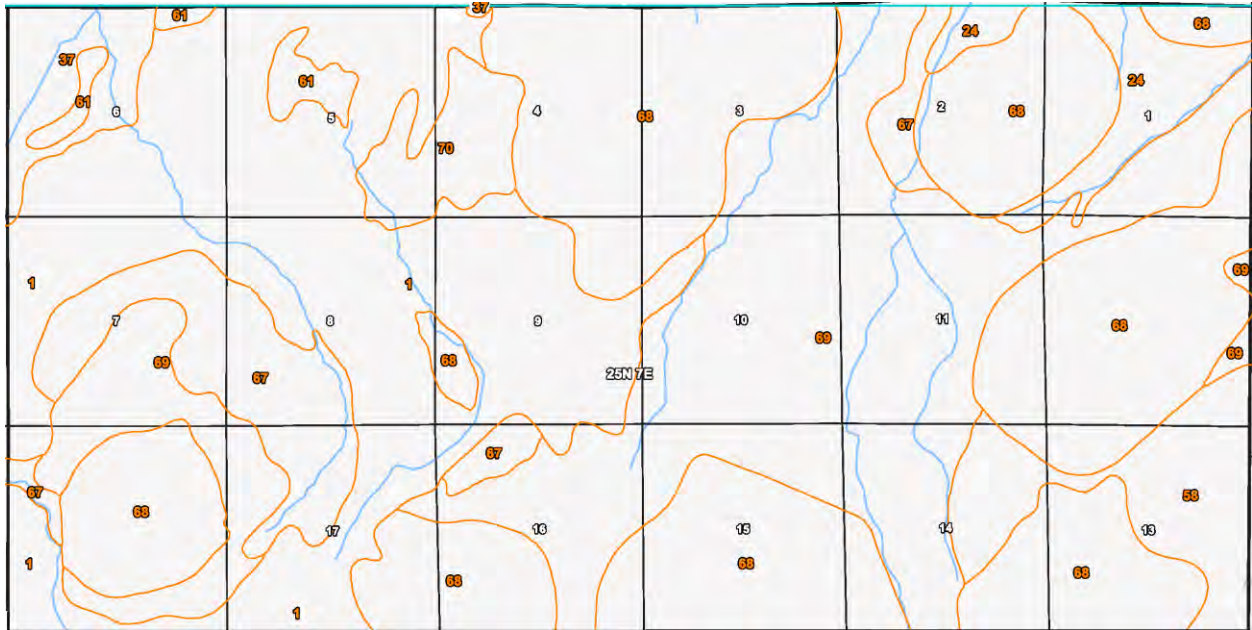
T25N R7E (Colton Crater)

Soil types within T25N R7E (Colton Crater) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	23%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	3%
37	Rune silty clay loam, 0 to 8 percent slopes	2%
58	Wilaha cindery loam, 2 to 30 percent slopes	4%
61	Winona stony loam, 0 to 8 percent slopes	1%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	6%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	34%
69	Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes	24%
70	Ziegler gravelly loam, 0 to 8 percent slopes	2%
Total		100%

T25N R7E (Colton Crater)

Distribution of Soil Types within T25N R7E (Colton Crater) on CO Bar Ranch



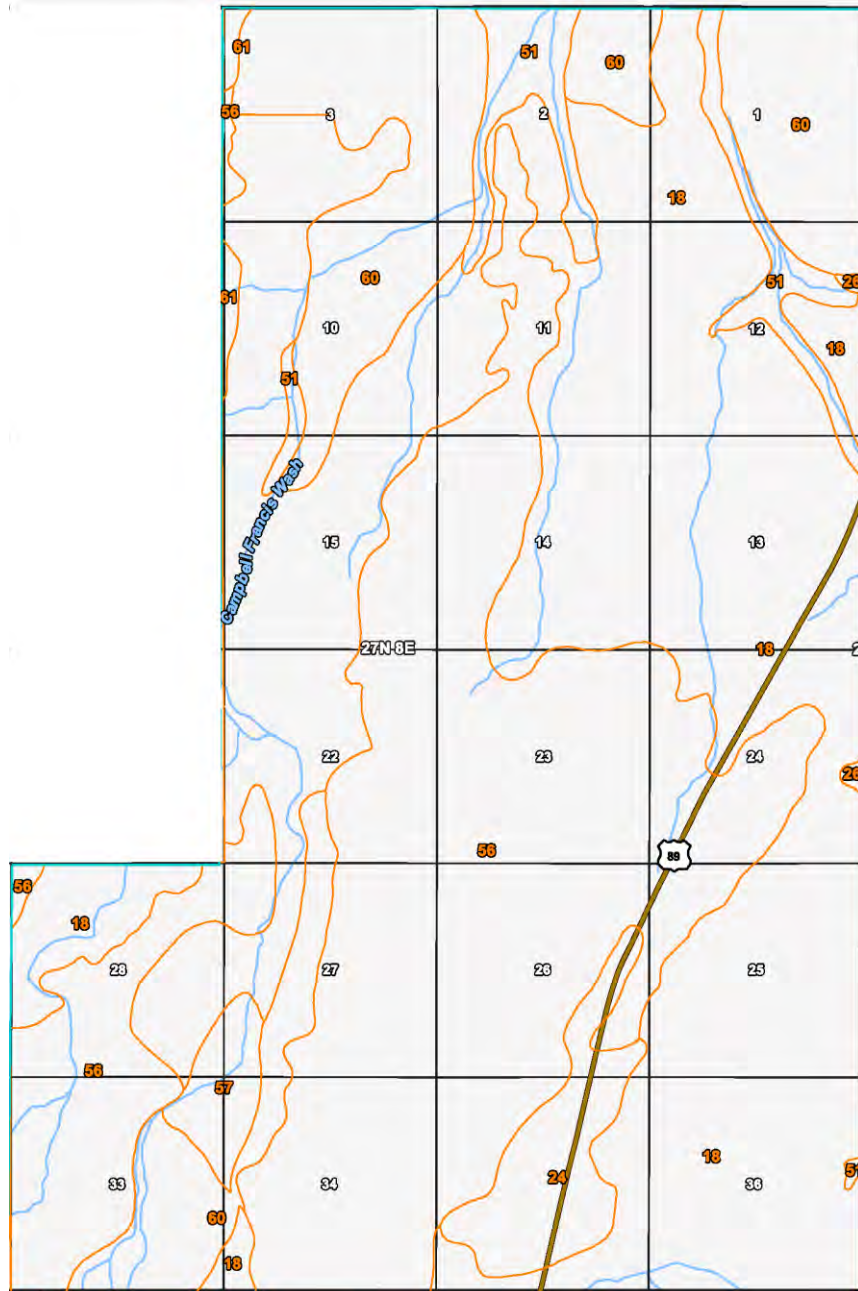
T27N R8E (Campbell Francis)

Soil types within T27N R8E (Campbell Francis) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
18	Epikom complex, 0 to 15 percent slopes	45%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	3%
26	Navajo clay, 0 to 5 percent slopes	<1%
51	Tours silty clay loam, 0 to 8 percent slopes	3%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	33%
57	Valle gravelly silt loam, 0 to 8 percent slopes	1%
60	Winona gravelly loam, 0 to 8 percent slopes	14%
61	Winona stony loam, 0 to 8 percent slopes	<1%
Total		100%

T27N R8E (Campbell Francis)

Distribution of Soil Types within T27N R8E (Campbell Francis) on CO Bar Ranch



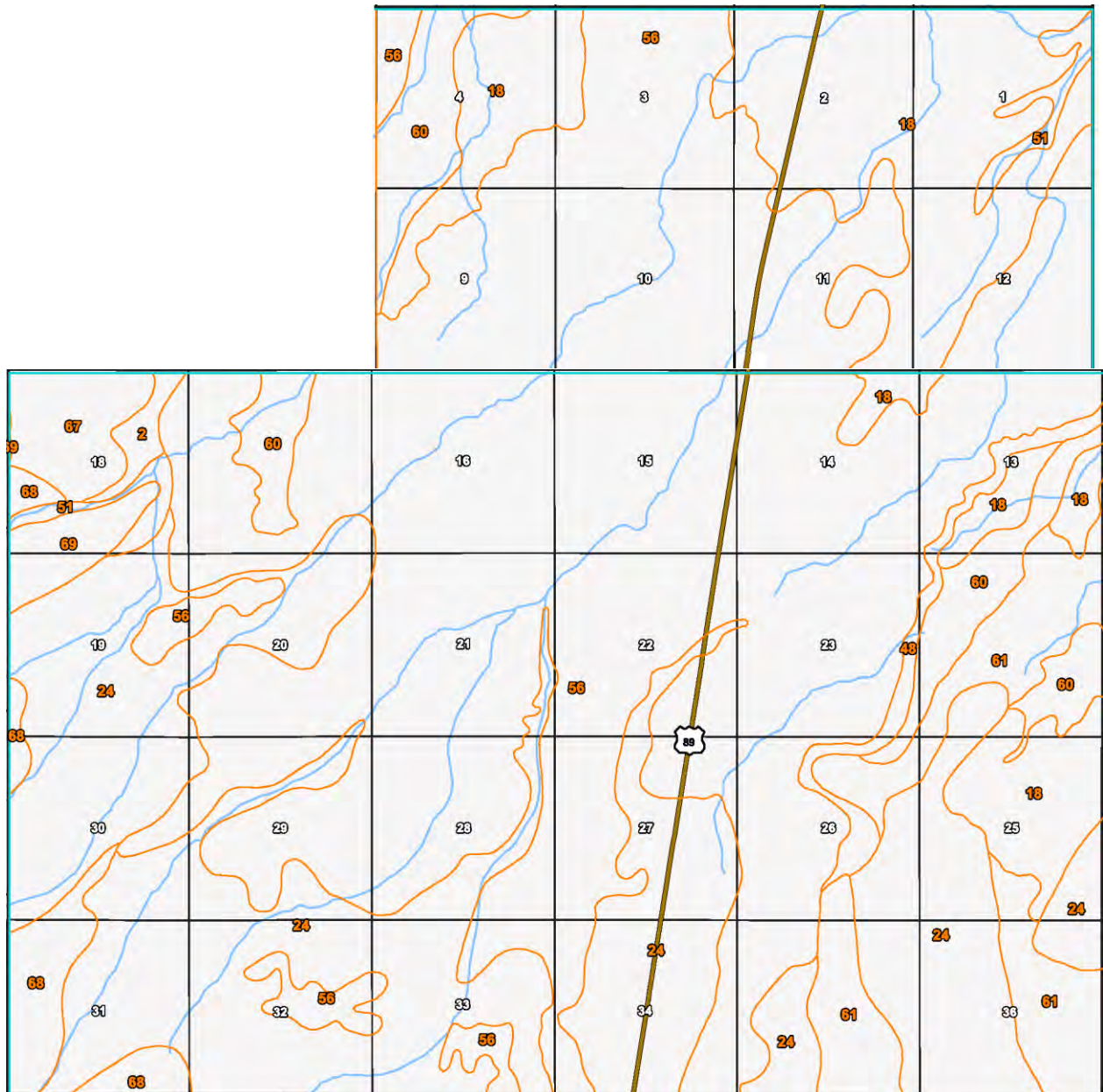
T26N R8E (3 Corner Trap)

Soil types within T26N R8E (3 Corner Trap) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
2	Aut gravelly loam, 0 to 8 percent slopes	<1%
18	Epikom complex, 0 to 15 percent slopes	13%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	24%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	1%
51	Tours silty clay loam, 0 to 8 percent slopes	1%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	48%
60	Winona gravelly loam, 0 to 8 percent slopes	4%
61	Winona stony loam, 0 to 8 percent slopes	5%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	1%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	2%
69	Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes	1%
Total		100%

T26N R8E (3 Corner Trap)

Distribution of Soil Types within T26N R8E (3 Corner Trap) on CO Bar Ranch



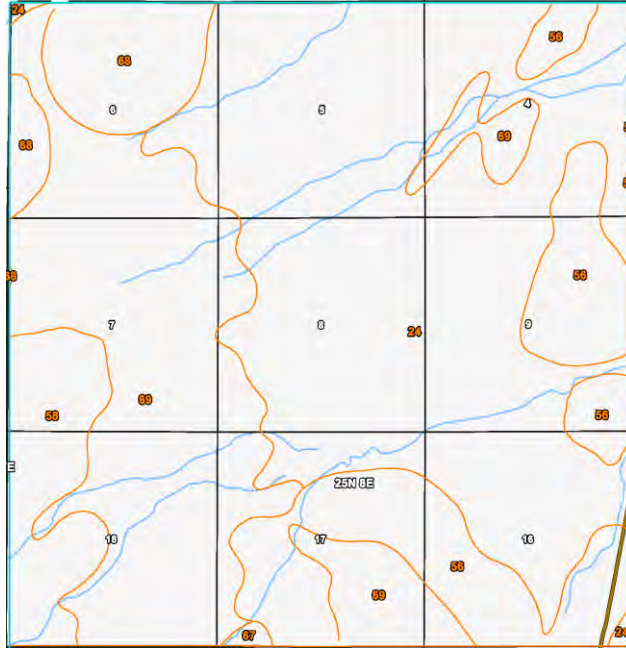
T25N R8E (Buck Rodgers)

Soil types within T25N R8E (Buck Rodgers) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	44%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	15%
58	Wilaha cindery loam, 2 to 30 percent slopes	6%
67	Wukoki-Rock outcrop complex, 5 to 25 percent slopes	<1%
68	Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes	6%
69	Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes	28%
Total		100%

T25N R8E (Buck Rodgers)

Distribution of Soil Types within T25N R8E (Buck Rodgers) on CO Bar Ranch



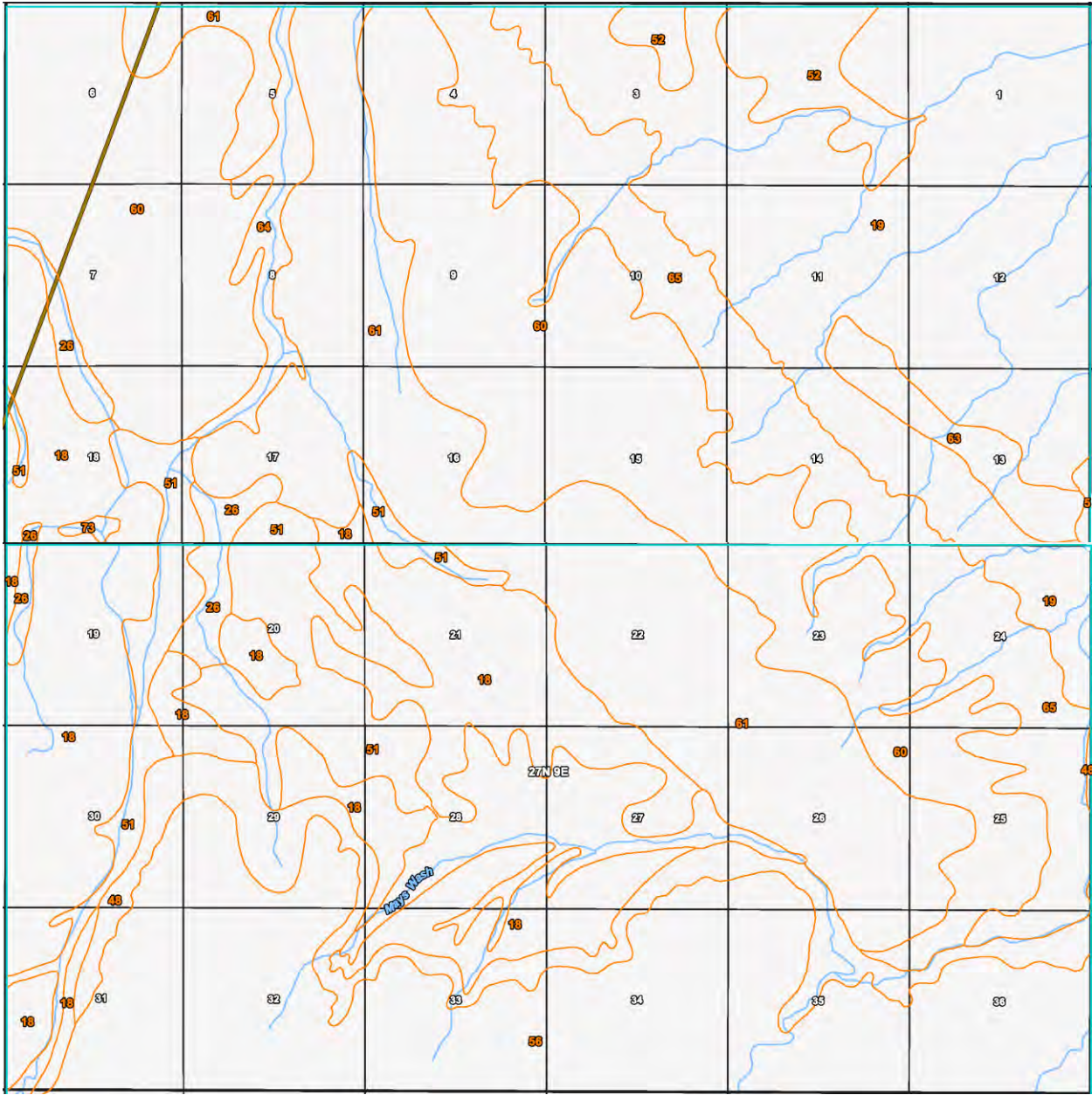
T27N R9E (Gray Mountain)

Soil types within T27N R9E (Gray Mountain) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
5	Badland-Torriorthents complex, moderately steep	<1%
18	Epikom complex, 0 to 15 percent slopes	16%
19	Epikom-Rock outcrop complex, 8 to 60 percent slopes	10%
26	Navajo clay, 0 to 5 percent slopes	2%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	4%
51	Tours silty clay loam, 0 to 8 percent slopes	9%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	17%
60	Winona gravelly loam, 0 to 8 percent slopes	17%
61	Winona stony loam, 0 to 8 percent slopes	14%
63	Winona-Epikom association, gently sloping	1%
64	Winona-Rock outcrop complex, 15 to 30 percent slopes	1%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	7%
73	Water	<1%
Total		100%

T27N R9E (Gray Mountain)

Distribution of Soil Types within T27N R9E (Gray Mountain) on CO Bar Ranch



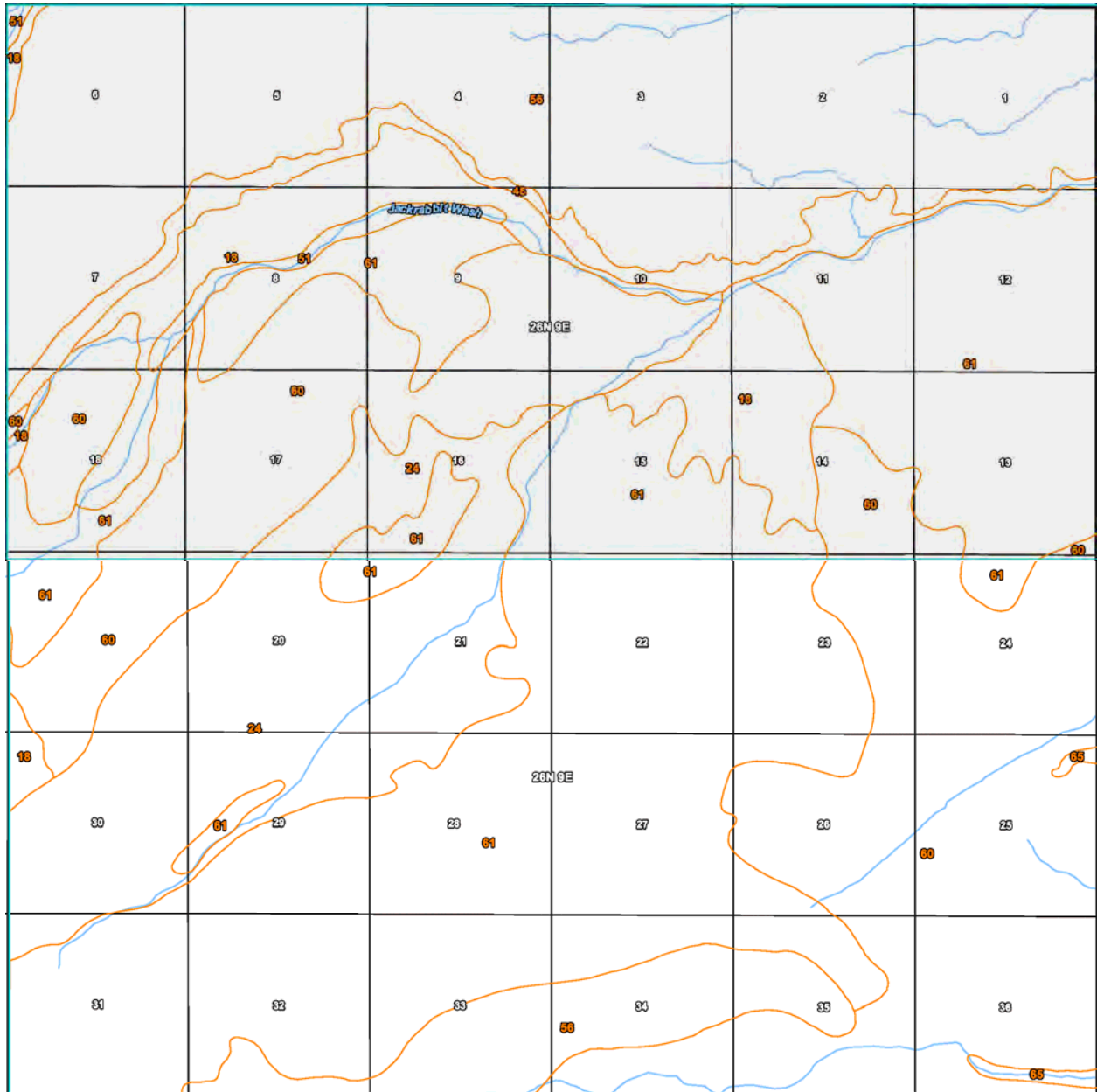
T26N R9E (Jackrabbit Wash)

Soil types within T26N R9E (Jackrabbit Wash) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
18	Epikom complex, 0 to 15 percent slopes	6%
24	Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes	11%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	2%
51	Tours silty clay loam, 0 to 8 percent slopes	1%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	22%
60	Winona gravelly loam, 0 to 8 percent slopes	24%
61	Winona stony loam, 0 to 8 percent slopes	35%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	<1%
Total		100%

T26N R9E (Jackrabbit Wash)

Distribution of Soil Types within T26N R9E (Jackrabbit Wash) on CO Bar Ranch



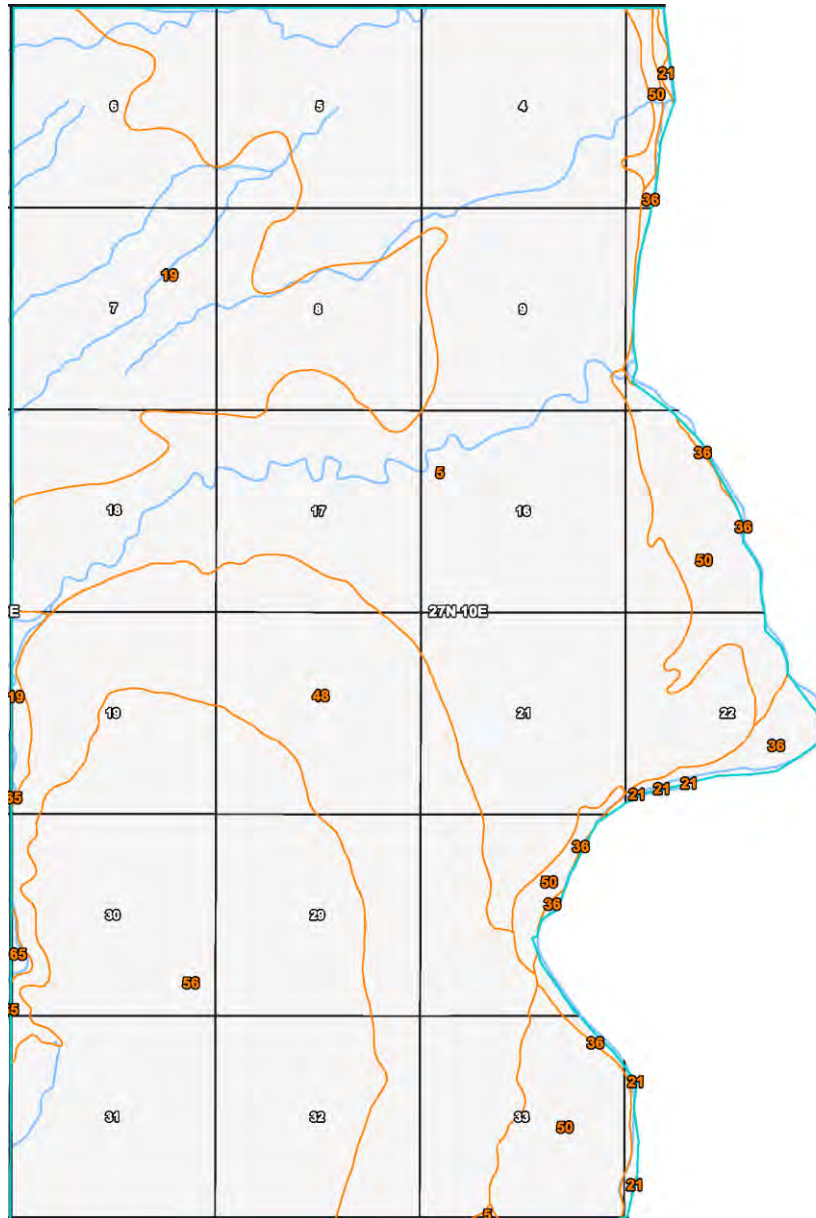
T27N R10E (Black Point)

Soil types within T27N R10E (Black Point) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
5	Badland-Torriorthents complex, moderately steep	39%
19	Epikom-Rock outcrop complex, 8 to 60 percent slopes	15%
36	Riverwash	2%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	17%
50	Torrifluvents, saline	7%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	20%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	<1%
Total		100%

T27N R10E (Black Point)

Distribution of Soil Types within T27N R10E (Black Point) on CO Bar Ranch



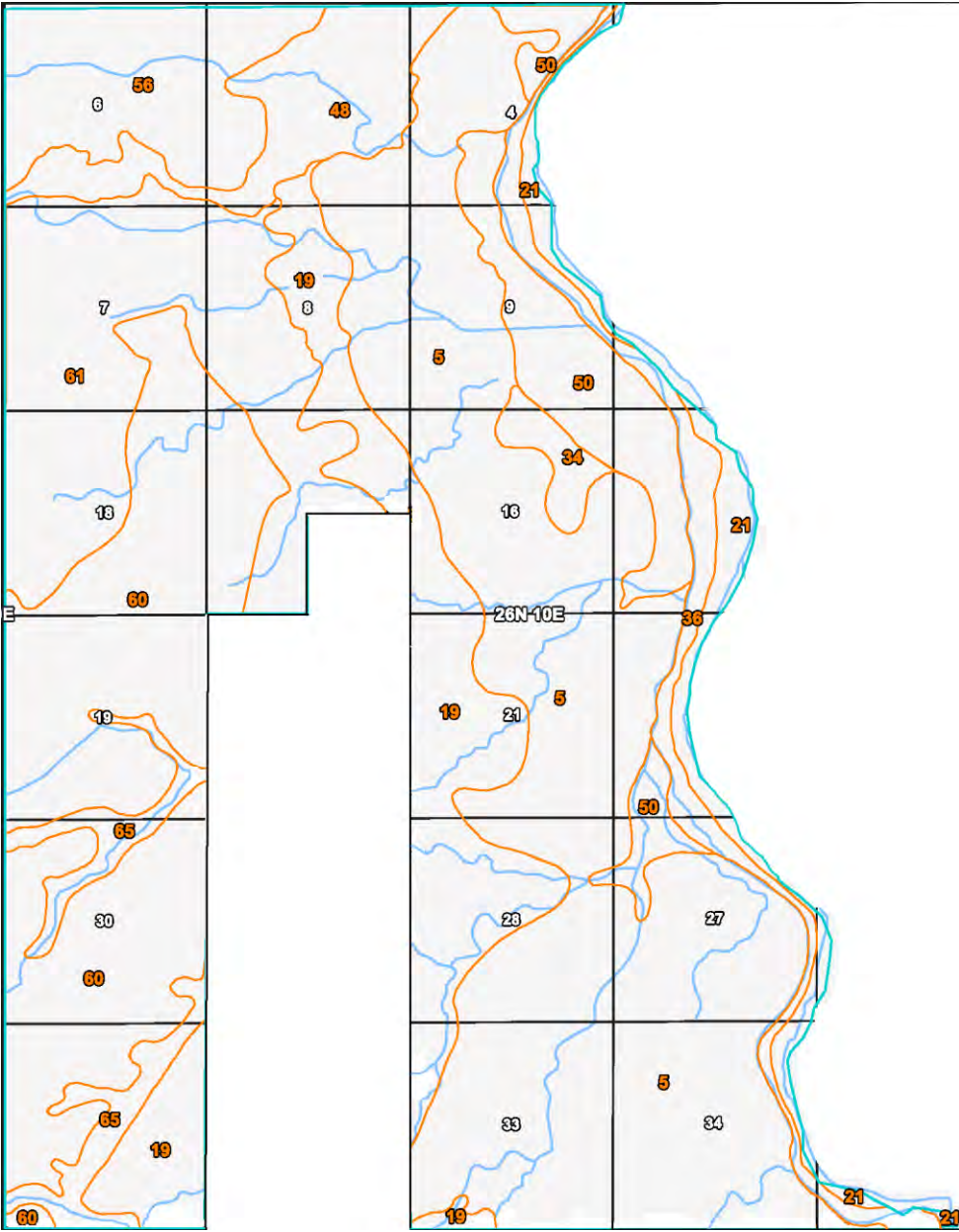
T26N R10E (Wupatki Strip)

Soil types within T26N R10E (Wupatki Strip) on CO Bar Ranch

Map Unit Symbol	Map Unit Name	Percent of Township
5	Badland-Torriorthents complex, moderately steep	35%
19	Epikom-Rock outcrop complex, 8 to 60 percent slopes	11%
34	Purgatory gravelly fine sandy loam, 0 to 8 percent slopes	1%
36	Riverwash	3%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	5%
50	Torrifluvents, saline	6%
56	Tuweep very gravelly loam, 0 to 15 percent slopes	6%
60	Winona gravelly loam, 0 to 8 percent slopes	19%
61	Winona stony loam, 0 to 8 percent slopes	13%
65	Winona-Rock outcrop complex, 30 to 70 percent slopes	3%
Total		98%

T26N R10E (Wupatki Strip)

Distribution of Soil Types within T26N R10E (Wupatki Strip) on CO Bar Ranch



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SOIL TYPE DESCRIPTIONS

1 Ashfork gravelly clay loam, 1 to 15 percent slopes

Map Unit Composition – 100 percent Ashfork gravelly clay loam, 1 to 15 percent slopes

Parent material: Colluvium and/or alluvium derived from basalt and/or pyroclastic rock

Slope: 1 to 15 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Gravelly clay loam

2 to 17 inches: Clay loam

17 to 30 inches: Stony loam

30 to 34 inches: Unweathered bedrock

2 Aut gravelly loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Aut gravelly loam, 0 to 8 percent slopes

Landform: Mesas, plateaus

Parent material: Alluvium derived from basalt and/or limestone

Slope: 0 to 8 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 7 inches: Gravelly loam

7 to 26 inches: Gravelly loam

26 to 38 inches: Cobbly loam

38 to 42 inches: Unweathered bedrock

3 Aut-Cross association, moderately sloping

Map Unit Composition – Aut and similar soils: 60 percent / Cross and similar soils: 30 percent

Aut (60%; Described in Map Unit 2, above)

Cross (30%)

Landform: Mesas, plateaus

Parent material: Colluvium and/or alluvium derived from basalt and/or pyroclastic rock

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 3 inches: Very stony clay loam

3 to 14 inches: Clay loam

14 to 19 inches: Cobbly clay loam

19 to 23 inches: Unweathered bedrock

5 Badland-Torriorthents complex, moderately steep

Map Unit Composition – Badland: 55 percent / Torriorthents and similar soils: 25 percent

Torriorthents (25%)

Landform: Hillsides, mesas

Parent material: Mixed colluvium and/or alluvium

Slope: 0 to 60 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Badland (25)

10 Deama gravelly loam, 2 to 15 percent slopes

Map Unit Composition – 100 percent Deama and similar soils:

Landform: Hills

Parent material: Alluvium and/or colluvium derived from limestone and/or calcareous sandstone

Slope: 2 to 15 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 7 inches: Gravelly loam

7 to 19 inches: Very cobbly loam

19 to 23 inches: Unweathered bedrock

11 Deama stony loam, 1 to 15 percent slopes

Map Unit Composition – 100 percent Deama and similar soils

Landform: Hills

Parent material: Alluvium and/or colluvium derived from limestone and/or calcareous sandstone

Slope: 1 to 15 percent

Surface area covered with cobbles, stones or boulders: 0.1 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 7 inches: Stony loam

7 to 19 inches: Very cobbly loam

19 to 23 inches: Unweathered bedrock

12 Deama-Rock outcrop complex, 8 to 30 percent slopes

Map Unit Composition – Deama and similar soils: 60 percent / Rock outcrop: 30 percent

Deama (60%)

Landform: Hills

Parent material: Alluvium and/or colluvium derived from limestone and/or calcareous sandstone

Slope: 8 to 30 percent

Surface area covered with cobbles, stones or boulders: 0.1 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 7 inches: Stony loam

7 to 19 inches: Very cobbly loam

19 to 23 inches: Unweathered bedrock

Rock outcrop (30%)

13 Deama-Toqui complex, 0 to 8 percent slopes

Map Unit Composition – Deama [0 to 8 percent] and similar soils: 45 percent / Toqui and similar soils: 35 percent

Map Unit Composition –

Deama [0 to 8 percent] (45%)

Landform: Hills

Parent material: Alluvium and/or colluvium derived from limestone and/or calcareous sandstone

Slope: 0 to 8 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 7 inches: Gravelly loam

7 to 19 inches: Very cobbly loam

19 to 23 inches: Unweathered bedrock

Toqui (35%)

Landform: Plateaus

Parent material: Eolian sands and/or alluvium derived from limestone and sandstone

Slope: 0 to 8 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 45 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 3 inches: Fine sandy loam

3 to 15 inches: Clay

15 to 19 inches: Very gravelly clay loam

19 to 23 inches: Unweathered bedrock

15 Disterheff very gravelly sandy clay loam, 1 to 15 percent slopes

Map Unit Composition – 100 percent Disterheff very gravelly sandy clay loam, 1 to 15 percent slopes

Landform: Hills, fan terraces

Parent material: Colluvium and/or alluvium derived from basalt and/or pyroclastic rock and/or quartzite

Slope: 1 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline

Typical profile

0 to 6 inches: Very gravelly sandy clay loam

6 to 24 inches: Clay

24 to 60 inches: Very gravelly clay loam

18 Epikom complex, 0 to 15 percent slopes

Map Unit Composition – Epikom 0 to 8 percent and similar soils: 50 percent; Epikom 8 to 15 percent and similar soils: 40 percent

Landform: Mesas, plateaus

Parent material: Eolian sands and/or alluvium derived from limestone and sandstone and/or pyroclastic rock

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline

Typical profile:

0 to 3 inches: Fine sandy loam

3 to 15 inches: Gravelly loam

15 to 19 inches: Unweathered bedrock

19 Epikom-Rock outcrop complex, 8 to 60 percent slopes

Map Unit Composition – Epikom [8 to 15 percent] and similar soils: 70 percent / Rock outcrop: 20 percent

Epikom 8 to 15 percent (70%)

(Described in Map Unit 18, above)

Rock outcrop (20%)

22 Kopie-Servilleta association, moderately sloping

Map Unit Composition – Kopie and similar soils: 60 percent / Servilleta and similar soils: 30 percent

Kopie (60%)

Landform: Plateaus, mesas

Parent material: Eolian sands over sandstone and shale

Slope: 1 to 15 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 2 inches: Gravelly fine sandy loam

2 to 6 inches: Loam

6 to 14 inches: Channery loam

14 to 18 inches: Unweathered bedrock

Servilleta (30%)

Landform: Mesas, plateaus

Parent material: Alluvium derived from sandstone and shale and/or quartzite

Slope: 0 to 8 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 2 inches: Fine sandy loam

2 to 17 inches: Clay

17 to 34 inches: Clay loam

34 to 38 inches: Unweathered bedrock

23 Lava flows

Map Unit Composition – 100 percent Lava flows

Landform: Lava flows on plateaus

Parent material: Residuum weathered from basalt

24 Lomaki-Nalaki very cindery loams, 0 to 8 percent slopes

Map Unit Composition – Lomaki and similar soils: 60 percent / Nalaki and similar soils: 30 percent

Lomaki (60%)

Landform: Fan terraces

Parent material: Alluvium derived from pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 3 inches: Very gravelly loam

3 to 24 inches: Very gravelly loam

24 to 60 inches: Cinders

Nalaki (30%)

Landform: Fan terraces

Parent material: Alluvium derived from pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: 20 to 40 inches to duripan

Drainage class: Well drained

Calcium carbonate, maximum content: 25 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 10 inches: Very gravelly loam

10 to 21 inches: Extremely gravelly loam

21 to 27 inches: Indurated

27 to 60 inches: Cinders

26 Navajo clay, 0 to 5 percent slopes

Map Unit Composition – 100 percent Navajo clay

Landform: Flood plains, basin floors

Parent material: Mixed alluvium

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline

Typical profile:

0 to 14 inches: Clay

14 to 60 inches: Clay

27 Palma sandy loam, 0 to 5 percent slopes

Map Unit Composition – 100 percent Palma and similar soils

Landform: Fan terraces

Parent material: Wind worked mixed alluvium

Slope: 0 to 5 percent

Surface area covered with cobbles, stones or boulders:

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 6 inches: Sandy loam

6 to 60 inches: Sandy loam

29 Paymaster-Lynx association, gently sloping

Map Unit Composition – Paymaster and similar soils: 50 percent / Lynx and similar soils: 40 percent

Paymaster (50%)

Landform: Alluvial fans, stream terraces

Parent material: Mixed alluvium

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Maximum salinity: Nonsaline

Typical profile

0 to 6 inches: Sandy loam

6 to 42 inches: Loam

42 to 60 inches: Gravelly sandy loam

Lynx (40%)

Landform: Alluvial fans

Parent material: Mixed alluvium

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Loam

2 to 60 inches: Clay loam

31 Poley gravelly loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Poley gravelly loam, 0 to 8 percent slopes

Landform: Fan terraces

Parent material: Alluvium derived from limestone, sandstone, and shale and/or pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 50 percent

Maximum salinity: Nonsaline

Typical profile

0 to 4 inches: Gravelly loam

4 to 10 inches: Clay loam

10 to 22 inches: Clay

22 to 60 inches: Gravelly loam

33 Poley-Tusayan association, gently sloping

Map Unit Composition – Poley and similar soils: 60 percent / Tusayan and similar soils: 30 percent

Poley (60%)

Landform: Fan terraces

Parent material: Alluvium derived from limestone, sandstone, and shale and/or pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 50 percent

Maximum salinity: Nonsaline

Typical profile

0 to 4 inches: Gravelly loam

4 to 10 inches: Clay loam

10 to 22 inches: Clay

22 to 60 inches: Gravelly loam

Tusayan (30%)

(Described in Map Unit 55, below)

34 Purgatory gravelly fine sandy loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Purgatory and similar soils

Landform: Plateaus, mesas

Parent material: Eolian sands over gypsiferous alluvium derived from shale

Slope: 0 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 80 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 2 inches: Gravelly fine sandy loam

2 to 14 inches: Sandy loam

14 to 34 inches: Clay loam

34 to 44 inches: Weathered bedrock

35 Quivera very gravelly loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Quivera and similar soils

Landform: Fan terraces

Parent material: Alluvium derived from pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 3 inches: Very gravelly loam

3 to 28 inches: Gravelly clay

28 to 60 inches: Very gravelly loam

36 Riverwash

Map Unit Composition – 100 percent Riverwash

37 Rune silty clay loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Rune silty clay loam, 0 to 8 percent slopes

Landform: Alluvial fans, stream terraces

Parent material: Stratified, mixed alluvium

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline

Typical profile

0 to 3 inches: Silty clay loam

3 to 60 inches: Silty clay

39 Servilleta fine sandy loam, 1 to 8 percent slopes

Map Unit Composition – Rock outcrop: 60 percent/Torriorhents and similar soils: 30 percent

Rock outcrop (60%)

Depth to restrictive feature: 0 inches to lithic bedrock

Torriorhents (30%)

Landform: Canyons

Parent material: Colluvium and/or residuum weathered from sedimentary rock

Slope: 35 to 99 percent

Depth to restrictive feature: 3 to 61 inches to lithic bedrock

Drainage class: Well drained

40 Servilleta-Tusayan complex, 1 to 8 percent slopes

Map Unit Composition – Servilleta and similar soils: 50 percent/Tusayan and similar soils: 40 percent

Servilleta (50%)

Landform: Plateaus, mesas

Parent material: Alluvium derived from sandstone and shale and/or quartzite

Slope: 1 to 8 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Fine sandy loam
2 to 17 inches: Clay
17 to 35 inches: Gravelly clay loam
35 to 39 inches: Unweathered bedrock

Tusayan (40%)

(Described in Map Unit 55, below)

44 Springerville very stony clay, 0 to 8 percent slopes

Map Unit Composition – 100 percent Springerville very stony clay, 0 to 8 percent slopes

Landform: Alluvial flats, fan terraces

Parent material: Colluvium and/or alluvium derived from basalt and/or pyroclastic rock

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline

Typical profile

0 to 3 inches: Very stony clay

3 to 42 inches: Clay

42 to 46 inches: Unweathered bedrock

48 Thunderbird-Rock outcrop complex, 30 to 60 percent slopes

Map Unit Composition – Thunderbird and similar soils: 50 percent / Rock outcrop: 30 percent

Thunderbird (50%)

Landform: Hills

Parent material: Colluvium and/or alluvium derived from basalt and/or pyroclastic rock

Slope: 30 to 60 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 9 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Extremely stony clay loam

2 to 24 inches: Clay

24 to 28 inches: Unweathered bedrock

Rock outcrop (30%)

49 Thunderbird-Springerville association, strongly sloping

Map Unit Composition – Thunderbird and similar soils: 60 percent / Springerville and similar soils: 30 percent

Thunderbird (60%)

(Described in Map Unit 48, above)

Springerville (30%)

(Described in Map Unit 44, above)

50 Torrifluvents, saline

Map Unit Composition – 100 percent Torrifluvents and similar soils

Landform: Drainageways, flood plains

Parent material: Mixed alluvium

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

51 Tours silty clay loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Tours silty clay loam and similar soils

Landform: Flood plains, alluvial fans
Parent material: Mixed alluvium
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline
Typical profile:
0 to 10 inches: Silty clay loam
10 to 60 inches: Silt loam

52 Tours-Ives association, gently sloping

Map Unit Composition – Tours and similar soils: 45 percent / Ives and similar soils: 35 percent

Tours (45%)

(Described in Map Unit 51, above)

Ives (35%)

Landform: Alluvial fans, flood plains
Parent material: Mixed alluvium
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline
Typical profile:
0 to 3 inches: Sandy loam
3 to 60 inches: Fine sandy loam

55 Tusayan-Lynx association, gently sloping

Map Unit Composition – Tusayan and similar soils: 60 percent/Lynx and similar soils: 30 percent

Tusayan (60%)

Landform: Mesas, plateaus
Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Moderately well drained
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline
Typical profile
0 to 3 inches: Gravelly loam
3 to 29 inches: Very gravelly loam
29 to 33 inches: Unweathered bedrock

Lynx (30%)

(Described in Map Unit 29, above)

56 Tuweep very gravelly loam, 0 to 15 percent slopes

Map Unit Composition – 100 percent Tuweep and similar soils

Landform: Plateaus, mesas
Parent material: Alluvium derived from basalt and/or pyroclastic rock
Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline
Typical profile:
0 to 3 inches: Very gravelly loam
3 to 34 inches: Clay loam

34 to 60 inches: Extremely stony loam

57 Valle gravelly silt loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Wilaha, cindery, and similar soils

Landform: Fan terraces, hills

Parent material: Alluvium derived from basalt and/or pyroclastic rock

Slope: 2 to 30 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 5 inches: Gravelly loam

5 to 14 inches: Gravelly clay loam

14 to 17 inches: Very gravelly loam

17 to 60 inches: Cinders

58 Wilaha cindery loam, 2 to 30 percent slopes

Map Unit Composition – 100 percent Wilaha, cindery, and similar soils

Landform: Fan terraces, hills

Parent material: Alluvium derived from basalt and/or pyroclastic rock

Slope: 2 to 30 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 5 inches: Gravelly loam

5 to 14 inches: Gravelly clay loam

14 to 17 inches: Very gravelly loam

17 to 60 inches: Cinders

60 Winona gravelly loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Winona gravelly loam, 0 to 8 percent slopes

Landform: Mesas, plateaus

Parent material: Eolian sands over alluvium derived from limestone and sandstone

Slope: 0 to 8 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Gravelly loam

2 to 15 inches: Extremely cobbly loam

15 to 19 inches: Unweathered bedrock

61 Winona stony loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Winona stony loam, 0 to 8 percent slopes

Landform: Mesas, plateaus

Parent material: Eolian sands over alluvium derived from limestone and sandstone

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 0.1 percent

Depth to restrictive feature: 6 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline

Typical profile

0 to 2 inches: Stony loam
2 to 15 inches: Extremely cobbly loam
15 to 19 inches: Unweathered bedrock

62 Winona-Boysag gravelly loams, 0 to 8 percent slopes

Map Unit Composition – Winona and similar soils: 55 percent / Boysag and similar soils: 30 percent

Winona [stony loam] (55%)

(Described in Map Unit 61, above)

Boysag (30%)

Landform: Mesas, plateaus

Parent material: Eolian sands over alluvium derived from limestone and/or calcareous sandstone

Slope: 0 to 8 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline

Typical profile

0 to 3 inches: Gravelly loam

3 to 13 inches: Clay

13 to 16 inches: Very cobbly loam

16 to 20 inches: Unweathered bedrock

63 Winona-Epikom association, gently sloping

Map Unit Composition – Winona and similar soils: 50 percent / Epikom [0 to 8 percent slope] and similar soils: 40 percent

Winona [stony loam] (50%)

(Described in Map Unit 61, above)

Epikom [0 to 8 percent slope] (40%)

(Described in Map Unit 18, above)

64 Winona-Rock outcrop complex, 15 to 30 percent slopes

Map Unit Composition – Winona and similar soils: 60 percent / Rock outcrop: 30 percent

Winona [stony loam] (60%)

(Described in Map Unit 61, above)

Rock outcrop (30%)

65 Winona-Rock outcrop complex, 30 to 70 percent slopes

Map Unit Composition – Winona and similar soils: 60 percent / Rock outcrop: 30 percent

Winona [stony loam] (60%)

(Described in Map Unit 61, above)

Rock outcrop (30%)

66 Winona-Tusayan association, gently sloping

Map Unit Composition – Winona and similar soils: 50 percent / Tusayan and similar soils: 40 percent

Winona [stony loam] (50%)

(Described in Map Unit 61, above)

Tusayan (40%)

(Described in Map Unit 55, above)

67 Wukoki-Rock outcrop complex, 5 to 25 percent slopes

Map Unit Composition – Wukoki and similar soils: 70 percent / Rock outcrop: 25 percent

Wukoki (70%)

Landform: Fan terraces, hills

Parent material: Alluvium and/or colluvium derived from pyroclastic rock

Slope: 5 to 25 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 10 inches: Very gravelly loam
10 to 18 inches: Very gravelly loam
18 to 60 inches: Cinders

Rock outcrop (25%)

68 Wukoki-Wupatki very cindery loams, 15 to 60 percent slopes

Map Unit Composition – Wukoki and similar soils: 45 percent / Wupatki and similar soils: 35 percent

Wukoki (45%)

Landform: Hills

Parent material: Alluvium and/or colluvium derived from pyroclastic rock

Slope: 15 to 60 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 10 inches: Very gravelly loam
10 to 18 inches: Very gravelly loam
18 to 60 inches: Cinders

Wupatki (35%)

Landform: Hills

Parent material: Alluvium and/or colluvium derived from pyroclastic rock

Slope: 15 to 20 percent

Depth to restrictive feature: 8 to 20 inches to duripan

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 6 inches: Very gravelly loam
6 to 16 inches: Very gravelly loam
16 to 20 inches: Indurated
20 to 60 inches: Cinders

69 Wupatki-Wukoki very cindery loams, 0 to 15 percent slopes

Map Unit Composition – Wupatki and similar soils: 60 percent / Wukoki and similar soils: 25 percent

Wupatki (60%)

(Described in Map Unit 68, above)

Wukoki (25%)

(Described in Map Unit 68, above)

70 Ziegler gravelly loam, 0 to 8 percent slopes

Map Unit Composition – 100 percent Ziegler and similar soils

Landform: Fan terraces

Parent material: Alluvium derived from basalt and/or pyroclastic rock

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 3 inches: Gravelly loam
3 to 15 inches: Clay
15 to 24 inches: Very gravelly clay loam
24 to 60 inches: Cinders

71 Ziegler-Cross association, moderately sloping

Map Unit Composition – Ziegler and similar soils: 60 percent / Cross and similar soils: 30 percent

Ziegler (60%)

(Described in Map Unit 70, above)

Cross (30%)

(Described in Map Unit 3, above)

72 Ziegler-Wilaha association, strongly sloping

Map Unit Composition – Ziegler [8 to 15 percent sloping] and similar soils: 70 percent / Wilaha and similar soils: 25 percent

Ziegler [8 to 15 percent sloping] (70%)

(Described in Map Unit 70, above)

Wilaha (25%)

Landform: Hills

Parent material: Alluvium derived from basalt and/or pyroclastic rock

Slope: 15 to 30 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline

Typical profile:

0 to 5 inches: Gravelly loam

5 to 14 inches: Gravelly clay loam

14 to 17 inches: Very gravelly loam

17 to 60 inches: Cinders

APPENDIX D

A Checklist of the Flora on CO Bar Ranch

A Checklist of the Flora of CO Bar Ranch (Babbitt Ranches)
Lockwood Canyon, Mesa Butte, Cedar Wash, Gray Mountain, Black Point, LCR
(Collections and Observations Draft December 5, 2013 G. Goodwin)

Family/Scientific Name	Common Name	Origin	Collection No.	Comments
Amaranthaceae - Amaranth - Family				
<i>Allenrolfea occidentalis</i>	Iodine bush	Native	4096	Uncommon; locally common in alkaline soils in the LCR floodplain
<i>Amaranthus albus</i>	Prostrate pigweed	Introduced	3966, 4440	Occasional; in disturbed areas
<i>Amaranthus powellii</i>	Powell's amaranth	Native	2544	Common; in disturbed areas especially drainages
<i>Amaranthus torreyi</i>	Torrey's amaranthus	Native	2552	Occasional; in cinders on Mesa Butte
<i>Atriplex canescens</i>	Four-wing saltbush	Native	2914	Common and widespread
<i>Atriplex confertifolia</i>	Shadscale saltbush	Native	4076, 4108	Occasional; locally common in alkaline soil at lower elevations
<i>Atriplex obovata</i>	Mound saltbush	Native	4078	Occasional; locally common in alkaline soil at lower elevations
<i>Bassia hyssopifolia</i>	Five horn smother weed	Introduced	4415b	Uncommon; disturbed areas in LCR floodplain
<i>Chenopodium fremontii</i>	Fremont's goosefoot	Native	2530	Occasional; locally common in disturbed areas
<i>Chenopodium graveolans</i>	Fetid goosefoot	Native	2500	Occasional; locally common in disturbed areas
<i>Chenopodium watsoni</i>	Watson's goosefoot	Native	2508	Occasional
<i>Halogeton glomeratus</i>	Saltlover	Introduced	4176, 4177, 4195	Occasional; disturbed areas primarily east of Highway 89
<i>Kochia (Bassia) scoparia</i>	Burning bush	Introduced	4415	Common and widespread; locally common in disturbed areas
<i>Krascheninnikovia lanata</i>	Winterfat	Native	2514	Common and widespread; especially in deeper soils
<i>Monolepis nuttalliana</i>	Nuttall's poverty weed	Native	4081	Uncommon; at lower elevations near LCR
<i>Salsola tragus</i>	Russian thistle	Introduced	Observed	Common and widespread; in disturbed areas
<i>Sarcobatus vermiculatus</i>	Greasewood	Native	4169	Uncommon; locally common in alkaline soils in the LCR floodplain
<i>Suaeda moquini</i>	Mojave seablite	Native	4206	Uncommon; locally common in alkaline soils in the LCR floodplain
Anacardiaceae - Sumac Family				
<i>Rhus trilobata</i>	Skunkbush	Native	Observed	Occasional and widespread; in drainages and in rock outcrops
Apiaceae - Celery Family				
<i>Cymopterus acaulis</i> var. <i>fendleri</i>	Fendler's spring parsley	Native	4067a	Uncommon; low elevations in sand in early spring
<i>Cymopterus megacephalus</i>	Longleaf spring parsley	Native	4072, 4092	Uncommon; lower elevations near LCR in early spring
<i>Cymopterus purpurascens</i>	Widewing spring parsley	Native	4073	Uncommon; low elevations in early spring
Apocynaceae - Dogbane Family				
<i>Amsonia peeblesii</i>	Peebles' bluestar	Native	4084, 4090, 4116, 4155	Uncommon; lower elevations usually in drainage channels
<i>Apocynum cannabinum</i>	Indian hemp	Native	4412	Uncommon; shady drainages
<i>Asclepias latifolia</i>	Broadleaf milkweed	Native	4162	Occasional; mostly in disturbed areas or loose sand
<i>Asclepias subverticillata</i>	Horsetail milkweed	Native	2537	Occasional; can be locally common along roads and in drainages
Asparagaceae - Asparagus Family				
<i>Yucca angustissima</i>	Narrow-leaf yucca	Native	Observed	Occasional and widespread; usually in sandy soil
Asteraceae - Sunflower Family				
<i>Acroptilon repens</i>	Russian knapweed	Introduced	4413	Occasional; in disturbed areas
<i>Amauriopsis dissecta</i>	Ragleaf bahia	Native	2538	Occasional; in drainages with deep soil as in Lockwood Canyon
<i>Ambrosia acanthicarpa</i>	Flat spine bur ragweed	Native	4266	Occasional; sandy soils
<i>Artemisia bigelovii</i>	Bigelow sage	Native	2523, 2906, 4212	Common and widespread; rocky soils and in cinders on Mesa Butte
<i>Artemisia carruthii</i>	Carruth's sagewort	Native	3059, 4278	Occasional and widespread
<i>Artemisia frigida</i>	Prairie sagewort	Native	2542	Occasional; in pinyon-juniper woodland

<i>Artemisia ludoviciana</i>	White sagebrush	Native	4276	Occasional and widespread
<i>Brickellia californica</i>	California brickellbush	Native	2543, 3886, 4279	Occasional and widespread; in drainages and along rock outcrops
<i>Brickellia eupatorioides</i> var. <i>chlorolepis</i>	False boneset	Native	4365, 4376	Occasional; usually near rock outcrops
<i>Brickellia microphylla</i> var. <i>scabra</i>	Rough brickellbush	Native	4424	Occasional at lower elevations
<i>Brickellia oblongifolia</i>	Mojave brickellbush	Native	4161	Uncommon; low elevations east of highway 89
<i>Chaenactis macrantha</i>	Bighead dustymaiden	Native	4107	Occasional
<i>Chaenactis steviodes</i>	Esteve's pinchusion	Native	4112	Common and widespread
<i>Chaetopappa ericoides</i>	Rose heath	Native	4115	Common and widespread
<i>Chrysothamnus depressus</i>	Longleaf rabbitbrush	Native	3062	Occasional; pinyon-juniper woodlands in openings
<i>Chrysothamnus molestus</i>	Arizona rabbitbrush	Native	2527	Uncommon; limestone gravel on benches in Lockwood Canyon
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	Native	2511	Common and widespread
<i>Cirsium (arizonicum?)</i>	Thistle		Observed	Disturbed areas
<i>Cirsium undulatum</i>	Wavyleaf thistle	Native	2905	Occasional; in cinders on Mesa Butte
<i>Dieteria canescens</i>	Hoary tansy aster	Native	2535	Widespread; late summer
<i>Dyssodia papposa</i>	Fetid marigold	Native	3885, 4374	Occasional; locally common in disturbed areas
<i>Encelia resinifera</i> ssp. <i>resinifera</i>	Sticky brittlebush	Native	4159, 4422	Uncommon; low elevations east of Highway 89
<i>Enceliopsis nudicaulis</i>	Naked stem sunray	Native	4110	Rare; low elevations in Moenkopi gravel
<i>Ericameria nauseosa</i> var. <i>juncea</i>	Rubber rabbitbrush	Native	4273, 4422	Uncommon; low elevations in disturbed areas
<i>Erigeron concinnus</i>	Navajo fleabane	Native	2509	Occasional but widespread
<i>Erigeron divergens</i>	Spreading fleabane	Native	4125	Common and widespread
<i>Gaillardia pinnatifida</i>	Red dome blanket flower	Native	4103	Occasional; limestone
<i>Grindelia (arizonica?)</i>	Gumweed	Native	Observed	Occasional; locally common in drainages and seasonally wet areas
<i>Gutierrezia microcephala</i>	Thread leaf snakeweed	Native	4264	Occasional but widespread
<i>Gutierrezia sarothrae</i>	Broom snakeweed	Native	2525	Common and widespread
<i>Helianthus petiolaris</i>	Prairie sunflower	Native	4200	Occasional; locally common in disturbed areas
<i>Heliomeris longifolia</i>	Longleaf false goldeneye	Native	2553	Occasional; in disturbed areas
<i>Heterotheca villosa</i>	Hairy false goldenaster	Native	2563	Common and widespread
<i>Hymenopappus filifolius</i>	Fine leaf hymenopappus	Native	2917	Occasional
<i>Hymenoxys richardsonii</i>	Colorado rubberweed	Native	3063	Occasional
<i>Isocoma rusbyi</i>	Rusby's goldenbush	Native	4171	Occasional; LCR floodplain and low elevation disturbed areas
<i>Layia glandulosa</i>	White daisy tidytip	Native	2776	Widespread; can be locally common in early spring
<i>Malacothrix fendleri</i>	Fendler's desert dandelion	Native	2902	Occasional; in cinders on Mesa Butte
<i>Malacothrix sonchoides</i>	Sowthistle desert dandelion	Native	4113	Occasional; in sandy soils
<i>Pectis angustifolia</i>	Lemonscent	Native	4215, 4423	Occasional; widespread in rocky soils and sand
<i>Pericome caudata</i>	Mountain tail-leaf	Native	Observed	Occasional; in rocky areas and bare cinders
<i>Pleianthus spinosus</i>	Thorn skeletonweed	Native	2548	Uncommon; in cinders on Mesa Butte
<i>Psilostrophe sparsiflora</i>	Greenstem paperflower	Native	2513, 2526	Common and widespread
<i>Sanvitalia abertii</i>	Albert's creeping zinnia	Native	2502, 2531, 4220	Common and widespread; late summer
<i>Schkuhria multiflora</i>	Manyflower false threadleag	Native	2501	Occasional and widespread; late summer
<i>Senecio flaccidus</i> var. <i>flaccidus</i>	Threadleaf ragwort	Native	2516, 2551, 4167	Common and widespread; usually in disturbed areas
<i>Solidago sp.</i>	Goldenrod		Observed	Occasional; locally common in drainage channels
<i>Stephanomeria pauciflora</i>	Brownplume wirelettuce	Native	3060, 4165	Occasional but widespread
<i>Tetradymia canescens</i>	Spineless horsebrush	Native	3057	Occasional
<i>Tetraneuris acaulis</i> var. <i>arizonica</i>	Stemless four-nerve daisy	Native	Observed	Common and widespread
<i>Verbesina encelioides</i>	Golden crownbeard	Native	2534	Occasional; in disturbed areas especially along roads
<i>Xanthisma gracile</i>	Sleepy daisy	Native	2515	Occasional; can be locally common in disturbed areas
<i>Xanthium strumarium</i>	Cocklebur	Native	Observed	Occasional; in disturbed areas and seasonally wet soils
<i>Zinnia grandiflora</i>	Rocky Mtn. zinnia	Native	Observed	Common and widespread

Berberidaceae - Barberry Family				
<i>Berberis fremontii</i>	Fremont's barberry	Native	2904	Occasional; can be locally common in rocky areas
Boraginaceae - Borage Family				
<i>Cryptantha cinerea</i> var. <i>jamesii</i>	James' cryptantha	Native	4075	Occasional; at lower elevations
<i>Cryptantha crassisepta</i>	Thick sepal cryptantha	Native	4121	Occasional; sandy soil
<i>Cryptantha cineria</i>	James' cryptantha	Native	2510	Occasional
<i>Lappula occidentalis</i>	Flatspine stickseed	Native	2779	Occasional; can be locally common in disturbed areas
<i>Nama dicotomum</i>	Wishbone fiddle leaf	Native	2503, 3882, 4367	Occasional and widespread
<i>Phacelia crenulata</i> var. <i>corrugata</i>	Cleft leaf wild heliotrope	Native	4085, 4104	Common; early spring at low elevations in sand or gravel soils
<i>Phacelia crenulata</i>	Cleft leaf wild heliotrope	Native	2911	Uncommon; cinders on Mesa Butte
<i>Phacelia serrata</i>	Saw phacelia	Native	4202, 4203	Uncommon; bare cinders on SP Crater
<i>Tiquilia latior</i>	Matted crinklemat	Native	4164	Uncommon; rocky areas at lower elevations east of Highway 89
Brassicaceae - Mustard Family				
<i>Descurainia obtusa</i>	Blunt tansy mustard	Native	2528, 4122	Occasional; can be locally common in disturbed areas
<i>Descurainia sophia</i>	Herb sophia	Native	2791	Occasional; can be locally common in disturbed areas
<i>Dimorphocarpa wislizeni</i>	Touristplant	Native	4070	Uncommon; lower elevations in sand
<i>Lepidium montanum</i>	Pepper weed	Native	2506, 2524	Common and widespread
<i>Physaria arizonica</i>	Arizona bladderpod	Native	4101	Occasional; limestone
<i>Physaria intermedia</i>	Mid bladderpod	Native	2789	Widespread; in early spring
<i>Stanleya pinnata</i>	Desert pinesplume	Native	4111	Occasional; lower elevations
Cactaceae - Cactus Family				
<i>Cylindropuntia whipplei</i>	Whipple cholla	Native	Observed	Occasional but widespread
<i>Echinocactus polycephalus</i> var. <i>xeranthemoides</i>	Cottontop cactus	Native	4175	Uncommon; lower elevations in rocky areas
<i>Escobaria vivipara</i> ssp. <i>arizonica</i>	Arizona spinystar	Native	Observed	Occasional and widespread
<i>Opuntia polycantha</i>	Plains pricklypear	Native	Observed	Common and widespread
<i>Pediocactus peeblesianus</i> ssp. <i>fickeiseniae</i>	Fickeisen plains cactus	Native	Observed	Uncommon; scattered across the Kaibab Limestone on the Black Point Monocline and in Cedar Wash
Caryophyllaceae - Pink Family				
<i>Eremogone eastwoodiae</i> var. <i>adenophora</i>	Eastwood's sandwort	Native	4091	Uncommon; widespread in rocky areas
Cleomaceae - Beeplant Family				
<i>Peritoma serrulata</i>	Rocky Mtn. beeplant	Native	Observed	Occasional; locally common in disturbed areas
<i>Polanisia dodecandra</i> var. <i>trachysperma</i>	Sandyseed clammy weed	Native	2556	Uncommon; in cinders on Mesa Butte
<i>Wislizenia refracta</i>	Spectacle fruit	Native	4166	Uncommon; can be locally common in disturbed areas at low elevations
Convolvulaceae - Morning Glory Family				
<i>Convolvulus arvensis</i>	Field bindweed	Introduced	Observed	Common and widespread; in disturbed areas
<i>Evolvulus nuttallianus</i>	Shaggy dwarf morning glory	Native	4198	Uncommon; sandy soils
Crossosomataceae - Greasebush Family				
<i>Glossopetalon spinescens</i> var. <i>aridum</i>	Spiny greasebush	Native	Observed	Occasional; east of Highway 89 in limestone soils
Cupressaceae - Cypress Family				
<i>Juniperus monosperma</i>	One-seed juniper	Native	Observed	Common and widespread
<i>Juniperus osteosperma</i>	Utah juniper	Native	Observed	Common and widespread
Ephedraceae - Joint-Fir Family				
<i>Ephedra torreyana</i>	Jointfir	Native	4093, 4098	Common and widespread
Euphorbiaceae - Spurge Family				
<i>Chamaesyce fendleri</i>	Fendler's sandmat	Native	4071	Common and widespread
<i>Chamaesyce revoluta</i>	Threadstem sandmat	Native	4151	Occasional; deep soils and sand
<i>Chamaesyce parryi</i>	Parry's sandmat	Native	4197	Uncommon; sand

<i>Chamaesyce serpyllifolia</i>	Thymeleaf sandmat	Native	4222	Occasional; rocky soils
<i>Croton texensis</i>	Texas croton	Native	4418	Uncommon; in disturbed areas
<i>Euphorbia exstipulata</i>	Square seed spurge	Native	4261, 4366	Uncommon; rocky limestone soils
Fabaceae - Pea Family				
<i>Alhagi pseudalhagi</i>	Camelthorn	Introduced	4154	Occasional; common in drainages and seasonally wet areas mostly east of Highway 89
<i>Astragalus allochrous</i> var. <i>playanus</i>	Half moon milkvetch	Native	4126	Uncommon; drainage channels in deep soil
<i>Astragalus amphioxys</i> var. <i>amphioxys</i>	Crescent milkvetch	Native	4069	Uncommon; at lower elevations in sand
<i>Astragalus amphioxys</i> var. <i>modestus</i>	Crescent milkvetch	Native	2788	Occasional; in early spring, open grassland
<i>Astragalus lentiginosus</i>	Milkvetch	Native	2785,	Common and widespread; mid to high elevations
<i>Astragalus newberryi</i>	Newberry's milkvetch		Observed	Occasional; in early spring in limestone
<i>Astragalus nuttallianus</i> var. <i>micranthiformis</i>	Turkeypeas	Native	4099	Uncommon; in rocky limestone soils
<i>Hoffmannseggia drepanocarpa</i>	Sicklepod holdback	Native	4221	Uncommon; rocky limestone soils
<i>Lupinus pusillus</i> var. <i>pusillus</i>	Rusty lupine	Native	4086	Uncommon; in sand at lower elevations
<i>Phaseolus angustissimus</i>	Slim leafbean	Native	4201	Uncommon; locally common in bare cinders
<i>Pomaria jamesii</i>	James' holdback	Native	Observed	Uncommon; sand
Geraniaceae - Geranium Family				
<i>Erodium cicutarium</i>	Filaree	Introduced	Observed	Common and widespread; can be locally common in disturbed areas
Lamiaceae - Mint Family				
<i>Glandularia bipinnatifida</i>	Dakota mock vervain	Native	4127	Common and widespread
<i>Hedeoma</i> sp.		Native	2541	Occasional; on limestone outcrops
<i>Salvia reflexa</i>	Lance leaf sage	Native	3884	Occasional; can be locally common in disturbed areas
<i>Salvia subincisa</i>	Saw tooth sage	Native	2540	Occasional and widespread
<i>Tetradlea coulteri</i>	Coulter's wrinkle fruit	Native	4160, 4163, 4265	Uncommon; low elevation east of highway 89
<i>Verbena bracteata</i>	Big bract verbena	Native	Observed	Common and widespread; disturbed areas
Liliaceae - Lily Family				
<i>Androstaphyllum breviflorum</i>	Pink funnel lily	Native	4067, 4077	Occasional; at lower elevations in early spring
<i>Calochortus flexuosus</i>	Winding mariposa lily	Native	4105	Occasional; at lower elevations in early spring
<i>Calochortus nuttalli</i>	Sego lily	Native	2899	Occasional and widespread; including cinders on Mesa Butte
Linaceae - Flax Family				
<i>Linum puberulum</i>	Plains flax	Native	2915, 4368	Occasional; on limestone gravel
Loasaceae - Loasa Family				
<i>Mentzelia albicaulis</i>	White stem blazing star	Native	2908, 4083, 4118	Common; in cinders on Mesa Butte and open grasslands
<i>Mentzelia multiflora</i>	Adonis blazing star	Native	2547, 4428	Uncommon but widespread
Malvaceae - Mallow Family				
<i>Sphaeralcea grossulariifolia</i>	Gooseberry leaf globemallow	Native	4095	Uncommon; lower elevations
<i>Sphaeralcea hastulata</i>	Spear globemallow	Native	2536	Occasional
<i>Sphaeralcea leptophylla</i>	Scaly globemallow	Native	4271	Uncommon; disturbed areas
<i>Sphaeralcea parvifolia</i>	Smallflower globemallow	Native	2505, 2529	Occasional
Montiaceae - Miner's Lettuce Family				
<i>Phemeranthus validulus</i>	Tusayan flameflower	Native	3878, 3887	Uncommon; in limestone gravel west of Highway 89
Nyctaginaceae - Four O' Clock Family				
<i>Allionia incarnata</i>	Trailing windmills	Native	4157, 4223	Uncommon; rocky limestone and sandy soils
<i>Mirabilis linearoides</i>	Narrowleaf four o'clock	Native	2512, 2522	Occasional and widespread; pinyon-juniper woodland
<i>Mirabilis multiflora</i>	Colorado four o'clock	Native	Observed	Occasional; flowers in late summer
<i>Mirabilis oxybaphoides</i>	Small spreading four	Native	2507, 2532	Occasional and widespread; pinyon-juniper woodland

	o'clock			
Oleaceae - Olive Family				
<i>Forestiera pubescens</i>	Desert olive	Native	Observed	Common and widespread; drainage channels and rocky canyons
Onagraceae - Evening Primrose Family				
<i>Calylophus lavandulifolius</i>	Lavender sundrops	Native	Observed	Occasional and widespread
<i>Camissonia gouldii</i>	Diamond Valley suncup	Native	2549	Uncommon; in cinders on Mesa Butte
<i>Gaura coccinea</i>	Scarlet beeblossum	Native	4156	Occasional; in disturbed areas
<i>Oenothera caespitosa</i> var. <i>marginata</i>	Tufted evening primrose	Native	2776, 4087	Occasional; including cinders on Mesa Butte and sandy soils
Orobanchaceae - Broomrape Family				
<i>Castilleja integra</i>	Whole leaf paintbrush	Native	2546	Common and widespread
Papaveraceae - Poppy Family				
<i>Argemone pleiacantha</i>	Southwestern pricklypoppy	Native	4262	Occasional; low elevations
<i>Corydalis aurea</i>	Golden smoke	Native	2790	Occasional; in woodlands and pine forests
Pinaceae - Pine Family				
<i>Pinus edulis</i>	Pinyon pine	Native	Observed	Common and widespread
<i>Pinus ponderosa</i>	Ponderosa pine	Native	Observed	Common at higher elevations
Plantaginaceae - Plantain Family				
<i>Penstemon barbatus</i>	Beardleaf penstemon	Native	Observed	Occasional
<i>Penstemon caespitosus</i> var. <i>desertipicti</i>	Mat penstemon	Native	2533	Occasional and widespread; usually on limestone benches
<i>Plantago patagonica</i>	Wooly plantain	Native	Observed	Common and widespread primarily west of Highway 89
Poaceae - Grass Family				
<i>Acnatherum hymenoides</i>	Indian ricegrass	Native	2909, 4120	Widespread
<i>Aristida adscensionis</i>	Six-weeks threeawn	Native	3883, 4224	Common and widespread; can be locally common after summer rains
<i>Aristida purpurea</i> var. <i>fendleri</i>	Fendler's threeawn	Native	4214	Occasional
<i>Bothriochloa laguroides</i> ssp. <i>torreyana</i>	Silver beard grass	Native	4274	Uncommon
<i>Bouteloua aristidoides</i>	Needle grama	Native	4417, 4420	Uncommon; lower elevations east of Highway 89
<i>Bouteloua barbata</i>	Sixweeks grama	Native	4206	Occasional; locally common in disturbed areas at low elevations
<i>Bouteloua curtipendula</i>	Side-oats grama	Native	Observed	Common and widespread
<i>Bouteloua eriopoda</i>	Black grama	Native	4216	Common and widespread
<i>Bouteloua gracilis</i>	Blue grama	Native	Observed	Common and widespread
<i>Bouteloua simplex</i>	Matted grama	Native	Observed	Occasional; locally common in disturbed areas in late summer
<i>Bromus tectorum</i>	Cheat grass	Introduced	2783	Common and widespread; can be locally common in disturbed areas
<i>Dasyochloa pulchella</i>	Low woollygrass	Native	4114, 4199	Occasional; locally common in grasslands east of Highway 89
<i>Distichlis spicata</i>	Saltgrass	Native	4123	Occasional; low elevations in drainage channels and alkaline soils
<i>Echinochloa crus-galli</i>	Barnyard grass	Introduced	4414	Uncommon; seasonally wet soils along the LCR
<i>Elymus elymoides</i> ssp. <i>brevifolius</i>	Squirrel tail	Native	2784	Occasional and widespread; disturbed areas
<i>Enneapogon desvauxii</i>	Nineawn pappusgrass	Native	3881, 4369, 4421	Occasional; rocky outcrops
<i>Eragrostis mexicana</i>	Mexican lovegrass	Native	2571, 4268	Occasional; disturbed areas
<i>Erioneuron pilosum</i>	Hairy woollygrass	Native	4102, 4218	Occasional; rocky limestone soils
<i>Hesperostipa comata</i>	Needle-and-thread grass	Native	Observed	Common and widespread; usually in sandy soils
<i>Hilaria jamesii</i>	James' galleta	Native	2912, 4088	Common and widespread; can be locally common as near Mesa Butte
<i>Hopia obtusa</i>	Vine mesquite	Native	4208	Uncommon; seasonally wet areas especially drainage channels
<i>Hordeum jubatum</i>	Foxtail barley	Introduced	Observed	Occasional; in disturbed areas
<i>Lycurus setosus</i>	Bristly wolfstail	Native	3968, 4219	Occasional; rocky limestone soils
<i>Muhlenbergia depauperata</i>	Six-weeks muhly	Native	3880, 3970, 4370	Common; in limestone gravel, late summer after rain
<i>Muhlenbergia porteri</i>	Bush muhly	Native	4217, 4371	Occasional; in rocky limestone ledges
<i>Muhlenbergia wrightii</i>	Spike muhly	Native	Observed	Occasional; rocky drainage channels
<i>Panicum mohavense</i>	Mojave panicgrass	Native	3878, 3888, 3967	Occasional; in limestone gravel in blue grama grasslands, late summer

<i>Poa fendleriana</i>	Mutton grass	Native	2786	Common and widespread; mid to high elevation in early spring
<i>Schedonnarus paniculatus</i>	Tumblegrass	Native	Observed	Uncommon; deep soil in drainage channels at mid elevations
<i>Setaria viridis</i>	Green bristlegrass	Introduced	4375	Uncommon; base of limestone outcrops
<i>Sporobolus airoides</i>	Alkali sacaton	Native	4211	Occasional; locally common Gray Mtn. and Spider Web Camp areas
<i>Sporobolus contractus</i>	Spike dropseed	Native	4211	Occasional; rocky outcrops
<i>Sporobolus cryptandrus</i>	Sand dropseed	Native	4196	Common and widespread
<i>Sporobolus flexuosus</i>	Mesa dropseed	Native	4426	Uncommon; in deep sand
<i>Vulpia octoflora</i>	Sixweeks fescue	Native	2781	Common and widespread; early spring annual
Polemoniaceae - Phlox Family				
<i>Gilia flavocincta</i> ssp. <i>australis</i>	Lesser yellow throat gilia	Native	4100, 4117	Occasional; grassland in rocky soils
<i>Gilia ophthalmoides</i>	Eyed gilia	Native	2919	Occasional
<i>Ipomopsis polycladon</i>	Many flowered ipomopsis	Native	4080, 4100, 4106	Occasional but widespread; lower elevations
<i>Phlox austromontana</i>	Mountain phlox	Native	3969	Occasional; in rocky drainage channels at higher elevations
<i>Phlox gracilis</i>	Slender phlox	Native	2792	Uncommon; early spring at higher elevations
Polygalaceae - Milkwort Family				
<i>Polygala subspinoso</i>	Spiny mildwort	Native	4094	Uncommon; rocky limestone soils
Polygonaceae - Buckwheat Family				
<i>Eriogonum cernuum</i>	Nodding buckwheat	Native	2504, 4280	Occasional
<i>Eriogonum corymbosum</i> var. <i>glutinosum</i>	Crispleaf buckwheat	Native	4269	Occasional; lower elevations east of Highway 89
<i>Eriogonum deflexum</i>	Flatcrown buckwheat	Native	4210	Occasional
<i>Eriogonum divaricatum</i>	Divergent buckwheat	Native	4153	Occasional; lower elevations
<i>Eriogonum inflatum</i> var. <i>inflatum</i>	Desert trumpet	Native	4074	Occasional; locally common in rocky areas at lower elevations primarily east of 89
<i>Eriogonum jonesii</i>	Jone's buckwheat	Native	4373	Rare; limestone
<i>Eriogonum microthecum</i> var. <i>simpsonii</i>	Simpson's buckwheat	Native	2517, 4213	Common and widespread
<i>Eriogonum racemosum</i>	Redroot buckwheat	Native	2558	Occasional
<i>Eriogonum wetherilli</i>	Wetherill's buckwheat	Native	4419	Uncommon
<i>Polygonum douglasii</i>	Douglas' knotweed	Native	2574	Occasional; can be locally common in disturbed areas
Portulacaceae - Purslane Family				
<i>Portulaca oleracea</i>	Little hogweed	Introduced	4267	Common and widespread; disturbed areas
Pteridaceae - Fern Family				
<i>Cheilanthes feei</i>	Slender lipfern	Native	2916	Occasional on limestone rock faces in canyons such as Lockwood Cyn.
Ranunculaceae - Buttercup Family				
<i>Ceratocephala testiculata</i>	Curve seed butterwort	Introduced	2787	Common and widespread; early spring annual at higher elevations
Rosaceae - Rose Family				
<i>Amelanchier utahensis</i>	Serviceberry	Native	Observed	Occasional; rocky areas
<i>Chamaebatiaria millefolium</i>	Fern bush	Native	Observed	Occasional; locally common in limestone outcrops
<i>Fallugia paradoxa</i>	Apache plume	Native	2903	Common and widespread; can be locally common in limestone outcrops
<i>Petrophytum caespitosum</i>	Rock mat	Native	Observed	Occasional; locally common on limestone ledges at higher elevations
<i>Purshia stansburiana</i>	Cliffrose	Native	Observed	Occasional and widespread; limestone outcrops
Rubiaceae - Madder Family				
<i>Houstonia rubra</i>	Red bluet	Native	4372	Uncommon
Salicaceae - Willow Family				
<i>Populus fremontii</i>	Fremont cottonwood	Native	4097	Uncommon; a few remnant trees along the LCR
Santalaceae - Mistletoe Family				
<i>Arceuthobium divaricatum</i>	Pinyon dwarf mistletoe	Native	Observed	Occasional; parasitic on pinyon pine
<i>Phoradendron juniperinum</i>	Juniper mistletoe	Native	Observed	Occasional; parasitic on juniper
Solanaceae - Potato Family				

<i>Chamaesaracha coronopus</i>	Greenleaf five eyes	Native	4079	Common and widespread
<i>Datura wrightii</i>	Sacred datura	Native	Observed	Occasional and widespread
<i>Lycium andersoni</i>	Water jacket	Native	4082	Occasional; at lower elevations
<i>Physalis hederifolia</i> var. <i>fendleri</i>	Fendler's ground cherry	Native	2550, 2545	Common; in disturbed areas but also in cinders on Mesa Butte
<i>Solanum elaeagnifolium</i>	Silver leaf nightshade	Native	4168	Uncommon; sandy drainage channels and along roads
Tamaricaceae - Tamarisk Family				
<i>Tamarix chinensis</i>	Five-stamen tamarisk (saltcedar)	Introduced	4119	Occasional; locally common in LCR, other drainage channels and stock tanks primarily east of Highway 89
Zygophyllaceae - Caltrop Family				
<i>Kallstroemia parviflora</i>	Warty caltrop	Native	4207	Uncommon
<i>Tribulus terrestris</i>	Goat head	Introduced	Observed	Common and widespread; disturbed areas

All collections deposited at Deaver Herbarium (ASC), Northern Arizona University

APPENDIX E

Wildlife Species Known or likely to Occur on CO Bar Ranch

Table E-1. Mammal species known or likely to occur on CO Bar Ranch.

Common Name	Scientific Name	Common Name	Scientific Name
Desert shrew	<i>Notiosorex crawfordi</i>	Botta's pocket gopher	<i>Thomomys bottae</i>
*Pallid bat	<i>Antrozous pallidus</i>	Plains pocket mouse	<i>Perognathus flavescens</i>
*Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Silky pocket mouse	<i>Perognathus flavus</i>
*Big brown bat	<i>Eptesicus fuscus</i>	Arizona pocket mouse	<i>Perognathus amplus</i>
*Western mastiff bat	<i>Eumops perotis</i>	Rock pocket mouse	<i>Perognathus intermedius</i>
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	Ord's kangaroo rat	<i>Dipodomys ordii</i>
*Silver-haired bat	<i>Lasionycteris noctivagans</i>	Deer mouse	<i>Peromyscus maniculatus</i>
Western red bat	<i>Lasiurus blossevilli</i>	Canyon mouse	<i>Peromyscus crinitus</i>
*Hoary bat	<i>Lasiurus cinereus</i>	Brush mouse	<i>Peromyscus boylii</i>
*California myotis	<i>Myotis californicus</i>	Pinyon mouse	<i>Peromyscus truei</i>
*Western small-footed bat	<i>Myotis ciliolabrum</i>	Northern grasshopper mouse	<i>Onychomys leucogaster</i>
*Long-eared myotis	<i>Myotis evotis</i>	White-throated woodrat	<i>Neotoma albigula</i>
*Small-footed myotis	<i>Myotis leibii</i>	Arizona woodrat	<i>Neotoma devia</i>
*Little brown bat	<i>Myotis lucifugus</i>	Stephens's woodrat	<i>Neotoma stephensi</i>
*Fringed myotis	<i>Myotis thysanodes</i>	Porcupine	<i>Erethizon dorsatum</i>
*Long-legged myotis	<i>Myotis volans</i>	Coyote	<i>Canis latrans</i>
*Yuma myotis	<i>Myotis yumanensis</i>	Kit fox	<i>Vulpes macrotis</i>
*Western pipistrelle	<i>Pipistrellus Hesperus</i>	Gray Fox	<i>Urocyon cinereoargenteus</i>
*Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	Black bear	<i>Ursus americanus</i>
Desert cottontail	<i>Sylvilagus audubonii</i>	Long-tailed weasel	<i>Mustela frenata</i>
Black-tailed jack rabbit	<i>Lepus californicus</i>	Badger	<i>Taxidea taxus</i>
Cliff chipmunk	<i>neotamias dorsalis</i>	Mountain lion	<i>Puma concolor</i>
White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	Bobcat	<i>Lynx rufus</i>
Spotted ground squirrel	<i>Spermophilus spilosoma</i>	Elk	<i>Cervus elaphus</i>
Rock squirrel	<i>Spermophilus variegates</i>	Mule deer	<i>Odocoileus hemionus</i>
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	Pronghorn	<i>Antilocapra Americana</i>

* Recorded within western portion of CO Bar Ranch in 2012–2014 (SWCA Environmental Consultants unpublished data)

Source: Drost, C. 2009. Inventory of Mammals at Walnut Canyon, Wupatki, and Sunset Crater National Monuments. Natural Resource Technical Report NPS/SCPN/NRTR—2009/278. U.S. National Park Service, Natural Resource Program Center, Fort Collins, Colorado.

Table E-2. Additional bat species that may occur on CO Bar Ranch.

Common Name	Scientific Name
Cave myotis	<i>Myotis velifer</i>
Southwestern myotis	<i>Myotis auriculus</i>
Arizona myotis	<i>Myotis occultus</i>
Pocketed free-tailed bat	<i>Nyctinomops emorosaccus</i>
Big free-tailed bat	<i>Nyctinomops macrotis</i>

Source: Arizona Game and Fish Department (AGFD). 2003. Arizona Bat Conservation Strategic Plan. Nongame and Endangered Wildlife Program Technical Report 213. Arizona Game and Fish Department, Phoenix.

Table E-3. Bird species recorded on western CO Bar Ranch.

Common Name	Scientific Name	Rimmy Jim Tank (Eastern CO Bar) ¹	NextEra Wind Site (Western CO Bar) ²
Tundra swan	<i>Cygnus columbianus</i>	X	
Gadwall	<i>Anas strepera</i>	X	
American wigeon	<i>Anas americana</i>	X	
Mallard	<i>Anas platyrhynchos</i>	X	
Blue-winged teal	<i>Anas discors</i>	X	
Cinnamon teal	<i>Anas cyanoptera</i>	X	
Northern shoveler	<i>Anas clypeata</i>	X	
Northern Pintail	<i>Anas acuta</i>	X	
Green-winged teal	<i>Anas crecca</i>	X	
Canvasback	<i>Aythya valisineria</i>	X	
Redhead	<i>Aythya americana</i>	X	
Ring-necked duck	<i>Aythya americana</i>	X	
Bufflehead	<i>Bucephala albeola</i>	X	
Ruddy duck	<i>Oxyura jamaicensis</i>	X	
Pied-billed grebe	<i>Podilymbus podiceps</i>	X	
Eared grebe	<i>Podiceps nigricollis</i>	X	
Great blue heron	<i>Ardea Herodias</i>	X	X
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	X	
White-faced ibis	<i>Plegadis chihi</i>	X	X
Turkey vulture	<i>Cathartes aura</i>	X	X
Osprey	<i>Pandion haliaetus</i>	X	
Northern harrier	<i>Circus cyaneus</i>	X	X
Sharp-shinned hawk	<i>Accipiter striatus</i>	X	X
Cooper's hawk	<i>Accipiter cooperi</i>	X	X
Red-tailed hawk	<i>Buteo jamaicensis</i>	X	X
Ferruginous hawk	<i>Buteo regalis</i>		X
Golden eagle	<i>Aquila chrysaetos</i>		X
Bald eagle	<i>Haliaeetus leucocephalus</i>		X
American kestrel	<i>Falco sparverius</i>	X	X
Merlin	<i>Falco columbarius</i>	X	X
Peregrine falcon	<i>Falco peregrines</i>	X	X
Prairie falcon	<i>Falco mexicanus</i>	X	X
American coot	<i>Fulica americana</i>	X	
Black-necked stilt	<i>Himantopus mexicanus</i>	X	
American avocet	<i>Recurvirostra americana</i>	X	
Semipalmated plover	<i>Charadrius semipalmatus</i>	X	
Killdeer	<i>Charadrius vociferous</i>	X	X
Solitary sandpiper	<i>Tringa solitaria</i>	X	
Greater yellowlegs	<i>Tringa melanoleuca</i>	X	
Lesser yellowlegs	<i>Tringa flavipes</i>	X	
Willet	<i>Tringa semipalmata</i>	X	
Long-billed curlew	<i>Numenius americanus</i>	X	
Marbled godwit	<i>Limosa fedoa</i>	X	
Baird's sandpiper	<i>Calidris bairdii</i>	X	
Least sandpiper	<i>Calidris minutilla</i>	X	

Table E-3. Bird species recorded on western CO Bar Ranch, continued

Common Name	Scientific Name	Rimmy Jim Tank (Eastern CO Bar) ¹	NextEra Wind Site (Western CO Bar) ²
Pectoral sandpiper	<i>Calidris melanotos</i>	X	
Western sandpiper	<i>Calidris mauri</i>	X	
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>	X	
Wilson's snipe	<i>Gallinago delicata</i>	X	
Wilson's phalarope	<i>Phalaropus tricolor</i>	X	X
Red-necked phalarope	<i>Phalaropus lobatus</i>	X	
California gull	<i>Larus californicus</i>	X	
Black tern	<i>Chlidonias niger</i>	X	
Eurasian collared-dove	<i>Streptopelia decaocto</i>	X	
Mourning dove	<i>Zenaida macroura</i>	X	X
Greater roadrunner	<i>Geococcyx californianus</i>	X	
Great horned owl	<i>Bubo virginianus</i>	X	
Western screech-owl	<i>Megascops kennicottii</i>		X
Common nighthawk	<i>Chordeiles minor</i>	X	X
White-throated swift	<i>Aeronautes saxatalis</i>	X	X
Black-chinned hummingbird	<i>Archilocus alexandri</i>	X	X
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>	X	X
Ladder-backed woodpecker	<i>Picoides scalaris</i>	X	
Red-naped sapsucker	<i>Sphyrapicus ruber</i>		X
Downy woodpecker	<i>Picoides pubescens</i>		X
Hairy woodpecker	<i>Picoides villosus</i>		X
Northern flicker	<i>Colaptes auratus</i>	X	X
Western wood-pewee	<i>Contopus sordidulus</i>	X	X
Willow flycatcher	<i>Empidonax traillii</i>	X	
Gray flycatcher	<i>Empidonax wrightii</i>	X	X
Dusky flycatcher	<i>Empidonax oberholseri</i>	X	
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	X	X
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>		X
Black phoebe	<i>Sayornis nigricans</i>	X	
Say's phoebe	<i>Sayornis saya</i>	X	X
Cassin's kingbird	<i>Tyrannus vociferans</i>		X
Western kingbird	<i>Tyrannus verticalis</i>	X	X
Loggerhead shrike	<i>Lanius ludovicianus</i>	X	X
Gray vireo	<i>Vireo vicinor</i>		X
Plumbeous vireo	<i>Vireo plumbeus</i>	X	X
Warbling vireo	<i>Vireo gilvus</i>	X	
Common raven	<i>Corvus corax</i>	X	X
American crow	<i>Corvus brachyrhynchos</i>		X
Horned lark	<i>Eremophila alpestris</i>	X	X
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	X	
Tree swallow	<i>Tachycineta bicolor</i>	X	X
Violet-green swallow	<i>Tachycineta thalassina</i>	X	X
Bank swallow	<i>Riparia riparia</i>	X	
Barn swallow	<i>Hirundo rustica</i>	X	
Cliff swallow	<i>Petrochelidon pyrronota</i>	X	X
Mountain chickadee	<i>Poecile gambeli</i>		X
Juniper titmouse	<i>Baeolophus ridgwayi</i>		X

Table E-3. Bird species recorded on western CO Bar Ranch, continued

Common Name	Scientific Name	Rimmy Jim Tank (Eastern CO Bar) ¹	NextEra Wind Site (Western CO Bar) ²
Bushtit	<i>Psaltiriparus minimus</i>		X
White-breasted nuthatch	<i>Sitta carolinensis</i>		X
Rock wren	<i>Salpinctes obsoletus</i>	X	X
House wren	<i>Troglodytes aedon</i>	X	
Marsh wren	<i>Cistothorus palustris</i>	X	
Bewick's wren	<i>Thyomanes bewickii</i>	X	X
Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	X	X
Ruby-crowned kinglet	<i>Regulus calendula</i>	X	X
Hermit thrush	<i>Catharus guttatus</i>	X	
Mountain bluebird	<i>Sialia currucoides</i>		X
Western bluebird	<i>Sialia mexicana</i>		X
Townsend's solitaire	<i>Myadestes townsendi</i>		X
American robin	<i>Turdus migratorius</i>	X	X
Bendire's thrasher	<i>Toxostoma bendirei</i>		X
Sage thrasher	<i>Oreoscoptes montanus</i>	X	X
Northern mockingbird	<i>Mimus polyglottos</i>	X	X
American pipit	<i>Anthus rubescens</i>	X	X
Orange-crowned warbler	<i>Oreothlypis celata</i>	X	
Nashville warbler	<i>Oreothlypis ruficapilla</i>	X	
MacGillivray's warbler	<i>Geothlypis tolmiei</i>	X	
Common yellowthroat	<i>Geothlypis trichas</i>	X	
American redstart	<i>Setophaga ruticilla</i>	X	
Yellow warbler	<i>Setophaga petechia</i>	X	
Black-throated gray warbler	<i>Setophaga nigrescens</i>	X	X
Yellow-rumped warbler	<i>Setophaga coronate</i>	X	X
Townsend's warbler	<i>Setophaga townsendi</i>		X
Wilson's warbler	<i>Cardellina pusilla</i>	X	X
Hermit warbler	<i>Setophaga occidentalis</i>	X	
Green-tailed towhee	<i>Pipilo chlorurus</i>	X	
Spotted towhee	<i>Pipilo maculatus</i>	X	X
Brewer's sparrow	<i>Spizella breweri</i>	X	X
Chipping sparrow	<i>Spizella passerine</i>	X	X
Vesper sparrow	<i>Pooecetes gramineus</i>	X	X
Black-chinned sparrow	<i>Spizella atrogularis</i>	X	X
Lark sparrow	<i>Chondestes grammacus</i>	X	X
Savannah sparrow	<i>Passerculus sandwichensis</i>	X	
Song sparrow	<i>Melospiza melodia</i>	X	
Lincoln's sparrow	<i>Melospiza lincolnii</i>	X	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	X	
Dark-eyed junco	<i>Junco hyemalis</i>	X	X
Western tanager	<i>Piranga ludoviciana</i>	X	
Hepatic tanager	<i>Piranga flava</i>		X
Blue grosbeak	<i>Passerina caerulea</i>	X	
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>		X
Lazuli bunting	<i>Passerina amoena</i>	X	
Western meadowlark	<i>Sturnella neglecta</i>	X	X
Eastern meadowlark	<i>Sturnella magna</i>		X

Table E-3. Bird species recorded on western CO Bar Ranch, continued

Common Name	Scientific Name	Rimmy Jim Tank (Eastern CO Bar) ¹	NextEra Wind Site (Western CO Bar) ²
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	X	
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	X	X
Great-tailed grackle	<i>Quiscalus mexicanus</i>	X	
Brown-headed cowbird	<i>Molothrus ater</i>	X	X
Bullock's oriole	<i>Icterus bullockii</i>	X	
Scott's oriole	<i>Icterus parisorum</i>		X
House finch	<i>Carpodacus mexicanus</i>	X	X
Lesser goldfinch	<i>Spinus psaltria</i>	X	X

¹ Detected by Joe Edward Crouse, Ecological Restoration Institute, NAU, at Rimmy Jim Tank. Dates unknown.

² Detected by ornithologists, SWCA Environmental Consultants, at NextEra Proposed wind energy development site in 2012.

Table E-4. Additional bird species recorded at Wupatki National Monument and likely to occur on CO Bar Ranch.

Common Name	Scientific Name
Black-throated sparrow	<i>Amphispiza bilineata</i>
Cassin's sparrow	<i>Aimophila cassinii</i>
House sparrow	<i>Passer domesticus</i>
Rufous-crowned sparrow	<i>Aimophila ruficeps</i>
Crissal thrasher	<i>Toxostoma crissale</i>
Northern pygmy-owl	<i>Glaucidium gnoma</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>

Sources: Holmes, J.A., and M.J. Johnson. 2012. Bird community monitoring for Wupatki National Monument: 2008 summary report. Natural Resource Data Series NPS/SCPN/NRDS—2012/330. National Park Service, Fort Collins, Colorado.

Holmes, J.A., and M.J. Johnson. 2013. Bird community monitoring for Wupatki National Monument: 2011 summary report. Natural Resource Data Series NPS/SCPN/NRDS—2013/466. National Park Service, Fort Collins, Colorado.

Table E-5. Reptile species reported from Wupatki National Monument and likely to occur on CO Bar Ranch.

Common Name	Scientific Name
Lizards	
Western collared lizard	<i>Crotaphytus bicinctores</i>
Leopard lizard	<i>Gambelia wislizenii</i>
Lesser earless lizard	<i>Holbrookia maculata</i>
Short-horned lizard	<i>Phrynosoma hernandesi</i>
Desert spiny lizard	<i>Sceloporus magister</i>
Orange-headed desert spiny lizard	<i>Sceloporus magister cephaloflavus</i>
Eastern fence lizard	<i>Sceloporus undulatus</i>
Side-blotched lizard	<i>Uta stansburiana</i>
Tree lizard	<i>Urosaurus ornatus</i>
Western whiptail	<i>Cnemidophorus tigris</i>
Plateau striped whiptail	<i>Cnemidophorus velox</i>
Little striped whiptail	<i>Cnemidophorus inornatus</i>
Snakes	
Glossy snake	<i>Arizona elegans</i>
Night snake	<i>Hypsiglena torquata</i>
Common king snake	<i>Lampropeltis getula</i>
Arizona mountain king snake	<i>Lampropeltis pyromelana pyromelana</i>
Striped whipsnake	<i>Coluber taeniatus</i>
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>
Western patch-nosed snake	<i>Salvadora hexalepis</i>
Western rattlesnake	<i>Crotalus viridis</i>
Hopi rattlesnake	<i>Crotalus viridis nuntius</i>
Arizona black rattlesnake	<i>Crotalus oreganus cerberus</i>

Source: Wupatki National Monument Website at
<http://www.nps.gov/wupa/naturescience/reptiles.htm>.

APPENDIX F

Cedar Springs Forest Legacy Project Baseline Documentation Report

**Please Return to
Babbitt Ranches
Bill Cordasco**

Cedar Springs Forest Legacy Project

Baseline Documentation Report

December 5, 2007



**In Support of a Conservation Easement
dated December 2007**

**Granted by Babbitt Ranches, LLC
to
Coconino County**

Prepared by Pamela Peterson and Steve Gatewood



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Disclaimer

This report is thought to be accurate and complete by its preparers however, the baseline survey covered all of the 629.34 acres in the Cedar Springs parcel, much of it in rugged terrain and heavy vegetated cover. Thus, it would have been very easy to have overlooked some items.

Qualifier

The baseline documentation report represents information for both phases I and II of the Cedar Springs Forest Legacy Project. Consequently not all resources documented are present on the phase I parcel likewise not all resources documented are present on the phase II parcel. Maps contained in the report indicate the boundaries in extent of the phases I and II. Monitoring and subsequent discussions of this conservation easement must take into account the phase boundaries and the parcel location of resources in relation to the parcels.

I. General Information

This Baseline Documentation Report is for the parcel known as the Cedar Springs Forest Legacy Project, which is owned by the Babbitt Ranches, LLC. It is in support of a Conservation Easement granted by the landowner and held by Coconino County as part of Arizona's Forest Legacy Program. The project is divided into two half-section tracts totaling 640 acres (Figure 1). Development pressures are intensifying on rural lands in Arizona, whose growth rate makes it the second-fastest growing state in the nation according to the 2005 Census Bureau. The owners have a history of land conservation and wish to ensure that this land is protected in perpetuity.

Owner

Babbitt Ranches, LLC
PO Box 520
Flagstaff, Arizona 86002

Property Location and Legal Description

Township 25 North; Range 06 East
South Half of Section 17, North Half of Section 20
Coconino County, Arizona

The property is located approximately 30 miles north of Flagstaff, Arizona at the northern edge of the Coconino National Forest.

Directions to Property

From Flagstaff, travel north on U.S. Route 180 for 37.5 miles. Turn East on Forest Service Road 417 (an improved dirt road) and travel approximately 4.5 miles. Bear left at the fork at the Babbitt Ranches sign (the right fork leads to the ranch house and corrals). After ¼ mile pass through a gate where the subject property begins. Please see Figure 1.

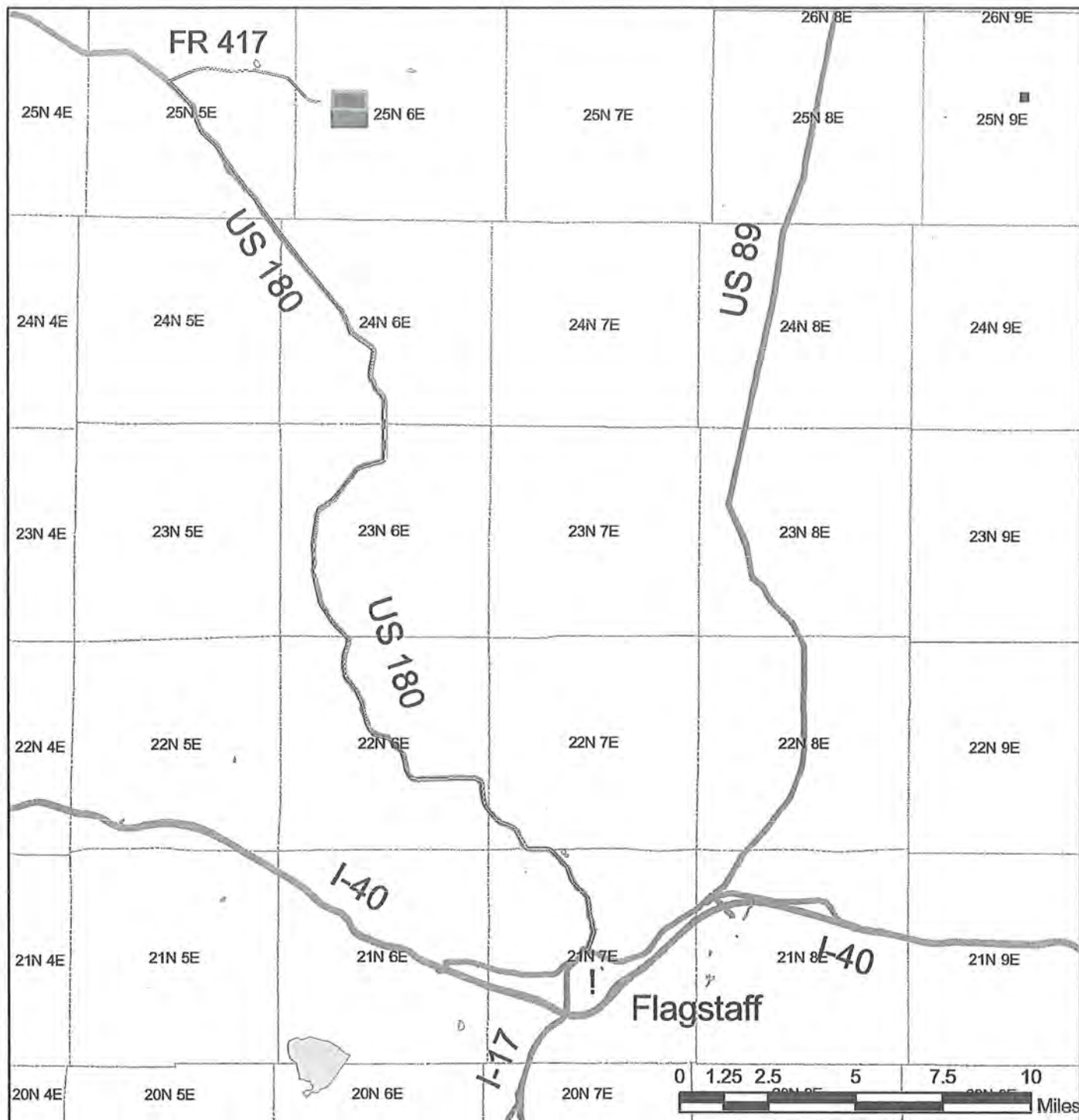
II. History

The Cedar Springs parcel became part of the CO Bar Ranch during the mid nineteen hundreds. The CO Bar Ranch was established in 1886 and is owned by Babbitt Ranches, LLC. Only a couple years after the establishment a stage coach road was laid through the nowadays Cedar Ranch and on it placed a stage coach stop, the half way stop from Flagstaff to the Grand Canyon. The stop was located near the eastern spring and travelers would rest there for one night after a traditional cowboy meal. The Historic Stage Line survived only nine years before a railway access was completed from Williams to the Grand Canyon.

In the mid nineteen-eighties, the Arizona Trail was established though part of the Cedar Springs parcel for recreational use. The trail is demarked by signs.



Cedar Springs Forest Legacy Project



Legend

- Phase 1
- Phase 2
- Highways
- Township/Range

OFFICE of the STATE FORESTER
1110 W. Washington St. Suite 100
Phoenix, Arizona 85007
1:250,000
Datum & Projection
NAD 83 Harn UTM 12N

Created By: A. Green 7/3/2007
The Arizona State Land Department
makes no warranties expressed or
implied with respect to the information
shown on this map.

III. Conservation Purposes

Cedar Springs is working ranch land supporting high quality natural ecosystems and containing habitat and critical winter range for game and non-game wildlife. It has two natural springs and a well system that provide water for wildlife habitat and cattle grazing on over 350,000 surrounding acres.

The property contains many forest types including: old-growth ponderosa pine, mixed conifer and aspen forest, pinyon-juniper woodlands, grassland, and riparian community; natural features such as basalt cliffs and boulder fields, springs, and ephemeral washes; cultural and historic sites like ancient Native American ruins, lithic scatter sites, and ranch improvements; and scenic views, open space and recreation lands i.e. – the Arizona Trail traverses the property.

IV. Methods

Vegetation plots

Forty plot centers were established at the intersections of a 100 meter by 100 meter grid digitally placed over an aerial photographic map of the property (Figure 2). The plots were randomly selected within each of the four general habitats: northern grasslands, lower pinyon-juniper woodland, ponderosa pine belt below the cliff face, and the upper portion of pinyon-juniper woodland at the southern end of the property. These plots were given the names Plot1-Plot40. Since the random selection didn't provide many plots with a good stand of ponderosa pine trees, four more plots were selected with a bias for obtaining old growth ponderosa pine within these plots. These were named Pipo1, Pipo2, etc. The same was done for a stand of Douglas fir and aspen, resulting in two more plots named Plot Doug Fir and Plot Aspen respectively. Two riparian area plots were also chosen with the bias for demonstrating the common plants and habitat along the Cedar Wash riparian strip, named Riparian1 and Riparian2. This results in a total of 48 plots on the property. All data collection was carried out in the same manner for all plots.

The center of each plot was placed at the UTM coordinate given for the grid, while the eight additional plots which were strategically placed to emphasize a given forest structure or habitat type. UTM coordinates for each plot were recorded on the data sheets. Each plot was a spherical tenth-of-an-acre (37.246 foot radius) for overstory, regeneration and a list of all vegetation. A 0.5meter by 2.0meter quadrat (1m²) was placed at the center of the plot with its northwest corner touching plot center and aligned with the cardinal directions (long side N/S). Photos were taken of the quadrat and from plot center in all cardinal directions. Elevation, slope, and aspect of the plot were recorded.

a.) Overstory

Overstory included any tree species taller than breast height - 1.4meters. Trees recorded in the overstory were ponderosa pine (PIPO), Utah juniper (JUOS), one-seed juniper (JUMO), pinyon pine (PIED), Douglas fir (PSME), aspen (POTR), Arizona walnut (JUMA), Fremont cottonwood (POFR), and narrow-leaf cottonwood (POAN).

Each live tree was measured for height and diameter. All trees were measured for diameter at breast height (dbh) except junipers and those trees whose trunks were multi-stemmed (more than two) starting below dbh. Trees, excluding junipers, which had a split trunk of only two stems, had both trunks measured at dbh. Junipers were always measured for diameter at the root crown (drc), and junipers that were cored were also measured for diameter of stump height (dsh).

All trees were classified into one of three categories: live, snag, or dead-and-down. Live trees included those that had green leaves/needles from the current season (2007) and those that were declining but had some green branches. Snags included recently dead trees to snags whose bark was completely gone. Also in the category of a snag may be a dead tree whose top portion had broken off but what remained was still above breast height. Dead-and-down included all trees that were dead and no longer standing. They may have their root ball showing or they were broken lower than breast height. Downed trees that had rotted or decomposed into a linear pile of debris and duff and that clearly came from a tree were included in the category of dead-and-down.

Canopy cover for overstory trees was estimated for the 1/10-acre plot and for that portion of the quadrat covered by canopy trees. An exception was that New-Mexican locust (classified as a shrub) was included in canopy cover estimates because of its growth form.

b.) Regeneration

Regeneration included those tree species listed above but that had not yet grown above breast height. These young trees were tallied by species and differentiated into one of the same categories as overstory trees: live, snag, or dead-and-down.

c.) Understory

Within the 1m² quadrat, surface cover classified as plant life (live that season), litter, bole, wood, scat, crust, rock, and bare soil was estimated and totaled of 100%. Plant species were recorded individually and they were in turn divided into the percentages they covered of the total plant cover. Some plants were listed only to genus when the species was unknown. In this case the genus was listed followed by "spp." When the genus was also unknown then "unknown forb" or "unknown graminoid", was listed. Late in the growing season, many species were unidentifiable through their natural course of curing and dropping of seed. In instances where we believed we had recorded the species before, but still could not identify the plant, "unidentifiable" was listed.

The remaining part of understory data collection was the listing of all the plant species found within the 1/10-acre plot. Trees were not included if that particular species was already listed in the measurements of overstory. If a plant was unknown or unidentifiable, the same held true as within the quadrat - "unknown" or "unidentifiable" was listed with the life form, or genus was listed with "spp." following.

A copy of the data sheets are included as Appendix C.

Species Lists

Species list of all plants and animals observed during fieldwork were developed. Field guides were used to identify species when not already known. Several plant species were keyed out at the Northern Arizona University Herbarium. Birds observed were identified with field guides when close enough to identify. This goes for the identification of animals as well. Some animals were never seen, but signs of their presence were apparent i.e. - tracks, scat, vocals calls, feeding sign, burrows, or antler rubs.

Cultural Resources

A cultural resource inventory was completed for the parcel. The descriptions of the methods used in the surveys are in a confidential file as per A.R.S. § 39-125.

Improvements

Improvements and disturbances were mapped with a GPS unit by plotting specific improvements or tracking around the perimeter of human caused disturbances in natural ecosystems. Points and polygons were digitized onto an aerial photo to emphasize what could not be deciphered with only the view. Improvements include roads, surface pipelines, wells, tanks, power lines, fences, buildings, and structures. Disturbances include soil disturbance adjacent to roads, pits dug for construction, pipeline corridors, and earthen water "tanks", including erosion caused by these and other anthropogenic processes. Photos of these improvements and disturbances can be found in Appendix D of this document.

V. Physical Description

Landscape

The property tiers from a level plateau at the south end to a north-facing basalt cliff, then down a fairly steep slope to another flatland at the north end. The elevation from south to north ranges from a high of 7,018 feet to a low of about 6,322 feet. This variable elevation and north-facing slopes result in several different ecosystem types within the 640 acres. Four ecological communities occupy the property: grasslands make up the northern edge of the property at the lowest elevations; pinyon/juniper woodlands occupy the slopes rising up to meet the cliff face and resume on the flatlands above the cliff edge; along the base of the cliff face, ponderosa pine, aspen, Douglas fir and Arizona walnut stands occur; and several linear riparian habitats occur along south-to-north oriented washes.

There are a few different riparian areas on the property. The largest is Cedar Wash, which runs along the western edge from south to north. There are two springs, located on the east and west sides of the ranch, that create a small area of riparian habitat adjacent to each spring. Several areas of seepage along the slope at the elevation of the springs support willow, narrowleaf cottonwood, rose and New-Mexican locust, but should not be classified as riparian.

Geology

There are three basic geologic formations represented on the tract: Kaibab limestone, Moenkopi formation, and quaternary lava flows. The Paleozoic era Kaibab limestone underlies the entire region. This is a dense, fractured marine/estuarine deposit containing solution holes, caves and internal drainage features. This Permian period (290-240 million years ago) layer is overlain by Triassic period deposits of the Mesozoic era (240-63 million years ago), such as the Moenkopi formation, which hasn't eroded away in a few places. It is composed of a mix of sandstones, clays, alluvial deposits and occasional gypsum beds, and several areas with exposed chunks of petrified wood are scattered throughout the tract from this period. Overlying these formations are Cenozoic era volcanic deposits and flows. Inter-bedded layers of cinders and boulders represent explosive Tertiary period (63-2 million years ago) volcanic activity, while Quaternary period (2 million years ago to present) lava flows form the high plateau of basalt to the south and cliff-face running east-west across the middle of the tract.

Recent differential erosion and deposition of these formations has resulted in the current topography and "lay of the land" that the property exhibits today. This is illustrated in the sloping area from the cliff-face to the grasslands, in the exposed beds of clay, river gravel, petrified wood and sandstone, and in the formation of spring heads used and developed by the indigenous and Euro-American cultures that have occupied the site.

Soils

Although no soil maps exist of the subject property, maps have been developed for the adjacent area to the east. In addition, some soil classification has been done, but not mapped, for the site. On the mapped adjacent land from the figures on the following three pages four soil types are classified: Navajo clay on 0-5 % slopes in the wash at the lowest elevations; Ashfork gravelly clay loam on 1-15% slopes and Springerville very stony clay on 0-8% slopes of the lower grasslands; and Thunderbird-Rock outcrop complex on 30-60% slopes of the sloping pinyon-juniper woodlands.

Soil Map—Coconino County Area, Arizona, Central Part; and Oak Creek-San Francisco Peaks Area, Arizona, Part of Coconino County
(Cedar Springs Area)





















































Natural Resources
Conservation Service

Web Soil Survey 2.0
National Cooperative Soil Survey

11/26/2007
Page 1 of 3

Soil Map—Coconino County Area, Arizona, Central Part; and Oak Creek-San Francisco Peaks Area, Arizona, Part of Coconino County
(Cedar Springs Area)

MAP LEGEND

	Area of Interest (AOI)		Very Stony Spot
	Soils		Wet Spot
	Soil Map Units		Other
	Special Point Features		Special Line Features
	Blowout		Gully
	Borrow Pit		Short Steep Slope
	Clay Spot		Other
	Closed Depression		Political Features
	Gravel Pit		Public Land Survey
	Gravelly Spot		Township and Range
	Landfill		Section
	Lava Flow		Municipalities
	Marsh		Cities
	Mine or Quarry		Urban Areas
	Miscellaneous Water		Water Features
	Perennial Water		Oceans
	Rock Outcrop		Streams and Canals
	Saline Spot		Transportation
	Sandy Spot		Rails
	Severely Eroded Spot		Roads
	Sinkhole		Interstate Highways
	Slide or Slip		US Routes
	Sodic Spot		State Highways
	Spoil Area		Local Roads
	Stony Spot		Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Coconino County Area, Arizona, Central Part
Survey Area Data: Version 6, Feb 28, 2007

Soil Survey Area: Oak Creek-San Francisco Peaks Area, Arizona, Part of Coconino County
Survey Area Data: Version 3, Mar 6, 2007

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/22/1992; 9/25/1992; 10/20/1997; 9/21/1998

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Coconino County Area, Arizona, Central Part (AZ631)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Ashfork gravelly clay loam, 1 to 15 percent slopes	30.3	2.3%
26	Navajo clay, 0 to 5 percent slopes	14.3	1.1%
44	Springerville very stony clay, 0 to 8 percent slopes	44.5	3.3%
48	Thunderbird-Rock outcrop complex, 30 to 60 percent slopes	65.9	4.9%
Oak Creek-San Francisco Peaks Area, Arizona, Part of Coconino County (AZ693)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NOTCOM	Not Complete	1,188.8	88.5%
Totals for Area of Interest (AOI)		1,343.8	100.0%

Hydrology

The hydrologic features existing on the site are significant and were very important in supporting diverse ecological communities and wildlife, and attracting human occupation and development. Cedar Wash is a large ephemeral creek system traversing the west side of the property. It supports the primary area of riparian vegetation and has extensive indigenous cultural sites associated with it. In addition to Cedar Wash, several small washes drop from the cliff down to the broad drainage swale along the north side of the property and draining to the east.

Emanating from the mid-slope areas below the cliff are at least 3 springs and several wet seeps. Two springs provide spring water pools and/or flow, while the third seems to be dry. They appear to be heavily used by wildlife and have been developed to one degree or another to supply water by gravity feed for human use and domestic livestock grazing. These springs were noted in a 1904 USGS report on forest resources of the San Francisco Mountains Forest Reserve (Leiberg, et al 1904).

The eastern most one, named East Cedar Spring based on its use as a stage stop, is a very small pool lined with juniper logs and supporting a small area of wet soil just down slope. From limited observations during development of this baseline report, its discharge is limited and water levels fluctuate several inches within the approximately two square foot pool basin – from dry to just to the lip of the basin. Extensive piping below the spring indicates a gravity-fed water distribution system that provided water to an earthen water "tank" and a steel water tank, as well as a broad, shallow basin off the property to the northeast.

The middle spring is currently dry and exhibits no indication of recent discharge or flow. This spring is lined with stone to make a well, has extensive clay beds down slope, and evidence of significant earth moving and alteration for water use. Water development involved concentrating flow with juniper-lined tunnels and ditches, evidence of a well casing nearby, and extensive piping to gravity feed a lower-elevation cattle tank.

The western spring called Turkey Water, on a bluff above Cedar Wash, appears to have continuous seepage as the clay soil surrounding the spring is always saturated. A small (2 ft. X 2 ft.) concrete basin is in disrepair, but holds some water. Based on tracks around this springhead, wildlife such as elk, deer and javelina make extensive use of this water source. As with the other springs, a gravity-fed piping system leads down slope.

Based on observation of creek-side and down slope conditions and vegetation, it appears that Cedar Wash and the springs were much wetter in the recent past. Cedar Wash may have been perennial.

Improvements

Due to the presence of water sources, extensive improvements have been made by all of the previous occupants. Indigenous cultures built pit houses and the walled rooms on the cliff at the west end, as well as the stone pathway or "sidewalk" associated with that structure. They appear to have developed the middle spring where they also dug channels and built ridges of clay, cleared rocks from adjacent areas and built walls, perhaps developed a clay pit, and generally improved key sites to enhance what appears to be fairly intensive habitation. Many of their sites have been reclaimed by native vegetation.

By far the most extensive improvements have been made by Euro-Americans for the stage coach line and the ranching lifestyle. Starting with simple spring enhancements and road improvements, the value of springs and groundwater resources led to a network of first gravity-based cedar flumes, pipelines (surface and buried) and earthen tanks, and then pump-based pipelines and steel holding/pressure tanks. In addition to the one operational well on the upper plateau, several inactive well casings are present.

The main ranch house and associated improvements (corrals, sheds, diesel generator, power line, open storage areas, etc.) were developed on the adjacent private 160-acre parcel Section 18 not considered for inclusion within this conservation easement project. A system of unimproved two-track roads provides access to most of this infrastructure while one improved gravel road provides access from US 180 to the west and crosses the NW corner of the property. Interior fencing is minimal for this section of land – one E-W fence connecting the corral to the east property line, partial N-S fences on the east and west sides below the cliff and running off the property, and one N-S fence on the plateau just west of Cedar Wash and running S from the cliff off the property.

Observed disturbance associated with these improvements has been mapped and is included in the disturbance map insert. Many of the disturbed areas associated with water development and ranching have also been re-colonized by vegetation, but numerous weedy and exotic species are now present.

VI. Biology

Vegetation

The Cedar Springs project area supports four general plant communities that are mostly in excellent condition, and hence, extremely valuable attributes for this site. Three are forest or woodland – pinyon/juniper, ponderosa/Douglas fir/aspen/Arizona walnut, and riparian – and the fourth is grassland. Species diversity is typically high and most areas support at least scattered examples of mature or old-growth specimens. Of prime significance are the ponderosa pine belt below the cliff face and riparian strips along Cedar Wash.

The ponderosa pine community supports a mostly open stand of ponderosa pine of varying age – old growth through seedlings – typically growing in clumps or groups. Many mature trees, snags and downed logs are present. Fire is evident but only a few living trees have fire scars. Only one cut stump was observed. Occasional Douglas fir and aspen are scattered throughout, as well as numerous Arizona black walnut, pinyon pine and junipers. These taxa are also represented by snags, large mature specimens, middle-aged trees, saplings and regeneration, indicating stable composition and structure overall. Extensive litter and duff is present wherever there is any canopy of these overstory species, and boulder fields are throughout creating complex and finely dissected ground surface with very little soil exposed.

The well developed riparian community along Cedar Wash transitions from mature ponderosa dominated canyon habitat above the escarpment, through Douglas fir and aspen at higher elevations in boulder fields below the cliff, to traditional willow/cottonwood/locust habitat at lower elevations associated with the sloped areas. Many riparian species are in decline, probably due to changing climate and reduced flow in the wash.

Pinyon/juniper (P-J) and grassland communities are typical of other mid-elevation settings throughout the region. In the P-J habitat, numerous large juniper snags are present, as well as all age classes. Extensive pinyon mortality of both large and small specimens is evident. As with the riparian community, climate change has probably pushed the pinyon component into decline, although regeneration is present. Occasional juniper stumps left after cutting for fence posts were observed. Grassland communities are generally in good to excellent condition with diverse grass assemblages, generally high plant cover and prolific seedhead production. Some disturbance areas from domestic livestock are present and juniper invasion is ongoing.

Patches of various plant communities occur throughout the property, including: grassy meadows; spring heads and seeps with wetland vegetation (sedges, willow, cottonwood, rose); boulder fields with sparse coverage of forbs and grasses; and short, shallow washes with linear concentrations of various common taxa.

A complete list of all species of vegetation found on the property during field surveys can be found in Appendix A *i*. These species most likely do not include all the species present on the ranch but only those plants observed during 4 months (August-November) of surveys. Within the four general ecosystems on the property, several micro-habitats are apparent. For example, riparian areas have different species depending on their elevation or amount of water flow, and whether they are spring-fed or influenced by rainwater concentrated in washes. In several areas, patches of open grassland are found within the pinyon-juniper woodlands. Appendix B provides lists of all the species found within the vegetation plots and quadrats of each habitat type.

The two distinct pinyon/juniper woodlands share similar traits and species compositions, but also exhibit distinct species more commonly occurring or found only in one or the other location. For example, astragalus and lupine were much more common in the upper P/J whereas Russian thistle and goldeneye were more common in the lower (northern) P/J, probably due to proximity to the grasslands.

There are several species that were only found once or twice. Examples are Torrey's crag lily in the ponderosa belt, and coyote willow, alligator Juniper, and Fremont cottonwood in two of the riparian areas.

Fairy sword fern, wooly mullein, and tailleaf pericome were only occurring along or on the north face of the rock cliff.

Weedy species of concern include cheat grass and tumblegrass, amongst others, occurring in the disturbed areas of grasslands and currently spreading to surrounding areas. Fluffgrass as well indicates disturbance and can be found along roadsides.

The lower PJ woodland had the most variety of species in total whereas the lower riparian plot contained the most species within the 1/10-acre plot area. Perhaps if more plots were carried out, it would be found that the riparian areas had the most species variety in total.

a.) Tree cores

Tree cores taken throughout the property demonstrate that the old growth ponderosa pines below the cliff face are around 200-300 years old. A core read from a small tree in a highly dense dog-hair-ponderosa-thicket shows that its size is more likely to be small (3.25 inches dsh.) due to its younger age of 23 years than due to lack of healthy habitat in an open area with more sunlight and water. The aspen trees are likely to live in the riparian area at Cedar Springs for approximately 100 years. The two doug-firs cored were between the ages of approximately 300-400 years. They were both healthy and showed no signs of health declination. The large Utah juniper down by the ranch house came out to be over 400 years old. There were only a few other large Utah junipers of this size (32.5 inches drc) found throughout the property. A more common size was about half of that diameter.

One of the largest pinyon pines (19.5 inches dsh) found in the ponderosa dominated ecosystems turned out to be 120 years old. This indicates that 120 years ago was about when pinyon pines started to grow up the slope into the higher elevations and the cooler climate that the north-facing slope and cliff offer. An average sized one-seed juniper in the grasslands was dated as approximately 100 years old. Looking at these figures it can be assumed that about 100 years ago, the grasslands began to be populated with a large amount of one-seed junipers and pinyon/juniper began to move upward into the ponderosa belt.

Wildlife

Appendix A *iv.* illustrates a brief list of the wildlife observed on the property. The short list is concisely those animals that were seen, heard, or identified by their tracks or scat. Other animals that are known to occupy the area are antelope, turkey, skunk, golden eagle, red-tailed hawk, dove, and numerous songbirds. And due to the current use of the property, domestic livestock, such as horses and cattle, can be found at certain times of the year.

Species of Concern

The Arizona Game & Fish Department has documented the presence of several species of concern in the Cedar Springs project area and surrounding public lands, such as the northern goshawk, western small-footed myotis, Tusayan rabbitbrush, cinder phacelia, and Sunset Crater beardtongue. Positive confirmation for the presence of any of these species was not made during 5 months of field surveys.

VII. Cultural Resources

A cultural resource inventory was completed for the parcel. The descriptions of the survey results are in a confidential file as per A.R.S. § 39-125.

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IX. Appendices

Appendix A.) Species Lists

i.)

Vegetation List		
Common name	Latin name	Life Form
Ageratina	<i>Ageratina herbacea</i>	Forb
Alpine Goldenrod	<i>Solidago multiradiata</i>	Forb
Arizona Hymenoxys	<i>Tetranneuris acaulis</i>	Forb
Arizona Pea	<i>Lathyrus arizonicus</i>	Forb
Arizona Thistle	<i>Cirsium arizonicum</i>	Forb
Aster	<i>Erigeron</i> spp.	Forb
Astragalus	<i>Astragalus praelongus</i>	Forb
Bahia	<i>Bahia</i> spp.	Forb
Bajada Lupine	<i>Lupinus concinnus</i>	Forb
Basin Rayless Daisy	<i>Erigeron aphanactis</i>	Forb
Beardtongue	<i>Penstemon barbatus</i>	Forb
Biennial Wormwood	<i>Artemisia biennis</i>	Forb
Bitterweed	<i>Hymenoxys bigelovii</i>	Forb
Branched Noseburn	<i>Tragia ramosa</i>	Forb
Bristly Hiddenflower	<i>Cryptantha setosissima</i>	Forb
Broom Groundsel	<i>Senecio spartioides</i>	Forb
Buckwheat	<i>Eriogonum</i> spp.	Forb
Calliopsis	<i>Coreopsis tinctoria</i>	Forb
Canada Goldenlodge	<i>Solidago canadensis</i>	Forb
Canadian Horseweed	<i>Conyza canadensis</i>	Forb
Cocklebur	<i>Xanthium strumarium</i>	Forb
Cologania	<i>Cologania angustifolia</i>	Forb
Common Purslane	<i>Portulaca oleracea</i>	Forb
Corn-Kernel Milkweed	<i>Asclepias latifolia</i>	Forb
Cowboy Grass	<i>Arenaria fendleri</i>	Forb
Curly Dock	<i>Rumex crispus</i>	Forb
Daisy	<i>Erigeron</i> spp.	Forb
Desert Four O'Clock	<i>Mirabilis multiflora</i>	Forb
Desert Paintbrush	<i>Castilleja chromosa</i>	Forb
False Mesquite	<i>Calliandra humilis</i>	Forb
Fendler's Globemallow	<i>Sphaeralcea fendleri</i>	Forb
Fendler's Hawkweed	<i>Hieracium fendleri</i>	Forb
Fendler's Meadowrue	<i>Thalictrum fendleri</i>	Forb
Fennel	<i>Eupatorium</i> spp.	Forb
Fetid Goosefoot	<i>Chenopodium graveolens</i>	Forb
Field Bindweed	<i>Convolvulus arvensis</i>	Forb
Fineleaf Woollywhite	<i>Hymenopappus filifolius</i>	Forb
Fringed Willowherb	<i>Epilobium ciliatum</i>	Forb
Golden Beard Penstemon	<i>Penstemon barbatus</i>	Forb
Goldeneye	<i>Viguiera multiflora</i>	Forb
Goldenrod	<i>Solidago wrightii</i>	Forb
Goosefoot	<i>Chenopodium</i> spp.	Forb
Ground Cherry	<i>Physalis</i> spp.	Forb
Hairy Plantain	<i>Plantago patagonica</i>	Forb
Hill's Lupine	<i>Lupinus hillii</i>	Forb
Horehound	<i>Marrubium vulgare</i>	Forb
Iris	<i>Iris</i> spp.	Forb

Larkspur	<i>Delphinium</i> spp.	Forb
Lettuce	<i>Lactuca</i> spp.	Forb
Littleleaf Globemallow	<i>Sphaeralcea parvifolia</i>	Forb
Lizardtail	<i>Gaura parviflora</i>	Forb
Ludovic's Sagebrush	<i>Artemisia ludoviciana</i>	Forb
Mint	<i>Mentha</i> spp.	Forb
Mock-Pennyroyal	<i>Hedeoma oblongifolium</i>	Forb
Narrowleaf Penstemon	<i>Penstemon linarioides</i>	Forb
New Mexican Yellow Flax	<i>Linum neomexicanum</i>	Forb
Northern Bedstraw	<i>Galium boreale</i>	Forb
Paperflower	<i>Psilostrophe tagetina</i>	Forb
Pink Windmills	<i>Thelepodiopsis linearifolia</i>	Forb
Poison Milkweed	<i>Asclepias subverticillata</i>	Forb
Prairie Sagewort	<i>Artemisia frigida</i>	Forb
Prairie Sunflower	<i>Helianthus petiolaris</i>	Forb
Prostrate Vervain	<i>Verbena bracteata</i>	Forb
Purple Daisy	<i>Macarantha canescens</i>	Forb
Purple Loco	<i>Oxytropis lambertii</i>	Forb
Pussytoes	<i>Antennaria rosulata</i>	Forb
Rattlesnake Weed	<i>Euphorbia albomarginata</i>	Forb
Red Clover	<i>Trifolium pratense</i>	Forb
Redroot Buckwheat	<i>Eriogonum racemosum</i>	Forb
Ribbon Four O'clock	<i>Mirabilis linearis</i>	Forb
Rocky Mountain Bee Plant	<i>Cleome serrulata</i>	Forb
Roseheath	<i>Chaetopappa ericoides</i>	Forb
Running Daisy	<i>Erigeron colomexicanus</i>	Forb
Sand Sagebrush	<i>Artemisia filifolia</i>	Forb
Scarlet Bugler Penstemon	<i>Penstemon eatoni</i>	Forb
Silvery Lupine	<i>Lupinus argenteus</i>	Forb
Snake River Twinpod	<i>Physaria integrifolia</i>	Forb
Stickseed	<i>Lappula</i> spp.	Forb
Tailleaf Pericome	<i>Pericome caudata</i>	Forb
Trailing Fleabane	<i>Erigeron flagellaris</i>	Forb
Tufted Four O'clock	<i>Oxybaphus comatus</i>	Forb
Tumbleweed	<i>Salsola tragus</i>	Forb
Vervain	<i>Verbena</i> spp.	Forb
Wavyleaf Thistle	<i>Cirsium undulatum</i>	Forb
Western Pepperweed	<i>Lepidium montanum</i>	Forb
Wheeler Thistle	<i>Cirsium wheeleri</i>	Forb
White-Ball Acacia	<i>Acacia angustissima</i>	Forb
White Prairie Clover	<i>Petalostemon occidentale</i>	Forb
White Sweetclover	<i>Melilotus alba</i>	Forb
Wild Chrysanthemum	<i>Bahia dissecta</i>	Forb
Wild Gernium	<i>Geranium caespitosum</i>	Forb
Wild Pennyroyal	<i>Mentha arvensis</i>	Forb
Wild Prickley Lettuce	<i>Lactuca seriola</i>	Forb
Wirestem Buckwheat	<i>Erigeron pharnaceoides</i>	Forb
Woolly Mullein	<i>Verbascum thapsus</i>	Forb
Wright's Birdbeak	<i>Cordylanthus wrightii</i>	Forb
Wright's Deervetch	<i>Lotus wrightii</i>	Forb
Yellow Menodora	<i>Menodora scabra</i>	Forb
Yellow Spiny Daisy	<i>Machaeranthera gracilis</i>	Forb
Yellow Sweetclover	<i>Melilotus officinalis</i>	Forb

Annual Muhly	<i>Muhlenbergia minutissima</i>	Graminoid
Arizona Fescue	<i>Festuca arizonica</i>	Graminoid
Black Grama	<i>Bouteloua eriopoda</i>	Graminoid
Blue Grama	<i>Bouteloua gracilis</i>	Graminoid
Chairmaker's Bulrush	<i>Schoenoplectus americanus</i>	Graminoid
Cheatgrass	<i>Bromus tectorum</i>	Graminoid
Curly Mesquite	<i>Hilaria belangeri</i>	Graminoid
Flat Sedge	<i>Cyperus</i> spp.	Graminoid
Fluffgrass	<i>Dasyochloa pulchellum</i>	Graminoid
Foxtail Barley	<i>Hordeum jubatum</i>	Graminoid
Fringed Bromegrass	<i>Bromus ciliatus</i>	Graminoid
Galleta	<i>Hilaria jamesii</i>	Graminoid
Hairy Grama	<i>Bouteloua hirsuta</i>	Graminoid
Indian Ricegrass	<i>Oryzopsis hymenoides</i>	Graminoid
Jointed Rush	<i>Juncus articulata</i>	Graminoid
Junegrass	<i>Koeleria cristata</i>	Graminoid
Little Bluestem	<i>Andropogon scoparius</i>	Graminoid
Mountain Muhly	<i>Muhlenbergia montana</i>	Graminoid
Muttongrass	<i>Poa fendleriana</i>	Graminoid
Needle and Thread Grass	<i>Stipa comata</i>	Graminoid
Nineawn Pappusgrass	<i>Enneapogon desvauxii</i>	Graminoid
Nodding Brome	<i>Bromus anomalus</i>	Graminoid
Plains Lovegrass	<i>Eragrostis intermedia</i>	Graminoid
Purple Three-Awn	<i>Aristida purpurea</i>	Graminoid
Ringgrass Muhly	<i>Muhlenbergia torreyi</i>	Graminoid
Sacaton	<i>Sporobolus wrightii</i>	Graminoid
Sand Dropseed	<i>Sporobolus cryptandrus</i>	Graminoid
Sideoats Grama	<i>Bouteloua curtipendula</i>	Graminoid
Six-weeks Grama	<i>Bouteloua barbata</i>	Graminoid
Slender Wheatgrass	<i>Agropyron caninum</i>	Graminoid
Spike Muhly	<i>Muhlenbergia wrightii</i>	Graminoid
Spike Pappusgrass	<i>Enneapogon devauxii</i>	Graminoid
Spikerush	<i>Eleocharis parishii</i>	Graminoid
Squirreltail	<i>Elymus elymoides</i>	Graminoid
Texas Beardgrass	<i>Andropogon cirratus</i>	Graminoid
Tumblegrass	<i>Schedonnardus paniculatus</i>	Graminoid
Umbrella Sedge	<i>Cyperus fendlerianus</i>	Graminoid
Vine Mesquite	<i>Panicum obtusum</i>	Graminoid
Wolftail	<i>Lycurus phloides</i>	Graminoid
Apache Plume	<i>Fallugia paradoxa</i>	Shrub
Arizona Rose	<i>Rosa arizonica</i>	Shrub
Broom Snakeweed	<i>Gutierrezia sarothrae</i>	Shrub
Brush	<i>Ceanothus</i> spp.	Shrub
Cliffrose	<i>Purshia mexicana</i>	Shrub
Creeping Barberry	<i>Berberis repens</i>	Shrub
Desert Thorn	<i>Lycium macrodon</i>	Shrub
Diffuse Knapweed	<i>Centaurea diffusa</i>	Shrub
Four-wing Saltbush	<i>Atriplex canescens</i>	Shrub
Fremont Barberry	<i>Berberis fremontii</i>	Shrub
Green Rubber Rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	Shrub
Large-Flowered Brickellbush	<i>Brickellia grandiflora</i>	Shrub
Mormon Tea	<i>Ephedra viridis</i>	Shrub
New Mexican Forestiera	<i>Forestiera neomexicana</i>	Shrub
New Mexican Locust	<i>Robinia neomexicana</i>	Shrub

Rubber Rabbitbrush	<i>Chrysothamnus nauseosus</i>	Shrub
Skunkbush	<i>Rhus trilobata</i>	Shrub
Smooth Sumac	<i>Rhus glabra</i>	Shrub
Squaw Currant	<i>Ribes inebrians</i>	Shrub
Tall Sagebrush	<i>Artemisia tridentata</i>	Shrub
Utah Serviceberry	<i>Amelanchier utahensis</i>	Shrub
Wax current	<i>Ribes cereum</i>	Shrub
Banana Yucca	<i>Yucca baccata</i>	Cactus
Beehive Cactus	<i>Coryphantha vivipara</i> var. <i>arizonica</i>	Cactus
Hedgehog	<i>Echinocereus engelmannii</i>	Cactus
Narrowleaf Yucca	<i>Yucca angustissima</i>	Cactus
Prickly Pear	<i>Opuntia engelmannii</i>	Cactus
Soaptree Yucca	<i>Yucca elata</i>	Cactus
Whipple Cholla	<i>Opuntia whipplei</i>	Cactus
Alligator Juniper	<i>Juniperus deppeana</i>	Tree
Arizona Black Walnut	<i>Juglans major</i>	Tree
Blueberry Elder	<i>Sambucus glauca</i>	Tree
Bonpland Willow	<i>Salix bonplandiana</i>	Tree
Coyote Willow	<i>Salix exigua</i>	Tree
Fremont Cottonwood	<i>Populus fremontii</i>	Tree
Narrowleaf Cottonwood	<i>Populus angustifolia</i>	Tree
Oneseed Juniper	<i>Juniperus monosperma</i>	Tree
Pinyon Pine	<i>Pinus edulis</i>	Tree
Ponderosa Pine	<i>Pinus ponderosa</i>	Tree
Quaking Aspen	<i>Populus tremuloides</i>	Tree
Rocky Mountain Douglas Fir	<i>Pseudotsuga menzeisii</i> var. <i>glauca</i>	Tree
Utah Juniper	<i>Juniperus osteosperma</i>	Tree
White Fir	<i>Abies concolor</i>	Tree
Slime Mold	<i>Physarum</i> spp.	Fungus
White Dung Mushroom	<i>Coprinus</i> spp.	Fungus
Yellow Boletus	<i>Boletus edulis</i>	Fungus
Dwarf Mistletoe	<i>Arceuthobium</i> spp.	Parasitic
Fragile Bladder Fern	<i>Cystopteris fragilis</i>	Fern
Lindheimer's Lip Fern (Fairy Sword)	<i>Cheilanthes linheimeri</i>	Fern
Torrey's Crag Lily	<i>Anthericum torreyi</i>	Lily
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	Vine

ii.)

Bird List

Common Name	Latin Name
American Kestrel	<i>Falco sparverius</i>
American Robin	<i>Turdus migratorius</i>
Bank Swallow	<i>Riparia riparia</i>
Blue-Gray Gnatcatcher	<i>Poliophtila caerulea</i>
Canyon Wren	<i>Catherpes mexicanus</i>
Chipping Sparrow	<i>Spizella passerina</i>
Common Crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>
Gray Flycatcher	<i>Empidonax wrightii</i>
Grey-Headed Dark-Eyed Junco	<i>Junco hyemalis</i> var. <i>caniceps</i>
Hairy Woodpecker	<i>Picoides villosus</i>

House Finch	<i>Carpodacus mexicanus</i>
Mountain Chickadee	<i>Poecile gambeli</i>
Mourning Dove	<i>Zenaida macrora</i>
Northern Goshawk	<i>Accipiter gentilis</i>
	<i>Gymnorhinus</i>
Pinyon Jay	<i>cyanocephalus</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>
Red-Shafted Flicker	<i>Colaptes auratus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Rock Wren	<i>Salpinctes obsoletus</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Sage Sparrow	<i>Amphispiza belli</i>
Song Sparrow	<i>Melospiza melodia</i>
Stellar's Jay	<i>Cyanocitta stellari</i>
Western Bluebird	<i>Sialia mexicana</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Western Tanager	<i>Piranga ludovic</i>
Western Wood Peewee	<i>Contopus sordidulus</i>

iii.)

Reptiles and Insects List

Common Name	Latin Name	
Black-Tailed Rattlesnake	<i>Crotalus molossus</i>	Reptile
Blue-Tailed Skink	<i>Eumeces fasciatus</i>	Reptile
Clouded Sulfur Butterfly	<i>Colias philodice</i>	Insect
Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>	Reptile
Harvester Ants	<i>Pogonomyrmex</i> spp.	Insect
Short Horned Lizard	<i>Phrynosoma hernandezi</i>	Reptile

iv.)

Mammals List

Common Name	Latin Name
Blacktailed Jack Rabbit	<i>Lepus californicus</i>
Bobcat	<i>Felis rufus</i>
Botta's Pocket Gopher	<i>Thomomys bottae</i>
Chipmunk	<i>Tamias</i> spp.
Coyote	<i>Canis latrans</i>
Desert Cottontail	<i>Sylvilagus auduboni</i>
Elk	<i>Cervus canadensis</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Javelina	<i>Pecari tajacu</i>
Mule Deer	<i>Odocoileus</i>
Rock Squirrel	<i>Spermophilus variegatus</i>

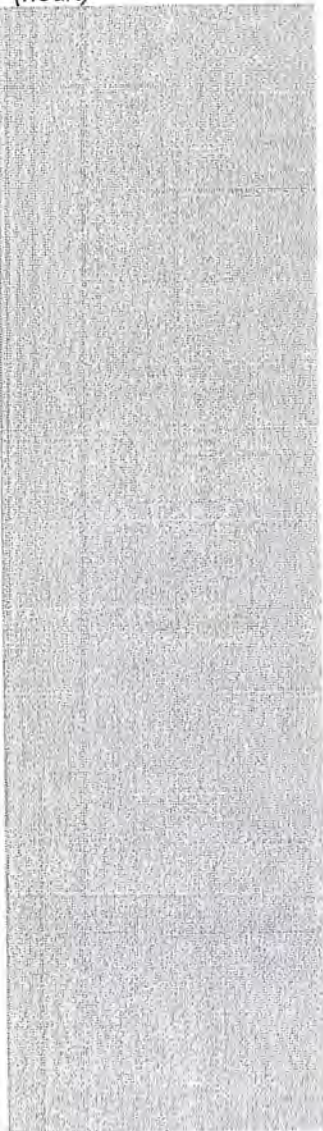
Appendix B.) Plot Species Lists

i.)

Upper B.

Species in Quadrats	Species in 1/10 acre plots
<i>Bouteloua gracilis</i>	<i>Senecio</i> spp.
<i>Gutierrezia sarothrae</i>	<i>Senecio spartoides</i>
<i>Chenopodium</i>	
<i>graviolens</i>	<i>Bahia dissecta</i>

Chamacyces spp. (low)
Chamacyces spp.
Hordeum jubatum
Bouteloua hirsuta
Aristida purpurea
Chenopodium spp.
Physaria integrifolia
Hymenopappus filifolia
Chenopodium
graviolens
Chamacyces spp. (upright)
Bahia dissecta
Pershia mexicana
Penstemon linarioides
Muhlenbergia
minutissima
Eriogonum racemosum
Cordylanthus wrightii
Juniperus monosperma
Chenopodium spp.
 (heart)



Berberis fremontii
Pershia mexicana
Cyperus fendlerianus
Aristida purpurea
Hilaria jamesii
Poa fendleriana
Hymenopappus filifolia
Penstemon spp.

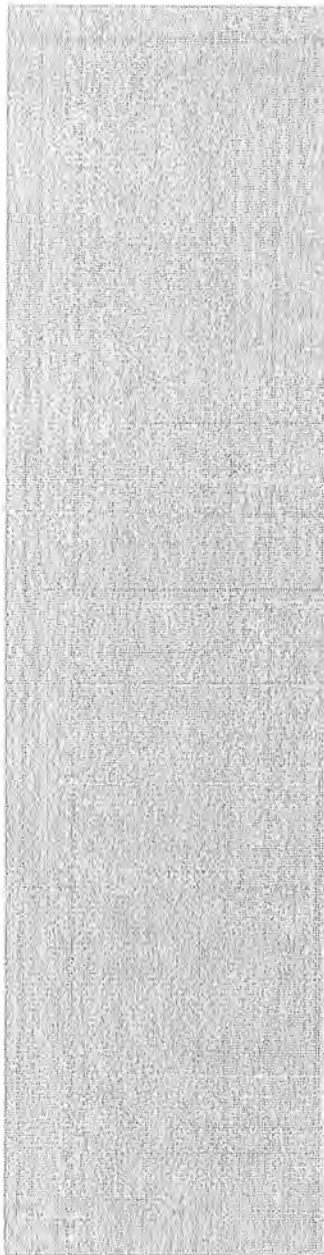
Elymus elymoides
Opuntia engelmannii
Opuntia whipplei
Rhus trilobata
Linum neomexicana

Asclepias subverticillata
Oxybaphus comatus
Tragia ramosa
Echinocereus elgelmannii

Rumex spp.
Chamacyces spp. (low)
Erigeron flagellaris
Penstemon linarioides
Oxytropis lambertii
Bouteloua curtipendula
Muhlenbergia minutissima
Yucca baccata
Fallugia paradoxa
Astragalus spp.
Coryphantha vivipara
Chenopodium graviolens
Portulaca oleracea
Mirabilis linearis
Gutierrezia sarothrae
Eriogonum racemosum
Erigeron colomexicanis
 unknown sedge
Cryptantha spp.
Asclepias spp.
Berberis repens
Amelanchier utahensis
Muhlenbergia spp.
Arceuthobium spp. (Junipers)
Hordeum jubatum
Arceuthobium spp. (Pinyons)
Bouteloua hirsuta
Physerum spp.
Linanthus spp.
Cryptantha setosissima
Mirabilis multiflora
Artemisia frigida
Chrysothamnus nauseosus
Hieracium fendleri

ii.

Lower P.J.	
Species in Quadrats	Species in 1/10 acre plots
<i>Bouteloua gracilis</i>	<i>Chrysothamnus nauseosus</i>
<i>Chenopodium</i>	
<i>graviolens</i>	<i>Lycium</i> spp.
<i>Shaeralcea</i> spp.	<i>Berberis fremontii</i>
<i>Chamacyces</i> spp.	<i>Senecio</i> spp.
<i>Portulaca oleracea</i>	<i>Erigeron colomexicanis</i>
<i>Chenopodium</i> spp.	<i>Macarantha canescens</i>
<i>Sporobolus cryptandrus</i>	<i>Viguiera multiflora</i>
<i>Gutierrezia sarothrae</i>	<i>Hilaria jamesii</i>
<i>Muhlenbergia</i> spp.	<i>Atriplex canescens</i>
unknown forb (compositae)	<i>Salsola tragus</i>
unknown forb (pea?	
Blue)	<i>Elymus elymoides</i>
<i>Hilaria jamesii</i>	<i>Rhus trilobata</i>
<i>Aristida purpurea</i>	<i>Salsola iberica</i>
<i>Plantago patagonica</i>	<i>Atriplex canescens</i>
<i>Macarantha gracilis</i>	unknown forb (compositae)
unknown grass	<i>Gutierrezia sarothrae</i>
<i>Penstemon linarioides</i>	<i>Schedonnardus paniculatus</i>
<i>Cordylanthus wrightii</i>	<i>Muhlenbergia</i> spp.
<i>Senecio</i> spp.	<i>Bahia dissecta</i>
<i>Physeria integrifolia</i>	<i>Plantago patagonica</i>
<i>Eriogonum racemosum</i>	<i>Dalea</i> spp.
<i>Hymenopappus filifolia</i>	unknown forb (pea? Blue)
<i>Viguiera multiflora</i>	<i>Chenopodium</i> spp.
<i>Bromus tectorum</i>	<i>Opuntia engelmannii</i>
<i>Hordeum jubatum</i>	unknown forb (yarrow-like)
<i>Eragrostis</i> spp.	<i>Sphaeralcea</i> spp.
<i>Pinus edulis</i>	<i>Sporobolus cryptandrus</i>
<i>Poa fendleriana</i>	<i>Coryphantha vivipara</i>
<i>Juniperus monosperma</i>	<i>Menodora scabra</i>
<i>Mirabilis linearis</i>	<i>Bouteloua gracilis</i>
<i>Oxytropis lambertii</i>	<i>Opuntia whipplei</i>
<i>Senecio spartoides</i>	<i>Penstemon</i> spp.
<i>Schoenoplectus americanus</i>	<i>Portulaca oleracea</i>
	<i>Aristida purpurea</i>
	<i>Muhlenbergia minutissima</i>
	<i>Echinocereus engelmannii</i>
	<i>Shaeralcea</i> spp.
	<i>Astragalus</i> spp.
	<i>Archeuthobium</i> spp.
	(juniper)
	<i>Hymenopappus filifolia</i>
	<i>Mirabilis linearis</i>
	<i>Senecio spartoides</i>
	<i>Hordeum jubatum</i>
	<i>Asclepias</i> spp.

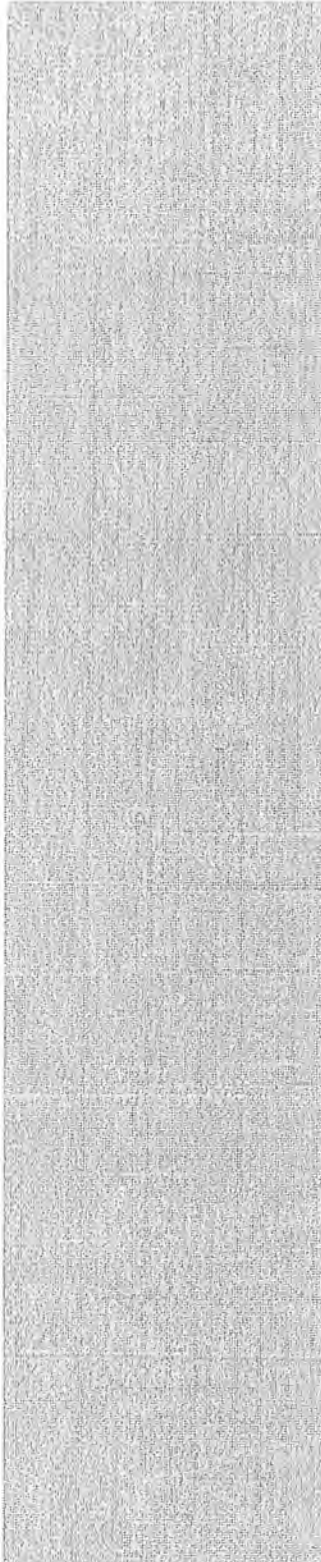


Penstemon linarioides
Cirsium spp.
Lepidium montanum
unknown forb (cat tongue-like)
Bouteloua hirsuta
Chamacyces spp. (low)
Poa fendleriana
Tetradymia spp.
Artemisia ludoviciana
Cordylanthus wrightii
Oxybaphus comatus
Purshia mexicana
Bouteloua curtipendula
Cyperus fendlerianus
Erigeron colomexicanis
Ageratina herbacea
Psilotrophe tagetina
Physalis hederifolia
Erigeron flagellaris
Berberis repens
Stipa comata
Mirabilis multiflora
Koeleria cristata
Asclepias latifolia
Eriogonum racemosum
Arceuthobium sp. (on Pinyons)
Oxytropis lambertii
Ephedra viridis
Cologania angustifolia
Amalanchier utahensis
Ceanothus spp.
Lotus wrightii
Forestiera neomexicana
Cryptantha setosissima
Festuca spp.

iii.)

Ponderosa Belt	
Species in quadrats	Species in 1/10 acre plots
<i>Erigeron flagellaris</i>	<i>Purshia mexicana</i>
<i>Bouteloua curtipendula</i>	<i>Penstemon linarioides</i>
<i>Arenaria fendleri</i>	<i>Hymenopappus filifolia</i>
<i>Poa fendleriana</i>	<i>Elymus elymoides</i>
<i>Bouteloua gracilis</i>	<i>Senecio spartoides</i>
<i>Koeleria cristata</i>	<i>Aristida purpurea</i>
<i>Pinus ponderosa</i>	<i>Koeleria cristata</i>
<i>Festuca</i> spp.	<i>Coryphantha vivipara</i>
<i>Chenopodium</i>	
<i>graviolens</i>	<i>Eriogonum racemosum</i>
<i>Solidago canadensis</i>	<i>Penstemon</i> spp.
<i>Artemisia ludoviciana</i>	<i>Opuntia engelmannii</i>
<i>Festuca</i> spp.	<i>Ageratina herbacea</i>

Penstemon linarioides
Fallugia paradoxa
Muhlenbergia montana
Lotus wrightii
Elymus elymoides
Hordeum jubatum



Chenopodium graviolens
Artemisia ludoviciana
Fallugia paradoxa
Muhlenbergia montana
Solidago canadensis
Opuntia whipplei
Bouteloua hirsuta
Andropogon cirratus
Festuca arizonica
Rhus trilobata
Hilaria jamesii
Oxytropis lambertii
Juniperus monosperma
Bromus anomalus
Enneapogon devauxii
Pinus edulis
Hordeum jubatum
Anthericum torreyi
Gutierrezia sarothrae
Lotus wrightii
Tragia ramosa
Bouteloua curtipendula
Erigeron flagellaris
Bouteloua gracilis
Poa fendleriana
Arceuthobium spp. (junipers)
Cirsium wheeleri
Tetradymia spp.
Lycurus phloides
Artemisia filifolia
Brickellia spp.
Lepidium montanum
Senecio spp.
Pershia mexicana
Bahia dissecta
Muhlenbergia minutissima
Cyperus fendlerianus
Chamacyces spp.
Linanthus spp.
Robinia neomexicana
Ribes inebrians
Berberis fremontii
Forestiera neomexicana
Cyperus spp.
Chrysothamnus nauseosus
Erigeron colomexicanis
unknown forb (strawberry?)
Festuca spp.
Cheilanthes linheimeri
Echinocereus engelmannii
Ribes cereum
unknown forb (dandelion-like)



Eupatorium spp.
Rhus trilobata
Pericome caudata
Yucca elata
Antennaria rosulata
Petalostemon occidentale
Asclepias spp.

iv.)

Grasslands	
Species in quadrats	Species in 1/10 acre plots
<i>Viguiera multiflora</i>	<i>Atriplex canescens</i>
<i>Hilaria jamesii</i>	<i>Gutierrezia sarothrae</i>
<i>Portulaca oleracea</i>	<i>Chrysothamnus nauseosus</i>
<i>Bouteloua gracilis</i>	<i>Sphaerolacca</i> spp.
<i>Opuntia engelmannii</i>	<i>Muhlenbergia minutissima</i>
<i>Chenopodium</i>	
<i>graviolens</i>	<i>Macarantha canescens</i>
<i>Chrysothamnus nauseosus</i>	<i>Opuntia whipplei</i>
<i>Sporobolus cryptandrus</i>	<i>Chenopodium</i> spp.
<i>Chamacyces</i> spp. (upright)	unknown forb (compositae)
<i>Muhlenbergia</i>	
<i>minutissima</i>	<i>Senecio</i> spp.
<i>Sphaeralcea</i> spp.	<i>Erigeron colomexicanis</i>
<i>Plantago patagonica</i>	<i>Asclepias</i> spp.
<i>Aristida purpurea</i>	<i>Asclepias subverticillata</i>
<i>Hordeum jubatum</i>	<i>Sporobolus cryptandrus</i>
unknown forb (compositae)	<i>Berberis fremontii</i>
unknown forb (yarrow-like)	
<i>Lycium macrodon</i>	<i>Hordeum jubatum</i>
<i>Salsola tragus</i>	<i>Aristida purpurea</i>
<i>Schoenoplectus americanus</i>	<i>Eragrostis</i> spp.
<i>Chenopodium</i> spp.	<i>Viguiera multiflora</i>
(heart)	
	<i>Bouteloua gracilis</i>
	<i>Opuntia engelmannii</i>
	<i>Salsola tragus</i>
	<i>Chamacyces</i> spp.
	<i>Helianthus petiolaris</i>
	unknown forb (pea? Blue)
	<i>Eragrostis intermedia</i>

v.)

Aspen	
Species in quadrat	Species in 1/10 acre plot
<i>Populus tremuloides</i>	<i>Pericome caudata</i>
<i>Festuca</i> spp.	<i>Forestiera neomexicana</i>
	<i>Brickellia grandiflora</i>
	<i>Rhus trilobata</i>
	<i>Ribes cereum</i>
	<i>Chrysothamnus nauseosus</i>
	<i>Verbascum thapsus</i>
	<i>Penstemon</i> spp.
	unknown grass (wheat-like)

vi.)

Doug-Fir	
Species in quadrat	Species in 1/10 acre plot
<i>Hordeum jubatum</i>	<i>Festuca</i> spp.
<i>Populus tremuloides</i>	<i>Pericome caudata</i>
	<i>Ribes cereum</i>
	<i>Cheilanthes linheimeri</i>
	<i>Berberis fremontii</i>
	<i>Verbascum thapsus</i>
	<i>Lepidium montanum</i>
	<i>Penstemon</i> spp.
	unknown forb

vii.)

Riparian	
Species in quadrats	Species in 1/10 acre plots
<i>Bromus anomalus</i>	<i>Pericome caudata</i>
<i>Festuca</i> spp.	<i>Juglans major</i>
<i>Brickellia grandiflora</i>	<i>Robinia neomexicana</i>
<i>Solidago canadensis</i>	<i>Poa fendleriana</i>
<i>Bouteloua curtipendula</i>	<i>Hordeum jubatum</i>
<i>Cirsium arizonica</i>	<i>Ribes cereum</i>
<i>Senecio</i> spp.	<i>Artemisia ludoviciana</i>
<i>Hordeum jubatum</i>	<i>Verbascum thapsus</i>
	<i>Rhus trilobata</i>
	<i>Penstemon</i> spp.
	<i>Sporobolus cryptandrus</i>
	<i>Opuntia engelmannii</i>
	<i>Gutierrezia sarothrae</i>
	<i>Mirabilis linearis</i>
	<i>Berberis fremontii</i>
	<i>Forestiera neomexicana</i>
	<i>Geranium caespitosum</i>
	unknown forb (pea? Blue)
	<i>Ageratina herbacea</i>
	<i>Stipa comata</i>
	<i>Bromus anomalus</i>

i.)

Date 2007 Photo numbers: _____ UTM Coordinates: _____
 Plot No. _____ Elev. _____ ft. Slope _____ % Aspect _____ Deg. _____

REGENERATION:

Species	Live	Snag	Dead and down

%

Canopy cover:

[illegible]

Canopy cover: _____ %

Soil:%

Species on plot:

ii.) Cultural Resources Datasheet

A cultural resource inventory was completed for the parcel. The descriptions of the collection-datasheets used in the surveys are in a confidential file as per A.R.S. § 39-125.

Photos (please see attached cd or hardcopy inserts)

- a) Vegetation plot photos
- b) Features, improvements and disturbance area photos
- c) Strategic view photos

Large Format Maps (please see attached cd or hardcopy inserts)

APPENDIX G

Babbitt Ranches Long-Term Pronghorn Succession Plan

Babbitt Ranches

Long-Term Pronghorn Succession Plan



Lori Rodgers

2009

Prepared for:
Babbitt Ranches

Completed by:
Jim deVos and Billy Cordasco

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History and Environmental Spirit of Babbitt Ranches

The area occupied by the present day Babbitt Ranches has been important to Native Americans as the area was farmed by several indigenous cultures including the Cohonina, Sinagua, and most recently Anasazi people. As these cultures perished, the area was crossed by Spanish missionaries, military and science explorations, and early mountain men.

The Babbitt Ranches has a long and storied history and has maintained a position as one of the most important ranch operations since its beginnings in 1886 when the first cattle were purchased. In 1887, the first property was obtained; a portion of the San Francisco Peaks. In the next few years a number of ranches were purchased and ranch operations continued to expand. In the early 1900s, the Babbitt Ranches was recognized as one of the most important ranching operations in the entire Southwest.



The San Francisco Peaks are an important land feature to early cultures as well as for current Arizonans. This is a prominent landscape feature that can be seen from long distances and provides habitat for wildlife and livestock. It is also an important area for human recreation. Pronghorn use the high-elevation meadows in summer.

In subsequent years, Babbitt Ranches has continued to be a major producer of livestock commodities, however, the focus has broadened to include a strong sense of environmental responsibility as Babbitt Ranches has been a leader in aggressively pursuing long-term conservation actions to ensure that the lands they treasure are maintained as they are for future generations to enjoy. Amongst some the major actions that demonstrate this land ethic is the series of conservation easements that have been developed in recent years. Most recent is the Forest Legacy Project where Cedar Springs, an important ecological and sociological resource was protected in perpetuity. This 640-acre project preserves Cedar Springs and surrounding acres of important wildlife habitat. Additionally, this conservation easement has high historical value as Cedar Springs was an important watering site along the Grand Canyon stage line, which transported tourists to the remote Grand Canyon prior to road access.

Prior to the Cedar Springs Forest Legacy Project, Babbitt Ranches had entered into an important conservation easement to protect the Cataract Ranch property, an ecologically sensitive area that had a high potential for development. In December 2000, nearly 40,880 acres of unique habitat was protected from development as Babbitt Ranches entered into conservation easements with the Nature Conservancy and Coconino County. The ethic that defines the history and future of Babbitt Ranches is captured clearly in the Babbitt Ranches Constitution.

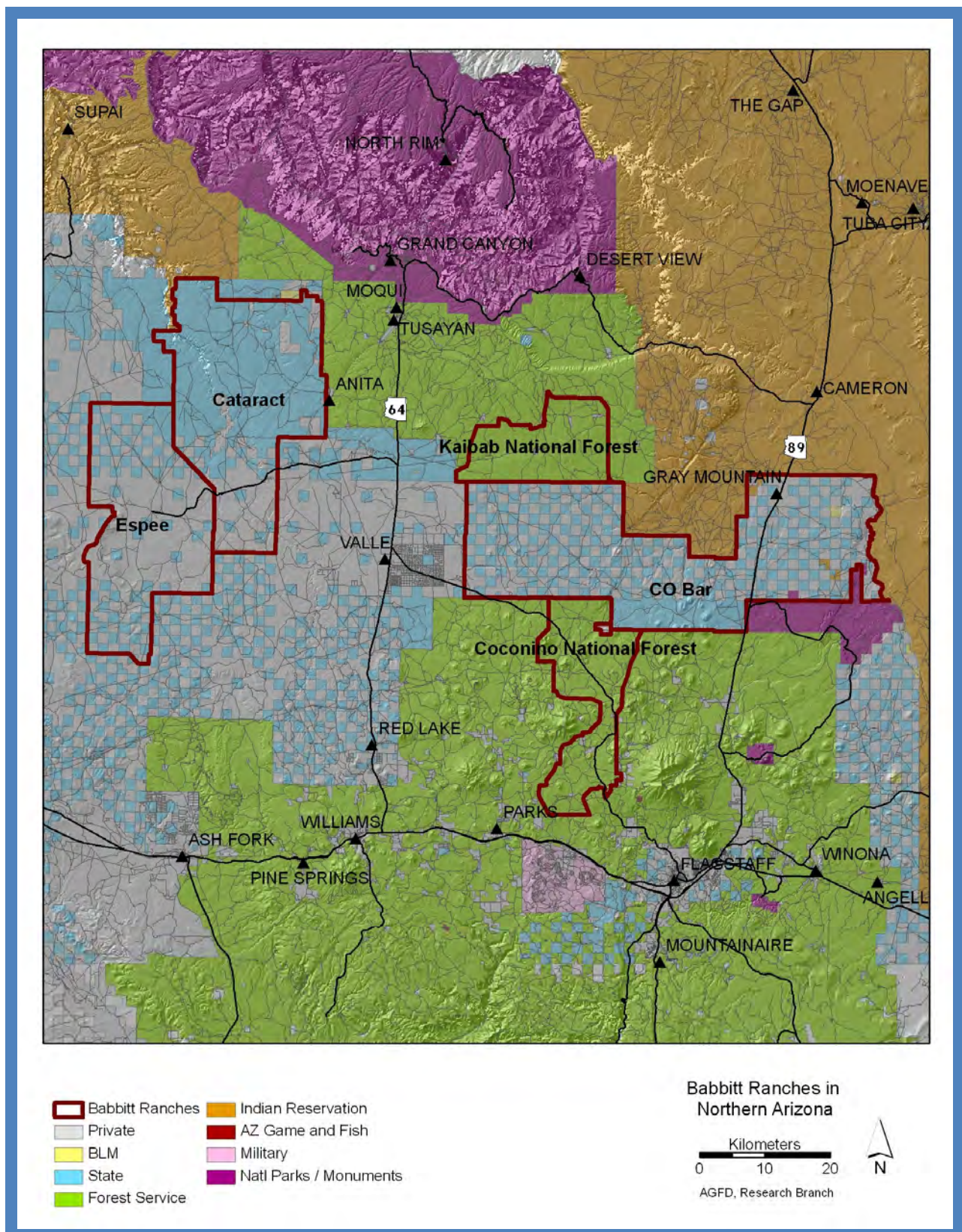


Figure 1 General location of Babbitt Ranch in Northern Arizona. This area is comprised of many different biotic communities and holds considerable value for pronghorn.



One of the tenets of the Babbitt Ranches' business models is that a healthy environment is conducive to healthy economic conditions. Further, sound land stewardship provides a valuable contribution to current and future generations of Arizonans.

In this spirit, Babbitt Ranches demonstrates a deep sense of responsibility to the people and communities of the region through more than a century of cooperation and community participation. The economic well being of the region cannot be separated from the well being of the environment. Given this defining tenet, the Babbitt Ranches have prepared this long-term pronghorn succession plan to ensure that pronghorn and pronghorn management are considered in all actions undertaken on ranch properties and that this species has a place on the ranch far into the future.

It is important to recognize that there are many factors that influence the environment in which we live. One of the emerging issues that all actions on Babbitt Ranches must take into consideration is global climate change. It is projected that a number of climate changes will occur in the Southwestern United States including a gradual warming trend, more variable precipitation patterns, shifting from snow to more rainfall (IPPC 2007); all of which will likely result in subtle changes in the biotic community found in the Southwest, including Babbitt Ranches (deVos and McKinney 2008).

Pronghorn Plan Background

Pronghorn (*Antilocapra americana*) are an important component of the wildlife community that occurs in many areas and biotic communities in western North America (Hall and Nelson 1959). In Arizona, this species occurred throughout much of the state where meadows and open fields occurred (Hoffmeister 1986, Brown and Ockenfels 2007). The current pronghorn distribution in Arizona is less extensive than previously (Hoffmeister 1986), although it is widely distributed in Northern Arizona including many of the lands owned and management by Babbitt Ranches. Pronghorn numbers have varied considerable since Anglo-European settlement with numbers greatly reduced prior to 1900, rebounding for several decades after the turn of the century due to a variety of anthropogenic causes, and generally declining in the last decade (Brown and Ockenfels 2007). Pronghorn are a species that is highly sought after for both consumptive use and wildlife watching. Given the uniqueness of this wildland species, coupled with the decline in both distribution and abundance that has been observed in recent years, it will

be challenging to maintain this species on the landscape without intense habitat and species management activities.

Recognizing the importance of this species, Babbitt Ranches and the Arizona Game and Fish Department have worked in unison to draft these plans to ensure to the extent possible that pronghorn abundance and distribution is maintained or preferably enhances on those lands owned/managed by Babbitt Ranches. To accomplish this, this document provides information on the historic pronghorn management practices, identifies current habitat limitations, and discusses potential actions that can be taken to meet the objective of maintaining or enhancing pronghorn populations and the habitat upon which these populations depend.

This document is developed to contain the following sections:

- A description of the key components of suitable pronghorn habitat
- Identification of current habitat conditions that occur on the three separate areas where pronghorn are found on lands owned/managed by Babbitt Ranches
- Discussions of key habitat and management issues which are important to meeting the objective of this plan which includes:
 - Nutritional needs
 - Maintaining movement corridors within and to the extent possible between subunits of Babbitt Ranches
 - Habitat quality and improvements
 - Water distribution and availability
 - Maintaining or enhancing genetic diversity
 - Minimum viable population size
 - The role of climate change on pronghorn populations

The information in this plan and other wildlife plans developed by state and federal wildlife and habitat management agencies will be used as the basis for making management decisions to maintain or enhance pronghorn populations on Babbitt Ranch lands and other similar lands where pronghorn occur.



Proactive planning is a key element of meeting the goal of maintaining or enhancing pronghorn populations on lands managed by Babbitt Ranches.

One of the key reasons for the development of this plan is to place a roadmap for successive managers of pronghorn on Babbitt Ranches. As time progresses, people change and move to new challenges and opportunities in life. The authors of this plan hope that the roadmap to pronghorn management contained in this plan will transcend these personnel changes and will serve the Babbitt Ranch Mission of enhancing the environment for future generations.

To accomplish this, it will be important that this plan is reviewed and updated on a regular cycle. Most of the actions in this plan have a 5-year cycle and to be effective, it will be important that this plan is reviewed and accomplishments identified and changes to the plan be made every five years.

Plan Goal

The goal of this plan is to accomplish three specific items as follows:

- To identify and detail important components of pronghorn habitat in a fashion that is easily understood and able to be applied to rangeland improvements on lands owned and managed by Babbitt Ranches.
- To describe existing conditions relative to pronghorn populations and habitat and identify needed improvements that would benefit management of this unique species and its habitat.
- To detail specific work tasks that will be employed as time and financial resources exist to optimize the long-term persistence of this species at a level that is socially and biologically appropriate.

Introduction

The lands owned and managed by Babbitt Ranches offer a unique environmental laboratory for several reasons including their large size, ecological diversity, and interest of the partners in the environment. The ranch properties range in elevation from approximately 4,000 feet near the Painted Desert to nearly 9,000 feet in proximity to the San Francisco Peaks. As expected there is also considerable vegetative diversity within this vast elevational change. There are three primary vegetative communities, with a multitude of vegetative associations found on Cataract, Espee and CO BAR ranches. At lower elevations, grassland and shrub-invaded grasslands are most dominant. Shrub-dominated communities occur throughout these ranches, but at relatively smaller scales than grasslands or woodlands. Woodlands, primarily pinyon-juniper but extending into ponderosa pine-dominated forests occur on all three ranches.

The region is relatively dry with no perennial waterways. Rainfall is bimodal with summer monsoons and winter precipitation (often in the form of snow) and ranges from around 10 inches in lower elevations to nearly 25 inches in higher elevations near the San Francisco Peaks. As a result of low precipitation coupled with high infiltration rates that occur in the Kaibab limestone formations, little surface water occurs. The ephemeral drainages flow eastward to the Little Colorado River and westward to Cataract Creek, both of which are tributaries to the Colorado River. To provide surface water to wildlife and domestic livestock, approximately 200 water sources have been developed on the ranches. These include dirt-bank

tanks that catch and hold surface runoff, an extensive array of pipes supply water in many areas, and various water development styles have been constructed for wildlife.

A key to the ability to use these ranches as an environmental laboratory is the large size of the ranches and the high percentage of the land held in private holdings. In all, the ranches exceed 700,000 acres of which 270,000 are privately held, with the remainder managed under permits by state and federal agencies.

Babbitt Ranches has been a leader in developing databases that will serve well as long-term monitoring/management plans. One of these documents is the Biological Assessment of the Coconino Plateau (Babbitt Ranches 1998). This is a comprehensive plan that provides a wealth of information on biotic and abiotic environmental factors on these ranches. This document provides a clear platform for the development of further, more specific planning/implementation documents that will help meet the ecological component of the Babbitt Ranches Constitution which states “Across the high desert landscape of northern Arizona, Babbitt Ranches promotes and respects regional continuity, wildlife habitat, diverse vegetation, watersheds, historic sites, cultural resources and access for recreationists and scientists.” One of the species of special interest to Babbitt Ranches is the pronghorn, a species that occurs throughout the majority of the property owned/managed by Babbitt Ranches. Projects that have been designed to improve pronghorn habitat and populations have been occurring on Babbitt Ranches for more than 20 years and a long-term management implementation plan will help guide future efforts to ensure continued existence of this unique wildlife species.

Pronghorn have been an important species to First Nation and subsequent settlers in Arizona for eons (O’Gara and McCabe 2004, Brown and Ockenfels 2007). Pronghorn remain important to current day Americans and much attention has been paid to their management in recent times. The Arizona Game and Fish Department’s (AGFD) statewide wildlife strategic plan (Arizona Game and Fish Department 2001) includes a goal to maintain pronghorn populations that provide diverse recreational opportunities for the public. Specific pronghorn management objectives include maintenance of a statewide population of 8,250 to 10,000 post-hunt adults, with an annual harvest of between 600 and 800 animals. This would provide recreational opportunity for approximately 1,200 to 1,600 hunters a year and would provide extensive opportunity for pronghorn viewing. The specific approaches outlined below will allow lands managed by Babbitt Ranches to play an integral role in meeting or exceeding these targets.

Pronghorn are an important resource to the owners/managers of Babbitt Ranches and they desire to develop a successional plan that will aid in optimizing the number and distribution of this valued resource on lands they manage. This document is intended to be a dynamic document that will be amended as new information becomes available that dictates that changes to the plan would further the goal of optimal pronghorn management.



Pronghorn are an important component of the natural environment on Babbitt Ranches and maintaining this species as a feature on the landscape is an important part of the Babbitt Ranch Mission. To accomplish this will require a science-based successional plan for future managers of the ranch properties.

The Babbitt Ranch pronghorn plan is based on a variety of existing plans including the State Strategic Plans, and the statewide pronghorn operational plan, with emphasis on the portion dealing with Units 7 and 9. Further, we have made extensive use of the existing published and unpublished results of research projects conducted in biotic communities similar to those that occur on Babbitt Ranches. We also rely on research findings for other management activities such as management of small populations that make contributions useful to this plan.

This plan is a collaborative effort with many sources involved including the Arizona Game and Fish Department (Game Management and Research branches and Region II personnel), Babbitt Ranches, and other scientific entities. This document is structured in such a fashion as to provide specific information and guidance to be used to improve pronghorn population and habitat management on two temporal scales: short-term (less than five years) and long-term (greater than five years). It is important to recognize that like any successful strategic plan, this document is dynamic and can be updated when new information becomes available. Modifications should be made using an adaptive management approach where the results of applying management actions to pronghorn and pronghorn habitat are used to improve future efforts.

It is very likely that prior to Anglo-European settlement of northern Arizona, there were essentially no barriers to movement between adjacent pronghorn herds and isolation of small populations was rare. Currently, this is not true and human-caused impacts to pronghorn habitat has resulted in the isolation of not less than three pronghorn populations on lands managed by Babbitt Ranches. These subdivided populations can best be described as: the eastern most subpopulation which occurs on CO BAR Ranch east of US Highway 89; the second subpopulation is found on the CO BAR ranch west of Highway 89; and the third subpopulation occurs west of Arizona Highway 64 on the Cataract and Espee ranches.



The prevalence of pronghorn in Native American rock art support the importance of this species to First Nation persons, an importance that remains today.

These isolative mechanisms that result in these subpopulations, which are most likely major transportation corridors, dictate that these populations occupy different biotic communities and therefore have different migratory strategies and requirements. The subpopulation that occupies areas east of Highway 89 appear to be primarily migratory; wintering on the lower elevation CO BAR and Wupatki National Monument areas and summering on higher elevation Forest Service land. The subpopulation that occupies areas west of Arizona Highway 89 is split between migratory and non-migratory subgroups depending on the biotic community that each subgroup occupies. The non-migratory subgroup occupies both state and private lands at lower elevations. The migratory subgroup occupies higher elevation areas as far south as Interstate 40 in summer and ranges from Arizona Highway 64 on the west to Observatory Mesa on the east. In winter, both subgroups occupy lower elevation areas north of US Highway 180. The western most subpopulation on the Cataract and Espee ranches is non-migratory, likely due to the lower elevation that occurs in this area.

Babbitt Ranches have played an important role in pronghorn research and management in recent years and have been cooperators in many different pronghorn projects. The long interest in promoting effective pronghorn management on lands management by Babbitt Ranches, coupled with the expansive area occupied by Babbitt Ranches, makes this a key area to meet the objectives outlined in the AGFD *Wildlife 2006* (Arizona Game and Fish Department 2001) and *Wildlife 2012* (Arizona Game and Fish Department 2007). Further, Babbitt Ranches has demonstrated a long history of creative approaches to improving habitat quality, making this area very important to pronghorn elsewhere in northern Arizona as it functions as a working laboratory.

As an example of the importance of Babbitt Ranches, AGFD conducted a statewide evaluation of pronghorn habitat in 1995 (Ockenfels et al. 1996b) and found that Babbitt Ranches contain approximately 6% of the total pronghorn habitat in Arizona. That study demonstrated how important improving pronghorn habitat is as the study found that of the approximately 21,000 mi² of pronghorn habitat in Arizona, only 250 mi² of this land was classified as high quality habitat.

Summary of prior pronghorn research/management on Babbitt Ranches

In the last 20 years, a number of research and management projects have been conducted in cooperation with Babbitt Ranches and various management and research agencies and with several universities. A listing of these projects include:

Ockenfels, R. A., C. L. Ticer, A. Alexander, J. A. Wennerlund. 1996a. A landscape-level pronghorn evaluation model for Arizona. Arizona Game and Fish Department, Research Branch Technical Report #19. Phoenix

This document is an assessment of the habitat limitations that were present when the research was done. The approach was to do an on-site visit on a section by section basis and rate the quality of the habitat based on several biotic and abiotic factors. All suitable pronghorn habitat was rated. Much of the research that was done to develop the model was conducted on Babbitt Ranches.

Ockenfels, R. A., C. L. Ticer, A. Alexander, J. A. Wennerlund, P. A. Hurley, and J. L. Bright. 1996b. Statewide evaluation of pronghorn habitat in Arizona: A final report. Arizona Game and Fish Department, Federal Aid in Wildlife Restoration, Project W-78-R. Phoenix.

This report is the result of a statewide pronghorn habitat rating system whereby all potential habitat in Arizona was inspected and rated for habitat quality and to identify factors that reduce the habitat quality on a section of land scale. Although this scale is coarse, it does provide a valuable tool to identify habitat quality patterns and to aid in designing habitat improvement programs.

Ticer, C. L., and J. C. deVos, Jr. 2000. Assessment and modification of pronghorn habitat in northwestern Arizona. Technical Guidance Bulletin, No. 5. Arizona Game and Fish Department, Phoenix.

This project was conducted on the Cataract and Espee ranches in the western portion of the Babbitt Ranch complex. The goal of this research was to use locations of telemetered pronghorn as a measure of actual use patterns for pronghorn. Where appropriate, 400-m buffers were established using GIS to assess habitat availability. Several of the use versus availability measures were taken with 40-m² or 400-m² circular plots established at actual use sites. In total, 30 pronghorn were captured and 1,288 locations were obtained. In this study, pronghorn selected for vegetative conditions that were more open and avoided those that were densely vegetated. The micro- and macrosite assessments supported this as trees were absent in more than 96.5% of the smaller sized plots. In general, pronghorn avoided areas proximate to busy roadways. In this study, fence structure appeared to inhibit movements between at least some pastures.

Ticer, C. L., S. A. Boe, R. A. Ockenfels, and J. C. deVos, Jr. 1999. Factors affecting home ranges and movements of pronghorn on a shortgrass prairie of Northern Arizona. 18th Biennial Pronghorn Workshop.

Research conducted prior to this study by the Arizona Game and Fish Department suggested that many areas of northern Arizona provided less than desirable conditions for pronghorn due to low plant diversity; inadequate yearlong water sources, overly restrictive fence structure, and the presence of major travel corridors. It appeared as if the movement patterns of pronghorn were dictated primarily by the presence of fences and secondarily to the presence of roadways, with the roads with greater vehicle passage rates affecting pronghorn movements the most.

Ticer, C. L., and R. A. Ockenfels. 1997. A validation of Arizona's landscape-scale pronghorn habitat model. Arizona Game and Fish Department, Phoenix.

After considerable literature review relative to habitat models that have been developed to assess habitat quality for pronghorn in the western United States, a model was developed specific to Arizona pronghorn habitat. Several factors were included in this model including vegetative community, terrain, human use, water availability, and several specific vegetative characteristics. This study used the landscape-scale habitat assessment to rate the habitat quality within portions of Babbitt Ranches. A total of 29 pronghorn were telemetered and their movements monitored to assess use patterns. Non-random use patterns were observed with approximately 82% of the locations occurring within areas that had been classified as having moderate or better ratings, while this habitat quality rating comprised less than 10% of the available habitat; supporting the validity of the rating system.

Ockenfels, R. A., W. K. Carrel, and C. VanRiper, III. 1997. Home range and movement patterns of pronghorn in northern Arizona. Proceedings of the Third Biennial Conference of Research on the Colorado Plateau.

This study was conducted on two national monuments in northern Arizona; Wupatki and Petrified Forest. Pronghorn were telemetered and their movements monitored during aerial flights to determine movement patterns and home range characteristics. This study documented fenced rights-of-way inhibited pronghorn movements and had long-term survivorship issues due to possible genetic isolation of discrete herd units. These authors also indicated that the lack of movement has the potential to strand pronghorn during episodes of large snowfall, resulting in direct mortality. Movement patterns were similar between these study areas, however, the home ranges were somewhat larger on Wupatki National Monument. They recommended removing or modifying fences to facilitate movements.

Miller, W. H., and M. Drake. No date. Nutritional concerns of pronghorn antelope on Anderson Mesa and Garland Prairie. Applied Biological Sciences Department, Arizona State University, Tempe. Report submitted to the Arizona Game and Fish Department, Phoenix, AZ.

This study selected two sites, one with historically high fawn survival (Garland Prairie) and one with lower fawn survival (Anderson Mesa) and compared diet composition and quality between these two sites. Pronghorn on Garland Prairie consumed a much more diverse diet than those on Anderson Mesa. In addition, diaminopimelic acid (DAPA) which reflects diet quality was higher on Garland Prairie than Anderson Mesa. The researchers concluded that the diet of

Garland Prairie was superior to that of Anderson Mesa and this difference contributed greatly to the different population performance levels observed.

Key components of pronghorn habitat

In general terms, pronghorn habitat is comprised of food resources, cover (thermal and fawn-hiding), and water. The key to providing high quality habitat depends on the composition and distribution of these resources. As part of the research conducted to complete a landscape-scale habitat model for Arizona, Ockenfels et al. (1996a) evaluated nine existing habitat models that have been developed to determine pronghorn habitat quality. In looking at these models, there are several habitat components that were deemed important to determining habitat quality. It is important to recognize that these components seldom dictate habitat quality by themselves but that each of these interacts with each other to determine suitability of pronghorn habitat at various spatial scales:

- An area sufficiently large to support a viable pronghorn population
- Movement corridors are present that allow for movement between adjacent areas to ensure the flow of genetic material vital to long-term survival of this unique species. Recognized impediments to movement include the presence of roadways, poorly designed fences, railways, etc.
- Presence of a diverse vegetative community which provides adequate food resources which is often measured in the following terms:
 - Percent forb cover
 - Percent shrub cover
 - Percent grass cover
- Vegetation vertical height is less than 24 inches in height
- Suitable distribution of water sources
- Suitable range conditions with lack of dense trees
- Relatively flat terrain

Using these criteria as basis for developing an Arizona-specific model (Ockenfels et al. 1996a) tested a landscape-scale habitat rating system and found a high degree of predictability of habitat use, from which they inferred habitat quality. It therefore seems reasonable to employ these field-tested criteria to portray those features that comprise high quality habitat components. Where appropriate, other research/management information is also used to assess what components constitute high class pronghorn habitat.

- Terrain class
 - Optimally, terrain should be flat to undulating terrain with a slope less than 5% and a lack of deeply incised canyons. The quality of the habitat declines rapidly when slopes exceed 10% (Yoakum 2004). The pronghorn management guidelines (Autenrieth et al. 2006) indicate that slopes greater than 20% are generally avoided.
- Vegetation class
 - A diverse community where vegetative structure is less than 24 inches in height, trees are largely absent, a mix of grass species including both warm and cool-season species, and approximately 25% bare ground to promote growth of seasonal forbs which are important food resources for pronghorn. Yoakum (2004) suggested that a plant community dominated by grass species (50-80%), forbs (10-20%), and shrubs (approximately 5%) provided optimal pronghorn habitat. Given that pronghorn rely

on sight to avoid predators, closed canopy woodland or shrublands/woodlands that have been invaded by tall woody species, is consistently classed as poor quality pronghorn habitat with increased mortality due to predation. Autenrieth et al. (2006) report similar composition, density, and vegetation height classes as providing high quality habitat for pronghorn.

- Human disturbance rating
 - High quality habitat is considered that which lacks permanent residences and has minimal recreational disturbance, particularly during fawning/fawn rearing periods. Further, high quality habitat is not bisected by major roadways or railroad rights-of-way which preclude or limit movements into small, fragmented areas.
- Fencing standards
 - One of the key impacts to western rangelands relative to pronghorn use/value is the presence of fences that preclude or impede pronghorn movements. In general, fences that promote pronghorn movement are those that incorporate a smooth-wire bottom strand that is approximately 18 inches above the ground. More recently use of PVC pipes that raise the lower fence strand to facilitate pronghorn movements have proven to improve fence permeability.



Fences that are too low to the ground impede easy movement by pronghorn and can eliminate access to key habitat features such as traditional fawn areas or access to traditional water sources. By raising the lower strand to at least 16 inches above the ground, fences become less of a barrier to movements.



Goat bars such as the one pictured here, have been used to quickly modify fence structure in a fashion to facilitate movement in fences that are not constructed to recommended standards to permit pronghorn movements.

- Water distribution
 - Although the importance of water to pronghorn is equivocal, some studies of North American pronghorn suggest that water distribution is important to this species (Kindschy et al. 1978, Ockenfels et al. 1996a). These researchers suggest that areas within one mile of a dependable water source improve the habitat rating for pronghorn. Areas that were greater than four miles from a dependable water source were rated as poor for pronghorn. Water distribution is also an important feature in determining use patterns for fawning sites. Ockenfels et al. (1992) found that most pronghorn fawning sites were located between 0.3 and 0.6 miles for a reliable water site.



While waters have been constructed for wildlife throughout western North America, it is important to develop a clear understanding of the need for and the potential consequences of water developments before initiation of any water development consequences.

- Cover classes
 - Important cover classes include thermal and fawn hiding cover. Thermal cover is often found in the form of trees and tall shrubs where pronghorn can find shade during hot periods. Land depressions are also important in cold environments where pronghorn can find shelter from cold winds and blowing snow (Yoakum 2004). In Arizona, vegetation 16 inches in height, particularly when found in areas with varied terrain are important areas for pronghorn fawning (Ticer and Miller 1994).

EASTERN SUBPOPULATION: **CO BAR RANCH EAST OF US HIGHWAY 89**

This area is bounded to the west by Highway 89, to the east by the Little Colorado River, to the north by the Navajo Nation, and to the south by the urban areas surrounding Flagstaff. The majority of the region is dominated by grasslands to the north, pinyon-juniper invaded grasslands in the middle region, and by coniferous woodlands to the south. There is considerable urban and exurban development in the portion of this subunit south of Wupatki National Monument.

This pronghorn subpopulation is largely migratory with the herd predominately wintering east of Two Grey Hills on Babbitt Ranches and summering in higher elevation areas on Babbitt Ranches, in proximity to Wupatki National Monument, and south proximate to Flagstaff. This subpopulation has been stable or slowly decreasing over the last ten years. Historically they used the pinyon-juniper community during summer. Radio tracking data indicate that telemetered pronghorn are found frequently on the sides of the cinder cones in the area during summer. The reason for this habitat use pattern is speculative and warrants additional investigation.

As would be expected from a block of habitat of the size of this subunit, there is considerable habitat heterogeneity and a plan needs to recognize this and focus on site-specific actions that will benefit pronghorn and their habitat. Within this habitat block, Ockenfels et al. (1996b) applied a landscape-scale habitat rating system to potential pronghorn habitat and found a consistent pattern of increasing habitat quality trending toward the northern and western portion of this habitat block and along the eastern boundary. This is reflected in the vegetative communities present in the area which are predominantly comprised of grasslands/shrublands which are widely used by pronghorn (Figure 2)

There has been considerable research on pronghorn in this subunit, focusing primarily on movements and habitat use patterns. Of particular interest from these studies is that the presence of Highway 89 appears to pose a barrier for movement as cross-highway movements were very infrequent. A high number of locations were in close proximity to the highway. Pronghorn were found most frequently in the more northern portions of this subunit (Figure 3). This may reflect a preference for these habitat types, but it also may reflect capture locations.

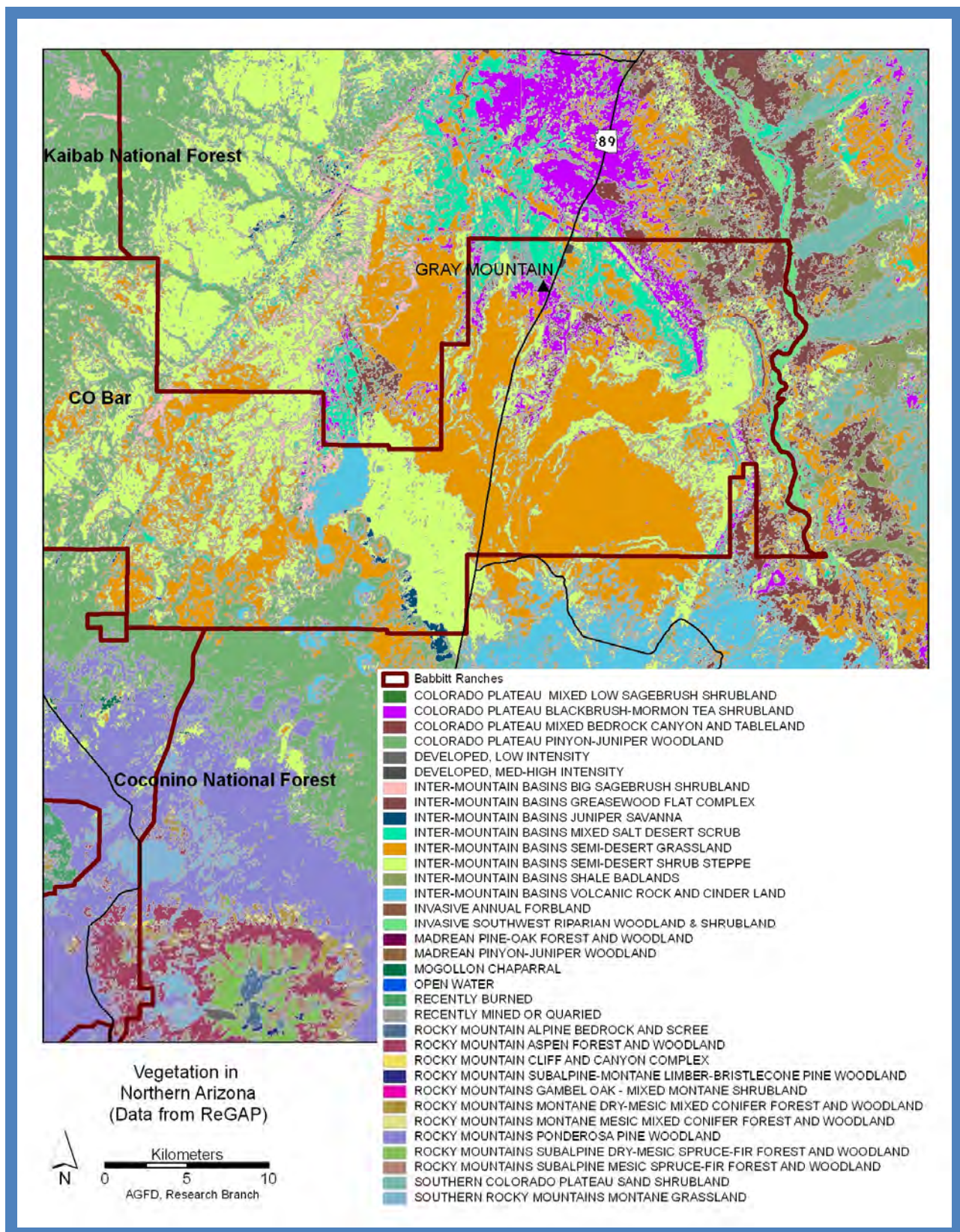


Figure 2. The vegetation of this subunit is comprised primarily of Inter-mountain basins mixed desert grassland and several other biotic communities important to pronghorn.

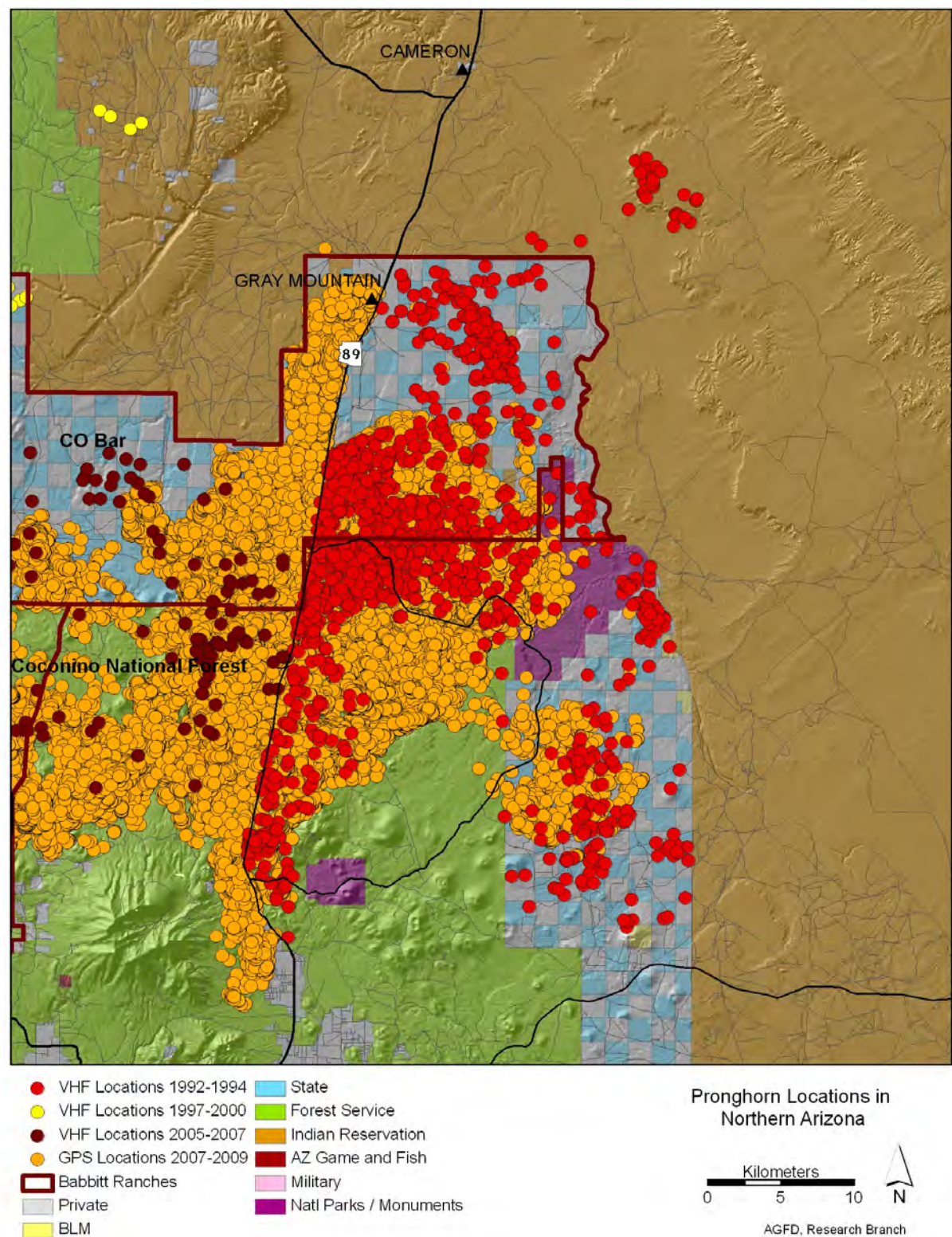


Figure 3. Considerable research has been done in this subunit; of particular note is the fact that there has been a very low rate of cross-highway movement by telemetered pronghorn. The 2007-2009 locations represent pronghorn that were collared on both sides of the highway.

Issues and Concerns

Due largely to the proximity of this area to Flagstaff, there are considerable emerging human-related impacts related to urban and exurban developments. In addition, there are several long-term impacts that adversely impact the quality of pronghorn habitat in the area. In their evaluation of pronghorn habitat in the area, Ockenfels et al. (1996b) identified the following factors as being key limitations on pronghorn habitat in this area.

- There are a number of major transportation corridors in this area that are effective barriers to pronghorn movements, thus, several smaller, discrete subpopulations exist in the larger area.
- There is an issue of fence construction and distribution within this area that, in concert with transportation corridors, reduce pronghorn habitat quality.
- Although there were a number of water sources located within pronghorn habitat, Ockenfels et al. (1996b) found that not all contained water during spring and summer, a period deemed important for fawning/lactating female pronghorn.
- As indicated, prime pronghorn habitat exists where vegetative height is less than approximately 24-inches high. Much of this subunit has been invaded by woody tree and shrub species with greater vertical height than desired, which reduces the overall quality of much of the pronghorn habitat available for this subunit.
- Given that pronghorn are selective feeders, they require a variety of plant species and younger-aged, new growth vegetation to meet their dietary needs. Much of the area occupied by this subpopulation was determined to lack species richness, therefore potentially limiting the potential of this subpopulation to maintain or increase pronghorn density.
- Human population impacts appear to be a factor in this portion of pronghorn habitat as much of the area on the southern portion of the area has been subdivided and occupied by housing areas. The area of greatest human presence is also the area where telemetered pronghorn move to during summer.

Within this subpopulation, some of the specific issues that have been identified as impacting pronghorn or their habitat include human development and associated increases in human activity near residences south of Wupatki National Monument. Further compounding the loss of habitat quality in this area is the broad increase in woody species that have invaded this area, reducing forage diversity and reducing visual sight distances, and important security factor for pronghorn. The area east of Sunset Crater National Monument has been especially fragmented by home development. Another issue of concern in the area is the loss of connectivity among important use areas that is created by the construction of Interstate 40, Highway 89, human developments as discussed previously, which reduces access to the cinder hills and meadows at base of the San Francisco Peaks and to the north of the Peaks. Some of these connections are being lost as human development takes place such as along the Leupp Highway. Connectivity can also be adversely impacted when woody species such as pinyon and juniper invade an area to a density that excludes movement by pronghorn, likely due to loss of visual distance which in turn impacts pronghorn security. Another problem that is imposed on this subpopulation as the result of loss of connectivity is the reduction in exchange of individual pronghorn between this and adjacent subpopulations in virtually all directions.

Loss of connectivity presents unique challenges to management of the resultant small populations as these small populations are at increased risk of local extirpations (Gilpin and Soule 1986, Soule 1987, Belovsky et al. 1994). Lynch et al. (1995) attributes the increased risk of extinction to three risk factors related to small populations including demographic stochasticity (random changes in birth or mortality rates), environmental stochasticity (random extremes in critical environmental factors such as extreme droughts), or genetic problems such as accumulation of deleterious mutations or inbreeding depression.

Another consequence of loss of connectivity is the potential isolation of critical habitat components such as fawning areas which reduces subpopulation fitness. As pronghorn are less able to move long distances, the population may experience increased mortality, decreased reproduction, an increased magnitude of population fluctuation, and an increased risk of extirpation for the local population.

There are several potential management actions that can be taken to avoid or reduce the adverse impacts from increased fragmentation. Some of these management actions include increasing the quality of the remaining habitat, decreasing mortality, maintaining genetic diversity or population density by conducting transplants into the area, changing sport harvest, and improving connections to adjacent but currently isolated population segments.

Opportunities

While there are a number of factors that potentially impact this subpopulation, there are also a number of situations that can be taken advantage of when considering management actions that can be taken to improve conditions for pronghorn in this subpopulation. Some of these potential benefits include:

- In 2006, Babbitt Ranches, AGFD, the Arizona Department of Transportation, and the Federal Highway Administration initiated a study of pronghorn movements in proximity to Highway 89 with a goal of developing strategies to optimize connectivity across transportation corridors. A potential outcome of this is a bridge that spans Highway 89 at a location determined by pronghorn movement patterns and topography to facilitate movements across this highway.
- There are large blocks of federally-managed areas including Coconino National Forest and Wupatki and Sunset Crater national monuments are within the pronghorn subpopulation's habitat and present opportunities for protected habitat and areas with reduced human use. These federally-managed lands are managed by agencies with a portion of their mission including effective, collaborative management of habitat to improve conditions for wildlife.
- Babbitt Ranches has a long history of concern for wildlife and the habitat that many wildlife species depend, with particular attention to pronghorn. This has been manifested in an initiation of many site-specific projects with research and management agencies and universities, but particularly with the Arizona Game and Fish Department that is highly unusual and appreciated.
- In recent years pronghorn have been available for transplants on a regular basis and if conditions dictate that a supplemental release of pronghorn is warranted, the availability of pronghorn for this action would be easily facilitated.
- Recent advances in the woody species management such as the development of the hydro-ax has opened opportunities that were heretofore unavailable to managers. This

method allows for efficient reduction of woody species in a fashion that opens the area visually for pronghorn, leaves the wood products in small pieces that act as mulch on the ground, and enhances seed sprouting post-treatment.

- Many federal and state grant programs are available to provide funding to private landowners to conduct habitat improvement programs on privately held lands. This will greatly enhance the potential for funding to conduct activities identified in this plan.
- Because of the large area managed by Babbitt Ranches, there is opportunity to experiment with differing approaches to pronghorn management. In the future, it will be possible to experiment with applying a treatment and monitoring a response to the treatment.

Eastern Subpopulation Goal

The goal for the eastern subpopulation is to reduce adverse habitat conditions to the extent possible to allow for increasing pronghorn density to the point of obtaining a healthy, viable pronghorn subpopulation. This can best be accomplished by implementing the following management approaches.

Management Issues For Pronghorn Populations on Babbitt Ranches

PRIMARY CONSERVATION ISSUES – East subpopulation

There are a number of conservation problems addressed below and all of them affect the potential for maintaining or enhancing this subpopulation of pronghorn. There are, however, three issues that pose greatest risk to this subpopulation including:

- Substantial areas have been impacted by woody invasion, reducing both forage resources and necessary sight distance.
- Loss of connectivity with other areas where pronghorn exist, which leads to reduced population fitness and increases the risk of loss of this population due to genetic decay or random environmental pressures.
- Low vegetative community diversity; an issue that is key to forage availability and suitability for pronghorn.

Tree and Shrub Invasion:

Tree and shrub invasion guidelines – *the goal of this plan segment is to restore, to the extent possible, the ecological function in this vegetative community while recognizing the alteration of ecological processes resulting from changed fire regimes, excessive herbivory, and the influence of global climate change. Efforts will not be expended to change vegetative communities to other than what naturally occurred in the region.*



Dense stands of pinyon and juniper trees have converted once healthy grasslands and shrublands that supported much larger herds of pronghorn than are supported in regions with tree densities such as this.

Woody species have increased in much of this area, which results in reduced forage availability and quality, increased predation as stalking/ambush cover for predators is expanded, and reduced the total area of suitable habitat for pronghorn by decreased visual sight distance which appears to be important in habitat selection by pronghorn.

Problem areas for the eastern subpopulation are south of Wupatki National Monument on Forest Service lands. Work on Coconino National Forest and Wupatki National Monument will complement other work on the CO BAR.

Strategy 1. Utilize existing funding programs such as the Habitat Partnership Committees and other potential funding sources to fund pinyon-juniper and ponderosa removal from invaded grasslands and savannas at all elevations. The approach here will be to stage the treatments in a step-wise fashion as follows:

- Treat areas in low-lying drainages first to ensure connectivity within this subunit to the extent possible. As a target, not less than 500 acres/year for a five year period should be treated to reduce woody invaders in areas that would improve connectivity between existing, but isolated pronghorn use areas. By working on these drainage areas, a high degree of connectivity can be obtained with minimal acres converted (Figure 4).
- Open areas in proximity to the cleared drainages where the age of the trees is predominately less than 40-50 years old. This will optimize the treatments in areas where recent woody invasion has occurred and grasslands can be best restored. Pinyon and juniper trees with greater than 18 inch DBH should be left as a food resource and to provide cover. As a target, not less than 500 acres per year should be treated for a period of 5 years.
- Identify key meadows that have historic use by pronghorn and other ungulate species such as elk that have been invaded by ponderosa pines and initiate removal programs to restore ecological function to these meadows. This habitat type can be particularly important as a food resource during summer. As a target, at least one meadow will be treated each year for a five year period.

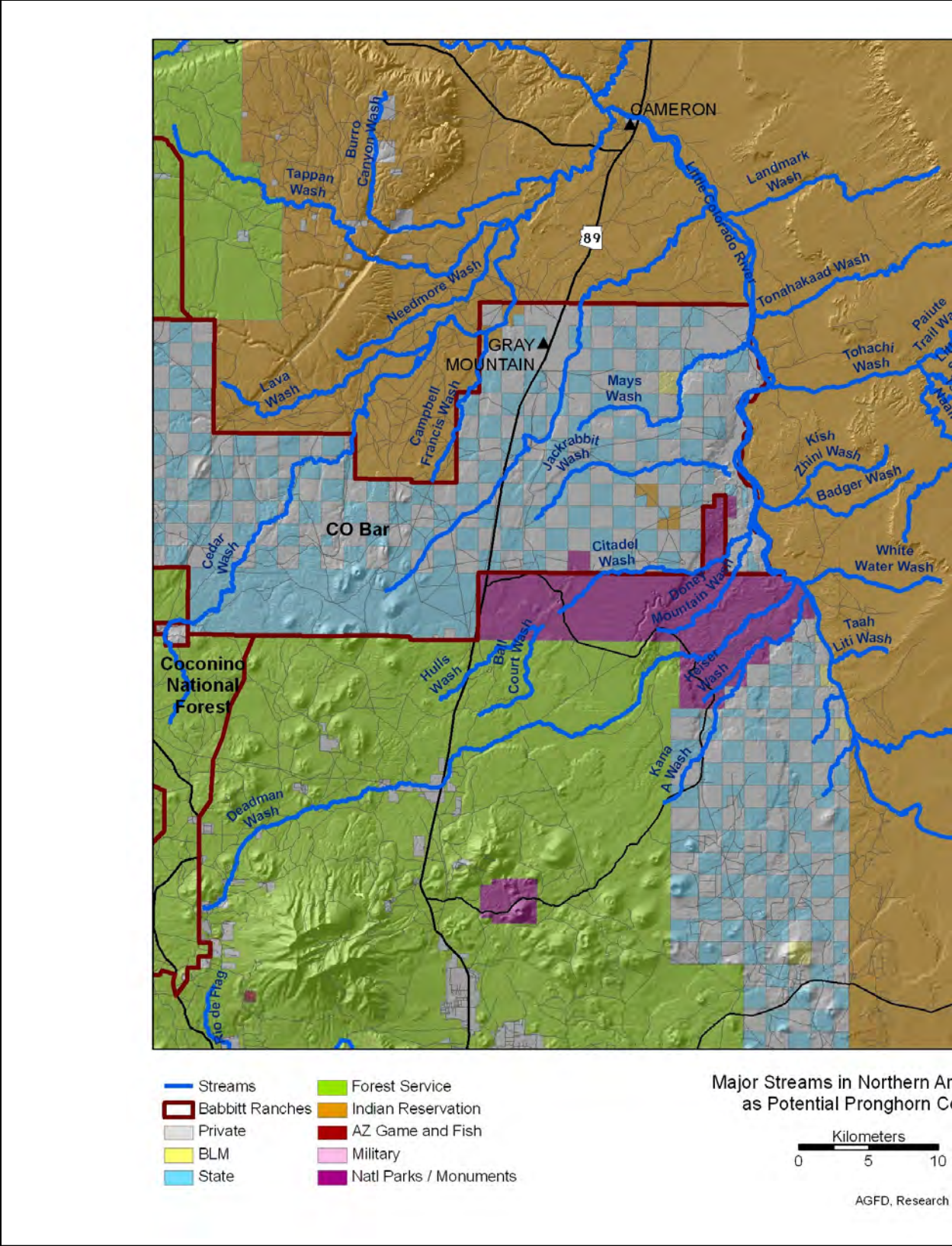


Figure 4. Low areas such as streambeds offer potential as places to reduce vegetative density for connectivity.

Strategy 2. Using existing data from telemetry studies or using a Delphi approach, identify additional areas where reduction of woody species would enhance recovery of pronghorn populations. An example of these types of areas would be potential fawning areas that are located in proximity to water and have other features identified by Ticer and Miller (1994) Project sites should be far enough from rural homes to avoid most conflicts with homeowners, recreationists or domestic or feral dogs.

- To achieve the above treatment type, site visits to waters in pronghorn habitat should be conducted to identify not less than five water sites that are potential fawning areas using the guidance of Ticer and Miller (1994). Tree density reduction should be conducted using the hydro-ax in a fashion to obtain a site that meets the description of fawning cover as identified by Ticer and Miller (1994). In the first five years of this plan, the five fawning areas should be treated to improved pronghorn habitat.

Forage Availability and Diversity:

Forage availability and diversity guidelines – *restoring forage to pre-settlement conditions should be based on reduction of woody material, utilization of watered plots, and application of seeds. Seeds will be solely from native species with preference for seeds that have been collected from ecologically similar conditions to that of Babbitt Ranches.*



Pronghorn are selective, concentrate feeders and require a diverse vegetative community, with abundant forbs in spring and shrubs in winter to meet their metabolic requirement and support sustainable population size.

Pronghorn rely on a diverse vegetative community where forbs and shrubs are important components of their diet. Pronghorn are selective foragers and depend on forage diversity and plant quality where high digestibility and nutrient levels occur.

Past management and drought in this area reduced vegetative diversity, particularly on cool season grasses and desirable browse over much of the range. The native summer grass, blue grama filled in the gaps and now dominates vegetative cover in most ranges below 6,500 feet elevation. When the soil warms and moisture is available, blue grama provides nutritious forage with crude protein content above 10%. Conversely, under adverse conditions, the crude protein

content of blue grama drops to less than 2%, digestibility is very low and this resource is of little value for livestock or wildlife. This adaptation of blue grama explains its ability to survive heavy winter use and its ability to out-compete other more desirable forage species. One of the key management strategies to improve habitat conditions for pronghorn is restoration of vegetative diversity in the area and to reintroduce habitat disturbances to rejuvenate individual plants.

Strategy 1. Evaluate the potential to use irrigated forage plots in key areas to improve forage quality/availability for pronghorn. Under the right conditions forage plots could provide additional dependable pronghorn forage. If the logistics can be worked out we would like to try forage plots near Denton-Sayer on the CO BAR and somewhere near Spider Ranch. Assuming that this approach achieves desired outcomes, we recommend implementing no less than two of these treatments per year in the eastern subunit within areas where forage quality/availability is lower quality than desirable for a period of not less than five years for a total of 10 treatment areas. Each treatment area should consist of an area of not less than 2 acres.

Strategy 2. Spreader berms have the potential to increase soil moisture and thereby to increase forage diversity, growing season and quantity of forage available. Tests on the efficiency of spreader berms were initiated on Raymond Wildlife Area and the Flying M Ranch in 2007. If those tests are successful in increasing vegetative diversity and abundance, no less than 5 acres of spreader berms per year will be placed in drainage areas in this subunit of the Babbitt Ranches as away to improve forage.

Strategy 3. Conduct literature review and develop an appendix for this plan that identifies the key components of pronghorn diets and develop sources of seeds that can be used to reseed treated areas.

Strategy 4. Implement a variety of treatment approaches to increase the number, distribution, quality of key forage species for pronghorn. Potential treatments could include:

- Disking grassland flats to disturb the soil and rejuvenate existing shrubs that have become senescent due to lack of disturbance or excessive herbivory.
- A target of not less than 100 acres a year for a period of 5 years is projected as a goal for this subsection of Babbitt Ranches. Monitoring needs to be implemented to determine the vegetative response to this treatment. If plant diversity and growth form improves during this trial period, additional acreage should be treated in this fashion in subsequent years.
- Seeding with desirable plant species. Research conducted by Ockenfels et al. (1996b) suggested that the number of desirable forage species was reduced in much of this area. Therefore, obtaining desirable forage species seeds and reseed key areas where species diversity is low would benefit pronghorn.
- In areas where species diversity is low, particularly the shrub component, native species seeds from not less than five desirable species need to be obtained, either by purchase or by local collection and not less than 50 acres a year of treated areas (either disking or hydro-axed areas) should be

reseeded to improve the plant community with valuable species for pronghorn consumption.

- Pinyon-juniper invaders should be removed on sites dominated by blue grama or snakeweed. It is important to monitor treated sites for the presence of undesirable species of exotic plants such as cheatgrass as this species is a frequent invader of disturbed sites and is a management concern as it changes fire regimes to being very frequent with a conversion to a cheatgrass monoculture being a potential result of some treatments (Ecological Restoration Institute 2007).

Strategy 5. Design livestock grazing protocols and utilize elk management strategies to ensure that over utilization of forage resources does not occur on treated landscapes.

Water Distribution:

Water development philosophy – *the focus of this plan is to create better habitat for pronghorn and this is the driving force for water developments for pronghorn. Therefore, it is important that waters be developed in habitats that are purely pronghorn habitat and not areas where the addition of water would facilitate or encourage use by elk or other wildlife species that could compete with pronghorn.*



Wildlife waters while having some controversial aspects are frequently used to improve conditions for wildlife, particularly in areas where access to naturally-occurring water sites has been blocked by human infrastructure such as highways and fences.

Previous research suggests that optimal water distribution is placement of a permanent water site at a distance of about every two miles within occupied habitat and that use areas within 4 miles of permanent water were selected by pronghorn at a rate greater than this habitat was available (Autenrieth et al. 2006). Further, it is important that these waters have little vegetative cover around water sources that would result in inaccessibility to pronghorn or would possibly facilitate predation at water sites.

Strategy 1. Provide a wildlife water source just south of Wupatki boundary at near Mesa Well and Wupatki Camp. This water should be constructed and maintained during the first two years of this plan.

Strategy 2. Identify all waters (including those targeted for livestock) that occur within pronghorn habitat, conduct an assessment of their persistence (is water available during spring and summer; key periods of water demand for pronghorn) and their availability to pronghorn and other wildlife species.

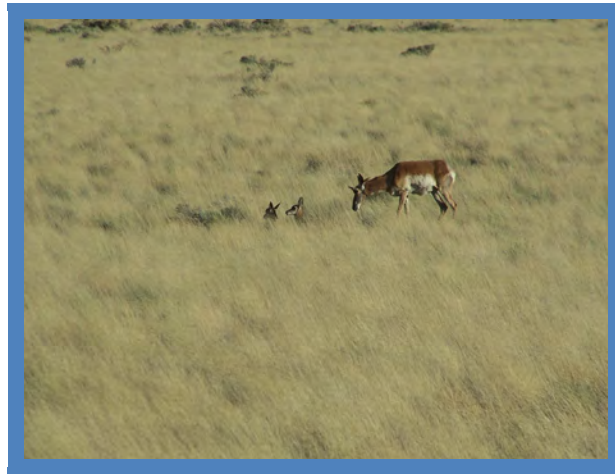
- Develop a list of and field verify the existence of all waters in potential pronghorn habitat and assess their availability for pronghorn and their persistence potential. This activity should be completed by the second year of this plan.
- Prioritize and develop rehabilitation strategies for all waters that do not provide key season access for pronghorn based on the need for suitable waters in the area. Prepare grant proposals and rehabilitate waters in priority order to ensure suitability for both wildlife and livestock. Rehabilitate at least one water per year for the first five years of this plan.

Strategy 3. Identify locations in this subunit where water is not available to pronghorn within a 4-mile radius and identify potential locations on existing pipelines where pronghorn waters can be developed at minimal cost.

- Develop a needs assessment based on the 4-mile radius recommended by Autenrieth et al. (2006) where water does not exist within suitable pronghorn habitat. This should be completed within the first two years of this plan.
- Develop wildlife waters in areas where water is lacking. One water per plan year will be developed.

Fawning Cover:

Fawning cover guidelines – *research has demonstrated that gravid does select specific habitat conditions to give birth and rear fawns. When optimal habitat conditions occur and does have access to prime fawning habitat, herd productivity will be optimized.*



Research has tied high levels of fawn survival to locations where adequate fawning cover is maintained.

Having sufficient cover to hide fawns from predators is a key habitat consideration. Research conducted in Arizona suggest that at least 16 inches vertical height is needed.

Fawning cover is low and less than desired on the area occupied by this subpopulation area in general. Ticer and Miller (1994) conducted research on the habitat characteristics at fawning sites in Arizona. One of the key predictors of pronghorn population trajectory is the rate

of fawn recruitment into the population. In general, when fawn recruitment is at or below 30 fawns per 100 does, the population will be in decline. Increasing fawn recruitment is a key management action that is needed throughout most pronghorn ranges in Arizona, including the habitat on Babbitt Ranches.

Strategy 1. Using the fawning habitat description developed by Ticer and Miller (1994), identify at least five potential fawning areas in this subunit.

- Select two of the potential fawning areas identified and develop rehabilitation strategies for each location. In general, key characteristics for pronghorn fawning include: distance from water, varied topography, vegetative height approximately 16 inches tall. Rehabilitation plans should be completed within two years of the initiation of this plan.
- Apply the rehabilitation plan identified above and rehabilitate one fawning area in year 3 and 4 of this plan. This could entail woody species removal and reseedling with desired species to provide vertical height.

Fence Standards:

Fence standard guidelines – *fences are necessary for proper livestock management and can play an important role in restricting movements of pronghorn when fence structure is close enough to the ground to preclude movements. A key management practice to benefit pronghorn on western rangelands is modification of fences to ensure movement is possible under fences thereby maintaining connectivity between herd units.*

Fences in this segment of the CO BAR serve three primary purposes; providing highway barriers, defining pastures for livestock use, and providing locations to work cattle, usually around waters. While many of the fences have been modified to enhance pronghorn movements, there are still areas which do not meet recommended standards recommended in the Pronghorn Management Guidelines. Currently, many fences on the CO BAR have been enhanced with placement of Goat Bars, which provide movement sites for pronghorn use.

Strategy 1. Identify pasture fences where the bottom strand is less than 18 inches high and comprised of barbed wire and place “Goat Bars” where pronghorn have been crossing fences. The goal will be to modify approximately 10 miles of fence per year for a five-year period.

Strategy 2. Investigate the potential to modify highway boundary fences to guide pronghorn to locations where they can cross major roadways in a fashion that ensures their and highway user safety. Potential approaches could include moving highway barrier fences farther from the road right of way in areas where pronghorn cross; use of guide fences to facilitate pronghorn movements to a specific crossing area; elimination of highway boundary fences in areas where domestic livestock are not pastured. The goal will be to have a strategic plan for all highway fences along Highway 89 by the second year of the plan.

Fragmentation and Loss of Habitat to Human Development

Fragmentation guidelines – *the demand for rural living is rapidly increasing on privately held lands in and around all of the areas owned/managed by Babbitt Ranches. While development*

has not been a habitat issue on Babbitt Ranch lands, there is definite potential for this to occur in the future on Babbitt Ranch lands. It is also very likely that new developments that occur in proximity to Babbitt Ranches will have an adverse impact on wildlife populations in the region.



Roadways, fencing, and dense housing developments all have the effect of both direct mortality and to block movements that are important to pronghorn so they can freely move to areas such as fawning and water sites. Disruption of these movement corridors can drastically affect pronghorn herd productivity and long-term survival. Strong land use planning efforts can help avoid adverse impacts from development in high quality wildlife habitat.

One of the key issues that face wildlife managers today is the trend towards habitat fragmentation resulting in small isolated wildlife populations that are at increased risk of extirpation. Undoubtedly, factors such as decreased genetic diversity, reduced patch size via habitat fragmentation, inability of movement between isolated populations all increase pressures on typically small, isolated wildlife populations, and as many studies suggest, increased management efforts is required to avoid population extinctions (Berger 1990, Belovsky et al. 1994, Krausman et al. 1996).

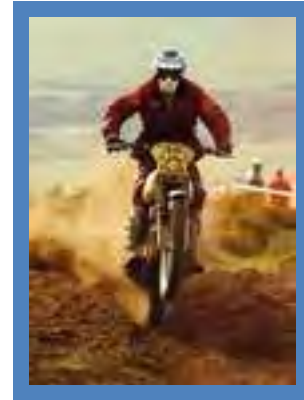
Strategy 1. Use easements to help protect Babbitt Ranches from development.

Strategy 2. Work with the Forest Service and Coconino County to reduce the potential for wide spread rural housing development in areas where these developments are not currently present. Instead work to concentration housing contiguous with existing housing.

Human Disturbance

Human disturbance guidelines – *where practical, it can benefit pronghorn reproductive success by limiting incompatible human activities in key pronghorn habitats such as fawning areas and when pronghorn are raising fawns.*

Strategy 1. Encourage OHV clubs to use the Cinder Hills OHV Area and discourage dispersed OHV use of rangelands.



Use of off-highway vehicles can have an impact on the quality of wildlife habitat or it can be relatively benign. The difference depends on the type of use and time of the year when the activity occurs. Development of educational programs to inform users of appropriate uses/riding styles can help reduce any adverse impacts from OHV use.

- Develop or obtain a PowerPoint presentation and other informational materials that identify the importance of appropriate OHV use to minimize adverse impacts to wildlife habitat. Provide at least one presentation to OHV organizations in the Flagstaff area per year of this plan.
- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV users of appropriate usage in these areas. Post at least 5 advisory signs at key locations in the first two years of this plan and expand as needed after this.
- Work with agency OHV programs and obtain brochures or other literature sources that can be provided to OHV riders encountered in the field that advise riders of lawful use patterns while riding OHVs.

Strategy 2. Evaluate the potential to restrict motorized vehicles to roads on the CO BAR except for ranch work and game retrieval during fawning periods.

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV users of seasonal closures or other restrictions during fawning periods.

Strategy 3. Support and push for increased enforcement and education programs by the land and wildlife management agencies to relegate OHV and motorcycle use to roadways and designated trails.

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV users of appropriate usage in these areas. A goal is to have five key roadways signed with advisory signage by the third year of this plan.

Strategy 4. AZGFD Use fixed-wing monitoring and on-ground enforcement during spring antler-search times and during pronghorn hunts to prevent illegal off-road travel by persons using OHVs on state lands and on Babbitt Ranch private property.

- Contact AZGFD and the USFS prior to prime antler shed search times to identify key areas where extensive off-road OHV use has occurred in the past to optimize law enforcement efforts.

Strategy 5. Develop road management plans and conduct closures of wildcat roads on State Trust Land; e.g. those on volcanic craters where use of these roads diminish habitat quality for pronghorn.

- Develop a database of illegal roads that should be closed and advise the State Land Department of those that are of concern and seek their assistance in developing a road management plan for those roads that have the greatest potential to impact pronghorn use of important habitats. The data base needs to be completed by the third year of this plan with the goal of having key roads closed by the fifth year of this plan.

Strategy 6. Work with the Forest Service to close unnecessary roads traversing grasslands and parks in the ponderosa pine belt.

- Develop a database of illegal roads that should be closed and advise the Forest Service of those that are of concern and seek their assistance in developing a road management plan for those roads that have the greatest potential to impact pronghorn use of important habitats. . The data base needs to be completed by the third year of this plan with the goal of having key roads closed by the fifth year of this plan.

Small Population Size:

Small population guidelines – *Management of small populations has become increasingly important to wildlife managers as small populations are at risk to extirpation for several reasons. Some of the concerning attributes related to increased risk of extirpation include demographic stochasticity (random changes in birth or mortality rates), environmental stochasticity (random extremes in critical environmental factors such as extreme droughts or hurricanes), or genetic problems such as accumulation of deleterious mutations or inbreeding depression. To minimize the risk to small populations, it is important to maintain or enhance interchange between adjacent pronghorn populations or to supplement small populations to maintain genetic diversity*

This population may already be in jeopardy because of its small size and high human-related impacts and increasing the opportunity for individual animal exchange between adjacent populations is an important management strategy. A preferable approach would be to facilitate expansion of the existing population, but it may be advantageous to implement a supplemental release into this subpopulation.

Strategy 1. Work with ADOT and the AZGFD Research Branch in considering potential pronghorn crossing bridges over Highway 89 to reconnect the subpopulation with the subpopulation west of Highway 89. In addition, continue to evaluate the potential to use angled fencing to move pronghorn across Highway 89 as is currently being done north of the Wupatki National Monument.

Strategy 2. As opportunities arise collect information on pronghorn on the Navajo Reservation which may interact with this subpopulation.

Strategy 3. If the population drops below 50 animals or if five-year average fawns per 100 does drops below 20 for three consecutive years and if habitat enhancement has occurred, consider supplementing the subpopulation.

Strategy 4. Conduct a literature review to determine if alternate management strategies such a narrowing of buck to doe ratios alter population dynamics.

Implementation Matrix for woody invasion plan element

Strategy Number	Action	Date Due	Date Completed
Strategy 1 – reduce woody species	Treat 500 acres of drainage lands to maintain connectivity	Annually for five years	
	Treat 500 acres of uplands in proximity to drainages to enhance forage production	Annually for five years	
	Treat one meadow on summer range woodland communities per year to reduce wood invaders	Annually for five years	
Strategy 2 – restore key habitat features such as fawn bedding areas	Using Delphi approach, identify one fawning area per year and treat one site per year to standards described by Ticer and Miller 1994	Annually for five years	

Implementation matrix to increase forage availability and diversity

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop forage enhancement plots	Implement forage irrigation for two plots; one on Spider Ranch and one near Denton-Sayer	Within two years of the implementation of this plan	
	If successful, implement 2 additional irrigated forage plots per year for 5 years	Annually for five years	
Strategy 2 – use spreader berms to capture additional runoff to enhance forage production	Use equipment to develop spreader berms on five acres of drainage areas to increase forage	Annually for five years	

	production		
Strategy 3 – literature review to determine sources and composition of seed mixes	Conduct a literature and produce a report on desired seed mix and source	within two years of the initiation of this plan	
Strategy 4 – use mechanical disturbance to rejuvenate senescent shrublands	Identify suitable areas For mechanical disturbance and treat 100 acres year	Annually for five years	
	Assuming seed is available, apply native seed to 50 acres as treated above	Annually for five years	
Strategy 5 – develop cattle and elk management plans to minimize to the extent possible impacts to newly treated lands	Research and write management plans to minimize herbivory in newly treated lands	Within two years of the initiation of this plan	

Implementation matrix for water developments

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop a water site in proximity to Mesa Well	Construct a water facility with sufficient quantity that it will provide reliable water to pronghorn	Within two years of the implementation of this plan.	
Strategy 2 – complete an assessment of existing water sites on CO BAR	Develop a list of all existing know water sites on CO BAR and field verify availability and permanence	Within two years of the implementation of this plan	
	Prioritize a rehabilitation schedule for existing waters that need improvement for pronghorn	Schedule and complete one water rehabilitation per year for a five year period if necessary	
Strategy 3 – conduct needs assessment for water developments where existing water is lacking	Use the existing database of waters from above and determine if areas are devoid of water for	Within two years of the implementation of this plan	

	pronghorn		
	If the assessment above demonstrates a need for additional water, construct new waters as needed	If necessary, complete one new water per year for five years	

Fawning cover rehabilitation implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – identify areas that appear to be suitable fawning sites as described by Ticer and Miller (1994)	Identify two potential fawning areas and develop a rehabilitation plan for each	Within two years of the implementation of this plan	
	Rehabilitate one of the fawning sites identified above	One site each in year 3 and 4 of this plan	

Fence modification implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 - modify existing fences where the lower strand is less than 18 inches above the ground	Identify fences that have a lower strand less than 18 inches below the ground and modify these fences using fence removal or modification with goat bars	Bring 10 miles of pasture fence to where the lower strand is greater than 18 inches above the ground or develop passages using goat bars	
Strategy 2 – modify highway boundary fences by removal, moving a greater distance from the highway, developing drift fences to funnel pronghorn to a highway crossing structure, or by using goat bars to facilitate pronghorn passage	Identify all areas along Highway 89 where highway boundary fences have bottom wires less than 18 inches above the ground and identify an array of management options to remedy the problem.	Complete this plan within the first three years of this plan.	

Off-road vehicle (human disturbance) management implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop/obtain informational	Develop or obtain a PowerPoint	Conduct at least one informational	

material to advise of impacts of inappropriate OHV use	presentation regarding OHV habitat impacts	presentation per year to organized OHV groups in the Flagstaff area	
	Develop signage for key areas advising of legal OHV operation standards	Provide signage for 5 key areas within 2 years of the implementation of this plan	
	Develop/obtain brochures relative to the appropriate use of OHVs and provide these to ranch/agency personnel to distribute when contacting OHV users in the field	Complete by the end of the first year of this plan.	
Strategy 2 – evaluate the potential to close roads on Babbitt Ranches where in areas such as fawning/fawn rearing sites	Identify roads that bisect key pronghorn activity areas	Complete within the first two years of this plan	
	Develop signage that advise OHV users of seasonal restrictions	Complete by the end of the third year of this plan	
Strategy 3 – support/push for greater enforcement by land management agencies	Identify five areas where frequent off-road OHV use occurs and provide this information to land management agencies	Complete this action by the end of the third year of the plan	
Strategy 4 – focus additional enforcement for illegal OHV use during antler shed season	By April 1 of each year of this plan, advise land and wildlife management agencies of the areas where illegal OHV use occurs by people searching for antler sheds and ask for increased enforcement during key periods	Completed by April 1 of each year of this plan.	
Strategy 5 – develop a road management	Identify illegal roads that are frequently	Complete a data base of important illegal	

plan for illegal roads on State Trust Lands	used where the use on these roads impacts pronghorn or pronghorn habitat	roads by the end of the third year of this plan	
		Work with the State Land Department to develop and implement a road closure plan where illegal roads are adversely impacting pronghorn or pronghorn habitat by the end of the fifth year of this plan.	
Strategy 6 – develop a road management plan for illegal roads on Forest Service lands with emphasis on high-elevation grassland habitats used by pronghorn in summer	Identify illegal roads that are frequently used where the use on these roads impacts pronghorn or pronghorn habitat	Complete a data base of important illegal roads by the end of the third year of this plan	
		Work with the Forest Service to develop and implement a road closure plan where illegal roads are adversely impacting pronghorn or pronghorn habitat by the end of the fifth year of this plan.	

Small population size implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – enhance interchange opportunity across Highway 89 and to increase the population size in this subpopulation	Work with ADOT and AZGFD to identify if a suitable site exists for development of crossing structures such as a highway overpass to facilitate pronghorn movement	On-going	
Strategy 2. where	As the opportunity	On-going	

possible, obtain data on pronghorn populations on the Navajo Nation	occurs, collect data on the size and movement patterns of pronghorn on the Navajo Nation		
Strategy 3. Evaluate the need for population supplementing	If the population size drops below 50 pronghorn or if the fawn-doe ratio remains below 20:100 for three consecutive years, evaluate the potential for a supplemental transplant into this subunit.	On-going	
Strategy 4. conduct a literature review to determine the potential for alternative management approaches to benefit pronghorn populations	Investigate the potential for alternative management approaches to benefit pronghorn populations. Focus on methods used to collect and use data relative to the desired buck to doe ratio to optimize population stability	Completed by the third year of the plan	

WESTERN SUBPOPULATION: **THE CO BAR RANCH WEST OF US HIGHWAY 89.**

The area encompassed by this segment of the Babbitt Ranches represents one of the largest and most important blocks of pronghorn habitat in Arizona. On the eastern edge of this habitat block, the habitat consists largely of grasslands and shrub-steppe communities that while intact, are not without challenges from a pronghorn perspective. Some of these challenges include decreased vegetative diversity than desired and invasion by pinyon and juniper in some areas. On the lands to the south and western portion of this habitat block, the vegetation changes from a grassland to a woodland, with pinyon-juniper woodlands dominating mid-elevation areas and ponderosa pine forests occurring at the higher levels (Figure 5). Interspersed in the coniferous forest areas are open meadows, which are important habitat features for summering pronghorn.

While there are areas with high human developments, these are located mostly in the southern portion of the area and in the area proximate to Valle and currently pose little impact to pronghorn habitat, but if expansion of these areas are not well planned and focused on concentrated rather than dispersed locations.

According to information from radio tracking there are both migratory and sedentary segments of the middle subpopulation. Both segments of the subpopulation winter Between Two Grey Hills and Valle on the CO BAR. The migratory segment crosses Highway 180 and summers on the Kaibab and the Coconino national forests between Highway 64 and Highway 180, north of Interstate 40. Of the three subpopulations this middle subpopulation travels the farthest in its yearly migration. The habitat area of this subpopulation has been the site of a large cooperative grassland restoration project which is still in progress in 2009.

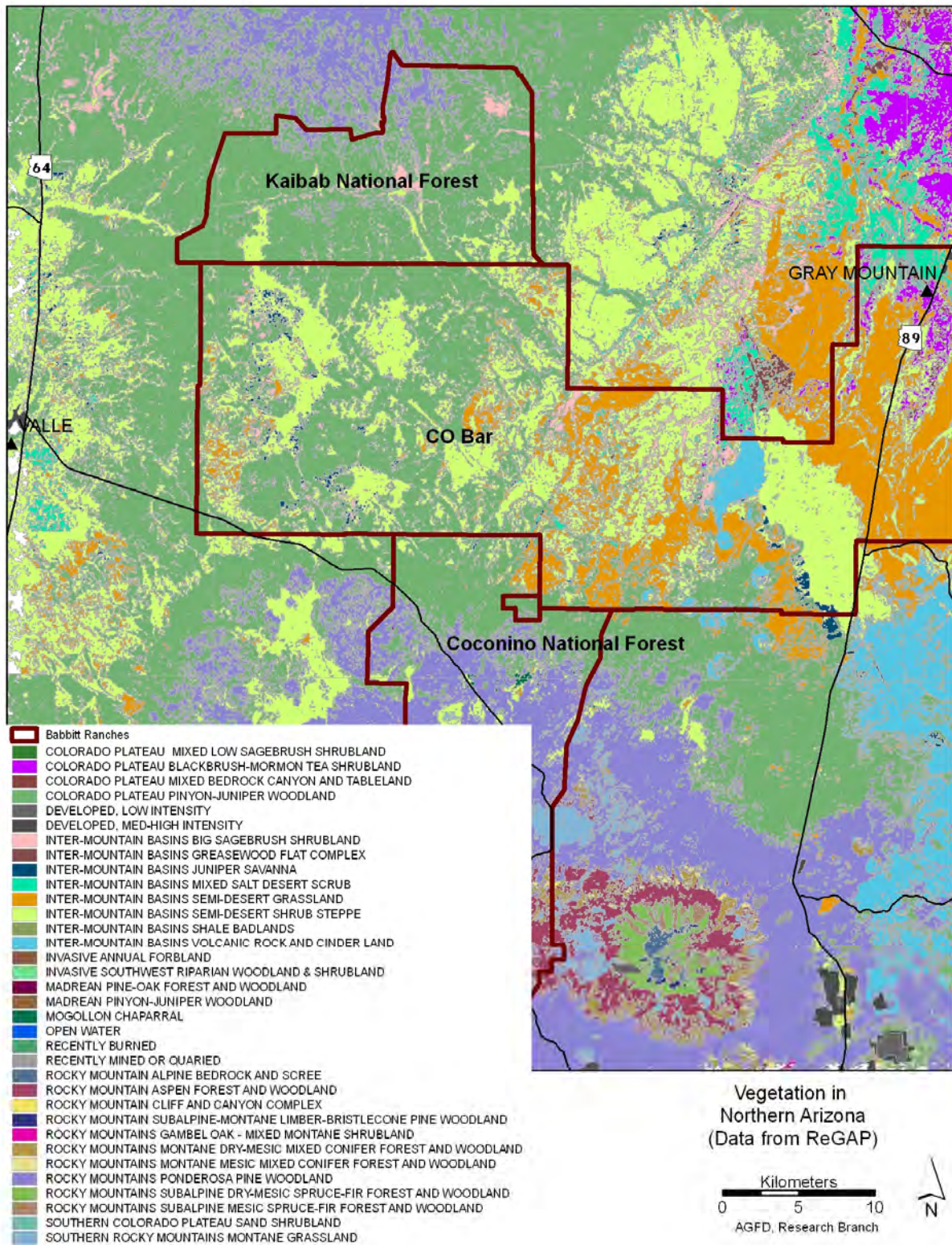


Figure 5. Vegetation in this subunit is predominantly Inter-mountain basin semi-desert grassland and desert shrub-steppe communities in the eastern portion, with large areas of pinyon-juniper woodlands interspersed with shrub-steppe community to the western portion.

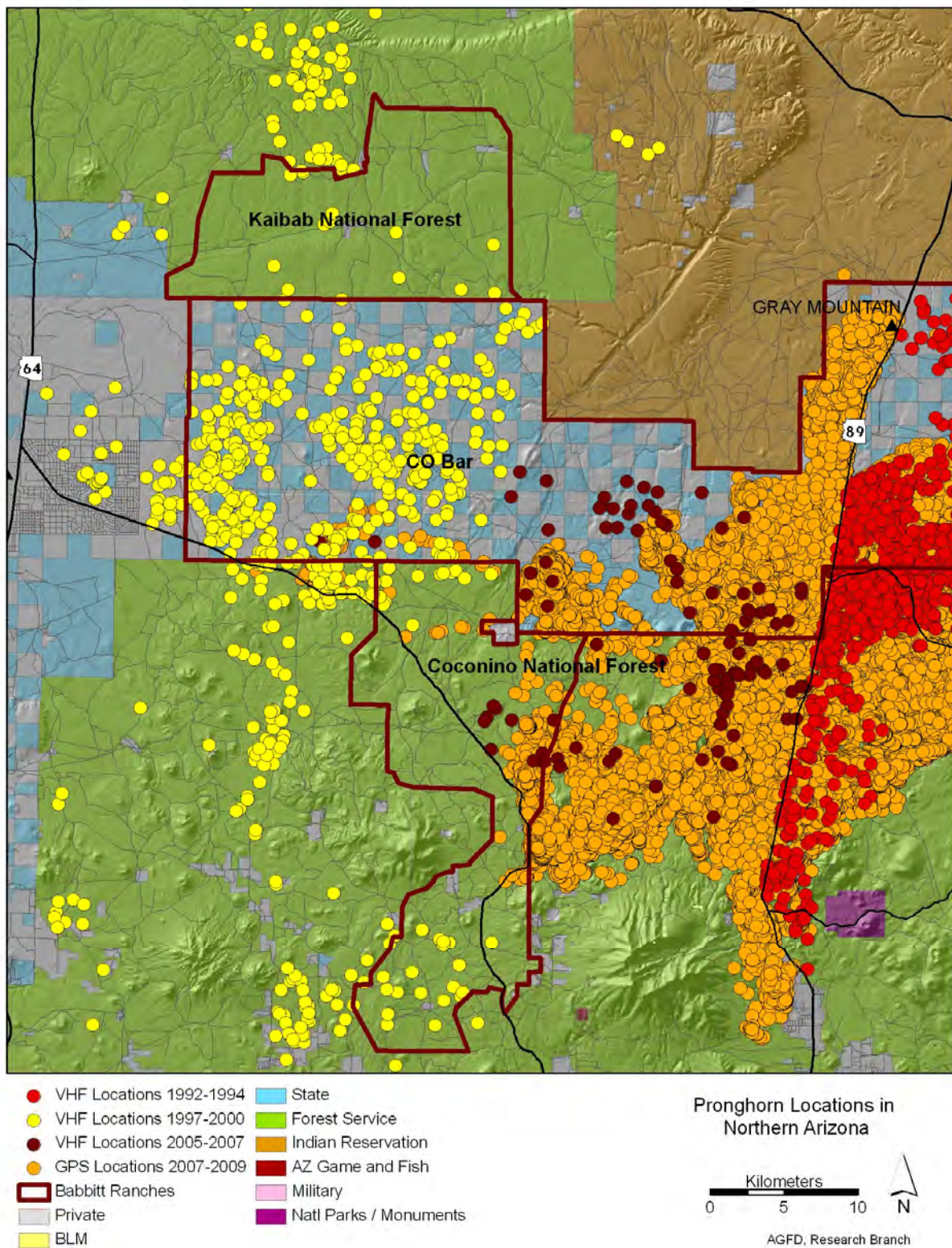


Figure 6. There have been a number of studies conducted in this subunit documenting substantial north/south movements. Reducing density of pinyon-juniper trees that have invaded grass/shrubland communities is likely to facilitate movements between patches of suitable habitat.

Issues and Concerns

This habitat block represents an important component of Arizona's pronghorn habitat. Historically, this was a large block of intact grassland that provided high quality habitat for pronghorn. The quality of this area has been degraded by increased pinyon-juniper invasion and loss of vegetative diversity. In addition, due to the proximity of this area to Flagstaff and with increased recreationist's visits from other areas, there are areas where OHV use has adversely affected pronghorn habitat. Another area of concern for this area is the increase in both pinyon-juniper and ponderosa pine encroachment in meadows contained within these woodlands. As noted, there is a segment of this pronghorn population that summer in the southern-most portion of this habitat block which requires movement across Highway 180. This is a concern as woody invasion impedes sight distance for pronghorn approaching the highway to cross. Without improvement in key areas, it is likely that this historic movement may be precluded.

In their evaluation of pronghorn habitat in the area, Ockenfels et al. (1996b) identified the following factors as being key limitations on pronghorn habitat in this area.

- Within this habitat block, both highways 64 and 180 have the potential to subdivide this area into smaller, less functional areas for pronghorn. Further, Highway 89, which occurs along the eastern edge of this area has been documented as being an impediment to movements to the east to areas that may have been important wintering areas for pronghorn. The consequence of this disruption of movement is unmeasured but may have the consequence of decreased genetic diversity for both subunits, a challenge to long-term survival.
- There is an issue of fence construction and distribution within this area that can reduce pronghorn habitat quality.
- Although there were a number of water sources located within pronghorn habitat, Ockenfels et al. (1996b) found that not all contained water during spring and summer, a period deemed important for fawning/lactating female pronghorn.
- As indicated, prime pronghorn habitat exists where vegetative height is less than approximately 24-inches high. Much of this subunit has been invaded by woody tree and shrub species with greater vertical height than desired, which reduces the overall quality of much of the pronghorn habitat available for this subunit.
- Given that pronghorn are selective feeders, they require a variety of plant species and younger-aged, new growth vegetation to meet their dietary needs. Much of the area occupied by this subpopulation was determined to lack species richness, therefore potentially limiting the potential of this subpopulation to maintain or increase pronghorn density.
- Human population impacts appear to be a factor in this portion of pronghorn habitat as much of the area on the southern portion of the area has been subdivided and occupied by housing areas. The area of greatest human presence is also the area where telemetered pronghorn move to during summer and in areas with high OHV use, particularly when young pronghorn fawns are present.

Opportunities

- Babbitt Ranches has a long history of concern for wildlife and the habitat that many wildlife species depend, with particular attention to pronghorn. This has been manifested in an initiation of many site-specific projects with research and management agencies and

universities, but particularly with the Arizona Game and Fish Department that is highly unusual and appreciated.

- In recent years pronghorn have been available for transplants on a regular basis and if conditions dictate that a supplemental release of pronghorn is warranted, the availability of pronghorn for this action would be easily facilitated.
- Recent advances in the woody species management such as the development of the hydro-ax has opened opportunities that were heretofore unavailable to managers. This method allows for efficient reduction of woody species in a fashion that opens the area visually for pronghorn, leaves the wood products in small pieces that act as mulch on the ground, and enhances seed sprouting post-treatment.
- Many federal and state grant programs are available to provide funding to private landowners to conduct habitat improvement programs on privately held lands. This will greatly enhance the potential for funding to conduct activities identified in this plan.
- Development of the application of goat bars to improve permeability of many fences is a tool that has been proven to be effective.

Goal

The goal for this subpopulation is to reduce adverse habitat conditions to the extent possible to allow for increasing pronghorn density to the point of obtaining a healthy, viable pronghorn subpopulation. This can best be accomplished by implementing the following management approaches.

Management Issues for Pronghorn Populations on Babbitt Ranches

PRIMARY CONSERVATION ISSUES – West subpopulation

There are a number of conservation problems addressed below and all of them affect the potential for maintaining or enhancing this subpopulation of pronghorn. There are, however, two issues that pose greatest risk to this subpopulation including:

- Substantial areas have been impacted by woody invasion, reducing both forage resources and necessary sight distance.
- Low vegetative community diversity; an issue that is key to forage availability and suitability for pronghorn.

Tree and Shrub Invasion:

Tree and shrub invasion guidelines – *the goal of this plan segment is to restore, to the extent possible, the ecological function in this vegetative community while recognizing the alteration of ecological processes resulting from changed fire regimes, excessive herbivory, and the influence of global climate change. Efforts will not be expended to change vegetative communities to other than what naturally occurred in the region.*



One of the key management actions to improve pronghorn habitat is to reduce pinyon-juniper densities where these species have invaded grass/shrublands. It is important to recognize that these dense stands of invasive species reduce forage availability and impede sight distances which are important to pronghorn as they use sight to avoid predation.

Woody species have increased in much of this area, which results in reduced forage availability and quality, increased predation as stalking/ambush cover for predators is expanded, and reduced the total area of suitable habitat for pronghorn by decreased visual sight distance which appears to be important in habitat selection by pronghorn.

One of the areas with the greatest problem associated with woody invasion is the elevational band that runs from Cedar Ranch Camp to approximately Babbitt Lake.

Strategy 1. Utilize existing funding programs such as the Habitat Partnership Committees and other potential funding sources to fund pinyon-juniper and ponderosa removal from invaded grasslands and savannas at all elevations. The approach here will be to stage the treatments in a step-wise fashion as follows:

- Treat areas in low-lying drainages first to ensure connectivity within this subunit to the extent possible. As a target, not less than 500 acres/year for a five year period should be treated to reduce woody invaders in areas that would improve connectivity between existing, but isolated pronghorn use areas.
- Open areas in proximity to the cleared drainages where the age of the trees is predominately less than 40-50 years old. This will optimize the treatments in areas where recent woody invasion has occurred and grasslands can be best restored. Pinyon and juniper trees with greater than 18 inch DBH should be left as a food resource and to provide cover. As a target, not less than 500 acres per year should be treated for a period of 5 years.
- Identify key meadows that have historic use by pronghorn and other ungulate species such as elk that have been invaded by ponderosa pines and initiate removal programs to restore ecological function to these meadows. This habitat type can be particularly important as a food resource during summer. As a target, at least one meadow will be treated each year for a five year period.

Strategy 2. Using existing data from telemetry studies or using a Delphi approach, identify additional areas where reduction of woody species would enhance recovery of pronghorn populations. An example of these types of areas would be potential fawning areas that are located in proximity to water and have other features identified by Ticer

and Miller (1994) Project sites should be far enough from rural homes to avoid most conflicts with homeowners, recreationists or domestic or feral dogs.

- To achieve the above treatment type, site visits to waters in pronghorn habitat should be conducted to identify not less than five water sites that are potential fawning areas using the guidance of Ticer and Miller (1994). Tree density reduction should be conducted using the hydro-ax in a fashion to obtain a site that meets the description of fawning cover as identified by Ticer and Miller (1994). In the first five years of this plan, the five fawning areas should be treated to improved pronghorn habitat.

Forage Availability and Diversity:

Forage availability and diversity guidelines – *restoring forage to pre-settlement conditions should be based on reduction of woody material, utilization of watered plots, and application of seeds. Seeds will be solely from native species with preference for seeds that have been collected from ecologically similar conditions to that of Babbitt Ranches.*



Pronghorn does that have adequate food resources are more likely to successfully reproduce

Pronghorn rely on a diverse vegetative community where forbs and shrubs are important components of their diet. Pronghorn are selective foragers and depend on forage diversity and plant quality where high digestibility and nutrient levels occur.

Past management and drought in this area reduced vegetative diversity, particularly on cool season grasses and desirable browse over much of the range. The native summer grass, blue grama filled in the gaps and now dominates vegetative cover in most ranges below 6,500 feet elevation. When the soil warms and moisture is available, blue grama provides nutritious forage with crude protein content above 10%. Conversely, under adverse conditions, the crude protein content of blue grama drops to less than 2%, digestibility is very low and this resource is of little value for livestock or wildlife. This adaptation of blue grama explains its ability to survive heavy winter use and its ability to out-compete other more desirable forage species. One of the key management strategies to improve habitat conditions for pronghorn is restoration of vegetative diversity in the area and to reintroduce habitat disturbances to rejuvenate individual plants.

Strategy 1. Evaluate the potential to use irrigated forage plots in key areas to improve forage quality/availability for pronghorn. Under the right conditions forage plots could provide additional dependable pronghorn forage. If the logistics can be worked out we would like to try forage plots in some of the areas in where tree grinding has occurred and vegetative recover is in progress. Assuming that this approach achieves desired

outcomes, we recommend implementing no less than two of these treatments per year in the eastern subunit within areas where forage quality/availability is lower quality than

desirable for a period of not less than five years for a total of 10 treatment areas. Each treatment area should consist of an area of not less than 2 acres.

Strategy 2. Spreader berms have the potential to increase soil moisture and thereby to increase forage diversity, growing season and quantity of forage available. Tests on the efficiency of spreader berms were initiated on Raymond Wildlife Area and the Flying M Ranch in 2007. If those tests are successful in increasing vegetative diversity and abundance, no less than 5 acres of spreader berms per year will be placed in drainage areas in this subunit of the Babbitt Ranches as away to improve forage.

Strategy 3. Conduct literature review and develop an appendix for this plan that identifies the key components of pronghorn diets and develop sources of seeds that can be used to reseed treated areas.

Strategy 4. Implement a variety of treatment approaches to increase the number, distribution, quality of key forage species for pronghorn. Potential treatments could include:

- Disking grassland flats to disturb the soil and rejuvenate existing shrubs that have become senescent due to lack of disturbance or excessive herbivory.
- A target of not less than 100 acres a year for a period of 5 years is projected as a goal for this subsection of Babbitt Ranches. Monitoring needs to be implemented to determine the vegetative response to this treatment. If plant diversity and growth form improves during this trial period, additional acreage should be treated in this fashion in subsequent years.
- Seeding with desirable plant species. Research conducted by Ockenfels et al. (1996b) suggested that the number of desirable forage species was reduced in much of this area. Therefore, obtaining desirable forage species' seeds and reseed key areas where species diversity is low would benefit pronghorn.
- In areas where species diversity is low, particularly the shrub component, native species seeds from not less than five desirable species need to be obtained, either by purchase or by local collection and not less than 50 acres a year of treated areas (either disking or hydro-axed areas) should be reseeded to improve the plant community with valuable species for pronghorn consumption.
- Pinyon-juniper invaders should be removed on sites dominated by blue grama or snakeweed. It is important to monitor treated sites for the presence of undesirable species of exotic plants such as cheatgrass as this species is a frequent invader of disturbed sites and is a management concern as it changes fire regimes to being very frequent with a conversion to a cheatgrass monoculture being a potential result of some treatments (Ecological Restoration Institute 2007).

Strategy 5. Design livestock grazing protocols and utilize elk management strategies to ensure that over utilization of forage resources does not occur on treated landscapes.

Water Distribution:

Water development philosophy – *the focus of this plan is to create better habitat for pronghorn and this is the driving force for water developments for pronghorn. Therefore, it is important that waters be developed in habitats that are purely pronghorn habitat and not areas where the addition of water would facilitate or encourage use by elk or other wildlife species that could compete with pronghorn.*



Well planned wildlife waters can have benefits to a wide variety of species

Previous research suggests that optimal water distribution is placement of a permanent water site at a distance of about every two miles within occupied habitat and that use areas within 4 miles of permanent water were selected by pronghorn at a rate greater than this habitat was available (Autenrieth et al. 2006). Further, it is important that these waters have little vegetative cover around water sources that would result in inaccessibility to pronghorn or would possibly facilitate predation at water sites.

Strategy 1. Identify all waters (including those targeted for livestock) that occur within pronghorn habitat, conduct an assessment of their persistence (is water available during spring and summer; key periods of water demand for pronghorn) and their availability to pronghorn and other wildlife species.

- Develop a list of and field verify the existence of all waters in potential pronghorn habitat and assess their availability for pronghorn and their persistence potential. This activity should be completed by the second year of this plan.
- Prioritize and develop rehabilitation strategies for all waters that do not provide key season access for pronghorn based on the need for suitable waters in the area. Prepare grant proposals and rehabilitate waters in priority order to ensure suitability for both wildlife and livestock. Rehabilitate at least one water per year for the first five years of this plan.

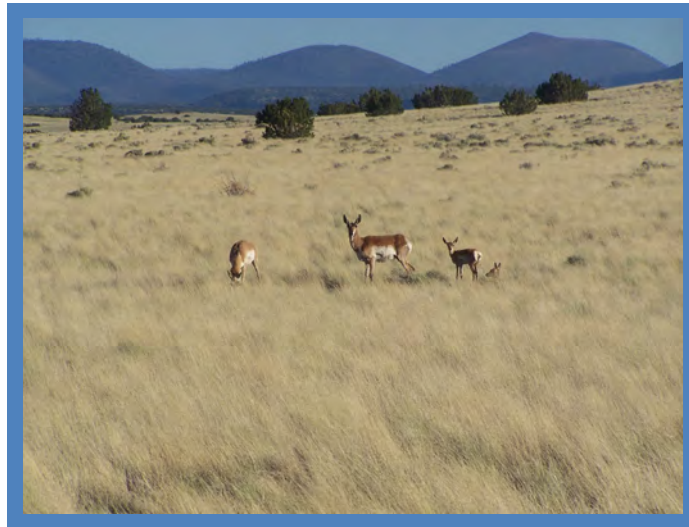
Strategy 2. Identify locations in this subunit where water is not available to pronghorn within a 4-mile radius and identify potential locations on existing pipelines where pronghorn waters can be developed at minimal cost.

- Develop a needs assessment based on the 4-mile radius recommended by Autenrieth et al. (2006) where water does not exist within suitable pronghorn habitat. This should be completed within the first two years of this plan.

- Develop wildlife waters in areas where water is lacking. One water per plan year will be developed.

Fawning Cover:

Fawning cover guidelines – *research has demonstrated that gravid does select specific habitat conditions to give birth and rear fawns. When optimal habitat conditions occur and does have access to prime fawning habitat, herd productivity will be optimized.*



Open grasslands with sufficient vegetative height to hide fawns (note the bedded fawn to the right of the picture) which reduces predation is a key component of suitable pronghorn habitat.

Having sufficient cover to hide fawns from predators is a key habitat consideration. Research conducted in Arizona suggest that at least 16 inches vertical height is needed.

Fawning cover is low and less than desired on the area occupied by this subpopulation area in general. Ticer and Miller (1994) conducted research on the habitat characteristics at fawning sites in Arizona. One of the key predictors of pronghorn population trajectory is the rate of fawn recruitment into the population. In general, when fawn recruitment is at or below 30 fawns per 100 does, the population will be in decline. Increasing fawn recruitment is a key management action that is needed throughout most pronghorn ranges in Arizona, including the habitat on Babbitt Ranches.

Strategy 1. Using the fawning habitat description developed by Ticer and Miller (1994), identify at least five potential fawning areas in this subunit.

- Select two of the potential fawning areas identified and develop rehabilitation strategies for each location. In general, key characteristics for pronghorn fawning include: distance from water, varied topography, vegetative height approximately 16 inches tall. Rehabilitation plans should be completed within two years of the initiation of this plan.

- Apply the rehabilitation plan identified above and rehabilitate one fawning area in year 3 and 4 of this plan. This could entail woody species removal and reseeding with desired species to provide vertical height.

Fence Standards:

Fence standard guidelines – *fences are necessary for proper livestock management and can play an important role in restricting movements of pronghorn when fence structure is close enough to the ground to preclude movements. A key management practice to benefit pronghorn on western rangelands is modification of fences to ensure movement is possible under fences thereby maintaining connectivity between herd units.*

Fences in this segment of the CO BAR serve three primary purposes; providing highway barriers, defining pastures for livestock use, and providing locations to work cattle, usually around waters. While many of the fences have been modified to enhance pronghorn movements, there are still areas which do not meet recommended standards recommended in the Pronghorn Management Guidelines. Currently, many fences on the CO BAR have been enhanced with placement of Goat Bars, which provide movement sites for pronghorn use.

Strategy 1. Identify pasture fences where the bottom strand is less than 18 inches high and comprised of barbed wire and place “Goat Bars” where pronghorn have been crossing fences. The goal will be to modify up to 10 miles of fence per year for a five-year period.

Strategy 2. Investigate the potential to modify highway boundary fences to guide pronghorn to locations where they can cross major roadways in a fashion that ensures their and highway user safety. Potential approaches could include moving highway barrier fences farther from the road right of way in areas where pronghorn cross; use of guide fences to facilitate pronghorn movements to a specific crossing area; elimination of highway boundary fences in areas where domestic livestock are not pastured. The goal will be to have a strategic plan for all highway fences along Highway 89 by the second year of the plan.

Strategy 3. Continue to identify corridors along Highway 180 where pronghorn migrate across in summer and reduce pinyon-juniper density in these areas.

Fragmentation and Loss of Habitat to Human Development

Fragmentation guidelines – *the demand for rural living is rapidly increasing on privately held lands in and around all of the areas owned/managed by Babbitt Ranches. While development has not been a habitat issue on Babbitt Ranch lands, there is definite potential for this to occur in the future on Babbitt Ranch lands. It is also very likely that new developments that occur in proximity to Babbitt Ranches will have an adverse impact on wildlife populations in the region.*



Where possible, it is recommended that land use planning try and concentrate development in areas of low quality habitat to avoid sprawl into many areas used by pronghorn in proximity to Babbitt Ranches

One of the key issues that face wildlife managers today is the trend towards habitat fragmentation resulting in small isolated wildlife populations that are at increased risk of extirpation. Undoubtedly, factors such as decreased genetic diversity, reduced patch size via habitat fragmentation, inability of movement between isolated populations all increase pressures on typically small, isolated wildlife populations, and as many studies suggest, increased management efforts is required to avoid population extinctions (Berger 1990, Belovsky et al. 1994, Krausman et al. 1996).

Strategy 1. Use easements to help protect Babbitt Ranches from development.

Strategy 2. Work with the Forest Service and Coconino County to reduce the potential for wide spread rural housing development in areas where these developments are not currently present. Instead work to concentration housing contiguous with existing housing.

Human Disturbance

Human disturbance guidelines – *where practical, it can benefit pronghorn reproductive success by limiting incompatible human activities in key pronghorn habitats such as fawning areas and when pronghorn are raising fawns.*

Strategy 1. Encourage OHV clubs to use the Cinder Hills OHV Area and discourage dispersed OHV use of rangelands.



As OHV use increases, there is a potential that the cumulative impacts can adversely impact wildlife habitat and disturb pronghorn, particularly when fawns are young

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV users of appropriate usage in these areas. Post at least 5 advisory signs at key locations in the first two years of this plan and expand as needed after this.
- Work with agency OHV programs and obtain brochures or other literature sources that can be provided to OHV riders encountered in the field that advise riders of lawful use patterns while riding OHVs.

Strategy 2. Evaluate the potential to restrict motorized vehicles to roads on the CO BAR except for ranch work and game retrieval during fawning periods.

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV uses of seasonal closures or other restrictions during fawning periods.

Strategy 3. Support and push for increased enforcement and education programs by the land and wildlife management agencies to relegate OHV and motorcycle use to roadways and designated trails.

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV uses of appropriate usage in these areas. A goal is to have five key roadways signed with advisory signage by the third year of this plan.

Strategy 4. AZGFD Use fixed-wing monitoring and on-ground enforcement during spring antler-search times and during pronghorn hunts to prevent illegal off-road travel by persons using OHVs on state lands and on Babbitt Ranch private property.

- Contact AZGFD and the USFS prior to prime antler shed search times to identify key areas where extensive off-road OHV use has occurred in the past to optimize law enforcement efforts.

Strategy 5. Develop road management plans and conduct closures of wildcat roads on State Trust Land; e.g. those on volcanic craters where use of these roads diminish habitat quality for pronghorn.

- Develop a database of illegal roads that should be closed and advise the State Land Department of those that are of concern and seek their assistance in developing a road management plan for those roads that have the greatest potential to impact pronghorn use of important habitats. The data base needs to be completed by the third year of this plan with the goal of having key roads closed by the fifth year of this plan.

Strategy 6. Work with the Forest Service to close unnecessary roads traversing grasslands and parks in the ponderosa pine belt.

- Develop a database of illegal roads that should be closed and advise the Forest Service of those that are of concern and seek their assistance in developing a road management plan for those roads that have the greatest potential to impact pronghorn use of important habitats. The data base needs to be completed by the third year of this plan with the goal of having key roads closed by the fifth year of this plan.

Implementation Matrix for woody invasion plan element

Strategy Number	Action	Date Due	Date Completed
Strategy 1 – reduce woody species	Treat 500 acres of drainage lands to maintain connectivity	Annually for five years	
	Treat 500 acres of uplands in proximity to drainages to enhance forage production	Annually for five years	
	Treat one meadow on summer range woodland communities per year to reduce wood invaders	Annually for five years	
Strategy 2 – restore key habitat features such as fawn bedding areas	Using Delphi approach, identify one fawning area per year and treat one site per year to standards described by Ticer and Miller 1994	Annually for five years	

Implementation matrix to increase forage availability and diversity

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop forage enhancement plots	Implement forage irrigation for two plots; one on Spider Ranch and one near Denton-Sayer	Within two years of the implementation of this plan	
	if successful, implement 2 additional irrigated forage plots per year for 5 years	Annually for five years	
Strategy 2 – use spreader berms to capture additional runoff to enhance forage production	use equipment to develop spreader berms on five acres of drainage areas to increase forage production	Annually for five years	
Strategy 3 – literature review to determine sources and composition of seed	conduct a literature and produce a report on desired seed mix and source	Within two years of the initiation of this plan	

mixes			
Strategy 4 – use mechanical disturbance to rejuvenate senescent shrublands	Identify suitable areas for mechanical disturbance and treat 100 acres year	Annually for five years	
	Assuming seed is available, apply native seed to 50 acres as treated above	Annually for five years	
Strategy 5 – develop cattle and elk management plans to minimize to the extent possible impacts to newly treated lands	Research and write management plans to minimize herbivory in newly treated lands	Within two years of the initiation of this plan	

Implementation matrix for water developments

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – complete an assessment of existing water sites on CO BAR	Develop a list of all existing water sites on CO BAR and field verify availability and permanence	Within two years of the implementation of this plan	
	Prioritize a rehabilitation schedule for existing waters that need improvement for pronghorn	Schedule and complete one water rehabilitation per year for a five year period if necessary	
Strategy 2 – conduct needs assessment for water developments where existing water is lacking	Use the existing database of waters from above and determine if areas are devoid of water for pronghorn	Within two years of the implementation of this plan	
	If the assessment above demonstrates a need for additional water, construct new waters as needed	If necessary, complete one new water per year for five years	

Fawning cover rehabilitation implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – identify	Identify two potential	Within two years of	

areas that appear to be suitable fawning sites as described by Ticer and Miller (1994)	fawning areas and develop a rehabilitation plan for each	the implementation of this plan	
	Rehabilitate one of the fawning sites identified above	One site each in year 3 and 4 of this plan	

Fence modification implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 - modify existing fences where the lower strand is less than 18 inches above the ground	Identify fences that have a lower strand less than 18 inches below the ground and modify these fences using fence removal or modification with goat bars	Bring 10 miles of pasture fence to where the lower strand is greater than 18 inches above the ground or develop passages using goat bars	
Strategy 2 – modify highway boundary fences by removal, moving a greater distance from the highway, developing drift fences to funnel pronghorn to a highway crossing structure, or by using goat bars to facilitate pronghorn passage	Identify all areas along Highway 89 where highway boundary fences have bottom wires less than 18 inches above the ground and identify an array of management options to remedy the problem.	Complete this plan within the first three years of this plan.	
Strategy 3. identify corridors use by pronghorn to cross highway 180 and continue to reduce vegetative density in these areas	Identify one corridor in the first two years of the plan and develop a plan to reduce vegetative density in these areas.	Complete this action in the first two years of the plan	

Off-road vehicle management implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop/obtain informational material to advise of impacts of inappropriate OHV use	Develop or obtain a PowerPoint presentation regarding OHV habitat impacts	Conduct at least one informational presentation per year to organized OHV groups in the Flagstaff area	

	Develop signage for key areas advising of legal OHV operation standards	Provide signage for 5 key areas within 2 years of the implementation of this plan	
	Develop/obtain brochures relative to the appropriate use of OHVs and provide these to ranch/agency personnel to distribute when contacting OHV users in the field	Complete by the end of the first year of this plan.	
Strategy 2 – evaluate the potential to close roads on Babbitt Ranches where in areas such as fawning/fawn rearing sites	Identify roads that bisect key pronghorn activity areas	Complete within the first two years of this plan	
	Develop signage that advise OHV users of seasonal restrictions	Complete by the end of the third year of this plan	
Strategy 3 – support/push for greater enforcement by land management agencies	Identify five areas where frequent off-road OHV use occurs and provide this information to land management agencies	Complete this action by the end of the third year of the plan	
Strategy 4 – focus additional enforcement for illegal OHV use during antler shed season	By April 1 of each year of this plan, advise land and wildlife management agencies of the areas where illegal OHV use occurs by people searching for antler sheds and ask for increased enforcement during key periods	Completed by April 1 of each year of this plan.	
Strategy 5 – develop a road management plan for illegal roads on State Trust Lands	Identify illegal roads that are frequently used where the use on these roads impacts pronghorn or pronghorn habitat	Complete a data base of important illegal roads by the end of the third year of this plan	

		Work with the State Land Department to develop and implement a road closure plan where illegal roads are adversely impacting pronghorn or pronghorn habitat by the end of the fifth year of this plan.	
Strategy 6 – develop a road management plan for illegal roads on Forest Service lands with emphasis on high-elevation grassland habitats used by pronghorn in summer	Identify illegal roads that are frequently used where the use on these roads impacts pronghorn or pronghorn habitat	Complete a data base of important illegal roads by the end of the third year of this plan	
		Work with the Forest Service to develop and implement a road closure plan where illegal roads are adversely impacting pronghorn or pronghorn habitat by the end of the fifth year of this plan.	

CATARACT/ ESPEE SUBPOPULATION: **CATARACT AND ESPEE RANCHES.**

This area has a high potential for maintaining or enhance pronghorn populations due to the large expanse of intact habitat that although there are limitations, there is also a high potential for management improvements. The majority of this subunit is comprised of the Inter-mountain semi-desert shrub-steppe community (Figure 7), a community that has high value to pronghorn provided that there is sufficient forage diversity and availability and cover for fawn rearing. This is particularly true given the fact that the Cataract Ranch is currently under a conservation easement and the Espee Ranch is proposed for inclusion under a conservation easement.

According to information from radio tracking the western subpopulation is essentially nonmigratory. Pronghorn in this subpopulation sometimes appear reluctant to move between pastures, which could be an artifact of fence structure that limits pronghorn passage (Figure 8). This subpopulation has been stable or slowly decreasing over the last ten years.

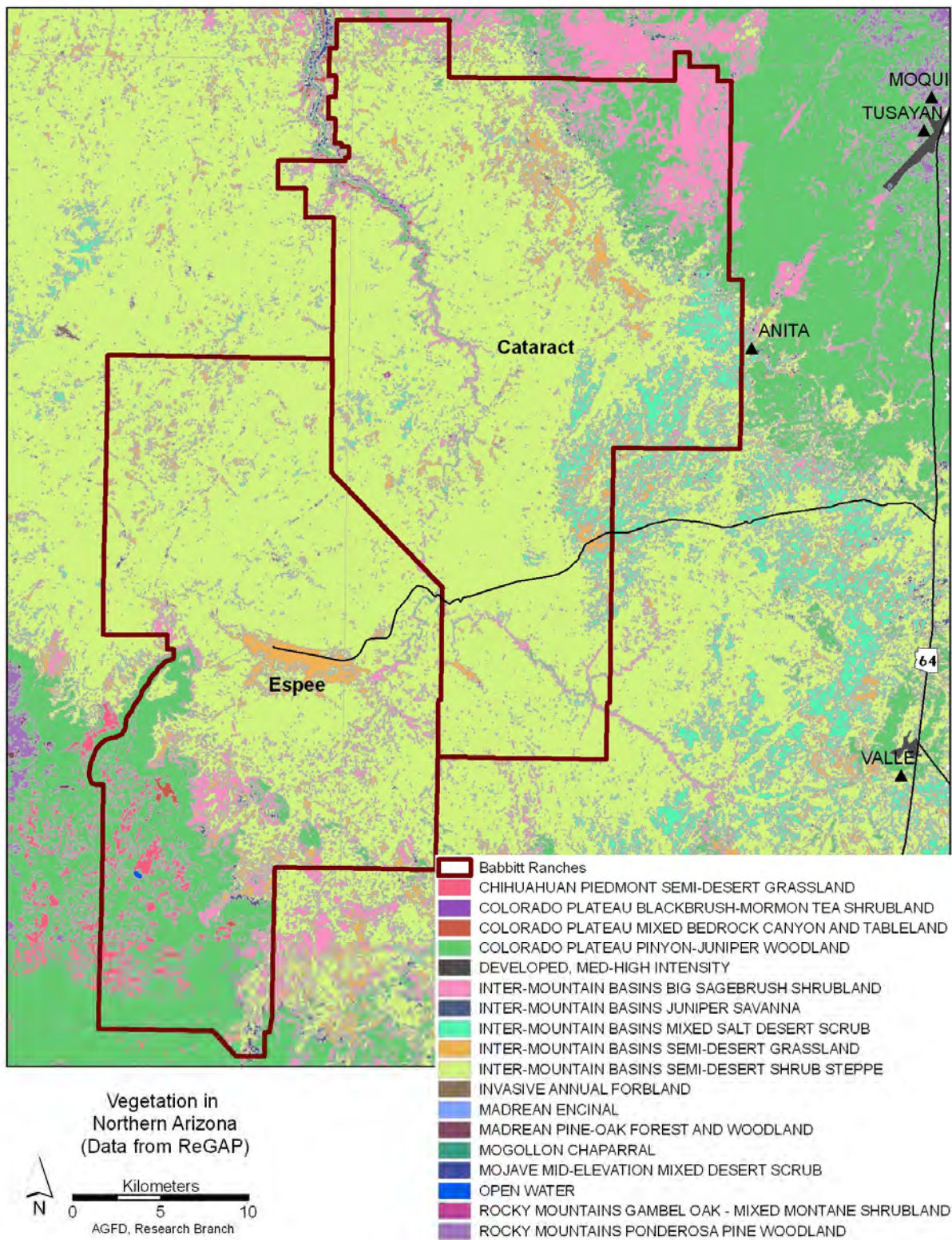


Figure 7. The vast majority of this area is comprised of the Inter-mountain basins semi-desert shrub steppe vegetative community, a community that is quite valuable to pronghorn when sufficient forage and cover are present.

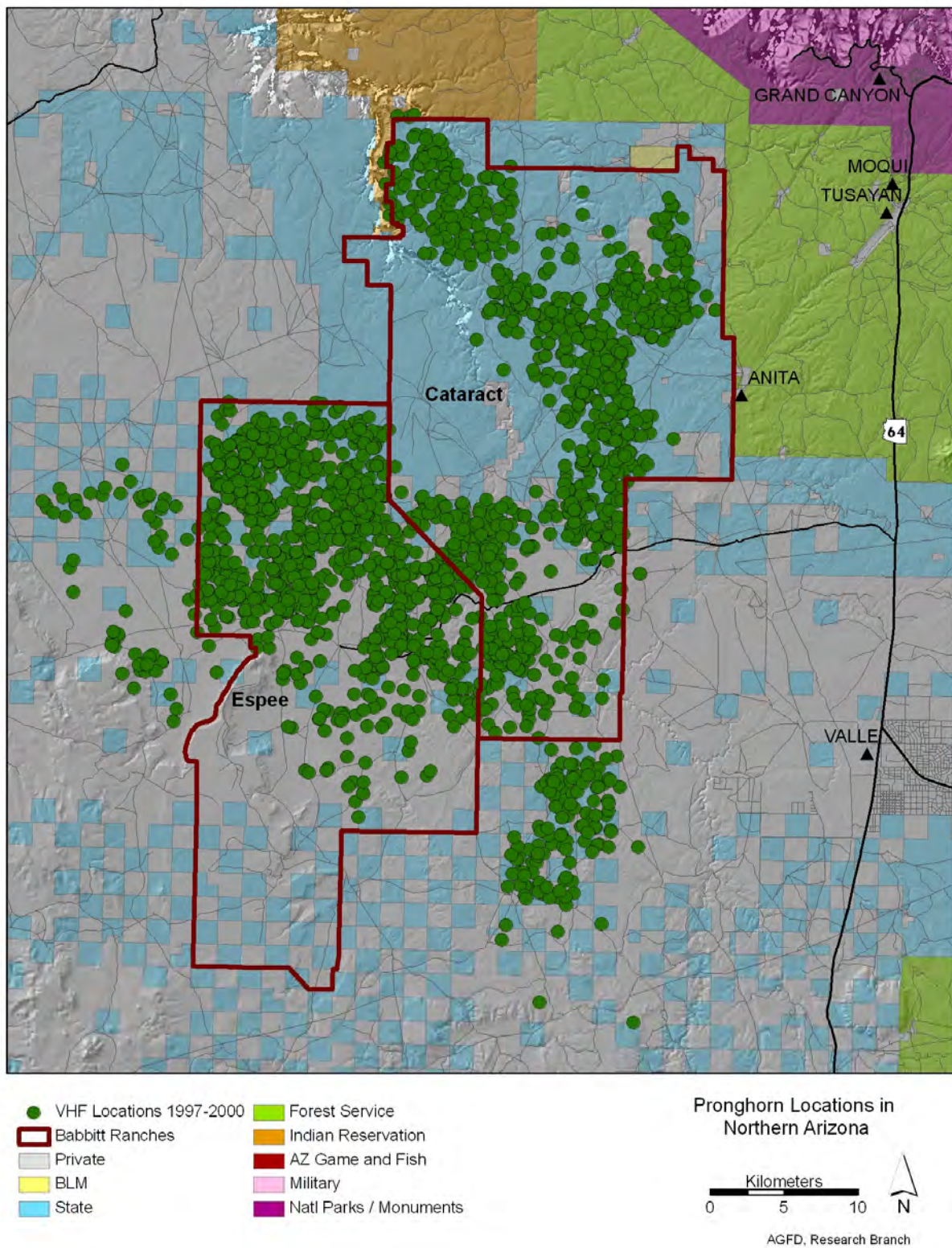


Figure 8. Movement patterns from telemetered pronghorn suggest that fence distribution plays a role in the movement patterns of these pronghorn. Goat bars have been widely placed in this subunit to facilitate pronghorn movement.

Issues and Concerns

In their evaluation of pronghorn habitat in the area, Ockenfels et al. (1996b) identified the following factors as being key limitations on pronghorn habitat in this area.

- Within this habitat block, Highway 64 has the potential to reduce movements to the east and making the area less functional for pronghorn. The consequence of this disruption of movement is unmeasured but may have the consequence of decreased genetic diversity for both subunits, a challenge to long-term survival.
- There is an issue of fence construction and distribution within this area that can reduce pronghorn habitat quality.
- Although there were a number of water sources located within pronghorn habitat, Ockenfels et al. (1996b) found that not all contained water during spring and summer, a period deemed important for fawning/lactating female pronghorn.
- As indicated, prime pronghorn habitat exists where vegetative height is less than approximately 24-inches high. Portions of this subunit has been invaded by woody tree and shrub species with greater vertical height than desired, which reduces the overall quality of much of the pronghorn habitat available for this subunit.
- Given that pronghorn are selective feeders, they require a variety of plant species and younger-aged, new growth vegetation to meet their dietary needs. Much of the area occupied by this subpopulation was determined to lack species richness, therefore potentially limiting the potential of this subpopulation to maintain or increase pronghorn density.
- The Cataract Ranch has been placed into a conservation easement and there has been discussion of having the Espee Ranch placed into a conservation easement. This ensures that pronghorn management can be a high priority in this subunit.

Opportunities

- Babbitt Ranches has a long history of concern for wildlife and the habitat that many wildlife species depend, with particular attention to pronghorn. This has been manifested in an initiation of many site-specific projects with research and management agencies and universities, but particularly with the Arizona Game and Fish Department that is highly unusual and appreciated.
- In recent years pronghorn have been available for transplants on a regular basis and if conditions dictate that a supplemental release of pronghorn is warranted, the availability of pronghorn for this action would be easily facilitated.
- Recent advances in the woody species management such as the development of the hydro-ax has opened opportunities that were heretofore unavailable to managers. This method allows for efficient reduction of woody species in a fashion that opens the area visually for pronghorn, leaves the wood products in small pieces that act as mulch on the ground, and enhances seed sprouting post-treatment.
- Many federal and state grant programs are available to provide funding to private landowners to conduct habitat improvement programs on privately held lands. This will greatly enhance the potential for funding to conduct activities identified in this plan.
- Development of the application of goat bars to improve permeability of many fences is a tool that has been proven to be effective.

Goal

The goal for the Cataract/Espee subpopulation is to maintain a healthy and viable subpopulation by offsetting the impacts of habitat loss and habitat degradation off Babbitt ranches, and reducing man caused mortality where possible.

Management Issues For Pronghorn Populations on Babbitt Ranches

PRIMARY CONSERVATION ISSUES – Cataract/Espee subpopulation

There are a number of conservation problems addressed below and all of them affect the potential for maintaining or enhancing this subpopulation of pronghorn. There are, however, three issues that pose greatest risk to this subpopulation including:

- Some areas have been impacted by woody invasion, reducing both forage resources and necessary sight distance.
- Low vegetative community diversity; an issue that is key to forage availability and suitability for pronghorn.
- Water availability and dependability are prime management concerns.

Tree and Shrub Encroachment:

Tree and shrub invasion guidelines – *the goal of this plan segment is to restore, to the extent possible, the ecological function in this vegetative community while recognizing the alteration of ecological processes resulting from changed fire regimes, excessive herbivory, and the influence of global climate change. Efforts will not be expended to change vegetative communities to other than what naturally occurred in the region.*

Strategy 1. Utilize existing funding programs such as the Habitat Partnership Committees and other potential funding sources to fund pinyon-juniper and ponderosa removal from invaded grasslands and savannas at all elevations. The approach here will be to stage the treatments in a step-wise fashion as follows:

- Treat areas in low-lying drainages first to ensure connectivity within this subunit to the extent possible. As a target, not less than 500 acres/year for a five year period should be treated to reduce woody invaders in areas that would improve connectivity between existing, but isolated pronghorn use areas.
- Open areas in proximity to the cleared drainages where the age of the trees is predominately less than 40-50 years old. This will optimize the treatments in areas where recent woody invasion has occurred and grasslands can be best restored. Pinyon and juniper trees with greater than 18 inch DBH should be left as a food resource and to provide cover. As a target, not less than 500 acres per year should be treated for a period of 5 years.

Strategy 2. Using existing data from telemetry studies or using a Delphi approach, identify additional areas where reduction of woody species would enhance recovery of pronghorn populations. An example of these types of areas would be potential fawning areas that are located in proximity to water and have other features identified by Ticer and Miller (1994) Project sites should be far enough from rural homes to avoid most conflicts with homeowners, recreationists or domestic or feral dogs.

- To achieve the above treatment type, site visits to waters in pronghorn habitat should be conducted to identify not less than five water sites that are potential fawning areas using the guidance of Ticer and Miller (1994). Tree density reduction should be conducted using the hydro-ax in a fashion to obtain a site that meets the description of fawning cover as identified by Ticer and Miller (1994). In the first five years of this plan, the five fawning areas should be treated to improved pronghorn habitat.

Forage Availability and Diversity:

Forage availability and diversity guidelines – *restoring forage to pre-settlement conditions should be based on reduction of woody material, utilization of watered plots, and application of seeds. Seeds will be solely from native species with preference for seeds that have been collected from ecologically similar conditions to that of Babbitt Ranches.*

Pronghorn rely on a diverse vegetative community where forbs and shrubs are important components of their diet. Pronghorn are selective foragers and depend on forage diversity and plant quality where high digestibility and nutrient levels occur.

Past management and drought in this area reduced vegetative diversity, particularly on cool season grasses and desirable browse over much of the range. The native summer grass, blue grama filled in the gaps and now dominates vegetative cover in most ranges below 6,500 feet elevation. When the soil warms and moisture is available, blue grama provides nutritious forage with crude protein content above 10%. Conversely, under adverse conditions, the crude protein content of blue grama drops to less than 2%, digestibility is very low and this resource is of little value for livestock or wildlife. This adaptation of blue grama explains its ability to survive heavy winter use and its ability to out-compete other more desirable forage species. One of the key management strategies to improve habitat conditions for pronghorn is restoration of vegetative diversity in the area and to reintroduce habitat disturbances to rejuvenate individual plants.



Providing sufficient forage is important, particularly to does with fawns

Strategy 1. Evaluate the potential to use irrigated forage plots in key areas to improve forage quality/availability for pronghorn. Under the right conditions forage plots could provide additional dependable pronghorn forage. If the logistics can be worked out we would like to try forage plots in some of the areas in where tree grinding has occurred and vegetative recover is in progress. Assuming that this approach achieves desired outcomes, we recommend implementing no less than two of these treatments per year in the eastern subunit within areas where forage quality/availability is lower quality than desirable for a period of not less than five years for a total of 10 treatment areas. Each treatment area should consist of an area of not less than 2 acres.

Strategy 2. Spreader berms have the potential to increase soil moisture and thereby to increase forage diversity, growing season and quantity of forage available. Tests on the efficiency of spreader berms were initiated on Raymond Wildlife Area and the Flying M Ranch in 2007. If those tests are successful in increasing vegetative diversity and abundance, no less than 5 acres of spreader berms per year will be placed in drainage areas in this subunit of the Babbitt Ranches as away to improve forage.

Strategy 3. Conduct literature review and develop an appendix for this plan that identifies the key components of pronghorn diets and develop sources of seeds that can be used to reseed treated areas.

Strategy 4. Implement a variety of treatment approaches to increase the number, distribution, quality of key forage species for pronghorn. Potential treatments could include:

- Disking grassland flats to disturb the soil and rejuvenate existing shrubs that have become senescent due to lack of disturbance or excessive herbivory.
- A target of not less than 100 acres a year for a period of 5 years is projected as a goal for this subsection of Babbitt Ranches. Monitoring needs to be implemented to determine the vegetative response to this treatment. If plant diversity and growth form improves during this trial period, additional acreage should be treated in this fashion in subsequent years.
- Seeding with desirable plant species. Research conducted by Ockenfels et al. (1996b) suggested that the number of desirable forage species was reduced in much of this area. Therefore, obtaining desirable forage species seeds and reseed key areas where species diversity is low would benefit pronghorn.
- In areas where species diversity is low, particularly the shrub component, native species seeds from not less than five desirable species need to be obtained, either by purchase or by local collection and not less than 50 acres a year of treated areas (either disking or hydro-axed areas) should be reseeded to improve the plant community with valuable species for pronghorn consumption.

Strategy 5. Where vegetative diversity is low, evaluate the use of small-scale fires to increase the presence of forbs and other food resources necessary for maintaining a productive pronghorn population. In addition, develop test plots where the use of chemical fertilizers can be tested to increase forage quality and availability.

Water Distribution:

Water development philosophy – *the focus of this plan is to create better habitat for pronghorn and this is the driving force for water developments for pronghorn. Therefore, it is important that waters be developed in habitats that are purely pronghorn habitat and not areas where the*

addition of water would facilitate or encourage use by elk or other wildlife species that could compete with pronghorn.

Previous research suggests that optimal water distribution is placement of a permanent water site at a distance of about every two miles within occupied habitat and that use areas within 4 miles of permanent water were selected by pronghorn at a rate greater than this habitat was available (Autenrieth et al. 2006). Further, it is important that these waters have little vegetative cover around water sources that would result in inaccessibility to pronghorn or would possibly facilitate predation at water sites.

Strategy 1. Identify all waters (including those targeted for livestock) that occur within pronghorn habitat, conduct an assessment of their persistence (is water available during spring and summer; key periods of water demand for pronghorn) and their availability to pronghorn and other wildlife species.

- Develop a list of and field verify the existence of all waters in potential pronghorn habitat and assess their availability for pronghorn and their persistence potential. This activity should be completed by the second year of this plan.
- Prioritize and develop rehabilitation strategies for all waters that do not provide key season access for pronghorn based on the need for suitable waters in the area. Prepare grant proposals and rehabilitate waters in priority order to ensure suitability for both wildlife and livestock. Rehabilitate at least one water per year for the first five years of this plan.



Wildlife drinkers can be camouflaged to decrease visibility and improve acceptance of these rangeland improvements

Strategy 2. Identify locations in this subunit where water is not available to pronghorn within a 4-mile radius and identify potential locations on existing pipelines where pronghorn waters can be developed at minimal cost.

- Develop a needs assessment based on the 4-mile radius recommended by Autenrieth et al. (2006) where water does not exist within suitable pronghorn habitat. This should be completed within the first two years of this plan.
- Develop wildlife waters in areas where water is lacking. One water per plan year will be developed.

Fawning Cover:

Fawning cover guidelines – *research has demonstrated that gravid does select specific habitat conditions to give birth and rear fawns. When optimal habitat conditions occur and does have access to prime fawning habitat, herd productivity will be optimized.*

Having sufficient cover to hide fawns from predators is a key habitat consideration. Research conducted in Arizona suggest that at least 16 inches vertical height is needed.

Fawning cover is low and less than desired on the area occupied by this subpopulation area in general. Ticer and Miller (1994) conducted research on the habitat characteristics at fawning sites in Arizona. One of the key predictors of pronghorn population trajectory is the rate of fawn recruitment into the population. In general, when fawn recruitment is at or below 30 fawns per 100 does, the population will be in decline. Increasing fawn recruitment is a key management action that is needed throughout most pronghorn ranges in Arizona, including the habitat on Babbitt Ranches.

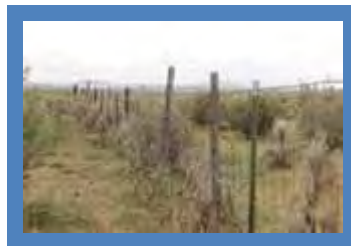
Strategy 1. Using the fawning habitat description developed by Ticer and Miller (1994), identify at least five potential fawning areas in this subunit.

- Select two of the potential fawning areas identified and develop rehabilitation strategies for each location. In general, key characteristics for pronghorn fawning include: distance from water, varied topography, vegetative height approximately 16 inches tall. Rehabilitation plans should be completed within two years of the initiation of this plan.
- Apply the rehabilitation plan identified above and rehabilitate one fawning area in year 3 and 4 of this plan. This could entail woody species removal and reseedling with desired species to provide vertical height.

Fence Standards:

Fence standard guidelines – *fences are necessary for proper livestock management and can play an important role in restricting movements of pronghorn when fence structure is close enough to the ground to preclude movements. A key management practice to benefit pronghorn on western rangelands is modification of fences to ensure movement is possible under fences thereby maintaining connectivity between herd units.*

Strategy 1. Most of the existing fences have been modified with goat bars to the point where this is a minor issue on this subunit, however, as fences, particularly those around water sources are identified that need to be modified, continue until all fencing facilitates movements throughout this subunit.



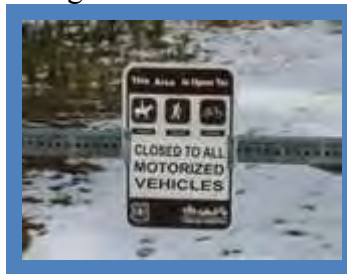
**Sheep fencing function as complete barriers to pronghorn movements
Removing this type of fence will improve connectivity for pronghorn**

Human Disturbance

Human disturbance guidelines – *where practical, it can benefit pronghorn reproductive success by limiting incompatible human activities in key pronghorn habitats such as fawning areas and when pronghorn are raising fawns.*

Strategy 1. Use informational programs and signage to improve compliance with OHV regulations.

- Work with agency OHV programs to develop appropriate signage in areas that are key pronghorn habitat that advise OHV users of appropriate usage in these areas. Post at least 5 advisory signs at key locations in the first two years of this plan and expand as needed after this.
- Work with agency OHV programs and obtain brochures or other literature sources that can be provided to OHV riders encountered in the field that advise riders of lawful use patterns while riding OHVs.



Signage can be an effective method to reduce environmental damage in key areas or during sensitive times such as fawning

Implementation Matrix for woody invasion plan element

Strategy Number	Action	Date Due	Date Completed
Strategy 1 – reduce woody species	Treat 500 acres of drainage lands to maintain connectivity	Annually for five years	
	Treat 500 acres of uplands in proximity to drainages to enhance forage production	Annually for five years	
Strategy 2 – restore key habitat features such as fawn bedding areas	Using Delphi approach, identify one fawning area per year and treat one site per year to standards described by Ticer and Miller 1994	Annually for five years	

Implementation matrix to increase forage availability and diversity

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – develop forage enhancement plots	Implement forage irrigation for two plots; one in proximity to	within two years of the implementation of this plan	

	Redlands and one in proximity to Tin House		
	if successful, implement 2 additional irrigated forage plots per year for 5 years	Annually for five years	
Strategy 2 – use spreader berms to capture additional runoff to enhance forage production	use equipment to develop spreader berms on five acres of drainage areas to increase forage production	Annually for five years	
Strategy 3 – literature review to determine sources and composition of seed mixes	conduct a literature and produce a report on desired seed mix and source	within two years of the initiation of this plan	
Strategy 4 – use mechanical disturbance to rejuvenate senescent shrublands	Identify suitable areas for mechanical disturbance and treat 100 acres year	Annually for five years	
	Assuming seed is available, apply native seed to 50 acres as treated above	Annually for five years	
Strategy 5 Evaluate the use of small fires and chemical fertilizers to improve forb and other forage components	Develop a site specific plan to experiment with small-scale fires and application of chemical fertilizers with the goal of testing 20 different locals for fire application and 10 for the application of fertilizers	Within two years of the initiation of this plan	

Implementation matrix for water developments

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – complete an assessment of existing water sites on	Develop a list of all existing know water sites on CO BAR and	Within two years of the implementation of this plan	

CO BAR	field verify availability and permanence		
	Prioritize a rehabilitation schedule for existing waters that need improvement for pronghorn	Schedule and complete one water rehabilitation per year for a five year period if necessary	
Strategy 2 – conduct needs assessment for water developments where existing water is lacking	Use the existing database of waters from above and determine if areas are devoid of water for pronghorn	within two years of the implementation of this plan	
	If the assessment above demonstrates a need for additional water, construct new waters as needed	If necessary, complete one new water per year for five years	

Implementation matrix for water developments

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – complete an assessment of existing water sites on CO BAR	Develop a list of all existing know water sites on CO BAR and field verify availability and permanence	Within two years of the implementation of this plan	
	Prioritize a rehabilitation schedule for existing waters that need improvement for pronghorn	Schedule and complete one water rehabilitation per year for a five year period if necessary	
Strategy 2 – conduct needs assessment for water developments where existing water is lacking	Use the existing database of waters from above and determine if areas are devoid of water for pronghorn	within two years of the implementation of this plan	
	If the assessment above demonstrates a need for additional water, construct new waters as needed	If necessary, complete one new water per year for five years	

Fawning cover rehabilitation implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1 – identify areas that appear to be suitable fawning sites as described by Ticer and Miller (1994)	Identify two potential fawning areas and develop a rehabilitation plan for each	Within two years of the implementation of this plan	
	Rehabilitate one of the fawning sites identified above	One site each in year 3 and 4 of this plan	

Fence modification implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1. Continue to modify fences using goat bars particularly where access is limited at water sources	On an annual basis, identify fences that need to be modified to facilitate pronghorn movement, with the goal of having all areas fitted with goat bars	Within five years	

Human disturbance (OHV use) implementation matrix

Strategy Number	Action	Due Date	Date Completed
Strategy 1. Use informational programs and material and signage to increase legal use of OHVs	Place at least five advisory signs with this subunit	Annually	
	Provide agency and ranch personnel with informational brochures to provide to OHV users as encountered	Annually as needed	

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CO Bar Grassland Restoration

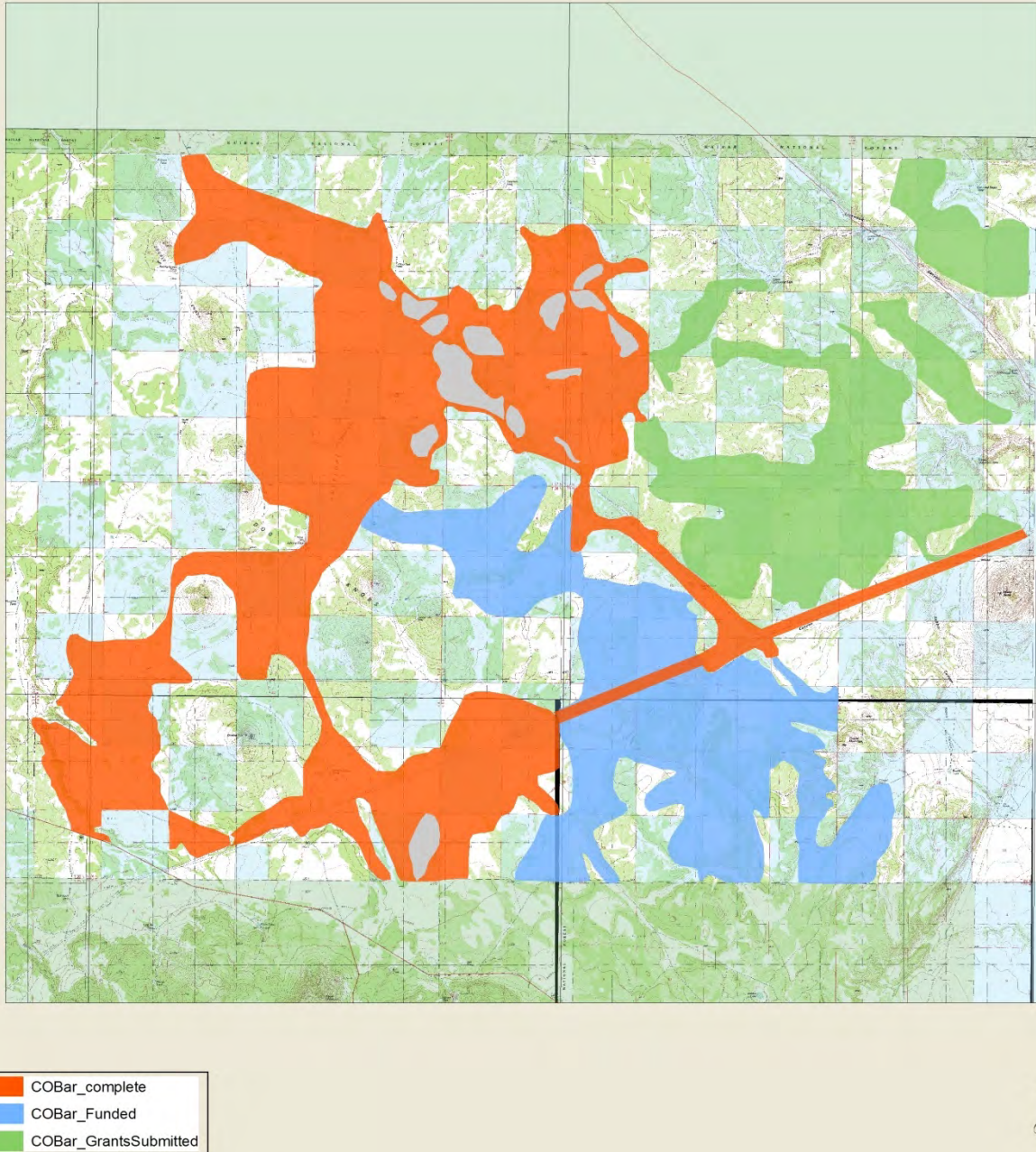


Figure 9. Areas in orange have been treated to reduce pinyon-juniper density to benefit pronghorn. Light blue and green are scheduled to be treated in 2009.

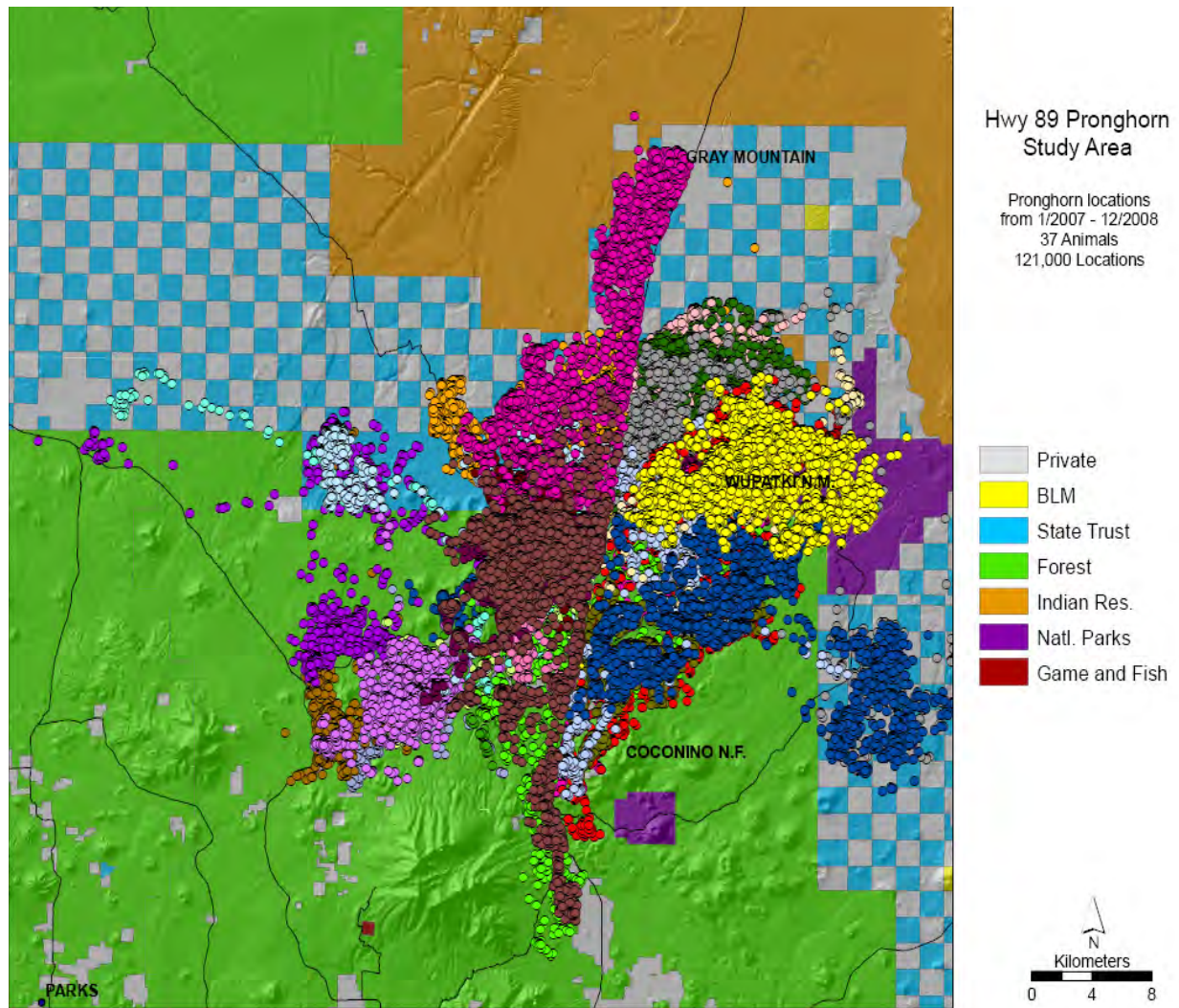


Table X. Summary of pronghorn survey and harvest data for Game Management Unit 7

YEAR ¹	POPULATION SURVEY DATA					HARVEST DATA	
	MALES	FEMALES	JUVENILES	Fawns:100 does	GROUPS	PERMITS	HARVEST
1957	41	105	38	36		0	0
1958	60	175	60	34		40	25
1959	89	160	105	66		80	54
1960	108	236	152	64		100	63
1961	38	42	13	31		60	34
1962	47	126	43	34		50	24
1963	55	129	70	54		50	29
1964	32	155	66	43		40	24
1965	47	121	61	50		50	31
1966	75	130	46	35		65	30
1967	65	192	48	25		75	47
1968	36	131	71	54		40	15
1969	53	116	51	44		60	27
1970	51	156	65	42		60	27
1971	41	128	40	31		60	33
1972	62	157	94	60		60	28
1973	72	132	23	17		80	48
1974	33	133	33	25		80	42
1975	26	126	46	37		83	35
1976	37	176	54	31		60	25
1977	33	110	33	30		60	33
1978	36	150	82	55		60	23
1979	16	119	30	25		60	25
1980	46	109	41	38		45	27
1981	69	125	32	26		45	33
1982	32	122	45	37		45	37
1983	40	202	95	47		50	37
1984	69	178	55	31	62	55	48
1985	42	143	32	22	31	60	49
1986	50	144	39	27	44	65	48
1987	54	186	69	37	54	60	43
1988	80	270	99	37	76	60	50
1989	56	231	54	23	50	60	49
1990	82	307	109	36	78	60	42
1991	92	315	83	26	75	60	45
1992	90	237	61	26	59	60	48
1993	59	282	79	28	61	60	44
1994	54	236	49	21	51	60	51
1995	75	215	50	23	70	55	52
1996	49	138	9	7	46	55	45
1997	71	279	98	35	62	55	44
1998	70	215	68	32	81	55	46
1999	97	284	67	24	82	55 ²	41
2000	53	182	41	23	55	55 ²	35
2001	88	291	70	25	90	55 ²	46
2002	11	64	7	11	13	55 ²	37
2003	4	156	75	48	51	50 ²	36
2004	43	168	74	44	53	50 ²	38
2005	33	108	60	56	37	55	45
2006	73	93	22	24	28	55	45

Table X. Summary of pronghorn survey and harvest data on Game Management Unit 7, continued.

POPULATION SURVEY DATA						HARVEST DATA³	
YEAR¹	MALES	FEMALES	JUVENILES	FAWNS:100 DOES	GROUPS	PERMITS	HARVEST
2007	32	98	21	21	39	65	51
2008	70	177	58	33	61	50	44
2009	42	197	42	21	54	55	46
2010	67	248	60	24	73	40	36
2011	45	194	57	29	56	40	30
2012	60	159	40	25	54	40	35
2013	79	173	77	45	67	40	32

¹ Note that GMU 7 and 9 were combined as a single unit in 1957–1960, at which time, data were recorded as separate units.

² This number of permits includes five permits that were issued for Junior hunt opportunity.

³ These data are for the General Hunt only.

Table X. Summary of pronghorn survey and harvest data for Game Management Unit 9.

YEAR ¹	POPULATION SURVEY DATA					HARVEST DATA	
	MALES	FEMALES	JUVENILES	FAWNS:100 DOES	GROUPS	PERMITS	HARVEST
1957	41	105	38	36		0	0
1958	60	175	60	34		40	25
1959	89	160	105	66		80	54
1960	108	236	152	64		100	63
1961	69	130	87	67		120	59
1962	27	95	23	24		50	32
1963	27	59	8	14		50	22
1964	15	40	7	18		35	14
1965	17	102	21	21		25	17
1966	16	78	17	22		25	14
1967	29	106	13	12		37	16
1968	15	72	27	38		25	12
1969	28	85	15	18		30	19
1970	28	113	42	37		35	16
1971	23	81	4	5		25	20
1972	20	49	22	45		25	13
1973	82	114	27	24		80	40
1974	12	71	21	30		80	38
1975	17	92	19	21		45	28
1976	20	56	7	13		60	27
1977	15	93	9	10		60	18
1978	26	48	22	46		40	14
1979	26	100	21	21		40	20
1980	49	143	60	42		40	21
1981	38	67	7	10		40	25
1982	32	128	61	48		40	25
1983	28	129	37	29		45	32
1984	51	84	10	12	51	40	30
1985	39	140	17	12	33	45	36
1986	57	185	37	20	64	45	23
1987	43	161	34	21	51	50	26
1988	48	199	48	24	55	50	28
1989	25	88	26	30	34	50	30
1990	43	177	33	19	52	50	31
1991	43	140	31	22	32	50	31
1992	36	140	45	32	42	40	20
1993	54	138	57	41	46	40	20
1994	27	129	19	15	49	40	25
1995	51	205	27	13	52	30	20
1996	53	155	10	6	61	30	27
1997	28	90	22	24	30	40	29
1998	39	128	35	27	37	40	26
1999	59	132	33	25	60	40	32
2000	25	117	16	14	39	40	28
2001	38	197	37	19	43	40	21
2002	30	136	23	17	41	20	14
2003	47	135	34	25	51	15	13

Table X. Summary of pronghorn survey and harvest data on Game Management Unit 9, continued.

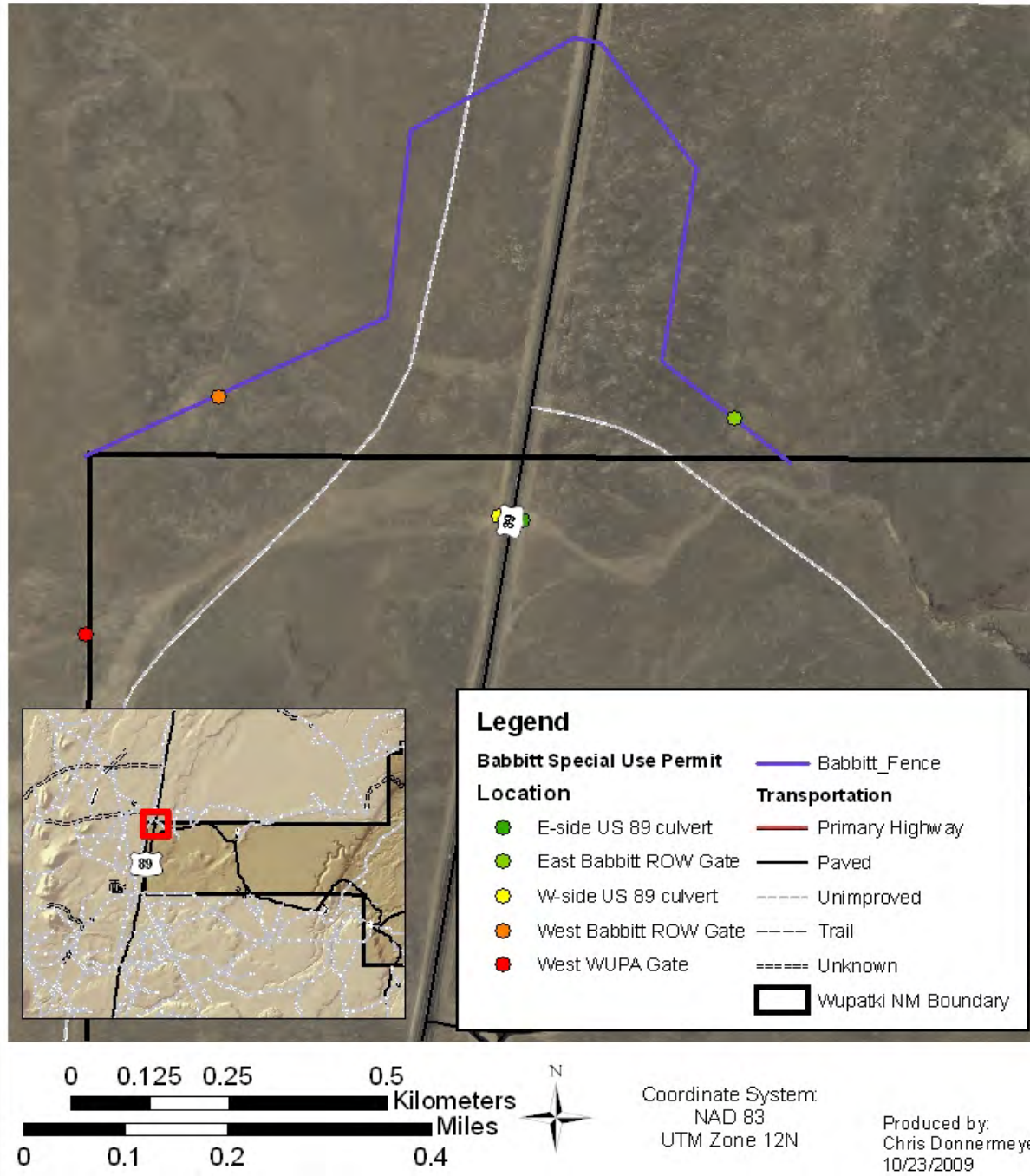
YEAR¹	POPULATION SURVEY DATA					HARVEST DATA²	
	MALES	FEMALES	JUVENILES	FAWNS:100 DOES	GROUPS	PERMITS	HARVEST
2004	31	95	31	33	37	15	14
2005	33	67	30	48	27	15	14
2006	12	62	8	13	24	20	19
2007	42	61	27	40	41	20	19
2008	30	85	23	27	33	25	24
2009	23	60	5	8	28	25	18
2010	42	105	25	24	32	20	17
2011	45	76	48	63	36	25	24
2012	35	72	46	64	32	27	24
2013	43	75	45	60	40	32	25

¹ Note that GMU 7 and 9 were combined as a single unit in 1957–1960, at which time, data were recorded as separate units.

²These data are for the General Hunt only.



WUPA Babbitt Special Use Permit



Pronghorn Trap Hwy 89 North 1

APPENDIX H

Babbitt Ranches Fickeisen Plains Cactus Management Plan



DRAFT
BABBITT RANCHES
FICKEISEN PLAINS CACTUS
MANAGEMENT PLAN
COCONINO COUNTY, ARIZONA



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DRAFT

**BABBITT RANCHES
FICKEISEN PLAINS CACTUS MANAGEMENT PLAN
COCONINO COUNTY, ARIZONA**

Prepared for

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October 31, 2013

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Note: Cover photographs by Greg Goodwin

EXECUTIVE SUMMARY

The Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*) was listed as endangered on October 1, 2013 (78 FR 60608). This species is known to occur only in Coconino and Mohave Counties in northern Arizona and has been found on Cataract Ranch, Espee Ranch, and CO Bar Ranch, all cattle ranches owned and operated by Babbitt Ranches, LLC (Babbitt Ranches). This document serves as the species and habitat management plan for the Fickeisen plains cactus and its habitat on all three ranches.

The *Babbitt Ranches Fickeisen Plains Cactus Management Plan* (Plan) is intended to assist Babbitt Ranches in the protection and effective management of the Fickeisen plains cactus on Cataract Ranch, Espee Ranch, and CO Bar Ranch. The Plan summarizes the threats faced by the species throughout its range, addresses what is currently known about the status of the cactus on the Babbitt ranches, and describes targeted conservation actions taken to ensure the long-term survival of species on the ranches.

The primary conservation measure that has been practiced on Babbitt land in the past, that is currently being practiced, and that will be practiced in the future is utilization of the best available grazing management practices to sustain rangeland health over the long term. While not targeting the Fickeisen plains cactus, the methods used by Babbitt Ranches over the decades to ensure long-term livestock productivity and preserve native grassland and shrub-steppe habitats on the lands they manage have incidentally allowed the Fickeisen plains cactus to endure and—judging by the surveys completed to date—flourish.

Targeted conservation actions include surveys of the Babbitt ranches to better identify the distribution and abundance of the Fickeisen plains cactus on the ranches, and a long-term monitoring program to assess plant demographic trends and health through time. Survey and monitoring protocols will be determined in cooperation with the Service. In addition to committing to additional surveys and monitoring, Babbitt Ranches will avoid known cactus localities during any ground-disturbing activities (e.g., digging fencepost holes), placement of salt licks that attract cattle, and cattle drives. Babbitt Ranches will employ an adaptive management approach for the Fickeisen plains cactus, investigating, evaluating, and implementing conservation actions as appropriate depending upon monitoring results, new information, and changing conditions.

This Plan is meant to be a living document that will be adapted as conservation actions are identified and implemented, new data are collected, actions are evaluated for effectiveness, scientific knowledge expands, regulations change, funding is procured, and the environment evolves.

Conservation actions identified in this Plan were developed in conjunction with the multi-species *Espee Ranch Regional Conservation and Land Use Plan*, which approaches conservation on the Babbitt properties from a grassland landscape perspective. The Fickeisen plains cactus Plan can stand alone, however, and fully communicates Babbitt Ranches' commitment and ability to effectively manage and protect the Fickeisen plains cactus on well over a half million acres under its control.

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1.0 INTRODUCTION

The Fickeisen Plains Cactus (*Pediocactus peeblesianus* var. *fickeiseniae*) was proposed for listing as endangered with critical habitat on October 3, 2012 (77 FR 60510). This species is known to occur only in Coconino and Mohave Counties in northern Arizona and has been found on the Cataract, Espee, and CO Bar Ranches, all cattle ranches owned and operated by Babbitt Ranches, LLC (Figure 1). Babbitt Ranches is headquartered in Flagstaff, Arizona. All three ranches comprise both deeded property and leased State Trust Land. CO Bar Ranch also includes grazing leases on U.S. Forest Service and Bureau of Land Management (BLM) land (Table 1).

Table 1. Approximate area in acres of the Babbitt ranches by landownership (all figures rounded).

Babbitt Ranches	Deeded Land	State Trust Land (Leases)	U.S. Forest Service (Leases)	BLM Land (Leases)	TOTAL
Cataract	45,000	133,000	0	0	178,000
Espee	100,600	42,400	0	0	143,000
CO Bar	125,000	132,000	130,000	4,800	391,800
TOTAL	270,600	307,400	130,000	4,800	712,800

This Fickeisen plains cactus management plan (Plan) is designed to provide a framework for better understanding, protecting, and effectively managing the Fickeisen plains cactus and its habitat on the three Babbitt ranches. It summarizes what is currently known about the status of the Fickeisen plains cactus on the ranches and details specific conservation actions that will be pursued through time. This Plan should be viewed within the context of the broader multi-species *Espee Ranch Regional Conservation and Land Use Plan*, but this Plan can stand alone and, as such, fully demonstrates Babbitt Ranches' willingness and ability to effectively manage and protect the Fickeisen plains cactus on well over a half million acres of its lands.

1.1 Conservation Mission of Babbitt Ranches

In operation since 1886, Babbitt Ranches, LLC is a family-owned business that has dedicated itself to sustainably managing large landholdings in northern Arizona while raising cattle and American Quarter Horses. The Babbitt family operates its ranches in the traditional manner, working its livestock by horseback rather than by mechanized vehicles. Understanding that the economic well being of the region cannot be separated from the well being of the human and natural environment, Babbitt Ranches acknowledges multiple bottom lines, integrating not only economic but community and ecological values into all its decision-making processes. Inseparable from its ranching business is a commitment to work with others to promote and respect regional ecological continuity, wildlife habitat, diverse vegetation, watersheds, historic sites, cultural resources, and access for recreationists and scientists.

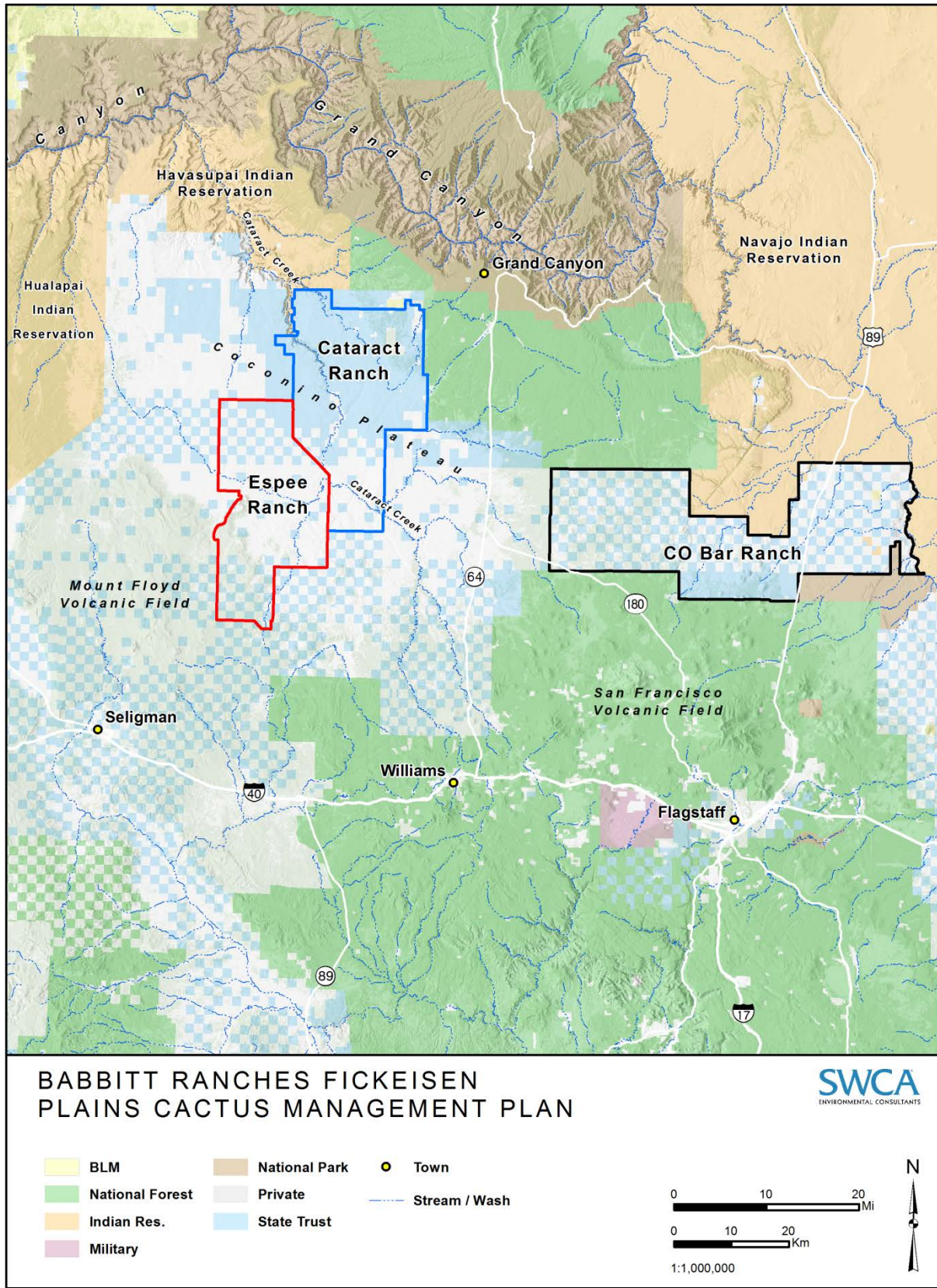


Figure 1. Location of Espee, Cataract, and CO Bar Ranches in northern Arizona.

The shareholders of Babbitt Ranches, all related by familial ties, are a large, geographically far-flung, and diverse group of people. They represent many different walks of life, but they are united in their adherence to the principles embodied in the company's constitution. According to that constitution, the guiding land ethic at the Babbitt ranches "reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity" (Babbitt Ranches Constitution Article 5, Section 3).

The commitment of Babbitt Ranches to living this land ethic is evidenced by numerous conservation efforts, including: 1) Applying livestock management practices aimed at sustaining rangeland health over the long term; 2) Establishing two conservation easements on Cataract Ranch totaling 40,880 acres and a conservation easement on CO Bar Ranch totaling 640 acres; 3) Sponsoring a biological assessment of the Coconino Plateau that provides an overview of the biotic and abiotic environment of the region (Thybony and Thomas 1998); 4) Supporting studies of wildlife and plant populations on the Babbitt ranches and implementing actions designed to benefit those populations; 5) Supporting studies of rangeland conditions on the ranches and implementing measures to improve and preserve those habitats; and 6) Proactively seeking opportunities to work with a wide spectrum of government agencies, educational institutions, environmental organizations, and other area ranchers to better understand, enhance, and conserve the natural landscape, not only on the Babbitt ranches, but throughout northern Arizona. For example, Babbitt Ranches, LLC:

- Participated with the Arizona Game and Fish Department (AGFD) in the release of the federally endangered black-footed ferrets (*Mustella niger*) on Espee Ranch in 2007, 2008, and 2009. Permission was freely granted by Babbitt Ranches for the releases without the landowner protections afforded by Section 10(j) of the Endangered Species Act of 1973 (ESA) or a Safe Harbor Agreement.
- In support of the ferret release program, invited the AGFD to annually map and monitor Gunnison's prairie dog (*Cynomys gunnisoni*) colonies on Espee Ranch (2007 to the present). This project produces data on colony densities and prairie dog population size and trends. Related conservation actions included dusting by AGFD in 2008, 2009, and 2011 of some colonies with DeltaDust insecticide in an effort to control fleas carrying sylvatic plague (*Yersinia pestis*).

Babbitt Ranches is also permitting the AGFD to conduct sylvatic plague vaccine (SPV) trials on Espee Ranch prairie dog colonies in 2013.

- Opened the Babbitt ranches to Northern Arizona (NAU) faculty and students. Research projects to date include monitoring long-term ecological responses to climate change, study of cottonwood ecology, dating of volcanic flows, and a prairie dog release study. Babbitt Ranches also gifted a 24-acre parcel to NAU for an ecological center.
- Engaged with researchers from the AGFD, NAU, and Texas Tech University to study the impact of off-highway vehicle use on pronghorn; how increased hunting pressure affects wildlife cycles such as breeding periods and the successful rearing of young; and the potential impact of dispersed recreation on wildlife and habitat in general.
- Cooperated with the AGFD on radio-telemetry studies of pronghorn movement across northern Arizona, 1992–2010. Resulting data revealed critically important information

about the segregation of pronghorn into subpopulations. Babbitt Ranches also worked with AGFD staff to prepare a long-term pronghorn succession plan for Espee, Cataract, and CO Bar Ranches (deVos and Cordasco 2009).

- Worked with the Natural Resources Conservation Service (NRCS) to restore some 50,000 acres of grassland on CO Bar Ranch by removing encroaching trees and reducing the trees to mulch. The mulch was left in situ to enhance the growth of native grasses, forbs, and shrubs used by pronghorn and other wildlife, as well as livestock.
- Cooperated with the National Oceanic and Atmospheric Administration (NOAA) in installing a U.S. Climate Reference Network (USCRN) station at Cataract Ranch. The USCRN, one of the preeminent networks for monitoring climate change in the world, is intended to gather continuous climate-related measurements from a vast network of stations for 50 or more years. The station is AZ Williams 35 NNW – Babbitt Ranches.
- Established the Ecological Monitoring & Assessment (EMA) Program and Foundation at Northern Arizona University (NAU), which evolved into the Landsward Institute (now the Babbitt's Landsward Foundation). Among other projects, EMA promoted cooperation among stakeholders to protect the Havasu Creek Watershed (West et al. 2009).

Babbitt's Landsward Foundation is now in the process of seeking grant funding to initiate a regional golden eagle long-term monitoring program to identify and track

1) golden eagle nest occupancy, density, and productivity; 2) golden eagle population numbers, including resident and/or breeding adults, and sub-adult/floater individuals across seasons; 3) golden eagle home ranges and movements; and 4) the ecological and climatic variables that drive golden eagle reproductive success, including prey base, habitat condition/health, and regional climatic conditions.

1.2 Purpose and Need for the Plan

In its Proposed Rule to list the Fickeisen plains cactus as endangered (77 FR 60545; USFWS 2012), the Service requested notification from landowners if they are interested in participating in the species recovery process. Babbitt Ranches LLC desires to participate in the recovery of the Fickeisen plains cactus and has developed this Plan with that interest in mind.

The Plan is designed to provide guidelines for the effective management of the cactus on Cataract, Espee, and CO Bar Ranches using accepted conservation techniques. Numerous healthy, reproducing populations of Fickeisen plains cactus have been documented on Cataract Ranch, and one small population has been documented on Espee Ranch and two on CO Bar Ranch (Goodwin 2011, USFWS 2012); however, the full range, distribution, and density of the species on the ranches are unknown. Only a very small fraction of potential habitat for the Fickeisen plains cactus on the Babbitt ranches has been searched. There is a need to better understand the distribution and population size of the Fickeisen plains cactus on the three ranches, and to statistically quantify population demographic processes, and to document current and changing habitat conditions throughout the species' range on the ranches.

1.3 Authorization

The Plan shall become effective upon approval by the Babbitt Ranches Board of Directors and the Service. Once approved by the Service, the Plan will remain in effect until such time as the species is de-listed under federal law. Babbitt Ranches will review the Plan, in coordination with the Service, at least every 5 years, and it will be adaptively revised as appropriate.

1.4 Applicable Federal and State Laws

Federal – The Fickeisen plains cactus is proposed to be listed as an endangered species under the ESA. A federally endangered species is one “which is in danger of extinction throughout all or a significant portion of its range” (16 USC 1532). Under the ESA, with respect to plants, it is illegal to: “(A) import any such species into, or export any such species from, the United States; (B) remove and reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law” (16 USC 1538(a)(2)).

State – The Arizona Department of Agriculture has classified the Fickeisen plains cactus as “highly safeguarded,” which means the State considers these plants to be threatened or are in danger of extinction (Arizona Native Plant Law, ARS §3-901 *et seq.*). As a rule, highly safeguarded plants may not be collected on either private or non-private land; however, noncommercial salvage or collection for research purposes is permissible with a permit from the Arizona Department of Agriculture. Protection includes the plants themselves and all plant parts such as fruits, seeds and cuttings.

2.0 SPECIES AND HABITAT OVERVIEW

2.1 Species Description

The Fickeisen plains cactus is a small globular cactus, difficult to see unless blooming. Stems of mature plants are only 1.0 to 2.4 inches tall and up 2.2 inches in diameter. It is a cold-adapted plant with contractile roots; that is, the plant has the ability to retract into the soil during the winter (cold) and summer (dry) seasons and during drought conditions. Plants may shrink completely under the surface or only until the crown is flush with the surface. With adequate precipitation, plants emerge to flower from mid-March to late April. Flowers are cream-yellow or yellowish-green, up to 1.0 inch in diameter, and produced on the apex of the stem. The fruit is top-shaped, smooth, and turns reddish brown upon maturity. After flowering, plants set seed in June, and then shrink back into the soil. Some plants may re-emerge in the autumn following monsoonal rains (Mikesic and Roth 2008, USFWS 2012).

2.2 Habitat Description, Geographic Range, and Land Ownership

Fickeisen plains cactus is an endemic species restricted to the Kaibab Limestone-derived soils in Coconino and Mohave Counties in northern Arizona. It occurs on along canyon rims and flat terraces along washes and hillsides, typically with limestone chips and gravel scattered across the surface (Brown 1994, Mikesic and Roth 2008). The species is known to occur in aggregations between 4,000 and 6,000 feet elevation. The Fickeisen plains cactus occurs on lands managed by the BLM, Navajo Nation, Hualapai Nation, Arizona State Land Department, and the U.S. Forest Service (Roth 2008). It also occurs on private land, including all three of the Babbitt ranches in northern Arizona (see Goodwin 2009, 2011; USFWS 2012).

Approximately 1,150 individuals, occurring within 33 separate populations or aggregations, of FPS have been documented within the total range of the species. Of these 33 separate populations, at least 29 percent occur on private land, with the overriding majority of this on the Babbitt ranches, specifically Cataract Ranch (USFWS 2012).

2.3 Habitat and Status on the Babbitt Ranches

Due to the apparent rarity of the Fickeisen plains cactus and the potential for its listing as a threatened or endangered species under the ESA, botanist Greg Goodwin, on behalf of Babbitt Ranches and The Nature Conservancy, gathered data on the Fickeisen plains cactus occurrence on Cataract Ranch annually from 2006 to 2011. During informal, targeted surveys, Goodwin recorded 36 populations of the cactus comprising an estimated 306 plants on Cataract Ranch. Surveys for this species were not conducted on Espee Ranch, but a single population comprising two plants was opportunistically discovered on that ranch (Goodwin 2011; see Table 2 and Figure 2).

Searches for the Fickeisen plains cactus were conducted in the spring when individual plants were most likely to have emerged from under the soil, and mature specimens were in bloom. Most of the 37 populations recorded by Goodwin (2011) occurred in a rather linear fashion within 2–3 miles of Cataract Canyon, and virtually all were found on mostly flat, stable, gravelly limestone benches (terraces) in shallow soil.

Table 2. Locations of known Fickeisen plains cactus population sites on Cataract and Espee Ranches (from Goodwin 2011).

Site No.	Site Name	Ranch	Date Discovered	Latitude/ Longitude ²	Elevation (feet)	No. of Plants Observed	Land Status ¹
1	Original 1	Cataract	5/11/06		5,655	2 mature	State Trust Land
2	C. C. Ranch	Cataract	5/11/06		5,575	3 mature	Deeded land TNC **
3	Shilo Tank 1	Cataract	5/30/06		5,497	1 mature	Deeded land TNC
4	Anita Road	Cataract	4/8/07		5,630	14 mature 2 immature	State Trust Land
5	Drill Road	Cataract	4/25/07		5,650	8 Mature 5 immature	State Trust Land
6	South Box K	Cataract	4/25/07		5,640	7 mature 1 immature	State Trust Land
7	Bull Pasture	Cataract	5/1/07		5,600	9 mature	State Trust Land
8	Bull Pasture 2	Cataract	5/8/07		5,600	7 mature 3 immature	Deeded land TNC
9	Tombstone 1	Cataract	5/1/07		5,560	4 mature 11 immature	State Trust Land
10	New Harpo	Cataract	5/1/07		5,560	5 mature	State Trust Land
11	Tombstone 2	Cataract	5/08/07		5,620	8 mature	State Trust Land
12	Little Harpo	Cataract	5/10/07		5,530	5 mature 2 immature	Deeded land TNC
13	Water Tank	Cataract	5/10/07		5,650	4 mature	State Trust Land
14	South Horse Tank 1	Cataract	5/27/07		5,575	1 mature 1 immature	State Trust Land
15	South Horse Tank 2	Cataract	5/27/07		5,625	1 mature	State Trust Land
16	Islands Tank	Cataract	8/12/07		5,610	32 mature 2 immature	Deeded land TNC
17	New Harpo North	Cataract	4/6/08		5,590	9 mature 1 immature	State Trust Land
18	Bull Pasture SW	Cataract	5/1/08		5,650	2 mature	Deeded land TNC
19	Tombstone 3	Cataract	5/1/08		5,600	2 mature	State Trust Land
20	Islands Tank South	Cataract	6/1/08		5,625	1 mature	Deeded land TNC
21	Espee 1	Espee	6/1/08		5,600	2 mature	State Trust Land
22	Box K	Cataract	7/13/08		5,660	5 mature	State Trust Land

Table 2. Location of known Fickeisen plains cactus population sites on Cataract and Espee Ranches (from Goodwin 2011), continued.

Site No.	Site Name	Ranch	Date Discovered	Latitude/ Longitude	Elevation (feet)	No. of Plants Observed	Land Status ¹
23	Moore Tank	Cataract	9/23/08		5,620	3 mature	Deeded land TNC
24	Islands Tank NW 1	Cataract	9/23/08		5,660	5 mature	State Trust Land
26	Islands Tank NW 2	Cataract	9/23/08		5,660	2 mature 9 immature	Deeded land TNC
25	Babbitt Tank SW	Cataract	9/23/08		5,740	13 mature	Deeded land TNC
26	Tank No. 1	Cataract	10/26/08		5,660	2 mature	Deeded land TNC
27	SE Corner	Cataract	10/26/08		5,700	4 mature 5 immature	Deeded land TNC
28	SE Corner 2	Cataract	10/26/08		5,640	4 mature 13 immature	Deeded land TNC
29	Fuller Tank	Cataract	3/18/09		5,600	6 mature 5 immature	Deeded land TNC
30	Islands Tank Cabin	Cataract	4/6/09		5,600	1 mature 2 immature	State Trust Land
31	Islands Tank Cabin 2	Cataract	4/6/09		5,730	3 mature	State Trust Land
32	Windy Point	Cataract	4/6/09		5,680	1 mature 6 immature	State Trust Land
33	SE Corner 3	Cataract	5/7/09		5,600	11 mature 8 immature	Deeded land TNC
34	Cataract Canyon NW	Cataract	6/1/09		5,600	14 mature 9 immature	State Trust Land
35	North End 1	Cataract	11/22/09		5,700	9 mature 2 immature	State Trust Land
36	North End 2	Cataract	11/22/09		5,650	4 mature 4 immature	State Trust Land
37	Shilo Tank 2	Cataract	9/29/11		5,175	2 mature 1 immature	Deeded land TNC

¹ TNC = The Nature Conservancy Conservation Easement

² Site coordinates redacted in this version of the draft management plan at the Service's request.

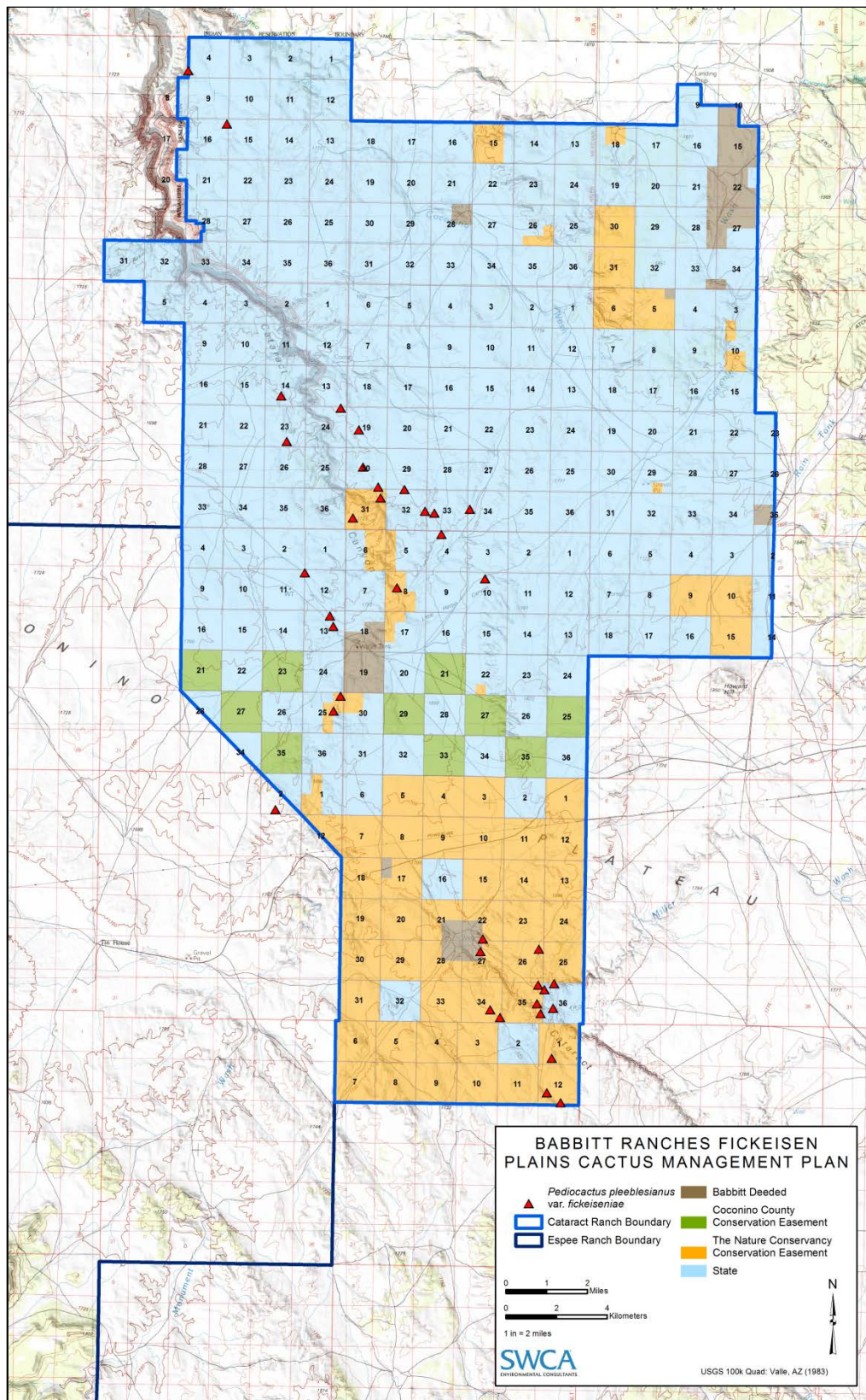


Figure 2. Approximate locations of known Fickeisen plains cactus populations on Cataract and Espee Ranches.

Based on field analysis of 12 Fickeisen plains cactus sites on Babbitt property, the NRCS found that, in general, the cactus can be found on shallow (sandy loam, loam, fine sandy loam) south facing slopes (ranges 3–18%) and an average clay soil texture of 18% (ranges 16%–25%).

A common description of the 12 sites includes the following:

Landscape: Terrace and hills on limestone and calcareous sandstone

Parent material: Eolian deposits on alluvium material

Average clay %: 18

Moisture regime: Ustic Aridic

Vegetation: Cholla cactus, bluegrama, winterfat, algerita, rubber rabbitbrush, prickly pear, fern clove, cliff rose, apache plume, bigelow sagebrush, juniper, and cheatgrass among others.

Elevation: 1,660 (lowest) and 1,737 (highest) meters

Depths: Very shallow, shallow, moderately deep

Soils: Sandy loams, loams, fine sandy loams

Fragments: Medium to coarse gravels, surface channers, few flagstones

Land Resource Unit: 35.1 for all sites

All Fickeisen plains cactus populations observed by Goodwin on Cataract and Espee Ranches were mapped by SWCA Environmental Consultants using the NRCS Web Soil Survey interactive Website. All locations were in soils of the Winona Series, with 49% in Winona stony loam, 0–8 percent slopes; 38% in Winona-Rock outcrop complex, 15–30 percent slopes; 11% in Winona-Boysag gravelly loams, 0–8 percent slopes; and 2% in Winona-Rock outcrop complex, 30–70 percent slopes (see Appendix C in the *Espee Ranch Regional Conservation and Land Use Plan* for descriptions and maps of these soil types).

In his search for the occurrence of this cactus, Goodwin targeted relatively accessible sites that displayed these habitat characteristics. He generally found the cactus at such sites, but he made no intensive effort to locate all the plants at each occupied site. The number of individual plants at each location was noted based on plants observed during a 10– to 15–minute search. The purpose of noting the number of plants at a location was to obtain an estimate of the age classes present and to assist in the possible selection of future monitoring locations. The limited level of effort at each occupied site, combined with the plant's cryptic nature, make it virtually certain that individual plants went undetected and that the overall numbers of individual plants on Cataract and Espee Ranches is much greater than records currently indicate. Goodwin generally surveyed new areas each year rather than revisiting previously surveyed areas, and he inspected only a small fraction of suitable habitat on Cataract Ranch and a negligible fraction of suitable habitat on Espee Ranch (Goodwin 2011; Pers. comm., Greg Goodwin, botanist, U.S. Forest Service (retired), to William Cordasco, Babbitt Ranches and SWCA Environmental Consultants staff, April 9, 2013). A map of Espee Ranch showing the four soil types known to support Fickeisen plains cactus are depicted in Figure 3.

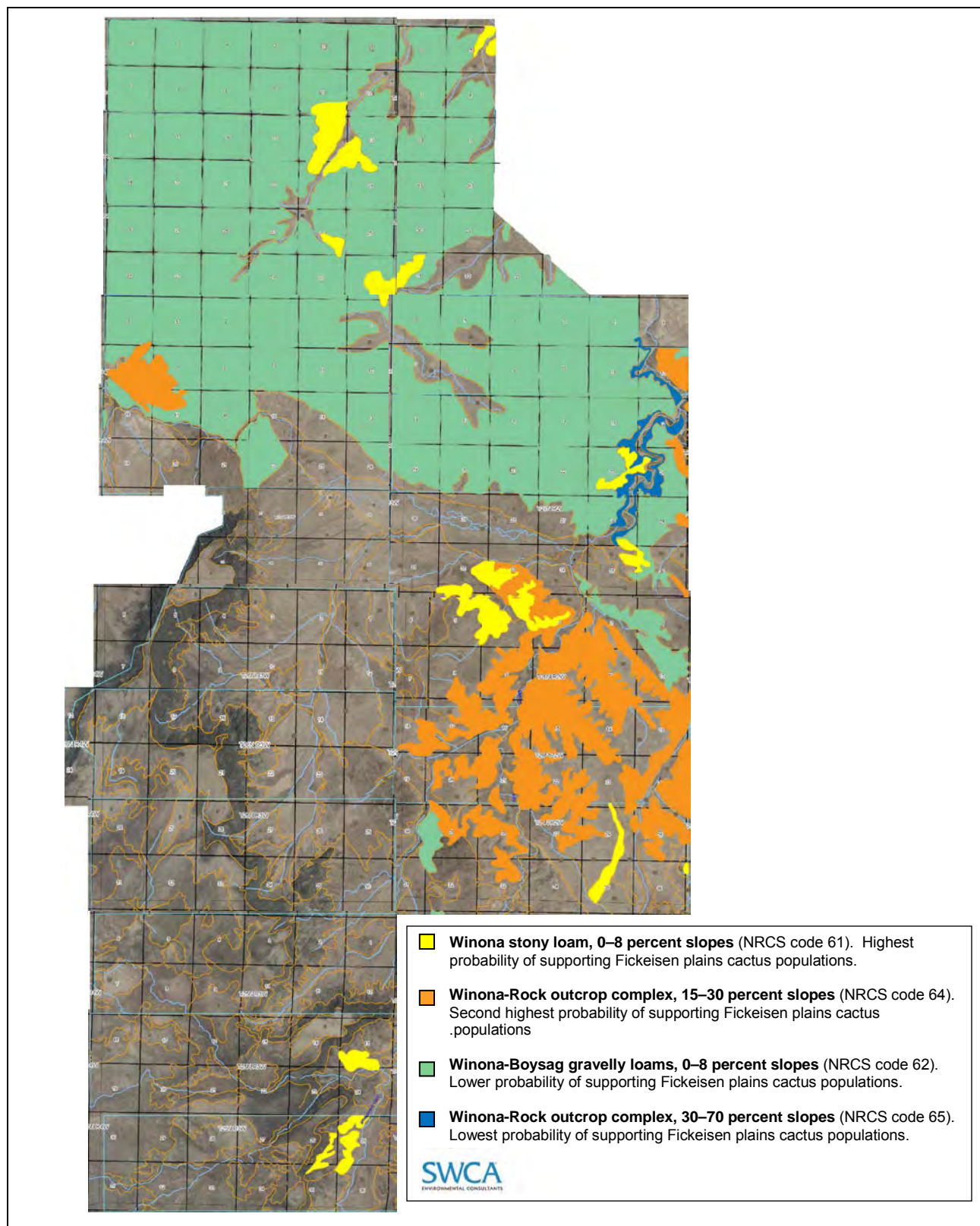


Figure 3. Soil types on Espee Ranch with the probability of supporting populations of Fickeisen plains cactus. Uncolored areas are unlikely to support cactus.

Very little is known about the occurrence of the Fickeisen plains cactus on CO Bar Ranch; however, two localities have been identified (Figure 4). There are isolated records for the Mays Wash area dating from 1981 (location estimated to be N35 42.315 and W111 23.115). An additional record dating from 1984 was recently confirmed by Greg Goodwin at N35 45.259 and W111 28.573 (Written comm., Greg Goodwin, botanist, U.S. Forest Service [retired], to Dorothy House, SWCA Environmental Consultants, April 16, 2013). It is believed that substantial suitable habitat for the species exists on CO Bar Ranch (Pers. comm., Greg Goodwin, botanist, U.S. Forest Service [retired], to William Cordasco, Babbitt Ranches and SWCA Environmental Consultants staff, April 9, 2013).

3.0 REASONS FOR PROPOSED LISTING AND CURRENT THREATS

The ESA lists five factors that must be considered when determining if a species should be designated as threatened or endangered. These factors are: “(A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; and (E) Other natural or manmade factors affecting its continued existence” (16 USC 1533(a)). A species may be determined to be an endangered or threatened species due to one or more of the five factors.

After a thorough analysis, the Service determined the following:

We find that the species is in danger of extinction due to the current and ongoing modification and destruction of its habitat and range (Factor A) from ongoing and future livestock grazing; nonnative, invasive species; and long-term drought. The most significant factors threatening the Fickeisen plains cactus across its range are long-term drought and warmer winters occurring in the past several decades and projected to continue with the effects of climate change. We find that livestock grazing and nonnative species, in combination with drought and climate change, exacerbate the threats to this species (Factor A). We also find predation (Factor C) and other natural or manmade factors are threats to the Fickeisen plains cactus (Factor E). We do not find any threats to the species from unauthorized collection (Factor B). We find no inadequate existing regulatory mechanisms (Factor D). (USFWS 2012:60545)

3.1 Factor A: The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

In their Proposed Rule, the Service assessed seven factors that may affect the habitat and range of the Fickeisen plains cactus: 1) livestock grazing, 2) non-native invasive species, 3) uranium mining, 4) road construction and maintenance, 5) off-road vehicle use and recreation, 6) commercial development and 7) drought and climate change. The Service concluded that, of these seven factors, only livestock grazing; nonnative, invasive plant species; and drought and climate change are threats to the Fickeisen plains cactus. Predation by small mammals

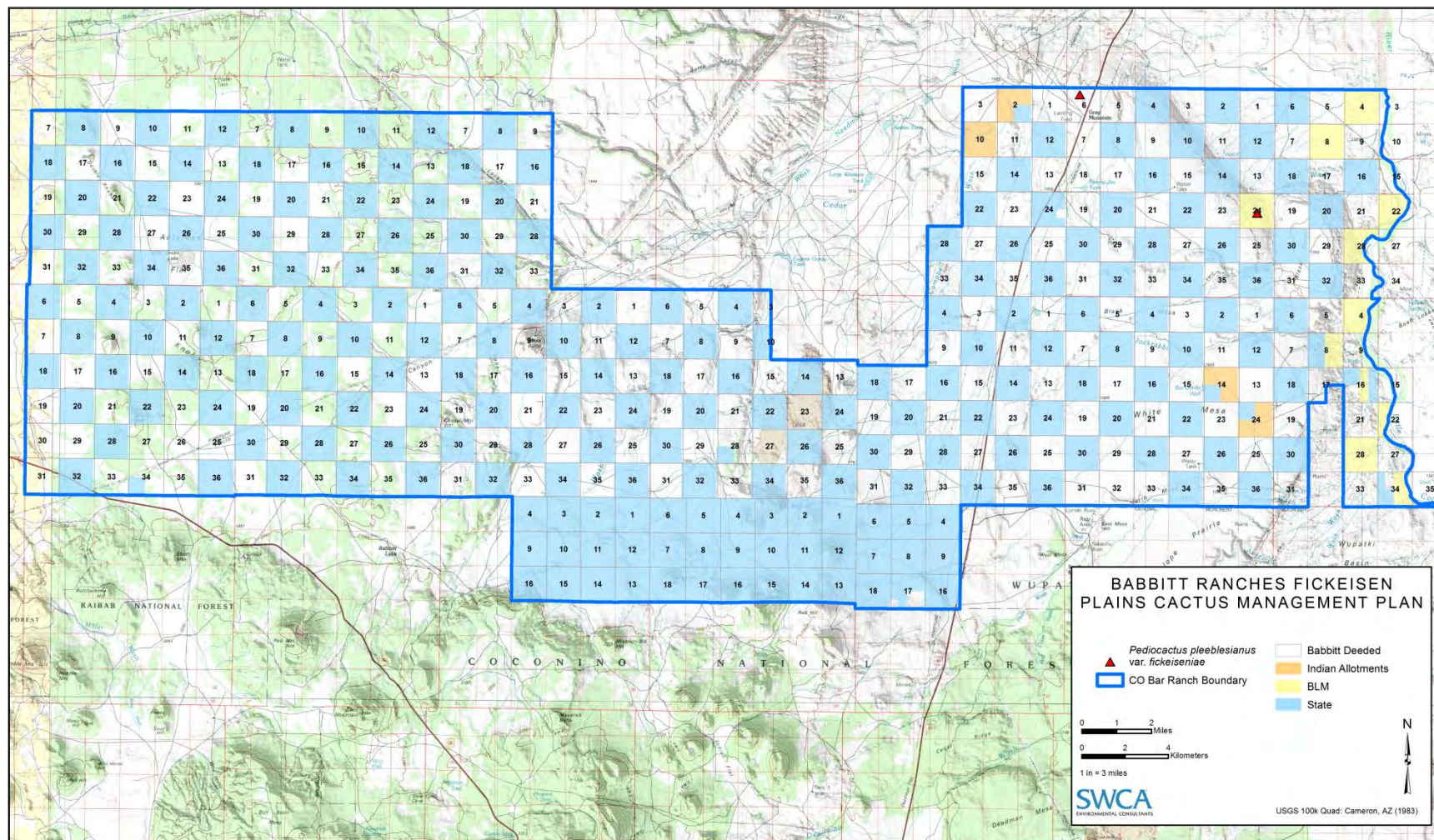


Figure 4. Approximate locations of known Fickeisen plains cactus populations on CO Bar Ranch.

Livestock Grazing. According to the Service, livestock grazing may result in direct loss or damage to the Fickeisen plains cactus and the habitat that supports its persistence as a result of trampling, compacting soil, increasing erosion, losing the soil seed bank, introducing invasive species, and disturbing native pollinators. For the Fickeisen plains cactus, the risk of trampling is greatest when plants emerge above ground at the same time that livestock occupy the area. Given their small size and lack of hard spines, plants are vulnerable to being stepped on and may be killed or damaged as a result. During the wet winter months when rainfall is sufficient, water may collect in pockets of bedrock on the canyon rims, attracting livestock to these areas. Although most plants retract in winter, those plants whose crown sits above the surface are still vulnerable to trampling and risk damage to their meristem. Plants can also be dislodged by livestock as they wander through an occupied area (USFWS 2012).

Nonnative, Invasive Plant Species. According to the Service, it is very likely that non-native, invasive species are a threat to the Fickeisen plains cactus; however, there are currently few data to support this assumption. Nonnative, invasive species such as cheatgrass (*Bromus tectorum*), red brome (*B. rubens*), and redstem filaree (*Erodium cicutarium*) grow rapidly and are prolific seed producers in wet years. Although site-specific information is unavailable on where nonnative, invasive species occur, they are known to occur in varying densities within or near the Fickeisen plains cactus. Invasion of these species may contribute to the low recruitment of the cactus by inhibiting seedling germination due to competition and increasing the plant's risk of exposure to high intensity fires. Densities of the nonnative, invasive species may increase due to climate change. Based on available information, it is anticipated that densities of nonnative, invasive species will increase in the future. Therefore, the Service considers nonnative, invasive species to be a threat to the Fickeisen plains cactus (USFWS 2012).

Drought and Climate Change. According to the Service, the climate within the Fickeisen plains cactus's range is predicted to become warmer with reduced precipitation in the future. Strong evidence suggests that the cactus is being impacted by drought coupled with increased annual temperatures. Poor reproduction in the Fickeisen plains cactus is likely to worsen in the future if climatic patterns shift towards becoming more arid with increased winter nighttime temperatures. However, it is not clear if drought or climate change, of themselves, present population-level threats of extinction. It appears that drought and climate change in combination with rodent predation, as a combined effect, is the more likely scenario for population-level impacts to the plant. Therefore, the Service concluded that climate change and drought are threats to Fickeisen plains cactus populations (USFWS 2012).

3.2 Factor C: Disease or Predation

Predation by Small Mammal Predators. According to the Service, because of their small size and spongy spines, the Fickeisen plains cactus may be less protected from predation by rodents and rabbits than other spiny cactus species. Several sources suggest that cactus herbivory by these small mammals is greater during dry conditions, as the cactus and its fruit can provide a source of food when other vegetation is scarce, as well as much needed moisture. Although there is no clear evidence of the scope of the impact that small mammal predation has had on the Fickeisen plains cactus and its seeds, taken in conjunction with other habitat disturbances

occurring across its range, low recruitment, and small population size, small mammal predation is likely to rise to the level where it becomes a threat to the species (USFWS 2012).

3.3 Factor E: Other Natural or Manmade Factors Affecting Its Continued Existence

Small Population Size. The Service found that small population size, when combined with the threats from livestock grazing, rodent and rabbit predation, and nonnative, invasive species, likely exacerbates the effects of these threats on the Fickeisen plains cactus.

4.0 STATUS OF THE FICKEISEN PLAINS CACTUS ON THE BABBITT RANCHES

The Fickeisen plains cactus populations recorded on Cataract and Espee Ranches by Goodwin (2011) appeared to be in good health and reproducing. About 30 percent of the plants observed were classified as immature, which would suggest abundant reproduction. It was not uncommon for Goodwin to see plants of multiple age classes surrounding mature plants. Livestock graze on both ranches, and hunters use off-road vehicles on the ranches, but Goodwin (2011) observed no impacts to this species related to these uses. While an occasional plant may be trampled (this cannot be ruled out), livestock use of this species' habitat is likely to be low. Forage for livestock is relatively sparse on the gravelly benches, and stock tanks where livestock congregate are located in depressed areas where conditions are unsuitable for the Fickeisen plains cactus. At present, the threats to the future of cactus on Cataract and Espee Ranches appear to be related to drought and climate change (USFWS 2012). This includes the possibility of increased predation by small mammals.

The Service in its Proposed Rule agreed that livestock grazing does not constitute a threat to the Fickeisen plains cactus on Cataract Ranch, attributing this to the Babbitt's management philosophy. The Service stated that:

While the cattle operations are vital to the Cataract Ranch, livestock grazing is managed in a manner that is consistent with the philosophies, values, and conservation ethic of the Babbitt Ranches. For example, cattle operations are one component of the Cataract Ranch, but the Ranch and the other Babbitt Ranches are managed in a holistic manner that incorporates ecology (wildlife habitat, vegetation diversity, watershed health, historical preservation, cultural values, and recreation), the local and regional economies, and the local and regional human community (Babbitt Ranches 2012, entire). Therefore, herd sizes are not adjusted in response to seasonal availability of water and forage due to drought but are managed together with rangeland health, watershed, and wildlife habitat. More specific to the Fickeisen plains cactus, Goodwin (2011, p. 8) noted no habitat impacts from grazing in this population while conducting searches for the plant from 2006–2011. Additionally, a land assessment by TNC determined that much of Cataract Ranch remains in an undisturbed, natural state (TNC 2000, p. 1), and the general ecological conditions of the land are excellent (TNC 2011, p. 9).

While the Fickeisen plains cactus remains vulnerable to being stepped on by cattle or horses, we anticipate that livestock grazing would not rise to a population-level threat based on habitat conditions. We, therefore, do not anticipate livestock grazing on the Cataract Ranch to be a threat to the Fickeisen plains cactus and its habitat. (USFWS 2012:60537)

While the Service refers only to Cataract Ranch in this finding, its justification for that finding rests largely on the Babbitt's land management philosophy and practices, which are applied by the Babbitts to all three ranches.

5.0 REGIONAL CONSERVATION PLANNING FOR THE BABBITT RANCHES

Conservation planning for the Fickeisen plains cactus is taking place within the broader context of conservation planning for the larger ecosystem of which this species is a part. Efforts in this direction include a biological assessment for the entire Coconino Plateau (Thybonny and Thomas 1998) and a conservation and land use plan centered on Espee Ranch, but relevant to a much broader regional landscape and ecosystem that spreads across the entire Coconino Plateau and includes the majority of all three Babbitt ranches. The ecological focus of the *Espee Ranch Conservation and Land Use Plan* is a vanishing resource: the native grassland/shrub-steppe biome of the high-altitude, semi-arid Southwest. The Fickeisen plains cactus is one of six special status species addressed in that plan. The other five target species are the golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Gunnison's prairie dog, black-footed ferret, and American pronghorn (*Antilocapra americana americana*). All six species occur or, in the case of the ferret, have the future potential to occur on all three Babbitt ranches. Conservation actions identified in the conservation plan have the potential to benefit the target species and their habitat on all three ranches. Babbitt's Landsward Foundation is now in the process of seeking grant funding to initiate the first phase of this plan (a regional golden eagle long-term monitoring program).

6.0 CONSERVATION EASEMENTS ON THE BABBITT RANCHES

The two largest conservation easements on the Babbitt properties were established in 2000/2001 when Babbitt Ranches entered into conservation agreements with The Nature Conservancy (TNC) and Coconino County for 34,480-acre and 6,400-acre conservation easements, respectively. Both of these easements are on Cataract Ranch (see Figure 2). Babbitt Ranches also entered into a conservation agreement with the U.S. Forest Service for a 640-acre conservation easement on CO Bar Ranch.

All but 3 of the 39 populations of Fickeisen plains cactus recorded on the three Babbitt Ranches occur on Cataract Ranch. Approximately 29 percent of those are protected within the conservation easement held by TNC (USFWS 2012). According to the TNC Deed of Conservation Easement, the primary purposes of that easement are to: 1) assure that the property will be preserved forever in its predominantly open, scenic, undeveloped and natural condition;

2) prevent any use of the property that will significantly impair or interfere with the conservation values of the property; 3) conserve habitat for wildlife on the property; 4) protect rare and unique native plants and animals currently known on the property; 5) conserve vegetative communities on the property; and 6) promote the conservation purposes stated in ARS § 33–271(2)(b) on the property. The easement permits the continuation of historical uses of the property (primarily livestock grazing) in a manner that is consistent with the conservation values of the property. Prohibited uses include such activities as subdividing the property and permitting the exploration for, or extraction of, minerals.

7.0 CONSERVATION MEASURES SPECIFIC TO THE FICKEISEN PLAINS CACTUS

7.1 Survey and Monitoring Program

Babbitt Ranches is committed to continuing surveys for the Fickeisen plains cactus on its ranches and to working with the Service and others to develop survey and monitoring protocols that can be employed range-wide. Babbitt Ranches intends to pursue funding (2014 Section 6 funding cycle) to host a protocol workshop and to support more surveys and a long-term monitoring program on the three Babbitt ranches. Likely participants in a workshop would include staff from the Service, BLM, U.S. Forest Service, Navajo Nation, the Arboretum at Flagstaff, and other experts. For example, Dr. Barbara Philips, botanist, U.S. Forest Service (retired), an expert on *Pediocactus* biology, surveys, and monitoring, has expressed interest in participating in such a workshop, as well as in a survey and monitoring program for the Babbitt ranches.

The initial step in implementing surveys will be to identify potential habitat for the species on the three ranches. Goodwin (2011) identified occupied habitat on Cataract Ranch to consist of relatively flat benches on moderate slopes and ridge tops that contain a surface layer of limestone gravel that shows little sign of soil movement (Figure 5). Gravelly limestone soil is widespread on the ranches, but only the terraces and ridge tops appear to support the cactus. Goodwin (2011) had good results using Google Earth to identify probable topography, and his methods will be used to identify locations for future field surveys. Greg Goodwin is interested in continuing to participate in future surveys and monitoring on the Babbitt properties, as are staff in the Flagstaff TNC office.



Figure 5. Typical Fickeisen plains cactus habitat, a limestone gravel relatively flat and stable terrace. Photo by Greg Goodwin.

7.2 Measures to Address Livestock Grazing

Although populations of Fickeisen plains cactus have only recently been identified on the Babbitt ranches, conservation measures to benefit the species have been in place for as long as

the Babbitt family has been engaged in the ranching business. The primary conservation measure that has been practiced on Babbitt land in the past, that is currently being practiced, and that will be practiced in the future, is utilization of the best available grazing management practices to sustain rangeland health and Fickeisen plains cactus habitat over the long term. Babbitt Ranches uses a rest rotation grazing system, moving livestock among pastures based upon forage utilization. By this method, the timing, intensity, and frequency of grazing is controlled to allow forage and rangeland habitats to recover between grazing periods. Depending upon range conditions and the terms of grazing leases, maximum utilization of the forage production can range from roughly 35 to 50%. Babbitt Ranches generally keeps their stocking rates below standard Animal Unit Months (AUMs) and grazing lease maximums.

Determining how many head of cattle to keep on a pasture and for how long varies greatly depending upon seasonal moisture and forage conditions. Babbitt Ranches does not follow written prescriptions; rather, managing livestock to sustain productive forage and an intact ecosystem has become a gestalt based on 127 years and four generations of experience raising cattle and horses on the same range. That Babbitt Ranches has been successful in this endeavor would be difficult to dispute. The proof is in the condition of the range. As noted in the preceding section, TNC has determined that the general ecological conditions of the land on Cataract Ranch are excellent. Goodwin (2011:10) reported that “current livestock management appears to be maintaining the area in good ecological condition. The ranches are dominated by a diverse semi-arid grassland, some of which is under a conservation easement, that supports healthy and widely dispersed populations of rare plants.” The NRCS concurs with these positive assessments. Based on their still incomplete inventory of the rangeland that stretches across both Espee and Cataract Ranches, the NRCS has found the dominate native grassland/shrub-steppe ecosystem on both ranches to be in a stable and healthy condition.

The methods used by Babbitt Ranches over the decades to ensure long-term livestock productivity and preserve native grassland and shrub-steppe habitats on the lands they manage have incidentally allowed the Fickeisen plains cactus to endure and—judging by the surveys completed to date—flourish. Goodwin (2011) reported no evidence of livestock trampling amongst the over 300 individuals he observed from 2006 to 2011. This may be attributable to the fact that forage for livestock is relatively sparse and water is unavailable on the gravelly benches where the plant grows (i.e., there are few reasons for a cow to go there and no reason for cattle to congregate in such areas). In addition, Babbitt stocking levels are light. Good grazing practices maintain ground cover and reduce soil erosion that can adversely affect populations of Fickeisen plains cactus. Light stocking rates reduce the likelihood that soils at occupied sites will be compacted and individual plants trampled. Good grazing practices also allow for a diverse assemblage of native plants species to persist, which in turn supports the native pollinators needed to pollinate *Pediocactus* species (Spence 1992).

The final NRCS inventory report is due early in 2014 (Written comm., Iric Burden, NRCS, to Dorothy House, SWCA Environmental Consultants, March 19, 2013). Once the inventory is complete, NRCS will work with Babbitt Ranches—drawing on information learned from the inventory and the long experience of the Babbitt cattlemen—to develop a formal grazing management and conservation plan tailored to the Babbitt properties and the company’s values and goals. Following standard NRCS practice, that plan will address the conservation needs of

special status species, including the Fickeisen plains cactus. It is expected that current conservation planning (see Section 5.0, above) and this document will inform the NRCS effort. Until such time as the NRCS advises adjustments, or findings from Fickeisen plains cactus monitoring suggest otherwise, Babbitt Ranches will continue to manage grazing as they have in the past, only with a heightened awareness of the need to protect populations of Fickeisen plains cactus and a commitment to avoid them when possible (see Section 7.21, below).

While specific survey and monitoring protocols have yet to be identified, information collected at plant locations will undoubtedly include observations of habitat and plant conditions, including evidence of livestock use, and any trampling of plants, soil compaction, or soil erosion associated with such use. In the spirit of adaptive management, if such evidence materializes, Babbitt Ranches will investigate specific methods to address specific threats (e.g., consider fencing a vulnerable population).

7.2.1 Avoidance

Babbitt Ranches will avoid known Fickeisen plains cactus localities during any ground-disturbing activities (e.g., digging fencepost holes), placement of salt licks that attract cattle, and cattle drives.

7.3 Measures to Address Nonnative, Invasive Plant Species

Like livestock grazing, nonnative, invasive species have not been identified as a threat to Fickeisen plains cactus on the Babbitt ranches. However, conditions may change, particularly given the likelihood of climate change. As pointed out above, specific survey and monitoring protocols have yet to be identified. This said, it can be assumed that threats posed by nonnative, invasive plants to Fickeisen plains cactus populations will be noted during surveys and monitoring visits. In the spirit of adaptive management, if such threats are noted, Babbitt Ranches will investigate specific methods to address those threats. For example, while widespread infestations by invasive species such as cheatgrass are extremely difficult (if not impossible) to reverse with current technology, local infestations can be controlled with herbicides or mechanical removal. The NRCS grazing management planning effort will address the issue of nonnative, invasive plants on the Babbitt ranches.

7.4 Measures to Address Drought and Climate Change

Babbitt Ranches has not in the past, nor will it in the future, stock the range beyond its carrying capacity. During drought conditions, the Babbitts minimize the risk of overgrazing by reducing herd size or even removing cattle to leased pasturage offsite (as far away as Montana in one case), and keeping them offsite until stock tanks refill and the forage recovers. In the face of uncertainty about the timing, frequency, and severity of future droughts and other possible climate changes, the Babbitts will manage their ranches adaptively, taking into account the ecological integrity of the land as well as the financial bottom line.

Transplanting (assisted migration) or seed planting rare plants to suitable but unoccupied habitat has been proposed as an option to address climate change and drought impacts (Vitt et al. 2010).

Babbitt Ranches, in coordination with the Service, will consider opportunities to participate in studies or programs related to the collection, translocation, propagation, and/or banking of Fickeisen plains cactus if such measures are considered feasible and desirable for the survival and recovery of the species. For some rare plants, introduction by transplanting or seed planting to newly suitable but unoccupied habitat has been proposed as an option to address climate change and extended drought impacts (Vitt et al. 2010). This option may be considered if populations decline, the number or size of the remaining populations becomes extremely low, and the projection is for further decline. Monitoring species in natural populations is required to determine if and when assisted migration should be considered. Ongoing monitoring on the Babbitt ranches (see Section 7.1, above) will allow assessment of whether severe population declines are occurring on the ranches. The information gained from the Babbitt monitoring program, when pooled with monitoring data from other localities throughout the species' range, will provide a regional perspective on the species' population trajectory in relation to long-term climatic conditions. If assisted migration studies or programs for the Fickeisen plains cactus are deemed advisable by experts in the field, Cataract Ranch in particular may be a source of transplanted cacti. Any translocation effort would be carried out only after extensive study of its potential impacts on the ecology of the recipient area. It may be an area farther north or higher in elevation, where climatic and other environmental conditions would be comparable to those in which the species evolved. Transplant projects would be designed so that long-term monitoring of plant establishment and survival could be done.

7.5 Measures to Address Predation by Small Mammal Predators

Babbitt Ranches understands that the threat of predation by such small mammals as rodents and rabbits may increase in the future if predicted climate change takes place, and warmer, drier conditions become the norm. In recognition of this possibility, it is expected that predation by small mammals will be assessed during Fickeisen plains cactus monitoring. If small mammal predation becomes a problem that threatens the future existence of the species on the Babbitt ranches, measures designed to address that problem, including the advisability of population control, will be investigated as part of adaptive management.

7.6 Adaptive Management

As used in this plan, the term "adaptive management" simply refers to flexible management in the face of uncertainty (especially in regard to climate change). Conservation actions for the Fickeisen plains cactus will be developed as needed in response to new information, including data collected during monitoring activities on the three Babbitt Ranches. The classical definition of "adaptive management" includes the concept of management through experimentation (Holling 1978). Babbitt Ranches will remain open to the possibility of management experiments in the future but does not identify any at this time.

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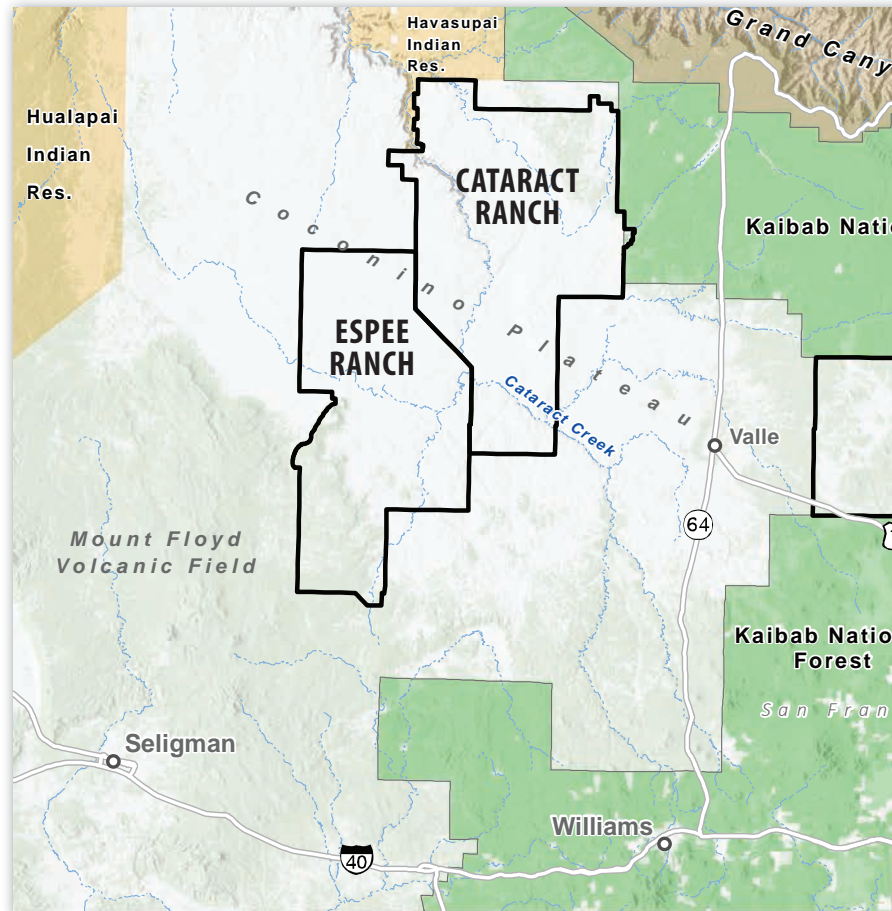


CONSERVATION AND RESEARCH ON THE BABBITT RANCHES



INTRODUCTION

Babbitt Ranches raises cattle and American Quarter Horses on CO Bar Ranch, Cataract Ranch, and Espee Ranch in northern Arizona; the ranches total more than 750,000 acres and include private, state, and federal lands. Babbitt Ranches also owns and operates the Nordic Village, located 60 miles south of the Grand Canyon, fostering and perpetuating the recreation ethic of Babbitt Ranches. In operation since 1886, Babbitt Ranches is at its core a business with fiduciary responsibilities to its family shareholders, but the company acknowledges multiple bottom lines and incorporates not only economic but also community and ecological values into all its decision-making. Inseparable from its business enterprises is a commitment to work cooperatively with others to respect and promote the conservation of regional ecological continuity, wildlife habitat, diverse vegetation, watershed integrity, historical and other cultural resources, and public access to its ranches. Babbitt Ranches also promotes and provides direct support for the generation and utilization of science-based knowledge and technologies to support sound stewardship of the region's land and natural resources.



THE BABBITT RANCHES MISSION STATEMENT

Through our efforts of learning and understanding, Babbitt Ranches, a family business and pioneering land company, raises livestock, manages natural resources, promotes science and participates in the broader community in order to join, share and do the very best we know how.

THE BABBITT RANCHES CONSERVATION PHILOSOPHY

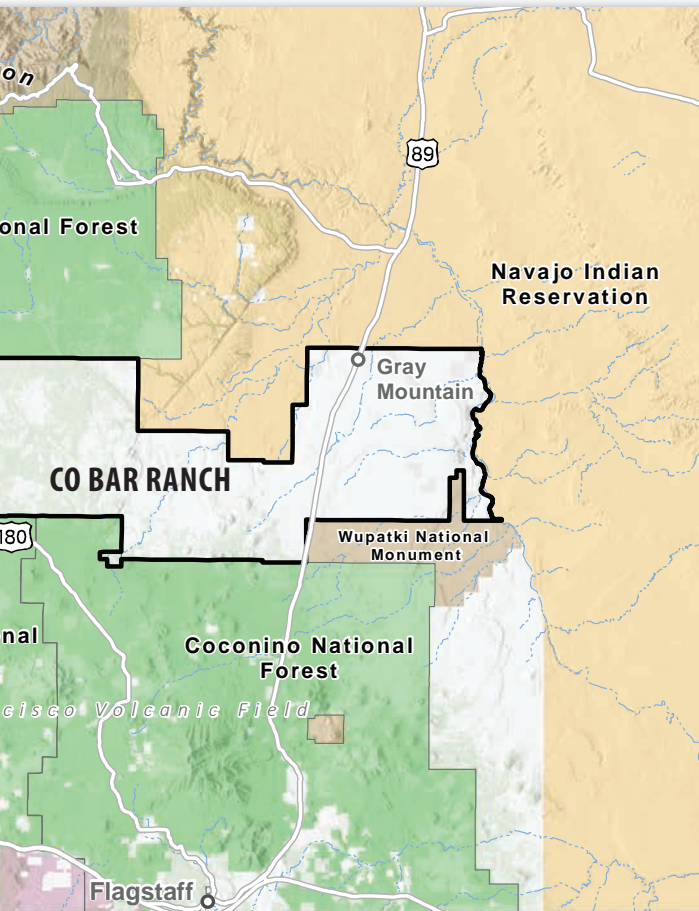
Babbitt Ranches embraces a conservation-oriented land use ethic that we define as:

... a process that takes place within each individual and must begin with awareness of the surrounding environment and an understanding and appreciation of its intrinsic values. With awareness comes a sense of responsibility and obligation to care for the land. A sense of responsibility and obligation translates into the need for individuals to be accountable for their actions as those actions affect the land.

When each individual understands and accepts his or her relationship to the land and its ecological processes, its plant communities, its wildlife, and its productivity to meet human needs—and individuals are willing to work together to embrace those values—then the result is good land stewardship.

The process is circular. The more people interact with the land as good stewards, the more they are aware of how they fit into the grand scheme of things and the better stewards they become.

Babbitt Ranches tries never to lose sight of the fact that it is part of a much larger community, and that much can be accomplished by partnering with neighbors, non-profit organizations, educational institutions, businesses, and local, state, and federal agencies.



COWBOY ESSENCE

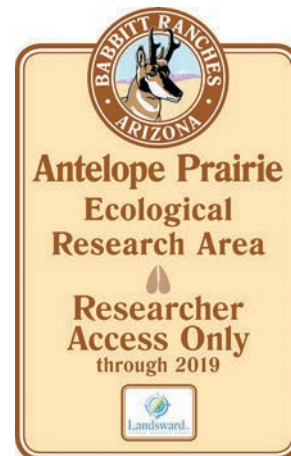
A core part of the Constitution of Babbitt Ranches is the Cowboy Essence, which is

... the self-satisfaction in knowing you did your best to become the best you are capable of becoming ... Cowboy Essence creates that peace of mind that comes from knowing our heritage and that we are at our best .

CONSERVATION AND RESEARCH ON BABBITT LANDS

The commitment of Babbitt Ranches to this land use ethic is evidenced by numerous conservation and research efforts to expand conservation to a landscape level, including

- establishment of conservation easements
- creation of the non-profit, conservation-oriented Landward Foundation
- conservation, land use, and management planning
- native grassland restoration through removal of invasive juniper woodland
- climate-related research and monitoring studies
- wildlife studies, implementing actions designed to benefit native populations
- continued Memorandum of Understanding with the National Park Service (Wupatki National Monument)
- recovery of endangered species, most notably by inviting the reintroduction of black-footed ferret and preserving prairie dog colonies
- establishment of the Antelope Prairie Ecological Research Area
- creation of the Little Colorado River Valley Conservation Area
- golden eagle long-term monitoring and research program
- voluntary non-lead ammunition program
- creation of opportunities to work with researchers and students on a wide spectrum of topics, using ranch resources to advance knowledge, increase understanding, and improve management of the region's natural environment



LANDSWARD FOUNDATION – SCIENCE, RESEARCH, ETHICS

The Landsward Foundation is an independent, non-profit organization originally created by Babbitt Ranches as the Ecological Monitoring and Assessment Foundation and Program (EMA). In 2002, the EMA was gifted to Northern Arizona University, along with research rights within Babbitt Ranches' boundaries and a 24-acre parcel for the Wild Bill Ecological Center. Now independent and managed by Babbitt Ranches, the Landsward Foundation promotes scientific research to advance the understanding of the ecological, social, and economic factors affecting the Coconino Plateau and the Little Colorado River Valley. Its mission is to provide private landowners and managers with the latest science-based information to support decisions and conservation practices.

CONSERVATION, LAND USE, AND RESOURCE MANAGEMENT PLANS

Babbitt Ranches has completed conservation, land use, and management planning for each of its three ranches. These plans are intended to aid Babbitt Ranches in making informed land use and management decisions within a conservation context; provide a framework for developing conservation efforts centered on the ranches; and facilitate the acquisition of funding and other types of assistance to support those efforts. The overarching conservation

objective of all three plans is to benefit and sustain the long-term ecological integrity of the ranches' natural communities, particularly native grassland and shrub-steppe habitats. The plans focus on six grassland species in special need of conservation: golden eagle, ferruginous hawk, Gunnison's prairie dog, black-footed ferret, American pronghorn, and Fickeisen plains cactus. Each plan identifies strategies for promoting the conservation of these species on Babbitt ranchlands.



In recognition of its efforts, Babbitt Ranches received the Arizona Environmental Stewardship Award from the Arizona Cattle Growers' Association in 1995; the National Environmental Stewardship Award from the National Cattlemen's Association in 1996; and the National Private Lands Fish and Wildlife Stewardship Award from the International Association of Fish and Wildlife Agencies in 2003.



PRONGHORN MANAGEMENT PLAN

In association with Arizona Game and Fish Department (AGFD) pronghorn expert James deVos, Babbitt Ranches developed *Babbitt Ranches: Long-Term Pronghorn Succession Plan*. The plan identifies important components of pronghorn habitat; describes existing conditions relative to pronghorn populations and habitat; identifies needed improvements that would benefit management of the species and its habitat; and details specific work tasks that will be employed as financial resources are developed to optimize the long-term persistence of this species at a level that is socially and biologically appropriate.

FICKEISEN PLAINS CACTUS MANAGEMENT PLAN

The Fickeisen plains cactus, a federally listed endangered species, occurs on all three of the Babbitt ranches. The *Babbitt Ranches Fickeisen Plains Cactus Management Plan* is intended to assist Babbitt Ranches in the protection and effective management of the species. The plan summarizes the threats faced by the species throughout its range, addresses what is currently known about the status of the cactus on the Babbitt ranches, and describes targeted conservation actions intended to ensure the long-term survival of species on the ranches.

GRASSLAND RESTORATION

For decades, Babbitt Ranches has worked with the Natural Resources Conservation Service (NRCS) and other cooperating organizations to restore native grasslands by removing invasive juniper trees from some 30,000 acres on CO Bar Ranch. During the restoration process, trees are reduced to mulch, and the mulch is left in situ to enhance the growth of native grasses, forbs, and shrubs used by pronghorn and other wildlife, as well as by livestock.



ENDANGERED SPECIES CONSERVATION ACTIONS

BLACK-FOOTED FERRET

Babbitt Ranches has entered into a Safe Harbor Agreement with the U.S. Fish and Wildlife Service (USFWS) for the release of the endangered black-footed ferret on Babbitt ranchlands. A release by the AGFD of 26 ferrets on Espee Ranch in October 2014 followed previous releases in 2007, 2008, and 2009. The U.S. Geological Survey (USGS) National Wildlife Health Center oversaw the immunization of both the ferrets and prairie dogs at the release site as part of a Sylvatic Plague Vaccine (SPV) trial. Espee Ranch is one of 31 sites in seven states at which SPV field trials are being conducted through 2016. In addition to protecting prairie dog populations on its lands, Babbitt Ranches welcomes the translocation of prairie dogs from development sites where the animals would otherwise be destroyed.

FICKEISEN PLAINS CACTUS

In addition to supporting surveys for the endangered Fickeisen plains cactus and committing to protecting the species through the *Babbitt Ranches Fickeisen Plains Cactus Management Plan*, Babbitt Ranches hosted a multi-agency workshop in 2013 to help develop range-wide survey and monitoring protocols for the cactus. To fund the workshop, Babbitt Ranches' Landsward Foundation and SWCA Environmental Consultants (SWCA) submitted a proposal for, and were awarded, a Section 6 Grant through the Arizona Department of Agriculture. The grant and subsequent workshop resulted in draft survey and monitoring protocols for the Fickeisen plains cactus, which were submitted for finalization to the USFWS.



VEGETATION COMMUNITY INVENTORY AND MONITORING

NATURAL RESOURCES CONSERVATION SERVICE RANGELAND INVENTORY

Babbitt Ranches is working with the NRCS to inventory rangeland resources on Cataract Ranch (fieldwork completed in 2012) and Espee Ranch (fieldwork in progress). In total, 42 inventory sites were established on Cataract Ranch, and an estimated 25 to 35 sites will be established on Espee Ranch by the time the inventory is complete. The inventories provide baseline data on a number of variables, including soils and plant species composition and abundance. The inventory sites will be monitored to identify and evaluate changes in rangeland ecological characteristics. Information gleaned from the inventory and future monitoring will be used to inform rangeland management decisions and assess the effects of climate change on regional grassland and shrub-steppe environments.

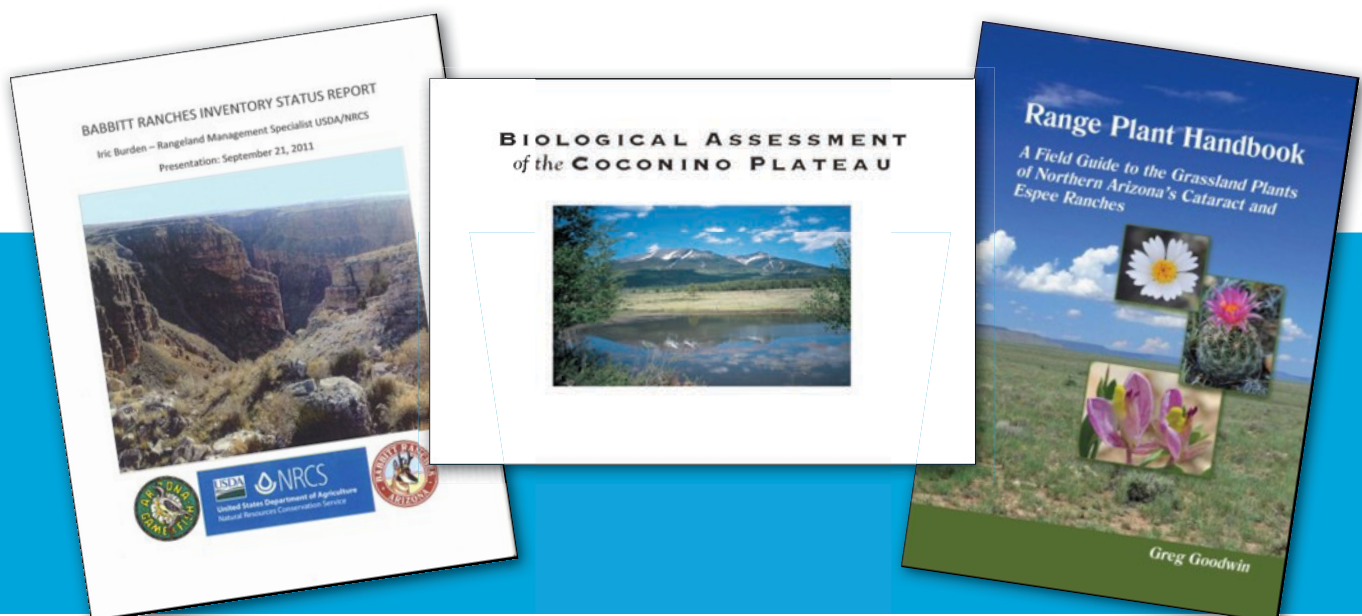
BIOLOGICAL ASSESSMENT OF THE COCONINO PLATEAU, USGS STUDY PLOTS, AND REPEAT PHOTOGRAPHY

In a similar but smaller scale effort, scientists from the USGS's Colorado Plateau Field Station established 12 vegetation study plots on CO Bar and Espee Ranches in 1997–1998. The information will serve as a benchmark for long-term biological assessment of vegetation change at the sites. This work was part of a regional biological assessment underwritten by Babbitt Ranches that culminated in the publication titled *Biological Assessment of the Coconino Plateau*. In addition, beginning in 2005, 100 photo points were randomly selected across the ranches to visually capture qualitative changes at each point over time. The visual information gained through repeat photography at the locations may enhance the ability of land managers, as well as Babbitt Ranches, to perceive, evaluate, and respond to evolving ecological conditions.

VASCULAR PLANT SURVEY

A comprehensive vascular plant survey has been underway on Cataract, Espee, and CO Bar Ranches since 2006. Conducted by retired U.S. Forest Service botanist Greg Goodwin, the survey has resulted in:

- 1) a checklist of plant species on the ranches;
- 2) a published, illustrated field guide to grassland plant



species;¹ and 3) targeted surveys and documentation of the occurrence of Fickeisen plains cactus on the ranches, information used by the USFWS in its recent listing of the cactus as an endangered species.

CLIMATE-RELATED RESEARCH AND DATA COLLECTION

SOUTHWEST EXPERIMENTAL GARDEN ARRAY PROJECT

Babbitt Ranches, through the Landsward Foundation, has partnered with Northern Arizona University to help implement the Southwest Experimental Garden Array (SEGA) project. Two of the 10 SEGA research sites are on CO Bar Ranch. Babbitt Ranches is providing the land and water for the sites. In addition, Babbitt Ranches has removed grazing from a third site in the southeast corner of CO Bar Ranch in Citadel Wash, where a unique genetic strain of cottonwoods provides source material for the SEGA project.

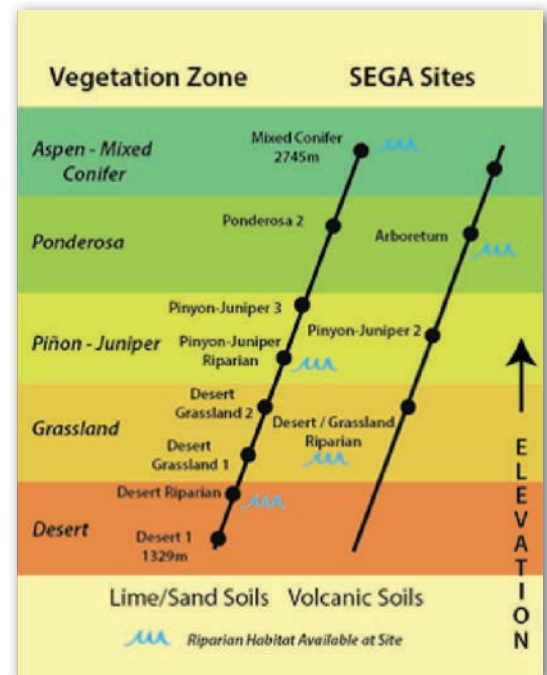
Funded by nearly \$3 million in NSF grants and another \$1 million in matching support, SEGA is a genetics-based climate change research platform that allows scientists to quantify the ecological and evolutionary responses of genotypes within species and communities of species to changing climate conditions. Because temperature and moisture predictably change with elevation, these gardens reflect large-scale climatic differences that mimic the effects of climate change over time. By raising the same plant genotypes in an array of sites along an elevational gradient of temperature and moisture, scientists can examine how different genotypes perform under different climatic conditions. The ability to identify genotypes most likely to survive and reproduce in a rapidly changing climate provides the basis for improving the success of efforts to maintain ecosystems, restore damaged ecosystems, and assist the migration of species in the face of climate change.

U.S. CLIMATE REFERENCE NETWORK STATION

Babbitt Ranches invited the National Oceanic and Atmospheric Administration to install a U.S. Climate Reference Network (USCRN) station at Cataract Ranch. The USCRN, one of the preeminent networks for monitoring climate change in the world, is intended to gather continuous climate-related measurements from a vast network of stations for 50 or more years.

NATURAL RESOURCES CONSERVATION SERVICE SOIL CLIMATE STATIONS

The NRCS has installed four soil climate stations on CO Bar Ranch. The purpose of the stations is to measure soil moisture availability, migration, and retention in the soil type present at each station. The data collected will allow the NRCS to build a soil-specific model that can be used in the future to estimate soil climate at similar sites in other locations.



¹ Goodwin, G. 2012. *Range Plant Handbook: A Field Guide to the Grassland Plants of Northern Arizona's Cataract and Espee Ranches*. In coordination with Babbitt Ranches, LLC, Flagstaff, Arizona.

ANTELOPE PRAIRIE ECOLOGICAL RESEARCH AREA

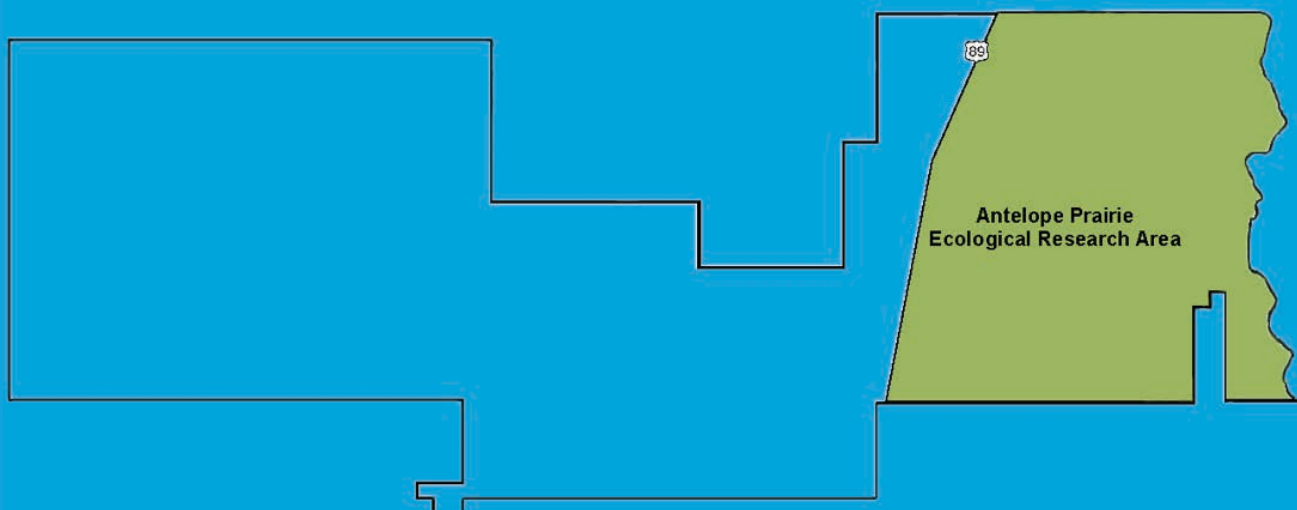
The Antelope Prairie Ecological Research Area, totaling approximately 78,438 acres, encompasses all of CO Bar Ranch east of U.S. Route (U.S.) 89.

Established in early 2014, the Antelope Prairie Ecological Research Area (Research Area) is intended to serve as the geographic focus for a number of studies and conservation actions. To facilitate wildlife investigations, the AGFD has agreed to close and modify the hunting season in the Research Area during the period from 2014 to 2019, depending on research design needs. Babbitt Ranches will also manage public access to that area to accommodate research needs. Species of particular interest within the Research Area include, but are not limited to, pronghorn, golden eagles, prairie dogs, and the endangered Fickeisen plains cactus. Studies and conservation actions relating to pronghorn and golden eagles are in the planning stages, and the AGFD and USFWS are assessing the feasibility of releasing black-footed ferrets in the area. A population of Fickeisen plains cactus in the Research Area may be a candidate for a monitoring program, and the Rimmy Jim stock tank is being considered for native riparian habitat restoration following invasion of the tamarisk leaf beetle. Rimmy Jim tank appears to be an important area for migrating birds and has long been popular with birders, who have recorded more than 120 species at the site. The SEGA Black Point research garden site and the NRCS's Black Point soil climate station are located within the Research Area (see Climate-Related Research and Data Collection, above), and SEGA program researchers are seeking funding to establish additional SEGA sites in the area (specifically in the Little Colorado River valley).

LITTLE COLORADO RIVER VALLEY CONSERVATION AREA

Babbitt Ranches is considering the establishment of a Little Colorado River Valley Conservation Area along the approximately 16-mile-long reach of the Little Colorado River. An opportunity for initiating native riparian habitat restoration on a limited scale through Northern Arizona University's SEGA project and the need to address abandoned uranium mining issues has focused new attention on the Little Colorado River valley. Rather than address such opportunities and challenges on a piecemeal basis, Babbitt Ranches is seeking a broader, landscape-level path toward environmental improvement. Establishing a conservation area may be that path.

Location of the Antelope Prairie Ecological Research Area on CO Bar Ranch.



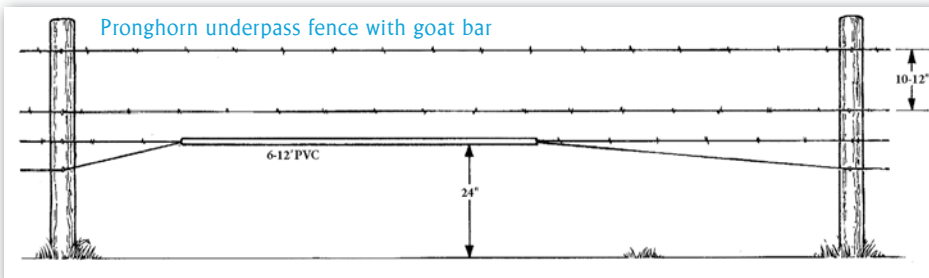
WILDLIFE STUDIES AND CONSERVATION ACTIONS

AMERICAN PRONGHORN STUDIES

Pronghorn telemetry studies were conducted across the ranches by the AGFD from 1992 through 2010. Data were collected on pronghorn distribution, movement, and habitat use. Among other important findings, the studies showed that the pronghorn population in northern Arizona has been segregated into subpopulations by highways, and pronghorn movement has been limited by fence lines. Genetic studies by Northern Arizona University researchers on CO Bar Ranch have confirmed these results. Currently, the AGFD is considering additional pronghorn telemetry studies on Babbitt ranchlands. In the meantime, Babbitt Ranches is analyzing the existing AGFD pronghorn telemetry data to identify more detailed habitat use patterns, particularly as they relate to fawning.

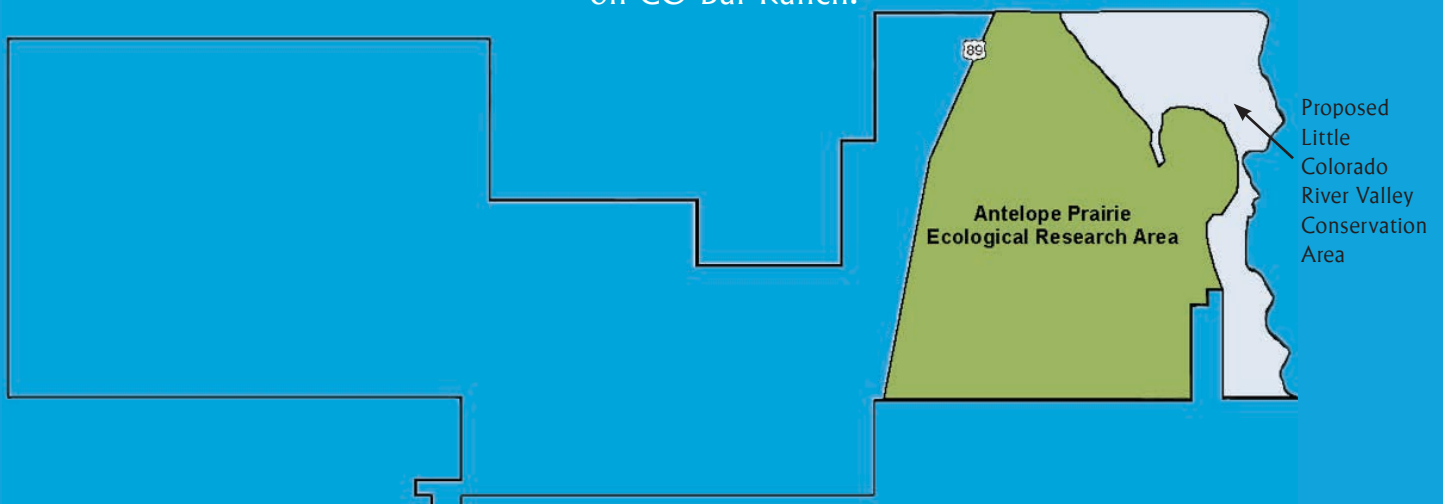
AMERICAN PRONGHORN CONSERVATION ACTIONS

To maintain a pronghorn migration corridor and reduce fence line barriers in the southwest corner of CO Bar Ranch, Babbitt Ranches ceased livestock grazing on more than 700 acres of land; constructed a required right-of-way fence well back from U.S. 180; and, working with the Arizona Department of Transportation and the AGFD, equipped the fence with goat bars. Goat bars are simple, cost-effective devices invented by Babbitt Ranches to raise the bottom wire on a fence high enough to allow pronghorn to pass underneath. Goat bars have been installed on fence wires at strategic locations on all three ranches and have been adopted by other landowners and managers as far away as Alberta, Canada. Babbitt Ranches also reconfigured fences along



U.S. 89 on CO Bar Ranch to facilitate pronghorn crossing there. In addition, Babbitt Ranches has cooperated with staff from the AGFD in evaluating locations for building pronghorn passage structures over U.S. 89, which is being widened from two lanes to four. And as part of a new landscape-level initiative (see the Antelope Prairie Ecological Research

Location of the proposed Little Colorado River Valley Conservation Area on CO Bar Ranch.



Area discussion, below), Babbitt Ranches has proposed, and the AGFD has approved, flexibility in pronghorn hunting regulations on the eastern CO Bar Ranch to support additional pronghorn studies in that area.

AVIAN SPECIES STUDIES

Avian studies (2010–present) have been conducted on Espee and CO Bar Ranches in support of potential wind energy development. The studies have included small- and large-bird use surveys, bat acoustic monitoring, and golden eagle and other raptor studies. As part of the studies, in 2011 and 2013 SWCA conducted aerial surveys in northern Arizona for golden eagle and other raptor nests. The survey area included Long Point on Espee Ranch and the western part of CO Bar Ranch. Golden eagle, ferruginous hawk, and unidentified raptor nests were found on both ranches. Several golden eagles were captured and equipped with transmitters for long-term telemetry study of eagle movement and habitat use. These data will be pooled with data from other studies throughout the West to better understand golden eagle habitat use over vast areas.

NORTHERN ARIZONA UNIVERSITY FACULTY AND STUDENT PROJECTS

In addition to the SEGA program, Babbitt Ranches has opened its ranches to Northern Arizona University faculty and staff to study a multitude of subjects, including juniper encroachment on grasslands, volcanic flow dates, pocket mice distribution, pronghorn genetics, archaeological resources on Babbitt land adjacent to Wupatki National Monument, and the economic viability of wind energy production in northern Arizona. Other scholars have studied the impact of off-highway vehicle use on pronghorn; the effect of increased hunting pressure on wildlife cycles such as breeding periods and the successful rearing of young; and the potential impact of dispersed recreation on wildlife and habitat in general.

SPACE EXPLORATION: DESERT RESEARCH AND TECHNOLOGY STUDIES

In 1968, the USGS Center of Astrogeology blasted craters in the Black Point lava flow on CO Bar Ranch to simulate an impact crater field on the lunar surface in preparation for NASA's manned Apollo Moon missions. Forty years later, in 2008, Black Point lava flow was designated an analogue test site for NASA's Desert RATS (short for Research and Technology Studies). In October 2008, several 1- and 3-day simulations of lunar missions were conducted along the western and southwestern portions of the flow. The site was used again to simulate a 14-day lunar mission in September 2009. In 2010, the analogue site was expanded to the west to include SP Crater and lava flow. Mission simulations in 2010 included using Space Exploration Vehicles and other assets to simulate a 28-day mission to the Moon. In 2011, the Desert RATS field tests on CO Bar Ranch focused on asteroid exploration and testing of a space truck, a robotic rover assistant, and deep space communication systems.

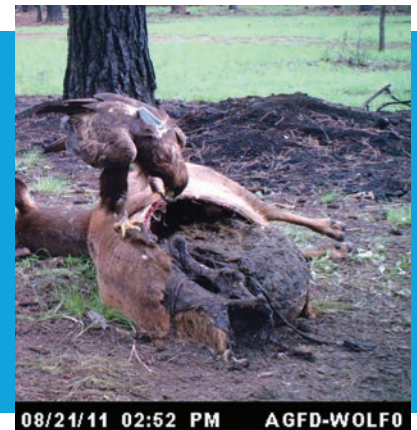




GOLDEN EAGLE RESEARCH AND LONG-TERM MONITORING PROGRAM

As part of Babbitt Ranches conservation, land use, and resource management planning, the golden eagle was singled out for the highest conservation priority at this time. The first phase of conservation plan implementation includes initiation of a long-term monitoring and research program for the golden eagle within the region that encompasses all three ranches. The primary objectives of the research are to identify and quantify the biological and environmental variables that facilitate eagle occupancy and productivity, determine how to potentially manage for those resources, and determine how to potentially enhance and create those resources elsewhere. The ultimate goal for Babbitt Ranches is to create and quantify “ecological lift” for the golden eagle across a large portion of the species’ range in the Southwest. Targeted research, conservation management policy, and quantifiable measures of conservation and land use will combine to quantify the indices and measures of avoidance, minimization, ecological trends of landscape health, and “ecological lift” via enhancement projects.

The Golden Eagle Research and Long-Term Monitoring Program is based on a *Dynamic Golden Eagle Conservation Model* guided by adaptive management. Given some uncertainties, such as a shifting climate, flexible decision-making is key to the program. Adaptive management will address the importance of natural variability in contributing to ecological resilience and productivity on a landscape level, leading to more effective management and scientific decision-making and enhanced benefits to those actions.



BABBITT RANCHES DYNAMIC GOLDEN EAGLE CONSERVATION MODEL

MODEL FRAMEWORK

1. Context
 - a. Climate shift
 - b. Ecosystem resilience
 - c. Landscape; scale
 - d. Conservation values
 - e. Conservation investments
2. Define: Sustainability Sciences
 - a. Living off interest, not principal
 - b. Community and relationships
 - c. Capacity
3. Define: Landscape-Scale Conservation Values
 - a. Biological diversity
 - b. Biological core
 - c. Unfragmented habitats; linkages
 - d. Future wildlife movements
 - e. Land uses
 - f. Other
4. Identify
 - a. High natural resource areas
 - b. Where natural resources are irreplaceable
 - c. Current and future land uses
 - d. Recreation uses and activity areas
 - e. Current and future development areas
5. Develop Dynamic Golden Eagle Conservation Management Plan
6. Goals
 - a. Landscape health
 - b. Capability to transition
 - c. Ecological lift
 - Preserve
 - Promote
 - No net loss
 - Net benefit
7. Quantify Goals
 - a. Conservation actions
 - b. Landscape treatments
 - c. Pre-store projects
8. Multiple Bottom Lines; Decision-Making Process; Values

MANAGEMENT ACTION

9. Develop: Research; Information
10. Develop: Conservation Management Policy and Objectives
11. Develop: Quantifiable Conservation and Land Use: Indices; Measures
 - a. Avoidance
 - b. Minimization of impacts
 - c. Trends
 - d. Landscape health
 - e. Capability to transition
 - f. Ecological lift
 - g. Recreation
 - h. Enhancement projects
12. Develop: Monitoring Plans
13. Develop: Species-Specific Conservation Plans; Easements (on the shelf)
14. Develop: Mitigation/Credit/Habitat Exchange Programs
15. Develop: Compensation Programs
 - a. Capability to transition
 - b. Ecological lift
 - c. Landscape health
16. Develop: Business Diversity
17. Develop: Recreation Management Model
18. Back to 9: Develop Research; Information

The objectives of the Golden Eagle Research and Long-Term Monitoring Program are consistent with Presidential, U.S. Department of the Interior, and USFWS policies that aim to achieve a net benefit of natural resources, including eagles. Currently, the USFWS is encouraging the use of in-lieu fee programs, mitigation and/or conservation banks, and other established mitigation programs and projects to benefit eagles, and, working with the USFWS, Babbitt Ranches intends to establish such a program.

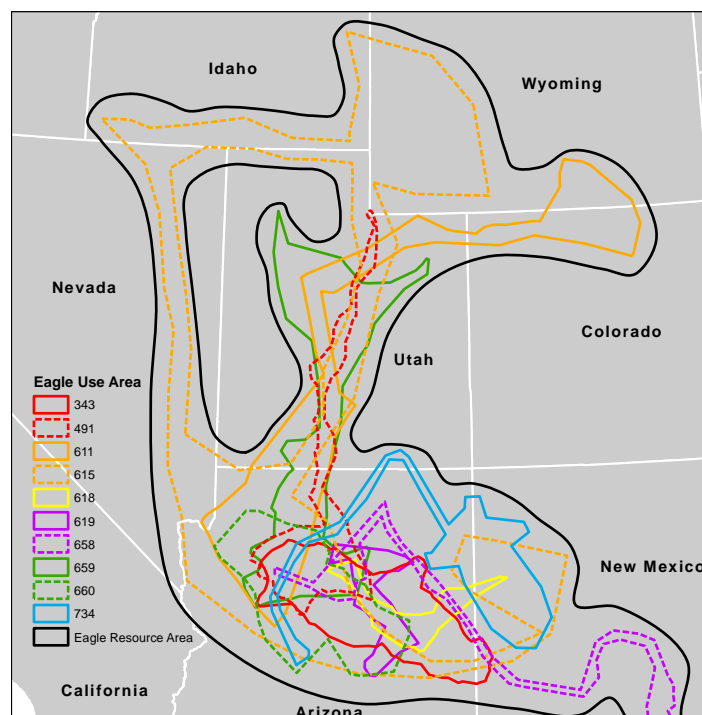
Nesting and Productivity Studies

Golden eagle nest monitoring studies are currently being conducted to provide annual golden eagle occupancy and breeding productivity across and adjacent to the ranches. All nesting area territories and nests within Babbitt Ranches have been inventoried and mapped, and are monitored annually using aerial (helicopter) and ground-based surveys. Analyses of occupancy and productivity will include modeling that incorporates specific environmental variables such as prey base type, distribution, densities, and habitat characteristics; habitat condition; climate; potential anthropomorphic disturbance; and land management practices.

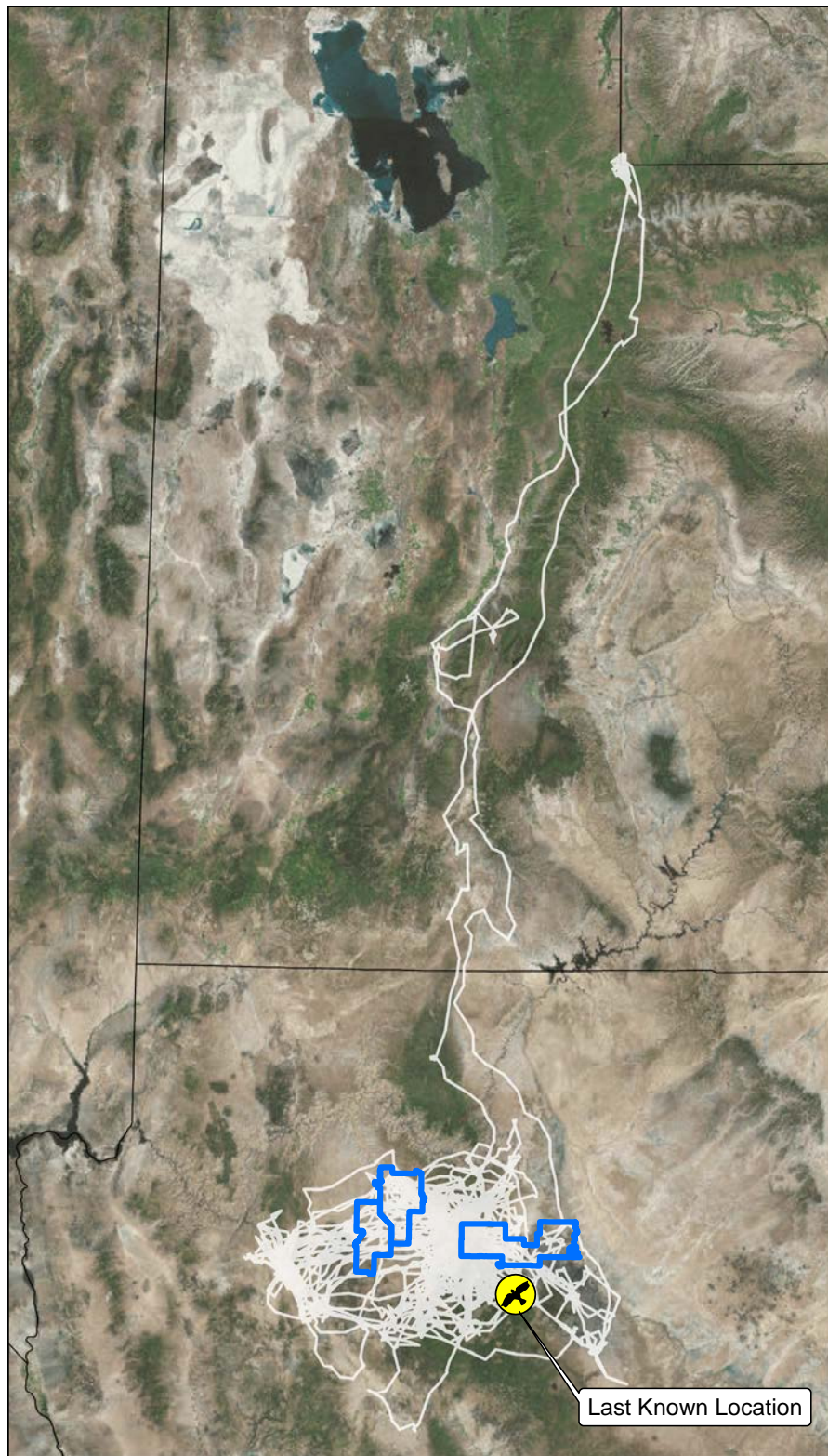


Home Range and Movement Studies Using Telemetry

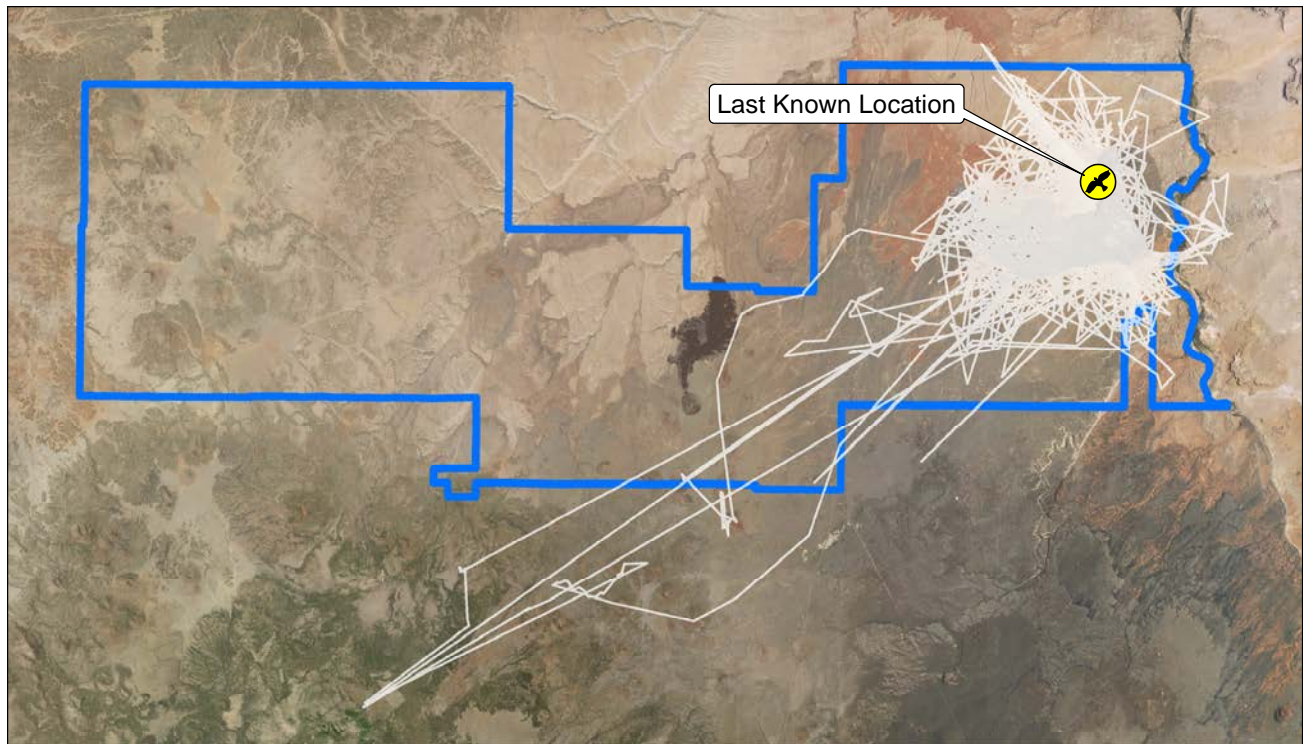
Objectives of global positioning system (GPS) telemetry studies are to gain a more thorough understanding of southwestern golden eagle home ranges, habitat use, movements, foraging, and behavior of golden eagles that use the ranches. Breeding and non-breeding home range estimates of resident adults and young are determined using GPS telemetry, providing high-resolution location and spatial use data of foraging, resource, and migration areas. Home range estimates of eagles known to use Babbitt Ranches currently range across seven western U.S. states and two USFWS Eagle Management Flyways. Telemetry targeting non-resident sub-adults and adult floater individuals identify the degree to which the ranches are used by wintering and migratory golden eagles.



Seven states documented to be visited by 10 eagles that also use habitat on Babbitt Ranches.



Golden Eagle 491 Male
Locations from March 25, 2011 to October 19, 2013



Golden Eagle B88 Female
Locations from May 10, 2015 to June 8, 2015

Prey Base Studies

Prey base studies include determining the distribution, abundance, and population trends of prey species on which golden eagles rely, specifically Gunnison's prairie dog, black-tailed jackrabbit, desert cottontail rabbit, and American pronghorn. Data gathered are used to quantify and assess the golden eagle prey base on the ranches over time, inform efforts to quantify and enhance the prey base via "ecological lift," and evaluate the efficacy of such efforts.

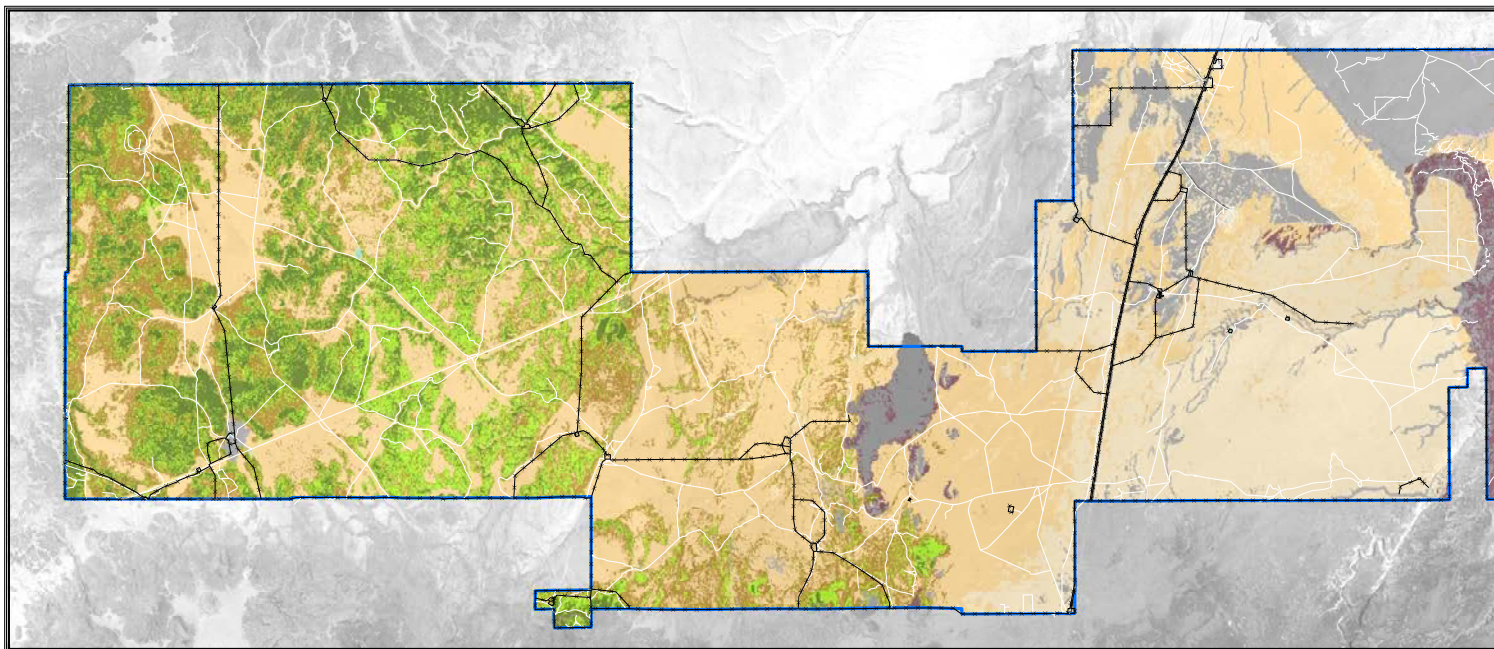


In the Four Corners region of the Southwest, golden eagles most commonly prey on black-tailed jackrabbits and desert cottontail rabbits. Therefore, current prey base studies target these two species. Estimates of rabbit population densities are based on distance-based field surveys and modeling applications using Program Distance. Long-term population monitoring of golden eagle prey will allow for the examination and quantification of fluctuations of population numbers and density and of the relationships between changes in prey base, climate, and golden eagle occupancy, habitat quality, and reproduction over time. A graduate student from Northern Arizona University has been selected to assist with these studies and will use the study as the basis for her graduate research project.

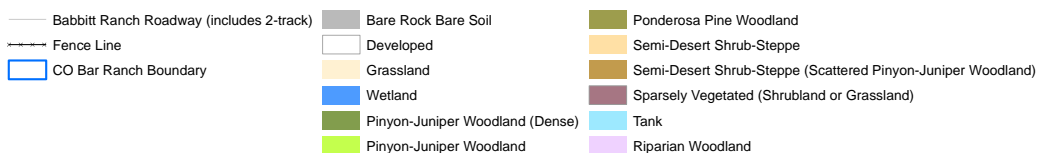


Vegetation Classification Modeling

The first step in designing eagle prey base studies was the development of a vegetation classification model to stratify habitat classes across all of the ranches. High-resolution delineation of the different types of vegetation and land cover are critical to effectively estimating densities of golden eagle prey across large landscapes and understanding the ecological controls of prey population distributions. The classification design was based on analysis of remotely sensed data (USGS Landsat 8), with vegetation classes developed to delineate plant community structure that influences habitat quality for golden eagle prey.

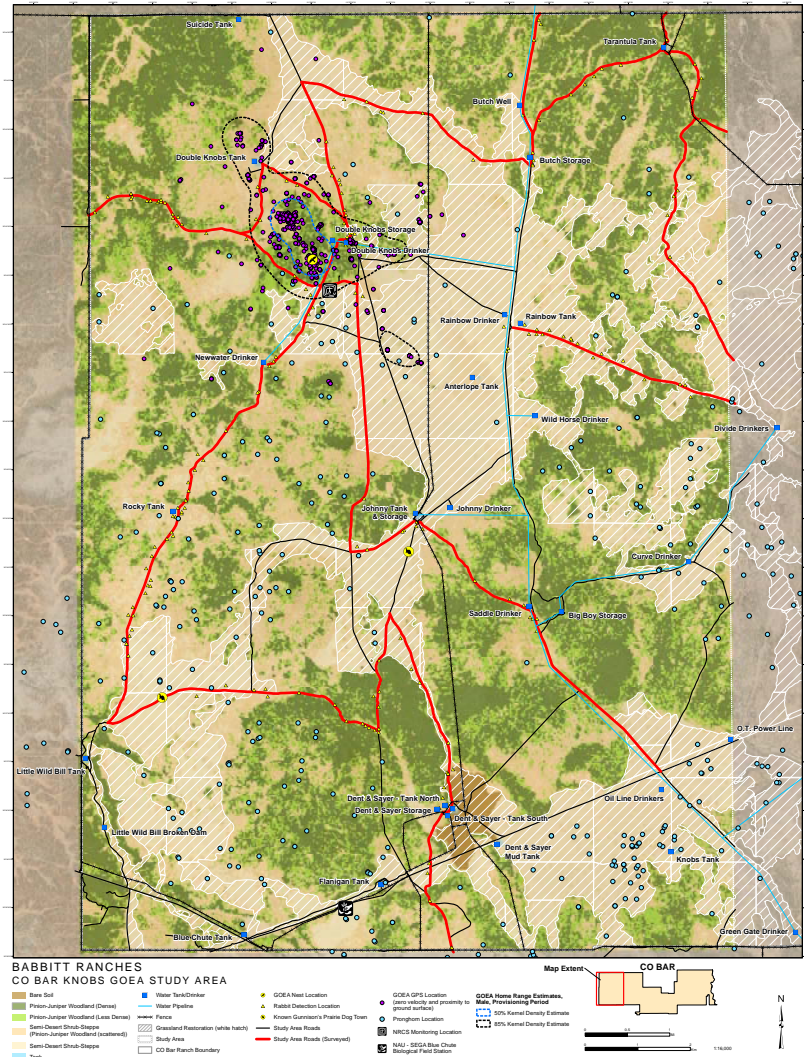


**CO BAR RANCH
2016 VEGETATION CLASSIFICATION**



CO Bar Knobs Golden Eagle Study Area

In 2015, Babbitt Ranches established the 53,728-acre CO Bar Knobs Golden Eagle Study Area, which is located on the west side of the CO Bar Ranch. This study area was established to not only conduct eagle nesting, home range, vegetation/habitat, and prey base studies, but to serve as an “example” study area where additional eagle and habitat focused studies are currently being conducted. These additional studies include grassland restoration, Gunnison’s prairie dog mapping and demography, American pronghorn home range and distribution, and climate shift. These studies will be conducted in the future across all of the ranches.



HABITAT CONDITION STUDIES

Study objectives for golden eagle habitat condition studies include quantification and assessment of habitat conditions (including climate) through time on the Babbitt ranches. In cooperation with the Landscape Conservation Initiative at Northern Arizona University, geographic information system (GIS) remote sensing data will be gathered to conduct model-based analyses of habitat conditions across survey areas and through time. Remote sensing data for Cataract and Espee Ranches will be ground-truthed with information gathered at the NRCS range inventory sites established on those ranches. Climate data gathered at the USCRN station on Cataract Ranch and other regional weather stations will be incorporated. The habitat and climate data with the results of the other monitoring studies in this program will be integrated to model how ecological variables relate to golden eagle breeding, population, and habitat use dynamics.





**CONSERVATION AND RESEARCH
ON THE BABBITT RANCHES
COCONINO COUNTY, ARIZONA**



CONSERVATION AND RESEARCH ON THE BABBITT RANCHES COCONINO COUNTY, ARIZONA

INTRODUCTION

Babbitt Ranches raises cattle and American Quarter Horses on CO Bar Ranch, Cataract Ranch, and Espee Ranch in northern Arizona. The ranches, together with three U.S. Forest Service allotments, total over 700,000 acres (Figure 1). In operation since 1886, Babbitt Ranches is at its core a business with fiduciary responsibilities to its family shareholders, but the company acknowledges multiple bottom lines and incorporates not only economic but community and ecological values into all its decision-making. Inseparable from its business enterprises is a commitment to work cooperatively with others to respect and promote the conservation of regional ecological continuity, wildlife habitat, diverse vegetation, watershed integrity, historical and other cultural resources, and public access to its ranches. Babbitt Ranches also promotes and provides direct support for the generation and utilization of science-based knowledge and technologies to support sound stewardship of the region's land and natural resources.

This paper presents the Babbitt Ranches conservation philosophy and demonstrates the Babbitt Ranches' commitment to land stewardship and social responsibility through a listing of past and ongoing conservation and conservation-oriented research efforts, including establishment of the Antelope Prairie Ecological Research Area and proposed creation of a Little Colorado River Valley Conservation Area.

THE BABBITT RANCHES CONSERVATION PHILOSOPHY

Babbitt Ranches embraces a conservation-oriented land ethic that we define as:

. . . a process that takes place within each individual and must begin with awareness of the surrounding environment and an understanding and appreciation of its intrinsic values. With awareness comes a sense of responsibility and obligation to care for the land. A sense of responsibility and obligation translates into the need for individuals to be accountable for their actions as those actions affect the land.

When each individual understands and accepts his or her relationship to the land and its ecological processes, its plant communities, its wildlife, and its productivity to meet human needs—and individuals are willing to work together to embrace those values—then the result is good land stewardship.

The process is circular. The more people interact with the land as good stewards, the more they are aware of how they fit into the grand scheme of things and the better stewards they become.

Babbitt Ranches tries never to lose sight of the fact that it is part of a much larger community, and that much can be accomplished by partnering with neighbors, non-profit organizations, educational institutions, businesses, and local, state, and federal agencies. Following is a short list of organizations Babbitt Ranches has recently worked with on a variety of ranch-based conservation and research projects:

Arizona Department of Agriculture	National Park Service
Arizona Department of Transportation	Natural Resources Conservation Service
Arizona Game and Fish Department	SWCA Environmental Consultants
Coconino County	The Nature Conservancy
NextEra Energy Resources, LLC	U.S. Fish and Wildlife Service
Northern Arizona University	U.S. Forest Service
National Aeronautics and Space Administration	U.S. Geological Survey
National Oceanic and Atmospheric Administration	

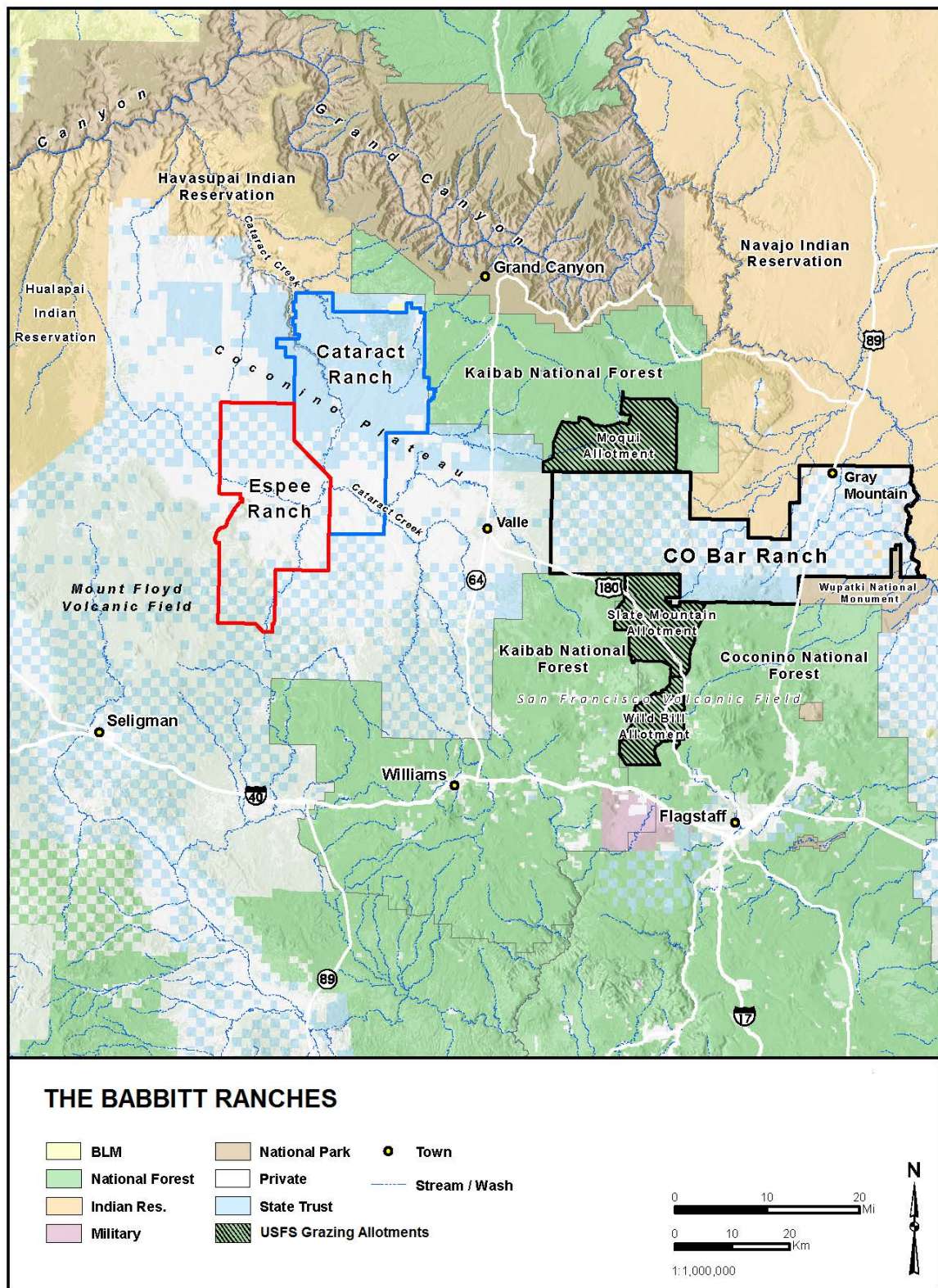


Figure 1. CO Bar, Espee, and Cataract Ranches, located in northern Arizona, between Flagstaff and the Grand Canyon.

CONSERVATION AND RESEARCH ON BABBITT LANDS

The commitment of Babbitt Ranches to this land use ethic is evidenced by numerous conservation and research efforts, including: 1) establishing conservation easements on Cataract Ranch and CO Bar Ranch totaling 41,520 acres, the largest in Arizona; 2) creating the non-profit, conservation-oriented Landsward Foundation; 3) signing a Memorandum of Understanding with the National Park Service (Wupatki National Monument); 4) developing conservation and land use plans for each ranch and resource-specific management plans; 5) restoring native grassland through removal of invasive junipers on some 30,000 acres of ranchland; 6) working with scientists to inventory vegetation communities on all three ranches and to establish monitoring plots to assess responses to a changing climate; 7) supporting studies of wildlife populations on the Babbitt ranches and implementing actions designed to benefit those populations; 8) aiding the recovery of endangered species, most notably by inviting the reintroduction of black-footed ferrets and preserving prairie dog colonies on Babbitt ranchland; 9) facilitating climate-related data collection and research; and 10) seeking opportunities to work with researchers and students on a wide spectrum of topics, using ranch resources to advance knowledge, increase understanding, and improve management of the region's natural environment. Establishment of the Antelope Prairie Ecological Research Area and the proposed creation of a Little Colorado River Valley Conservation Area are recent efforts to expand conservation to a landscape level.

In recognition of its efforts, Babbitt Ranches received the Arizona Environmental Stewardship Award from the Arizona Cattle Growers Association in 1995; the National Environmental Stewardship Award from the National Cattlemen's Association in 1996; and the National Private Lands Fish and Wildlife Stewardship Award from the International Association of Fish and Wildlife Agencies in 2003.

Conservation Easements

Cataract Ranch Conservation Easements

In 2001, Babbitt Ranches entered into a conservation agreement with The Nature Conservancy to establish a 34,480-acre conservation easement on Cataract Ranch, the largest donated conservation easement in the State of Arizona. An additional 6,400-acre conservation easement on the ranch was granted to Coconino County. The easements are intended to preserve a great expanse of increasingly rare, unfragmented, native grassland and shrub-steppe habitats. These habitats are occupied by a large community of wildlife and plant species, many of which have been identified by state and federal wildlife agencies as being in special need of conservation. Historical uses of the property (primarily livestock grazing) are permitted in a manner that is consistent with articulated conservation values. Prohibited uses include subdividing the property and permitting the exploration for, or extraction of, minerals.

Cedar Springs Forest Legacy Project (Conservation Easement)

The Cedar Springs Forest Legacy Project is a conservation easement on CO Bar Ranch granted by Babbitt Ranches and held by Coconino County as part of the national Forest Legacy Program. Granted in 2007, the conservation easement totals approximately 640 acres and includes all but a quarter-section of historic Cedar Ranch, a rest stop along the old Grand Canyon–Flagstaff stagecoach line. The Forest Legacy Program is a federal program designed to protect private forest lands from conversion to non-forest uses and to preserve forest wildlife, habitat, biodiversity, and riparian areas. Cedar Springs, Arizona's first and to date only Forest Legacy Program project, is distinguished by its ecological diversity and riparian habitat. Ranging over a steep, 700-foot gradient, the property includes pinyon-juniper woodlands, old-growth ponderosa pine, aspen, grasslands, and spring-fed riparian vegetation. The availability of water and diverse vegetation communities sustain a large and diverse wildlife community.

Landward Foundation

The Landward Foundation is an independent, non-profit organization originally created by Babbitt Ranches as the Ecological Monitoring & Assessment Foundation and Program (EMA). In 2002, the EMA was gifted to Northern Arizona University, along with research rights within the Babbitt Ranches boundaries and a 24-acre parcel for the Wild Bill Ecological Center. Now independent and managed by Babbitt Ranches, the Landward Foundation promotes scientific research to advance the understanding of the ecological, social, and economic factors affecting the Coconino Plateau and the Little Colorado River Valley. Its mission is to provide private landowners and managers with the latest science-based information to support decisions and conservation practices.

Wupatki National Monument Memorandum of Understanding

Babbitt Ranches is a signatory with the National Park Service on a Memorandum of Understanding (MOU) to work together to manage cultural and natural resources in the borderlands connecting CO Bar Ranch and Wupatki National Monument. Areas of cooperation have included protection of archaeological sites, pronghorn management, bird surveys, and a regional fire management plan. Plans are underway for Babbitt Ranches, researchers from Northern Arizona University, and Park Service staff to cooperate on the stabilization of two major Puebloan structures on CO Bar Ranch. Babbitt Ranches, SWCA Environmental Consultants, and the Park Service are also exploring opportunities to restore riparian habitat along the Little Colorado River and to inventory, monitor, and protect golden eagles on CO Bar and Wupatki lands. Fundamental to the MOU is the understanding that ownership of certain CO Bar Ranch lands will eventually be ceded to Wupatki National Monument.

Conservation, Land Use, and Resource Management Plans

Conservation and Land Use Plans for CO Bar, Cataract, and Espee Ranches

Babbitt Ranches has completed a conservation and land use plan for each of its three ranches. The plans are intended to aid Babbitt Ranches in making informed land use and management decisions within a conservation context; provide a framework for developing conservation efforts centered on the ranches; and facilitate the acquisition of funding and other types of assistance to support those efforts. The overarching conservation objective of all three plans is to benefit and sustain the long-term ecological integrity of the ranches' natural communities, particularly native grassland and shrub-steppe habitats. Focus of the plans is on six grassland species in special need of conservation: golden eagle, ferruginous hawk, Gunnison's prairie dog, black-footed ferret, American pronghorn, and Fickeisen plains cactus. Each plan identifies strategies for promoting the conservation of these species on Babbitt ranchlands.

Pronghorn Management Plan

In association with Arizona Game and Fish Department pronghorn expert James deVos, Babbitt Ranches developed the *Babbitt Ranches: Long-term Pronghorn Succession Plan*. The plan identifies important components of pronghorn habitat; describes existing conditions relative to pronghorn populations and habitat and identifies needed improvements that would benefit management of the species and its habitat; and details specific work tasks that will be employed as financial resources exist to optimize the long-term persistence of this species at a level that is socially and biologically appropriate.

Fickeisen Plains Cactus Management Plan

The Fickeisen plains cactus, a federally listed endangered species, occurs on all three Babbitt ranches. The *Babbitt Ranches Fickeisen Plains Cactus Management Plan* is intended to assist Babbitt Ranches in the protection and effective management of the species. The plan summarizes the threats faced by the

species throughout its range, addresses what is currently known about the status of the cactus on the Babbitt ranches, and describes targeted conservation actions intended to ensure the long-term survival of species on the ranches.

Grassland Restoration

Over the past several years, Babbitt Ranches has worked with the Natural Resources Conservation Service (NRCS) and other cooperating organizations to restore native grasslands by removing invasive juniper trees from some 30,000 acres on CO Bar Ranch. In the restoration process, trees are reduced to mulch and the mulch left in situ to enhance the growth of native grasses, forbs, and shrubs used by pronghorn and other wildlife, as well as by livestock.

Vegetation Community Inventory and Monitoring

NRCS Rangeland Inventory

Babbitt Ranches is also working with the NRCS to inventory rangeland resources on Cataract Ranch (fieldwork completed in 2012) and Espee Ranch (fieldwork in progress). A total of 42 inventory sites were established on Cataract Ranch, and an estimated 25–35 sites will be established on Espee Ranch by the time the inventory is complete. The inventories provide baseline data on a number of variables, including soils and plant species composition and abundance. The inventory sites will be monitored to identify and evaluate changes in rangeland ecological characteristics. Information gleaned from the inventory and future monitoring will be used to inform rangeland management decisions and assess the effects of climate change on regional grassland and shrub-steppe environments.

Biological Assessment of the Coconino Plateau, USGS Study Plots, and Repeat Photography

In a similar but smaller-scale effort, scientists from the U.S. Geological Survey's Colorado Plateau Field Station established 12 vegetation study plots on CO Bar and Espee Ranches in 1997–1998. Data collected and stored in ArcView shape file format include percent cover per species inventoried, total percentage of vegetation cover, soils and stratum data, geospatial data, and photographic data. The information will serve as a benchmark for long-term biological assessment of vegetation change at the sites. This work was part of a regional biological assessment underwritten by Babbitt Ranches that culminated in the publication *Biological Assessment of the Coconino Plateau*, which is available online at <http://www.babbitranches.com/media/PDF/cpnrl/CPNRL.pdf>. In addition, beginning in 2005, 100 photo points were randomly selected across the ranches to visually capture qualitative changes at each point over time. The visual information gained through repeat photography at the locations may enhance the ability of land managers, as well as Babbitt Ranches, to perceive, evaluate, and respond to evolving ecological conditions.

Vascular Plant Survey

A comprehensive vascular plant survey has been underway on Cataract, Espee, and CO Bar Ranches since 2006. Conducted by retired U.S. Forest Service botanist Greg Goodwin, the survey has resulted in: 1) a checklist of plant species on the ranches; 2) a published, illustrated field guide to grassland plant species¹; and 3) targeted surveys and documentation of the occurrence of Fickeisen plains cactus on the ranches, information used by the U.S. Fish and Wildlife Service (USFWS) in their recent listing of the cactus as an endangered species.

¹ Goodwin, G. 2012. Range plant handbook: A field guide to the grassland plants of northern Arizona's Cataract and Espee Ranches. In coordination with Babbitt Ranches, LLC, Flagstaff, Arizona.

Wildlife Studies and Conservation Actions

Wildlife studies and related actions conducted with the support and cooperation of Babbitt Ranches include, but are not limited to, the following:

American Pronghorn Studies

Pronghorn telemetry studies were conducted by the Arizona Game and Fish Department (AGFD) in 1992–2010 on CO Bar, Espee, and Cataract Ranches. Data were collected on pronghorn distribution, movement, and habitat use. Among other important findings, the studies showed that the pronghorn population in northern Arizona has been segregated into subpopulations by highways, and pronghorn movement has been limited by fencelines. Genetic studies by Northern Arizona University researchers on CO Bar Ranch have confirmed these results. Currently, the AGFD is considering additional pronghorn telemetry studies on Babbitt ranchlands and has committed to providing funding for SWCA Environmental Consultants to analyze the existing AGFD pronghorn telemetry data to identify more detailed habitat use patterns, particularly as they relate to fawning.

American Pronghorn Conservation Actions

To maintain a pronghorn migration corridor and reduce fenceline barriers in the southwestern corner of CO Bar Ranch, Babbitt Ranches ceased livestock grazing on over 700 acres of land; constructed a required right-of-way fence well back from Route 180; and, working with the Arizona Department of Transportation and the AGFD, equipped the fence with goat bars. “Goat bars” are simple, cost-effective devices invented by Babbitt Ranches to raise the bottom wire on a fence high enough to allow pronghorn to pass underneath. Goat bars have been installed on fence wires at strategic locations on all three ranches, and have been adopted by other landowners and managers as far away as Alberta, Canada. Babbitt Ranches also reconfigured fences along Route 89 on CO Bar Ranch to facilitate pronghorn crossing there. Babbitt Ranches also cooperated with staff from the AGFD in evaluating locations for building pronghorn passage structures over US 89, which is being widened from two lanes to four. And as part of a new landscape-level initiative (see the Antelope Prairie Ecological Research Area discussion, below), Babbitt Ranches has proposed, and the AGFD has approved, flexibility in pronghorn hunting regulations on the eastern CO Bar Ranch to support additional pronghorn studies in that area.

Golden Eagle and Other Avian Species

Avian studies (2010–present) have been conducted on Espee and CO Bar Ranches by biologists from SWCA in support of potential wind energy development. Funded by NextEra Energy Resources, LLC, the studies have included small and large bird use surveys, bat acoustic monitoring, and golden eagle and other raptor studies. As part of the studies, in 2011 and 2013 SWCA conducted aerial surveys in northern Arizona for golden eagle and other raptor nests. The survey area included Long Point on Espee Ranch and the western part of CO Bar Ranch. Golden eagle, ferruginous hawk, and unidentified raptor nests were found on both ranches. Several golden eagles were captured and equipped with transmitters for long-term telemetry study of eagle movement and habitat use. These data will be pooled with data from other studies throughout the West to better understand golden eagle habitat utilization over vast areas.

Currently, funding is being sought to expand the golden eagle studies to include nest surveys on Cataract Ranch and eastern CO Bar Ranch, conduct nest occupancy and productivity investigations on the Babbitt ranches, and capture additional eagles for telemetry studies.

Endangered Species Conservation Actions

Black-footed Ferret

Babbitt Ranches has entered into a Safe Harbor Agreement with the USFWS for the release of the endangered black-footed ferret on Babbitt ranchlands. A release by the AGFD of 26 ferrets on Espee Ranch in October 2014 followed previous releases in 2007, 2008, and 2009. Related conservation actions taken by the AGFD on Espee Ranch include post-release monitoring for the occurrence of ferrets; a program conducted to manage Gunnison's prairie dog colonies, the ferret's essential prey base; and annual predator monitoring for sylvatic plague and canine distemper, ongoing threats to the prairie dogs and ferrets.

Management actions for Gunnison's prairie dog colonies on Espee Ranch since 2007 include annual mapping and monitoring by the AGFD to assess colony densities and prairie dog population size and trends. The AGFD has also periodically dusted some colonies with insecticide in an effort to control fleas carrying sylvatic plague. Despite this effort, the plague has decimated the prairie dog colonies on Espee Ranch, endangering the ferret reintroduction effort. Therefore, prior to the 2014 ferret release, the U.S. Geological Survey National Wildlife Health Center oversaw the immunization of both the ferrets and prairie dogs at the release site as part of a Sylvatic Plague Vaccine (SPV) trial. Espee Ranch is one of 31 sites in seven states at which SPV field trials are being conducted through 2016. In addition to protecting prairie dog populations on its lands, Babbitt Ranches welcomes the translocation of prairie dogs from development sites where the animals would otherwise be destroyed.

Fickeisen Plains Cactus

In addition to supporting the surveys for the Fickeisen plains cactus that have been conducted by botanist Greg Goodwin and committing to protecting the species through the *Babbitt Ranches Fickeisen Plains Cactus Management Plan* (both described above) Babbitt Ranches hosted a multi-agency workshop in 2013 to help develop range-wide survey and monitoring protocols for the cactus. To fund the workshop, the Babbitt's Landsward Foundation and SWCA submitted a proposal for, and were awarded, a Section 6 Grant through the Arizona Department of Agriculture. The grant and subsequent workshop resulted in draft survey and monitoring protocols for the Fickeisen plains cactus, which were submitted for finalization to the USFWS.

Climate-Related Research and Data Collection

Southwest Experimental Garden Array (SEGA) Project

Babbitt Ranches, through the Landsward Foundation, has partnered with Northern Arizona University to help implement the Southwest Experimental Garden Array (SEGA) project.² Two of the ten SEGA research sites are on CO Bar Ranch: one in grassland on the eastern side of the ranch (Black Point Garden Site) and the other in pinyon-juniper woodland on the western side (Blue Chute Garden Site). Babbitt Ranches is providing the land and water for the sites. In addition, Babbitt Ranches has removed grazing from a third site, in the southeastern corner of CO Bar Ranch in Citadel Wash, where a unique genetic strain of cottonwoods provides source material for the SEGA project.

Funded by nearly \$3 million in NSF grants and another \$1 million in matching support, SEGA is a genetics-based climate change research platform that allows scientists to quantify the ecological and evolutionary responses of genotypes within species and communities of species to changing climate

² See <http://www.sega.nau.edu/>

conditions. Because temperature and moisture predictably change with elevation, these gardens reflect climatic differences that mimic the effects of climate change over time. By raising the same plant genotypes in an array of sites along an elevational gradient of temperature and moisture, scientists can examine how different genotypes perform under different climatic conditions. The ability to identify genotypes most likely to survive and reproduce in a rapidly changing climate provides the basis for improving the success of efforts to maintain ecosystems, restore damaged ecosystems, and assist the migration of species in the face of climate change.

U.S. Climate Reference Network (USCRN) Station

Babbitt Ranches invited the National Oceanic and Atmospheric Administration to install a U.S. Climate Reference Network (USCRN) station at Cataract Ranch. The USCRN, one of the preeminent networks for monitoring climate change in the world, is intended to gather continuous climate-related measurements from a vast network of stations for 50 or more years. The station on Cataract Ranch is *AZ Williams 35 NNW – Babbitt Ranches*.

NRCS Soil Climate Stations

The NRCS has installed four soil climate stations on CO Bar Ranch at the following locations: Site 1 – The SEGA Black Point Garden Site; Site 2 – East of SP Lava Flow; Site 3 – Base of Mesa Butte; and Site 4 – In Lockwood Canyon. The purpose of the stations is to measure soil moisture availability, migration, and retention in the soil type present at each station. The data collected will allow the NRCS to build a soil-specific model that can be used in the future to estimate soil climate at similar sites in other locations. Data will be collected at the four soil climate stations on CO Bar Ranch for five years, with the option to renew for an additional five years.

Additional Research

Northern Arizona University Faculty and Student Projects

In addition to the SEGA program, Babbitt Ranches has opened their ranches to Northern Arizona University faculty and staff to study a multitude of subjects, including juniper encroachment on grasslands, volcanic flow dates, pocket mice distribution, pronghorn genetics, archaeological resources on Babbitt land adjacent to Wupatki National Monument, and the economic viability of wind energy production in northern Arizona. Other scholars have studied the impact of off-highway vehicle use on pronghorn; how increased hunting pressure affects wildlife cycles such as breeding periods and the successful rearing of young; and the potential impact of dispersed recreation on wildlife and habitat in general.

Space Exploration: Desert Research and Technology Studies

In 1968, the USGS Center of Astrogeology blasted craters in the Black Point lava flow on CO Bar Ranch to simulate an impact crater field on the lunar surface in preparation for NASA's manned Apollo Moon missions. Forty years later, in 2008, Black Point lava flow was designated an analogue test site for NASA's Desert RATS (short for Research and Technology Studies). In October 2008 several 1- and 3-day simulations of lunar missions were conducted along the western and southwestern portions of the flow. The site was used again to simulate a 14-day lunar mission in September 2009. In 2010, the analogue site was expanded to the west to include SP Crater and lava flow. Mission simulations in 2010 included using Space Exploration Vehicles and other assets to simulate a 28-day mission to the Moon. In 2011, the Desert RATS field tests on CO Bar Ranch focused on asteroid exploration and testing of a space truck, a robotic rover assistant, and deep space communication systems.

ANTELOPE PRAIRIE ECOLOGICAL RESEARCH AREA

The Antelope Prairie Ecological Research Area, totaling approximately 78,438 acres, encompasses all of CO Bar Ranch east of US 89 (Figure 2).

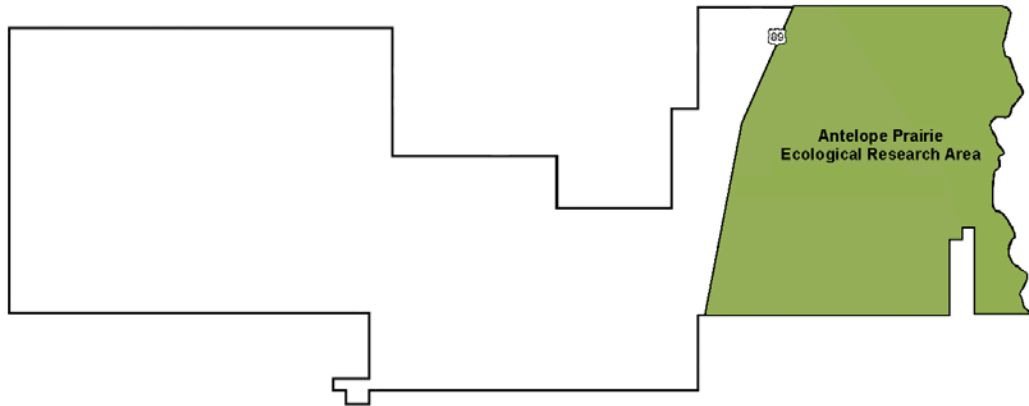


Figure 2. Location of the Antelope Prairie Ecological Research Area on CO Bar Ranch.

Established in early 2014, the Antelope Prairie Ecological Research Area is intended to serve as the geographic focus for a number of studies and conservation actions. To facilitate wildlife investigations, the AGFD has agreed to close or modify the hunting season in the Research Area during the period 2014–2019, depending on research design needs. Babbitt Ranches will also manage public access to that area to accommodate research needs. Species of particular interest within the Research Area include, but are not limited to, pronghorn, golden eagles, prairie dogs, and the endangered Fickeisen plains cactus. Studies and conservation actions relating to pronghorn and golden eagles are in the planning stages, and the AGFD and USFWS are assessing the feasibility of releasing black-footed ferrets in the area. A population of Fickeisen plains cactus in the Research Area may be a candidate for a monitoring program, and the Rimmy Jim stock tank is being considered for native riparian habitat restoration following invasion of the tamarisk leaf beetle. Rimmy Jim tank appears to be an important area for migrating birds and has long been popular with birders, who have recorded over 120 species at the site. The SEGA Black Point research garden site and the NRCS's Black Point soil climate station are located within the Research Area (see Climate-related Research section, above), and SEGA program researchers are seeking funding to establish additional SEGA sites in the area (specifically in the Little Colorado River Valley).

Environmental Setting

The Antelope Prairie Ecological Research Area is divided between the Coconino Plateau (>75%) to the west and the Little Colorado River Valley (<25%) to the east. On the Coconino Plateau, plains and low-relief basalt mesas slope gently to the east from 5,600 to about 5,000 feet above sea level. The land then dips precipitously to the bottom of the Little Colorado River Valley at 4,200 feet. The climate is arid, and vegetation consists largely of grassland/shrub-steppe on the Plateau and scrub, Painted Desert badlands, and invasive riparian species in the Valley. Vegetation communities and other SWReGAP cover classes within the Antelope Prairie Ecological Research Area are listed in Table 1.

Table 1. Acres and percent of Southwest Regional Gap Analysis Project (SWReGAP) cover classes within the Antelope Prairie Ecological Research Area.

Cover Class	Acres	% of Total
Grassland/shrub-steppe	55,740	71.1%
Woodland	38	0.0%
Shrubland and Scrub	14,745	18.8%
Colorado Plateau Mixed Bedrock Canyon and Tableland	4,463	5.7%
Inter-Mountain Basins Shale Badland	1,805	2.3%
Inter-Mountain Basins Volcanic Rock and Cinder Land	39	0.0%
Invasive Southwest Riparian Woodland and Shrubland	1,471	1.9%
Developed, Medium-High Intensity	114	0.1%
Open water	23	0.0%
TOTAL	78,438	100.0%

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

LITTLE COLORADO RIVER VALLEY CONSERVATION AREA

Babbitt Ranches is considering the establishment of a Little Colorado River Valley Conservation Area along the approximately 16-mile-long reach of the Little Colorado River (see Figure 3). An opportunity for initiating native riparian habitat restoration on a limited scale through Northern Arizona University's SEGA project (see above) and the need to address abandoned uranium mining issues have focused new attention on Little Colorado River Valley. Rather than address such opportunities and challenges on a piecemeal basis, Babbitt Ranches is seeking a broader, landscape-level path toward environmental improvement. Establishing a conservation area may be that path. Currently, discussions are underway exploring the purpose, need, and feasibility for creating such an area; identifying specific goals and objectives; and developing a framework for achieving those goals and objectives.



Figure 3. Location of the proposed Little Colorado River Valley Conservation Area on CO Bar Ranch.

Environmental Setting

Landownership within the entire 16,826-acre area is summarized below and shown in Figure 5 at the end of this section. Bordering the river, the odd-numbered sections (with one exception) are owned by Babbitt Ranches, and the even-numbered sections are owned by the Bureau of Reclamation. Land east of the river belongs to the Navajo Nation.

Landownership In the Little Colorado River Valley on CO Bar Ranch	Acres
Babbitt Ranches	6,990
Antelope Springs (Babbitt)	318
State Trust	3,832
Bureau of Reclamation	3,967
Bureau of Land Management	119
Other Private	1,600

Little Colorado River

The Little Colorado River is ephemeral in this reach. It is frequently dry, flowing only in response to seasonal snowmelt and precipitation events (see the hydrograph in Figure 4). The river channel is sinuous, braided, and unstable, shifting across the sandy floodplain during sporadic flood flows. In prehistoric times the Little Colorado River was a perennial stream, though perhaps intermittent seasonally where its flow was absorbed in sand deposits.

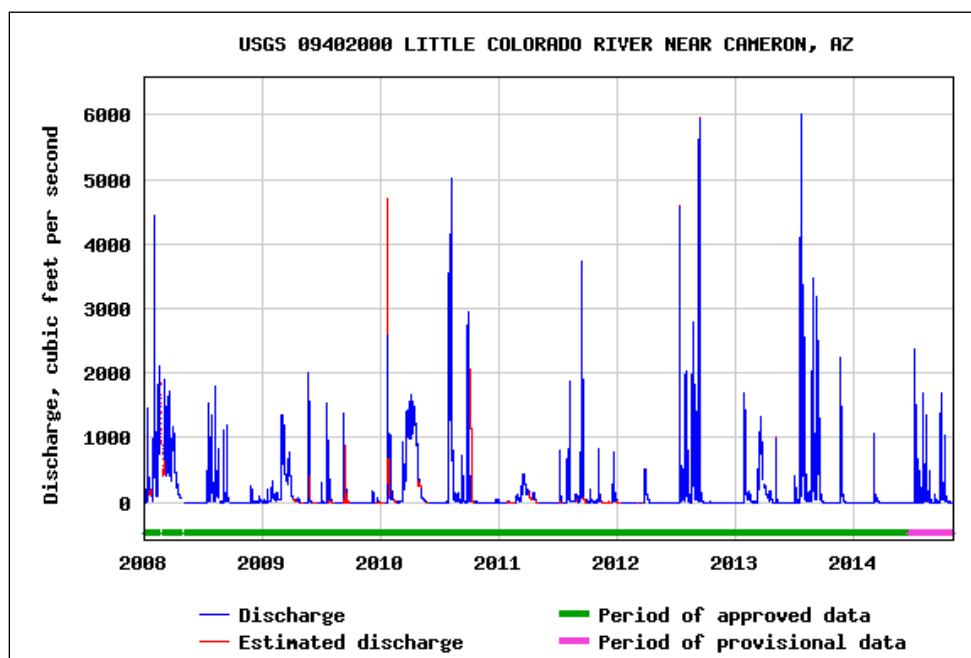


Figure 4. Discharge of the Little Colorado River near Cameron, Arizona, 2008–2014.

Average annual discharge in the Little Colorado River is about 260 cubic feet per second, but flow is extremely variable, fluctuating between 0 and 6,000 cubic feet per second in recent years (Figure 4). Water quality in the Little Colorado River is poor in some regards. Water samples collected from the Little Colorado River at Wupatki National Monument in 2001–2002 had high concentrations of aluminum, antimony, arsenic, and iron relative to U.S. Environmental Protection Agency Primary and Secondary Maximum Contaminant Levels. Primary Maximum Contaminant Levels for were exceeded for antimony and arsenic.

The Little Colorado River carries a heavy load of silt and dissolved solids, including salt. To a considerable extent, this is natural. Large areas of erodible surficial material, sparse vegetation characteristic of arid climates, and intense rainstorms produce very high suspended-sediment concentrations in runoff. Erosion rates in the Little Colorado River watershed have always been high, but they have increased in historic times due to human activities. Since the 1880s, overgrazing by domestic sheep and cattle have led to a higher percentage of bare soil in much of the watershed, and this in turn has increased sediment deposition into an already silty river. The mineral composition of sediment delivered to the river reflects the mineral composition of the soil and rock being eroded. For example, Little Colorado River water is saline because the river and its tributaries drain large areas of salt-bearing soils and bedrock. Levels of uranium, radium, beryllium, copper, lead, manganese, and nickel are high for the same reason. The concentrations of these minerals in river water are proportional to sediment loads. The more turbid the conditions, the higher the mineral concentrations.

Geology

The geology of the Little Colorado River Valley Conservation Area is depicted in Figure 6, and the key to rock formations, surface deposits, and structural features is provided below. Bedrock is dominated by the Chine Formation in the northern part of the Conservation Area and by the Moenkopi Formation in the southern part. The Chinle forms the colorful badlands topography of the Painted Desert and contains uranium-bearing ores.

During the 1950s and 1960s, uranium was mined at several locations in the Little Colorado River basin, including locations on CO Bar Ranch. When the mines were abandoned, waste rock containing elevated concentrations of radionuclides and metals were generally left behind. Concerns about abandoned mine sites include, but are not limited to, stormwater runoff carrying unnaturally high levels of uranium-bearing sediment to watercourses. While this is a concern, Wirt (1994) found the differences in the radioactivity of sediment samples taken from the Little Colorado River to be related to geographical differences in geology rather than to the proximity of upstream uranium mines.

Vegetation

Vegetation communities and other SWReGAP cover classes within the Little Colorado River Valley Conservation Area are listed in Table 2 and shown in Figure 7. The SWReGAP analysis shows only invasive (i.e., non-native) riparian vegetation along the Little Colorado River. This invasion is a recent occurrence. What the riparian corridor looked like in the CO Bar reach back when the river flow was perennial is unknown. In other reaches of the river, however, native riparian vegetation such as willows and cottonwoods grew in areas where the banks were high enough to be spared the scouring effects of floods. Those patches of vegetation largely died out when Euro-American settlers diverted and impounded most of the streamflow in the upper reaches of the river. Over time, non-native species like tamarisk and Russian olive spread all through the Little Colorado River Valley. While dense growths of tamarisk alter natural ecosystems, and native vegetation is preferred, tamarisk often occupies ground that would otherwise be bare, and tamarisk leaves, flowers, and seeds attract insects and birds. Some species

of birds, including the endangered southwestern willow flycatcher, build nests in the cool shade of tamarisk branches. Currently, the introduced tamarisk leaf beetle is defoliating tamarisk trees along the Little Colorado River.

Table 2. Acres and percent of Southwest Regional Gap Analysis Project (SWReGAP) cover classes within the Little Colorado River Valley Conservation Area.

Cover Class	Acres	% of Total
Grassland/shrub-steppe	5,204	30.9
Shrubland and Scrub	5,511	32.7
Colorado Plateau Mixed Bedrock Canyon and Tableland	2,905	17.3
Inter-Mountain Basins Shale Badland	1,739	10.3
Inter-Mountain Basins Volcanic Rock and Cinder Land	2	0.0
Invasive Southwest Riparian Woodland and Shrubland	1,465	8.7
TOTAL	16,826	100.0

Source: Southwest Regional Gap Analysis Project (SWReGAP) data.

FIGURES

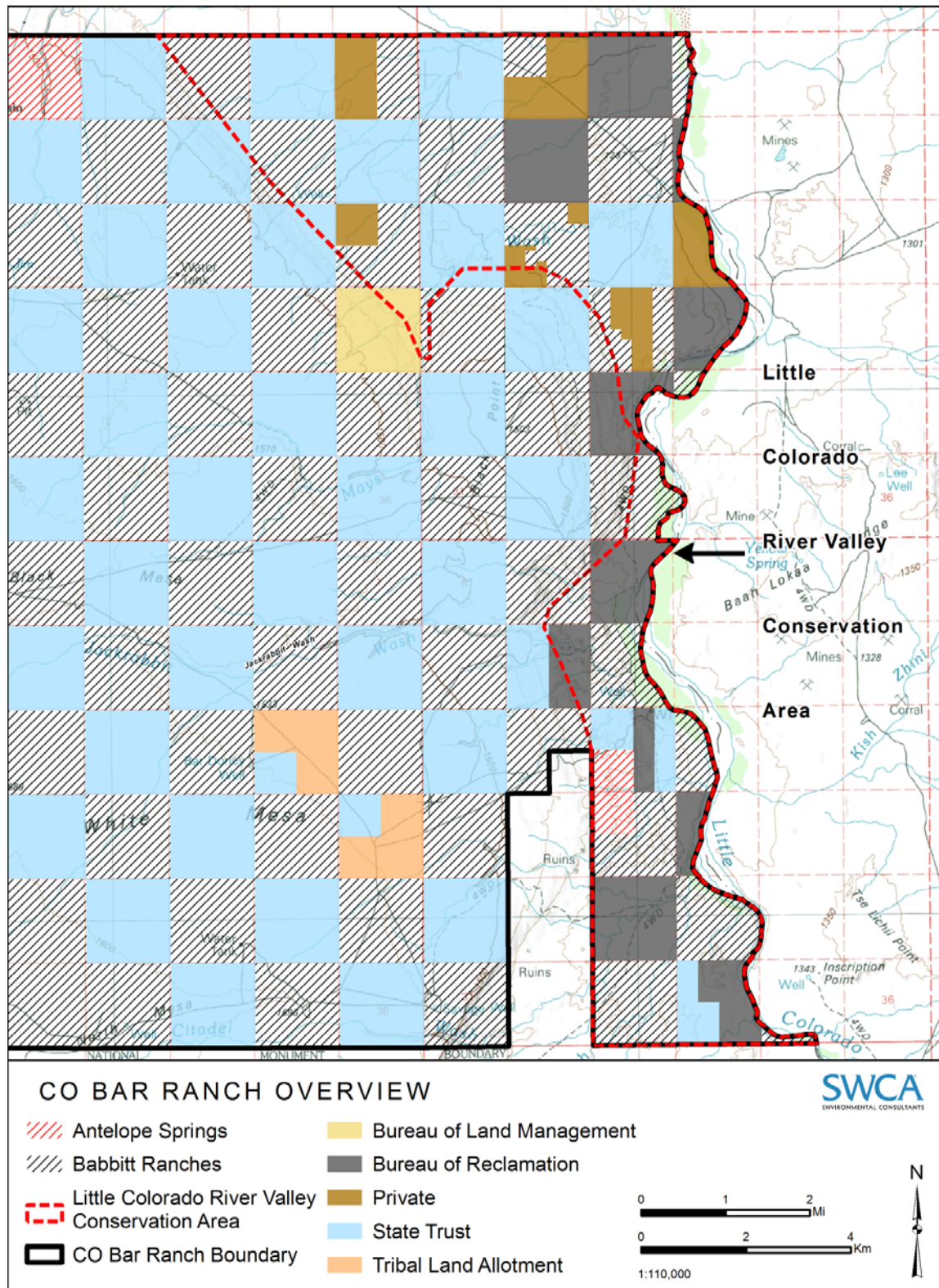


Figure 5. Little Colorado River Valley Conservation Area: landownership map.

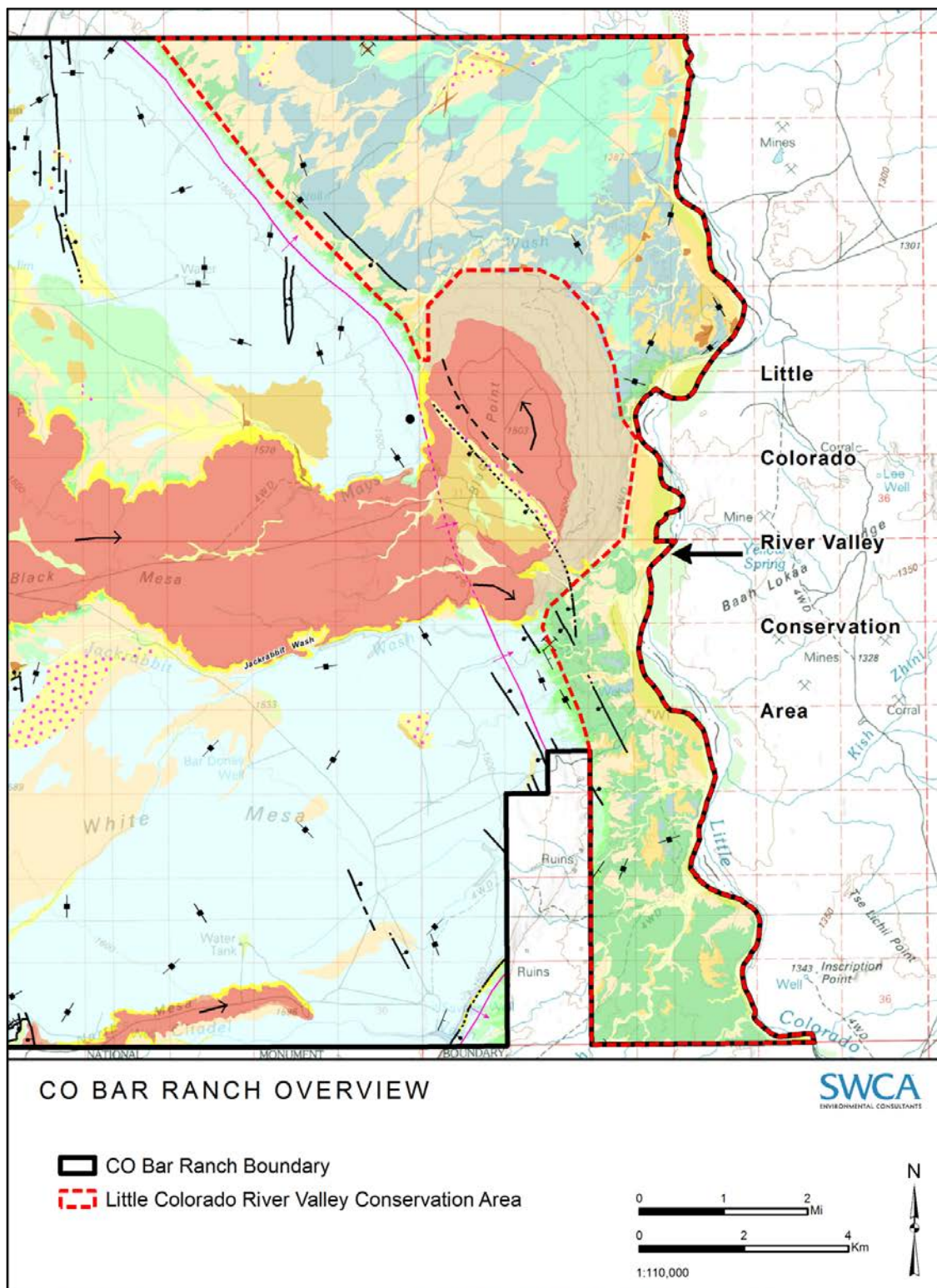
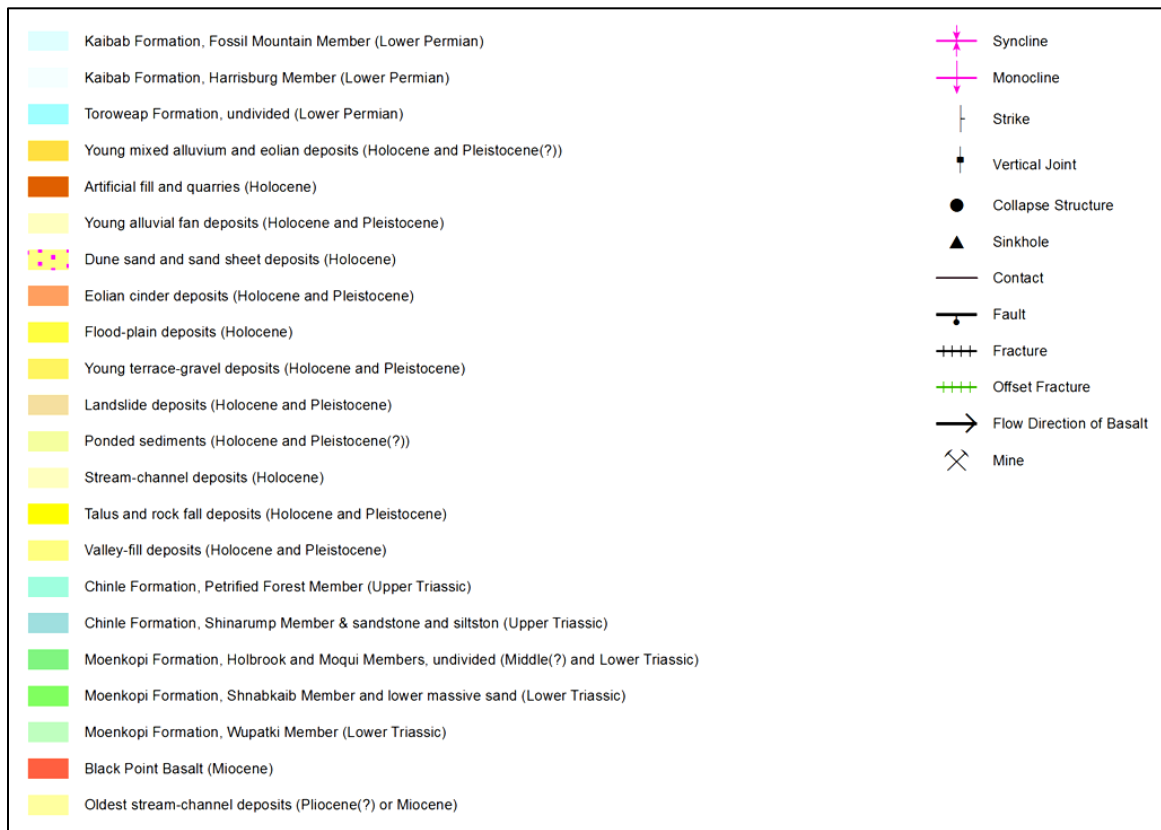


Figure 6. Little Colorado River Valley Conservation Area: geologic map.

Figure 6 Legend



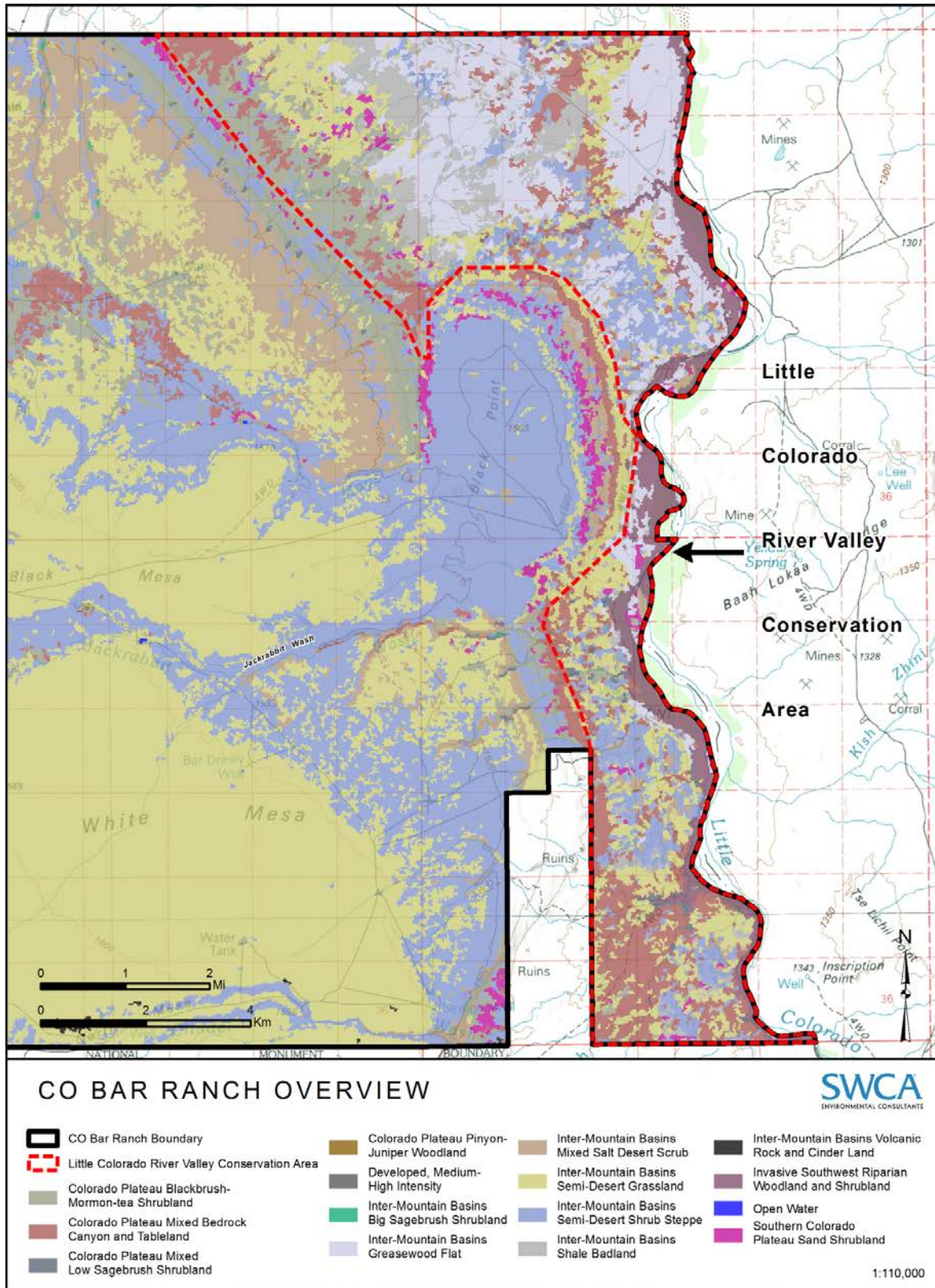


Figure 7. Little Colorado River Valley Conservation Area: vegetation map.



Little Colorado River Valley Conservation Area Restoration Project

EXISTING PLANS, REPORTS, INFORMATION RELEVANT TO THE PROJECT

- ❖ **Natural Resource Conservation Service Lomaki Soil Station Data** (United States Department of Agriculture, Natural Resource Conservation Service. 2017. Climate Station Lomaki, Flagstaff Soil Survey Office, Flagstaff, AZ. Unpublished.) – *This report contains soil climate data from a station in close proximity (northwest of Wupatki) to our South Unit (project site). This station is known as “Lomaki Soil Climate Station” for the name of a “type of soil;” the soil climate station is located at the “type location” soil pit for the Lomaki soil. Current data includes 2014-2016, but will be continually updated. Soil moisture is measured at three depths to 40 inches.*
- ❖ **Southwest Experimental Garden Array Soil Data** (United States Department of Agriculture, Natural Resource Conservation Service. 2017, Flagstaff Soil Survey Office, Flagstaff, AZ. In conjunction with Southwest Experimental Garden Array, at Little Colorado River site.) – *Soil profile descriptions at an adjacent parcel within the Little Colorado River Valley Conservation Area posted online at the Southwest Experimental Garden Array website: <https://sega.nau.edu/node/193>*
- ❖ **Babbitt Times Review FootNotes** – “Restoring Environmental Health to the Little Colorado River” feature story
- ❖ **Babbitt Ranches Noxious and Invasive Weed Strategic Plan**
- ❖ **Landward Foundation Documentation of IRS Tax-exempt Status**
- ❖ **Landward Foundation Board of Directors and Officers**
- ❖ **Landward Foundation Arizona Corporation Commission Certificate of Good Standing**
- ❖ **Landward Foundation Certificate of Insurance**
- ❖ **Documentation of Plans to Attain Burning Permit**
- ❖ **Landward Foundation Overview**
- ❖ **Conservation and Research on the Babbitt Ranches Overview**
- ❖ **Conservation and Research on the Babbitt Ranches Report**
- ❖ **CO Bar Ranch Land Use and Conservation Overview**



**AMERICAN CONSERVATION EXPERIENCE
2900 N Fort Valley Rd, Flagstaff
AZ 86001, USA**

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 4th, 2018

Dear Mr. Teran,

The Arizona Water Protection Fund Grant requires that all permits be gathered and approved for grant acceptance. We will be burning tamarisk slash piles created by the cut stump method of invasive plant control. I'm submitting this document to explain the absence of a burn permit with our grant. Burn permits, which include an air impact statement, smoke modeling, and burn plan, are renewed each year. According to our project timeline slash burning will occur more than a year from now.

Furthermore, we do not yet know the amount of tamarisk slash that we'll accumulate during the cut stump portion of this project (this will directly affect the burn plan and the amount of particulate matter we'll create). Therefore, we will submit our request once we have all available and up-to-date slash pile accumulation information. We'll submit our burn request to the Arizona Department of Environmental Quality (ADEQ). The process is as follows:

- 1) Arizona Department of Forestry and Fire Management (ADFFM) will create our burn plan once we've establish the amount of slash and number of piles created.
- 2) ADFFM will then submit the plan to ADEQ.
- 3) ADFFM will then request permission from ADEQ to burn the day before.
- 4) ADFFM will receive approval from ADEQ the morning of the burn.
- 5) ADFFM will then submit an accomplishment report to ADEQ for evaluation.

Thank you,

A handwritten signature in dark ink, appearing to read "Ian Torrence", is written over the typed name and title.

Ian Torrence
National Restoration Director
American Conservation Experience



Babbitt Ranches President and General Manager Bill Cordasco looks out over an area where tamarisk has been removed by American Conservation Experience workers so native cottonwood trees can grow. Photo courtesy ACE

Restoring Environmental Health to Little Colorado River

Babbitt Ranches strives to rid the Little Colorado River Conservation Area of invasive species, promote biodiversity and conduct environmental studies

Babbitt Ranches, together with Northern Arizona University (NAU) and the American Conservation Experience (ACE), has been engaged in efforts to restore northern Arizona’s Little Colorado riparian area, a major tributary of the Colorado River. Goals include removing invasive vegetation, protecting old growth cottonwood trees, planting seedlings, creating habitat for native and migrating birds, raising groundwater accessibility, decreasing the fire risk and conducting climate change research.

The group is fighting against a tenacious non-native tree that has gained a stubborn foothold throughout the West. Tamarisk, nicknamed salt cedar because of its rough salty leaves, was once an invited guest, welcomed by settlers. Farmers planted rows for wind breaks and residents liked the way it looked with its feathery pink blooms that could last from spring to fall.

The hardy, brushy trees did well in the harsh, desert climate. Too well. Today, the plant has become an enemy of the natural landscape, taking over soil once occupied by native plants like cottonwoods, and soaking up valuable water from streams and rivers.

Scientists say the impact has changed ecosystems. Where tamarisk moved in, many native plants moved out taking their valuable wildlife habitat with them, which had provided shelter for other vegetation and animals, particularly song birds and raptors.

ACE, a non-profit wildland restoration organization, has recently stepped in to cut down tamarisk and apply herbicide – the only way to prevent the invasive tree from re-sprouting. The volunteer effort was funded through a grant from the Nina Mason Pulliam Charitable Trust, matched by the Landsward Foundation, the non-profit branch of Babbitt Ranches that supports scientific endeavors, in cooperation with NAU.

“I can’t say enough about the hard work



The Little Colorado River is an important riparian zone for many desert plants and animals. Photo courtesy ACE



White cottonwood branches can be seen reaching through the green tangle of tamarisk on this stretch of the Little Colorado River on Babbitt Ranches in northeastern Arizona. Photo courtesy ACE

and stewardship of the amazing American Conservation Experience,” said Babbitt Ranches General Manger and President Bill Cordasco. “They showed up with the expertise necessary to tackle this immense project and recover the land so native plants can thrive and biodiversity can be restored.”

Within the cleared area, NAU excavated shallow ponds and established one of ten Southwest Experimental Garden Arrays (SEGA). The SEGA project, headed by biologist and Regents’ Professor Tom Whitham, Ph.D., allows researchers to study plants for their ecological and evolutionary responses to a changing climate. In this particularly area, more than 3,000 Fremont cottonwood saplings were planted around the groundwater collecting ponds.

In the past year, other volunteer groups, like students from High Tech High at Point Loma in San Diego, Calif., have participated in the conservation and research effort by planting trees along the banks of the Little Colorado on Babbitt Ranches. Philip Alioto, age 15, says the work was rewarding. “We’re helping these people predict the future because we’re finding trees from other regions and seeing if they’ll work here with these climate change predictions. It’s honestly really amazing because knowing that I helped make the future better is heartwarming.”

“Our riparian areas are so incredibly important to the health of the fragile desert environment,” said ACE’s National Restoration Director Ian Torrence. “The cottonwood community in particular is renowned for its high bird species diversity and abundance of forage and shelter value. Lofty cottonwoods are also used by nesting raptors and support other valuable riparian tree species like willow, box elder and oak.”

Torrence believes the Little Colorado restoration model can be reproduced by adjoining landowners such as the Navajo Nation, town of Cameron and Wupatki National Monument.

“We are so thrilled to have such wonderful support from Ian and others,” said Cordasco. “Their participation in the natural environment is a significant contribution to the Little Colorado River Conservation Area and fits perfectly with Babbitt Ranches’ objectives of promoting science and education, and managing natural resources.”



American Conservation Experience crews work to cut through the jungle of invasive tamarisk to reestablish ground for native species and wildlife habitat. Photo courtesy ACE



An American Conservation Experience crew cuts through the thick jungle of invasive non-native trees that has been out-competing native plants. Photo courtesy ACE

Cowboy Essence creates that peace of mind that comes from knowing our heritage and that we are at our best.

Through our efforts of learning and understanding, Babbitt Ranches, a family business and pioneering land company, raises livestock, manages natural resources, promotes science and participates in the broader community in order to join, share and do the very best we know how.

babbitranches.com

This document contains excerpts verifying our original IRS tax exemption, two organizational name changes, and associated articles of amendment confirming 501(c)(3) status

INTERNAL REVENUE SERVICE
P. O. BOX 2508
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: MAR 17 2003

COCONINO PLATEAU ENVIRONMENTAL
MONITORING AND ASSESSMENT
FOUNDATION
C/O MICHAEL MONGINI
HOFFORD, HORSTMAN, MONGINI, PARNELL & MC
323 NORTH LEROUX STREET
FLAGSTAFF, AZ 86002

Employer Identification Number:
66-0957662
DLN:
17053011009020
Contact Person:
RICHARD K DOLFI ID# 31363
Contact Telephone Number:
(877) 829-5500

Accounting Period Ending:
December 31
Addendum Applies:
No

Dear Applicant:

Based on information you supplied, and assuming your operations will be as stated in your application for recognition of exemption, we have determined you are exempt from federal income tax under section 501(a) of the Internal Revenue Code as an organization described in section 501(c)(3). We also determined that you are a private foundation within the meaning of section 509(a) of the Code.

Based on the information you submitted with your application, we have determined that you are likely to qualify as a private operating foundation described in section 4942(j)(3) of the Code. Accordingly, you are treated as a private operating foundation for your first year. After that, you will be treated as a private operating foundation as long as you continue to meet the requirements of section 4942(j)(3).

This ruling satisfies the good faith determination requirement of section 53.4942(b)-3(b)(2) of the Excise Tax Regulations.

Z. CORP. COMMISSION
FILED

OCT 24 2002

APPR.
TERM
DATE

16-24-02
0870592-8

EXPEDITED

ARTICLES OF AMENDMENT
OF

COCONINO PLATEAU ENVIRONMENTAL MONITORING
AND ASSESSMENT FOUNDATION

1. The name of the corporation is COCONINO PLATEAU MONITORING AND ASSESSMENT FOUNDATION.
2. Attached hereto as Exhibit A is the text of each amendment adopted.
3. The amendment was adopted the 4th day of October, 2002.
4. The amendment was duly adopted by act of the board of directors, and with approval, in writing, by the person or persons so specified in the corporation's Articles of Incorporation and Bylaws.

DATED as of this 21 day of October, 2002.

COCONINO PLATEAU ENVIRONMENTAL
MONITORING AND ASSESSMENT FOUNDATION

By: [Signature]
Its: President
Name: William C. Cordasco

EXHIBIT "A"

1. Article I shall be amended as follows: The name of the corporation, COCONINO PLATEAU ENVIRONMENTAL MONITORING AND ASSESSMENT FOUNDATION is being changed to ECOLOGICAL MONITORING AND ASSESSMENT FOUNDATION. *okmp*

2. Article II shall be amended as follows: The known place of business of this corporation shall be Northern Arizona University, Ashurst Hall, Room 109, Flagstaff, Arizona (P.O. Box 5845, Flagstaff, Arizona, 86011-5845), but it may establish other principal places of business and other offices at such other places, either within or without the State of Arizona, as the Board of Directors may from time to time determine.

2. Article III shall be amended to read as follows:

This corporation is organized and shall be operated as a nonprofit corporation solely and exclusively for charitable, educational and scientific purposes, and specifically to provide, through collection, monitoring and assessment of scientific data, baseline and continuing information relative to the biology, habitats, populations and other factors impacting the general environmental condition and quality of the land. This information will be provided to public and private landowners and managers to assist in understanding and protecting the long and short-term integrity and bio-diversity of this environment and the populations it supports. Without limiting the generality of the foregoing or the character of the affairs to be conducted by the corporation in the future, the corporation initially shall conduct the following business: The collection, monitoring and assessment of scientific data relative to the environment, the dissemination of this data and all business necessary therefore and necessary in accomplishing the purposes described above.

Consistent with the foregoing purposes and subject to all other limitations, restrictions and prohibitions set forth in these Articles, this corporation shall have all the powers specified in Section 10-2305 of the Arizona Revised Statutes, as amended from time to time, and to do all and every thing necessary, suitable and proper for the accomplishment of the purposes or attainment of the objects hereinabove set forth either alone or in association with other individuals, corporations or partnerships, including federal, state, county and municipal bodies and authorities; and, in general, to do and perform such acts and transact such business in connection with the foregoing objects not inconsistent with law; provided, however, that the corporation shall not perform any act or transact any business that will jeopardize the tax exempt status of the corporation under Section 501(c)(3) of the Internal Revenue Code and its regulations as such Section and regulations now exist or may hereafter be amended or under corresponding laws and regulations hereafter adopted.

3. Articles IV shall be deleted in its entirety and replaced with the following:

The Corporation shall be a nonprofit corporation under Internal Revenue Code Section 501(c)(3) and shall have no stock, and no dividends or pecuniary profits. No part of the net earnings of the corporation shall inure to the benefit of, or be distributable to its members, directors, officers, or other private persons, except that the corporation shall be authorized and

This document contains excerpts verifying our original IRS tax exemption, two organizational name changes, and associated articles of amendment confirming 501(c)(3) status

empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in ARTICLE III. No substantial part of the activities of the corporation shall be the carrying on of propaganda, or otherwise attempting to influence legislation, and the corporation shall not participate in, or intervene in (including the publishing or distribution of statements,) any political campaign on behalf of any candidate for public office. Notwithstanding any other provision of these Articles, the corporation shall not carry on any other activities not permitted to be carried on: (a) by a corporation exempt from Federal Income Tax Under the Internal Revenue Code Section 501(c)(3).

4. Article V shall be deleted in its entirety.
5. Article VII shall be deleted in its entirety.

ARTICLES OF AMENDMENT
OF
ECOLOGICAL MONITORING AND ASSESSMENT FOUNDATION

1. The name of the corporation is Ecological Monitoring and Assessment Foundation.
2. Attached hereto as Exhibit A is the text of each amendment adopted.
3. The amendment was adopted the 1st day of April, 2013.
4. The amendment was duly adopted by the act of the board of directors, and with approval, in writing by the person or persons so specified in the corporation's Articles of Incorporation and Bylaws.

DATED as of this 23rd day of April, 2013.

AZ CORPORATION COMMISSION
FILED

MAY 23 2013

FILE NO. -0870592-8

Ecological Monitoring and Assessment Foundation

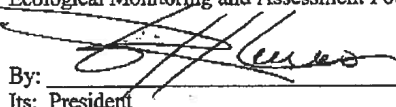
By: 
Its: President
Name: William Cordasco

EXHIBIT "A"

1. Article I shall be amended as follows: The name of the corporation, Ecological Monitoring and Assessment Foundation, is being changed to Landsward Foundation.
2. Article II shall be amended as follows: The known place of business of this corporation shall be 113 N. San Francisco Street, Suite 212, Flagstaff, Arizona, 86001 (P.O. Box 520, Flagstaff, Arizona 86002), but it may establish other principal places of business and other offices at such other places, either within or without the State of Arizona, as the Board of Directors may from time to time determine.



Landsward_{fdn}
SCIENCE RESEARCH ETHICS





Landsward

The Name

The name, **Landsward**, derives from the vision and mission of the **Foundation** to support the land use ethic and comprehensive land stewardship. *Steward* originates from the Old English terms *stig* (manor) and *ward* (guard), or one who minds the home and grounds of the landowner. In this sense, the compound term **Landsward** names the keeper of the land itself. It is the archaic term for **Landward**, used in navigation, a meaning appropriately echoed in the **Foundation's** purpose to provide vision and guidance toward the future of land stewardship. Finally, the Old English word *sward* denotes Earth or open land covered by grass.

The Colors



The colors of green, yellow, blue and white represent the life, energy, water and air of Earth's ecological processes.

The Leaf



The leaf stands for healthy, sustainable ecological processes, which must be valued and respected under the principles of a land use ethic.



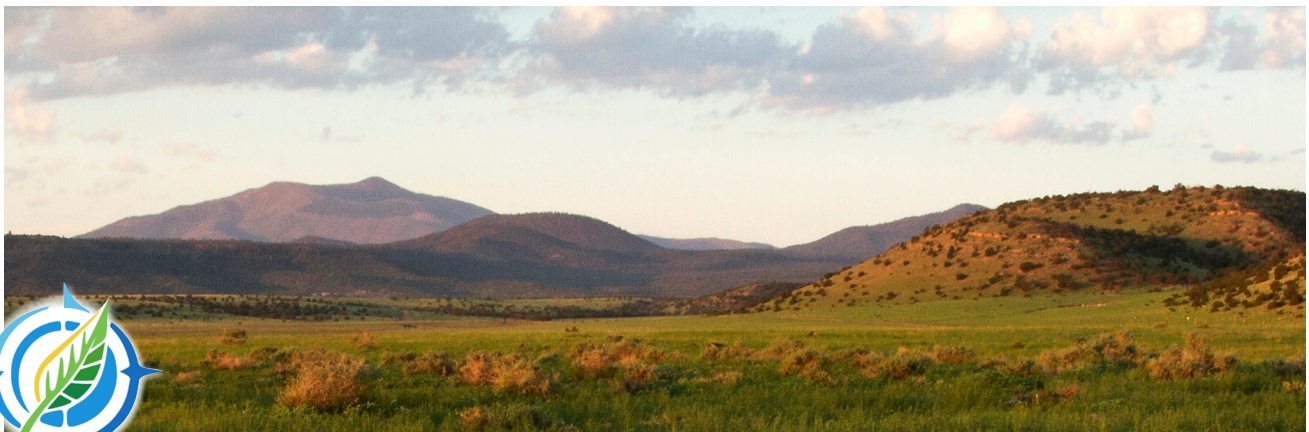
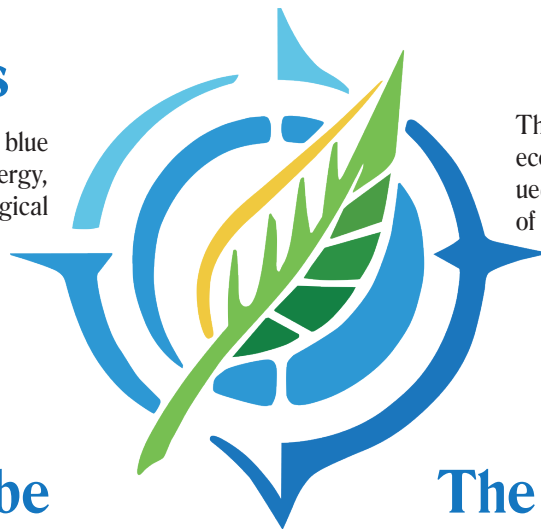
The Globe

The globe, with poles and an equator, references the worldwide implications of land stewardship and the **Foundation's** goal to disseminate knowledge and lessons learned from scientific research.

The Compass



The compass combines all elements into a tool that symbolizes our efforts to participate in the natural world. In the same way, the **Landsward Foundation** aims to acquire and provide knowledge to help direct society's continuing relationship with nature and the landscape.



Vision

The **Landward Foundation** will be the land use ethic model advancing the understanding of ecological, social and economic factors affecting the lands of the Coconino Plateau Region and the Little Colorado River Valley.

Mission

The **Landward Foundation** develops and promotes ecological and social science research so private landowners and managers will have the latest science-based information to support decisions and conservation practices.

Purpose

Our purpose is twofold:

Develop and disseminate scientific information that will increase awareness and understanding of ecological processes; and,

Facilitate and advance land use management based on a land use ethic, which places the long-term ecological health of the land as the primary objective, and takes into account the intimate relationships that exist between people and the natural world.

Goals and Objectives

Assess and monitor ecological processes, social dynamics and land use trends of the Coconino Plateau Region and the Little Colorado River Valley;

Integrate **Landward Foundation** research, education and outreach with other efforts in Northern Arizona;

Utilize an interdisciplinary Information Management System as a central source for comprehensive data on the natural resources of the Coconino Plateau Region and the Little Colorado River Valley; and,

Develop and implement education and outreach strategies to position the **Landward Foundation** as an example of land use ethic-based research, education and stewardship practices.



Overview

Landward Foundation is a 501(c)(3) organization that operates solely for charitable, educational and scientific endeavors. It provides scientific data, both baseline and range-shift information, about the biology, habitats, wildlife populations and general environmental condition and quality of the land. That information is disseminated to private and public landowners and managers to assist in understanding and protecting the short-term and long-term integrity and biodiversity of this environment.

The **Foundation** brings together researchers who share a common interest in understanding and sustaining the lands of the Coconino Plateau Region and the Little Colorado River Valley, and promoting environmental stewardship in conjunction with agricultural production and other land uses. Activities include: collecting and assessing scientific data relative to the environment, monitoring changes to the land, and disseminating information to private and public landowners and managers.

The **Foundation** serves as a liaison between landowners, land use managers and the scientific community. Its relationship with land managers is summarized through a Statement of Awareness. This serves as an acknowledgment to operate with the utmost consideration for each other when making decisions and taking action. The Statement recognizes a responsibility and obligation to the broad regional perspective, appreciating that quality regional planning begins by honoring relationships through our behavior and decisions, recognizing that we are separate, yet connected. As such, we will remain aware of others' goals and objectives as we work together and independently to be effective land stewards today while setting the standard for future generations.



History

The **Landsward Foundation** evolved with a conservation and land management philosophy of “Just Participate!” This approach to land and resource stewardship emphasizes an attitude of participation through efforts of learning and understanding in order to be better able to join, share and be a part of the land’s ecological processes.

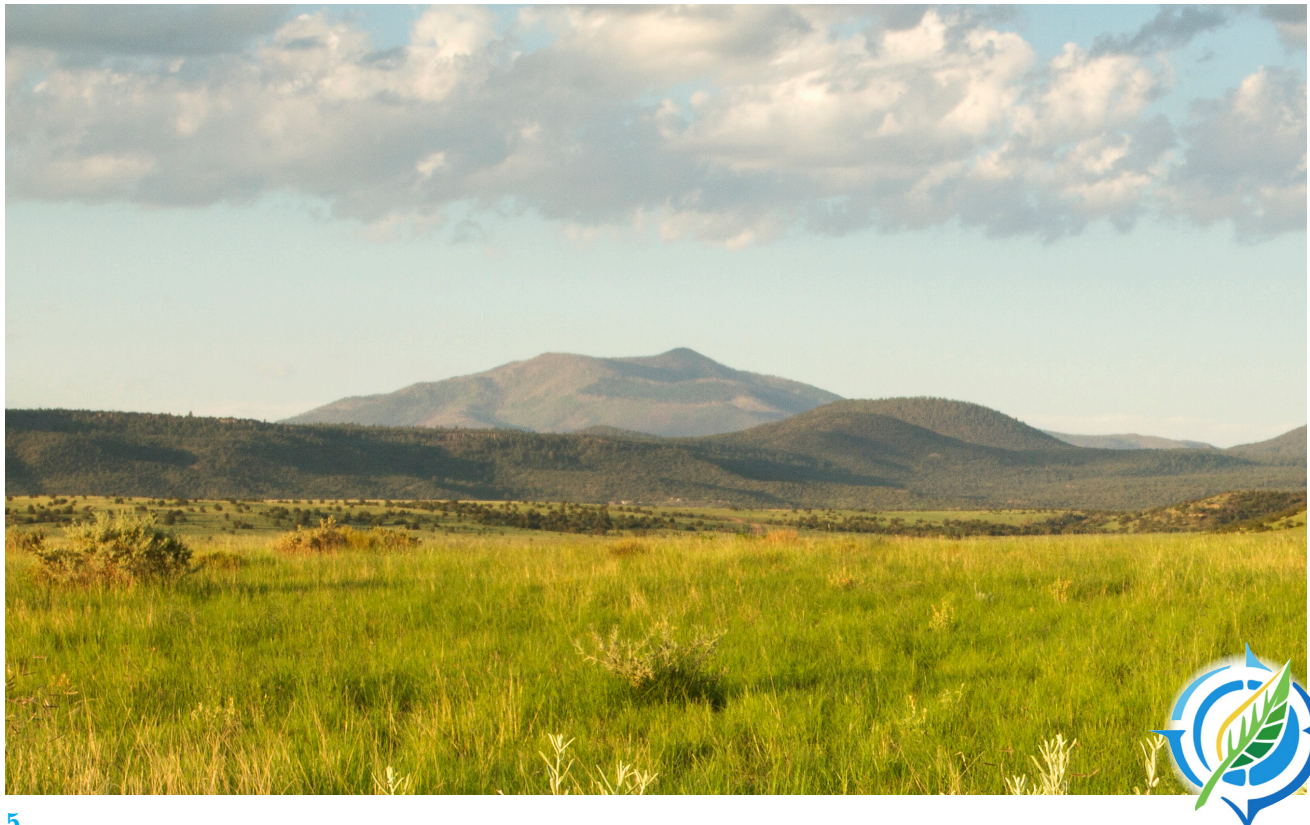
Additionally, an awareness and appreciation of the first biological survey of the San Francisco mountain area—conducted in 1889-‘90 by Dr. C. Hart Merriam—inspired a similar comprehensive biological assessment of the Coconino Plateau Region and the Little Colorado River Valley in the early 1990s. The intent was to collect information as a benchmark for understanding the ecological processes and human impacts on these lands.

The Ecological Monitoring & Assessment Foundation, (EMA), was created to integrate science and research in one place. And, a foundation was envisioned to benefit other private landowners in the Coconino Plateau Region and the Little Colorado River Valley.

In the year 2000, EMA donated a Conservation Easement to The Nature Conservancy and to Coconino County totaling 45,000 acres in an effort to preserve open space for the enjoyment of future generations. With this donation, the Foundation was assigned the responsibility of monitoring and assessing the conservation lands.

In spring 2002, the EMA Foundation, along with research access to lands across the Coconino Plateau and a 24-acre parcel of Wild Bill Ranch Camp for an ecological center, were gifted to Northern Arizona University.

Since then, EMA’s name has been changed to the **Landsward Foundation**. Today it operates as an independent non-profit organization. The intent continues to be to provide learning and teaching opportunities so private landowners have the benefit of advanced scientific data to guide decisions about their lands.



Land Use Ethic Philosophy

The philosophy of the **Foundation** is based upon the concept of a land use ethic that has evolved from the writings of Aldo Leopold, defining the relationship between humankind and the earth. It broadens our concept of the land to be inclusive of humans and our impact on the complex community of the environment. This concept of the land serves as a platform from which the land use ethic grows.

Land Use Ethics of Aldo Leopold

A land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such.

The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively, the land.

The land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity. It is inconceivable to me an ethical relation to land can exist without love, and a high regard for its value. By value, I of course mean something far broader than mere economic value; I mean value in the philosophical sense.

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.

Whatever may be the equation for men and land, it is improbable we as yet know all its terms.

The answer, if there is any, seems to be in a land ethic, or some other force which assigns more obligations to the private landowner.

An ethical obligation on the part of the private landowner is the only visible remedy for these situations.



Conservation Philosophy

While the meaning of the word “conservation” may appear to be self-evident, to the people of **Landward** it signifies something more complex than the simple act of “preserving.” The term “conservation” encapsulates a relationship with the land that has developed out of more than 125 years of working on, and with, the natural world.

This relationship is a process, which takes place within each of us and must begin with an *awareness* of the land and its ecological processes and a desire to understand and appreciate land’s essential values. This *awareness* then promotes a sense of *responsibility* and *obligation* to acknowledge these values and to be *accountable* for our actions as those actions affect the plant, wildlife and other land communities and the land’s productivity to meet human needs.

Recognizing our place within the land community, we become willing to further embrace these values; the result is good land stewardship. The process is circular. The more we interact with and understand the land, the more we value the land’s complex ecological processes. This relationship is what is meant by “conservation.”

Landward further defines this relationship through its Generations Sustainability Sciences Program, which is a framework by which the stakeholders make land use decisions. The goal of the program is to affect a land use ethic as landowners have science-based knowledge and technologies to inform sound stewardship and conservation of their lands, and the natural and cultural resources. The focus areas of the Generations Sustainability Sciences Program include:

- Land Use Ethic
- Social Dynamics and Relationships
- Sustainability Practices
- Living Off Interest, Not Principal*
- Cross-Disciplinary Research
- Blending Natural and Social Sciences
- Science and a Sense of Art
- Information Dissemination
- Regional Planning



Landward Structure

Organization

The **Foundation** is guided by a Board of Directors made up of representatives from the regional landowner and science community. The Board meets approximately two times per year.

Administration

The **Landward Foundation** is responsible for securing funding for programs and operations, administering contracts, providing administrative management for programs and research projects, and ensuring the vision, mission and goals of the **Foundation** are met. In addition, administrators will work to ensure that the Coconino Plateau Region and Little Colorado River Valley landowners and resource managers have early access to research findings, and that publication timelines do not unnecessarily delay the sharing of findings with vested stakeholders.



Landward Discovery Community

The **Landward Discovery Community** is made up of advisors who serve to provide perspective and direction on the ecological and social science components of the **Landward Foundation Generations Sustainability Sciences Program**.



Landward Discovery Community Purpose

Provide vision and direction to the **Foundation**;

Advise the **Foundation** on research priorities and protocols in order to advance ecological and social science land use ethic research and resource conservation;

Ensure diverse perspectives are considered on the environmental and social science principles of land use ethic research; and,

Present insight on the scientific issues of the day.



Research

The **Landward Foundation** conducts a wide variety of scientific research to understand and minimize threats to natural resources. These include projects focused on: protecting the integrity of ecological processes from range-shift conditions caused by climate changes, invasive non-indigenous species, or contaminants; forest and grassland health; habitat loss and fragmentation; and wildlife populations.

Species of special interest to **Landward** include the golden eagle, American pronghorn, the endangered black-footed ferret, Gunnison's prairie dog, the ferruginous hawk, and the endangered Fickeisen plains cactus. The **Landward Foundation** provides guidelines for managing and monitoring these species, as well as conservation objectives and strategies. **Landward** also monitors the natural and cultural resource qualities of the Coconino Plateau Region and the Little Colorado River Valley, including the geology, soils, hydrology and archaeology.

The Antelope Prairie Ecological Research Area has been established through 2019 for the purpose of studying all of these natural and cultural resources.

Along with Northern Arizona University researchers, **Landward** facilitates inventory studies and research in the San Juan River corridor; avian and bat surveys along the San Juan, Fossil Creek and Verde rivers; and, bird habitat research in the Verde River riparian zone at Camp Verde.

Through an agreement with NAU, two **Landward** biological research field stations—Blue Chute and Black Point—are being used to study how genetic variation in plants can help them adapt to a changing environment through the Southwestern Experimental Garden Array (SEGA).

The Wild Bill Ranch Camp in the Coconino National Forest also is a **Landward** ecological site.

With a climate data collection station on the Cataract Ranch, **Landward** supports sophisticated climate studies being conducted by the National Oceanic and Atmospheric Administration (NOAA). The weather station, part of the Climate Research Network (CRN), is the only site of its kind located in Northern Arizona.

Research partners include local, state and federal governmental agencies, agricultural and conservation organizations, universities and institutes.







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8/2/2014 0:00	2014	213	0	213	8/1/2014	12.69
8/2/2014 1:00	2014	213	100	213.041667	8/1/2014	12.67
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8/2/2014 20:00	2014	214	2000	214.833333	8/2/2014	12.76
8/2/2014 21:00	2014	214	2100	214.875	8/2/2014	12.73
8/2/2014 22:00	2014	214	2200	214.916667	8/2/2014	12.71
8/2/2014 23:00	2014	214	2300	214.958333	8/2/2014	12.69
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8/3/2014 17:00	2014	215	1700	215.708333	8/3/2014	13.22
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8/3/2014 19:00	2014	215	1900	215.791667	8/3/2014	13.15
8/3/2014 20:00	2014	215	2000	215.833333	8/3/2014	12.86
8/3/2014 21:00	2014	215	2100	215.875	8/3/2014	12.78
8/3/2014 22:00	2014	215	2200	215.916667	8/3/2014	12.76
8/3/2014 23:00	2014	215	2300	215.958333	8/3/2014	12.74
8/4/2014 0:00	2014	215	0	215	8/3/2014	12.72
8/4/2014 1:00	2014	215	100	215.041667	8/3/2014	12.7
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8/4/2014 5:00	2014	215	500	215.208333	8/3/2014	12.62
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8/4/2014 7:00	2014	215	700	215.291667	8/3/2014	12.73
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8/4/2014 14:00	2014	216	1400	216.583333	8/4/2014	13.13
8/4/2014 15:00	2014	216	1500	216.625	8/4/2014	13.14
8/4/2014 16:00	2014	216	1600	216.666667	8/4/2014	13.13
8/4/2014 17:00	2014	216	1700	216.708333	8/4/2014	13.14
8/4/2014 18:00	2014	216	1800	216.75	8/4/2014	13.13
8/4/2014 19:00	2014	216	1900	216.791667	8/4/2014	13.01
8/4/2014 20:00	2014	216	2000	216.833333	8/4/2014	12.83
8/4/2014 21:00	2014	216	2100	216.875	8/4/2014	12.77
8/4/2014 22:00	2014	216	2200	216.916667	8/4/2014	12.74
8/4/2014 23:00	2014	216	2300	216.958333	8/4/2014	12.72
8/5/2014 0:00	2014	216	0	216	8/4/2014	12.7
8/5/2014 1:00	2014	216	100	216.041667	8/4/2014	12.68
8/5/2014 2:00	2014	216	200	216.083333	8/4/2014	12.66
8/5/2014 3:00	2014	216	300	216.125	8/4/2014	12.64
8/5/2014 4:00	2014	216	400	216.166667	8/4/2014	12.62
8/5/2014 5:00	2014	216	500	216.208333	8/4/2014	12.59
8/5/2014 6:00	2014	216	600	216.25	8/4/2014	12.58
8/5/2014 7:00	2014	216	700	216.291667	8/4/2014	12.7
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8/5/2014 10:00	2014	216	1000	216.416667	8/4/2014	13.23
8/5/2014 11:00	2014	216	1100	216.458333	8/4/2014	13.19
8/5/2014 12:00	2014	217	1200	217.5	8/5/2014	13.15
8/5/2014 13:00	2014	217	1300	217.541667	8/5/2014	13.11
8/5/2014 14:00	2014	217	1400	217.583333	8/5/2014	13.09
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8/5/2014 18:00	2014	217	1800	217.75	8/5/2014	13.11
8/5/2014 19:00	2014	217	1900	217.791667	8/5/2014	13.01
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8/5/2014 21:00	2014	217	2100	217.875	8/5/2014	12.77
8/5/2014 22:00	2014	217	2200	217.916667	8/5/2014	12.74
8/5/2014 23:00	2014	217	2300	217.958333	8/5/2014	12.73
8/6/2014 0:00	2014	217	0	217	8/5/2014	12.71
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8/6/2014 5:00	2014	217	500	217.208333	8/5/2014	12.6
8/6/2014 6:00	2014	217	600	217.25	8/5/2014	12.58
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8/6/2014 20:00	2014	218	2000	218.833333	8/6/2014	12.83
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8/6/2014 23:00	2014	218	2300	218.958333	8/6/2014	12.72
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8/7/2014 4:00	2014	218	400	218.166667	8/6/2014	12.62
8/7/2014 5:00	2014	218	500	218.208333	8/6/2014	12.6
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8/7/2014 8:00	2014	218	800	218.333333	8/6/2014	13.2
8/7/2014 9:00	2014	218	900	218.375	8/6/2014	13.23
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8/7/2014 12:00	2014	219	1200	219.5	8/7/2014	13.11
8/7/2014 13:00	2014	219	1300	219.541667	8/7/2014	13.08
8/7/2014 14:00	2014	219	1400	219.583333	8/7/2014	13.07
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8/7/2014 22:00	2014	219	2200	219.916667	8/7/2014	12.75
8/7/2014 23:00	2014	219	2300	219.958333	8/7/2014	12.73
8/8/2014 0:00	2014	219	0	219	8/7/2014	12.71
8/8/2014 1:00	2014	219	100	219.041667	8/7/2014	12.69
8/8/2014 2:00	2014	219	200	219.083333	8/7/2014	12.68
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8/8/2014 4:00	2014	219	400	219.166667	8/7/2014	12.64
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8/8/2014 21:00	2014	220	2100	220.875	8/8/2014	12.77
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8/8/2014 23:00	2014	220	2300	220.958333	8/8/2014	12.72
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8/9/2014 1:00	2014	220	100	220.041667	8/8/2014	12.69
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8/10/2014 1:00	2014	221	100	221.041667	8/9/2014	12.7
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8/10/2014 3:00	2014	221	300	221.125	8/9/2014	12.67
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8/10/2014 19:00	2014	222	1900	222.791667	8/10/2014	12.94
8/10/2014 20:00	2014	222	2000	222.833333	8/10/2014	12.81
8/10/2014 21:00	2014	222	2100	222.875	8/10/2014	12.76
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8/11/2014 1:00	2014	222	100	222.041667	8/10/2014	12.68
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8/11/2014 7:00	2014	222	700	222.291667	8/10/2014	12.75
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8/11/2014 13:00	2014	223	1300	223.541667	8/11/2014	13.08
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8/11/2014 19:00	2014	223	1900	223.791667	8/11/2014	13
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8/11/2014 21:00	2014	223	2100	223.875	8/11/2014	12.75
8/11/2014 22:00	2014	223	2200	223.916667	8/11/2014	12.72
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8/12/2014 2:00	2014	223	200	223.083333	8/11/2014	12.65
8/12/2014 3:00	2014	223	300	223.125	8/11/2014	12.63
8/12/2014 4:00	2014	223	400	223.166667	8/11/2014	12.61
8/12/2014 5:00	2014	223	500	223.208333	8/11/2014	12.59
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8/12/2014 13:00	2014	224	1300	224.541667	8/12/2014	13.17
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8/12/2014 15:00	2014	224	1500	224.625	8/12/2014	13.12
8/12/2014 16:00	2014	224	1600	224.666667	8/12/2014	13.17
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8/12/2014 19:00	2014	224	1900	224.791667	8/12/2014	12.85
8/12/2014 20:00	2014	224	2000	224.833333	8/12/2014	12.78
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8/12/2014 22:00	2014	224	2200	224.916667	8/12/2014	12.72
8/12/2014 23:00	2014	224	2300	224.958333	8/12/2014	12.7
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8/13/2014 10:00	2014	224	1000	224.416667	8/12/2014	13.27
8/13/2014 11:00	2014	224	1100	224.458333	8/12/2014	13.34
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8/13/2014 13:00	2014	225	1300	225.541667	8/13/2014	13.29
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8/13/2014 15:00	2014	225	1500	225.625	8/13/2014	13.25
8/13/2014 16:00	2014	225	1600	225.666667	8/13/2014	13.25
8/13/2014 17:00	2014	225	1700	225.708333	8/13/2014	13.25
8/13/2014 18:00	2014	225	1800	225.75	8/13/2014	13.27
8/13/2014 19:00	2014	225	1900	225.791667	8/13/2014	13.05
8/13/2014 20:00	2014	225	2000	225.833333	8/13/2014	12.83
8/13/2014 21:00	2014	225	2100	225.875	8/13/2014	12.78
8/13/2014 22:00	2014	225	2200	225.916667	8/13/2014	12.76
8/13/2014 23:00	2014	225	2300	225.958333	8/13/2014	12.74
8/14/2014 0:00	2014	225	0	225	8/13/2014	12.72
8/14/2014 1:00	2014	225	100	225.041667	8/13/2014	12.7
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8/14/2014 3:00	2014	225	300	225.125	8/13/2014	12.66
8/14/2014 4:00	2014	225	400	225.166667	8/13/2014	12.63
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8/14/2014 10:00	2014	225	1000	225.416667	8/13/2014	13.25
8/14/2014 11:00	2014	225	1100	225.458333	8/13/2014	13.19
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8/14/2014 14:00	2014	226	1400	226.583333	8/14/2014	13.22
8/14/2014 15:00	2014	226	1500	226.625	8/14/2014	13.24
8/14/2014 16:00	2014	226	1600	226.666667	8/14/2014	13.25
8/14/2014 17:00	2014	226	1700	226.708333	8/14/2014	13.2
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8/14/2014 19:00	2014	226	1900	226.791667	8/14/2014	13.01
8/14/2014 20:00	2014	226	2000	226.833333	8/14/2014	12.81
8/14/2014 21:00	2014	226	2100	226.875	8/14/2014	12.77
8/14/2014 22:00	2014	226	2200	226.916667	8/14/2014	12.75
8/14/2014 23:00	2014	226	2300	226.958333	8/14/2014	12.73
8/15/2014 0:00	2014	226	0	226	8/14/2014	12.72
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8/15/2014 13:00	2014	227	1300	227.541667	8/15/2014	13.13
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8/15/2014 21:00	2014	227	2100	227.875	8/15/2014	12.78
8/15/2014 22:00	2014	227	2200	227.916667	8/15/2014	12.75
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8/16/2014 0:00	2014	227	0	227	8/15/2014	12.72
8/16/2014 1:00	2014	227	100	227.041667	8/15/2014	12.7
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8/16/2014 8:00	2014	227	800	227.333333	8/15/2014	13.2
8/16/2014 9:00	2014	227	900	227.375	8/15/2014	13.24
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8/16/2014 20:00	2014	228	2000	228.833333	8/16/2014	12.82
8/16/2014 21:00	2014	228	2100	228.875	8/16/2014	12.77
8/16/2014 22:00	2014	228	2200	228.916667	8/16/2014	12.74
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8/17/2014 0:00	2014	228	0	228	8/16/2014	12.7
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8/17/2014 10:00	2014	228	1000	228.416667	8/16/2014	13.17
8/17/2014 11:00	2014	228	1100	228.458333	8/16/2014	13.12
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8/17/2014 13:00	2014	229	1300	229.541667	8/17/2014	13.06
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8/17/2014 20:00	2014	229	2000	229.833333	8/17/2014	12.81
8/17/2014 21:00	2014	229	2100	229.875	8/17/2014	12.76
8/17/2014 22:00	2014	229	2200	229.916667	8/17/2014	12.73
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8/18/2014 9:00	2014	229	900	229.375	8/17/2014	13.22
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8/18/2014 22:00	2014	230	2200	230.916667	8/18/2014	12.7
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8/19/2014 0:00	2014	230	0	230	8/18/2014	12.66
8/19/2014 1:00	2014	230	100	230.041667	8/18/2014	12.64
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8/19/2014 3:00	2014	230	300	230.125	8/18/2014	12.59
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8/19/2014 9:00	2014	230	900	230.375	8/18/2014	13.26
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8/19/2014 11:00	2014	230	1100	230.458333	8/18/2014	13.3
8/19/2014 12:00	2014	231	1200	231.5	8/19/2014	13.28
8/19/2014 13:00	2014	231	1300	231.541667	8/19/2014	13.28
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8/19/2014 17:00	2014	231	1700	231.708333	8/19/2014	13.24
8/19/2014 18:00	2014	231	1800	231.75	8/19/2014	13.27
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8/19/2014 20:00	2014	231	2000	231.833333	8/19/2014	12.8
8/19/2014 21:00	2014	231	2100	231.875	8/19/2014	12.76
8/19/2014 22:00	2014	231	2200	231.916667	8/19/2014	12.75
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8/20/2014 0:00	2014	231	0	231	8/19/2014	12.72
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8/20/2014 5:00	2014	231	500	231.208333	8/19/2014	12.62
8/20/2014 6:00	2014	231	600	231.25	8/19/2014	12.6
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8/20/2014 18:00	2014	232	1800	232.75	8/20/2014	13.07
8/20/2014 19:00	2014	232	1900	232.791667	8/20/2014	13.04
8/20/2014 20:00	2014	232	2000	232.833333	8/20/2014	12.8
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8/20/2014 22:00	2014	232	2200	232.916667	8/20/2014	12.72
8/20/2014 23:00	2014	232	2300	232.958333	8/20/2014	12.7
8/21/2014 0:00	2014	232	0	232	8/20/2014	12.69
8/21/2014 1:00	2014	232	100	232.041667	8/20/2014	12.67
8/21/2014 2:00	2014	232	200	232.083333	8/20/2014	12.66
8/21/2014 3:00	2014	232	300	232.125	8/20/2014	12.64
8/21/2014 4:00	2014	232	400	232.166667	8/20/2014	12.62
8/21/2014 5:00	2014	232	500	232.208333	8/20/2014	12.6
8/21/2014 6:00	2014	232	600	232.25	8/20/2014	12.58
8/21/2014 7:00	2014	232	700	232.291667	8/20/2014	12.62
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8/21/2014 9:00	2014	232	900	232.375	8/20/2014	13.35
8/21/2014 10:00	2014	232	1000	232.416667	8/20/2014	13.28
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8/21/2014 19:00	2014	233	1900	233.791667	8/21/2014	12.79
8/21/2014 20:00	2014	233	2000	233.833333	8/21/2014	12.74
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8/21/2014 22:00	2014	233	2200	233.916667	8/21/2014	12.7
8/21/2014 23:00	2014	233	2300	233.958333	8/21/2014	12.69
8/22/2014 0:00	2014	233	0	233	8/21/2014	12.67
8/22/2014 1:00	2014	233	100	233.041667	8/21/2014	12.64

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8/22/2014 5:00	2014	233	500	233.208333	8/21/2014	12.55
8/22/2014 6:00	2014	233	600	233.25	8/21/2014	12.54
8/22/2014 7:00	2014	233	700	233.291667	8/21/2014	12.56
8/22/2014 8:00	2014	233	800	233.333333	8/21/2014	12.73
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8/22/2014 12:00	2014	234	1200	234.5	8/22/2014	13.21
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8/22/2014 14:00	2014	234	1400	234.583333	8/22/2014	13.2
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8/22/2014 19:00	2014	234	1900	234.791667	8/22/2014	12.97
8/22/2014 20:00	2014	234	2000	234.833333	8/22/2014	12.81
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8/22/2014 22:00	2014	234	2200	234.916667	8/22/2014	12.74
8/22/2014 23:00	2014	234	2300	234.958333	8/22/2014	12.71
8/23/2014 0:00	2014	234	0	234	8/22/2014	12.69
8/23/2014 1:00	2014	234	100	234.041667	8/22/2014	12.68
8/23/2014 2:00	2014	234	200	234.083333	8/22/2014	12.66
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8/23/2014 4:00	2014	234	400	234.166667	8/22/2014	12.62
8/23/2014 5:00	2014	234	500	234.208333	8/22/2014	12.59
8/23/2014 6:00	2014	234	600	234.25	8/22/2014	12.56
8/23/2014 7:00	2014	234	700	234.291667	8/22/2014	12.65
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8/23/2014 9:00	2014	234	900	234.375	8/22/2014	13.31
8/23/2014 10:00	2014	234	1000	234.416667	8/22/2014	13.26
8/23/2014 11:00	2014	234	1100	234.458333	8/22/2014	13.21
8/23/2014 12:00	2014	235	1200	235.5	8/23/2014	13.16
8/23/2014 13:00	2014	235	1300	235.541667	8/23/2014	13.13
8/23/2014 14:00	2014	235	1400	235.583333	8/23/2014	13.12
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8/23/2014 18:00	2014	235	1800	235.75	8/23/2014	13.14
8/23/2014 19:00	2014	235	1900	235.791667	8/23/2014	12.98
8/23/2014 20:00	2014	235	2000	235.833333	8/23/2014	12.81
8/23/2014 21:00	2014	235	2100	235.875	8/23/2014	12.76
8/23/2014 22:00	2014	235	2200	235.916667	8/23/2014	12.74
8/23/2014 23:00	2014	235	2300	235.958333	8/23/2014	12.71
8/24/2014 0:00	2014	235	0	235	8/23/2014	12.69

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8/24/2014 4:00	2014	235	400	235.166667	8/23/2014	12.61
8/24/2014 5:00	2014	235	500	235.208333	8/23/2014	12.59
8/24/2014 6:00	2014	235	600	235.25	8/23/2014	12.57
8/24/2014 7:00	2014	235	700	235.291667	8/23/2014	12.66
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8/24/2014 10:00	2014	235	1000	235.416667	8/23/2014	13.23
8/24/2014 11:00	2014	235	1100	235.458333	8/23/2014	13.2
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9/4/2014 11:00	2014	246	1100	246.458333	9/3/2014	13.23
9/4/2014 12:00	2014	247	1200	247.5	9/4/2014	13.27
9/4/2014 13:00	2014	247	1300	247.541667	9/4/2014	13.29
9/4/2014 14:00	2014	247	1400	247.583333	9/4/2014	13.32
9/4/2014 15:00	2014	247	1500	247.625	9/4/2014	13.28
9/4/2014 16:00	2014	247	1600	247.666667	9/4/2014	13.23
9/4/2014 17:00	2014	247	1700	247.708333	9/4/2014	13.23
9/4/2014 18:00	2014	247	1800	247.75	9/4/2014	13.2

9/4/2014 19:00	2014	247	1900	247.791667	9/4/2014	12.94
9/4/2014 20:00	2014	247	2000	247.833333	9/4/2014	12.8
9/4/2014 21:00	2014	247	2100	247.875	9/4/2014	12.76
9/4/2014 22:00	2014	247	2200	247.916667	9/4/2014	12.73
9/4/2014 23:00	2014	247	2300	247.958333	9/4/2014	12.71
9/5/2014 0:00	2014	247	0	247	9/4/2014	12.69
9/5/2014 1:00	2014	247	100	247.041667	9/4/2014	12.67
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9/5/2014 4:00	2014	247	400	247.166667	9/4/2014	12.6
9/5/2014 5:00	2014	247	500	247.208333	9/4/2014	12.57
9/5/2014 6:00	2014	247	600	247.25	9/4/2014	12.54
9/5/2014 7:00	2014	247	700	247.291667	9/4/2014	12.66
9/5/2014 8:00	2014	247	800	247.333333	9/4/2014	13.41
9/5/2014 9:00	2014	247	900	247.375	9/4/2014	13.35
9/5/2014 10:00	2014	247	1000	247.416667	9/4/2014	13.27
9/5/2014 11:00	2014	247	1100	247.458333	9/4/2014	13.2
9/5/2014 12:00	2014	248	1200	248.5	9/5/2014	13.14
9/5/2014 13:00	2014	248	1300	248.541667	9/5/2014	13.1
9/5/2014 14:00	2014	248	1400	248.583333	9/5/2014	13.1
9/5/2014 15:00	2014	248	1500	248.625	9/5/2014	13.11
9/5/2014 16:00	2014	248	1600	248.666667	9/5/2014	13.14
9/5/2014 17:00	2014	248	1700	248.708333	9/5/2014	13.19
9/5/2014 18:00	2014	248	1800	248.75	9/5/2014	13.16
9/5/2014 19:00	2014	248	1900	248.791667	9/5/2014	12.93
9/5/2014 20:00	2014	248	2000	248.833333	9/5/2014	12.8
9/5/2014 21:00	2014	248	2100	248.875	9/5/2014	12.76
9/5/2014 22:00	2014	248	2200	248.916667	9/5/2014	12.73
9/5/2014 23:00	2014	248	2300	248.958333	9/5/2014	12.71
9/6/2014 0:00	2014	248	0	248	9/5/2014	12.7
9/6/2014 1:00	2014	248	100	248.041667	9/5/2014	12.68
9/6/2014 2:00	2014	248	200	248.083333	9/5/2014	12.67
9/6/2014 3:00	2014	248	300	248.125	9/5/2014	12.65
9/6/2014 4:00	2014	248	400	248.166667	9/5/2014	12.63
9/6/2014 5:00	2014	248	500	248.208333	9/5/2014	12.61
9/6/2014 6:00	2014	248	600	248.25	9/5/2014	12.58
9/6/2014 7:00	2014	248	700	248.291667	9/5/2014	12.71
9/6/2014 8:00	2014	248	800	248.333333	9/5/2014	13.35
9/6/2014 9:00	2014	248	900	248.375	9/5/2014	13.28
9/6/2014 10:00	2014	248	1000	248.416667	9/5/2014	13.21
9/6/2014 11:00	2014	248	1100	248.458333	9/5/2014	13.16
9/6/2014 12:00	2014	249	1200	249.5	9/6/2014	13.12
9/6/2014 13:00	2014	249	1300	249.541667	9/6/2014	13.08
9/6/2014 14:00	2014	249	1400	249.583333	9/6/2014	13.09
9/6/2014 15:00	2014	249	1500	249.625	9/6/2014	13.08
9/6/2014 16:00	2014	249	1600	249.666667	9/6/2014	13.13
9/6/2014 17:00	2014	249	1700	249.708333	9/6/2014	13.18

9/6/2014 18:00	2014	249	1800	249.75	9/6/2014	13.13
9/6/2014 19:00	2014	249	1900	249.791667	9/6/2014	12.89
9/6/2014 20:00	2014	249	2000	249.833333	9/6/2014	12.79
9/6/2014 21:00	2014	249	2100	249.875	9/6/2014	12.76
9/6/2014 22:00	2014	249	2200	249.916667	9/6/2014	12.73
9/6/2014 23:00	2014	249	2300	249.958333	9/6/2014	12.71
9/7/2014 0:00	2014	249	0	249	9/6/2014	12.7
9/7/2014 1:00	2014	249	100	249.041667	9/6/2014	12.67
9/7/2014 2:00	2014	249	200	249.083333	9/6/2014	12.65
9/7/2014 3:00	2014	249	300	249.125	9/6/2014	12.63
9/7/2014 4:00	2014	249	400	249.166667	9/6/2014	12.61
9/7/2014 5:00	2014	249	500	249.208333	9/6/2014	12.6
9/7/2014 6:00	2014	249	600	249.25	9/6/2014	12.58
9/7/2014 7:00	2014	249	700	249.291667	9/6/2014	12.62
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9/7/2014 9:00	2014	249	900	249.375	9/6/2014	13.31
9/7/2014 10:00	2014	249	1000	249.416667	9/6/2014	13.28
9/7/2014 11:00	2014	249	1100	249.458333	9/6/2014	13.24
9/7/2014 12:00	2014	250	1200	250.5	9/7/2014	13.18
9/7/2014 13:00	2014	250	1300	250.541667	9/7/2014	13.2
9/7/2014 14:00	2014	250	1400	250.583333	9/7/2014	13.24
9/7/2014 15:00	2014	250	1500	250.625	9/7/2014	13.2
9/7/2014 16:00	2014	250	1600	250.666667	9/7/2014	13.18
9/7/2014 17:00	2014	250	1700	250.708333	9/7/2014	13.09
9/7/2014 18:00	2014	250	1800	250.75	9/7/2014	12.85
9/7/2014 19:00	2014	250	1900	250.791667	9/7/2014	12.78
9/7/2014 20:00	2014	250	2000	250.833333	9/7/2014	12.75
9/7/2014 21:00	2014	250	2100	250.875	9/7/2014	12.73
9/7/2014 22:00	2014	250	2200	250.916667	9/7/2014	12.71
9/7/2014 23:00	2014	250	2300	250.958333	9/7/2014	12.69
9/8/2014 0:00	2014	250	0	250	9/7/2014	12.67
9/8/2014 1:00	2014	250	100	250.041667	9/7/2014	12.65
9/8/2014 2:00	2014	250	200	250.083333	9/7/2014	12.63
9/8/2014 3:00	2014	250	300	250.125	9/7/2014	12.61
9/8/2014 4:00	2014	250	400	250.166667	9/7/2014	12.58
9/8/2014 5:00	2014	250	500	250.208333	9/7/2014	12.56
9/8/2014 6:00	2014	250	600	250.25	9/7/2014	12.55
9/8/2014 7:00	2014	250	700	250.291667	9/7/2014	12.57
9/8/2014 8:00	2014	250	800	250.333333	9/7/2014	12.65
9/8/2014 9:00	2014	250	900	250.375	9/7/2014	13.24
9/8/2014 10:00	2014	250	1000	250.416667	9/7/2014	13.3
9/8/2014 11:00	2014	250	1100	250.458333	9/7/2014	13.25
9/8/2014 12:00	2014	251	1200	251.5	9/8/2014	13.19
9/8/2014 13:00	2014	251	1300	251.541667	9/8/2014	13.19
9/8/2014 14:00	2014	251	1400	251.583333	9/8/2014	13.18
9/8/2014 15:00	2014	251	1500	251.625	9/8/2014	13.17
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9/8/2014 17:00	2014	251	1700	251.708333	9/8/2014	13.18
9/8/2014 18:00	2014	251	1800	251.75	9/8/2014	13.16
9/8/2014 19:00	2014	251	1900	251.791667	9/8/2014	12.9
9/8/2014 20:00	2014	251	2000	251.833333	9/8/2014	12.8
9/8/2014 21:00	2014	251	2100	251.875	9/8/2014	12.76
9/8/2014 22:00	2014	251	2200	251.916667	9/8/2014	12.74
9/8/2014 23:00	2014	251	2300	251.958333	9/8/2014	12.72
9/9/2014 0:00	2014	251	0	251	9/8/2014	12.7
9/9/2014 1:00	2014	251	100	251.041667	9/8/2014	12.68
9/9/2014 2:00	2014	251	200	251.083333	9/8/2014	12.67
9/9/2014 3:00	2014	251	300	251.125	9/8/2014	12.65
9/9/2014 4:00	2014	251	400	251.166667	9/8/2014	12.63
9/9/2014 5:00	2014	251	500	251.208333	9/8/2014	12.61
9/9/2014 6:00	2014	251	600	251.25	9/8/2014	12.59
9/9/2014 7:00	2014	251	700	251.291667	9/8/2014	12.59
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9/9/2014 9:00	2014	251	900	251.375	9/8/2014	13.31
9/9/2014 10:00	2014	251	1000	251.416667	9/8/2014	13.28
9/9/2014 11:00	2014	251	1100	251.458333	9/8/2014	13.19
9/9/2014 12:00	2014	252	1200	252.5	9/9/2014	13.15
9/9/2014 13:00	2014	252	1300	252.541667	9/9/2014	13.12
9/9/2014 14:00	2014	252	1400	252.583333	9/9/2014	13.1
9/9/2014 15:00	2014	252	1500	252.625	9/9/2014	13.15
9/9/2014 16:00	2014	252	1600	252.666667	9/9/2014	13.22
9/9/2014 17:00	2014	252	1700	252.708333	9/9/2014	13.21
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9/9/2014 19:00	2014	252	1900	252.791667	9/9/2014	12.84
9/9/2014 20:00	2014	252	2000	252.833333	9/9/2014	12.77
9/9/2014 21:00	2014	252	2100	252.875	9/9/2014	12.73
9/9/2014 22:00	2014	252	2200	252.916667	9/9/2014	12.7
9/9/2014 23:00	2014	252	2300	252.958333	9/9/2014	12.68
9/10/2014 0:00	2014	252	0	252	9/9/2014	12.66
9/10/2014 1:00	2014	252	100	252.041667	9/9/2014	12.65
9/10/2014 2:00	2014	252	200	252.083333	9/9/2014	12.63
9/10/2014 3:00	2014	252	300	252.125	9/9/2014	12.61
9/10/2014 4:00	2014	252	400	252.166667	9/9/2014	12.59
9/10/2014 5:00	2014	252	500	252.208333	9/9/2014	12.57
9/10/2014 6:00	2014	252	600	252.25	9/9/2014	12.55
9/10/2014 7:00	2014	252	700	252.291667	9/9/2014	12.69
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9/10/2014 9:00	2014	252	900	252.375	9/9/2014	13.32
9/10/2014 10:00	2014	252	1000	252.416667	9/9/2014	13.26
9/10/2014 11:00	2014	252	1100	252.458333	9/9/2014	13.21
9/10/2014 12:00	2014	253	1200	253.5	9/10/2014	13.16
9/10/2014 13:00	2014	253	1300	253.541667	9/10/2014	13.13
9/10/2014 14:00	2014	253	1400	253.583333	9/10/2014	13.11
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9/10/2014 16:00	2014	253	1600	253.666667	9/10/2014	13.11
9/10/2014 17:00	2014	253	1700	253.708333	9/10/2014	13.13
9/10/2014 18:00	2014	253	1800	253.75	9/10/2014	13.13
9/10/2014 19:00	2014	253	1900	253.791667	9/10/2014	12.9
9/10/2014 20:00	2014	253	2000	253.833333	9/10/2014	12.79
9/10/2014 21:00	2014	253	2100	253.875	9/10/2014	12.74
9/10/2014 22:00	2014	253	2200	253.916667	9/10/2014	12.71
9/10/2014 23:00	2014	253	2300	253.958333	9/10/2014	12.69
9/11/2014 0:00	2014	253	0	253	9/10/2014	12.67
9/11/2014 1:00	2014	253	100	253.041667	9/10/2014	12.65
9/11/2014 2:00	2014	253	200	253.083333	9/10/2014	12.62
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9/11/2014 4:00	2014	253	400	253.166667	9/10/2014	12.58
9/11/2014 5:00	2014	253	500	253.208333	9/10/2014	12.56
9/11/2014 6:00	2014	253	600	253.25	9/10/2014	12.53
9/11/2014 7:00	2014	253	700	253.291667	9/10/2014	12.69
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9/11/2014 9:00	2014	253	900	253.375	9/10/2014	13.34
9/11/2014 10:00	2014	253	1000	253.416667	9/10/2014	13.27
9/11/2014 11:00	2014	253	1100	253.458333	9/10/2014	13.2
9/11/2014 12:00	2014	254	1200	254.5	9/11/2014	13.15
9/11/2014 13:00	2014	254	1300	254.541667	9/11/2014	13.11
9/11/2014 14:00	2014	254	1400	254.583333	9/11/2014	13.09
9/11/2014 15:00	2014	254	1500	254.625	9/11/2014	13.07
9/11/2014 16:00	2014	254	1600	254.666667	9/11/2014	13.08
9/11/2014 17:00	2014	254	1700	254.708333	9/11/2014	13.11
9/11/2014 18:00	2014	254	1800	254.75	9/11/2014	13.1
9/11/2014 19:00	2014	254	1900	254.791667	9/11/2014	12.89
9/11/2014 20:00	2014	254	2000	254.833333	9/11/2014	12.79
9/11/2014 21:00	2014	254	2100	254.875	9/11/2014	12.75
9/11/2014 22:00	2014	254	2200	254.916667	9/11/2014	12.72
9/11/2014 23:00	2014	254	2300	254.958333	9/11/2014	12.69
9/12/2014 0:00	2014	254	0	254	9/11/2014	12.67
9/12/2014 1:00	2014	254	100	254.041667	9/11/2014	12.65
9/12/2014 2:00	2014	254	200	254.083333	9/11/2014	12.62
9/12/2014 3:00	2014	254	300	254.125	9/11/2014	12.6
9/12/2014 4:00	2014	254	400	254.166667	9/11/2014	12.58
9/12/2014 5:00	2014	254	500	254.208333	9/11/2014	12.56
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9/12/2014 9:00	2014	254	900	254.375	9/11/2014	13.33
9/12/2014 10:00	2014	254	1000	254.416667	9/11/2014	13.25
9/12/2014 11:00	2014	254	1100	254.458333	9/11/2014	13.19
9/12/2014 12:00	2014	255	1200	255.5	9/12/2014	13.14
9/12/2014 13:00	2014	255	1300	255.541667	9/12/2014	13.11
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9/12/2014 18:00	2014	255	1800	255.75	9/12/2014	13.1
9/12/2014 19:00	2014	255	1900	255.791667	9/12/2014	12.88
9/12/2014 20:00	2014	255	2000	255.833333	9/12/2014	12.79
9/12/2014 21:00	2014	255	2100	255.875	9/12/2014	12.75
9/12/2014 22:00	2014	255	2200	255.916667	9/12/2014	12.71
9/12/2014 23:00	2014	255	2300	255.958333	9/12/2014	12.69
9/13/2014 0:00	2014	255	0	255	9/12/2014	12.66
9/13/2014 1:00	2014	255	100	255.041667	9/12/2014	12.64
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9/13/2014 4:00	2014	255	400	255.166667	9/12/2014	12.57
9/13/2014 5:00	2014	255	500	255.208333	9/12/2014	12.55
9/13/2014 6:00	2014	255	600	255.25	9/12/2014	12.53
9/13/2014 7:00	2014	255	700	255.291667	9/12/2014	12.71
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9/13/2014 9:00	2014	255	900	255.375	9/12/2014	13.34
9/13/2014 10:00	2014	255	1000	255.416667	9/12/2014	13.26
9/13/2014 11:00	2014	255	1100	255.458333	9/12/2014	13.2
9/13/2014 12:00	2014	256	1200	256.5	9/13/2014	13.14
9/13/2014 13:00	2014	256	1300	256.541667	9/13/2014	13.1
9/13/2014 14:00	2014	256	1400	256.583333	9/13/2014	13.07
9/13/2014 15:00	2014	256	1500	256.625	9/13/2014	13.06
9/13/2014 16:00	2014	256	1600	256.666667	9/13/2014	13.08
9/13/2014 17:00	2014	256	1700	256.708333	9/13/2014	13.13
9/13/2014 18:00	2014	256	1800	256.75	9/13/2014	13.11
9/13/2014 19:00	2014	256	1900	256.791667	9/13/2014	12.87
9/13/2014 20:00	2014	256	2000	256.833333	9/13/2014	12.79
9/13/2014 21:00	2014	256	2100	256.875	9/13/2014	12.76
9/13/2014 22:00	2014	256	2200	256.916667	9/13/2014	12.73
9/13/2014 23:00	2014	256	2300	256.958333	9/13/2014	12.71
9/14/2014 0:00	2014	256	0	256	9/13/2014	12.69
9/14/2014 1:00	2014	256	100	256.041667	9/13/2014	12.68
9/14/2014 2:00	2014	256	200	256.083333	9/13/2014	12.66
9/14/2014 3:00	2014	256	300	256.125	9/13/2014	12.63
9/14/2014 4:00	2014	256	400	256.166667	9/13/2014	12.6
9/14/2014 5:00	2014	256	500	256.208333	9/13/2014	12.58
9/14/2014 6:00	2014	256	600	256.25	9/13/2014	12.56
9/14/2014 7:00	2014	256	700	256.291667	9/13/2014	12.7
9/14/2014 8:00	2014	256	800	256.333333	9/13/2014	13.37
9/14/2014 9:00	2014	256	900	256.375	9/13/2014	13.29
9/14/2014 10:00	2014	256	1000	256.416667	9/13/2014	13.23
9/14/2014 11:00	2014	256	1100	256.458333	9/13/2014	13.18
9/14/2014 12:00	2014	257	1200	257.5	9/14/2014	13.12
9/14/2014 13:00	2014	257	1300	257.541667	9/14/2014	13.09

9/14/2014 14:00	2014	257	1400	257.583333	9/14/2014	13.08
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9/14/2014 16:00	2014	257	1600	257.666667	9/14/2014	13.14
9/14/2014 17:00	2014	257	1700	257.708333	9/14/2014	13.13
9/14/2014 18:00	2014	257	1800	257.75	9/14/2014	13.13
9/14/2014 19:00	2014	257	1900	257.791667	9/14/2014	12.89
9/14/2014 20:00	2014	257	2000	257.833333	9/14/2014	12.79
9/14/2014 21:00	2014	257	2100	257.875	9/14/2014	12.75
9/14/2014 22:00	2014	257	2200	257.916667	9/14/2014	12.73
9/14/2014 23:00	2014	257	2300	257.958333	9/14/2014	12.71
9/15/2014 0:00	2014	257	0	257	9/14/2014	12.69
9/15/2014 1:00	2014	257	100	257.041667	9/14/2014	12.68
9/15/2014 2:00	2014	257	200	257.083333	9/14/2014	12.66
9/15/2014 3:00	2014	257	300	257.125	9/14/2014	12.64
9/15/2014 4:00	2014	257	400	257.166667	9/14/2014	12.61
9/15/2014 5:00	2014	257	500	257.208333	9/14/2014	12.59
9/15/2014 6:00	2014	257	600	257.25	9/14/2014	12.57
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9/15/2014 9:00	2014	257	900	257.375	9/14/2014	13.29
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9/26/2014 21:00	2014	269	2100	269.875	9/26/2014	12.75
9/26/2014 22:00	2014	269	2200	269.916667	9/26/2014	12.73
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9/27/2014 10:00	2014	269	1000	269.416667	9/26/2014	13.29
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9/27/2014 22:00	2014	270	2200	270.916667	9/27/2014	12.63
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9/28/2014 19:00	2014	271	1900	271.791667	9/28/2014	12.85
9/28/2014 20:00	2014	271	2000	271.833333	9/28/2014	12.78
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9/29/2014 0:00	2014	271	0	271	9/28/2014	12.66
9/29/2014 1:00	2014	271	100	271.041667	9/28/2014	12.64
9/29/2014 2:00	2014	271	200	271.083333	9/28/2014	12.63
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10/1/2014 22:00	2014	274	2200	274.916667	10/1/2014	12.71
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11/3/2014 20:00	2014	307	2000	307.833333	11/3/2014	12.76
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11/8/2014 20:00	2014	312	2000	312.833333	11/8/2014	12.77
11/8/2014 21:00	2014	312	2100	312.875	11/8/2014	12.73
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11/18/2014 22:00	2014	322	2200	322.916667	11/18/2014	12.66
11/18/2014 23:00	2014	322	2300	322.958333	11/18/2014	12.63
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11/30/2014 16:00	2014	334	1600	334.666667	11/30/2014	13.37
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12/1/2014 12:00	2014	335	1200	335.5	12/1/2014	13.49
12/1/2014 13:00	2014	335	1300	335.541667	12/1/2014	13.43
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12/4/2014 20:00	2014	338	2000	338.833333	12/4/2014	12.78
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12/5/2014 22:00	2014	339	2200	339.916667	12/5/2014	12.72
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12/6/2014 19:00	2014	340	1900	340.791667	12/6/2014	12.82
12/6/2014 20:00	2014	340	2000	340.833333	12/6/2014	12.79
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12/7/2014 1:00	2014	340	100	340.041667	12/6/2014	12.63
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12/8/2014 0:00	2014	341	0	341	12/7/2014	12.68
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12/8/2014 22:00	2014	342	2200	342.916667	12/8/2014	12.46
12/8/2014 23:00	2014	342	2300	342.958333	12/8/2014	12.44
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12/9/2014 7:00	2014	342	700	342.291667	12/8/2014	12.41
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12/9/2014 11:00	2014	342	1100	342.458333	12/8/2014	13.06
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12/9/2014 14:00	2014	343	1400	343.583333	12/9/2014	13.55
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12/9/2014 22:00	2014	343	2200	343.916667	12/9/2014	12.71
12/9/2014 23:00	2014	343	2300	343.958333	12/9/2014	12.68
12/10/2014 0:00	2014	343	0	343	12/9/2014	12.66
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12/10/2014 5:00	2014	343	500	343.208333	12/9/2014	12.57
12/10/2014 6:00	2014	343	600	343.25	12/9/2014	12.55
12/10/2014 7:00	2014	343	700	343.291667	12/9/2014	12.52
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12/10/2014 23:00	2014	344	2300	344.958333	12/10/2014	12.44
12/11/2014 0:00	2014	344	0	344	12/10/2014	12.43
12/11/2014 1:00	2014	344	100	344.041667	12/10/2014	12.43
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12/14/2014 13:00	2014	348	1300	348.541667	12/14/2014	13.57
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12/22/2014 3:00	2014	355	300	355.125	12/21/2014	12.68
12/22/2014 4:00	2014	355	400	355.166667	12/21/2014	12.67
12/22/2014 5:00	2014	355	500	355.208333	12/21/2014	12.65
12/22/2014 6:00	2014	355	600	355.25	12/21/2014	12.63
12/22/2014 7:00	2014	355	700	355.291667	12/21/2014	12.62
12/22/2014 8:00	2014	355	800	355.333333	12/21/2014	12.76
12/22/2014 9:00	2014	355	900	355.375	12/21/2014	13.6
12/22/2014 10:00	2014	355	1000	355.416667	12/21/2014	13.54
12/22/2014 11:00	2014	355	1100	355.458333	12/21/2014	13.5
12/22/2014 12:00	2014	356	1200	356.5	12/22/2014	13.46
12/22/2014 13:00	2014	356	1300	356.541667	12/22/2014	13.41
12/22/2014 14:00	2014	356	1400	356.583333	12/22/2014	13.39
12/22/2014 15:00	2014	356	1500	356.625	12/22/2014	13.38
12/22/2014 16:00	2014	356	1600	356.666667	12/22/2014	13.4
12/22/2014 17:00	2014	356	1700	356.708333	12/22/2014	13.4
12/22/2014 18:00	2014	356	1800	356.75	12/22/2014	12.92
12/22/2014 19:00	2014	356	1900	356.791667	12/22/2014	12.83
12/22/2014 20:00	2014	356	2000	356.833333	12/22/2014	12.8
12/22/2014 21:00	2014	356	2100	356.875	12/22/2014	12.77
12/22/2014 22:00	2014	356	2200	356.916667	12/22/2014	12.74
12/22/2014 23:00	2014	356	2300	356.958333	12/22/2014	12.72
12/23/2014 0:00	2014	356	0	356	12/22/2014	12.7
12/23/2014 1:00	2014	356	100	356.041667	12/22/2014	12.68
12/23/2014 2:00	2014	356	200	356.083333	12/22/2014	12.66
12/23/2014 3:00	2014	356	300	356.125	12/22/2014	12.63
12/23/2014 4:00	2014	356	400	356.166667	12/22/2014	12.61
12/23/2014 5:00	2014	356	500	356.208333	12/22/2014	12.59
12/23/2014 6:00	2014	356	600	356.25	12/22/2014	12.56
12/23/2014 7:00	2014	356	700	356.291667	12/22/2014	12.53
12/23/2014 8:00	2014	356	800	356.333333	12/22/2014	12.84
12/23/2014 9:00	2014	356	900	356.375	12/22/2014	13.84
12/23/2014 10:00	2014	356	1000	356.416667	12/22/2014	13.77

12/23/2014 11:00	2014	356	1100	356.458333	12/22/2014	13.7
12/23/2014 12:00	2014	357	1200	357.5	12/23/2014	13.65
12/23/2014 13:00	2014	357	1300	357.541667	12/23/2014	13.61
12/23/2014 14:00	2014	357	1400	357.583333	12/23/2014	13.58
12/23/2014 15:00	2014	357	1500	357.625	12/23/2014	13.57
12/23/2014 16:00	2014	357	1600	357.666667	12/23/2014	13.6
12/23/2014 17:00	2014	357	1700	357.708333	12/23/2014	13.61
12/23/2014 18:00	2014	357	1800	357.75	12/23/2014	12.91
12/23/2014 19:00	2014	357	1900	357.791667	12/23/2014	12.79
12/23/2014 20:00	2014	357	2000	357.833333	12/23/2014	12.74
12/23/2014 21:00	2014	357	2100	357.875	12/23/2014	12.7
12/23/2014 22:00	2014	357	2200	357.916667	12/23/2014	12.67
12/23/2014 23:00	2014	357	2300	357.958333	12/23/2014	12.64
12/24/2014 0:00	2014	357	0	357	12/23/2014	12.61
12/24/2014 1:00	2014	357	100	357.041667	12/23/2014	12.59
12/24/2014 2:00	2014	357	200	357.083333	12/23/2014	12.57
12/24/2014 3:00	2014	357	300	357.125	12/23/2014	12.54
12/24/2014 4:00	2014	357	400	357.166667	12/23/2014	12.52
12/24/2014 5:00	2014	357	500	357.208333	12/23/2014	12.49
12/24/2014 6:00	2014	357	600	357.25	12/23/2014	12.46
12/24/2014 7:00	2014	357	700	357.291667	12/23/2014	12.45
12/24/2014 8:00	2014	357	800	357.333333	12/23/2014	12.86
12/24/2014 9:00	2014	357	900	357.375	12/23/2014	13.96
12/24/2014 10:00	2014	357	1000	357.416667	12/23/2014	13.85
12/24/2014 11:00	2014	357	1100	357.458333	12/23/2014	13.73
12/24/2014 12:00	2014	358	1200	358.5	12/24/2014	13.65
12/24/2014 13:00	2014	358	1300	358.541667	12/24/2014	13.59
12/24/2014 14:00	2014	358	1400	358.583333	12/24/2014	13.55
12/24/2014 15:00	2014	358	1500	358.625	12/24/2014	13.56
12/24/2014 16:00	2014	358	1600	358.666667	12/24/2014	13.6
12/24/2014 17:00	2014	358	1700	358.708333	12/24/2014	13.31
12/24/2014 18:00	2014	358	1800	358.75	12/24/2014	12.88
12/24/2014 19:00	2014	358	1900	358.791667	12/24/2014	12.81
12/24/2014 20:00	2014	358	2000	358.833333	12/24/2014	12.77
12/24/2014 21:00	2014	358	2100	358.875	12/24/2014	12.74
12/24/2014 22:00	2014	358	2200	358.916667	12/24/2014	12.72
12/24/2014 23:00	2014	358	2300	358.958333	12/24/2014	12.72
12/25/2014 0:00	2014	358	0	358	12/24/2014	12.71
12/25/2014 1:00	2014	358	100	358.041667	12/24/2014	12.69
12/25/2014 2:00	2014	358	200	358.083333	12/24/2014	12.67
12/25/2014 3:00	2014	358	300	358.125	12/24/2014	12.65
12/25/2014 4:00	2014	358	400	358.166667	12/24/2014	12.62
12/25/2014 5:00	2014	358	500	358.208333	12/24/2014	12.59
12/25/2014 6:00	2014	358	600	358.25	12/24/2014	12.56
12/25/2014 7:00	2014	358	700	358.291667	12/24/2014	12.54
12/25/2014 8:00	2014	358	800	358.333333	12/24/2014	12.57
12/25/2014 9:00	2014	358	900	358.375	12/24/2014	13.34

12/25/2014 10:00	2014	358	1000	358.416667	12/24/2014	13.66
12/25/2014 11:00	2014	358	1100	358.458333	12/24/2014	13.69
12/25/2014 12:00	2014	359	1200	359.5	12/25/2014	13.68
12/25/2014 13:00	2014	359	1300	359.541667	12/25/2014	13.56
12/25/2014 14:00	2014	359	1400	359.583333	12/25/2014	13.61
12/25/2014 15:00	2014	359	1500	359.625	12/25/2014	13.67
12/25/2014 16:00	2014	359	1600	359.666667	12/25/2014	13.6
12/25/2014 17:00	2014	359	1700	359.708333	12/25/2014	13.11
12/25/2014 18:00	2014	359	1800	359.75	12/25/2014	12.83
12/25/2014 19:00	2014	359	1900	359.791667	12/25/2014	12.77
12/25/2014 20:00	2014	359	2000	359.833333	12/25/2014	12.73
12/25/2014 21:00	2014	359	2100	359.875	12/25/2014	12.69
12/25/2014 22:00	2014	359	2200	359.916667	12/25/2014	12.66
12/25/2014 23:00	2014	359	2300	359.958333	12/25/2014	12.63
12/26/2014 0:00	2014	359	0	359	12/25/2014	12.61
12/26/2014 1:00	2014	359	100	359.041667	12/25/2014	12.58
12/26/2014 2:00	2014	359	200	359.083333	12/25/2014	12.56
12/26/2014 3:00	2014	359	300	359.125	12/25/2014	12.52
12/26/2014 4:00	2014	359	400	359.166667	12/25/2014	12.49
12/26/2014 5:00	2014	359	500	359.208333	12/25/2014	12.45
12/26/2014 6:00	2014	359	600	359.25	12/25/2014	12.43
12/26/2014 7:00	2014	359	700	359.291667	12/25/2014	12.43
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12/26/2014 9:00	2014	359	900	359.375	12/25/2014	13.93
12/26/2014 10:00	2014	359	1000	359.416667	12/25/2014	13.87
12/26/2014 11:00	2014	359	1100	359.458333	12/25/2014	13.79
12/26/2014 12:00	2014	360	1200	360.5	12/26/2014	13.72
12/26/2014 13:00	2014	360	1300	360.541667	12/26/2014	13.7
12/26/2014 14:00	2014	360	1400	360.583333	12/26/2014	13.71
12/26/2014 15:00	2014	360	1500	360.625	12/26/2014	13.68
12/26/2014 16:00	2014	360	1600	360.666667	12/26/2014	13.67
12/26/2014 17:00	2014	360	1700	360.708333	12/26/2014	13.54
12/26/2014 18:00	2014	360	1800	360.75	12/26/2014	12.92
12/26/2014 19:00	2014	360	1900	360.791667	12/26/2014	12.81
12/26/2014 20:00	2014	360	2000	360.833333	12/26/2014	12.77
12/26/2014 21:00	2014	360	2100	360.875	12/26/2014	12.73
12/26/2014 22:00	2014	360	2200	360.916667	12/26/2014	12.7
12/26/2014 23:00	2014	360	2300	360.958333	12/26/2014	12.67
12/27/2014 0:00	2014	360	0	360	12/26/2014	12.63
12/27/2014 1:00	2014	360	100	360.041667	12/26/2014	12.6
12/27/2014 2:00	2014	360	200	360.083333	12/26/2014	12.57
12/27/2014 3:00	2014	360	300	360.125	12/26/2014	12.53
12/27/2014 4:00	2014	360	400	360.166667	12/26/2014	12.5
12/27/2014 5:00	2014	360	500	360.208333	12/26/2014	12.46
12/27/2014 6:00	2014	360	600	360.25	12/26/2014	12.42
12/27/2014 7:00	2014	360	700	360.291667	12/26/2014	12.4
12/27/2014 8:00	2014	360	800	360.333333	12/26/2014	12.42

12/27/2014 9:00	2014	360	900	360.375	12/26/2014	13
12/27/2014 10:00	2014	360	1000	360.416667	12/26/2014	13.94
12/27/2014 11:00	2014	360	1100	360.458333	12/26/2014	13.83
12/27/2014 12:00	2014	361	1200	361.5	12/27/2014	13.76
12/27/2014 13:00	2014	361	1300	361.541667	12/27/2014	13.71
12/27/2014 14:00	2014	361	1400	361.583333	12/27/2014	13.68
12/27/2014 15:00	2014	361	1500	361.625	12/27/2014	13.66
12/27/2014 16:00	2014	361	1600	361.666667	12/27/2014	13.7
12/27/2014 17:00	2014	361	1700	361.708333	12/27/2014	13.73
12/27/2014 18:00	2014	361	1800	361.75	12/27/2014	12.92
12/27/2014 19:00	2014	361	1900	361.791667	12/27/2014	12.79
12/27/2014 20:00	2014	361	2000	361.833333	12/27/2014	12.73
12/27/2014 21:00	2014	361	2100	361.875	12/27/2014	12.69
12/27/2014 22:00	2014	361	2200	361.916667	12/27/2014	12.66
12/27/2014 23:00	2014	361	2300	361.958333	12/27/2014	12.63
12/28/2014 0:00	2014	361	0	361	12/27/2014	12.6
12/28/2014 1:00	2014	361	100	361.041667	12/27/2014	12.57
12/28/2014 2:00	2014	361	200	361.083333	12/27/2014	12.55
12/28/2014 3:00	2014	361	300	361.125	12/27/2014	12.52
12/28/2014 4:00	2014	361	400	361.166667	12/27/2014	12.49
12/28/2014 5:00	2014	361	500	361.208333	12/27/2014	12.45
12/28/2014 6:00	2014	361	600	361.25	12/27/2014	12.41
12/28/2014 7:00	2014	361	700	361.291667	12/27/2014	12.39
12/28/2014 8:00	2014	361	800	361.333333	12/27/2014	12.73
12/28/2014 9:00	2014	361	900	361.375	12/27/2014	13.91
12/28/2014 10:00	2014	361	1000	361.416667	12/27/2014	13.87
12/28/2014 11:00	2014	361	1100	361.458333	12/27/2014	13.8
12/28/2014 12:00	2014	362	1200	362.5	12/28/2014	13.73
12/28/2014 13:00	2014	362	1300	362.541667	12/28/2014	13.73
12/28/2014 14:00	2014	362	1400	362.583333	12/28/2014	13.71
12/28/2014 15:00	2014	362	1500	362.625	12/28/2014	13.67
12/28/2014 16:00	2014	362	1600	362.666667	12/28/2014	13.65
12/28/2014 17:00	2014	362	1700	362.708333	12/28/2014	13.65
12/28/2014 18:00	2014	362	1800	362.75	12/28/2014	12.93
12/28/2014 19:00	2014	362	1900	362.791667	12/28/2014	12.82
12/28/2014 20:00	2014	362	2000	362.833333	12/28/2014	12.77
12/28/2014 21:00	2014	362	2100	362.875	12/28/2014	12.74
12/28/2014 22:00	2014	362	2200	362.916667	12/28/2014	12.72
12/28/2014 23:00	2014	362	2300	362.958333	12/28/2014	12.7
12/29/2014 0:00	2014	362	0	362	12/28/2014	12.68
12/29/2014 1:00	2014	362	100	362.041667	12/28/2014	12.66
12/29/2014 2:00	2014	362	200	362.083333	12/28/2014	12.63
12/29/2014 3:00	2014	362	300	362.125	12/28/2014	12.6
12/29/2014 4:00	2014	362	400	362.166667	12/28/2014	12.56
12/29/2014 5:00	2014	362	500	362.208333	12/28/2014	12.53
12/29/2014 6:00	2014	362	600	362.25	12/28/2014	12.49
12/29/2014 7:00	2014	362	700	362.291667	12/28/2014	12.48

12/29/2014 8:00	2014	362	800	362.333333	12/28/2014	12.76
12/29/2014 9:00	2014	362	900	362.375	12/28/2014	13.74
12/29/2014 10:00	2014	362	1000	362.416667	12/28/2014	13.68
12/29/2014 11:00	2014	362	1100	362.458333	12/28/2014	13.62
12/29/2014 12:00	2014	363	1200	363.5	12/29/2014	13.58
12/29/2014 13:00	2014	363	1300	363.541667	12/29/2014	13.55
12/29/2014 14:00	2014	363	1400	363.583333	12/29/2014	13.53
12/29/2014 15:00	2014	363	1500	363.625	12/29/2014	13.54
12/29/2014 16:00	2014	363	1600	363.666667	12/29/2014	13.57
12/29/2014 17:00	2014	363	1700	363.708333	12/29/2014	13.6
12/29/2014 18:00	2014	363	1800	363.75	12/29/2014	12.93
12/29/2014 19:00	2014	363	1900	363.791667	12/29/2014	12.8
12/29/2014 20:00	2014	363	2000	363.833333	12/29/2014	12.74
12/29/2014 21:00	2014	363	2100	363.875	12/29/2014	12.7
12/29/2014 22:00	2014	363	2200	363.916667	12/29/2014	12.67
12/29/2014 23:00	2014	363	2300	363.958333	12/29/2014	12.64
12/30/2014 0:00	2014	363	0	363	12/29/2014	12.61
12/30/2014 1:00	2014	363	100	363.041667	12/29/2014	12.59
12/30/2014 2:00	2014	363	200	363.083333	12/29/2014	12.57
12/30/2014 3:00	2014	363	300	363.125	12/29/2014	12.54
12/30/2014 4:00	2014	363	400	363.166667	12/29/2014	12.52
12/30/2014 5:00	2014	363	500	363.208333	12/29/2014	12.5
12/30/2014 6:00	2014	363	600	363.25	12/29/2014	12.47
12/30/2014 7:00	2014	363	700	363.291667	12/29/2014	12.44
12/30/2014 8:00	2014	363	800	363.333333	12/29/2014	12.78
12/30/2014 9:00	2014	363	900	363.375	12/29/2014	14.05
12/30/2014 10:00	2014	363	1000	363.416667	12/29/2014	13.94
12/30/2014 11:00	2014	363	1100	363.458333	12/29/2014	13.82
12/30/2014 12:00	2014	364	1200	364.5	12/30/2014	13.73
12/30/2014 13:00	2014	364	1300	364.541667	12/30/2014	13.66
12/30/2014 14:00	2014	364	1400	364.583333	12/30/2014	13.63
12/30/2014 15:00	2014	364	1500	364.625	12/30/2014	13.62
12/30/2014 16:00	2014	364	1600	364.666667	12/30/2014	13.65
12/30/2014 17:00	2014	364	1700	364.708333	12/30/2014	13.69
12/30/2014 18:00	2014	364	1800	364.75	12/30/2014	12.93
12/30/2014 19:00	2014	364	1900	364.791667	12/30/2014	12.81
12/30/2014 20:00	2014	364	2000	364.833333	12/30/2014	12.76
12/30/2014 21:00	2014	364	2100	364.875	12/30/2014	12.72
12/30/2014 22:00	2014	364	2200	364.916667	12/30/2014	12.68
12/30/2014 23:00	2014	364	2300	364.958333	12/30/2014	12.66
12/31/2014 0:00	2014	364	0	364	12/30/2014	12.64
12/31/2014 1:00	2014	364	100	364.041667	12/30/2014	12.62
12/31/2014 2:00	2014	364	200	364.083333	12/30/2014	12.6
12/31/2014 3:00	2014	364	300	364.125	12/30/2014	12.58
12/31/2014 4:00	2014	364	400	364.166667	12/30/2014	12.55
12/31/2014 5:00	2014	364	500	364.208333	12/30/2014	12.52
12/31/2014 6:00	2014	364	600	364.25	12/30/2014	12.48

12/31/2014 7:00	2014	364	700	364.291667	12/30/2014	12.45
12/31/2014 8:00	2014	364	800	364.333333	12/30/2014	12.44
12/31/2014 9:00	2014	364	900	364.375	12/30/2014	12.58
12/31/2014 10:00	2014	364	1000	364.416667	12/30/2014	13.13
12/31/2014 11:00	2014	364	1100	364.458333	12/30/2014	13.65
12/31/2014 12:00	2014	365	1200	365.5	12/31/2014	13.78
12/31/2014 13:00	2014	365	1300	365.541667	12/31/2014	13.89
12/31/2014 14:00	2014	365	1400	365.583333	12/31/2014	13.88
12/31/2014 15:00	2014	365	1500	365.625	12/31/2014	13.88
12/31/2014 16:00	2014	365	1600	365.666667	12/31/2014	13.79
12/31/2014 17:00	2014	365	1700	365.708333	12/31/2014	13.12
12/31/2014 18:00	2014	365	1800	365.75	12/31/2014	12.84
12/31/2014 19:00	2014	365	1900	365.791667	12/31/2014	12.78
12/31/2014 20:00	2014	365	2000	365.833333	12/31/2014	12.74
12/31/2014 21:00	2014	365	2100	365.875	12/31/2014	12.71
12/31/2014 22:00	2014	365	2200	365.916667	12/31/2014	12.67
12/31/2014 23:00	2014	365	2300	365.958333	12/31/2014	12.64

Precip	Hourly Max	Hourly Min	Hourly Ave	Soil Temp	Soil Water	Soil Temp
inches	Air Temp	Air Temp	Air Temp	6 in	6 in	20 in
deg F	deg F	deg F	deg F	deg C	wfv	deg C
0	67.15	62.65	64.67	24.95	0	25.92
0	64.73	63.25	64.08	24.7	0	25.92
0	67.55	64.49	65.64	24.42	0	25.92
0	72.66	67.55	70.44	24.22	0	25.92
0	75.92	72.68	74.5	24.29	0	26.11
0	77.66	75.2	76.56	24.53	0	26.37
0	80.9	76.96	78.65	25.06	0	26.74
0	83.2	79.51	81.3	25.7	0	27.05
0	87.9	82.6	84.1	26.55	0	27.43
0	88.6	84.5	86.2	27.32	0.12	27.59
0	87.6	85.4	86.2	27.94	0.125	27.55
0	86.5	83.1	85.5	28.18	0.138	27.2
0.07	82.9	69.48	74.58	28.22	0	26.82
0	70.88	68.73	70.02	27.71	0	26.14
0	70.29	69	69.7	27.39	0	25.96
0	69.69	68.84	69.32	27.09	0	25.92
0	72.04	68.71	69.97	26.67	0	25.92
0.02	69.35	64.22	66.42	26.29	0	25.92
0	68.12	65.02	65.82	25.89	0	25.85
0	69.03	65.77	67.42	25.59	0	25.85
0	66.76	65.2	65.63	25.31	0	25.85
0	67.43	64.92	65.78	25.02	0	25.85
0	65.77	64.25	65.01	24.77	0	25.85
0	65.76	63.38	64.58	24.53	0	25.81
0	65.21	61.49	62.87	24.32	0	25.81
0	63.23	60.8	61.76	24.08	0	25.81
0	73.77	61.6	66.39	23.84	0	25.78
0	75.99	73.81	74.82	23.7	0	25.81
0	78.95	74.75	77.05	23.91	0	26.11
0	80.7	77.62	78.94	24.42	0	26.59
0	85.8	79.47	82.5	24.67	0	26.52
0	88.2	84.6	86.4	25.81	0	27.09
0	88.5	84.8	86.3	26.33	0	26.89
0	89.5	85.8	88	27.78	0.109	27.55
0	86.9	84.4	85.1	28.54	0.118	27.51
0	84.7	80.9	83	28.26	0.149	26.63
0	82.8	80.2	81.8	28.22	0	26.37
0	81.3	78.8	79.83	28.18	0	26.29
0	79.58	78.85	79.39	28.06	0	26.22
0	79.1	72.7	76.34	27.9	0	26.14
0	72.66	69.71	70.92	27.59	0	26.03
0	70.98	69.86	70.44	27.24	0	25.92
0	70.64	69.09	69.69	26.93	0	25.85
0	72.52	69.6	70.86	26.67	0	25.85

0	69.86	66.27	68	26.4	0	25.85
0	71.03	66.53	68.91	26.11	0	25.81
0	71	69.21	69.89	25.89	0	25.81
0	70.7	68.94	70.11	25.67	0	25.81
0	70.22	68.16	69.16	25.45	0	25.85
0	68.56	66.25	67.29	25.23	0	25.81
0	68.5	66.58	67.79	24.98	0	25.78
0	77.26	67.7	73.16	24.88	0	25.85
0	80	76.69	78.42	25.02	0	26.07
0	82.9	77.67	79.49	25.34	0	26.33
0	85	80.5	82.5	25.81	0	26.55
0	87	83.3	84.9	26.67	0.121	27.09
0	89.6	85.9	87.7	28.18	0.085	28.1
0	91.1	83.5	87.6	29.28	0.085	28.54
0.03	83.5	71.24	75.74	28.67	0.137	27.24
0.01	76.66	68.32	72.56	27.86	0	26.11
0.04	72.39	65.43	68.64	27.51	0	25.78
0.07	66.74	62.11	63.98	27.12	0	25.7
0.01	68.96	64.19	66.6	26.7	0	25.63
0	70.74	66.78	67.93	26.37	0	25.7
0	71.53	65.88	68.88	26	0	25.74
0	66.51	62.38	64.06	25.63	0	25.7
0	66.26	64.46	65.09	25.23	0	25.7
0	67.87	64.22	65.42	24.95	0	25.7
0	68.12	65.71	67.08	24.67	0	25.7
0	65.86	63.16	65.14	24.42	0	25.7
0	63.65	61.16	62.39	24.15	0	25.7
0	61.92	59.13	60.21	23.91	0	25.67
0	60.5	57.47	58.83	23.64	0	25.67
0	60.6	58.54	59.73	23.44	0	25.63
0	63.27	60.46	62.48	23.2	0	25.63
0	68.37	62.59	64.37	23.07	0	25.63
0	76.45	68.39	73.75	22.97	0	25.63
0	78.8	75.16	77.13	23.54	0	26.26
0	82.4	77.48	79.11	24.22	0	26.63
0	83.6	75.84	80.1	24.98	0.126	27.05
0	81.1	76.56	78.17	25.31	0.144	26.78
0	81.4	75.63	77.98	25.67	0.148	26.59
0	76.86	73.54	75.67	25.74	0	26.22
0	78.94	73.88	76.29	25.85	0	26.03
0	78.88	76.12	77.31	26.14	0	26.18
0	79.7	77.53	78.55	26.26	0	26.14
0	78.49	74.9	76.09	26.37	0	26.11
0	75.32	72.93	74.01	26.29	0	25.92
0	72.98	70.13	71.25	26.11	0	25.78
0	70.59	69.09	69.86	25.89	0	25.67
0	70.64	69.01	69.64	25.67	0	25.63

0	70.68	67.87	69.52	25.41	0	25.52
0	70	65.52	67.78	25.23	0	25.56
0	69.34	63.71	66.13	24.98	0	25.52
0	65.96	59.23	61.58	24.74	0	25.49
0	61.2	58.27	59.39	24.46	0	25.41
0	60.81	59.23	59.93	24.22	0	25.38
0	68.7	60.31	64.21	24.01	0	25.38
0	71.94	67.67	70.63	23.81	0	25.41
0	75.29	71.94	73.3	23.81	0	25.59
0	78.72	75.01	76.7	24.01	0	25.89
0	80.5	77.85	79.2	24.6	0	26.37
0	81.5	78.37	79.91	25.56	0.13	27.01
0	84.7	78.46	82	25.92	0.146	26.78
0	83.6	79.48	80.8	26.82	0.146	27.2
0	81	74.41	78.13	26.52	0.161	26.33
0	79.62	71.18	74.83	26.55	0.167	25.96
0	81.1	76.32	78.38	26.55	0.169	25.81
0	83.4	78.56	81.1	26.93	0.162	26.11
0	79.17	67.85	72.97	27.09	0.164	26.18
0	69.09	67.44	68.1	26.67	0.171	25.67
0	68.24	67.24	67.59	26.44	0	25.49
0	69.5	68.24	68.99	26.22	0	25.41
0	70.03	66.62	69.2	26	0	25.41
0	68.33	64.01	65.34	25.7	0	25.38
0	68.56	62.21	65.09	25.41	0	25.31
0	64.84	61.79	63.4	25.16	0	25.31
0	67.65	60.77	63.51	24.88	0	25.27
0	68.26	65.55	67.35	24.63	0	25.31
0	67.04	60.63	62.91	24.46	0	25.34
0	62.83	58.47	60.78	24.22	0	25.31
0	67.96	59.32	63.02	23.98	0	25.27
0	71.99	67.42	69.33	23.81	0	25.31
0	75.94	72.12	74.82	23.77	0	25.45
0	78.79	75.63	76.92	24.15	0	25.89
0	81.6	78.27	79.41	24.81	0.142	26.4
0	83.9	80.7	81.9	25.78	0.137	27.05
0	83.2	80.8	81.7	26.74	0.144	27.47
0	85.5	81.6	82.7	26.78	0.161	26.82
0	88.2	81.8	84.9	27.36	0.163	26.93
0	88.1	83.9	86	28.46	0.164	27.59
0	89.3	85.5	87.3	28.71	0.166	27.28
0	88.5	84.6	85.7	29.2	0.172	27.24
0	85.8	84	84.5	28.79	0.177	26.44
0	86.6	82.4	84.6	28.63	0.176	26.11
0	82.4	79.09	81.1	28.5	0.173	25.92
0	80.4	78.42	79.41	28.18	0.176	25.74
0	79.69	77.1	78.56	27.94	0.177	25.63

0	78.83	75.24	77.06	27.67	0.177	25.56
0	76.55	71.48	74.28	27.36	0.175	25.45
0	76.02	73.97	75.04	27.05	0.176	25.41
0	75.37	71.85	73.79	26.78	0.177	25.41
0	72.65	70.37	71.48	26.52	0.175	25.41
0	72.08	69.45	71.14	26.29	0.173	25.41
0	71.66	65.51	69.49	26.07	0	25.41
0	69.23	65.51	67.26	25.81	0	25.38
0	73.35	67.5	70.02	25.59	0	25.38
0	78.16	72.81	76.2	25.49	0	25.45
0	80.8	77.06	78.76	25.78	0.162	25.85
0	83.1	79.11	81.1	26.37	0.149	26.4
0	86	81.3	83.6	27.39	0.135	27.16
0	87.6	84.1	85.5	28.5	0.128	27.78
0	89.6	85.4	88	29.45	0.135	28.14
0	92.2	88.5	89.8	30.48	0.141	28.5
0	92.8	87.8	90.2	31.01	0.144	28.34
0	92	89.5	90.6	30.87	0.158	27.67
0	92.9	89.3	91.5	30.92	0.165	27.32
0	92.9	91	91.8	31.23	0.166	27.28
0	92.3	88.9	90.7	30.92	0.171	26.86
0	88.8	84.5	87.2	30.48	0.175	26.44
0	84.5	80.7	82.6	30.09	0.178	26.14
0	81.2	77.82	79.8	29.7	0.179	25.96
0	77.75	74.68	76.23	29.33	0.181	25.81
0	76.05	72.14	74.57	28.95	0.184	25.7
0	76.28	70.92	73.47	28.58	0.183	25.67
0	73.55	71.07	72.15	28.26	0.185	25.63
0	72.36	69.18	71.05	27.94	0.181	25.63
0	70.72	64.34	67.56	27.63	0.179	25.63
0	68.34	65.02	66.62	27.32	0.18	25.63
0	71.95	67.09	68.75	27.05	0.179	25.63
0	73.16	69.65	71.86	26.82	0.178	25.67
0	76.61	73.19	74.65	26.7	0.176	25.78
0	76.42	74.05	75.11	26.7	0.175	25.96
0	79.71	76.05	78.25	26.82	0.169	26.11
0	82.9	78.83	81.2	27.2	0.16	26.48
0	89.2	81.9	85.9	28.06	0.141	27.24
0	90.1	86	88	29.41	0.126	28.3
0	90.7	85.8	87.8	29.79	0.14	28.18
0	92.9	88.5	90.6	30.13	0.152	28.02
0	92.9	88.8	91.2	30.52	0.153	27.98
0	93.4	90.2	92.2	30.87	0.16	27.9
0	92.1	84.3	88.5	31.19	0.159	27.86
0	85.5	84.2	84.9	30.35	0.175	26.89
0	84.8	81.4	83.1	29.96	0.18	26.55
0	81.8	78.37	80.6	29.62	0.182	26.37

0	78.39	74.31	76.03	29.28	0.182	26.22
0	76.91	73.78	74.98	28.91	0.184	26.11
0	73.79	72.23	73.03	28.63	0.185	26.07
0	73.54	72.51	73.11	28.3	0.183	26.07
0	74.27	66.84	70.68	28.06	0.181	26.07
0	67.07	65.67	66.44	27.75	0.182	26.03
0	68.1	65.86	67.08	27.43	0.184	26
0	68.12	65.03	67.03	27.24	0.182	26
0	69.58	66.75	68.03	26.97	0.182	26
0.01	71.29	65.56	68.18	26.74	0.181	26
0	71.08	65.84	68.11	26.44	0.183	25.96
0	77.58	70.73	74.53	26.37	0.179	26.07
0	80.9	76.3	78.81	26.78	0.166	26.67
0	83	78.99	80.5	27.86	0.143	27.67
0	85.3	79.5	82.2	28.06	0.156	27.55
0	85.7	83	84.5	29.2	0.154	28.34
0	89.1	84.3	86	30.09	0.161	28.71
0	90.3	86.3	88.1	30.7	0.167	28.75
0	90.4	87.4	89.1	30.7	0.174	28.22
0	90.3	87.8	89	30.96	0.176	28.02
0	89	85.5	88.2	31.05	0.177	27.82
0	85.5	78.73	81.5	30.65	0.183	27.28
0	78.68	76.37	77.16	30.13	0.189	26.74
0	76.77	74.69	75.71	29.7	0.188	26.48
0	75.49	74.23	75	29.41	0.191	26.37
0	74.23	68.72	70.04	29.16	0.189	26.37
0	68.92	67.86	68.4	28.75	0.189	26.26
0	69.86	67.24	68.91	28.42	0.189	26.22
0	71.64	69.82	70.55	28.18	0.187	26.26
0	71.88	70.89	71.54	27.9	0.186	26.29
0	70.97	69.12	70.17	27.71	0.185	26.29
0	70.09	66.99	68.02	27.47	0.183	26.33
0	67.7	66.04	67.13	27.24	0.182	26.29
0	68	65.96	66.85	26.97	0.183	26.29
0	68.63	66.08	67.81	26.82	0.181	26.33
0.07	66.08	63.28	64.32	26.63	0.183	26.33
0	70.03	64.27	66.73	26.37	0.185	26.26
0	79.01	70.03	74.48	26.29	0.181	26.37
0	76.77	73.56	75.19	26.48	0.171	26.7
0	80	75.8	77.83	26.93	0.162	27.24
0	81.3	77.41	79.37	27.63	0.155	27.86
0	80.1	73.83	76.12	27.82	0.162	27.78
0	76.63	73.77	74.92	27.39	0.177	27.09
0	78.08	75.47	76.45	27.43	0.18	26.93
0	79.39	77.37	78.17	27.51	0.18	26.97
0	79.09	77.32	77.86	27.51	0.18	26.89
0	77.32	74.78	75.73	27.39	0.18	26.82

0	75.03	73.41	74.13	27.16	0.183	26.63
0	74.63	73.71	74.24	26.97	0.182	26.55
0	74.73	73.95	74.33	26.78	0.18	26.55
0	74.59	73.91	74.28	26.59	0.179	26.55
0	74.62	74.12	74.38	26.48	0.179	26.59
0	74.44	73.71	74.17	26.33	0.177	26.59
0.1	74.03	66.42	71.7	26.22	0.179	26.59
0.17	68.34	63.51	65.21	25.89	0.182	26.37
0	70.1	65.77	68.83	25.56	0.181	26.29
0	70.44	68.69	69.65	25.31	0.181	26.33
0	72.22	70.35	71.74	25.02	0.178	26.37
0	75.46	71.9	73.06	24.84	0.179	26.4
0	75.41	73.2	74.15	24.81	0.175	26.59
0	77.85	73.11	75.13	24.84	0.173	26.67
0	79.02	76.61	77.45	25.09	0.167	26.97
0	80.9	77.87	78.91	25.45	0.165	27.32
0	84.1	78.79	80.9	25.67	0.167	27.39
0	86.8	81.7	83.9	26.22	0.168	27.78
0	89.4	82.9	85.2	26.86	0.174	28.14
0	85.1	81.7	83	27.09	0.182	27.94
0	85.9	82.4	84	26.97	0.181	27.43
0	85.3	80.8	83.1	27.2	0.186	27.36
0	81.1	78.03	80.3	27.12	0.184	27.09
0	78.82	76.85	77.97	26.89	0.184	26.7
0	79.17	77.7	78.44	26.67	0.181	26.55
0	77.91	74.71	76.22	26.52	0.183	26.52
0	76.17	74.98	75.47	26.29	0.183	26.4
0	76.01	74.59	75.46	26.03	0.18	26.33
0	75.6	74.27	75.03	25.85	0.178	26.33
0	74.63	73.07	73.98	25.63	0.182	26.29
0	74.63	73.23	74.04	25.45	0.18	26.29
0	74.5	73.21	73.79	25.27	0.177	26.29
0	74.23	72.48	73.21	25.09	0.175	26.26
0	74.64	72.66	73.69	24.91	0.176	26.26
0	76.93	72.74	75.48	24.77	0.175	26.26
0	80.3	76.83	78.33	24.77	0.175	26.4
0	83.2	79.78	81.5	25.13	0.166	26.78
0	86	82.4	84.2	25.74	0.157	27.32
0	88.3	85.3	86.7	26.7	0.147	27.98
0	90.6	86.5	88.7	27.98	0.149	28.79
0	92.3	87.6	89.6	29.37	0.153	29.58
0	92.5	88.4	90.6	30	0.165	29.45
0	93.2	88.6	90.3	30.48	0.163	29.2
0	92.6	87.7	89.6	30.09	0.17	28.26
0	92.8	87.8	90.8	29.87	0.175	27.78
0	89.2	81.9	86.4	29.92	0.178	27.63
0	84.8	80.6	82.6	29.28	0.182	26.93

0	85.4	82.9	84.2	28.91	0.185	26.63
0	83.3	80.9	81.9	28.67	0.183	26.52
0	80.8	76.91	78.65	28.3	0.185	26.4
0	78.58	77.25	77.83	27.94	0.185	26.29
0	78.25	75.71	77.03	27.67	0.184	26.26
0	78.21	75.49	76.62	27.39	0.182	26.26
0	78.15	76.38	77.57	27.12	0.182	26.22
0	77.79	75.44	77.31	26.89	0.179	26.26
0	76.32	71.75	75.3	26.7	0.178	26.29
0	76.19	74.9	75.48	26.48	0.18	26.26
0	76.21	74.93	75.66	26.29	0.179	26.26
0	78.7	76.11	77.26	26.11	0.177	26.26
0	82.2	78.21	80.5	26.07	0.175	26.37
0	84.2	79.78	81.9	26.33	0.166	26.7
0	86.5	81	83.9	26.7	0.154	27.01
0	90	85.2	87.4	27.36	0.138	27.47
0	91.2	87.4	89.3	28.42	0.112	28.18
0	93.9	88.3	90.8	29.2	0.113	28.46
0	95	87.9	90.8	30.3	0.102	29.08
0	94.2	89.6	92.1	30.17	0.133	28.42
0	94.2	90.2	92.5	30.43	0.139	28.26
0	93.3	89.6	90.9	30.74	0.145	28.18
0	93.1	89.7	90.8	30.52	0.16	27.75
0	90.4	86.8	88.4	30.26	0.166	27.39
0	86.8	83.2	84.9	29.83	0.177	27.01
0	83.2	80.2	81.6	29.37	0.181	26.67
0	80.7	78.4	79.1	28.99	0.183	26.52
0	79.26	77.1	78.21	28.63	0.185	26.44
0	77.67	75.94	76.75	28.34	0.184	26.4
0	76.69	74.93	75.75	28.02	0.184	26.37
0	75.98	74.95	75.47	27.71	0.184	26.37
0	75.22	74.27	74.64	27.47	0.18	26.37
0	74.55	73.32	73.93	27.2	0.182	26.37
0	73.57	73.05	73.3	26.97	0.182	26.37
0	74.09	73.05	73.56	26.74	0.183	26.37
0	76.32	73.91	74.77	26.55	0.18	26.37
0	80.3	75.9	78.15	26.4	0.179	26.4
0	84.2	79.23	80.9	26.55	0.172	26.67
0	86.9	81.9	84.8	26.82	0.164	26.93
0	87.6	84.8	86.2	27.59	0.142	27.55
0	89.8	86.9	87.9	28.42	0.126	28.1
0	91.6	87	89.4	29.49	0.106	28.67
0	91.9	87.2	89.3	30.43	0.103	29.08
0	89.3	86.2	87.6	30.26	0.137	28.38
0	86.7	83.1	84.4	29.92	0.16	27.75
0	86.2	82.9	83.9	29.58	0.173	27.24
0	87.2	84.5	86	29.49	0.176	27.16

0	85.7	82.8	83.8	29.45	0.175	27.16
0	83.4	78.03	80.8	29.16	0.182	26.93
0	79.31	76.44	77.79	28.79	0.183	26.7
0	79.39	73.29	76.33	28.46	0.187	26.59
0	75.49	73.29	74.78	28.18	0.186	26.55
0	75.5	72.42	74.49	27.86	0.185	26.52
0	76.11	74.91	75.62	27.63	0.184	26.52
0	75.64	73.52	74.41	27.39	0.184	26.52
0	73.82	72.21	72.99	27.16	0.183	26.52
0	72.65	68.24	71.53	26.89	0.182	26.52
0	72.43	71.38	71.89	26.7	0.182	26.48
0	71.79	71.03	71.39	26.48	0.183	26.48
0	75.12	70.72	73.33	26.26	0.182	26.48
0	79.02	74.8	76.89	26.18	0.18	26.59
0	82.2	78.42	80.3	26.33	0.173	26.82
0	84.9	80.5	82.8	26.78	0.158	27.24
0	86.5	82.5	84	27.55	0.143	27.75
0	87.8	83.4	85.4	28.38	0.13	28.18
0	90.4	85.7	87.9	29.37	0.116	28.71
0	90.4	86.1	87.9	30.22	0.116	28.99
0	91.4	86.6	88.8	30.3	0.134	28.58
0	89.7	86.2	87.7	30.39	0.149	28.26
0	89.9	87.1	88.4	30.3	0.162	27.9
0	88.8	86.6	87.6	30.26	0.169	27.71
0	87.2	82.8	84.9	30	0.175	27.36
0	82.8	77.08	80.1	29.7	0.186	27.09
0	77.03	73.31	74.87	29.28	0.188	26.82
0	76.94	72.09	74.94	28.87	0.191	26.63
0	76.2	70.98	73.84	28.58	0.189	26.63
0	74.68	72.83	73.53	28.26	0.189	26.59
0	74.04	72.47	73.42	27.94	0.186	26.59
0	73.59	67.39	72.01	27.67	0.188	26.59
0	73.15	70.55	71.73	27.39	0.187	26.55
0	71.71	67.55	69.19	27.09	0.185	26.55
0	68.05	66.02	67.15	26.82	0.186	26.55
0	66.87	61.75	64.24	26.55	0.184	26.52
0	71	61.32	64.06	26.26	0.186	26.48
0	76.7	71.13	74.73	26	0.187	26.48
0	80.2	74	77.49	26.07	0.179	26.7
0	81.9	79.46	80.6	26.33	0.17	27.01
0	85.3	80.9	83.5	26.89	0.159	27.39
0	88.1	84	85.8	27.78	0.143	27.9
0	90.8	86.9	88.4	28.91	0.124	28.46
0	92.3	88	89.7	30.05	0.108	28.99
0	94.5	90.7	92.4	30.52	0.125	28.87
0	93.7	91.1	92.5	31.1	0.126	28.87
0	92.9	89.9	91.3	31.19	0.144	28.54

0	91.2	87.9	89.2	31.01	0.159	28.1
0	88.6	84.8	86.5	30.61	0.176	27.67
0	84.7	80.2	82.6	30.22	0.183	27.32
0	81	76.41	79.23	29.79	0.187	27.05
0	79.75	77.29	79.21	29.41	0.188	26.89
0	79.12	76.91	78.45	29.08	0.187	26.86
0	78.34	76.84	77.51	28.79	0.189	26.82
0	77.41	75.66	76.59	28.46	0.185	26.82
0	76.59	72.85	74.85	28.18	0.188	26.78
0	75.11	72.18	74.08	27.9	0.186	26.74
0	73.39	71.87	72.68	27.63	0.186	26.74
0	72.88	68.92	70.57	27.39	0.186	26.74
0	69.37	67.63	68.6	27.09	0.184	26.7
0	78.56	69.37	73.71	26.86	0.185	26.67
0	83.3	78.51	80.4	26.7	0.183	26.78
0	85.1	82.5	83.9	26.89	0.175	27.09
0	87.4	84.7	85.9	27.32	0.165	27.47
0	90.5	86.3	88.1	27.94	0.152	27.86
0	92.9	88.2	90.9	28.91	0.132	28.42
0	95.9	88.9	91.6	29.83	0.121	28.87
0	94.6	90.6	92.2	30.3	0.129	28.79
0	94	88.8	90.6	30.39	0.146	28.46
0	94.4	90.5	92.6	30.52	0.153	28.26
0	95	89.7	92.3	30.87	0.154	28.42
0	95	90.4	92	30.96	0.158	28.26
0	91.2	89.3	90.1	30.79	0.167	27.98
0	89.6	78.59	83.1	30.39	0.179	27.63
0	84.8	80.3	83.2	29.96	0.185	27.28
0	84.5	79.85	82.9	29.7	0.186	27.24
0	83.5	76.55	80.5	29.45	0.185	27.2
0	77.08	75.7	76.5	29.12	0.187	27.12
0	75.89	74.53	75.33	28.79	0.187	27.01
0	75.17	71.5	73.99	28.5	0.188	26.97
0	75.46	70.67	72.71	28.22	0.187	26.93
0	77.57	72.4	75.04	27.94	0.188	26.93
0	73.48	68.45	71.04	27.75	0.184	26.97
0	70.8	65.76	67.64	27.47	0.188	26.93
0	78.39	67.35	72.87	27.2	0.186	26.86
0	81.9	78.05	80.2	27.09	0.185	26.97
0	84.4	80.5	82.3	27.24	0.179	27.28
0	87.8	84.3	86	27.59	0.168	27.59
0	90.3	86.9	88.4	28.26	0.155	28.1
0	94	88.6	91.4	29.03	0.141	28.54
0	95.6	91.4	93.4	30.13	0.116	29.2
0	95.7	91.4	93.4	31.37	0.089	29.92
0	94.7	91.4	92.7	31.23	0.13	29.24
0	93.9	91.4	92.5	30.92	0.154	28.58

0	96.9	92	93.4	31.05	0.161	28.5
0	95.4	92.3	94	31.19	0.16	28.5
0	93.2	88.6	90.2	31.28	0.161	28.5
0	88.7	83.3	85.9	30.74	0.177	27.94
0	84	80	82.2	30.3	0.185	27.59
0	82.9	76.77	79.68	29.87	0.188	27.32
0	79.31	76.21	78.17	29.54	0.192	27.24
0	78.3	76.19	77.09	29.28	0.19	27.24
0	78.9	76.21	77.83	29.03	0.188	27.24
0	79.36	75.33	77.35	28.83	0.187	27.24
0	75.31	73.06	74.05	28.63	0.185	27.28
0	73.06	71.92	72.4	28.38	0.187	27.24
0	72.46	69.98	71.1	28.14	0.188	27.2
0	72.65	69.96	71.02	27.94	0.186	27.16
0	74.13	72.61	73.26	27.75	0.189	27.16
0	77.09	74.09	75.15	27.59	0.187	27.16
0	80.2	77.09	78.31	27.59	0.184	27.32
0	82.5	80.1	81	27.78	0.179	27.55
0	82.7	81.2	82	27.98	0.176	27.75
0	86.9	81.2	83.4	28.14	0.177	27.75
0	88.1	84.3	85.7	28.75	0.156	28.26
0	86.6	84.9	85.9	29.41	0.148	28.67
0	86.1	84.2	85.1	29.37	0.165	28.34
0	84.2	82.6	83.2	29.12	0.177	27.9
0	84.1	82.9	83.6	29.08	0.182	27.75
0	82.9	71.48	77.4	29.16	0.177	27.82
0	77.22	72.59	74.61	28.67	0.189	27.36
0	77.15	73.19	75.08	28.46	0.19	27.32
0	76.38	74.9	75.73	28.26	0.19	27.28
0	76.53	72.74	75.06	28.02	0.186	27.28
0	73.73	70.81	72.16	27.78	0.188	27.24
0	71.46	68.92	70.42	27.55	0.187	27.2
0	72.84	67.43	68.84	27.32	0.189	27.16
0	72.89	69.64	71.23	27.09	0.189	27.12
0	72.59	65.84	69.08	26.89	0.188	27.12
0	68.03	65.94	67.21	26.67	0.188	27.12
0	68.9	66.62	67.67	26.48	0.187	27.12
0	69.92	65.86	67.87	26.26	0.187	27.09
0	75.87	67.59	71.68	26.07	0.185	27.09
0	83.5	73.96	79.4	26	0.182	27.16
0	85.7	82.2	84.4	26.22	0.173	27.47
0	88.9	85.4	86.7	26.78	0.156	27.98
0	90.5	86.1	88.1	27.71	0.139	28.67
0	88.3	82.8	85.5	28.26	0.14	28.83
0	90.6	86.2	88.3	28.26	0.157	28.38
0	91.2	86.3	88.1	28.75	0.154	28.54
0	94.7	87	90.9	28.91	0.161	28.42

0.1	93.2	73.53	85.3	29.49	0.15	28.79
0.04	81.2	72.88	77.53	28.67	0.181	27.71
0	83.3	76.98	80.8	28.34	0.189	27.36
0	81.5	78.85	79.84	28.26	0.184	27.47
0	79.29	77.01	78.18	27.98	0.185	27.36
0	77.1	75.29	76.25	27.67	0.187	27.28
0	75.76	73.44	74.68	27.32	0.19	27.2
0	74.54	72.87	73.75	27.05	0.185	27.16
0	74.98	73.23	74.18	26.78	0.184	27.12
0	73.95	71.39	72.72	26.55	0.182	27.12
0	72.52	71.5	72.01	26.33	0.185	27.09
0	73.91	71.68	72.4	26.14	0.184	27.09
0	75.62	73.64	74.81	26	0.183	27.09
0	75.67	70.33	73.53	25.85	0.182	27.12
0	70.28	65.57	67.79	25.7	0.181	27.09
0	72.13	66.91	69.01	25.49	0.182	27.01
0	77.78	71.44	73.47	25.38	0.183	26.97
0	82.8	77.64	80.3	25.45	0.179	27.16
0	87	81.8	84.1	25.89	0.163	27.59
0	88.5	84.2	85.8	26.7	0.145	28.22
0	90.8	85.1	87.4	28.02	0.119	29.2
0	92.7	87.8	89.8	29.12	0.115	29.7
0	92.6	87.9	89.9	30.43	0.11	30.35
0	93.6	88.1	90.7	30.52	0.136	29.75
0.11	88.5	74.87	79.07	29.87	0.171	28.54
0	83.8	76.84	81.1	28.71	0.193	27.16
0	81.1	76.57	78.53	28.63	0.191	27.2
0	78.1	73.74	75.89	28.34	0.193	27.12
0	77.46	73.13	75.81	27.98	0.192	27.01
0	75	70.96	72.35	27.67	0.19	26.97
0	78.48	74.83	77.2	27.32	0.19	26.93
0	77.8	74.13	75.92	27.05	0.19	26.97
0	76.15	72.42	74.68	26.74	0.188	26.93
0	74.63	71.33	73.41	26.48	0.188	26.93
0	74.27	70.78	72.46	26.22	0.186	26.93
0	72.25	66.68	70.52	25.96	0.185	26.89
0.02	68.1	62.74	64.73	25.67	0.186	26.78
0	69.93	66.02	67.82	25.49	0.186	26.78
0	67.81	62.21	65.26	25.27	0.185	26.74
0	74.68	67.73	71.22	25.06	0.187	26.74
0	79.26	72.53	75.8	24.91	0.184	26.82
0	81.4	78.96	79.91	25.09	0.176	27.12
0	82.4	77.73	80.1	25.45	0.168	27.39
0	86.8	81.2	84	25.85	0.163	27.63
0	88.2	84.3	86.3	26.89	0.149	28.42
0	90.2	84.9	87.8	27.67	0.152	28.75
0	91.6	85.3	87.4	28.54	0.157	28.99

0	90.3	86.9	88.7	28.71	0.17	28.54
0	92.2	88.6	90.5	29.37	0.17	28.71
0	92.6	90	91.1	29.79	0.174	28.67
0	91	87.4	89.4	29.87	0.176	28.34
0	87.7	76.87	82.1	29.58	0.183	27.78
0	76.86	70.67	74.82	29.12	0.191	27.28
0.02	70.67	64.87	67.17	28.71	0.193	26.97
0.01	68.28	63.99	65.06	28.22	0.197	26.7
0	68.86	65.96	67.26	27.86	0.198	26.63
0	69.26	66.02	68.04	27.51	0.194	26.67
0	69.02	66.93	67.84	27.16	0.191	26.67
0	68.47	66.56	67.32	26.82	0.192	26.67
0	67.11	63.17	64.38	26.52	0.192	26.67
0	64.84	63.11	64.19	26.22	0.19	26.67
0	64.96	61.5	62.93	26	0.19	26.67
0	62.6	61.54	62.23	25.74	0.186	26.67
0	64.76	62.42	63.42	25.52	0.188	26.63
0	69.34	64.8	67.85	25.23	0.192	26.59
0	72.9	69.15	70.6	25.23	0.186	26.7
0	77.8	72.9	76.24	25.49	0.178	27.01
0	79.76	75.1	77.11	26.22	0.161	27.67
0	82.6	76.61	80.4	26.86	0.16	27.94
0	85.4	79.14	82.5	27.78	0.16	28.38
0	86	77.72	82.7	29.16	0.16	29.2
0	77.99	72.39	74.18	29.16	0.177	28.5
0.03	74.65	69.01	72.95	28.18	0.195	27.12
0	74.47	68.88	72.6	28.02	0.197	26.82
0	77.11	74.36	75.43	27.78	0.199	26.74
0	75.77	74.8	75.22	27.67	0.195	26.86
0	75.38	73	74.15	27.51	0.192	26.93
0	73.39	72.2	72.95	27.24	0.191	26.86
0	73.1	68.41	71.19	26.97	0.191	26.74
0	68.41	65.9	66.95	26.67	0.192	26.67
0	67.05	64.96	66.01	26.37	0.191	26.63
0	65.61	63.53	64.42	26.11	0.191	26.59
0	64.92	62.52	63.83	25.85	0.19	26.59
0	63.3	61.83	62.34	25.63	0.189	26.59
0	62.81	60.12	61.24	25.38	0.19	26.55
0	62.82	60.44	61.23	25.13	0.188	26.55
0	63.41	61.12	62.2	24.91	0.188	26.55
0	72.22	62.24	67.36	24.7	0.186	26.55
0	76.87	72.26	75.14	24.6	0.185	26.59
0	79.6	75.95	77.83	24.88	0.171	27.01
0	81.5	78.33	79.65	25.49	0.158	27.55
0	84.5	78.76	81.3	26.48	0.155	28.26
0	84.8	80.2	82.2	27.12	0.164	28.34
0	87.1	84.1	85.3	27.67	0.176	28.38

0	89.5	84.4	86.4	28.58	0.178	28.79
0	92.8	85.7	89.2	28.71	0.186	28.42
0	92.2	85	88.5	29.58	0.186	28.95
0	89.9	84.4	86.7	29.54	0.19	28.46
0	87.2	83	85.1	29.28	0.193	27.9
0	84.6	81.1	82.8	28.99	0.194	27.51
0	81.1	79.14	80.1	28.71	0.194	27.16
0	79.58	77.65	78.87	28.38	0.193	26.93
0	77.6	74.41	76.51	28.14	0.193	26.86
0	76.09	73.62	75.2	27.82	0.194	26.74
0	76.33	73.74	75.76	27.55	0.194	26.67
0	76.15	72.22	74.85	27.36	0.193	26.67
0	74.38	70.81	73.4	27.12	0.191	26.67
0	71.32	70.07	70.69	26.89	0.19	26.63
0	70.44	64.98	66.9	26.63	0.19	26.55
0	66.8	65.55	66.22	26.4	0.191	26.52
0	66.02	62.6	64.39	26.14	0.191	26.48
0	74.5	64.17	69.35	25.92	0.189	26.48
0	80.7	74.52	77.49	25.78	0.188	26.52
0	82.2	79.95	81	26.11	0.176	27.01
0	83.7	80.5	81.9	26.89	0.158	27.75
0	86.2	81.6	83.7	27.75	0.154	28.3
0	90.3	83.5	86.4	28.14	0.163	28.3
0	91	85.8	88.6	29.83	0.155	29.58
0	93.2	88	90.6	31.01	0.16	30.22
0	94	87.9	91.3	31.68	0.162	30.26
0	93.7	90.6	91.9	31.32	0.17	29.37
0	92.9	90	91.5	31.46	0.18	29.08
0	92	89.2	90.3	31.23	0.183	28.58
0	89.9	84.9	87.5	30.7	0.188	27.9
0	84.9	82.8	83.8	30.13	0.191	27.36
0	83	76.75	80.1	29.66	0.196	27.01
0	80.3	77.52	78.99	29.28	0.194	26.86
0	79.46	78.75	79.11	28.99	0.195	26.82
0	79.31	77.55	78.85	28.75	0.192	26.82
0	77.46	72.17	74.41	28.5	0.193	26.82
0	72.45	71.11	71.53	28.18	0.193	26.7
0	73.23	70.44	71.66	27.86	0.193	26.67
0	72.29	69.77	70.75	27.63	0.19	26.67
0	70.2	67.49	68.77	27.39	0.193	26.63
0	68.55	66.12	67.7	27.12	0.19	26.63
0	76.19	66.16	71.67	26.86	0.191	26.59
0	78.78	76.19	77.95	26.7	0.19	26.67
0	82	78.45	80.5	26.93	0.182	27.05
0	86.1	81.5	83.2	27.43	0.167	27.55
0	89.1	85.1	87	28.5	0.143	28.46
0	88.8	86.1	87.4	29.7	0.132	29.33

0	89.3	81.9	86.1	29.62	0.155	28.75
0	82.1	74.87	77.29	28.95	0.18	27.75
0.2	74.93	62.67	67.52	28.34	0.193	27.01
0	66.27	62.97	64.9	27.94	0.195	26.67
0	70.61	65.33	67.43	27.55	0.197	26.59
0	73.5	70.36	71.98	27.09	0.198	26.55
0	71.55	69.11	70.09	26.86	0.195	26.7
0	70.68	67.32	69.5	26.55	0.192	26.7
0	74.92	70.12	72.23	26.22	0.19	26.7
0	73.24	67.37	69.88	25.96	0.189	26.74
0	67.6	64.6	66.52	25.63	0.19	26.7
0	66.8	60.02	63.6	25.34	0.188	26.67
0	62.3	59.53	60.54	25.09	0.188	26.59
0	62.44	60.87	61.78	24.84	0.186	26.59
0	63.55	61.95	62.8	24.6	0.185	26.59
0	64.41	61.52	63.33	24.42	0.185	26.59
0	62.7	61.03	62.02	24.25	0.187	26.59
0	64.05	61.71	62.91	24.08	0.185	26.59
0	70.23	63.79	67.34	23.91	0.183	26.55
0	75.63	70.12	73.13	23.84	0.184	26.63
0	75.45	72.75	74.34	24.08	0.175	26.93
0	78.18	73.47	75.99	24.49	0.169	27.24
0	82.3	77.01	80	25.38	0.156	27.94
0	86.1	80.7	83.6	26.59	0.162	28.75
0	88.4	83.7	85.7	27.94	0.181	29.49
0	88.5	74.37	82.5	29.33	0.198	30.13
0	80.6	74.6	78.63	27.94	0.196	27.82
0	80.4	74.07	78.34	27.59	0.201	27.09
0	74.69	71.66	73.13	27.67	0.198	27.01
0	79.39	74.73	77.89	27.39	0.198	26.74
0	78.83	76.94	77.78	27.36	0.194	26.78
0	77.01	75.42	76.16	27.24	0.193	26.78
0	75.91	71.5	75.09	26.97	0.194	26.67
0	74.68	69.6	72.33	26.7	0.193	26.59
0	74.54	69.26	71.61	26.44	0.194	26.52
0	73.64	71.55	72.8	26.22	0.192	26.48
0	73.64	69.39	71.71	26.03	0.188	26.52
0	69.99	67.91	69.16	25.81	0.189	26.48
0	69.85	67.72	68.68	25.56	0.189	26.44
0	67.93	65.49	66.72	25.38	0.189	26.4
0	65.86	64.01	65.04	25.16	0.189	26.4
0	64.92	63.63	64.25	24.95	0.186	26.37
0	68.54	64.56	66.13	24.74	0.186	26.37
0	71.85	68.2	70.21	24.6	0.188	26.37
0	75.81	69.51	72.62	24.77	0.181	26.63
0	79.07	75.8	77.53	25.13	0.175	26.93
0	80.8	77.6	78.79	25.85	0.163	27.51

0	82.1	79.22	80.7	26.86	0.161	28.18
0	84.9	81.5	83.1	27.63	0.171	28.42
0	86.3	82.7	84.1	28.75	0.182	28.95
0	84	82.5	83.2	28.5	0.19	28.02
0	84.2	82.3	83.1	28.34	0.194	27.39
0	83.9	72.54	77.81	28.34	0.195	27.16
0	75.61	70.55	73.81	27.98	0.195	26.74
0	75.7	68.06	71.77	27.78	0.197	26.63
0	71.32	67.53	69.01	27.43	0.198	26.4
0	67.66	66.91	67.26	27.16	0.194	26.33
0	68.04	67.08	67.52	26.89	0.195	26.33
0	68.67	67.03	67.69	26.67	0.193	26.33
0	68.67	66.06	67.09	26.4	0.192	26.29
0	68.26	66.36	67.48	26.18	0.192	26.33
0.01	67.69	62.52	64.72	25.92	0.19	26.33
0	63	60.74	62.32	25.7	0.193	26.29
0	60.74	60.21	60.43	25.49	0.192	26.26
0	60.23	60.08	60.15	25.23	0.19	26.22
0	60.42	60.15	60.27	25.06	0.189	26.26
0.02	60.63	60.3	60.45	24.88	0.188	26.26
0.01	61.48	60.45	60.8	24.74	0.187	26.26
0.08	61.4	60.84	61.06	24.6	0.186	26.26
0.04	62.52	60.99	61.67	24.42	0.189	26.22
0.06	63.17	61.58	62.21	24.35	0.189	26.26
0	64.88	62.88	63.98	24.39	0.187	26.29
0.34	65.52	62.33	64.16	24.49	0.181	26.44
0.03	65	62.19	63.61	24.49	0.204	26.4
0	71.53	65	68.47	24.49	0.3	26.52
0	73.32	68.95	70.86	25.02	0.313	27.01
0.51	68.88	57.32	62.57	25.13	0.323	26.82
0	70.98	64.94	68.19	24.88	0.339	26.4
0	70.94	68.84	69.86	25.02	0.34	26.52
0	70.25	63.85	66.2	25.02	0.337	26.44
0	64.72	62.6	63.62	24.88	0.334	26.29
0.01	64.09	61.93	62.96	24.74	0.332	26.26
0	62.66	61.03	61.96	24.53	0.33	26.22
0	66.29	61.46	64.21	24.35	0.329	26.18
0	65.38	61.08	63.26	24.22	0.327	26.22
0	62.61	60.94	61.83	24.04	0.327	26.18
0	61.73	59.92	60.82	23.87	0.325	26.18
0	62.93	59.46	60.79	23.7	0.322	26.14
0	59.71	58.39	59.03	23.54	0.321	26.07
0	59.15	56.62	57.71	23.34	0.319	26.03
0	62.59	57.82	61.02	23.14	0.319	26.03
0	64.48	61.05	62.72	23.07	0.32	26.11
0	68.78	63.52	66.62	23.2	0.324	26.33
0	72.22	68.2	69.99	23.64	0.334	26.74

0	75.7	71.09	73.39	24.29	0.355	27.2
0	77.57	74.63	75.94	25.16	0.376	27.71
0	80.4	77.31	78.97	26.26	0.389	28.38
0	81.7	77.22	79.71	26.93	0.392	28.54
0	85.4	80.4	83.6	27.12	0.39	28.18
0	85.4	82.9	83.6	27.24	0.388	27.94
0	83.8	81.9	82.8	27.2	0.382	27.55
0	82.9	80.4	81.5	26.89	0.372	27.01
0	80.3	75.79	78.44	26.4	0.356	26.44
0	75.79	70.27	72.57	26.03	0.339	26.07
0	72.03	69.86	70.77	25.63	0.329	25.81
0	70.2	66.51	68.35	25.34	0.324	25.74
0	69.2	65.27	67.72	25.06	0.321	25.7
0	68.22	65.22	66.57	24.77	0.317	25.7
0	65.61	62.66	63.57	24.49	0.314	25.67
0	63.56	60.18	61.85	24.22	0.312	25.63
0	63.78	57.84	60.44	23.94	0.309	25.59
0	60.09	57.92	59.17	23.74	0.307	25.59
0	60.06	56.3	58.14	23.5	0.306	25.59
0	57.12	55.23	56.07	23.27	0.303	25.56
0	67.28	57.08	62.1	23.04	0.302	25.56
0	71.44	67.32	70.43	22.87	0.303	25.59
0	73.41	70.92	71.99	23.2	0.304	26.07
0	74.94	72.38	73.53	23.81	0.309	26.55
0	78.51	73.87	76.14	24.53	0.328	27.05
0	80.4	77.17	78.85	25.45	0.35	27.51
0	85.4	79.02	82.3	26.78	0.365	28.3
0	87.1	82.4	85.2	28.5	0.375	29.37
0	88	84.5	86.4	29.03	0.37	29.08
0	87.6	85	86.2	29.08	0.367	28.46
0	86.6	84.6	85.7	28.99	0.363	27.78
0	85.9	83.1	84.4	28.71	0.354	27.16
0	83.4	79.92	81.5	28.22	0.342	26.52
0	79.92	73.96	76.44	27.78	0.33	26.07
0	76.44	75.02	75.63	27.32	0.321	25.74
0	75.46	73.41	74.96	27.01	0.316	25.67
0	74.84	73.07	74.18	26.74	0.313	25.67
0	73.63	72.12	72.82	26.44	0.311	25.67
0	72.43	71.01	71.7	26.18	0.307	25.63
0	71.6	70.16	70.98	25.89	0.306	25.59
0	70.9	66.64	69.6	25.63	0.303	25.59
0	66.6	61.19	62.74	25.34	0.3	25.56
0	62.98	60.79	61.75	25.06	0.299	25.49
0	61	58.73	59.8	24.77	0.298	25.45
0	70.01	59.38	65.05	24.46	0.296	25.45
0	75.2	70.01	73.25	24.29	0.299	25.52
0	79.56	74.83	76.84	24.56	0.294	25.96

0	81	78.19	79.48	25.27	0.291	26.63
0	81.6	77.37	79.6	26.29	0.303	27.39
0	85.3	78.61	81.7	26.59	0.31	27.12
0	87.7	83.1	85.4	28.02	0.327	28.1
0	89.1	84.7	86.6	30.09	0.344	29.49
0	89.8	86.1	87.7	30.79	0.337	29.37
0	88.3	82.6	85.5	30.3	0.331	28.18
0	87.6	83	85.7	29.87	0.331	27.36
0	85.6	81.1	83.9	29.75	0.325	26.97
0	82.8	79.09	81	29.24	0.316	26.44
0	79.19	72.08	76.37	28.75	0.31	26.07
0	76.8	75	76.05	28.26	0.308	25.78
0	75.83	72.87	74.9	27.9	0.305	25.74
0	75.09	74.04	74.54	27.59	0.303	25.7
0	74.38	73.01	73.67	27.28	0.298	25.74
0	73.6	67.89	72.76	26.97	0.298	25.7
0	72.92	67.6	72.22	26.63	0.295	25.67
0	72.75	71.43	72.06	26.4	0.296	25.7
0	72.18	70.48	71.28	26.14	0.293	25.74
0	71.31	66.56	70.14	25.89	0.292	25.74
0	70.25	66.27	68.35	25.63	0.291	25.74
0	73.06	64.64	68.75	25.34	0.289	25.7
0	76.82	72.65	75.2	25.13	0.289	25.7
0	79.15	76.72	78.25	25.34	0.283	26.11
0	80.6	77.92	79.1	25.96	0.274	26.63
0	83.1	79.86	81.4	26.86	0.268	27.28
0	85.1	81.6	83.5	27.98	0.267	27.94
0	86.8	83.6	85.4	29.08	0.279	28.42
0	88.2	83.8	85.8	30.09	0.289	28.79
0	85.1	83.5	84.2	29.83	0.293	27.9
0	85.4	83.7	84.3	29.12	0.298	26.86
0	85.6	84	84.6	29.08	0.297	26.7
0	85.5	84.2	84.9	29.03	0.297	26.67
0	84.4	80.5	82.9	28.91	0.294	26.55
0	80.6	74.9	77.82	28.63	0.294	26.33
0	77.96	75.22	76.68	28.18	0.293	26.07
0	76.2	74.89	75.54	27.86	0.294	26
0	75.12	73.61	74.37	27.59	0.292	26
0	74.22	73.28	73.77	27.28	0.291	26
0	73.8	72.87	73.34	27.01	0.289	26
0	73.82	64.34	71.43	26.7	0.288	25.96
0	70.92	63.76	68.25	26.48	0.285	25.96
0	71.05	69.62	70.37	26.18	0.283	25.92
0	70.16	69.26	69.7	25.96	0.283	25.96
0	69.75	68.62	69.17	25.74	0.282	25.96
0	72.32	69.22	70.68	25.52	0.279	25.96
0	75.34	72.34	73.74	25.34	0.281	26

0	79.05	75.14	77.32	25.45	0.274	26.22
0	81.5	77.93	79.53	25.85	0.265	26.59
0	83.5	80.2	81.5	26.59	0.253	27.09
0	84.9	81.1	83.1	27.67	0.242	27.75
0	86.2	82.5	84.6	28.83	0.235	28.38
0	86.6	82.8	84.7	29.7	0.24	28.63
0	85.1	83.2	84.3	29.49	0.265	27.82
0	87.3	83.4	84.9	29.16	0.275	27.16
0	87.4	84.5	85.7	29.24	0.28	27.09
0	86.1	83.6	84.8	29.33	0.279	27.12
0	83.5	80.1	82	29.08	0.282	26.82
0	80.2	75.37	77.81	28.71	0.283	26.48
0	76.47	72.17	75.03	28.3	0.286	26.26
0	76.72	74.93	76.04	27.98	0.285	26.18
0	75.55	73.91	74.78	27.71	0.285	26.18
0	74	71.77	72.67	27.43	0.283	26.14
0	72.78	71.68	72.33	27.16	0.283	26.11
0	71.95	70.72	71.37	26.89	0.281	26.11
0	72.04	70.81	71.37	26.67	0.279	26.11
0	71.18	69.78	70.52	26.44	0.279	26.11
0	70.29	67.72	68.95	26.22	0.277	26.11
0	68.86	67.72	68.33	25.96	0.278	26.11
0	72.38	68.81	70.77	25.74	0.277	26.07
0	76.81	70.25	73.52	25.56	0.275	26.11
0	80.6	76.63	78.42	25.7	0.269	26.37
0	83.3	78.81	81	26.18	0.259	26.82
0	85.1	80.8	83.3	27.01	0.252	27.39
0	86.7	83.6	85.2	28.1	0.236	28.06
0	89.3	84.1	86.2	29.24	0.236	28.67
0	88	83.3	84.7	29.62	0.25	28.38
0	84.8	78.97	80.8	28.99	0.271	27.28
0	81.5	77.41	79.43	28.46	0.278	26.59
0	82.9	80.4	81.6	28.5	0.278	26.63
0	83.8	78.22	80.7	28.54	0.276	26.7
0	79.95	78.76	79.25	28.38	0.275	26.63
0	78.83	74.05	76.45	28.18	0.275	26.55
0	76.38	71.39	75.3	27.86	0.277	26.37
0	76.91	70.07	73.28	27.59	0.278	26.29
0	76.91	70.98	75.9	27.32	0.275	26.26
0	76.86	75.41	75.98	27.16	0.274	26.33
0	76.19	74.46	75.03	27.01	0.273	26.37
0	74.89	72.52	73.44	26.82	0.272	26.37
0	73.1	70.37	71.92	26.59	0.272	26.33
0	72.79	67.61	70.51	26.4	0.272	26.29
0	71.11	67.7	69.5	26.22	0.272	26.29
0	71.51	69.22	70.76	26.03	0.27	26.26
0	71.6	69.39	70.56	25.89	0.268	26.29

0	71.46	69.98	70.8	25.7	0.271	26.26
0	80.1	71.48	75.96	25.67	0.27	26.29
0	82.8	79.49	81.3	25.96	0.26	26.67
0	86.1	82.5	84.2	26.78	0.248	27.36
0	88.4	84.9	86.6	27.86	0.229	28.06
0	90.2	87.1	88.7	28.95	0.226	28.58
0	91.9	88.9	90.3	29.83	0.232	28.87
0	92.3	89.2	90.8	30.39	0.24	28.79
0	92.3	88.3	90.3	30.39	0.256	28.26
0	90	87.4	88.6	30.35	0.261	27.86
0	89	82.5	85.6	30.26	0.266	27.59
0	82.5	80.3	81.4	29.79	0.271	27.05
0	80.5	76.99	78.28	29.33	0.274	26.67
0	78.34	77.38	77.81	28.99	0.275	26.55
0	78.92	75.77	77.52	28.71	0.273	26.52
0	75.75	74.69	75.08	28.46	0.271	26.52
0	74.83	73.48	74.01	28.22	0.274	26.48
0	73.98	73.13	73.54	27.98	0.272	26.48
0	73.22	70.52	71.99	27.75	0.271	26.44
0	73.41	70.72	71.63	27.51	0.27	26.4
0	72.07	67.49	69.66	27.28	0.27	26.4
0	67.45	61.06	63.66	27.01	0.269	26.37
0	70.01	62.44	67.7	26.74	0.269	26.33
0	75.86	70.01	73.26	26.55	0.269	26.37
0	76.82	73.57	74.89	26.48	0.266	26.44
0	76.23	73.93	74.92	26.44	0.264	26.59
0	79.83	74.85	76.37	26.59	0.26	26.74
0	86.3	79.54	83	27.05	0.251	27.16
0	90.3	84.9	87.4	28.42	0.227	28.22
0	90.4	85.4	87.3	29.33	0.229	28.67
0	90.6	85	87	29.49	0.242	28.26
0	90.9	84.6	87.4	29.33	0.254	27.71
0	84.8	77.89	80	29.45	0.258	27.59
0	82.7	78.3	81	29.08	0.267	27.12
0	84.5	81.5	83.1	29.2	0.263	27.24
0.01	84.5	75.32	81.1	29.16	0.263	27.2
0.29	75.27	62.9	66.93	28.83	0.267	26.86
0	69.01	67.03	67.93	28.14	0.273	26.48
0	68.46	67.41	67.92	27.71	0.269	26.44
0	69.95	67.53	68.61	27.32	0.269	26.44
0	68.97	67.06	67.78	26.97	0.266	26.48
0	68.04	66.65	67.24	26.63	0.265	26.44
0	67.87	67.01	67.42	26.37	0.263	26.48
0	67.91	66.41	67.22	26.07	0.262	26.48
0	66.62	64.5	65.3	25.81	0.262	26.48
0	65.45	63.21	64.06	25.56	0.262	26.48
0	65.53	62.4	64.05	25.31	0.261	26.48

0	68.31	65.57	66.72	25.06	0.26	26.44
0	70.66	67.32	68.45	24.88	0.26	26.44
0	70.96	69.09	69.77	24.84	0.258	26.52
0	77.02	70.96	73.06	24.95	0.258	26.67
0	79.9	75.57	76.97	25.45	0.244	27.2
0	78.77	77.23	77.87	26.22	0.24	27.75
0	80.9	71.52	75.49	26.4	0.25	27.55
0	75.12	71.67	73.02	26.37	0.259	27.2
0	74.69	67.23	72.15	26.44	0.263	27.09
0	68.57	66.9	67.75	26.18	0.266	26.7
0	73.7	66.9	69.27	25.96	0.268	26.48
0	75.16	70.4	72.57	26	0.266	26.63
0	72.06	67.03	70.01	26	0.263	26.67
0	67.08	66.13	66.55	25.74	0.264	26.48
0	67.09	64.84	65.99	25.52	0.267	26.4
0.04	64.82	62.36	63.41	25.31	0.264	26.37
0.04	62.34	61.3	61.68	25.09	0.266	26.29
0.02	62.13	61.36	61.73	24.91	0.265	26.29
0.1	62.02	59.46	60.66	24.7	0.262	26.26
0.07	59.44	58.85	59.02	24.53	0.262	26.26
0.03	59.04	58.78	58.9	24.32	0.261	26.22
0.05	59.41	59	59.21	24.11	0.259	26.26
0.03	59.73	59.33	59.51	23.94	0.259	26.26
0.05	59.83	59.02	59.48	23.77	0.26	26.22
0.03	59.41	58.91	59.13	23.6	0.258	26.22
0.03	59.77	59.02	59.29	23.47	0.258	26.22
0.05	60.87	59.71	60.38	23.37	0.256	26.22
0.01	62.76	60.77	62.02	23.24	0.258	26.18
0.06	64.78	60.88	63.29	23.27	0.259	26.22
0	65.19	62.46	63.64	23.4	0.258	26.33
0	68.69	65.23	66.64	23.67	0.258	26.48
0	72.19	65.92	69.59	23.98	0.269	26.63
0	72.58	70.84	71.54	24.35	0.281	26.82
0	74.26	70.34	71.88	24.63	0.298	26.93
0	71.62	69.31	70.58	24.74	0.31	26.82
0	71.8	69.82	70.72	24.6	0.316	26.52
0	70.86	67.11	69.25	24.53	0.317	26.37
0	67.28	63.86	65.67	24.42	0.315	26.26
0	63.86	61.19	62.5	24.22	0.31	26.07
0	61.3	59.89	60.6	24.01	0.311	26
0	61	59.94	60.45	23.87	0.312	25.92
0	61.04	58.34	59.22	23.7	0.308	25.92
0	58.55	57.56	58.11	23.5	0.308	25.89
0	58.4	57.47	57.93	23.34	0.307	25.85
0	57.86	56.98	57.32	23.14	0.307	25.81
0	59.4	56.32	57.65	22.97	0.307	25.78
0	59.63	57.07	58.03	22.81	0.305	25.74

0	58.75	55.45	56.6	22.64	0.304	25.74
0	63.78	57.01	60.19	22.48	0.304	25.7
0	73.82	63.81	67.9	22.39	0.308	25.78
0	75.07	73.28	74.07	22.68	0.311	26.14
0	75.69	73.13	74.31	23.3	0.326	26.63
0	77.08	73.6	75.26	24.25	0.355	27.28
0	79.51	76.28	77.98	25.16	0.373	27.71
0	76.61	73.27	74.19	26	0.378	27.94
0	77.84	73.15	74.27	24.91	0.354	26.18
0	73.24	67.1	70.2	25.09	0.355	26.18
0	75.1	69.73	72.87	24.95	0.346	25.92
0	79	74.05	76.02	25.23	0.354	26.18
0	74.62	72.15	72.99	25.16	0.353	26.11
0	74.57	69.19	71.56	24.91	0.341	25.85
0	71.51	68.37	69.82	24.7	0.333	25.74
0	71.51	67.16	69.53	24.53	0.329	25.67
0	67.53	65.69	66.34	24.32	0.327	25.59
0	70.74	65.57	66.23	24.08	0.322	25.52
0	71.57	68.47	70.79	23.94	0.321	25.52
0	71	66.27	68.96	23.81	0.322	25.56
0	69.41	65.86	67.93	23.64	0.319	25.56
0	70.44	68.47	69.45	23.5	0.317	25.56
0	70.01	69.24	69.66	23.4	0.319	25.56
0	69.84	68.35	69.08	23.27	0.317	25.52
0	68.96	68.05	68.46	23.14	0.317	25.52
0	71.26	68.43	69.77	23	0.318	25.49
0	73.77	71.29	72.56	22.97	0.326	25.56
0	76.38	73.55	74.89	23.34	0.341	26.03
0	78.23	75.7	76.77	23.94	0.358	26.55
0	79.61	77.11	78.4	24.91	0.372	27.36
0	81.7	77.91	79.59	26.4	0.382	28.54
0	83.2	79.17	80.7	27.09	0.383	28.71
0	84.3	79.58	81.7	27.36	0.384	28.46
0	85.3	82.5	84.1	28.42	0.388	29.16
0	86.4	83.9	85.2	29.12	0.389	29.33
0	85.7	84	85	29.33	0.389	28.99
0	85.7	83.4	84.5	28.71	0.384	27.98
0	83.5	78.94	81.5	27.82	0.375	26.89
0	79.06	74.35	76.25	26.97	0.357	25.96
0	76.12	74.69	75.55	26.37	0.341	25.45
0	76.15	74.73	75.38	26.11	0.334	25.34
0	75.7	73.86	74.8	25.81	0.33	25.34
0	74.54	73.5	74.05	25.56	0.326	25.34
0	73.77	72.52	73.14	25.31	0.324	25.31
0	72.92	71.38	71.96	25.06	0.319	25.31
0	71.9	71.01	71.49	24.81	0.315	25.27
0	71.42	70.12	70.82	24.6	0.314	25.23

0	70.6	68.94	69.87	24.39	0.313	25.23
0	69.92	69.03	69.47	24.18	0.309	25.23
0	72.25	69.32	70.67	24.01	0.31	25.23
0	75.51	72.23	74.12	23.91	0.314	25.31
0	78.37	75.23	76.91	24.29	0.322	25.81
0	81.6	78.15	79.81	25.02	0.339	26.52
0	83.4	80.7	82.1	26.37	0.359	27.59
0	85.5	82.3	84.2	28.14	0.371	28.91
0	87.9	84.2	85.8	30.48	0.376	30.48
0	88.3	85.9	86.9	32.33	0.378	31.46
0	90	87.2	88.4	32.81	0.378	31.1
0	89.5	87.7	88.5	32.19	0.378	29.87
0	89.3	87.3	88.1	31.68	0.378	28.95
0	88.3	86.2	87.3	30.7	0.373	27.75
0	86.3	80.8	84.5	29.58	0.359	26.63
0	81.2	78.18	80.1	28.75	0.343	25.89
0	80.4	76.54	78.62	28.3	0.332	25.63
0	78.92	77.3	78.28	27.86	0.325	25.49
0	77.4	75.98	76.83	27.59	0.323	25.45
0	76.82	75.41	76.15	27.28	0.319	25.45
0	76.02	74.09	75.2	27.01	0.315	25.41
0	75.05	74.25	74.59	26.7	0.313	25.41
0	74.77	73.54	74.21	26.44	0.31	25.41
0	73.82	70.89	72.93	26.22	0.308	25.41
0	73.57	72.39	72.94	25.96	0.304	25.38
0	73.6	70.51	71.69	25.74	0.303	25.41
0	75.47	71.53	73.36	25.49	0.302	25.38
0	79.17	75.21	77.06	25.38	0.306	25.52
0	81.7	78.8	79.89	25.81	0.308	26.11
0	84.1	81.1	82.4	26.63	0.319	26.86
0	86.3	83.1	84.6	27.94	0.34	27.9
0	90	84.9	87.3	29.62	0.356	29.08
0	90.1	86.3	88.4	31.41	0.361	30.22
0	90.3	86.9	88.6	33	0.366	31.01
0	92.2	87.3	89.9	32.57	0.36	30
0	91	86.1	88.1	32.57	0.366	29.58
0	88.8	83.7	85.4	31.01	0.354	27.82
0	84.6	81.5	82.9	29.96	0.341	26.74
0	81.5	79.48	80.5	29.54	0.333	26.37
0	81.5	78.04	79.69	29.08	0.325	26.11
0	80.6	77.53	79.41	28.67	0.317	25.92
0	80.8	75.1	77.84	28.38	0.313	25.92
0	78.65	74.57	76.59	28.02	0.311	25.81
0	79.93	77.15	78.97	27.75	0.308	25.78
0	79.39	77.46	78.59	27.51	0.305	25.81
0	78.46	76.7	77.43	27.32	0.303	25.89
0	77.22	75.36	76.17	27.05	0.303	25.85

0	76.2	74.93	75.65	26.82	0.3	25.85
0	75.37	74.63	74.99	26.59	0.297	25.85
0	75	73.59	74.36	26.4	0.296	25.85
0	75.07	73.68	74.46	26.22	0.295	25.85
0	75.1	73.32	73.81	26.03	0.299	25.89
0	78.54	74.51	76.7	26.22	0.298	26.18
0	80.9	77.57	79.2	26.89	0.301	26.89
0	82.7	80.4	81.6	27.86	0.313	27.67
0	85.7	81.9	83.6	29.08	0.331	28.54
0	86.5	82.5	84.3	30.87	0.347	29.79
0	82.8	78.2	80.9	30.13	0.337	28.54
0	78.22	74.64	76.17	28.63	0.322	26.78
0	77.93	72.43	74.89	28.06	0.313	26.22
0	81.9	76.32	79.37	28.1	0.316	26.4
0	76.82	73.69	74.46	28.42	0.318	26.7
0	74.05	73.13	73.57	27.98	0.308	26.33
0	73.89	68.93	71.41	27.75	0.302	26.18
0	71.01	66.41	67.63	27.36	0.3	25.96
0	66.83	64.3	65.12	27.01	0.297	25.85
0	65.56	64.09	64.85	26.74	0.295	25.81
0	65.69	64.56	65.07	26.48	0.294	25.81
0	65.73	63.99	64.95	26.26	0.291	25.85
0	64.76	63.79	64.25	26.03	0.29	25.85
0	65.49	64.48	65.19	25.85	0.288	25.89
0	68.73	63.25	65.92	25.63	0.286	25.92
0	63.99	62.32	63.1	25.45	0.285	25.89
0	62.92	59.99	61.57	25.2	0.284	25.81
0	62.76	60.88	61.93	24.98	0.284	25.81
0	65.53	62.72	64.05	24.84	0.284	25.85
0	66.41	65.43	65.93	24.7	0.287	25.85
0	67.64	65.27	66.27	24.77	0.284	26
0.01	68.08	66.66	67.51	24.88	0.283	26.11
0	71.68	68.08	70.59	24.95	0.284	26.14
0	71.83	65.4	67.75	25.2	0.284	26.33
0	71.52	65.58	68.95	25.2	0.287	26.26
0	68.47	64.12	66.65	25.34	0.289	26.33
0	71.04	67.13	68.72	25.27	0.29	26.18
0	74.06	70.25	71.33	25.59	0.293	26.52
0	73.04	70.1	71.1	25.7	0.299	26.55
0	70.93	57.11	64.66	25.63	0.298	26.37
0	60.8	57.28	58.85	25.27	0.29	25.92
0	64.05	59.46	61.53	24.95	0.289	25.7
0	63.69	61.78	62.68	24.84	0.285	25.78
0	68.14	63.51	66.39	24.67	0.286	25.78
0	67.89	66.25	67.11	24.53	0.284	25.81
0	67.43	65	66.36	24.35	0.281	25.81
0	66.56	63.39	65.55	24.18	0.283	25.78

0	63.93	55.85	58.65	24.01	0.281	25.74
0	62.51	56.47	58.96	23.74	0.28	25.59
0	62.38	61.51	62.03	23.57	0.278	25.59
0	62.95	60.38	61.84	23.47	0.277	25.63
0	66.29	59.82	63.07	23.3	0.276	25.63
0	70.61	66.23	68.26	23.17	0.278	25.63
0	73.21	70.31	71.93	23.5	0.28	26.07
0	75.95	72.94	74.53	24.15	0.289	26.67
0	79.13	75.01	76.41	25.06	0.309	27.32
0	80.3	76.41	78.51	26.11	0.329	27.94
0	80.3	76.79	78.46	27.39	0.342	28.63
0	78.22	74.44	76.24	27.32	0.333	27.86
0	79.26	68.34	74.34	26.48	0.318	26.52
0	79.32	73.47	75.87	26.67	0.321	26.48
0	78.51	74.64	75.66	26.74	0.317	26.37
0	75.14	66.16	71.31	26.55	0.309	26.07
0	69.33	66.7	67.96	26.14	0.298	25.63
0	68.25	60.91	64.48	25.92	0.292	25.56
0	63.55	61.13	62.54	25.59	0.288	25.45
0	63.71	60.14	62.37	25.34	0.285	25.41
0	64.47	60.72	62.72	25.09	0.282	25.38
0	64.49	60.35	61.4	24.84	0.281	25.38
0	65.51	59.66	61.54	24.6	0.279	25.34
0	64.21	59.73	60.49	24.39	0.279	25.34
0	61.32	59.54	60.39	24.18	0.277	25.34
0	61.3	56.89	59.44	24.01	0.276	25.34
0	59.1	56.85	57.84	23.81	0.272	25.31
0	60.87	58.32	59.59	23.6	0.273	25.31
0	62.21	59.86	60.78	23.47	0.272	25.34
0	67.5	62.23	64.93	23.3	0.274	25.31
0	71.02	67.52	69.41	23.34	0.276	25.45
0	72.62	70.53	71.2	23.74	0.273	25.89
0	74.43	72.47	73.35	24.39	0.288	26.48
0	75.25	73.21	74.09	24.88	0.301	26.67
0	75.75	74.19	74.99	25.31	0.312	26.74
0	74.37	67.94	71.51	25.52	0.315	26.55
0	68.41	58.52	65.11	25.23	0.303	25.92
0.04	58.5	57.7	58.08	24.95	0.287	25.45
0.04	59.2	57.43	57.98	24.7	0.283	25.2
0	59.89	58.79	59.12	24.49	0.282	25.2
0.01	60.31	58.64	59.37	24.35	0.278	25.23
0	59.62	58.99	59.24	24.15	0.276	25.23
0.01	59.35	58.15	58.76	23.94	0.274	25.2
0	58.15	57.45	57.77	23.74	0.273	25.23
0.01	57.68	57.36	57.49	23.57	0.271	25.2
0	58.21	56.98	57.56	23.44	0.27	25.2
0	57.61	56.97	57.24	23.27	0.271	25.16

0	57.86	56.6	57.31	23.14	0.269	25.16
0	57.67	56.42	56.84	23	0.269	25.16
0	56.96	56.45	56.68	22.87	0.266	25.16
0	56.99	56.15	56.58	22.77	0.268	25.16
0	56.62	56.15	56.37	22.64	0.268	25.13
0	57.77	56.36	57.32	22.51	0.265	25.09
0	60.17	57.73	58.92	22.42	0.266	25.13
0	62.28	59.62	60.81	22.32	0.272	25.06
0	65.59	61.66	63.23	22.45	0.273	25.23
0	69.89	65.63	68.11	22.91	0.281	25.7
0	74	68.77	70.62	24.04	0.313	26.67
0	72.57	69.55	71.08	24.98	0.337	27.12
0	76.4	70.66	73.75	24.88	0.331	26.37
0	78.42	74.71	76.66	26.33	0.351	27.47
0	78.83	74.17	76.28	27.16	0.351	27.75
0	77.98	73.82	75.83	27.12	0.351	27.2
0	75.1	73.14	73.99	26.7	0.341	26.33
0	73.18	67.76	70.08	26.14	0.325	25.63
0	67.76	65.47	66.37	25.67	0.305	25.16
0	65.61	64.13	64.8	25.31	0.297	24.95
0	64.44	62.74	63.58	25.02	0.291	24.84
0	63.07	61.47	62.68	24.77	0.288	24.84
0	62.49	60.15	61.47	24.49	0.283	24.84
0	60.87	59.54	60.08	24.22	0.28	24.81
0	61.1	59.54	60.41	23.98	0.279	24.77
0	61.63	60.58	61.06	23.74	0.275	24.77
0	61.06	55.95	58.94	23.54	0.273	24.81
0	57.94	52.14	54.33	23.3	0.272	24.74
0	56.28	52.65	54.57	23.04	0.269	24.67
0	63.74	55.65	60.07	22.81	0.269	24.67
0	67.71	63.62	65.66	22.61	0.275	24.74
0	70.21	67.47	68.86	22.97	0.281	25.23
0	73.24	68.66	71.24	23.6	0.302	25.85
0	75.91	72.21	73.87	24.67	0.327	26.67
0	78.44	73.89	76.06	26.22	0.344	27.82
0	79.11	74.87	77.18	28.06	0.347	29.08
0	80.4	76.82	78.87	29.37	0.347	29.62
0	81	76.57	78.76	29.87	0.349	29.41
0	80.8	76.85	79.25	29.45	0.348	28.38
0	81	76.8	79.34	29.37	0.35	27.86
0	79.12	76.27	77.53	28.75	0.344	27.01
0	76.27	71.64	74.1	27.78	0.329	25.92
0	71.64	67.07	69.27	27.01	0.308	25.2
0	67.33	65.94	66.61	26.52	0.298	24.88
0	68.2	65.28	66.38	26.14	0.29	24.77
0	67.13	64.48	66.16	25.89	0.287	24.77
0	66.64	63.11	65.39	25.59	0.284	24.74

0	66.58	61.87	64.17	25.31	0.28	24.74
0	67.18	61.34	65.93	25.02	0.278	24.74
0	66.8	60.68	62.9	24.81	0.276	24.77
0	65.47	60.27	61.88	24.53	0.274	24.7
0	61.71	59.46	60.28	24.29	0.272	24.7
0	61.58	58.89	59.78	24.08	0.272	24.7
0	66.96	59.19	62.97	23.84	0.269	24.67
0	69.9	66.96	68.33	23.67	0.273	24.74
0	72.91	69.58	71.11	24.04	0.279	25.31
0	75.17	71.56	73.15	24.81	0.297	26.07
0	78.06	72.31	74.76	25.52	0.315	26.52
0	79.12	75.35	77.36	27.16	0.336	27.86
0	81.3	75.34	78.25	28.34	0.336	28.46
0	82.8	79.44	81	29.87	0.344	29.41
0	84.3	79.79	81.9	31.32	0.339	30.22
0	84.7	81.3	83.1	31.01	0.342	29.33
0	84.3	78.74	81.8	30.83	0.343	28.67
0	81.5	78.32	80.1	29.41	0.334	27.05
0	78.86	72.87	75.87	28.38	0.321	26
0	73.14	68.38	70.7	27.63	0.306	25.34
0	70.27	66.82	68.88	27.12	0.291	25.02
0	69.47	67.11	68.57	26.74	0.288	24.91
0	69.01	66.89	68.17	26.44	0.283	24.88
0	68.12	66.35	67.4	26.14	0.279	24.88
0	69.79	67.05	68.5	25.89	0.277	24.88
0	69.96	66.6	69.01	25.7	0.276	24.95
0	68.41	65.9	67.23	25.49	0.275	24.98
0	66.43	63.37	65.24	25.23	0.271	24.95
0	63.47	59.37	61.57	25.02	0.268	24.91
0	61.29	58.68	60.19	24.74	0.268	24.88
0	68.04	61.43	64.24	24.53	0.266	24.84
0	68.92	67.03	67.77	24.35	0.269	24.88
0	72.34	67.9	69.59	24.49	0.273	25.13
0	75.02	71.62	73.22	24.98	0.277	25.7
0	77.27	73.26	75.32	25.81	0.297	26.44
0	80.3	74.44	76.48	26	0.302	26.37
0	82.1	77.27	79.93	26.93	0.317	27.01
0	82.4	79.42	80.8	29.03	0.329	28.71
0	81.7	76.93	78.69	29.33	0.323	28.5
0	77.1	75.03	75.99	28.06	0.312	26.74
0	75	73.31	74.22	27.43	0.302	25.92
0	73.34	72.26	72.83	27.24	0.294	25.67
0	72.68	71.26	71.96	26.97	0.289	25.49
0	71.75	67.32	69.45	26.7	0.282	25.34
0	67.32	64.38	65.95	26.37	0.276	25.2
0	69.27	64.7	67.76	26.03	0.272	25.06
0	69.11	65.08	66.9	25.78	0.271	25.02

0	68.6	64.72	66.2	25.52	0.268	25.02
0	68.52	66.1	67.16	25.31	0.267	25.02
0	67.97	66.47	67.34	25.13	0.264	25.06
0	67.93	66.76	67.38	24.98	0.263	25.09
0	67.95	65.12	66.77	24.84	0.264	25.13
0	66.45	64.09	65.38	24.7	0.263	25.13
0	65.24	62.78	63.8	24.49	0.259	25.09
0	66.84	61.07	63.93	24.29	0.262	24.98
0	71.23	66.1	67.74	24.18	0.264	25.02
0	74.16	70.87	72.02	24.42	0.266	25.41
0	74.86	72.66	73.48	24.88	0.269	25.85
0	73.62	70.21	71.74	25.34	0.282	26.14
0	77.39	73.22	75.01	25.45	0.286	26.07
0	77.86	73.2	75.76	26.63	0.308	27.05
0	73.51	67.14	70.12	26.86	0.307	26.82
0	69.03	65.27	67.49	26.11	0.29	25.78
0.03	65.5	59.49	62.21	25.81	0.279	25.31
0.13	59.59	56.89	57.99	25.41	0.269	24.95
0	63.31	57.6	61.56	25.02	0.269	24.77
0	61.98	57.87	59.87	24.88	0.268	24.91
0	57.87	56.02	56.68	24.7	0.261	24.95
0	56.02	54.38	55.02	24.39	0.26	24.88
0	55.12	52.52	53.83	24.04	0.26	24.81
0	55.56	53.61	55.04	23.77	0.258	24.81
0	55.41	54.43	55.06	23.57	0.255	24.84
0	54.93	52.64	53.87	23.34	0.254	24.88
0	55.38	52.75	54.42	23.1	0.252	24.81
0	55.73	55.28	55.46	22.94	0.252	24.88
0	55.49	53.48	54.03	22.81	0.251	24.91
0	53.96	53.28	53.65	22.64	0.251	24.88
0	54.6	52.93	53.78	22.48	0.252	24.84
0	57.63	51.64	54.14	22.32	0.252	24.81
0	64.51	57.63	61.44	22.1	0.254	24.7
0	67.24	63.54	65.16	22.32	0.255	25.06
0	69.13	65.55	67.56	22.84	0.264	25.56
0	72.28	68.49	70.35	23.87	0.291	26.37
0	75.82	70.93	72.68	25.27	0.322	27.36
0	76.68	70.93	74.26	25.78	0.326	27.2
0	75.37	69.65	72.02	26.7	0.337	27.59
0	76.19	70.03	72.46	26.33	0.329	26.67
0	76.24	69.89	73.2	26.44	0.329	26.4
0	77.15	75.33	76.3	26.93	0.335	26.55
0	75.75	71.5	73.55	26.93	0.33	26.26
0	72.28	67.56	70.02	26.44	0.312	25.56
0	67.54	62.42	64.74	25.96	0.294	25.06
0	64.35	60.64	62.27	25.52	0.281	24.74
0	63.31	61.19	61.95	25.2	0.274	24.63

0	62.14	58.74	60.56	24.91	0.271	24.63
0	61.55	58.43	60.5	24.63	0.268	24.6
0	60.59	57.8	59.03	24.35	0.265	24.6
0	59.83	56.75	58.58	24.08	0.261	24.6
0	57.45	55.67	56.73	23.77	0.259	24.56
0	59.48	57.07	58.75	23.54	0.257	24.53
0	60.7	58.02	59.15	23.3	0.255	24.56
0	60.58	58.35	59.71	23.1	0.255	24.56
0	65.48	59.02	60.69	22.87	0.253	24.56
0	69.97	65.48	67.9	22.68	0.259	24.6
0	72.67	69.67	71.15	23.1	0.267	25.2
0	74.34	71.59	72.98	23.81	0.293	25.96
0	76.82	73.98	75.23	24.95	0.316	26.82
0	79.31	75.81	77.42	26.55	0.329	27.98
0	81	77.58	79.2	28.38	0.329	29.16
0	80.8	78.41	79.76	29.83	0.324	29.83
0	82.4	80.2	81.2	30.52	0.32	29.75
0	82.7	80.5	81.6	30.39	0.321	28.91
0	82.3	80.5	81.4	30.09	0.326	28.1
0	81.6	79.06	80.3	28.95	0.319	26.74
0	79.06	71.29	75.95	27.98	0.304	25.7
0	71.27	60.85	65.36	27.2	0.285	25.02
0	61.13	58.49	59.92	26.59	0.274	24.6
0	61.86	60.05	60.88	26.22	0.27	24.49
0	62.06	59.96	61.24	25.89	0.265	24.49
0	63.05	61.79	62.57	25.59	0.263	24.49
0	63.01	61.85	62.4	25.31	0.261	24.53
0	62.75	55.25	59.55	25.02	0.257	24.53
0	58.02	53.28	55.42	24.67	0.257	24.46
0	56.15	53.35	54.93	24.35	0.255	24.42
0	58.67	54.67	56.78	24.11	0.252	24.46
0	58.46	53.55	56.52	23.84	0.25	24.49
0	64.85	53.86	59.04	23.57	0.25	24.46
0	73.12	64.89	69.68	23.34	0.254	24.49
0	74.91	71.69	73.27	23.67	0.25	25.06
0	76.84	73.74	75.18	24.49	0.257	25.89
0	80.2	76.39	78.32	25.63	0.281	26.86
0	81.8	79.56	80.6	27.2	0.304	27.94
0	84.5	80.6	82.1	29.24	0.305	29.33
0	85.4	82.4	84	30.92	0.294	30.22
0	86.2	83.7	85	31.64	0.293	30.17
0	85.7	83.2	84.9	31.1	0.298	28.99
0	85.8	83.1	84.4	30.52	0.305	27.98
0	84	82.3	83.2	29.45	0.3	26.74
0	82.6	72.29	78.21	28.58	0.289	25.85
0	72.27	63.09	65.09	27.78	0.273	25.13
0	65.81	63.17	64.97	27.2	0.267	24.74

0	66.39	64.9	65.66	26.86	0.267	24.67
0	66.1	65.16	65.63	26.55	0.262	24.67
0	66.35	65.16	65.65	26.26	0.26	24.67
0	68.14	65.55	66.99	25.96	0.256	24.67
0	67.59	65.61	66.71	25.7	0.255	24.7
0	67.38	65.67	66.54	25.45	0.252	24.74
0	66.43	63.07	64.78	25.2	0.249	24.74
0	66.31	58.81	61.2	24.91	0.25	24.74
0	59.08	52.83	56.18	24.63	0.248	24.67
0	65.16	52.64	57.32	24.35	0.248	24.6
0	76.75	65.2	71.9	24.08	0.249	24.6
0	78.09	75.44	76.98	24.39	0.244	25.09
0	80.7	77.39	79.11	25.23	0.24	26
0	84.7	80.4	82.1	26.52	0.257	27.12
0	88.2	82.9	85.4	28.02	0.28	28.26
0	90.4	85.2	88	29.92	0.281	29.58
0	91.3	85.8	88.1	32.05	0.272	30.96
0	91	87.4	88.8	31.46	0.281	29.75
0	90	85.6	88.2	32.01	0.288	29.75
0	86.1	84.2	85.2	30.74	0.292	28.14
0	85.4	82.8	84.1	29.37	0.288	26.67
0	82.8	78.48	81.2	28.79	0.278	26.11
0	78.41	75	76.29	28.22	0.271	25.63
0	75.81	72.9	74.31	27.67	0.266	25.27
0	74.04	72.28	73.3	27.32	0.261	25.16
0	74.75	72.96	73.82	27.05	0.258	25.13
0	74.36	71.41	73.04	26.78	0.256	25.09
0	72.38	70.42	71.52	26.52	0.252	25.09
0	71.49	69.6	70.35	26.22	0.25	25.06
0	70.72	69.43	70.03	25.96	0.249	25.02
0	72.17	70.73	71.49	25.74	0.247	25.06
0	72.06	70.27	71.36	25.56	0.246	25.09
0	70.94	68.43	69.6	25.38	0.243	25.09
0	73.08	69.09	70.59	25.16	0.244	25.09
0	77.28	73.1	75.28	25.02	0.247	25.09
0	81.2	77.14	79.03	25.34	0.238	25.59
0	83.3	80.9	81.8	26.03	0.233	26.29
0	87.2	82.2	84.4	26.89	0.238	27.05
0	88.1	85.4	86.7	27.94	0.248	27.82
0	88.8	85.8	87.2	29.08	0.253	28.5
0	90.3	86.9	88.3	30.17	0.255	29.03
0	90.2	87	88.5	30.92	0.252	29.24
0	88.5	86.3	87.4	30.74	0.255	28.58
0	87.4	84.9	86.2	30.17	0.26	27.71
0	85.2	82.2	83.7	29.37	0.26	26.74
0	82.2	76.8	80	28.71	0.256	26.07
0	77.6	71.34	73.39	28.14	0.253	25.59

0	73.53	72.34	73.04	27.67	0.252	25.31
0	72.61	71.48	72.08	27.36	0.247	25.23
0	72.38	70.41	71.44	27.05	0.248	25.2
0	72.5	71.16	71.98	26.78	0.245	25.2
0	74.23	71.66	72.86	26.55	0.244	25.23
0	74.16	70.33	72.11	26.33	0.242	25.27
0	71.77	70.01	70.89	26.11	0.239	25.27
0	72.08	70.16	70.81	25.89	0.239	25.23
0	71.95	67.1	69.5	25.67	0.24	25.23
0	72.23	66.63	69.49	25.45	0.238	25.23
0	73.49	69.96	72.37	25.27	0.238	25.23
0	76.71	73.47	74.99	25.09	0.239	25.23
0	80.3	76.38	78.14	25.34	0.231	25.63
0	82.6	79.84	81.3	26	0.217	26.33
0	84.8	82.3	83.3	27.09	0.211	27.32
0	86.8	83.3	85.2	28.42	0.22	28.3
0	88.9	85.4	87.2	29.96	0.226	29.37
0	90.1	86.8	88.3	31.1	0.228	29.92
0	90.1	87.3	89.1	31.64	0.23	29.87
0	90.1	88	89	31.46	0.242	29.2
0	89.3	86.7	88.1	30.83	0.249	28.26
0	87.4	84.5	86	29.83	0.253	27.12
0	84.5	78.02	81.9	29.12	0.25	26.33
0	80.1	75.7	79.06	28.5	0.246	25.85
0	76.28	73.92	74.73	28.1	0.248	25.59
0	75.55	73.85	74.6	27.75	0.244	25.49
0	76	70.79	73.75	27.47	0.242	25.45
0	71.24	68.79	69.59	27.2	0.24	25.41
0	70.27	67.2	68.71	26.89	0.24	25.38
0	73.99	69.44	72.69	26.63	0.239	25.34
0	74.94	73.37	74.36	26.44	0.238	25.41
0	74.73	70.96	72.98	26.26	0.234	25.45
0	73.78	67.2	72.74	26.03	0.232	25.45
0	72.41	65.11	67.58	25.85	0.232	25.45
0	73.86	67.84	70.92	25.63	0.235	25.38
0	78.24	73.93	76.45	25.41	0.234	25.38
0	80.8	78.05	79.4	25.63	0.227	25.78
0	83	80.5	81.9	26.26	0.212	26.4
0	86.7	81.9	84.3	27.32	0.198	27.39
0	88.5	85.5	87	28.58	0.2	28.34
0	89.9	85.9	88	29.66	0.214	28.95
0	91	87.5	89.4	30.83	0.224	29.49
0	92.1	88.2	90.4	31.68	0.224	29.79
0	92.5	89.9	90.9	32.1	0.228	29.62
0	91.5	88.4	89.6	31.78	0.236	28.91
0	88.7	85.4	87.1	30.52	0.243	27.51
0	85.4	80.1	82.8	29.66	0.24	26.59

0	80.9	75.7	77.93	29.03	0.244	26.07
0	76.4	73.55	75.23	28.54	0.24	25.78
0	74.9	74.17	74.51	28.22	0.24	25.67
0	74.45	71.5	73.59	27.9	0.239	25.67
0	71.98	69.81	70.69	27.63	0.236	25.63
0	72.17	70.12	70.9	27.32	0.237	25.59
0	73.15	71.55	72.49	27.05	0.235	25.59
0	73.55	72.04	72.89	26.82	0.232	25.63
0	73.37	71.46	72.37	26.59	0.231	25.63
0	72.97	69.18	70.52	26.37	0.228	25.67
0	69.53	64.23	66.79	26.14	0.229	25.63
0	68.92	63.61	65.55	25.85	0.23	25.59
0	77.98	68.96	75.54	25.56	0.231	25.49
0	78.5	76.5	77.46	25.67	0.227	25.78
0	81.8	77.7	79.39	26.07	0.212	26.26
0	87.4	81.4	83.8	26.86	0.196	26.97
0	88.4	85	86.8	28.22	0.178	28.06
0	90.2	85.9	88.1	29.58	0.174	28.99
0	90.6	88.2	89.4	30.57	0.185	29.45
0	90.2	88.1	89.2	31.05	0.192	29.37
0	90.2	87.5	88.7	30.79	0.208	28.71
0	89.2	86.2	87.4	30.48	0.214	28.06
0	86.6	83.8	85.4	29.75	0.224	27.2
0	83.8	76.61	80.8	29.2	0.228	26.59
0	76.56	72.9	75.05	28.71	0.232	26.18
0	73.42	70.8	72.25	28.3	0.233	25.92
0	72.38	69.97	71.09	27.98	0.235	25.85
0	72.88	69.6	71.64	27.67	0.232	25.78
0	72.83	70.12	72.01	27.43	0.232	25.81
0	72.12	69.52	70.96	27.16	0.229	25.81
0	72.12	67.53	69.26	26.93	0.228	25.81
0	68.26	65.39	66.51	26.67	0.227	25.78
0	66.27	62.54	63.69	26.4	0.227	25.74
0	67.6	63.15	65.05	26.14	0.227	25.74
0	68.26	66.84	67.44	25.96	0.225	25.78
0	66.93	64.17	65.42	25.81	0.224	25.81
0	66.51	63.61	64.97	25.63	0.223	25.81
0.01	66.72	63.51	65.19	25.38	0.226	25.74
0.01	66.72	59.93	62.44	25.34	0.222	25.81
0.01	60.95	59.99	60.43	25.2	0.221	25.81
0.01	65.12	60.68	62.53	25.06	0.223	25.78
0.01	65.29	61.71	63.51	24.98	0.222	25.81
0	65.31	61.77	64.01	24.98	0.221	25.85
0	68.98	63.88	66.53	25.09	0.22	25.96
0	70.73	67.52	68.98	25.45	0.214	26.29
0	71.99	69.31	70.86	25.7	0.21	26.44
0	72.09	70.53	71.4	25.81	0.214	26.29

0	70.81	62.8	67.28	25.78	0.22	26.14
0	62.8	56.97	59.29	25.63	0.222	25.92
0	57.45	55.9	56.48	25.41	0.225	25.78
0	60	56.09	58.2	25.2	0.224	25.7
0	60.69	57.54	59.36	24.98	0.224	25.7
0	61.08	54.47	57.4	24.77	0.224	25.7
0	57.08	52.98	55.11	24.53	0.222	25.67
0	56.84	53.31	55.19	24.32	0.219	25.63
0	60.63	54.1	56.43	24.11	0.22	25.59
0	56.56	54.01	55.15	23.91	0.221	25.63
0	57.67	53.06	55.1	23.7	0.218	25.59
0	53.43	50.26	51.8	23.5	0.218	25.59
0	59.17	50.96	53.45	23.3	0.217	25.56
0	68.06	59.2	64.16	23.04	0.221	25.45
0	69.49	66.82	68.04	23.07	0.213	25.67
0	74.48	68.7	71.07	23.44	0.203	26.03
0	77.68	72.99	75.41	24.32	0.189	26.82
0	80.5	76.59	78.48	25.74	0.185	27.94
0	83.2	78.8	80.7	26.97	0.217	28.67
0	83.9	79.02	80.8	27.51	0.244	28.54
0	82.6	78.84	80.4	27.43	0.25	27.75
0	79.29	73.83	76.49	27.2	0.245	26.97
0	79.97	75.68	77.5	26.74	0.239	26.18
0	79.66	78.35	79	27.01	0.239	26.29
0	78.44	67.09	73.08	26.97	0.234	26.18
0	67.97	65.47	66.66	26.55	0.231	25.78
0	67.37	64.27	65.76	26.26	0.23	25.56
0	67.45	63.91	65.36	26.03	0.228	25.52
0	72.1	65.14	67.22	25.81	0.228	25.49
0	73.17	71.79	72.43	25.63	0.225	25.52
0	72.21	70.7	71.48	25.49	0.223	25.56
0	70.92	69.07	70.23	25.31	0.223	25.56
0	69.52	67.82	68.66	25.13	0.222	25.56
0	67.8	60.53	63.99	24.91	0.22	25.52
0	61.7	57.76	60.04	24.7	0.222	25.41
0	59.42	57.47	58.11	24.49	0.222	25.38
0	64.51	57.09	59.62	24.29	0.22	25.34
0	73.19	64.59	70.38	24.04	0.221	25.31
0	75.99	72.98	74.36	24.25	0.213	25.67
0	77.49	74.97	76.15	24.84	0.204	26.33
0	81.2	76.33	78.34	25.74	0.203	27.09
0	83.9	79.56	81.6	26.89	0.219	27.94
0	87.2	81.7	84.2	28.3	0.239	28.87
0	84.9	81.6	83.1	28.58	0.249	28.54
0	85.5	76.64	82	28.34	0.25	27.75
0	76.86	73.17	74.42	27.9	0.244	26.89
0	76.96	74.55	75.5	27.28	0.237	26.07

0	77.34	76.12	76.83	27.32	0.235	26.07
0	77.07	73.91	75.69	27.28	0.231	26.03
0	73.91	68.91	71.46	27.01	0.229	25.81
0	69.6	67.24	68.47	26.67	0.226	25.59
0	69.86	67.91	68.89	26.4	0.226	25.49
0	71.03	68.75	69.99	26.22	0.223	25.52
0	72.57	66.67	68.97	26.03	0.221	25.49
0	68.01	61.97	64.65	25.81	0.222	25.49
0	65.57	62.48	64.22	25.56	0.222	25.41
0	66.52	62.76	64.89	25.38	0.221	25.41
0	67.01	64.88	66.01	25.16	0.219	25.41
0	69.28	65.41	66.92	25.02	0.216	25.45
0	66.12	61.11	63.38	24.88	0.215	25.45
0	65.25	61.19	63	24.67	0.217	25.41
0	68.62	65.25	67.11	24.53	0.217	25.38
0	70.77	68.64	70.05	24.46	0.216	25.45
0	73.57	70.38	71.91	24.6	0.212	25.67
0	76.06	73.21	74.62	24.88	0.211	25.92
0	80.2	75.5	77.8	25.56	0.205	26.52
0	77.33	73.11	75.61	26.18	0.21	26.97
0	75.37	69.22	72.1	25.49	0.219	26
0	80.8	74.78	78.24	25.67	0.22	26
0	80.9	76.49	78.18	26.48	0.221	26.7
0	76.77	65.71	73.77	26.44	0.225	26.52
0.02	65.63	61.95	63.28	26.03	0.223	25.92
0.02	63.61	61.6	62.52	25.59	0.223	25.45
0	63.93	62.56	63.35	25.45	0.223	25.38
0	65.47	62.84	64.35	25.31	0.221	25.38
0	65.45	62.88	64	25.13	0.219	25.41
0	63.89	60.99	62.58	24.95	0.219	25.38
0	64.04	62.02	63.24	24.74	0.216	25.38
0	64.08	62.01	63.17	24.6	0.218	25.38
0	62.89	62.22	62.57	24.42	0.216	25.38
0	64.03	62.52	62.94	24.29	0.213	25.38
0	63.2	62.08	62.72	24.15	0.213	25.38
0	62.57	61.39	61.92	24.01	0.214	25.38
0	63.25	61.39	62.16	23.91	0.212	25.38
0	63.55	60.64	61.9	23.81	0.21	25.38
0	65.02	61.04	62.39	23.67	0.212	25.34
0	66.29	62.02	64.09	23.5	0.215	25.27
0	69.16	66.25	67.41	23.67	0.212	25.52
0	74.02	67.43	70.43	24.08	0.207	25.92
0	74.28	71.36	72.87	25.06	0.217	26.89
0	74.62	72.33	73.21	25.34	0.237	26.89
0	78.03	74.21	75.64	25.45	0.245	26.59
0	76.61	74.39	75.59	26	0.258	26.86
0	77.48	75.4	76.27	26.07	0.26	26.59

0	78.8	75.33	76.51	26.29	0.262	26.59
0	78.44	74.67	76.09	26.29	0.257	26.37
0	75.71	69.4	72.13	26.03	0.247	25.96
0	69.77	67.7	68.94	25.74	0.236	25.59
0	67.91	67.03	67.53	25.52	0.232	25.38
0	67.49	66.58	67.03	25.34	0.229	25.34
0	66.58	63.35	65	25.23	0.226	25.34
0	67.16	64.25	66.32	24.98	0.225	25.23
0	67.72	66.18	66.87	24.88	0.222	25.27
0	66.97	65.86	66.33	24.74	0.223	25.31
0	67.05	65.14	66.52	24.63	0.221	25.31
0	65.22	63	64.63	24.49	0.22	25.31
0	63.97	62.11	63.05	24.35	0.22	25.23
0	62.09	59.55	60.67	24.22	0.219	25.2
0	62.01	58.53	59.58	24.04	0.217	25.16
0	68.37	61.5	63.04	23.87	0.219	25.09
0	70.94	66.85	68.4	23.77	0.22	25.13
0	76.41	69.17	72.56	24.04	0.222	25.49
0	77.72	74.57	75.99	25.13	0.237	26.63
0	79.34	75.89	77.66	26.11	0.267	27.51
0	81.2	77.27	79.39	27.32	0.28	28.34
0	82	73.65	79.62	28.79	0.286	29.33
0	73.27	68.56	70.06	27.94	0.272	27.82
0	71.02	64.04	66.3	26.52	0.257	26
0	72.13	69.21	70.82	26.33	0.252	25.63
0	72.08	68.71	70.17	26.55	0.253	25.78
0.04	69.18	60.66	63.58	26.29	0.24	25.49
0	63.99	61.24	62.81	25.89	0.231	25.13
0	64.11	60.62	62.76	25.63	0.228	25.02
0	62.24	58.27	60.56	25.31	0.225	24.95
0	62.2	56.23	59.64	25.02	0.226	24.91
0	62.14	57.9	60.4	24.7	0.221	24.91
0	62.59	61.65	62.03	24.42	0.219	24.91
0	62.46	61.14	61.79	24.18	0.219	24.95
0	61.67	60.52	61.05	23.94	0.216	24.95
0	61.65	60.23	61.02	23.7	0.214	24.95
0	61.04	59.92	60.59	23.47	0.213	24.95
0	60.74	59.79	60.2	23.3	0.211	24.95
0	62.8	58.71	60.58	23.1	0.212	24.91
0	66.23	62.8	64.73	22.84	0.216	24.84
0	69.39	66.1	67.69	23.04	0.212	25.23
0	72.54	68.67	70.28	23.6	0.218	25.92
0	75.03	70.53	72.34	24.39	0.24	26.63
0	77.25	73.69	75.05	25.49	0.266	27.47
0	79.05	76.03	77.48	26.82	0.277	28.38
0	79.73	77.11	78.52	27.9	0.276	28.83
0	80.3	78.18	79.12	28.54	0.276	28.83

0	81.6	78.44	80	28.75	0.276	28.42
0	80.9	78.27	79.62	28.38	0.274	27.51
0	80.1	76.84	78.72	27.55	0.261	26.33
0	76.82	64.36	71.37	26.97	0.245	25.63
0	64.28	60.8	61.53	26.48	0.234	25.09
0	61.69	59.34	60.53	26.14	0.228	24.88
0	60.35	58.99	59.57	25.85	0.225	24.81
0	59.57	57.82	58.94	25.59	0.223	24.77
0	59.75	56.94	58.59	25.31	0.221	24.77
0	59.48	57.3	58.44	24.98	0.221	24.77
0	58.29	51.93	54.21	24.74	0.217	24.77
0	54.55	51.72	52.86	24.42	0.218	24.74
0	53.44	50.87	51.83	24.15	0.215	24.7
0	53.73	51.39	52.66	23.87	0.211	24.7
0	53.87	50.01	51.57	23.64	0.213	24.7
0	59.24	50.97	53.51	23.37	0.212	24.7
0	70.05	59.28	66.15	23.04	0.215	24.6
0	71.55	68.6	70.3	23.14	0.209	24.95
0	75.14	71.39	73.17	23.64	0.198	25.56
0	78.49	74.49	76.57	24.53	0.199	26.4
0	80.3	77.81	78.94	25.74	0.218	27.32
0	82.4	78.08	80.7	27.09	0.235	28.22
0	83.8	80.7	82.3	28.14	0.242	28.67
0	85.2	81.8	83.4	29.08	0.241	28.95
0	85.6	82.6	84	29.24	0.242	28.46
0	84.6	81.8	83.3	28.99	0.244	27.71
0	83.5	79.03	81.4	28.18	0.24	26.52
0	78.98	68.24	74.14	27.55	0.232	25.7
0	73.24	61.4	65.54	27.01	0.227	25.16
0	63.38	60.93	61.99	26.59	0.223	24.88
0	62.36	60.84	61.75	26.29	0.222	24.81
0	61.55	60.99	61.2	26.03	0.22	24.77
0	62.27	60.91	61.55	25.74	0.22	24.77
0	61.12	59.81	60.38	25.45	0.214	24.77
0	60.79	56.53	58.88	25.16	0.215	24.74
0	60.86	56.87	58.93	24.88	0.214	24.74
0	59.2	55.44	57.32	24.6	0.214	24.74
0	60.25	55.52	57.99	24.35	0.212	24.74
0	55.44	49.07	52.16	24.11	0.211	24.74
0	60.46	49.82	54	23.81	0.21	24.7
0	70.68	60.47	66.93	23.5	0.214	24.6
0	73.99	70.33	72.19	23.57	0.205	24.88
0	76.54	73.49	74.87	23.98	0.197	25.45
0	79.51	75.98	77.57	24.77	0.183	26.18
0	82.4	78.45	80.3	25.89	0.185	27.05
0	85.4	80.8	82.4	27.05	0.2	27.78
0	85.9	82.1	84.1	28.06	0.21	28.26

0	85.8	83.1	84.4	28.83	0.211	28.42
0	86	83.6	84.5	28.83	0.217	27.82
0	85.1	82.3	83.5	28.5	0.22	27.05
0	83.8	80.6	82	27.94	0.221	26.18
0	80.6	66.09	74.88	27.55	0.217	25.63
0	66.05	62.46	63.6	27.09	0.219	25.13
0	62.7	61.34	62.14	26.7	0.222	24.91
0	64.07	61.89	63.04	26.44	0.219	24.84
0	65.54	60.21	63.1	26.18	0.218	24.84
0	60.12	56.44	57.32	25.89	0.215	24.84
0	57.07	54.27	55.81	25.56	0.213	24.77
0	54.85	53.22	54.14	25.27	0.215	24.77
0	55.7	52.88	54.46	24.98	0.212	24.74
0	58.07	51.58	54.98	24.7	0.211	24.74
0	54.76	51.49	53.36	24.46	0.21	24.74
0	54.65	51.19	52.97	24.18	0.208	24.74
0	60.9	50.9	53.8	23.91	0.208	24.74
0	69.41	60.94	66.43	23.6	0.211	24.63
0	71.39	68.55	69.89	23.6	0.204	24.88
0	74.7	70	72.22	23.87	0.194	25.27
0	78.49	73.4	75.89	24.53	0.18	25.89
0	81.5	76.21	79.2	25.67	0.166	26.78
0	84	79.8	81.7	26.97	0.171	27.67
0	86.9	82.9	84.5	28.14	0.184	28.26
0	87.9	83.3	85.4	28.91	0.192	28.42
0	89	82	84.8	28.87	0.206	27.78
0	82.7	81.8	82.1	27.9	0.214	26.37
0	83.3	79.09	81.7	27.63	0.215	25.85
0	79.04	67.5	73.78	27.43	0.213	25.59
0	71.46	66.51	69.19	27.01	0.216	25.16
0	75.33	70.29	72.66	26.78	0.215	25.06
0	74.18	68.35	70.96	26.59	0.213	25.09
0	74.32	68.86	72.28	26.33	0.212	25.02
0	70.64	69.09	70.02	26.14	0.209	25.06
0	73.64	65.68	69.79	25.92	0.208	25.06
0	65.63	56.68	60.16	25.7	0.209	25.02
0	59.96	56.76	58.52	25.41	0.209	24.88
0	62.28	59.22	61.21	25.16	0.209	24.88
0	62.79	59.55	60.54	24.95	0.208	24.88
0	60.73	55.78	58.18	24.74	0.206	24.88
0	63.21	54.8	57.7	24.49	0.209	24.84
0	69.39	63.23	66.52	24.18	0.211	24.74
0	74.5	68.91	71.72	24.25	0.203	25.02
0	76.76	73.41	74.68	24.63	0.192	25.52
0	79.26	75.34	77.33	25.31	0.181	26.14
0	82.4	78.11	80.4	26.48	0.173	27.09
0	84.7	80.3	82.7	27.82	0.177	28.02

0	84.6	80.9	82.6	28.71	0.197	28.38
0	82.2	80.2	81	27.75	0.211	26.86
0	84.9	80.5	82.3	27.36	0.215	26.11
0	84.3	81.7	82.5	27.78	0.215	26.29
0	83.3	81.1	82.1	27.67	0.214	26.11
0	81.3	68.35	74.34	27.43	0.21	25.74
0	69.73	67.83	68.46	26.97	0.212	25.31
0	69.73	68.29	69.12	26.67	0.214	25.13
0	68.29	66.08	66.93	26.44	0.211	25.06
0	70.18	66.37	68.34	26.18	0.21	25.06
0	70.96	67.53	69.17	26	0.21	25.09
0	67.49	65.52	66.24	25.81	0.205	25.09
0	67.51	64.37	65.22	25.59	0.209	25.06
0	67.49	60.24	64.6	25.38	0.208	25.02
0	66.53	58.1	61.73	25.16	0.206	24.98
0	62.91	58.16	60.04	24.95	0.204	24.98
0	58.75	52.79	55.6	24.7	0.208	24.95
0	64.38	57.75	60.47	24.46	0.209	24.91
0	71.32	64.4	67.19	24.22	0.208	24.84
0	75.05	71.01	72.78	24.29	0.202	25.13
0	78.47	74.59	76.35	24.74	0.188	25.67
0	81.2	77.18	79.04	25.59	0.177	26.48
0	83.6	80	81.7	26.78	0.176	27.47
0	85.5	82.4	83.7	28.02	0.189	28.3
0	85.1	81.2	82	28.22	0.207	27.94
0	88.8	83.6	86.5	27.75	0.214	26.93
0	88.7	84.2	86.3	28.79	0.219	27.63
0	88	85.6	86.7	28.87	0.219	27.39
0	87.4	83	85.4	28.5	0.22	26.74
0	83	72.19	77.47	27.98	0.218	26.07
0	72.9	68.94	71.64	27.39	0.215	25.49
0	71.41	67.11	69.53	27.09	0.213	25.23
0	67.11	64.8	65.49	26.82	0.214	25.16
0	66.72	61.77	64.42	26.52	0.211	25.06
0	62.72	58.84	60.06	26.22	0.211	25.06
0	60.95	58.01	59.26	25.96	0.209	25.02
0	64.28	59.73	62.09	25.7	0.209	24.98
0	65.65	61.12	63.78	25.45	0.21	25.02
0	66.18	56.41	61.66	25.23	0.205	25.02
0	56.39	52.44	54.03	24.98	0.206	25.02
0	56.6	54.29	55.75	24.74	0.206	24.98
0	62.85	54.61	58.05	24.49	0.205	24.95
0	67.98	62.75	65.84	24.18	0.208	24.88
0	72.01	67.7	69.86	24.25	0.203	25.13
0	74.92	71.35	73.05	24.56	0.191	25.59
0	78.96	73.97	76.31	25.27	0.179	26.26
0	81.6	77.42	79.34	26.44	0.171	27.2

0	84	79.8	82	27.63	0.183	27.98
0	85.9	81.7	83.4	28.46	0.198	28.34
0	85.6	81.4	83.1	28.95	0.211	28.26
0	82.5	80.4	81.2	28.18	0.219	27.01
0	80.8	80	80.4	27.71	0.217	26.22
0	80	77.79	78.84	27.67	0.216	25.96
0.01	77.82	61.83	69.3	27.55	0.211	25.78
0.34	61.83	59.98	61.18	27.05	0.214	25.31
0.13	61.65	60.53	61.26	26.67	0.215	25.09
0.03	61.5	60.37	60.79	26.22	0.213	25.09
0	62.07	61.11	61.49	25.78	0.211	25.09
0	62.35	61.41	61.74	25.38	0.208	25.09
0	61.87	60.7	61.31	25.02	0.207	25.09
0	62.12	60.31	61.19	24.7	0.205	25.09
0	60.31	59.64	60.02	24.46	0.204	25.09
0	59.83	59.52	59.74	24.22	0.204	25.13
0	59.64	59.04	59.27	23.98	0.204	25.13
0	59.46	58.89	59.26	23.77	0.2	25.13
0	60.5	59.43	59.93	23.6	0.201	25.13
0	61.25	60.35	60.74	23.44	0.201	25.13
0	64.48	61.12	62.61	23.24	0.203	25.09
0	68.45	64.07	66.4	23.3	0.201	25.23
0	72.28	66.68	68.63	23.74	0.193	25.63
0	72.77	69.38	70.82	24.35	0.193	26.03
0	74.19	70.49	72.22	24.98	0.201	26.33
0	75.24	71.21	73.37	25.45	0.214	26.44
0	76.14	73.67	74.82	26.11	0.229	26.74
0	76.66	74.53	75.66	26.37	0.24	26.59
0	76.14	74.48	75.27	26.37	0.241	26.26
0	74.64	71.58	73.41	26.11	0.236	25.81
0	71.56	65.12	68.33	25.85	0.225	25.49
0	65.12	61.89	62.83	25.49	0.216	25.2
0	63.13	62.3	62.84	25.13	0.217	25.09
0	62.3	59.5	60.83	24.84	0.215	25.06
0	59.62	58.24	58.99	24.56	0.211	25.02
0	58.21	56.79	57.44	24.25	0.211	24.98
0	57.03	56.02	56.63	23.98	0.209	24.98
0	56.32	55.82	56.01	23.7	0.206	24.95
0	56.9	55.69	56.32	23.44	0.206	24.95
0	55.97	54.55	55.44	23.17	0.206	24.95
0	56.6	54.07	55.01	22.94	0.203	24.91
0	55.83	53.75	54.55	22.71	0.2	24.91
0	59.3	54.41	55.9	22.45	0.203	24.91
0	65.93	59.34	63.36	22.13	0.205	24.77
0	68.56	65.52	67.2	22.26	0.2	25.09
0	71.53	68.3	69.65	22.64	0.197	25.49
0	74.48	70.39	72.17	23.44	0.202	26.14

0	77.75	72.94	75.22	24.7	0.23	27.05
0	79.44	74.62	77.2	26.03	0.258	27.78
0	80.9	77.91	79.17	27.32	0.274	28.34
0	80.6	77.15	78.48	27.9	0.277	28.14
0	78.89	77.25	77.95	26.93	0.264	26.52
0	81.6	78.2	79.54	26.78	0.262	26.07
0	78.58	75.1	77.41	26.86	0.258	25.96
0	75.1	73.22	74.05	26.44	0.245	25.56
0	73.39	69.9	71.12	26.14	0.235	25.31
0	72.17	70.03	71.38	25.89	0.232	25.16
0	72.83	70.03	71.19	25.67	0.228	25.13
0	70.85	69.9	70.42	25.41	0.225	25.09
0	70.38	69.65	70.07	25.13	0.226	25.06
0	70.3	69.36	69.84	24.91	0.221	25.02
0	69.62	68.81	69.35	24.7	0.221	25.02
0	69.05	68.14	68.53	24.49	0.219	25.02
0	68.37	67.57	67.93	24.29	0.217	25.02
0	68.01	66.43	67.35	24.11	0.214	25.02
0	68.01	67.11	67.58	23.94	0.215	25.02
0	68.1	67.18	67.53	23.81	0.215	25.02
0	71.99	67.59	68.46	23.67	0.216	25.02
0	73.51	70.46	71.86	23.7	0.223	25.2
0	73.85	71.29	72.62	24.18	0.23	25.7
0	77.53	73.37	75.44	24.53	0.241	25.89
0	78.37	75.94	77.15	25.63	0.265	26.86
0	82.3	76.89	78.38	26.11	0.272	26.93
0	82.1	78.85	80.2	27.05	0.281	27.47
0	85.3	80.3	83.1	28.38	0.289	28.34
0	82.3	77.94	78.98	29.08	0.286	28.42
0	78.13	77.17	77.56	27.47	0.273	26.37
0	78.83	75.87	76.86	27.09	0.266	25.85
0	75.83	70.31	72.23	26.82	0.255	25.59
0	70.45	66.56	68.64	26.29	0.242	25.16
0	67.78	66.17	66.83	25.89	0.236	24.98
0	67.51	66.53	67.04	25.59	0.232	24.91
0	66.72	64.39	65.35	25.31	0.229	24.91
0	69.92	64.48	66.1	25.02	0.226	24.88
0	66.62	65.37	65.87	24.77	0.225	24.91
0	69.54	64.5	66.75	24.56	0.223	24.91
0	65.01	62.74	63.61	24.29	0.221	24.88
0	66.08	63.56	65.49	24.04	0.219	24.88
0	65.32	62.5	64.43	23.84	0.217	24.88
0	64.94	61.61	63.92	23.64	0.218	24.88
0	62.58	60.56	61.32	23.4	0.216	24.84
0	68.26	61.71	64.57	23.17	0.219	24.77
0	77.51	68.26	73.97	23.17	0.219	24.98
0	78.77	75.18	76.84	24.08	0.227	26

0	82.4	78.1	79.8	25.06	0.254	26.86
0	84.3	80.4	82.4	26.7	0.277	28.06
0	87.2	83.6	85.3	28.75	0.279	29.49
0	87	83.6	85.4	30.43	0.272	30.43
0	88.8	84	86.8	30.48	0.279	29.66
0	88	83.3	84.8	30.22	0.283	28.75
0	83.4	72.23	74.6	28.71	0.278	26.93
0	72.39	70.97	71.42	27.63	0.267	25.74
0	72.41	70.05	71.13	27.24	0.253	25.38
0	70.2	68.26	69.35	26.89	0.246	25.23
0	70.25	67.88	68.46	26.55	0.242	25.06
0	69.97	68.1	69.02	26.29	0.237	25.06
0	68.33	66.21	67.07	26.03	0.236	25.02
0.02	69.11	63.8	67.54	25.78	0.234	25.02
0.01	64.28	61.26	61.8	25.52	0.232	24.95
0	61.58	58.95	60.53	25.2	0.228	24.88
0	59.74	58.63	59.06	24.95	0.227	24.84
0	61.03	59.18	60.31	24.67	0.226	24.81
0	60.37	59.56	59.84	24.42	0.222	24.84
0	59.94	57.96	59.38	24.22	0.223	24.84
0	61.49	57.02	58.17	23.94	0.22	24.81
0	69.19	61.53	66.65	23.6	0.227	24.7
0	69.49	68.16	68.73	23.77	0.222	25.06
0	73.61	68.88	71.25	24.25	0.227	25.67
0	75.09	72.22	73.55	25.06	0.247	26.37
0	78.01	72.06	75.41	25.67	0.266	26.67
0.13	74.83	67.68	71.59	26.22	0.278	26.82
0	77.59	73.21	75.25	25.63	0.268	25.85
0	80.5	74.67	76.58	26.52	0.285	26.55
0	84.2	80.5	81.8	27.2	0.295	27.05
0	81.2	77.4	79.9	27.78	0.299	27.43
0	79.13	74.78	77.1	26.59	0.283	26.11
0	74.85	71.06	72.34	25.89	0.263	25.45
0	71.28	66.56	69.46	25.34	0.25	25.09
0	68.87	64.23	65.93	24.95	0.243	24.95
0	65.49	61.07	63.37	24.6	0.238	24.88
0	64.59	61.5	63.41	24.22	0.233	24.81
0	64.43	62.42	63.43	23.91	0.227	24.77
0	64.64	61.33	63.76	23.64	0.228	24.81
0	62.73	58.98	60.72	23.37	0.225	24.77
0	62.36	58.74	59.75	23.07	0.222	24.74
0	60.73	56.16	58.4	22.77	0.22	24.74
0	56.93	53.35	54.56	22.55	0.22	24.7
0	58.03	53.53	55.81	22.29	0.219	24.7
0	61.57	56.68	58.54	22.03	0.218	24.7
0	69.98	61.59	66.99	21.78	0.221	24.6
0	72.52	69.63	70.86	22.13	0.222	25.2

0	74.11	70.25	71.56	22.81	0.24	25.92
0	75.89	73.75	74.91	23.2	0.254	26.14
0	80.1	74.88	77.63	24.18	0.275	26.86
0	80.1	75.78	77.47	24.98	0.284	27.16
0	82.8	78.82	80.7	26.03	0.289	27.67
0	83.6	79.63	81.5	27.59	0.292	28.75
0	83.8	80.6	82.4	27.86	0.291	28.38
0	82.5	79.8	81	27.86	0.289	27.9
0	80.1	76.06	78.25	26.74	0.282	26.4
0	76.03	67.22	71.82	25.96	0.264	25.49
0	67.23	64.45	65.17	25.38	0.247	24.91
0	66.72	63.35	65.02	25.02	0.241	24.7
0	66.37	61.54	64.63	24.74	0.237	24.67
0	69.65	62.47	64.77	24.46	0.233	24.63
0	68.54	62.86	64.75	24.15	0.229	24.6
0	69.09	62.14	67.27	23.91	0.229	24.63
0	68.37	61.5	63.25	23.67	0.226	24.63
0	67.78	62.12	65.68	23.4	0.223	24.6
0	67.2	64.78	66.26	23.2	0.222	24.6
0	65.22	59.46	63.32	22.97	0.221	24.63
0	64.77	57.73	60.55	22.74	0.219	24.56
0	62.36	57.75	59.26	22.51	0.22	24.49
0	71.05	62.4	67.79	22.19	0.223	24.39
0	75.12	70.94	72.85	22.42	0.219	24.84
0	77.1	74.71	75.77	23.14	0.226	25.67
0	78.66	76.16	77.41	24.01	0.244	26.37
0	80.2	76.91	78.42	25.23	0.265	27.2
0	82.8	79.34	80.8	26.93	0.273	28.34
0	83.4	80.2	82	28.67	0.265	29.33
0	84.6	81.6	83.2	29.41	0.267	29.24
0	85.8	82.8	84.1	29.58	0.273	28.67
0	84.8	81.5	83.3	29.08	0.277	27.67
0	82.5	78.32	80.8	27.82	0.271	26.14
0	78.32	62.85	69.6	26.97	0.255	25.23
0	65.3	61.95	63.21	26.29	0.245	24.63
0	65.55	62.58	64.36	25.92	0.239	24.49
0	65.37	64.35	64.74	25.59	0.236	24.49
0	64.72	60.77	62.67	25.27	0.232	24.46
0	62.34	59.1	61.14	24.95	0.231	24.46
0	61.21	59.38	60.32	24.6	0.227	24.39
0	59.56	55.86	57.48	24.29	0.225	24.39
0	57.52	55.03	55.95	23.98	0.226	24.35
0	57.52	54.3	55.4	23.7	0.223	24.39
0	55.3	51.81	53.38	23.4	0.221	24.35
0	53.07	51.48	52.3	23.14	0.219	24.35
0	58.4	51.26	53.5	22.84	0.218	24.32
0	73.69	58.44	66.14	22.48	0.225	24.22

0	73.69	72.05	72.77	22.58	0.217	24.56
0	76.48	73.13	74.55	23.14	0.209	25.27
0	79.68	75.66	77.42	23.98	0.212	26.03
0	82.6	77.62	80.1	25.23	0.233	26.93
0	84.5	80.9	82.7	26.55	0.252	27.67
0	85.3	81.7	83.7	27.71	0.256	28.22
0	86	83.2	84.4	28.67	0.257	28.42
0	86.2	84	85.2	28.87	0.261	27.94
0	84.8	83.4	84	28.42	0.259	27.05
0	83.7	78.75	81.7	27.59	0.256	25.96
0	78.75	64.43	70.32	26.97	0.242	25.23
0	65.07	63.52	64.33	26.37	0.237	24.7
0	65.16	63.75	64.66	26	0.237	24.53
0	65.2	63.79	64.59	25.67	0.234	24.49
0	66.78	64.92	65.75	25.41	0.231	24.49
0	67.74	64.96	66.28	25.09	0.229	24.49
0	66.56	64.62	65.85	24.88	0.226	24.49
0	68.14	64.24	65.64	24.6	0.225	24.49
0	66.46	62.83	65	24.35	0.224	24.49
0	64.69	56.66	59.65	24.15	0.223	24.49
0	58.75	55.89	57.01	23.87	0.22	24.46
0	57.3	55.06	56.28	23.64	0.222	24.42
0	61.17	54.62	56.54	23.37	0.222	24.39
0	74.31	61.19	69.08	23.07	0.223	24.29
0	76.75	73.64	75.14	23.24	0.218	24.67
0	80.3	76.44	77.97	23.87	0.207	25.41
0	83	78.82	80.5	24.81	0.208	26.29
0	85	81.3	82.9	26.14	0.226	27.28
0	83.4	81	82	26.67	0.24	27.28
0	82.3	81.5	81.9	26.29	0.246	26.33
0	84.6	81.7	82.5	26.14	0.245	25.81
0	88.3	84.4	86.6	26.55	0.248	26.03
0	86.5	84.6	85.6	27.63	0.257	26.97
0	84.8	80.2	82.3	27.24	0.251	26.37
0	80.2	76.91	78.45	26.52	0.24	25.49
0	77.29	71.26	75.09	26.11	0.235	25.06
0	75.32	69.47	72.54	25.78	0.233	24.84
0	74.54	69.08	72.32	25.52	0.232	24.74
0	73.6	72.88	73.22	25.31	0.23	24.7
0	73.42	72.48	72.89	25.13	0.229	24.74
0	72.92	71.51	72.19	24.95	0.227	24.74
0	72.48	70.72	71.85	24.77	0.224	24.7
0	72.39	68.16	71.62	24.56	0.224	24.7
0	71.36	64.47	65.93	24.39	0.222	24.67
0	66.91	61.89	63.99	24.15	0.22	24.6
0	64.45	58.05	61.09	23.94	0.22	24.53
0	65.85	57.15	60.1	23.67	0.219	24.46

0	75.27	65.42	71.61	23.37	0.225	24.35
0	77.63	75.17	76.52	23.54	0.218	24.74
0	78.99	76.52	77.74	24.18	0.21	25.49
0	81.9	78.23	79.77	24.95	0.211	26.18
0	81.9	78.08	80.1	25.89	0.219	26.78
0	83.9	80.5	81.5	26.14	0.234	26.59
0	84.6	80.2	81.6	26.26	0.237	26.29
0	85.9	81	83.1	26.78	0.244	26.48
0	87.6	82.6	84.8	28.1	0.252	27.47
0	86.7	78.1	81.7	28.42	0.251	27.39
0	79.83	75.58	77.58	27.2	0.245	25.89
0	75.58	73.11	74.11	26.7	0.238	25.2
0	73.15	71.63	72.19	26.37	0.236	24.91
0	71.72	70.16	71.06	26.14	0.234	24.84
0	71.29	67.87	69.97	25.89	0.231	24.77
0	67.82	64.3	66.04	25.63	0.229	24.67
0	69.71	64.92	66.63	25.34	0.229	24.6
0	68.98	59.81	63.88	25.16	0.226	24.6
0	63.65	60.1	61.44	24.88	0.225	24.53
0	68.7	60.08	66.51	24.63	0.225	24.49
0	69.86	66.91	67.92	24.53	0.222	24.6
0	68.43	65.84	67.23	24.39	0.221	24.67
0	67.26	63.21	65.28	24.25	0.22	24.67
0	64.76	62.34	63.56	24.08	0.22	24.67
0	67.68	62.17	64.22	23.87	0.221	24.56
0	66.72	63.67	65.71	23.74	0.223	24.56
0	75.73	66.35	69.88	23.67	0.222	24.6
0	75.78	71.37	73.37	24.04	0.217	25.09
0	76.68	72.88	74.74	24.6	0.214	25.59
0	73.37	70.1	72.06	24.7	0.222	25.49
0	72.09	69.96	70.67	24.63	0.224	25.2
0	71.19	69.19	70.15	24.63	0.226	25.06
0	69.32	62.32	67.96	24.67	0.222	24.98
0.13	62.32	55.62	57.14	24.46	0.222	24.74
0.02	56.29	55.27	55.79	24.15	0.224	24.46
0.06	56.88	55.39	56.28	23.91	0.222	24.46
0.05	55.37	54.25	54.6	23.7	0.222	24.49
0	54.27	51.99	52.74	23.4	0.221	24.46
0	53.38	49.21	51.36	23.1	0.22	24.39
0	50.51	48.3	49.11	22.77	0.22	24.39
0.01	51.23	48.59	49.67	22.48	0.217	24.39
0	53.73	48.57	50.71	22.19	0.215	24.35
0	53.44	48.46	50.73	21.91	0.211	24.35
0	54.86	49.73	52.79	21.59	0.214	24.32
0	51.62	43.87	47.75	21.31	0.212	24.29
0	51.07	43.23	46.17	20.97	0.211	24.29
0	51.21	43.63	47.36	20.67	0.21	24.25

0	48.23	42.82	45.4	20.37	0.21	24.22
0	55.73	48.16	53.82	19.95	0.215	24.08
0	57.76	55.06	56.44	19.89	0.208	24.25
0	62.39	57.71	60.24	20.04	0.199	24.53
0	68.39	61.91	64.11	20.55	0.196	24.98
0	70.11	65.3	68.4	21.37	0.203	25.45
0	71.6	67.96	69.62	22.13	0.221	25.7
0	71.69	67.98	70.2	22.61	0.237	25.56
0	71.36	69.39	70.25	23.1	0.244	25.49
0	70.51	68.21	69.32	23.4	0.244	25.2
0	68.66	65.79	67.22	23.54	0.237	24.84
0	66.02	60.85	63.98	23.44	0.23	24.53
0	61.22	56.36	59	23.3	0.223	24.32
0	59.05	52.28	55.19	23	0.221	24.11
0	58.72	54.12	55.86	22.71	0.221	24.04
0	56.76	50.22	53.02	22.39	0.218	24.01
0	52.89	46.23	50.21	22.07	0.219	23.98
0	53	47.84	50.29	21.72	0.214	23.94
0	53.46	47.62	50.99	21.37	0.214	23.91
0	49.77	44.96	47.52	21.1	0.21	23.91
0	49.75	40.96	45.02	20.76	0.211	23.87
0	49.15	41.61	44.97	20.46	0.21	23.84
0	42.82	37.52	39.97	20.16	0.206	23.81
0	46.92	40.55	44.43	19.86	0.207	23.77
0	50.22	46.89	48.54	19.63	0.204	23.77
0	52.25	49.72	50.88	19.4	0.206	23.81
0	57.87	52.25	55.03	19.17	0.206	23.7
0	61.24	57.66	59.78	19.25	0.204	23.91
0	63.43	60.19	61.96	19.69	0.198	24.25
0	65.97	62.4	64.08	20.43	0.199	24.74
0	67.18	64.37	65.9	21.37	0.206	25.16
0	68.63	65.47	66.77	22.19	0.217	25.34
0	69.25	66.59	67.75	22.84	0.228	25.27
0	69.57	67.39	68.22	23.2	0.231	24.95
0	68.54	66.19	67.2	23.3	0.23	24.53
0	66.56	63.18	64.91	23.2	0.225	24.11
0	63.18	60.63	61.85	23.1	0.219	23.87
0	60.63	57.32	58.02	22.87	0.218	23.74
0	59.08	57.04	57.82	22.61	0.216	23.64
0	57.7	53.82	56.26	22.35	0.216	23.6
0	53.83	51.8	53.09	22.07	0.214	23.57
0	52.85	52.02	52.43	21.78	0.213	23.5
0	52.42	51.55	51.83	21.5	0.213	23.5
0	51.62	49.47	50.73	21.22	0.211	23.47
0	49.44	45.85	46.58	20.97	0.21	23.44
0	47.52	46.46	47.02	20.7	0.211	23.4
0	49.07	46.64	47.89	20.46	0.206	23.4

0	48.82	46.32	48.08	20.22	0.208	23.4
0	51.94	45.83	48.8	19.95	0.207	23.37
0	61.12	51.97	55.99	19.63	0.21	23.24
0	62.51	60.85	61.6	19.6	0.206	23.4
0	65.61	62	63.65	19.81	0.199	23.7
0	68.53	64.69	66.57	20.37	0.194	24.15
0	70.91	67.53	68.79	21.44	0.191	24.88
0	71.78	68.38	70.51	22.45	0.206	25.34
0	72.75	70.11	71.53	23.3	0.221	25.49
0	74.37	71.14	72.54	23.87	0.231	25.31
0	73.74	71.46	72.5	24.22	0.235	24.95
0	73.1	70.38	71.46	24.18	0.232	24.42
0	70.51	67.34	69.07	23.94	0.229	23.91
0	67.3	61.78	64.77	23.74	0.224	23.6
0	63.43	59.1	60.83	23.47	0.221	23.4
0	60.04	58.52	59.33	23.2	0.221	23.34
0	61.71	59.13	60.63	22.94	0.219	23.27
0	62.1	60.58	61.48	22.68	0.218	23.27
0	61.57	60.73	61.2	22.42	0.216	23.27
0	61.16	59.15	60.25	22.19	0.215	23.27
0	60.15	53.12	54.98	21.97	0.214	23.24
0	54.23	52.45	53.15	21.72	0.212	23.2
0	58.77	52.49	54.3	21.47	0.21	23.14
0	58.69	51.26	56.99	21.22	0.21	23.14
0	58.31	50.87	55.41	21	0.207	23.14
0	58.52	53.05	55.67	20.79	0.21	23.14
0	62.49	56.86	59.98	20.49	0.213	23
0	64.89	62.31	63.74	20.46	0.21	23.2
0	67.87	64.84	66.24	20.67	0.202	23.5
0	70.13	66.99	68.47	21.16	0.196	23.91
0	70.47	68.19	69.38	22.03	0.191	24.49
0	72.39	68.89	70.63	22.84	0.197	24.84
0	72.73	69.51	71.42	23.54	0.205	24.98
0	73.53	70.25	72.01	24.11	0.216	24.95
0	72.46	67.92	70.36	24.29	0.221	24.49
0	71.34	68.29	69.82	24.15	0.222	23.98
0	68.57	64.74	66.93	24.04	0.219	23.64
0	64.94	61.46	63.25	23.84	0.22	23.37
0	61.48	56.9	59.21	23.57	0.22	23.2
0	57.43	54.62	55.73	23.27	0.219	23.1
0	56.25	52.62	54.46	22.97	0.217	23.04
0	52.58	46.63	50.08	22.64	0.217	23
0	48.02	39.28	44.56	22.29	0.215	22.97
0	41.37	38.36	39.31	21.94	0.215	22.94
0	46.03	34.01	40.54	21.56	0.214	22.91
0	35.76	33.4	34.62	21.19	0.213	22.87
0	36.04	31.89	33.77	20.85	0.211	22.91

0	33.51	31.08	32.32	20.49	0.211	22.87
0	34.06	31.46	32.56	20.13	0.209	22.87
0	37.48	31.81	33.87	19.78	0.21	22.87
0	50.22	37.52	46.45	19.31	0.211	22.74
0	52.61	49.9	51.19	19.17	0.206	22.87
0	55.73	52.2	53.87	19.11	0.204	23
0	58.65	54.76	56.76	19.31	0.201	23.14
0	61.78	57.89	59.46	19.83	0.196	23.4
0	63.56	59.49	61.37	20.64	0.19	23.74
0	66.17	62.2	64.03	21.5	0.189	24.01
0	68.73	64.54	66.49	22.26	0.195	24.08
0	68.03	66.05	66.8	22.81	0.201	23.94
0	66.91	64.15	65.39	22.94	0.21	23.57
0	64.55	57.15	62.3	22.91	0.215	23.24
0	57.11	43.4	49.45	22.81	0.214	23.04
0	44.45	43.29	43.86	22.55	0.215	22.87
0	46.81	43.52	45.06	22.26	0.217	22.81
0	46.57	45.2	45.98	21.94	0.214	22.77
0	46.57	43.78	45.17	21.62	0.215	22.74
0	43.78	42.11	42.86	21.31	0.211	22.74
0	43.28	42	42.6	20.97	0.211	22.71
0	42.04	39.91	40.86	20.64	0.208	22.71
0	41.01	39.64	40.29	20.34	0.208	22.68
0	40.34	37.75	39.25	20.04	0.207	22.68
0	39.45	37.62	38.49	19.75	0.205	22.68
0	37.96	36.07	36.86	19.48	0.205	22.64
0	44.11	36.59	40.14	19.2	0.203	22.61
0	62.15	44.15	53.09	18.82	0.208	22.51
0	62.34	60.14	61.11	18.74	0.203	22.64
0	64.3	61.87	63.15	18.82	0.199	22.81
0	67.47	63.54	65.14	19.14	0.193	23.04
0	69.04	65.55	67.44	19.86	0.183	23.44
0	71.41	67.81	69.62	20.79	0.174	23.87
0	74.12	69.82	71.82	21.69	0.173	24.11
0	74.11	71.23	73	22.45	0.186	24.15
0	74	71.93	73.04	22.91	0.196	23.91
0	74.12	71.29	72.34	23.07	0.203	23.54
0	71.25	64.6	69.4	23	0.211	23.14
0	64.44	51.67	54.27	22.87	0.215	22.84
0	52.69	51.34	51.93	22.64	0.217	22.61
0	52.82	51.8	52.35	22.39	0.215	22.55
0	53.36	51.91	52.55	22.13	0.215	22.51
0	53.07	50.15	51.27	21.84	0.215	22.51
0	51.01	47	49.51	21.56	0.212	22.48
0	48.52	44.03	46.16	21.25	0.211	22.45
0	45.03	44.1	44.73	20.97	0.21	22.45
0	46.35	44.3	45.35	20.7	0.211	22.42

0	46.26	43.6	44.39	20.43	0.208	22.42
0	44	42.49	43.07	20.16	0.207	22.42
0	43.66	42.19	42.96	19.92	0.206	22.39
0	48.38	42.63	44.38	19.63	0.205	22.39
0	62.48	48.41	55.97	19.28	0.211	22.26
0	66.6	62.48	65.37	19.22	0.204	22.42
0	68.66	65.71	66.91	19.31	0.2	22.64
0	71.02	68.19	69.67	19.69	0.192	22.91
0	73.83	70.32	71.49	20.49	0.177	23.4
0	75.73	71.95	73.76	21.44	0.169	23.87
0	77.67	74.3	76.16	22.42	0.17	24.25
0	78.85	76.38	77.34	23.17	0.183	24.25
0	78.37	76.26	77	23.57	0.196	23.94
0	77.49	75.24	76.25	23.6	0.207	23.47
0	75.2	65.34	73.08	23.47	0.21	23
0	65.17	53.81	56.85	23.27	0.214	22.68
0	55.55	53.58	54.42	23	0.219	22.42
0	56.3	53.09	54.65	22.74	0.218	22.35
0	61.53	53.31	59.05	22.48	0.216	22.32
0	61.33	55.07	59.86	22.22	0.217	22.32
0	61.41	59.61	60.51	21.94	0.213	22.32
0	60.59	58.45	59.21	21.72	0.214	22.35
0	58.85	56.05	57.31	21.47	0.21	22.32
0	58.57	55.01	56.67	21.22	0.21	22.29
0	56.63	52.31	55.02	21	0.209	22.29
0	57.25	52.13	54.3	20.79	0.209	22.29
0	54.1	48.41	50.97	20.55	0.208	22.29
0	49.3	46.85	48.17	20.31	0.207	22.26
0	62.77	49.34	56.32	19.98	0.213	22.13
0	65.84	62.41	64.37	19.89	0.207	22.26
0	67.69	65.04	66.33	19.98	0.201	22.48
0	69.72	66.21	67.99	20.28	0.194	22.74
0	71.88	68.84	70.6	20.94	0.18	23.17
0	75.36	70.99	72.99	21.91	0.166	23.7
0	76.66	73.42	74.91	22.87	0.162	24.11
0	76.96	74.87	75.94	23.4	0.175	24.01
0	77.15	75.42	76.32	23.7	0.188	23.7
0	76.78	74.19	75.58	23.77	0.202	23.27
0	74.17	66.65	71.88	23.64	0.208	22.87
0	66.59	53.43	58.76	23.44	0.212	22.58
0	54.06	51.92	52.82	23.17	0.217	22.35
0	54.63	53.06	53.72	22.91	0.217	22.26
0	54.15	51.36	52.47	22.64	0.215	22.26
0	56.13	51.49	53.63	22.35	0.214	22.22
0	52.38	50.36	51.49	22.07	0.213	22.22
0	52.82	50.36	51.15	21.78	0.213	22.22
0	51.59	49.76	50.77	21.53	0.212	22.19

0	52.64	49.01	51.1	21.25	0.211	22.19
0	51.03	49.47	50.07	21	0.211	22.19
0	51.13	47.78	49.74	20.79	0.208	22.22
0	49.1	46.8	48.13	20.55	0.209	22.19
0	50.46	48.01	48.51	20.28	0.207	22.19
0	66.86	50.48	58.6	19.98	0.212	22.07
0	67.79	63.82	65.67	19.92	0.206	22.22
0	70.4	64.74	67.85	20.01	0.2	22.42
0	73.45	69.8	71.64	20.34	0.194	22.71
0	75.24	72.11	73.7	21.07	0.178	23.2
0	77.72	74.23	75.91	22.03	0.162	23.74
0	80.2	76.89	78.34	23	0.162	24.15
0	82.1	78.2	79.65	23.7	0.171	24.22
0	80.1	77.89	78.96	23.94	0.187	23.84
0	78.97	75.12	76.74	23.91	0.2	23.3
0	75.26	63.98	70.94	23.7	0.209	22.84
0	63.84	57.96	59.82	23.5	0.213	22.51
0	59.4	58.02	58.81	23.27	0.215	22.35
0	59.52	57.06	57.86	23.04	0.218	22.29
0	61.55	56.51	59.15	22.81	0.216	22.26
0	62.75	59	61.38	22.55	0.214	22.22
0	65.89	61.75	63.59	22.32	0.214	22.26
0	65.83	61.18	63.01	22.13	0.211	22.26
0	65.91	62.65	65.12	21.94	0.213	22.26
0	65.41	64.59	65.01	21.75	0.209	22.29
0	65.26	62.28	64.21	21.62	0.209	22.29
0	62.68	60.77	61.69	21.47	0.208	22.29
0	61.2	58.73	60.38	21.31	0.207	22.26
0	61.03	57.96	58.99	21.16	0.206	22.26
0	61.06	57.8	59.26	20.94	0.209	22.19
0	66.02	60.84	63.64	20.79	0.211	22.16
0	71.36	65.7	67.8	20.88	0.205	22.35
0	72.93	70.98	71.66	21.16	0.199	22.61
0	75.15	70.46	72.45	21.53	0.193	22.81
0	77.2	73.85	75.39	22.13	0.182	23.1
0	78.29	75.4	76.77	22.84	0.173	23.47
0	75.73	73.76	74.82	23.24	0.18	23.47
0	73.76	72.35	73.01	23.2	0.195	23
0	72.35	70.87	71.65	23.2	0.204	22.74
0	70.87	66.45	69.59	23.24	0.207	22.64
0	66.51	65.13	65.58	23.14	0.211	22.51
0	65.13	62.13	63.71	22.97	0.213	22.42
0	66.02	63.99	65.2	22.81	0.211	22.39
0	65.61	60.43	63.27	22.68	0.21	22.35
0	65.32	61.1	63.8	22.48	0.208	22.35
0	62.06	58.95	60.61	22.32	0.212	22.32
0	62.54	60.64	61.44	22.13	0.212	22.29

0	63.45	60.83	62.35	21.97	0.209	22.29
0	64.09	62.87	63.62	21.84	0.211	22.32
0	63.63	62.01	62.89	21.72	0.206	22.35
0	63.87	61.14	62.78	21.62	0.206	22.35
0	65.96	59.94	62.66	21.53	0.206	22.35
0	60.48	59.14	59.82	21.37	0.207	22.32
0	63.02	59.31	61.09	21.25	0.207	22.26
0	64.48	63.06	63.63	21.13	0.207	22.26
0	65.69	64.36	64.98	21.13	0.206	22.32
0	66.84	65.33	65.93	21.16	0.208	22.39
0	69.5	66.1	67.93	21.31	0.202	22.48
0	68.83	66.99	67.85	21.59	0.197	22.64
0	70.15	67.78	69.04	21.81	0.199	22.68
0	69.52	67.72	68.68	22.07	0.196	22.71
0	68.86	65.9	66.98	22.22	0.2	22.68
0	66.49	63.57	64.98	22.29	0.204	22.55
0	63.69	61.63	62.58	22.39	0.206	22.51
0	61.63	59.99	60.86	22.32	0.209	22.42
0	59.99	57.96	58.85	22.26	0.207	22.35
0	57.96	56.53	57.13	22.1	0.21	22.32
0	56.55	56.17	56.28	21.94	0.21	22.29
0	56.23	55.84	56	21.81	0.21	22.26
0	56.27	55.23	55.9	21.69	0.209	22.26
0	55.24	54.56	55	21.56	0.208	22.26
0	55.08	53.79	54.45	21.4	0.207	22.22
0	54.38	53.68	53.93	21.28	0.205	22.22
0	53.89	53.06	53.57	21.16	0.207	22.22
0	54.11	52.98	53.6	21.03	0.205	22.22
0	53.31	51.25	52.24	20.91	0.206	22.22
0	52.22	51.03	51.48	20.79	0.204	22.19
0	56.65	52.22	54.36	20.64	0.208	22.16
0	60.34	56.65	58	20.49	0.209	22.1
0	63.33	59.96	61.72	20.58	0.205	22.26
0	65.19	61.63	63.62	20.85	0.197	22.51
0	67.73	64.59	66.03	21.47	0.183	22.97
0	70.86	66.42	68.36	22.07	0.176	23.3
0	70.66	68.69	69.48	22.55	0.178	23.37
0	71.73	68.53	69.94	22.84	0.189	23.2
0	72.61	68.05	70.28	22.87	0.201	22.87
0	68.82	64.91	66.59	23	0.206	22.71
0	65.02	61.36	63.61	22.81	0.21	22.42
0	61.34	57.75	58.91	22.71	0.212	22.29
0	61.5	57.43	59.92	22.51	0.211	22.19
0	61.01	59.81	60.49	22.32	0.21	22.16
0	62.22	55.58	60.09	22.13	0.211	22.16
0	56.77	53.21	54.24	21.94	0.208	22.16
0	59	53.02	54.13	21.72	0.209	22.13

0	60.3	58.96	59.67	21.5	0.207	22.1
0	60.2	59.05	59.72	21.34	0.21	22.1
0	59.35	57.98	58.66	21.19	0.206	22.13
0	58.52	57.44	58.13	21.03	0.204	22.13
0	57.95	56.37	57.09	20.88	0.207	22.13
0	56.71	54.74	55.69	20.73	0.204	22.1
0	56.95	54.14	55.01	20.58	0.204	22.07
0	61.92	56.95	59.58	20.31	0.209	21.97
0	66.52	61.92	64.28	20.31	0.206	22.1
0	70.05	65.96	67.77	20.49	0.197	22.35
0	73.82	69.26	71.1	20.97	0.184	22.81
0	74.39	70.45	72.71	21.78	0.172	23.44
0	75.56	71.44	73.67	22.29	0.178	23.6
0	76.16	72.93	74.17	22.71	0.185	23.57
0	79.36	73.19	75.65	22.97	0.197	23.34
0	79.58	74.62	76.94	23.44	0.202	23.44
0	78.08	74.36	76.38	23.77	0.203	23.4
0	74.38	69.27	71.53	23.54	0.206	22.91
0	69.23	63.02	66.4	23.2	0.211	22.45
0	63.44	60.37	61.51	22.97	0.213	22.22
0	66.06	59.54	61.99	22.77	0.214	22.13
0	66.22	61.53	64.76	22.55	0.212	22.1
0	64.78	63.71	64.19	22.39	0.21	22.13
0	64.11	63.15	63.62	22.19	0.211	22.13
0	63.47	62.52	62.98	22	0.208	22.13
0	63.07	62.11	62.6	21.81	0.209	22.1
0	62.92	61.35	62	21.65	0.209	22.1
0	61.94	60.89	61.35	21.5	0.207	22.1
0	61.36	57.48	60.63	21.34	0.206	22.07
0	59.73	56.88	58.42	21.19	0.207	22.07
0	59.36	57.5	58.41	21.03	0.204	22.07
0	62.24	56.04	59.94	20.76	0.209	21.97
0	67.85	62.26	65.38	20.73	0.205	22.07
0	70.96	67.35	69.19	20.88	0.2	22.32
0	73.95	70.41	72.16	21.34	0.187	22.81
0	76.41	72.22	74.68	22.29	0.169	23.6
0	79.31	74.65	76.69	23.54	0.161	24.53
0	79.66	74.74	77.23	24.46	0.177	24.98
0	78.36	75.57	77.45	24.49	0.197	24.39
0	78.05	76	76.9	24.67	0.202	24.01
0	76.31	73.08	75.02	24.35	0.204	23.3
0	73.09	66.43	70.72	23.98	0.212	22.71
0	67.29	59.07	63.37	23.67	0.21	22.35
0	66.37	62.94	64.91	23.37	0.213	22.16
0	66.22	64.39	65.33	23.17	0.212	22.13
0	64.98	63.59	64.34	22.97	0.211	22.13
0	63.99	63.05	63.55	22.74	0.211	22.13

0	63.71	62.6	63.31	22.51	0.211	22.13
0	63.75	61.89	62.83	22.32	0.209	22.13
0	63.08	61.67	62.49	22.13	0.209	22.13
0	62.08	60.63	61.47	21.94	0.207	22.13
0	62.93	60.19	61.71	21.78	0.205	22.1
0	63.57	62.22	62.88	21.62	0.206	22.13
0	63.27	61.82	62.39	21.47	0.204	22.13
0	62.22	60.85	61.55	21.34	0.204	22.13
0	64.96	61.88	63.47	21.1	0.21	22.03
0	68.14	64.94	66.37	21.1	0.203	22.16
0	70.09	67.34	68.55	21.22	0.197	22.35
0	72.66	69.38	70.78	21.47	0.194	22.61
0	74.11	71.93	72.91	21.91	0.182	22.94
0	75.75	72.17	73.54	22.42	0.174	23.2
0	74.27	70.93	72.54	22.81	0.169	23.3
0	73.64	71.45	72.3	23	0.179	23.17
0	72.04	70.08	71.05	23.2	0.182	23.04
0	70.69	64.32	67.11	23.17	0.193	22.74
0	64.28	58.78	61.8	22.97	0.2	22.42
0	58.81	53.33	56.15	22.77	0.204	22.22
0	56.18	50.41	54.02	22.55	0.206	22.13
0	51.37	46.58	49.5	22.26	0.207	22.03
0	49.23	43.56	45.8	21.94	0.206	22.03
0	48.5	42.4	46.21	21.62	0.205	21.97
0	42.59	34.84	38.96	21.28	0.205	21.97
0	39.02	33.91	36.3	20.94	0.205	21.94
0	42.15	35.63	38.76	20.64	0.203	21.94
0	40.64	34.06	37.34	20.31	0.201	21.94
0	38.54	32.41	35.13	20.01	0.2	21.94
0	33.7	30.26	32.26	19.69	0.201	21.91
0	33.23	31.15	32.24	19.43	0.199	21.94
0	36.03	32.32	33.53	19.11	0.197	21.91
0	51.36	36.06	44.05	18.74	0.202	21.81
0	52.85	50.73	51.64	18.6	0.198	21.91
0	55.83	52.48	54.31	18.57	0.192	22.03
0	58.36	54.99	56.98	18.68	0.191	22.16
0	61.28	57.61	59.45	19.02	0.186	22.29
0	63.21	60.2	61.37	19.57	0.183	22.51
0	64.1	61.22	62.77	20.16	0.177	22.64
0	65.35	62.59	63.85	20.73	0.176	22.68
0	66.17	63.18	64.46	21.16	0.184	22.58
0	64.75	63.29	64.01	21.44	0.19	22.42
0	63.83	54.04	59.88	21.53	0.196	22.26
0	54	45.26	46.66	21.47	0.2	22.07
0	46.86	44.61	45.97	21.28	0.202	21.94
0	45.57	43.62	44.49	21.1	0.201	21.87
0	45.18	43.2	43.82	20.82	0.2	21.84

0	43.43	41.21	42.07	20.58	0.201	21.81
0	42.73	40.39	41.39	20.28	0.197	21.78
0	44.21	38.1	40.66	20.01	0.197	21.78
0	38.16	35.46	36.71	19.75	0.198	21.75
0	38.3	35.8	36.96	19.48	0.196	21.72
0	37.17	33.78	35.08	19.22	0.196	21.72
0	35.78	32.65	33.8	18.97	0.196	21.69
0	34.96	32.98	34.08	18.71	0.193	21.69
0	35.56	31.77	33.69	18.46	0.193	21.65
0	52.69	35.63	44.69	18.13	0.199	21.56
0	54.28	51.92	53.01	17.99	0.195	21.62
0	57.97	53.87	55.76	17.96	0.191	21.78
0	62.66	57.34	60.22	18.1	0.184	21.91
0	66.06	62.03	64.33	18.51	0.179	22.1
0	67.96	65.14	66.62	19.02	0.174	22.26
0	70.32	65.93	68.55	19.72	0.166	22.45
0	71.78	68.78	70.29	20.37	0.166	22.55
0	72.02	69.84	70.95	20.88	0.172	22.48
0	71.68	68.89	70.38	21.16	0.182	22.29
0	68.89	58.37	64.86	21.25	0.19	22.07
0	58.2	48.59	50.94	21.19	0.196	21.84
0	49.53	46.93	48.24	21.03	0.199	21.69
0	49.88	45.58	47.89	20.85	0.199	21.62
0	54.2	45.05	47.71	20.64	0.199	21.56
0	55.03	45.68	49.96	20.43	0.201	21.53
0	48.16	44.11	46.35	20.19	0.195	21.53
0	47.69	42.75	44.76	19.92	0.196	21.5
0	52.82	44.99	48.2	19.69	0.198	21.47
0	53.11	43.04	46.08	19.48	0.195	21.47
0	43.39	41.31	42.49	19.25	0.193	21.47
0	47.35	41.26	45.06	19.05	0.194	21.44
0	47.3	41.82	44.77	18.85	0.193	21.44
0	43.18	41	41.83	18.66	0.194	21.4
0	51.74	41.03	47.02	18.4	0.194	21.34
0	51.75	50.65	51.07	18.26	0.196	21.34
0	56.8	51.45	53.5	18.24	0.192	21.44
0	64.57	56.74	60.47	18.38	0.189	21.56
0.02	69.15	63.77	66.47	19.2	0.182	22.35
0	74.92	69.02	71.46	18.88	0.176	21.75
0	78.83	73.46	75.04	19.57	0.163	22.07
0	79.02	76.35	77.31	20.28	0.159	22.29
0	77.75	75.12	76.46	20.73	0.167	22.22
0	76.75	71.2	73.02	21.03	0.177	22.1
0	71.25	67.59	69.31	21.13	0.186	21.84
0	67.72	64.32	65.8	21.16	0.19	21.65
0	65.1	60.94	63.02	21.07	0.194	21.53
0	61.77	57.67	60.27	20.97	0.197	21.47

0	61.35	57.59	60.04	20.82	0.197	21.4
0	58.96	50.37	53.64	20.67	0.197	21.37
0	52.01	46.24	49.19	20.46	0.197	21.31
0	55.46	47.53	50.34	20.25	0.197	21.28
0	53.55	50.15	51.46	20.04	0.195	21.25
0	56.21	51.25	54.54	19.81	0.197	21.25
0	54.51	47.03	50.1	19.63	0.194	21.25
0	49.46	45.39	47.55	19.4	0.195	21.22
0	48.85	42.73	45.29	19.2	0.195	21.19
0	45.72	41.52	42.99	18.94	0.195	21.16
0	61.09	44.59	55.54	18.66	0.197	21.07
0	63.98	61.13	62.31	18.51	0.192	21.16
0	67.16	63.41	64.73	18.57	0.188	21.31
0	68.62	65.63	66.82	18.74	0.183	21.53
0	70.96	67.46	68.67	19.2	0.173	21.78
0	74.21	69.84	72.64	19.92	0.161	22.16
0	76.57	72.83	75.15	20.67	0.147	22.45
0	78.06	75.45	76.95	21.37	0.146	22.61
0	79.83	76.85	78.17	21.84	0.154	22.48
0	77.63	72.89	75.71	22	0.172	22.19
0	72.87	65.87	69.53	21.84	0.189	21.72
0	65.77	60.68	63.24	21.72	0.196	21.44
0	63.23	58.16	61.31	21.56	0.199	21.28
0	61.16	57.3	58.63	21.37	0.2	21.19
0	58.82	56.93	57.97	21.19	0.197	21.19
0	59.28	56.97	58.5	21	0.198	21.16
0	60.85	58.52	59.37	20.79	0.197	21.16
0	62.53	59.44	61.14	20.58	0.198	21.16
0	62.65	60.41	61.68	20.43	0.194	21.16
0	60.73	54.67	59.35	20.28	0.193	21.16
0	59.38	51.54	56.16	20.13	0.195	21.16
0	56.01	50.38	52.23	19.95	0.196	21.13
0	51.41	47.47	49.37	19.81	0.195	21.1
0	48.7	46.28	46.94	19.63	0.194	21.1
0	57.48	48.76	54.85	19.37	0.197	21.03
0	57.38	56.05	56.56	19.25	0.195	21.07
0	57.89	56.77	57.2	19.2	0.193	21.13
0	64.33	57.91	60.09	19.17	0.191	21.13
0	66.76	64.32	65.49	19.28	0.191	21.22
0	68.7	65.76	66.73	19.6	0.184	21.44
0	67.99	66.49	67.25	19.92	0.184	21.5
0	66.8	63.63	65.21	20.22	0.185	21.47
0	64.18	63.51	63.81	20.4	0.189	21.37
0	65.28	64.18	64.8	20.52	0.193	21.31
0	64.25	58.76	62.29	20.7	0.189	21.34
0	59.43	57.58	58.43	20.67	0.192	21.25
0	60.22	56.94	58.88	20.61	0.193	21.19

0	60.11	56.83	57.99	20.52	0.194	21.16
0	56.96	54.99	55.79	20.4	0.194	21.13
0	55.65	54.65	55.21	20.28	0.194	21.13
0	55.29	53.96	54.84	20.19	0.192	21.1
0	55.4	54.56	54.87	20.04	0.195	21.1
0	57.24	54.34	55.15	19.95	0.194	21.1
0	57.33	53.95	55.3	19.83	0.193	21.1
0	54.19	52.71	53.29	19.75	0.193	21.07
0	52.82	49.64	51.47	19.63	0.192	21.07
0	51.29	44.69	46.61	19.48	0.193	21
0	44.97	43.57	44.24	19.34	0.193	20.97
0	56.64	43.5	46.83	19.14	0.194	20.91
0	59.72	56.66	58.66	18.88	0.199	20.82
0	63.16	59.35	61.17	18.91	0.192	21.03
0	66.62	62.32	64.32	19.02	0.188	21.16
0	69.23	65.66	66.92	19.31	0.181	21.34
0	71.4	67.27	68.83	19.75	0.176	21.53
0	73.34	69.89	71.75	20.25	0.167	21.72
0	73.22	69.92	71.77	21.03	0.155	22.1
0	72.97	68.99	70.4	21.25	0.171	21.84
0	69.19	67.24	68.54	21.25	0.188	21.44
0	67.24	63.02	65.53	21.34	0.189	21.31
0	63.02	57.04	60.32	21.28	0.195	21.16
0	59.09	56.29	57.28	21.19	0.198	21.07
0	61.41	58.94	60.21	21.03	0.197	21
0	60.59	54.8	57.69	20.91	0.195	21
0	56.73	52.29	54.96	20.73	0.198	20.97
0	52.33	49.44	50.76	20.55	0.197	20.94
0	51.44	49.15	50.32	20.34	0.196	20.88
0	49.08	46.37	47.15	20.13	0.196	20.88
0	48.26	47.1	47.64	19.92	0.196	20.88
0	47.75	46.28	47.12	19.72	0.198	20.85
0	46.58	43.98	44.9	19.51	0.195	20.85
0	51.07	45.55	47.73	19.31	0.194	20.85
0	54.28	50.16	51.78	19.14	0.194	20.85
0	51.29	46.98	49.18	18.97	0.194	20.82
0	61.2	49.63	56.15	18.74	0.196	20.79
0	62.51	60.52	61.52	18.74	0.192	20.88
0	67.38	61.26	63.63	18.85	0.19	21.03
0	70.36	66.27	68.48	19.14	0.183	21.25
0	72.7	69.53	71.24	19.72	0.166	21.62
0	73.51	68.82	71.12	20.37	0.156	21.94
0	73.78	68.82	70.62	20.55	0.173	21.62
0	73.28	69.82	71.62	20.76	0.185	21.4
0	72.17	68.31	70.14	21.07	0.186	21.44
0	68.93	56.81	64.03	21.07	0.192	21.22
0	60.86	53.25	57.62	20.97	0.196	21.03

0	58.35	52.86	56.53	20.85	0.196	20.94
0	55.26	52.86	54.29	20.67	0.196	20.88
0	55.18	50.17	53.56	20.49	0.197	20.85
0	53.1	46.16	50.5	20.28	0.195	20.82
0	46.97	44.82	45.78	20.04	0.196	20.79
0	47.48	41.99	43.58	19.83	0.197	20.76
0	42.21	41.2	41.72	19.6	0.195	20.73
0	43.06	41.87	42.51	19.37	0.196	20.73
0	42.83	40.73	41.63	19.14	0.195	20.7
0	40.71	37.54	39.27	18.94	0.193	20.7
0	38.3	36.59	37.4	18.71	0.192	20.7
0	38.44	35.63	36.6	18.49	0.191	20.67
0	50.95	38.47	45.96	18.24	0.194	20.61
0	56.36	50.97	54.04	18.04	0.193	20.64
0	58.69	55.56	57.07	18.07	0.188	20.79
0	61.77	58.23	59.8	18.21	0.183	20.94
0	65.18	60.94	63.26	18.54	0.18	21.13
0	67.18	63.81	65.63	19.08	0.171	21.37
0	69.14	66.05	67.46	19.72	0.165	21.62
0	70.49	67.54	68.93	20.31	0.167	21.69
0	69.87	67.81	68.91	20.7	0.172	21.59
0	69.18	65.11	66.44	20.85	0.185	21.34
0	65.11	55.99	62.55	20.85	0.192	21.07
0	55.93	52.38	53.32	20.76	0.194	20.88
0	52.97	51.78	52.29	20.64	0.197	20.76
0	57.54	51.23	53.69	20.49	0.198	20.73
0	57.46	51.46	53.84	20.34	0.197	20.73
0	51.77	48.58	50.15	20.16	0.196	20.7
0	50.88	48.89	49.63	19.98	0.196	20.67
0	50.76	48.62	49.63	19.78	0.196	20.64
0	55.05	49.32	52.81	19.57	0.193	20.64
0	54.72	50.1	52.19	19.4	0.193	20.64
0	51.95	42.95	47.77	19.25	0.193	20.64
0	42.91	40.75	41.76	19.05	0.194	20.61
0	44.18	41.56	42.54	18.85	0.192	20.58
0	45.07	41.95	43.75	18.66	0.193	20.58
0	56.72	44.8	50.56	18.43	0.194	20.49
0	61.8	56.59	59.62	18.26	0.195	20.55
0	65.92	61.67	63.67	18.32	0.189	20.7
0	66.8	64.49	65.7	18.6	0.181	20.97
0	68.89	65.83	67.56	19.05	0.171	21.28
0	71.95	68	69.34	19.69	0.163	21.56
0	72.95	69.84	71.22	20.34	0.16	21.78
0	74.03	70.64	72.29	20.85	0.163	21.81
0	74.92	70.5	71.73	21.07	0.177	21.5
0	72.77	69.58	71.32	21.16	0.185	21.22
0	73.02	66.36	69.11	21.28	0.191	21.1

0	66.9	55.24	62.83	21.28	0.194	20.94
0	59.64	55.1	58.02	21.13	0.197	20.76
0	60.23	57.52	58.92	20.97	0.198	20.67
0	61.32	57.5	58.89	20.82	0.199	20.64
0	62.3	60.58	61.48	20.64	0.198	20.61
0	61.12	59.35	60.53	20.49	0.196	20.64
0	60.93	59.96	60.35	20.31	0.196	20.64
0	60.48	58.96	59.67	20.13	0.194	20.64
0	59.58	58.6	59.17	19.98	0.196	20.61
0	58.94	57.73	58.53	19.83	0.195	20.61
0	58.14	51.54	55.02	19.72	0.194	20.61
0	53.85	47.47	50.25	19.54	0.193	20.58
0	50.24	47.27	48.6	19.37	0.196	20.52
0	59.17	49.52	54.61	19.11	0.196	20.46
0	64.9	59.19	62.47	18.97	0.194	20.49
0	68.61	64.13	66.43	19.02	0.187	20.7
0	70.51	66.8	68.41	19.25	0.182	20.97
0	71.79	68.28	69.87	19.81	0.169	21.37
0	72.48	68.72	70.5	20.46	0.161	21.75
0	74.86	71.49	73.41	20.88	0.163	21.75
0	75.75	72.49	74.31	21.56	0.16	22
0	75.49	73.15	74.15	21.97	0.166	21.97
0	73.47	69.01	71.37	21.87	0.181	21.5
0	68.98	63.67	67.06	21.65	0.195	21.03
0	63.65	52.91	57.74	21.5	0.197	20.79
0	55.46	50.55	52.43	21.28	0.197	20.64
0	56.92	52.33	54.14	21.07	0.199	20.58
0	58.6	55.78	57.83	20.85	0.2	20.55
0	58.6	52.04	55.65	20.64	0.2	20.55
0	53.89	52.23	52.89	20.43	0.195	20.55
0	54.24	50.44	52.89	20.19	0.198	20.55
0	52.31	46.88	49.54	19.98	0.194	20.52
0	52.34	48.24	50.3	19.78	0.196	20.52
0	49.45	45.91	48.15	19.54	0.195	20.49
0	48.17	46.12	47.14	19.31	0.192	20.52
0	50.03	46.76	48.37	19.11	0.193	20.52
0	47.6	45.74	46.6	18.94	0.191	20.52
0	56.84	46.99	52.08	18.66	0.195	20.43
0	62.44	56.88	59.66	18.49	0.195	20.46
0	64.92	61.49	63.38	18.51	0.188	20.64
0	67.82	64.29	65.66	18.71	0.184	20.85
0	71.01	67.36	69.33	19.14	0.175	21.16
0	72.79	70.21	71.63	19.81	0.162	21.56
0	75.37	71.45	73.03	20.43	0.16	21.75
0	75.49	72.1	73.76	20.79	0.167	21.62
0	72.95	71.73	72.24	20.97	0.176	21.37
0	72.48	70.4	71.52	21.03	0.189	21.07

0	70.38	60.05	65.71	21.13	0.191	20.94
0	59.99	54.7	56.08	21.03	0.195	20.76
0	57.93	54.84	56.35	20.88	0.197	20.64
0	57.46	51.95	54.47	20.7	0.197	20.58
0	57.03	51.94	54.97	20.52	0.198	20.55
0	53.61	48.96	51.14	20.31	0.197	20.52
0	52.69	49.24	50.73	20.07	0.196	20.52
0	52.6	48.75	50.53	19.86	0.193	20.49
0	49.72	47.43	48.46	19.66	0.192	20.49
0	50.72	47.17	48.72	19.43	0.194	20.49
0	47.5	46.34	46.85	19.22	0.193	20.46
0	47.57	44.24	45.86	19.02	0.192	20.46
0	46.49	43.49	45.19	18.82	0.193	20.46
0	46.09	43.87	44.75	18.6	0.191	20.43
0	56.78	45.27	50.27	18.35	0.192	20.37
0	60.41	56.8	58.84	18.18	0.193	20.4
0	63.3	59.94	61.6	18.21	0.189	20.55
0	66.45	62.92	64.71	18.38	0.183	20.76
0	70.04	66.33	68.37	18.8	0.174	21.07
0	74.12	68.93	71.3	19.46	0.158	21.44
0	76.17	73.39	74.65	20.16	0.15	21.78
0	77.06	75.15	76	20.76	0.155	21.84
0	77.06	75.29	76.12	21.1	0.165	21.69
0	75.86	72.74	74.5	21.19	0.178	21.34
0	72.74	56.65	65.74	21.1	0.187	21
0	56.59	55.41	56.07	20.91	0.193	20.7
0	56.58	54.83	55.91	20.76	0.194	20.55
0	57.8	54.84	56.6	20.61	0.2	20.52
0	59.71	57.2	57.96	20.43	0.197	20.49
0	60.44	54.37	56.2	20.25	0.196	20.49
0	56.08	52.07	53.6	20.01	0.197	20.46
0	53.71	50.24	51.43	19.81	0.194	20.43
0	53.91	49.39	51.65	19.6	0.195	20.43
0	49.56	45.83	47.08	19.4	0.193	20.43
0	51.43	46.24	47.4	19.2	0.193	20.4
0	48.03	43.86	45.51	19	0.19	20.37
0	45.4	39.15	42.13	18.8	0.193	20.37
0	42.3	40.14	40.93	18.57	0.193	20.34
0	59.25	41.15	50.61	18.29	0.191	20.28
0	66.39	59.25	62.03	18.13	0.193	20.31
0	68.16	66.29	67.09	18.18	0.186	20.49
0	71.54	67.53	69.06	18.38	0.18	20.73
0	75.24	69.29	72.13	18.82	0.17	21.07
0	77.89	72.22	74.33	19.51	0.157	21.47
0	78.86	74.01	76.21	20.16	0.152	21.72
0	79.25	74.58	76.89	20.55	0.162	21.62
0	77.73	73.35	75.41	20.91	0.171	21.5

0	75.72	70.86	73.37	20.97	0.177	21.19
0	70.86	66.24	69.03	20.97	0.186	20.91
0	66.24	60.23	63.29	20.85	0.192	20.7
0	61.67	58.83	59.8	20.76	0.194	20.55
0	61.54	58.85	60.42	20.61	0.194	20.49
0	61.16	57.22	59.96	20.46	0.195	20.46
0	58.81	51.64	55.32	20.28	0.196	20.43
0	55.52	51.21	53.02	20.07	0.195	20.4
0	54.83	48.09	50.84	19.86	0.194	20.37
0	62.29	54.83	60.94	19.66	0.194	20.34
0	61.38	59.32	60.75	19.51	0.192	20.4
0	61.22	55.37	57.68	19.37	0.19	20.43
0	57.65	52.15	55.75	19.22	0.19	20.4
0	56.62	51.31	53.65	19.08	0.19	20.37
0	55.77	52.29	53.82	18.91	0.19	20.37
0	61.84	54.39	59.23	18.71	0.195	20.28
0	62.34	56.32	58.77	18.63	0.194	20.34
0	69.03	62.38	65.5	18.63	0.187	20.43
0	72.19	68.57	70.7	18.85	0.182	20.7
0	74.11	71.44	72.94	19.37	0.168	21.1
0	76.75	73.31	74.81	20.04	0.156	21.53
0	76	73.09	74.55	20.64	0.155	21.78
0	75.52	71.44	73.11	20.88	0.168	21.56
0	71.77	69.69	70.62	20.85	0.18	21.13
0	70.6	67.07	68.58	20.88	0.188	20.82
0	67.07	64.2	65.41	20.94	0.193	20.7
0	64.38	61.79	63.23	20.85	0.196	20.55
0	62.22	60.02	61.08	20.76	0.194	20.49
0	60.43	55.24	58.1	20.64	0.196	20.46
0	58.92	56.51	57.57	20.46	0.194	20.4
0	57.61	56.14	56.95	20.28	0.196	20.37
0	56.26	51.36	53.94	20.1	0.195	20.37
0	54.79	51.51	53.64	19.89	0.194	20.34
0	55.01	47.95	52.38	19.69	0.194	20.31
0	50.46	47.68	48.9	19.51	0.19	20.31
0	48.39	43.82	46.17	19.31	0.194	20.28
0	47.11	42.37	45.13	19.11	0.191	20.28
0	46.15	42.37	44.94	18.88	0.191	20.25
0	46	42.32	44.36	18.68	0.191	20.25
0	55.6	42.77	51.07	18.46	0.192	20.22
0	58.95	55.6	57.21	18.26	0.193	20.19
0	61.57	58.76	60.17	18.26	0.188	20.37
0	63.88	60.9	62.47	18.43	0.183	20.58
0	66.13	63.02	64.53	18.8	0.175	20.85
0	68.28	64.83	66.84	19.37	0.165	21.19
0	70.61	67.23	69.1	20.04	0.155	21.5
0	71.34	69.08	70.01	20.55	0.157	21.56

0	70.74	68.88	69.84	20.76	0.171	21.31
0	70.21	65.65	67.73	20.76	0.182	20.97
0	65.77	53.83	59.81	20.67	0.19	20.67
0	53.74	46.98	50.9	20.49	0.193	20.43
0	51.28	46.59	49.6	20.31	0.196	20.31
0	49.72	47.35	48.58	20.13	0.196	20.28
0	49.23	44.23	46.84	19.92	0.193	20.25
0	44.9	42.98	43.77	19.66	0.196	20.22
0	44.41	42.7	43.47	19.43	0.193	20.22
0	44.83	42.33	43.75	19.17	0.193	20.19
0	45.44	40.75	42.66	18.94	0.192	20.19
0	47.72	41.14	43.04	18.68	0.19	20.19
0	41.99	40.7	41.58	18.46	0.189	20.16
0	42.57	40.81	41.67	18.26	0.191	20.16
0	41.46	37.82	39.4	18.04	0.186	20.16
0	39.71	37.96	38.94	17.85	0.19	20.16
0	52.56	38.03	44	17.6	0.19	20.1
0	57.15	52.64	55.41	17.39	0.191	20.07
0	59.77	56.62	58.02	17.39	0.184	20.22
0	61.79	59.03	60.46	17.5	0.181	20.4
0	65.92	61.24	63.02	17.8	0.176	20.58
0	67.25	64.09	65.94	18.32	0.168	20.82
0	71.76	66.5	68.78	18.94	0.16	21.07
0	70.15	68.19	69.26	19.48	0.162	21.16
0	71.93	68.91	69.99	19.83	0.165	21.03
0	69.99	65.9	67.91	20.01	0.179	20.79
0	65.86	51.85	60.19	20.01	0.183	20.52
0	51.85	47.79	48.98	19.92	0.187	20.31
0	48.95	47.86	48.35	19.78	0.192	20.19
0	49.74	48.23	49.18	19.63	0.194	20.13
0	48.72	47.74	48.26	19.43	0.192	20.1
0	48.49	44.01	46.57	19.22	0.191	20.1
0	47.23	40.01	42.98	19	0.192	20.07
0	43.94	41.69	42.72	18.74	0.193	20.04
0	43.09	41.76	42.34	18.51	0.191	20.04
0	42.66	40.22	41.19	18.32	0.188	20.04
0	40.77	36.38	38.24	18.07	0.189	20.01
0	41.6	36.23	38.84	17.88	0.187	19.98
0	39.47	37.12	38.28	17.66	0.186	19.98
0	39.56	36.18	37.84	17.44	0.188	19.98
0	51.98	39.57	44.87	17.2	0.187	19.92
0	56.52	52.04	54.71	16.99	0.19	19.92
0	60.23	56.4	58.23	16.96	0.186	20.04
0	65.26	59.88	62.6	17.09	0.178	20.22
0	67.06	64.18	65.79	17.44	0.172	20.43
0	68.51	65.9	66.99	17.93	0.165	20.64
0	69.8	66.87	68.29	18.49	0.162	20.79

0	70.39	68.11	69.14	19	0.162	20.85
0	70.03	68.54	69.24	19.4	0.165	20.76
0	69.61	65.99	68.03	19.57	0.175	20.55
0	65.95	49.63	57.94	19.63	0.181	20.34
0	49.66	46.25	48.16	19.51	0.188	20.1
0	48.51	44.55	46.22	19.37	0.189	19.98
0	47.43	44.94	46.08	19.2	0.188	19.95
0	46.46	43.83	45.08	19	0.191	19.92
0	46.72	44.52	45.81	18.8	0.189	19.89
0	45.45	43.02	44.2	18.57	0.188	19.86
0	44.41	42.26	43.31	18.38	0.189	19.86
0	45.08	39.84	42.42	18.13	0.187	19.83
0	41.4	37.67	38.77	17.9	0.187	19.83
0	40.21	38.23	39.23	17.69	0.186	19.81
0	41.09	38.68	39.78	17.47	0.186	19.81
0	38.66	34.29	36.53	17.28	0.188	19.78
0	34.33	32.46	33.41	17.07	0.187	19.78
0	51.4	34.11	40.75	16.8	0.186	19.72
0	57.48	51.46	55.43	16.59	0.187	19.69
0	60.08	56.49	57.99	16.56	0.18	19.83
0	62.68	59.85	61.25	16.67	0.179	19.98
0	65.53	62.01	63.97	16.96	0.174	20.16
0	68.17	64.9	66.49	17.44	0.165	20.37
0	70.71	67.16	68.55	17.99	0.162	20.49
0	70.97	68.84	69.79	18.49	0.159	20.55
0	69.52	67.06	68.44	18.88	0.167	20.46
0	67.83	61.85	65.25	19.05	0.177	20.22
0	61.83	50.36	54.51	19.14	0.183	20.04
0	51.45	49.03	50.27	19.05	0.185	19.86
0	49.03	46.79	48.12	18.97	0.187	19.78
0	53.44	48.9	51.96	18.82	0.188	19.75
0	53.34	47.32	49.39	18.66	0.189	19.75
0	52.37	46.15	48.09	18.49	0.185	19.69
0	49.82	41.26	45.16	18.26	0.187	19.66
0	48.36	39.11	43.22	18.07	0.186	19.63
0	42.23	37.39	39.2	17.85	0.186	19.63
0	44.37	38.06	40.48	17.63	0.186	19.6
0	44.82	40.62	42.75	17.41	0.184	19.6
0	44.62	40.96	42.69	17.23	0.184	19.6
0	42.91	38.71	40.07	17.04	0.184	19.6
0	43.89	39.83	42.17	16.88	0.183	19.57
0	47.81	43.94	46.44	16.72	0.184	19.57
0	54.21	47.74	51.17	16.54	0.186	19.48
0	58.07	54.25	55.59	16.56	0.184	19.6
0	59.15	56.77	58.01	16.67	0.18	19.69
0	65.3	58.51	61.5	16.85	0.179	19.75
0	71.01	65.11	68.36	17.2	0.172	19.92

0	74.16	69.41	72.28	17.8	0.159	20.28
0	78.8	73.45	76.2	18.4	0.15	20.49
0	77.08	72.28	74.8	18.97	0.147	20.61
0	74.99	72.44	73.49	19.08	0.164	20.25
0	72.39	62.68	67.22	19.14	0.176	20.01
0	66.09	62.13	64.26	19.11	0.181	19.81
0	66.53	61.4	64.17	19.08	0.185	19.69
0	65.63	55.93	59.24	19.02	0.185	19.66
0	61.48	55.35	57.75	18.88	0.185	19.63
0	63.45	61.6	63.03	18.74	0.185	19.6
0	63.26	61.42	62.28	18.71	0.186	19.66
0	61.59	58.27	59.61	18.63	0.184	19.63
0	59.77	54.97	56.9	18.51	0.184	19.6
0	60.86	59.69	60.34	18.43	0.184	19.54
0	60.54	59	59.53	18.35	0.185	19.57
0	59.19	54.82	57.94	18.26	0.184	19.57
0	58.47	50.34	54.7	18.18	0.183	19.54
0	61.74	49.21	53.03	18.04	0.184	19.51
0	57.27	52.06	54.55	17.9	0.188	19.46
0	62.39	57.12	60.28	17.74	0.188	19.4
0	66.29	59.48	62.45	17.74	0.185	19.51
0	68.99	66	67.67	17.71	0.182	19.54
0	69.9	66.08	67.83	18.01	0.176	19.78
0	67.8	65.74	66.64	18.29	0.17	19.86
0	67.97	65.49	66.43	18.6	0.17	19.86
0	67.14	64.95	66.06	18.94	0.172	19.89
0	65.21	62.01	63.44	19.22	0.178	19.86
0	62.46	59.93	61.26	19.31	0.185	19.69
0	59.95	56.38	58.03	19.4	0.183	19.63
0	56.86	55.17	56.04	19.31	0.185	19.57
0	55.7	53.9	54.64	19.17	0.188	19.48
0	55	53.43	54.28	19	0.188	19.43
0	54.5	53.29	53.88	18.82	0.187	19.43
0	53.97	52.04	53.21	18.63	0.188	19.43
0	54.15	52.18	52.93	18.46	0.186	19.43
0	54.28	50.1	52.75	18.26	0.187	19.4
0	51.14	48.48	49.67	18.13	0.187	19.4
0	49.42	46.85	48.57	17.93	0.184	19.37
0	47.99	46.01	47.03	17.8	0.184	19.34
0	46.37	44.35	45.4	17.6	0.184	19.34
0	45.89	41.35	43.8	17.44	0.186	19.34
0	41.38	39.68	40.21	17.28	0.185	19.31
0	42.43	39.84	40.91	17.04	0.184	19.28
0	46.22	42.46	44.19	16.83	0.188	19.22
0	45.95	43.9	44.71	16.77	0.186	19.31
0	50.35	45.21	47.31	16.72	0.182	19.34
0	51.32	48.4	49.47	16.75	0.181	19.4

0	54.71	49.77	51.69	16.85	0.182	19.43
0	54.44	49.97	51.86	17.12	0.18	19.51
0	55.1	50.29	52.98	17.39	0.18	19.51
0	53.54	49.96	51.51	17.69	0.178	19.57
0	50.62	47.12	48.71	17.8	0.183	19.46
0	47.37	42.65	45.13	17.85	0.185	19.37
0	44.19	42.39	43.45	17.8	0.184	19.31
0	43.69	37.06	40.02	17.66	0.184	19.25
0	38.73	36.24	37.83	17.44	0.184	19.2
0	38.23	37.2	37.69	17.25	0.185	19.2
0	38.11	37	37.71	17.01	0.184	19.17
0	38.27	37.03	37.73	16.77	0.184	19.17
0	38.25	36.89	37.74	16.56	0.182	19.14
0	38.34	36.97	37.58	16.36	0.183	19.11
0	37.88	35.29	36.83	16.15	0.183	19.11
0	36.22	34.4	35.42	15.97	0.18	19.11
0	36.42	30.81	34.53	15.76	0	19.08
0	36.57	30.78	34.77	15.58	0	19.08
0	35.88	33.18	34.68	15.38	0	19.05
0	40.15	30.6	34.82	15.18	0	19.02
0	44.2	40.2	42.45	14.96	0	18.97
0	46.28	43.45	44.69	14.91	0	19.05
0	47.92	45.41	46.64	14.96	0	19.14
0	49.41	46.06	47.82	15.11	0.175	19.2
0	50.38	46.72	48.66	15.41	0.172	19.25
0	51.96	47.76	50.19	15.74	0.174	19.25
0	50.76	48.39	49.49	16.1	0.173	19.22
0	51.34	48.7	50.3	16.41	0.178	19.17
0	49.82	47.48	48.44	16.64	0.18	19.11
0	47.48	42.47	45.6	16.77	0.179	19.08
0	42.6	38.39	40.31	16.77	0.18	19
0	38.84	36.11	37.66	16.64	0.182	18.91
0	36.11	31.7	34.42	16.49	0.183	18.85
0	35.68	30.72	34.28	16.28	0.183	18.8
0	34.02	29.27	31.24	16.04	0.181	18.77
0	33.74	26.53	29.15	15.81	0	18.77
0	28.88	24.86	26.29	15.56	0	18.74
0	35	25.78	32.21	15.33	0	18.71
0	33.43	29.82	31.88	15.08	0	18.68
0	31.44	22.12	23.96	14.86	0	18.68
0	26.7	22.83	24.42	14.61	0	18.66
0	25.44	20.93	22.88	14.39	0	18.63
0	22.16	21.08	21.76	14.17	0	18.63
0	37.49	21.65	29.24	13.91	0	18.57
0	41.84	37.53	40.12	13.67	0	18.51
0	45.39	41.67	43.75	13.58	0	18.6
0	48.37	44.99	46.37	13.6	0	18.66

0	51.26	47.84	49.21	13.79	0	18.74
0	53.13	49.45	51.33	14.1	0	18.8
0	54.75	51.88	52.81	14.51	0	18.85
0	55.42	52.96	54.22	14.98	0.168	18.85
0	55.55	54.28	54.9	15.41	0.17	18.82
0	54.71	51.36	53.44	15.71	0.172	18.74
0	51.32	43.77	46.7	15.89	0.175	18.66
0	43.82	38.96	40.85	15.92	0.177	18.54
0	41.19	30.72	37.04	15.81	0	18.46
0	35.5	28	30.3	15.69	0	18.4
0	29.58	27.82	28.65	15.48	0	18.35
0	39.29	27.78	32.44	15.26	0	18.32
0	40.75	27.33	32.16	15.01	0	18.29
0	29.66	28.03	28.75	14.78	0	18.26
0	29.23	28.2	28.82	14.54	0	18.24
0	28.31	26.62	27.42	14.32	0	18.24
0	28.38	26.15	27.41	14.1	0	18.21
0	28	25.26	26.28	13.91	0	18.18
0	26.16	25.16	25.66	13.69	0	18.18
0	26.65	24.95	25.68	13.5	0	18.15
0	40.18	26.62	31.31	13.29	0	18.1
0	47.98	40.21	45.4	13.08	0	18.04
0	51.21	47.5	49.33	13.03	0	18.15
0	53.55	50.64	51.97	13.13	0	18.24
0	55.51	52.34	53.85	13.36	0	18.35
0	57.92	55.05	56.23	13.79	0	18.43
0	60.74	56.85	59.06	14.32	0	18.51
0	62.48	59.62	61.07	14.88	0.159	18.6
0	62.73	61.05	62.12	15.36	0.163	18.51
0	62.19	57.98	60.41	15.66	0.169	18.38
0	57.94	50.41	53.83	15.87	0.171	18.26
0	50.63	41.89	46.88	15.92	0.173	18.13
0	45.52	37.16	40.61	15.87	0.177	18.01
0	39.23	36.52	37.5	15.76	0	17.96
0	37.05	35.08	36.32	15.61	0	17.9
0	37	34.93	36.03	15.41	0	17.88
0	35.68	34.06	34.74	15.21	0	17.85
0	35.05	31.6	32.95	14.98	0	17.82
0	33.41	29.64	31.32	14.78	0	17.8
0	32.07	29.49	31.16	14.56	0	17.77
0	31.53	29.24	30.51	14.37	0	17.74
0	30.88	29.21	30.18	14.17	0	17.74
0	29.62	28.32	29.16	13.96	0	17.71
0	29.67	27.3	28.61	13.77	0	17.71
0	43.24	27.56	33.88	13.55	0	17.66
0	49	43.31	47.19	13.34	0	17.6
0	51.71	48.68	50.06	13.29	0	17.71

0	55.3	51.2	53.19	13.36	0	17.82
0	58.27	54.82	56.77	13.62	0	17.93
0	59.82	56.98	58.17	14	0	18.04
0	61.99	58.9	60.15	14.51	0.159	18.13
0	63.89	60.82	62.29	15.06	0.158	18.18
0	63.77	62.34	62.96	15.51	0.162	18.13
0	62.54	57.92	60.94	15.79	0.169	17.99
0	57.87	41.9	48.35	15.94	0.175	17.88
0	43.15	40.62	41.7	15.92	0.178	17.69
0	42.96	39.5	40.9	15.87	0.177	17.6
0	40.96	39.12	39.82	15.71	0	17.55
0	41.5	37.89	39.99	15.56	0	17.52
0	42.15	36.01	38.77	15.36	0	17.52
0	38.71	35.77	37.02	15.18	0	17.5
0	40.42	36.15	37.95	14.96	0	17.47
0	38.73	36.4	37.62	14.76	0	17.44
0	37.09	34.11	35.87	14.59	0	17.44
0	40.13	33.65	35.95	14.39	0	17.41
0	36.95	32.11	34.33	14.2	0	17.41
0	32.4	29	29.92	14.03	0	17.39
0	32.31	28.43	29.87	13.81	0	17.36
0	47.96	32.33	38.3	13.62	0	17.33
0	55.64	48.04	52.05	13.41	0	17.31
0	61.33	51.94	57.16	13.39	0	17.41
0	55.41	50.91	52.78	13.46	0	17.52
0	62.56	55.24	59.19	13.69	0	17.63
0	65.75	61.05	63.09	14.15	0.158	17.8
0	66.13	63.55	65.24	14.71	0.154	17.93
0	67.44	65.31	66.42	15.23	0.151	17.99
0	67.44	65.4	66.55	15.69	0.158	17.93
0	66.08	63.38	64.72	15.97	0.168	17.77
0	63.8	46.02	51.11	16.1	0.172	17.6
0	46.58	43.54	44.59	16.07	0.178	17.41
0	52.8	45.85	49.1	16.02	0.179	17.33
0	53.14	50.34	51.36	15.92	0.177	17.31
0	52.46	45.5	48.75	15.76	0.177	17.31
0	45.71	41.09	42.54	15.61	0.176	17.25
0	42.26	41.02	41.66	15.41	0	17.23
0	42.41	39.69	41.48	15.23	0	17.2
0	39.74	38.64	39.1	15.06	0	17.2
0	42.5	39.23	40.28	14.88	0	17.17
0	41.73	37.31	40.12	14.71	0	17.17
0	38.71	37.41	37.93	14.56	0	17.15
0	38.1	35.5	36.52	14.39	0	17.15
0	37.19	35.62	36.48	14.22	0	17.12
0	49.07	36.13	40.88	14.05	0	17.09
0	56.82	49.14	54.54	13.86	0	17.07

0	58.34	55.57	56.64	13.86	0	17.17
0	60.96	58.3	59.23	13.96	0	17.31
0	63.18	59.51	61.23	14.22	0	17.44
0	64.05	62.15	63.02	14.61	0.159	17.58
0	66.38	62.91	64.59	15.13	0.155	17.71
0	66.58	64.67	65.51	15.64	0.154	17.74
0	66.71	64.79	65.48	16.02	0.161	17.66
0	65.1	60.51	63.74	16.28	0.17	17.52
0	60.47	44.32	52.28	16.38	0.173	17.36
0	45.1	43.2	44.17	16.33	0.178	17.2
0	47	44.06	45.34	16.23	0.181	17.09
0	46.15	44.28	45.27	16.1	0.182	17.07
0	44.48	41.63	42.67	15.92	0.181	17.07
0	41.99	39.5	41.03	15.74	0	17.04
0	40.86	38.25	39.46	15.53	0	17.01
0	41.64	39.35	40.44	15.33	0	16.99
0	40.88	38.92	39.71	15.13	0	16.99
0	40.33	37.05	38.18	14.96	0	16.99
0	38.13	33.31	35.01	14.76	0	16.96
0	35.92	33.69	35.11	14.59	0	16.96
0	35.34	34.62	34.97	14.39	0	16.96
0	35.96	33.11	34.95	14.22	0	16.93
0	45.93	34.72	39.1	14	0	16.91
0	53.59	45.97	51.37	13.81	0	16.88
0	58.3	53.54	55.54	13.79	0	16.99
0	61.63	57.55	59.89	13.91	0	17.15
0	63.62	61.07	62.33	14.17	0	17.28
0	66.38	63.16	64.73	14.61	0.159	17.47
0	69.46	65.31	67.12	15.13	0.153	17.63
0	69.78	67.25	68.5	15.66	0.152	17.69
0	69.63	68.02	68.81	16.1	0.158	17.63
0	69.21	67.32	68.3	16.33	0.165	17.47
0	67.36	58.97	62.61	16.43	0.17	17.31
0	63.58	56.41	59.83	16.43	0.177	17.15
0	61.2	53.88	57.34	16.38	0.179	17.07
0	57.55	51.47	55.26	16.3	0.179	17.01
0	57.85	53.51	55.18	16.2	0.179	17.01
0	59.11	56.88	58.08	16.1	0.178	16.99
0	58.31	50.9	54.25	15.99	0.179	16.99
0	56.37	50.76	52.57	15.87	0.178	16.96
0	57.59	54.54	56.44	15.76	0	16.96
0	57.33	52.64	54.91	15.66	0	16.96
0	57.36	53.33	55.16	15.56	0.178	16.96
0	57.48	56.35	57.05	15.46	0.176	16.96
0	58.08	56.19	57.26	15.38	0.175	16.99
0	57.8	56.32	57.14	15.36	0.174	17.01
0	57.61	56.36	57.01	15.33	0.174	17.01

0	61.69	56.65	58.49	15.31	0.176	16.99
0	66.81	61.31	63.78	15.28	0	16.96
0	70.7	66.3	68.2	15.46	0.173	17.12
0	71.7	69.56	70.72	15.79	0.163	17.33
0	71.8	69.74	70.68	16.15	0.156	17.52
0	71.95	69.73	70.65	16.54	0.155	17.6
0	70.14	68.21	69.26	16.83	0.154	17.55
0	69.1	67.06	67.81	17.01	0.163	17.41
0	67.06	63.91	65.85	17.15	0.171	17.31
0	64.08	60.2	62.54	17.2	0.176	17.2
0	60.64	58.05	59.82	17.15	0.178	17.09
0	59.42	55.58	57.47	17.04	0.181	17.01
0	58.9	54.82	56.98	16.93	0.181	16.99
0	58.27	54.26	56.44	16.8	0.181	16.99
0	54.59	52.09	53.15	16.64	0.181	16.96
0	53.14	51.64	52.44	16.51	0.181	16.93
0	53.07	50.91	52.18	16.36	0.182	16.91
0	51.23	49.1	50.05	16.17	0.18	16.91
0	50.75	48.99	49.92	15.99	0.181	16.88
0	51.25	43.27	48.82	15.81	0.178	16.88
0	51.1	38.22	45.06	15.64	0.177	16.88
0	41.5	35.49	38.44	15.43	0	16.85
0	41.21	33.25	37.39	15.21	0	16.8
0	49.12	33.28	40.93	14.96	0	16.8
0	58.78	48.35	55.67	14.74	0	16.77
0	62.42	58.61	60.77	14.69	0	16.93
0	66.43	61.9	63.96	14.76	0	17.09
0	68.58	65.52	66.68	14.98	0.165	17.25
0	69.28	66.84	68.13	15.33	0.16	17.41
0	69.97	68.13	68.94	15.79	0.157	17.52
0	70.06	67.29	68.47	16.2	0.156	17.58
0	67.79	64.52	66.26	16.49	0.161	17.5
0	64.88	59.74	62.66	16.59	0.169	17.31
0	59.7	55.2	57.3	16.64	0.174	17.17
0	56.31	50.24	54.46	16.62	0.177	17.07
0	53.34	48.98	51.86	16.51	0.181	16.96
0	52.69	51.69	52.18	16.38	0.179	16.93
0	53.44	51.15	52.22	16.25	0.18	16.93
0	53.22	51.71	52.47	16.12	0.18	16.93
0	52.31	50.19	50.94	15.99	0.178	16.93
0	53.77	51.1	52.44	15.89	0.179	16.91
0	53.8	52.04	52.73	15.79	0.179	16.91
0	52.38	49.97	51.47	15.71	0.178	16.93
0	51.55	47.58	49.57	15.64	0.179	16.91
0	51.95	48.03	49.8	15.53	0.179	16.91
0	48.07	43.24	44.93	15.43	0	16.88
0	45.37	41.92	44.09	15.31	0	16.85

0	44.02	38.27	40.53	15.13	0	16.8
0	50.68	40.81	46.51	14.91	0	16.75
0	55.57	50.71	54.27	14.86	0	16.83
0	61.47	55.42	58.24	14.93	0.173	16.99
0	63.71	61	62.28	15.13	0.17	17.15
0	66.26	63.17	64.11	15.48	0.163	17.31
0	66.17	64.11	65.2	15.89	0.161	17.44
0	66.46	64.5	65.26	16.25	0.16	17.44
0	65.26	62.65	63.85	16.51	0.164	17.36
0	62.73	58.83	61.23	16.59	0.172	17.23
0	59.1	57.23	58.13	16.64	0.176	17.12
0	57.72	55.13	56.13	16.62	0.18	17.01
0	55.2	53.2	54.15	16.54	0.178	16.96
0	55.94	53.54	54.84	16.46	0.179	16.93
0	54.57	50.51	52.27	16.33	0.18	16.91
0	51.66	50.71	51.19	16.23	0.179	16.91
0	51.51	48.6	50.31	16.1	0.179	16.88
0	48.55	45.47	47.38	15.99	0.18	16.85
0	46.77	44.61	45.31	15.84	0.181	16.83
0	45.53	43.61	44.61	15.69	0.177	16.8
0	44.69	42.57	43.66	15.56	0	16.8
0	44.15	42.04	42.87	15.38	0	16.8
0	43.31	38.78	40.94	15.23	0	16.8
0	38.76	36.18	37.58	15.08	0	16.77
0	43.78	36.71	41.35	14.91	0	16.77
0	48.94	43.21	46.52	14.66	0	16.67
0	52.81	48.49	50.58	14.69	0	16.8
0	59.16	52.63	56.01	14.76	0	16.93
0	64.48	57.41	61.25	14.98	0	17.07
0	66.26	62.78	64.57	15.31	0.164	17.25
0	66.91	64.51	65.63	15.74	0.162	17.39
0	65.64	63.67	64.6	16.1	0.162	17.39
0	65.29	60.78	62.9	16.3	0.168	17.28
0	60.84	59.08	60.13	16.41	0.173	17.12
0	59.12	56.91	57.91	16.51	0.175	17.04
0	57.03	54.66	55.9	16.51	0.179	16.96
0	54.92	53.11	53.89	16.46	0.181	16.91
0	54.64	53.04	53.57	16.36	0.18	16.88
0	53.62	49.08	50.41	16.25	0.181	16.85
0	51.19	47.47	49.49	16.1	0.179	16.8
0	49.31	46.36	47.43	15.97	0.181	16.8
0	50.36	45.15	48.26	15.81	0	16.77
0	50.21	44.94	47	15.64	0	16.77
0	47.55	45.1	46.13	15.51	0	16.77
0	48.28	47.2	47.6	15.36	0	16.77
0	47.69	46.28	47.15	15.26	0	16.77
0	47.53	45.08	46.29	15.16	0	16.77

0	45.75	37.26	41.85	15.06	0	16.77
0	46.34	37.28	42.88	14.91	0	16.72
0	49.77	46.3	47.97	14.81	0	16.7
0	53.55	49.8	51.06	14.74	0	16.75
0	60.22	53.38	57.17	14.81	0	16.83
0	60.21	57.93	58.99	15.03	0.172	16.99
0	59.83	58.04	58.93	15.28	0.173	17.04
0	59.64	57.89	58.65	15.53	0.172	17.04
0	59.37	57.21	58.01	15.81	0.171	17.04
0	58.86	55.98	57.59	15.99	0.174	17.01
0	56.24	53.88	54.96	16.1	0.178	16.93
0	53.84	51.46	52.63	16.2	0.177	16.93
0	51.65	50.38	51.12	16.15	0.179	16.85
0	50.79	48.85	49.72	16.07	0.179	16.8
0	50.25	48.48	49.65	15.94	0.181	16.77
0	48.81	44.82	46.2	15.79	0	16.75
0	47.28	45.8	46.59	15.64	0	16.72
0	47	45.69	46.34	15.48	0	16.72
0	47.99	45.63	47.05	15.31	0	16.72
0	45.53	42.8	43.63	15.18	0	16.7
0	43.46	37.68	41.15	15.01	0	16.67
0	40.26	35.17	36.93	14.86	0	16.67
0	38.25	35.34	37.15	14.66	0	16.64
0	37.68	36.37	37.02	14.51	0	16.64
0	38.2	35.92	36.88	14.32	0	16.64
0	40.44	38.05	38.78	14.15	0	16.62
0	50.36	40.48	46.63	13.96	0	16.56
0	54.75	50.18	52.75	13.91	0	16.64
0	58.14	54.36	56.53	13.96	0	16.75
0	60.7	56.76	58.43	14.17	0	16.93
0	60.98	57.8	59.66	14.51	0.161	17.07
0	61.4	58.29	59.94	14.86	0.162	17.15
0	59.46	56.37	57.72	15.16	0.165	17.09
0	57.77	55.53	56.59	15.31	0.173	16.93
0	55.85	52.37	54.34	15.48	0.176	16.83
0	52.39	50	51.33	15.61	0	16.8
0	50.57	49.22	49.91	15.58	0.177	16.72
0	49.83	48.24	49.1	15.53	0	16.67
0	49.02	47.61	48.18	15.43	0	16.64
0	48.36	47.44	47.89	15.31	0	16.62
0	47.78	46.99	47.48	15.16	0	16.59
0	47.83	46.71	47.39	15.06	0	16.59
0	47.27	46.36	46.77	14.93	0	16.59
0	46.53	43.19	45.6	14.83	0	16.59
0	43.17	39.79	40.38	14.71	0	16.56
0	40.21	34.3	38.5	14.61	0	16.54
0	37.07	34.25	35.84	14.51	0	16.54

0	36.79	32.48	34.6	14.39	0	16.51
0	32.61	26.32	29.54	14.25	0	16.49
0	31.19	26.95	29.12	14.03	0	16.41
0	33.5	31.19	32.39	13.77	0	16.33
0	34.91	32.95	33.7	13.6	0	16.38
0	36.73	33.75	35.07	13.46	0	16.43
0	38.09	35.91	36.8	13.43	0	16.49
0	40.51	36.79	38.19	13.48	0	16.51
0	40.97	38.77	39.77	13.62	0	16.54
0	41.4	39.18	40.09	13.81	0	16.54
0	40.89	38.93	39.83	14.03	0	16.51
0	39.76	34.56	38.02	14.13	0	16.46
0	34.5	23.28	29.21	14.2	0	16.49
0	27.15	19.81	22.53	14.03	0	16.38
0	21.02	19.46	20.31	13.86	0	16.33
0	20.57	15.9	18.34	13.62	0	16.28
0	19.27	16.21	17.32	13.34	0	16.25
0	19.15	16.02	17.8	13.03	0	16.23
0	18.16	16	16.89	12.76	0	16.23
0	17.86	14.58	16.34	12.46	0	16.2
0	16.58	14.07	15.14	12.21	0	16.2
0	15.42	12.94	14.25	11.93	0	16.2
0	14.37	10.67	12.22	11.67	0	16.17
0	10.97	9.48	10.27	11.42	0	16.15
0	11.9	10.28	11.08	11.18	0	16.12
0	11.86	9.84	10.89	10.92	0	16.12
0	24.59	9.74	15.65	10.68	0	16.07
0	33.84	24.65	30.44	10.4	0	16.02
0	35.77	33.52	34.64	10.27	0	16.07
0	38.15	35.21	36.65	10.27	0	16.15
0	40.49	37.35	38.7	10.4	0	16.23
0	42.04	39.11	40.46	10.66	0	16.25
0	42.48	40.44	41.4	11.03	0	16.28
0	42.39	41.05	41.77	11.44	0	16.25
0	43.23	41.37	42.14	11.8	0	16.2
0	42.16	37.66	40.91	12.09	0	16.15
0	37.61	25.32	28.56	12.3	0	16.12
0	27.19	24.96	26.05	12.27	0	15.99
0	26.93	23.4	25.53	12.21	0	15.92
0	25.39	23.42	24.53	12.05	0	15.89
0	24.4	22.87	23.25	11.87	0	15.84
0	23.54	19.08	22.09	11.67	0	15.81
0	20.36	18.61	19.38	11.47	0	15.79
0	20	18.54	19.3	11.24	0	15.74
0	20.08	17.44	18.98	11.05	0	15.71
0	18.21	16.69	17.78	10.83	0	15.69
0	16.77	15.77	16.36	10.63	0	15.66

0	16.76	14.24	15.47	10.44	0	15.64
0	15.51	14.55	14.97	10.23	0	15.61
0	15.64	14.47	15	10.03	0	15.58
0	23.54	14.92	17.46	9.82	0	15.53
0	34.21	23.61	30.6	9.59	0	15.48
0	36.68	33.92	35.02	9.51	0	15.53
0	40.7	36.68	38.66	9.51	0	15.58
0	43.28	39.65	41.2	9.63	0	15.64
0	45.89	42.03	44.06	9.93	0	15.69
0	47.37	44.58	46.01	10.33	0	15.71
0	48.42	46.24	47.11	10.76	0	15.71
0	47.52	46.04	46.74	11.2	0	15.69
0	46.53	40.39	44.37	11.51	0	15.61
0	40.36	25.63	30.69	11.73	0	15.56
0	26.04	23.83	24.72	11.73	0	15.41
0	24.94	23.52	24.14	11.67	0	15.33
0	26.53	22.43	24.63	11.55	0	15.28
0	24.77	22.86	23.61	11.38	0	15.26
0	24.18	22.37	23.49	11.18	0	15.23
0	24.36	21.6	23.18	10.98	0	15.18
0	23.58	19.24	20.57	10.81	0	15.16
0	19.86	17.73	18.43	10.59	0	15.13
0	18.43	16.1	17.14	10.4	0	15.11
0	20.61	16.66	18.03	10.2	0	15.08
0	21.41	20.21	20.79	10.01	0	15.06
0	23.02	19.71	21.13	9.82	0	15.06
0	24.88	22.06	23.32	9.68	0	15.03
0	27.76	22.66	24.59	9.55	0	15.01
0	33.05	27.79	30.56	9.4	0	14.93
0	38.64	33.1	37.14	9.36	0	14.96
0	40.51	37.91	39.06	9.47	0	15.01
0	44.31	38.82	41.28	9.65	0	15.06
0	47.13	42.37	44.75	9.95	0	15.11
0	49.63	46.11	48.06	10.35	0	15.16
0	50.79	48.47	49.28	10.79	0	15.16
0	50.61	47.76	49.36	11.18	0	15.11
0	47.77	44.31	46.19	11.53	0	15.06
0	44.27	32.77	37.52	11.82	0	15.03
0	35.72	32.06	32.96	11.89	0	14.91
0	35.72	31.32	33.3	11.89	0	14.83
0	34.81	31.62	32.74	11.82	0	14.81
0	35.87	32.43	34.03	11.73	0	14.78
0	40.04	35.44	37.06	11.64	0	14.76
0	40.21	34.25	37.78	11.53	0	14.74
0	36.11	31.42	34.11	11.42	0	14.71
0	36.41	29.36	31.71	11.27	0	14.66
0	30.94	24.47	27.61	11.11	0	14.61

0	32.76	29.03	31.05	10.94	0	14.59
0	33.32	30.93	32.25	10.76	0	14.59
0	34.96	29.71	31.57	10.61	0	14.56
0	36.99	30.71	34.3	10.44	0	14.56
0	40.43	32.57	36.53	10.27	0	14.54
0	44.02	33.39	37.16	10.1	0	14.44
0	48.64	42.87	46.44	10.06	0	14.51
0	53.72	48.05	51.04	10.1	0	14.59
0	55.81	52.28	54.18	10.29	0	14.71
0	57.25	54.11	55.63	10.63	0	14.83
0	58.83	56.35	57.49	11.05	0	14.88
0	59.96	57.11	58.3	11.49	0	14.88
0	60.14	57.34	58.32	11.89	0	14.86
0	57.66	51.77	55.38	12.21	0	14.76
0	51.7	37.17	43.47	12.39	0	14.66
0	39.52	34.85	37.09	12.39	0	14.51
0	39.52	37.44	38.43	12.34	0	14.44
0	44.88	37.87	41.64	12.25	0	14.42
0	46.47	44.53	45.64	12.14	0	14.39
0	46.54	44.42	45.28	12.05	0	14.42
0	45.95	42.97	44.75	11.98	0	14.39
0	44.18	41.64	43.45	11.89	0	14.37
0	42.1	35.54	39.26	11.82	0	14.37
0	38.22	33.27	35.53	11.73	0	14.32
0	35.22	33.51	34.45	11.62	0	14.29
0	35.08	33.34	34.48	11.53	0	14.29
0	34.71	31.46	32.81	11.44	0	14.27
0	35.2	32.47	33.44	11.33	0	14.27
0	34.56	31.44	33.12	11.22	0	14.25
0	41.64	34.42	38.28	11.09	0	14.2
0	44.79	41.05	42.2	10.98	0	14.17
0	47.94	43.75	46.1	11.07	0	14.27
0	47.82	45.66	46.64	11.24	0	14.37
0	49.22	46.38	47.47	11.44	0	14.37
0	50.19	48.1	49.13	11.71	0	14.39
0	52.33	49.38	51.2	12.05	0	14.44
0	52.47	50.67	51.62	12.39	0	14.44
0	51.14	46.35	49.43	12.59	0	14.39
0	46.32	32.86	37.64	12.73	0	14.34
0	33.92	31.98	33.08	12.66	0	14.22
0	34.21	32.73	33.41	12.57	0	14.17
0	35.31	32.98	34.26	12.41	0	14.15
0	34.73	32.67	33.65	12.23	0	14.13
0	33.6	30.89	32.59	12.03	0	14.1
0	33.75	30.38	32.29	11.82	0	14.1
0	33.06	29.81	31.12	11.64	0	14.08
0	33.1	30.66	31.69	11.44	0	14.08

0	32.83	28.17	30.17	11.27	0	14.05
0	30.59	28.52	29.57	11.09	0	14.05
0	29.87	26.75	28.36	10.92	0	14.03
0	32.71	29.06	31.29	10.74	0	14.03
0	34.27	28.34	32.19	10.57	0	14
0	38.89	28.18	33.99	10.4	0	14
0	44.71	39	42.18	10.2	0	13.96
0	48.84	44.66	46.15	10.14	0	14.03
0	57.95	48.62	53.23	10.18	0	14.13
0	59.78	56.9	58.13	10.4	0	14.25
0	61.52	57.87	59.97	10.72	0	14.37
0	62.96	59.6	61.62	11.11	0	14.39
0	63.72	60.72	62.05	11.6	0	14.47
0	61.17	58.56	59.7	12.03	0	14.44
0	59.67	55.37	57.38	12.25	0	14.29
0	55.41	51.9	53.77	12.48	0	14.25
0	52.69	49.62	51.6	12.53	0	14.13
0	49.54	47.25	48.34	12.55	0	14.08
0	49.62	47.02	48.59	12.5	0	14.03
0	50.55	47.85	49.85	12.46	0	14
0	50.11	45.97	48.09	12.41	0	14
0	50.07	48.29	49.03	12.32	0	13.98
0	48.89	47.34	47.95	12.27	0	13.98
0	47.73	46.57	47.26	12.23	0	13.96
0	47.43	45.86	46.78	12.18	0	13.96
0	45.95	43.8	44.65	12.12	0	13.93
0	44.34	41.56	42.98	12.07	0	13.93
0	41.72	38.54	40.31	11.98	0	13.88
0	38.54	36.21	37.16	11.91	0	13.88
0	36.2	34.51	35.23	11.78	0	13.84
0	42.8	35.56	39.09	11.62	0	13.79
0	43.77	42.36	43.23	11.53	0	13.81
0	45.64	43.34	44.49	11.51	0	13.91
0	47.79	44.96	46.33	11.55	0	13.93
0	48.37	46.59	47.37	11.6	0	13.91
0	47.99	46.44	47.16	11.91	0	14.05
0	48.13	46.47	47.28	12.07	0	14
0	47.85	45.34	46.34	12.25	0	13.98
0	45.68	40.83	43.56	12.39	0	13.96
0	40.79	31.16	34.64	12.46	0	13.96
0	33.66	30.2	32.07	12.3	0	13.81
0	35.43	28.22	32.1	12.12	0	13.77
0	32.31	28.48	30.55	11.91	0	13.74
0	28.55	21.25	25.52	11.67	0	13.74
0	34.56	24.35	27.74	11.42	0	13.72
0	34.37	32.52	33.42	11.16	0	13.69
0	33.56	30.78	32.36	10.94	0	13.72

0	34.41	32.38	33.42	10.74	0	13.72
0	34.25	31.51	33.3	10.57	0	13.72
0	34.41	31.88	33.36	10.42	0	13.69
0	34.35	31.71	33	10.29	0	13.69
0	33.74	31.57	32.45	10.18	0	13.69
0	34.1	32.92	33.42	10.06	0	13.69
0	34.87	31.02	32.98	9.91	0	13.67
0	37.75	33.96	35.45	9.78	0	13.62
0	42.05	37.75	40.01	9.74	0	13.69
0	45.81	41.71	43.91	9.78	0	13.74
0	47.54	45.03	46.11	9.91	0	13.81
0	49.93	47.08	48.36	10.14	0	13.88
0	51.12	48.19	49.69	10.42	0	13.84
0	50.32	47.94	48.93	10.83	0	13.91
0	49.16	46.81	47.87	11.13	0	13.86
0	46.76	42.25	44.55	11.33	0	13.79
0	42.31	38.64	40.26	11.49	0	13.77
0	38.71	31.81	35.26	11.47	0	13.67
0	32	21.13	27.77	11.38	0	13.6
0	26.79	20.84	23.7	11.2	0	13.53
0	29.62	19.89	26.01	11	0	13.48
0	26.5	16.43	21.14	10.76	0	13.48
0	21.99	16.4	18.59	10.48	0	13.43
0	20.42	18.89	19.67	10.23	0	13.43
0	20.47	18.95	19.79	9.97	0	13.41
0	22.63	19.66	20.55	9.74	0	13.41
0	23.75	19.71	22.16	9.51	0	13.39
0	25.18	23.09	24.27	9.28	0	13.39
0	25.14	20.94	22.7	9.09	0	13.39
0	22.41	19.57	20.9	8.91	0	13.36
0	26.14	20.26	24.04	8.68	0	13.32
0	41.02	26.07	34.1	8.52	0	13.29
0	46.41	41.06	44.06	8.44	0	13.34
0	46.84	37.67	41.57	8.44	0	13.41
0	50.66	45.67	47.92	8.6	0	13.48
0	52.53	45.32	48.45	8.89	0	13.53
0	57.23	50.11	55.34	9.32	0	13.62
0	56.02	51.68	54.89	9.76	0	13.65
0	56.29	54.14	55	10.16	0	13.62
0	54.51	49.63	52.69	10.48	0	13.55
0	49.63	46.95	48.16	10.72	0	13.5
0	48.11	46.28	47.35	10.81	0	13.39
0	47.98	45.61	46.82	10.85	0	13.34
0	46.72	44.33	45.79	10.87	0	13.32
0	46.67	45.88	46.35	10.85	0	13.29
0	46.42	45.51	46.04	10.83	0	13.27
0	47.13	45.81	46.45	10.79	0	13.24

0	47.03	45.66	46.21	10.76	0	13.22
0	47.15	45.17	46.21	10.72	0	13.2
0	47.63	46.36	47.11	10.68	0	13.17
0	47.66	45.35	46.38	10.66	0	13.17
0	46.92	45	45.71	10.61	0	13.15
0	46.4	36.54	44.85	10.57	0	13.13
0	36.37	26.02	30.88	10.5	0	13.13
0	34.78	24.84	28.35	10.4	0	13.03
0	44.5	34.83	40.87	10.25	0	12.99
0	50.6	44.41	47.1	10.2	0	13.06
0	56.25	50.47	53.63	10.25	0	13.15
0	58.79	56.07	57.36	10.4	0	13.27
0	59.68	56.76	58.55	10.68	0	13.39
0	61.76	59.06	60.73	11.05	0	13.43
0	61.95	60.28	61.37	11.44	0	13.48
0	61.27	59.74	60.52	11.8	0	13.43
0	60.25	49.33	56.95	12.05	0	13.34
0	49.24	37.44	40.69	12.18	0	13.24
0	39.88	36.32	37.84	12.12	0	13.08
0	39.71	36.93	37.58	12.03	0	13.01
0	37.24	34.92	36.42	11.91	0	13.01
0	36.13	34.48	35.06	11.73	0	12.99
0	36.54	34.19	35.11	11.53	0	12.96
0	34.13	30.99	32.13	11.36	0	12.94
0	32.37	29.79	30.92	11.16	0	12.94
0	30.69	28.58	29.4	10.96	0	12.92
0	31.22	25.36	27.85	10.76	0	12.92
0	27.6	25.59	26.88	10.59	0	12.89
0	25.96	22.47	24.74	10.4	0	12.89
0	23.43	20.46	21.88	10.2	0	12.89
0	21.55	19.99	20.79	10.01	0	12.87
0	29.74	19.21	23.04	9.8	0	12.83
0	42.16	29.8	37.71	9.59	0	12.83
0	45.61	42.18	44.23	9.51	0	12.89
0	49	45.4	47.11	9.49	0	12.99
0	51.19	48.41	49.61	9.59	0	13.08
0	52.69	50.31	51.46	9.82	0	13.15
0	54.83	51.91	53.28	10.16	0	13.22
0	57.25	53.51	55.21	10.55	0	13.24
0	57.59	55.31	56.19	10.92	0	13.24
0	55.37	49.2	52.68	11.2	0	13.17
0	49.2	40.23	44.71	11.44	0	13.13
0	42.73	39.77	40.99	11.51	0	13.01
0	42.88	40.25	41.5	11.53	0	12.96
0	41.11	37.1	38.95	11.51	0	12.94
0	38.71	35.23	36.7	11.42	0	12.89
0	36.88	32.15	34.22	11.29	0	12.87

0	35.18	32.02	33.54	11.13	0	12.85
0	32.67	29.83	31.47	10.98	0	12.83
0	35.33	28.32	31.73	10.79	0	12.83
0	28.36	27.53	27.97	10.59	0	12.8
0	28.71	26.79	27.87	10.42	0	12.8
0	29.16	26.93	27.96	10.25	0	12.78
0	28.84	25.37	26.9	10.06	0	12.78
0	25.69	24.07	24.7	9.89	0	12.78
0	31.09	24.92	26.28	9.68	0	12.73
0	43.92	31.14	39.24	9.49	0	12.71
0	48.32	43.81	45.76	9.4	0	12.78
0	51.28	48.16	49.79	9.4	0	12.87
0	55.82	51.21	53.53	9.55	0	12.99
0	59.03	55.3	57.25	9.84	0	13.08
0	61.13	58.42	59.6	10.2	0	13.15
0	62.35	59.89	61.29	10.63	0	13.22
0	62.27	61.25	61.74	11.05	0	13.2
0	61.69	52.77	59.09	11.31	0	13.13
0	52.99	39.77	47.28	11.51	0	13.03
0	45.79	39.01	42.74	11.47	0	12.87
0	50.43	43.48	48.48	11.42	0	12.8
0	54.02	46.57	49.6	11.33	0	12.8
0	53.44	46.14	48.6	11.22	0	12.78
0	50.96	45.52	47.76	11.11	0	12.78
0	51.48	45.21	46.91	10.98	0	12.76
0	47.52	44.37	45.93	10.87	0	12.76
0	46.99	44.02	45.44	10.74	0	12.76
0	44.09	34.12	38.63	10.63	0	12.73
0	40.55	34.04	38.51	10.53	0	12.71
0	40.56	32.58	34.58	10.4	0	12.69
0	41.87	36.82	39.05	10.27	0	12.69
0	38.68	29.46	33.33	10.12	0	12.69
0	47.33	38.24	42.93	9.93	0	12.64
0	51.29	45.56	47.86	9.78	0	12.64
0	61.85	48.71	51.44	9.74	0	12.71
0	63.83	61.83	62.61	9.8	0	12.8
0	65.49	62.77	64.38	10.03	0	12.99
0	66.3	64.33	65.24	10.31	0	13.06
0	66.37	64.62	65.41	10.72	0	13.13
0	65.92	63.85	64.74	11.11	0	13.15
0	64.57	62.6	63.38	11.47	0	13.13
0	62.58	58.67	60.91	11.69	0	13.01
0	58.78	53.96	56.73	11.85	0	12.94
0	54.74	50.39	51.67	11.87	0	12.83
0	52.02	50	50.95	11.85	0	12.76
0	51.54	49.96	50.65	11.8	0	12.73
0	50.39	48.81	49.5	11.71	0	12.71

0	49.91	48.75	49.32	11.6	0	12.69
0	50.11	48.72	49.57	11.49	0	12.69
0	50.15	48.51	49.47	11.38	0	12.69
0	50.43	46.74	49.39	11.27	0	12.69
0	48.83	45.59	47.5	11.18	0	12.69
0	49.26	45.47	47.77	11.09	0	12.66
0	49.37	42.99	46.94	11.03	0	12.66
0	44.67	41.68	43.44	10.92	0	12.64
0	42.5	38.1	39.68	10.83	0	12.64
0	42.07	38.77	40.13	10.74	0	12.62
0	49.13	41.05	45.83	10.55	0	12.53
0	56.13	49.04	50.98	10.55	0	12.62
0	59.05	54.82	56.96	10.61	0	12.71
0	60.15	58.2	59	10.79	0	12.78
0	59.38	58.41	58.84	11.03	0	12.83
0	63.85	58.71	61.74	11.27	0	12.83
0	63.67	61.06	62.44	11.6	0	12.94
0	61.33	58.42	60.07	11.89	0	12.99
0	58.97	52.24	56.43	12.05	0	12.89
0	52.2	48.3	50.13	12.12	0	12.83
0	49.85	48.07	49.17	12.07	0	12.71
0	49.04	45.41	47.23	11.98	0	12.69
0	47.56	40.54	44.36	11.87	0	12.66
0	46.13	38.71	43.36	11.73	0	12.62
0	45.02	38.47	43.01	11.58	0	12.62
0	45.99	41.57	44.2	11.42	0	12.62
0	41.57	30.96	35.22	11.27	0	12.62
0	34.74	29.32	31.81	11.09	0	12.57
0	35.35	30.55	32.31	10.92	0	12.55
0	35.91	31.47	33.75	10.72	0	12.55
0	38.04	31.9	36.03	10.57	0	12.55
0	35.56	31.74	33.68	10.4	0	12.55
0	32.62	26.86	30.61	10.25	0	12.55
0	32.57	24.42	27.37	10.06	0	12.53
0	42.39	32.61	37.64	9.84	0	12.48
0	48.26	42.42	45.29	9.76	0	12.55
0	51.87	47.41	49.86	9.76	0	12.64
0	53.72	49.99	51.64	9.86	0	12.73
0	54.42	51.96	53.05	10.08	0	12.8
0	53.3	50.52	51.73	10.35	0	12.83
0	52.5	50.6	51.58	10.61	0	12.8
0	52.12	50.7	51.43	10.89	0	12.8
0	50.66	45.51	48.68	11.16	0	12.76
0	45.49	37.08	39.07	11.33	0	12.71
0	37.07	35.34	36	11.36	0	12.64
0	35.42	34.71	35.09	11.33	0	12.59
0	34.74	32.37	33.65	11.22	0	12.57

0	32.82	30.02	31.13	11.09	0	12.53
0	31.91	30.09	30.84	10.96	0	12.53
0	32.04	29.33	30.61	10.79	0	12.5
0	29.52	28.46	28.91	10.63	0	12.5
0	30.76	28.93	29.8	10.46	0	12.48
0	31.69	29.59	30.75	10.31	0	12.48
0	31.62	28.58	30.24	10.16	0	12.48
0	29.83	27.94	28.97	10.01	0	12.48
0	29.33	27.59	28.45	9.89	0	12.46
0	30.28	29.24	29.92	9.76	0	12.48
0	31.72	29.93	30.55	9.65	0	12.48
0	37.13	31.76	33.94	9.55	0	12.48
0	39.87	37.17	38.65	9.47	0	12.46
0	41.65	39.78	40.63	9.44	0	12.43
0	44.75	41.59	43.2	9.55	0	12.5
0	45.29	42.91	44.09	9.74	0	12.57
0	45.84	44.29	45.03	9.99	0	12.59
0	46.38	45.56	45.96	10.27	0	12.59
0	46.07	45	45.57	10.57	0	12.59
0	45.25	44.52	44.92	10.85	0	12.64
0	44.5	43.77	44.08	11	0	12.57
0	43.76	42.74	43.33	11.09	0	12.55
0	42.93	41.23	42.23	11.13	0	12.53
0	43.94	40.64	41.27	11.11	0	12.5
0	43.82	41.64	42.78	11.09	0	12.48
0.02	42.87	40.75	41.67	11.07	0	12.48
0	41.07	40.56	40.84	11.03	0	12.46
0	41.61	40.57	41.21	11	0	12.46
0.01	40.59	38.98	39.77	10.98	0	12.46
0.03	38.98	35.7	36.79	10.94	0	12.43
0.01	38.16	35.7	36.5	10.92	0	12.43
0	38.23	37.31	37.74	10.87	0	12.41
0.01	38.22	37.75	37.98	10.81	0	12.41
0	38.22	37.32	37.69	10.76	0	12.41
0.05	39.18	38.01	38.31	10.72	0	12.41
0.07	41.46	39.16	40.26	10.68	0	12.39
0.02	45.91	41.46	43.58	10.61	0	12.34
0	46.44	45.45	45.84	10.66	0	12.39
0.02	48.24	45.55	46.75	10.76	0	12.41
0.01	49.7	47.82	48.75	10.98	0	12.46
0	50.44	49.29	49.78	11.24	0	12.48
0	49.71	48.86	49.23	11.58	0	12.5
0	49.05	48.34	48.59	11.89	0	12.53
0	48.55	48.23	48.38	12.12	0	12.53
0	48.3	46.58	47.28	12.23	0	12.5
0	46.58	45.36	45.89	12.25	0	12.48
0.01	45.64	45.14	45.32	12.23	0	12.46

0.03	45.38	44.96	45.11	12.16	0	12.43
0	45.94	44.63	45.1	12.09	0	12.43
0.01	46.01	44.59	45.07	12.03	0	12.43
0.09	45.69	44.61	45.06	11.93	0	12.43
0.04	46.83	45.66	45.99	11.87	0	12.43
0.05	46.22	45.88	46.07	11.82	0	12.43
0	46.11	45.31	45.68	11.78	0	12.43
0	46.3	45.48	45.95	11.73	0	12.46
0	46.67	46.23	46.37	11.69	0	12.46
0	46.46	46.3	46.36	11.67	0	12.46
0.02	46.63	46.42	46.57	11.64	0	12.46
0.08	47.24	44.71	46.2	11.62	0	12.46
0	46.71	44.78	45.52	11.6	0	12.46
0	46.32	44.84	45.16	11.58	0	12.43
0	47.34	44.75	46.12	11.53	0	12.43
0.01	47.3	46.01	46.8	11.51	0	12.43
0.01	46.36	45.31	45.59	11.49	0	12.43
0	49.29	46.37	48.17	11.51	0	12.43
0	52.36	49.07	50.32	11.6	0	12.48
0.01	52.44	49.71	50.94	11.78	0	12.53
0	51.13	47.49	49.61	11.89	0	12.55
0	47.56	42.84	44.84	11.98	0	12.57
0	42.77	38.62	40.61	11.91	0	12.48
0	40.59	37.46	39.16	11.76	0	12.46
0	39.74	36.66	38.33	11.58	0	12.43
0	39.23	34.93	36.91	11.36	0	12.43
0	41.31	38.06	39.37	11.13	0	12.43
0	41.2	38.1	39.36	10.92	0	12.43
0	41.05	36.35	38.78	10.74	0	12.46
0	40.13	38.38	39.04	10.55	0	12.43
0	41.13	39.75	40.55	10.38	0	12.43
0	41.57	38.54	40.41	10.23	0	12.46
0	40.12	37.21	38.7	10.1	0	12.46
0	39.66	35.99	38.42	9.97	0	12.43
0	38.51	35.07	36.98	9.84	0	12.43
0	36.1	33.28	34.34	9.72	0	12.41
0	42.44	33.92	38.45	9.49	0	12.32
0	46.4	42.44	44.4	9.44	0	12.39
0	48.02	45.94	46.99	9.47	0	12.46
0	48.3	45.87	46.87	9.61	0	12.53
0	48.74	45.51	46.54	9.86	0	12.55
0	45.91	44.59	45.19	10.14	0	12.53
0	45.99	45.03	45.32	10.4	0	12.53
0	45.22	44.88	45.05	10.57	0	12.48
0	45.05	43.9	44.6	10.74	0	12.5
0	43.88	42.05	43.01	10.85	0	12.5
0	42.05	41.3	41.7	10.89	0	12.46

0	41.44	40.76	41.2	10.87	0	12.43
0	41.23	39.75	40.83	10.81	0	12.41
0	40.21	37.99	39.41	10.74	0	12.39
0	40.1	38.46	39.3	10.66	0	12.39
0	40.21	38.47	39.37	10.57	0	12.34
0	39.62	37.53	38.67	10.46	0	12.34
0	39.83	37.34	38.66	10.35	0	12.34
0	41	39.18	40.53	10.27	0	12.34
0	40.69	37.48	39.77	10.18	0	12.34
0	38.34	36.43	37.51	10.14	0	12.32
0	37.44	35.48	36.65	10.08	0	12.32
0	36.31	35.19	35.85	9.99	0	12.3
0	36.49	35.48	35.81	9.91	0	12.3
0	40.4	36.52	38.38	9.8	0	12.27
0	41.72	40.42	41.29	9.72	0	12.25
0	42.58	41.58	42.06	9.72	0	12.25
0	43.65	42.3	43.07	9.8	0	12.27
0	44.63	43.22	43.76	10.01	0	12.32
0	44.64	44.02	44.28	10.23	0	12.34
0	45.49	44.35	45.1	10.44	0	12.34
0	46.06	45.12	45.56	10.66	0	12.34
0	45.22	44.43	44.89	10.87	0	12.39
0	44.43	41.34	42.87	11.03	0	12.37
0	41.87	40.62	41.47	11.03	0	12.3
0	41.8	36	39.5	10.98	0	12.27
0	37.75	35.05	36.31	10.89	0	12.23
0	37.96	36.11	37.02	10.74	0	12.21
0	36.76	34.24	35.53	10.57	0	12.21
0	35.17	33.59	34.34	10.38	0	12.18
0	34.43	32.68	33.23	10.18	0	12.16
0	33.32	32.4	32.91	9.99	0	12.16
0	33.15	32.34	32.81	9.8	0	12.16
0	32.97	32.16	32.52	9.65	0	12.16
0	32.64	31.78	32.44	9.49	0	12.14
0	31.77	30.65	31.1	9.36	0	12.14
0	31.31	29.14	30.14	9.24	0	12.12
0	31.12	29.38	29.85	9.09	0	12.09
0	37.49	31.12	34.64	8.93	0	12
0	41.04	37.49	39.4	8.91	0	12.09
0	42.81	40.99	42.1	8.85	0	12.12
0	43.37	41.85	42.61	8.91	0	12.18
0	48.04	43.23	45.34	9.13	0	12.23
0	49.13	46.62	48.03	9.63	0	12.43
0	50.03	48.33	48.94	10.03	0	12.46
0	50.08	47.88	48.94	10.35	0	12.37
0	48.17	41.61	45.1	10.57	0	12.27
0	41.58	34.35	38.08	10.68	0	12.21

0	36.13	34.26	35.15	10.59	0	12.12
0	36.25	32.86	34.61	10.46	0	12.07
0	33.49	32.67	33.03	10.29	0	12.05
0	33.97	31.84	33.2	10.12	0	12.03
0	36.13	32.32	34.6	9.93	0	12.03
0	36.9	35.31	35.82	9.8	0	12.03
0	37.33	36.66	37.04	9.7	0	12.03
0	36.73	36.49	36.6	9.65	0	12.05
0	36.71	36.35	36.55	9.61	0	12.03
0.01	36.66	36.35	36.52	9.59	0	12.03
0	37.03	36.66	36.85	9.57	0	12.03
0	37.07	36.93	36.99	9.57	0	12
0.01	37.07	36.9	36.97	9.57	0	12
0	37.26	36.93	37.09	9.55	0	12
0	37.24	36.97	37.11	9.55	0	12
0	37.62	37.03	37.26	9.53	0	11.98
0	38.16	37.14	37.58	9.53	0	11.93
0	38.23	37.39	37.91	9.61	0	11.96
0	38.84	37.6	38.2	9.74	0	11.96
0	39.03	38.26	38.59	9.89	0	12
0	38.93	38.33	38.6	9.99	0	11.98
0	38.96	38.43	38.65	10.08	0	11.98
0	38.69	38.09	38.5	10.16	0	11.98
0	38.28	36.31	37.99	10.18	0	11.96
0	36.28	34.11	34.82	10.16	0	11.93
0	34.28	32.7	33.48	10.06	0	11.89
0	34.25	32.89	33.77	9.93	0	11.87
0	33.83	32.41	33.09	9.76	0	11.87
0	33.22	32.19	32.71	9.59	0	11.85
0	32.28	29.92	30.93	9.42	0	11.85
0	30.54	29.48	30.06	9.28	0	11.82
0	32.82	29.21	30.43	9.13	0	11.8
0	36.74	32.86	34.53	9.03	0	11.8
0	35.69	32.88	34.11	8.93	0	11.8
0	35.89	34.71	35.27	8.85	0	11.8
0	36.11	35.07	35.62	8.76	0	11.8
0	35.65	34.79	35.16	8.7	0	11.82
0	35.2	34.81	35.02	8.64	0	11.82
0	35.84	35.2	35.51	8.6	0	11.8
0	36.26	35.56	35.8	8.56	0	11.8
0	36.47	35.55	35.9	8.56	0	11.76
0	38.66	35.92	37.7	8.6	0	11.73
0	40.57	38.18	39.4	8.8	0	11.8
0	43.5	40.2	42.1	9.11	0	11.87
0	45.33	42.83	43.86	9.51	0	12
0	45.88	44.17	44.94	9.78	0	11.98
0	45.11	40.63	43.97	9.91	0	11.89

0	40.59	31.68	34.6	9.97	0	11.85
0	31.79	30.67	31.34	9.84	0	11.73
0	31.86	30.64	31.2	9.72	0	11.67
0	31.06	30.23	30.57	9.55	0	11.67
0	31.03	28.46	29.96	9.38	0	11.64
0	29.17	27.3	28.01	9.22	0	11.6
0	30.24	28.27	29.34	9.07	0	11.6
0	29.38	28.06	28.69	8.93	0	11.6
0	29.12	27.78	28.5	8.8	0	11.58
0	29.24	25.94	27.79	8.7	0	11.58
0	31.14	28.95	29.96	8.58	0	11.55
0	32.01	31.14	31.71	8.5	0	11.58
0	32.56	31.99	32.23	8.44	0	11.6
0	32.74	32.53	32.62	8.36	0	11.58
0	33.35	32.72	32.9	8.32	0	11.58
0.01	34.79	33.28	33.9	8.26	0	11.55
0	34.79	33.87	34.31	8.2	0	11.53
0	35.48	34.26	34.82	8.16	0	11.53
0	35.68	34.79	35.24	8.2	0	11.55
0	35.95	35.2	35.47	8.32	0	11.58
0	35.97	35.41	35.68	8.44	0	11.55
0	36.31	35.42	35.95	8.6	0	11.55
0	36.49	35.8	36.1	8.74	0	11.55
0	36.25	35.9	36.06	8.85	0	11.55
0	36.18	35.8	35.97	8.91	0	11.53
0	36.02	35.8	35.91	8.97	0	11.51
0	35.87	35.46	35.69	8.99	0	11.51
0	35.66	35.08	35.41	8.99	0	11.49
0	35.36	34.82	35.02	8.97	0	11.49
0	34.98	34.43	34.69	8.97	0	11.47
0	35.42	34.7	35.04	8.95	0	11.44
0	35.44	35.24	35.33	8.93	0	11.44
0	35.53	35.32	35.44	8.91	0	11.42
0	35.78	35.49	35.68	8.89	0	11.42
0.01	35.84	35.53	35.66	8.87	0	11.4
0	35.63	35.36	35.52	8.87	0	11.38
0	35.6	35.32	35.48	8.85	0	11.38
0	35.58	35.29	35.47	8.85	0	11.38
0	35.6	35.25	35.38	8.82	0	11.36
0	36.28	35.6	35.83	8.8	0	11.33
0	37.43	36.25	36.84	8.8	0	11.31
0	37.75	36.85	37.31	8.82	0.185	11.31
0	38.54	37.09	37.82	8.89	0.187	11.31
0	38.63	37.92	38.23	9.03	0.187	11.33
0	39.31	37.75	38.66	9.17	0.187	11.36
0	39.3	38.51	38.89	9.32	0.187	11.36
0	39.03	38.28	38.68	9.44	0.187	11.36

0	38.88	38.42	38.62	9.57	0.189	11.36
0	38.64	38.28	38.44	9.61	0.186	11.33
0	38.44	38.23	38.31	9.63	0.188	11.31
0	38.3	38.06	38.18	9.63	0.187	11.31
0	38.18	37.82	37.99	9.61	0.189	11.29
0.01	38.08	37.65	37.9	9.59	0.188	11.29
0	37.74	37.41	37.58	9.55	0.19	11.27
0	37.74	37.41	37.59	9.51	0.191	11.27
0	37.79	37.56	37.68	9.49	0.19	11.24
0	37.84	37.65	37.72	9.44	0.19	11.24
0	38.06	37.84	37.95	9.42	0.188	11.24
0.01	38.1	37.79	37.95	9.4	0.19	11.24
0	37.92	37.79	37.83	9.38	0.192	11.24
0	37.86	37.58	37.77	9.36	0.19	11.24
0	37.99	37.56	37.84	9.34	0.19	11.22
0	38.13	37.75	37.91	9.34	0.189	11.22
0	38.37	37.72	38.02	9.32	0.191	11.22
0	38.87	37.87	38.24	9.3	0.191	11.2
0	39.85	38.83	39.3	9.32	0.196	11.2
0	40.51	39.17	39.83	9.49	0.194	11.27
0	42.08	39.78	40.91	9.68	0.192	11.33
0	46.27	41.39	43.09	9.89	0.194	11.33
0	50.83	46.23	49.19	10.18	0.189	11.47
0	56.59	50.85	53.87	10.55	0.191	11.62
0	54.3	47.74	49.94	10.81	0.19	11.67
0	52.13	48.3	49.96	10.7	0.198	11.4
0	50.6	46.85	48.75	10.68	0.199	11.31
0	52.7	47.97	50.88	10.63	0.198	11.29
0	49.75	46.41	48.01	10.57	0.2	11.29
0	53.25	48.51	52.08	10.46	0.198	11.27
0	53.54	51.68	52.65	10.44	0.197	11.33
0	52.84	51.17	51.89	10.44	0.198	11.38
0	52.47	47.26	49.18	10.38	0.2	11.38
0	49.85	42.3	46.84	10.31	0.199	11.33
0	48.95	42.18	43.9	10.25	0.201	11.29
0	49.34	38.82	43.85	10.18	0.202	11.27
0.02	38.8	34.46	36.43	10.12	0.2	11.22
0.01	37.1	34.33	35.39	9.99	0.202	11.16
0	38.03	36.25	36.92	9.89	0.2	11.16
0	37.07	34.47	35.63	9.76	0.202	11.16
0	38.15	35.21	36.82	9.61	0.201	11.11
0	42.28	38.2	40.56	9.38	0.206	11.05
0	43.56	40.19	41.94	9.53	0.2	11.29
0	43.68	40.49	41.86	9.7	0.2	11.47
0	43.62	39.31	41.21	9.76	0.201	11.36
0	44.8	39.11	41.67	9.91	0.202	11.4
0	44.32	36.24	41.09	10.01	0.204	11.36

0	42.74	38.76	40.76	10.14	0.204	11.38
0	39.45	37.99	38.61	10.16	0.206	11.31
0	38.15	36.58	37.43	10.16	0.201	11.27
0	37.27	34.91	35.86	10.01	0.203	11.18
0	36.52	35.2	35.66	9.86	0.204	11.16
0	36.01	35.1	35.44	9.7	0.204	11.13
0	35.86	34.76	35.38	9.53	0.203	11.13
0	35.86	34.76	35.2	9.36	0.203	11.13
0	35	33.59	34.27	9.2	0.201	11.11
0	34.87	33.83	34.44	9.05	0.2	11.11
0	35.01	33.52	34.43	8.91	0.202	11.11
0	34.56	33.69	34.09	8.78	0.2	11.09
0	34.87	33.59	34.3	8.66	0.199	11.09
0	34.43	30.07	31.81	8.54	0.199	11.09
0	32.33	30.07	31.23	8.44	0.198	11.07
0	32.17	29.93	31.53	8.34	0.199	11.07
0	32.39	29.9	31.29	8.24	0.201	11.07
0	35.41	32.34	34.2	8.04	0.204	10.96
0	38.18	35.41	36.68	8.06	0.201	11.07
0	40.4	37.78	38.93	8.08	0.197	11.16
0	41.86	39.16	40.31	8.12	0.196	11.29
0	43.52	40.46	41.92	8.24	0.193	11.44
0	44.12	41.58	43.34	8.38	0.192	11.55
0	44.74	43.21	44.02	8.5	0.199	11.53
0	44.38	42.61	43.38	8.6	0.201	11.42
0	42.8	38.8	40.94	8.6	0.203	11.24
0	38.73	32.44	36.07	8.64	0.199	11.18
0	34.04	31.89	33.01	8.52	0.201	11.05
0	34.08	32.02	33.05	8.44	0.202	11
0	33.85	30.98	32.21	8.34	0.201	10.98
0	32.74	30.97	31.65	8.24	0.2	10.96
0	31.31	28.48	29.75	8.16	0.201	10.94
0	29.23	26.24	27.49	8.06	0.199	10.92
0	28.96	25.58	27.92	7.96	0.2	10.89
0	28.1	24.42	26.86	7.88	0.198	10.87
0	28.9	23.8	26.67	7.8	0.199	10.87
0	27.09	23.71	25.06	7.72	0.199	10.85
0	25.9	21.76	23.72	7.64	0.199	10.83
0	22.87	21.87	22.56	7.56	0.199	10.83
0	22.69	19.3	20.76	7.48	0.201	10.81
0	22.49	18.87	19.89	7.4	0.199	10.79
0	32.76	22.54	28.48	7.2	0.204	10.66
0	36.23	32.54	34.27	7.24	0.201	10.76
0	38.46	36.14	37.57	7.28	0.198	10.87
0	39.63	37.6	38.44	7.34	0.196	10.96
0	39.44	38.27	38.74	7.38	0.193	11.03
0	39.81	38.14	38.79	7.36	0.196	11.03

0	39.95	38.66	39.1	7.32	0.196	10.98
0	39.12	37.66	38.27	7.32	0.198	10.94
0	37.84	36.26	37.19	7.36	0.197	10.89
0	36.25	33.68	35.14	7.42	0.195	10.85
0	33.76	32.05	33.11	7.42	0.197	10.79
0	32.05	30.88	31.54	7.42	0.198	10.74
0	31.78	29.05	29.84	7.42	0.197	10.72
0	31.78	30.24	30.85	7.4	0.198	10.68
0	31.22	28.34	30.52	7.38	0.199	10.68
0	29.27	27.54	28.2	7.36	0.2	10.63
0	29.14	28.51	28.81	7.34	0.2	10.61
0	30.81	29.14	30.01	7.32	0.199	10.61
0	31.36	29.88	30.74	7.3	0.199	10.59
0	30.81	28.96	30.01	7.28	0.199	10.57
0	31.17	29.52	30.33	7.26	0.198	10.57
0	29.98	29.02	29.55	7.24	0.197	10.55
0	29.15	27.37	27.99	7.22	0.198	10.55
0	27.58	25.25	26.14	7.2	0.199	10.53
0	32.18	26.88	28.94	7.15	0.2	10.48
0	36.39	32.21	34.85	7.09	0.203	10.42
0	36.81	35.54	36.14	7.13	0.201	10.48
0	37.63	36.45	37.07	7.18	0.199	10.55
0	40.76	36.74	38.67	7.22	0.198	10.59
0	42.16	38.55	40.58	7.3	0.196	10.66
0	43.27	41.46	42.29	7.44	0.195	10.72
0	44.54	42.6	43.33	7.58	0.195	10.72
0	43.29	38.79	41.46	7.7	0.197	10.63
0	38.79	35.36	36.36	7.8	0.199	10.55
0	35.73	33.45	34.36	7.82	0.201	10.46
0	33.73	31.02	31.89	7.8	0.201	10.42
0	35.28	31.19	32.39	7.74	0.201	10.4
0	35.92	34.72	35.5	7.68	0.201	10.38
0	36.99	34.21	35.43	7.64	0.2	10.38
0	36.23	34.21	34.95	7.6	0.201	10.38
0	36.44	34.31	35.33	7.56	0.201	10.38
0	34.76	33.25	34.12	7.54	0.198	10.35
0	37.29	33.58	34.89	7.48	0.199	10.33
0	37.55	32.24	33.98	7.46	0.2	10.33
0	32.39	31.74	32.16	7.44	0.201	10.33
0	32.63	31.46	31.91	7.42	0.2	10.31
0	33.1	31.74	32.62	7.38	0.201	10.29
0	32.74	32.19	32.52	7.38	0.2	10.29
0	32.67	32.22	32.44	7.38	0.2	10.27
0.02	36.35	32.67	34.01	7.34	0.201	10.25
0	37.38	36.22	36.71	7.28	0.205	10.16
0	38.46	36.44	37.46	7.4	0.203	10.27
0	40.37	38.01	39.39	7.58	0.2	10.33

0	41.5	37.48	39.8	7.88	0.201	10.4
0	45.28	41	42.8	8.12	0.204	10.35
0	46.34	42.2	44.04	8.48	0.202	10.53
0	42.97	39.19	41.55	8.62	0.202	10.46
0	39.19	36.26	37.71	8.64	0.202	10.35
0	36.43	34.12	35.18	8.56	0.204	10.23
0	36.71	33.79	35.25	8.48	0.206	10.18
0	36.69	33.28	34.68	8.4	0.207	10.18
0	35.14	33.49	34.47	8.32	0.205	10.16
0	35.36	32.51	33.97	8.24	0.204	10.16
0	34.25	32.67	33.69	8.16	0.204	10.14
0	34.76	31.33	33.22	8.06	0.205	10.12
0	35.2	33.66	34.39	7.98	0.204	10.12
0	34.96	32.77	34.03	7.9	0.201	10.12
0	33.11	32.8	32.95	7.84	0.202	10.12
0	32.87	32.5	32.67	7.78	0.204	10.12
0	32.67	32.48	32.57	7.74	0.202	10.12
0	33.2	32.5	32.79	7.68	0.202	10.1
0	32.92	32.32	32.55	7.64	0.202	10.1
0	33.15	32.6	33	7.6	0.203	10.1
0.01	33.53	32.53	32.93	7.56	0.202	10.1
0	33.53	33.11	33.27	7.54	0.203	10.08
0.05	34.4	33.28	33.57	7.5	0.203	10.06
0.08	36.78	34.4	35.76	7.4	0.207	10.01
0	40.35	36.8	38.08	7.46	0.205	10.08
0	43.91	38.52	40.93	7.54	0.203	10.16
0	42.4	36.86	38.3	7.74	0.199	10.35
0	39.52	37.61	38.51	7.74	0.203	10.23
0	37.61	33.02	34.92	7.9	0.202	10.18
0	33.94	33.37	33.65	7.92	0.205	10.08
0	33.73	29.29	31.42	7.92	0.205	10.03
0	30.65	28.82	29.49	7.84	0.207	9.99
0	31	30.07	30.54	7.76	0.207	9.97
0	30.45	28.86	29.51	7.68	0.204	9.95
0	29.14	26.9	28.04	7.58	0.205	9.93
0	28.15	26.83	27.46	7.52	0.205	9.93
0	27.44	25.53	26.18	7.44	0.206	9.91
0	26.51	24.84	25.85	7.38	0.204	9.91
0	26.46	24.99	25.71	7.3	0.205	9.89
0	25.44	24.19	24.79	7.26	0.204	9.89
0	25.37	24.39	24.94	7.18	0.204	9.86
0	26.04	24.35	25.06	7.13	0.204	9.86
0	26.79	24.35	25.35	7.05	0.202	9.84
0	34.36	26.81	30.64	6.89	0.212	9.72
0	35.69	33.98	34.68	6.97	0.207	9.84
0	38.22	35.55	36.82	7.05	0.2	9.97
0	39.99	37.94	38.95	7.15	0.199	10.12

0	41.03	39.02	40.05	7.24	0.197	10.25
0	41.07	39.49	40.32	7.28	0.199	10.31
0	40.95	38.54	39.62	7.18	0.201	10.2
0	39.26	37.72	38.51	7.11	0.205	10.08
0	38.86	33.71	36.5	7.15	0.205	9.99
0	33.69	29.67	30.91	7.24	0.201	9.95
0	30.08	27.91	29.15	7.22	0.204	9.84
0	28.3	26.04	27.17	7.2	0.206	9.8
0	31.14	26.57	28.74	7.17	0.204	9.78
0	30.49	28.24	29.12	7.15	0.204	9.76
0	28.86	28.13	28.55	7.13	0.204	9.76
0	29.62	28.13	28.86	7.09	0.204	9.76
0	29.69	28.65	29.17	7.07	0.204	9.74
0	29.41	27.92	28.61	7.05	0.205	9.74
0	29.05	28.44	28.79	7.01	0.205	9.74
0	29.62	28.86	29.29	6.99	0.205	9.74
0	30.29	29.62	29.93	6.97	0.202	9.74
0	29.65	28.87	29.33	6.97	0.204	9.74
0	28.85	26.66	28.26	6.93	0.202	9.74
0	26.66	23.94	25.44	6.91	0.205	9.72
0	26.56	25.3	25.82	6.85	0.204	9.68
0	28.09	26.6	27.43	6.82	0.206	9.63
0	29.47	27.72	28.52	6.82	0.207	9.65
0	31.41	28.74	29.93	6.83	0.204	9.7
0	31.84	30.62	31.42	6.89	0.203	9.76
0	34.93	31.5	32.68	6.95	0.202	9.8
0	35.19	33.72	34.24	7.09	0.201	9.89
0	36.67	33.45	34.84	7.22	0.204	9.86
0	34	30.86	32.23	7.46	0.203	9.84
0	31	30.29	30.56	7.52	0.204	9.74
0	30.71	30.27	30.5	7.56	0.204	9.68
0	30.6	29.74	30.32	7.56	0.207	9.65
0	29.95	28.95	29.62	7.52	0.207	9.63
0	29.26	26.79	28.41	7.48	0.207	9.61
0	31.57	26.82	28.03	7.38	0.206	9.57
0	42.77	31.86	40.35	7.32	0.207	9.57
0	37.81	27.2	30.55	7.3	0.206	9.59
0	35.53	26.98	30.22	7.22	0.206	9.55
0	36.84	32.74	34.67	7.15	0.209	9.53
0	40.44	34.37	37.82	7.11	0.205	9.53
0	40.41	37.34	39.17	7.09	0.207	9.55
0	43.64	37.07	40.6	7.07	0.206	9.57
0	43.77	40.52	42.83	7.07	0.204	9.61
0	41.54	37.91	39.57	7.05	0.205	9.61
0	45.04	41.59	43.47	6.89	0.212	9.49
0	47.95	44.14	45.87	7.11	0.205	9.72
0	51.32	46.43	48.4	7.28	0.203	9.95

0	52.72	50.06	51.29	7.58	0.207	10.27
0	54.06	50.77	52.8	7.94	0.217	10.55
0	54.49	51.22	53.01	8.3	0.228	10.68
0	53.23	51.78	52.59	8.38	0.232	10.42
0	52.9	50.69	51.45	8.5	0.23	10.2
0	51.03	49.28	50.01	8.58	0.224	9.99
0	49.67	48.14	49.22	8.62	0.22	9.84
0	49.47	48.12	48.83	8.64	0.217	9.76
0	48.59	47.23	47.81	8.66	0.217	9.7
0	48.42	46.78	47.59	8.62	0.217	9.68
0	47.45	45.49	46.21	8.6	0.217	9.65
0	46.82	45.61	46.41	8.56	0.217	9.63
0	47.02	45.95	46.45	8.54	0.217	9.63
0	47.35	45.72	46.62	8.5	0.214	9.61
0	47.33	46.37	46.82	8.46	0.214	9.61
0	47.63	44.95	45.83	8.44	0.215	9.61
0	45.99	43.56	44.84	8.38	0.215	9.59
0	46.63	44.25	45.75	8.34	0.213	9.57
0	45.98	44.21	44.98	8.3	0.213	9.59
0	46.78	45.35	46.02	8.26	0.215	9.57
0	46.8	45.28	45.88	8.24	0.215	9.59
0	47.77	45.71	46.94	8.12	0.221	9.51
0	50.59	47.77	49.16	8.32	0.22	9.74
0	53.14	50.5	51.94	8.6	0.221	10.01
0	55.82	52.5	54	8.97	0.229	10.31
0	56.78	54.4	55.71	9.47	0.239	10.68
0	58.57	55.06	56.58	9.93	0.247	10.92
0	58.46	57.17	57.67	10.2	0.25	10.94
0	57.81	56.02	57.17	10.27	0.251	10.74
0	56.02	52.59	54.58	10.08	0.243	10.33
0	52.86	50.52	51.33	9.84	0.233	9.95
0	50.81	48.68	50	9.7	0.226	9.76
0	48.99	46.86	47.86	9.63	0.226	9.72
0	47.49	44.34	46	9.53	0.223	9.63
0	44.53	43.14	43.8	9.4	0.223	9.59
0	43.84	39.78	42.3	9.28	0.223	9.55
0	42.09	39.04	40.95	9.13	0.22	9.53
0	40.93	35.13	39.03	8.97	0.221	9.51
0	36.19	30.12	32.85	8.78	0.219	9.49
0	36.29	31.51	33.67	8.58	0.218	9.44
0	38.77	33.73	36.45	8.4	0.216	9.44
0	33.66	29.57	31.77	8.28	0.215	9.49
0	31	21.82	28.65	8.1	0.216	9.47
0	30.24	22.11	26.31	7.92	0.215	9.44
0	31.05	21.51	26.57	7.76	0.214	9.42
0	36.02	31	33.66	7.54	0.22	9.34
0	37.45	35.88	36.47	7.52	0.216	9.47

0	38.29	36.81	37.52	7.52	0.214	9.59
0	39.85	37.76	38.59	7.52	0.211	9.72
0	40.68	38.64	39.78	7.52	0.21	9.8
0	42.51	39.76	41.08	7.58	0.21	9.89
0	42.97	40.85	41.7	7.64	0.213	9.89
0	41.89	40.58	41.13	7.74	0.211	9.82
0	40.64	35.74	38.98	7.74	0.214	9.7
0	35.7	24.84	30.56	7.78	0.211	9.68
0	26.78	22.8	24.43	7.66	0.212	9.53
0	26.6	20.66	22.92	7.56	0.213	9.49
0	24.32	21.94	22.9	7.48	0.212	9.47
0	23.3	22.01	22.61	7.38	0.212	9.47
0	22.98	21.19	22.04	7.3	0.211	9.47
0	22.45	21.43	22.01	7.2	0.213	9.44
0	22.36	20.65	21.39	7.11	0.212	9.44
0	22.27	20.73	21.53	7.01	0.211	9.44
0	22.27	20.22	21.33	6.91	0.211	9.44
0	21.95	19.6	20.97	6.83	0.21	9.42
0	22.59	20.71	21.64	6.76	0.209	9.42
0	20.65	18.84	19.43	6.68	0.21	9.4
0	20.35	18.12	19.36	6.58	0.21	9.4
0	21.43	17.84	19.36	6.51	0.211	9.38
0	31.88	21.47	27.3	6.32	0.215	9.26
0	36.11	31.11	33.21	6.37	0.21	9.38
0	38.42	35.69	37.04	6.41	0.21	9.49
0	40.93	37.51	38.61	6.49	0.205	9.61
0	43.35	39.85	41.54	6.56	0.202	9.72
0	45.98	42.65	44.25	6.66	0.202	9.84
0	46.33	44.1	44.98	6.66	0.203	9.82
0	45.53	43.28	44.55	6.53	0.206	9.7
0	43.25	38.8	41.58	6.51	0.205	9.63
0	38.77	32.53	35.05	6.49	0.204	9.57
0	34.33	30.5	32.3	6.43	0.207	9.44
0	34.11	29.15	30.83	6.43	0.207	9.4
0	45.09	32.71	37.87	6.43	0.208	9.38
0	46.46	44.16	45.59	6.47	0.207	9.4
0	46.01	44.11	45.29	6.51	0.206	9.44
0	44.56	42.48	43.73	6.56	0.206	9.47
0	43	41.17	41.93	6.56	0.206	9.44
0	44.88	40.84	42.71	6.55	0.204	9.4
0	44.96	41.53	42.98	6.55	0.207	9.4
0	42.71	39.81	40.74	6.55	0.207	9.38
0	39.92	38.13	38.87	6.55	0.206	9.36
0	38.68	37.89	38.26	6.53	0.206	9.36
0	38.46	36.88	37.56	6.53	0.205	9.34
0	37.91	33.15	36.22	6.51	0.207	9.3
0	34.98	31.45	32.5	6.43	0.21	9.24

0	35.08	31.19	32.91	6.41	0.213	9.2
0	36.68	34.48	35.55	6.45	0.209	9.24
0	39.07	34.17	35.9	6.51	0.208	9.3
0	40.76	32.31	36.23	6.58	0.207	9.34
0	36.88	32.38	34.56	6.64	0.207	9.32
0	38.8	34.73	36.57	6.72	0.205	9.3
0	37.72	33.89	36.51	6.83	0.207	9.34
0	33.87	30.25	31.34	6.93	0.204	9.34
0	31.11	28.56	29.26	6.85	0.206	9.24
0	28.87	27.4	28.13	6.8	0.209	9.17
0	27.85	24.31	26.06	6.74	0.208	9.13
0	25.41	22.86	24.23	6.68	0.209	9.11
0	25.2	24.04	24.52	6.62	0.209	9.09
0	24.71	23.51	24.24	6.56	0.207	9.07
0	24.36	22.83	23.78	6.53	0.208	9.07
0	23.33	22.14	22.83	6.47	0.208	9.05
0	23.95	22.78	23.32	6.41	0.206	9.05
0	23.9	22.33	23.05	6.35	0.207	9.05
0	22.62	21.03	21.86	6.32	0.209	9.05
0	21.48	20.47	21.03	6.26	0.207	9.03
0	21.09	20.55	20.83	6.2	0.209	9.01
0	21.88	20.98	21.47	6.14	0.208	9.01
0	22.11	21.18	21.54	6.09	0.207	8.99
0	25.12	22.18	23.75	5.92	0.212	8.87
0	28.21	24.97	26.61	5.96	0.208	8.95
0	30.41	27.81	29.2	5.97	0.205	9.01
0	32.88	30	31.36	6.01	0.204	9.07
0	33.87	30.76	32.13	6.03	0.203	9.11
0	35.65	30.43	32.96	6.01	0.204	9.11
0	36.61	32.56	34.74	6.03	0.204	9.11
0	35.79	33.07	34.58	6.05	0.201	9.15
0	35.46	30.65	31.97	6.07	0.201	9.13
0	30.65	29.29	29.84	6.03	0.202	9.07
0	29.33	27.62	28.45	5.96	0.203	9.01
0	27.76	26.72	27.19	5.94	0.203	8.95
0	26.74	25.19	26.18	5.92	0.203	8.93
0	25.29	21.86	24.23	5.92	0.204	8.91
0	23.54	20.61	22.2	5.9	0.205	8.87
0	22.16	18.06	19.83	5.88	0.206	8.85
0	19.31	15.7	16.97	5.86	0.206	8.82
0	17.1	14.6	15.39	5.84	0.205	8.8
0	15.85	14.13	14.58	5.8	0.206	8.78
0	16.39	14.03	14.84	5.75	0.206	8.76
0	15.6	13.42	14.19	5.71	0.205	8.76
0	19.8	14.98	17.15	5.65	0.205	8.74
0	22.38	19.84	21.52	5.6	0.204	8.74
0	22.24	19	20.65	5.54	0.203	8.74

0	23.29	19.06	21.49	5.45	0.204	8.7
0	27.34	23.22	25.12	5.34	0.206	8.64
0	28.56	26.7	27.45	5.37	0.203	8.7
0	29.79	27.74	28.88	5.41	0.2	8.78
0	31.27	28.47	29.94	5.47	0.199	8.82
0	32.9	30.19	31.23	5.52	0.197	8.87
0	34.95	31.54	33.23	5.6	0.198	8.89
0	35.67	32.14	33.32	5.6	0.196	8.87
0	33.63	27.87	31.6	5.54	0.201	8.78
0	27.82	16.06	21.74	5.56	0.198	8.76
0	16.82	15.49	16.09	5.49	0.201	8.66
0	16.38	15.46	15.82	5.47	0.201	8.62
0	19.17	16.4	18.4	5.45	0.201	8.6
0	18.16	16.69	17.2	5.43	0.202	8.58
0	17.48	15.68	16.66	5.37	0.201	8.56
0	16.3	15.13	15.76	5.32	0.2	8.54
0	16.09	14.87	15.63	5.26	0.201	8.54
0	21.34	15.79	19.85	5.19	0.2	8.52
0	21.3	18.21	19.34	5.13	0.199	8.52
0	18.67	14.9	16.33	5.06	0.198	8.5
0	16.28	12.66	14.33	4.99	0.197	8.48
0	23.77	15.53	21.56	4.91	0.194	8.46
0	21.1	15.21	17	4.84	0.191	8.46
0	18.69	15.42	16.85	4.75	0	8.46
0	32.16	18.71	26.03	4.58	0	8.34
0	35.37	31.93	33.08	4.6	0	8.42
0	38.27	31.63	32.95	4.66	0	8.48
0	40.91	32.58	38.33	4.77	0	8.54
0	32.94	30.15	31.42	4.88	0	8.56
0	44.36	32.06	37.2	4.95	0	8.54
0	45.11	43.08	43.83	5.08	0.186	8.6
0	45.28	42.57	43.44	5.21	0.185	8.66
0	43.02	37.85	41.39	5.21	0.19	8.6
0	38.44	36.47	37.31	5.23	0.188	8.56
0	37.39	24.19	30.32	5.19	0.192	8.44
0	38.19	25.67	32.4	5.17	0.195	8.38
0	38.35	37.29	37.86	5.19	0.198	8.36
0	38.91	32.05	36.46	5.23	0.195	8.38
0	38.31	37.18	37.8	5.24	0.197	8.36
0	38.5	35.74	37.54	5.24	0.196	8.34
0	39.08	32.08	36.19	5.26	0.196	8.34
0	38.89	23.41	29.99	5.24	0.197	8.32
0	29.88	24.18	26.66	5.21	0.196	8.28
0	39.67	23.44	30.28	5.15	0.197	8.24
0	39.66	22.81	30.17	5.13	0.197	8.26
0	38.03	24.94	36.4	5.08	0.196	8.24
0	38.3	36.7	37.68	5.06	0.194	8.26

0	39.89	37.42	38.91	5.04	0.195	8.24
0	41.5	38.87	40.12	4.91	0.2	8.12
0	44.6	41.47	42.94	5.04	0.195	8.24
0	44.74	43.71	44.23	5.13	0.192	8.36
0	45.63	44	44.71	5.28	0.186	8.46
0	47.7	44.89	46.09	5.41	0.184	8.56
0	48.43	46.54	47.22	5.5	0.181	8.6
0	48.13	46.12	47.14	5.52	0.183	8.58
0	46.54	44.66	45.53	5.47	0.186	8.48
0	44.67	39.83	42.94	5.39	0.194	8.36
0	39.83	28.98	35.37	5.36	0.191	8.28
0	30.17	21.16	27.51	5.28	0.195	8.16
0	31.52	21.61	27.53	5.23	0.195	8.1
0	25.8	20.57	23.47	5.24	0.197	8.08
0	22.77	19.94	21.44	5.24	0.197	8.04
0	22.82	19.24	20.99	5.24	0.196	8.02
0	27.8	18.29	22.23	5.23	0.198	8
0	26.48	17.51	21.23	5.21	0.197	8
0	22.06	14.95	18.23	5.19	0.198	7.98
0	23.75	16.99	19.63	5.13	0.199	7.96
0	21.57	16.32	18.32	5.06	0.197	7.96
0	18.85	15.83	17.98	4.97	0.198	7.94
0	18.54	11.49	16.01	4.88	0.195	7.94
0	18.99	12.35	15.54	4.77	0.195	7.92
0	20.75	16.51	19.08	4.66	0.193	7.9
0	26.49	15.65	21.17	4.44	0	7.78
0	28.58	25.7	27.03	4.44	0	7.88
0	32.07	28.37	30.27	4.44	0	7.94
0	34.94	31.66	33.35	4.49	0	8
0	37.45	34.65	36.11	4.6	0	8.06
0	39.29	36.01	37.85	4.73	0	8.12
0	39.46	38.06	38.82	4.84	0	8.14
0	39.57	38.3	38.92	4.89	0	8.1
0	38.3	32.95	36.23	4.89	0	8.02
0	32.92	28.42	30.26	4.93	0	8.02
0	28.78	25.22	26.77	4.91	0.188	7.92
0	25.45	23.2	24.26	4.91	0.189	7.88
0	23.82	22.21	22.98	4.91	0.191	7.84
0	22.55	20.72	21.59	4.91	0.191	7.82
0	22.44	21.55	21.87	4.88	0.192	7.82
0	22.78	21.94	22.37	4.86	0.19	7.8
0	22.01	21.68	21.85	4.82	0.19	7.8
0	21.83	21.15	21.59	4.78	0	7.78
0	21.15	19.99	20.59	4.77	0	7.78
0	19.99	18.42	19.13	4.71	0	7.74
0	18.44	18.21	18.32	4.69	0	7.76
0	18.41	18.24	18.32	4.66	0	7.74

0	18.43	18.28	18.35	4.64	0	7.74
0	18.39	17.21	17.7	4.64	0	7.72
0	17.58	17.17	17.28	4.62	0	7.7
0	18.13	17.47	17.74	4.58	0	7.66
0	18.59	17.95	18.32	4.56	0	7.62
0	19.53	18.29	18.89	4.6	0	7.64
0	19.52	19.09	19.31	4.64	0	7.68
0	20.28	19.25	19.77	4.66	0	7.66
0	20.89	20.25	20.65	4.69	0	7.66
0	22.29	20.82	21.71	4.71	0	7.66
0	21.61	20.1	20.71	4.78	0	7.72
0	20.17	19.67	19.84	4.78	0	7.7
0	19.96	19.65	19.76	4.78	0	7.68
0	19.75	19.22	19.52	4.78	0	7.64
0	19.28	19.11	19.2	4.77	0	7.62
0	19.22	17.92	18.48	4.78	0	7.62
0	19	18.75	18.91	4.78	0	7.6

Soil Water	Soil Temp	Soil Water
20 in	40 in	40 in
wfv	deg C	wfv
0	24.84	0
0	24.84	0
0	24.81	0
0	24.81	0
0	25.02	0
0	25.31	0
0	25.63	0
0	25.96	0
0	26.33	0
0	26.52	0
0	26.48	0
0	26.11	0
0	25.74	0
0	25.06	0
0	24.88	0
0	24.88	0
0	24.88	0
0	24.88	0
0	24.81	0
0	24.81	0
0	24.81	0
0	24.81	0
0	24.81	0
0	24.81	0
0	24.77	0
0	24.74	0
0	24.74	0
0	24.77	0
0	25.09	0
0	25.52	0
0	25.52	0
0	26.07	0
0	25.89	0
0	26.55	0
0	26.48	0
0	25.63	0
0	25.38	0
0	25.31	0
0	25.23	0
0	25.2	0
0	25.06	0
0	24.95	0
0	24.91	0
0	24.91	0

0	24.88	0
0	24.84	0
0	24.84	0
0	24.84	0
0	24.84	0
0	24.81	0
0	24.77	0
0	24.84	0
0	25.06	0
0	25.31	0
0	25.56	0
0	26.11	0
0	27.09	0
0	27.51	0
0	26.22	0
0	25.09	0
0	24.77	0
0	24.67	0
0	24.63	0
0	24.7	0
0	24.74	0
0	24.7	0
0	24.7	0
0	24.67	0
0	24.7	0
0	24.7	0
0	24.67	0
0	24.63	0
0	24.63	0
0	24.6	0
0	24.6	0
0	24.6	0
0	24.63	0
0	25.23	0
0	25.67	0
0	26.07	0
0	25.81	0
0	25.63	0
0	25.27	0
0	25.09	0
0	25.27	0
0	25.23	0
0	25.23	0
0	25.06	0
0	24.91	0
0	24.81	0
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0	13.98	0
0	13.93	0
0	13.93	0
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0	13.88	0
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0	13.88	0
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0	13.79	0
0	13.77	0
0	13.77	0
0	13.77	0
0	13.81	0
0	13.81	0
0	13.84	0
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0	13.79	0
0	13.79	0
0	13.77	0
0	13.77	0
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0	13.5	0
0	13.46	0
0	13.36	0
0	13.65	0
0	13.79	0
0	13.69	0
0	13.72	0
0	13.67	0

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0	13.13	0
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0	12.94	0
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0	12.85	0
0	12.94	0
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0	13.08	0
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0	12.5	0
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0	12.92	0
0	12.78	0
0	12.69	0
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0	12.73	0

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0	12.48	0
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0	12.14	0
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0	12.03	0
0	11.96	0
0	11.96	0
0	11.98	0
0	11.93	0
0	11.91	0
0	11.87	0
0	11.76	0
0	11.89	0

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0	12.23	0
0	12.09	0
0	12.03	0
0	11.89	0
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0	11.71	0
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0	11.53	0
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0	11.27	0
0	11.27	0
0	11.24	0
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0	11.2	0

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0	11.33	0
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0	11.64	0
0	11.62	0
0	11.53	0
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0	11.18	0
0	11.09	0
0	11.09	0
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0	11.03	0
0	11.03	0
0	11	0
0	11	0
0	10.98	0
0	10.98	0
0	10.96	0
0	10.96	0
0	10.94	0
0	10.92	0
0	10.79	0
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0	10.83	0

0	10.81	0
0	10.81	0
0	10.79	0
0	10.74	0
0	10.7	0
0	10.72	0
0	10.74	0
0	10.74	0
0	10.76	0
0	10.76	0
0	10.81	0
0	10.81	0
0	10.76	0
0	10.74	0
0	10.72	0
0	10.72	0
0	10.72	0

Time stamp	YEAR	DAY OF YEAR	HOUR	TIME	DATE	Battery Voltage V	Precip inches
1/1/2015 0:00	2015	1	0	1	1/1/2015	12.6	0
1/1/2015 1:00	2015	1	100	1.041667	1/1/2015	12.55	0
1/1/2015 2:00	2015	1	200	1.083333	1/1/2015	12.5	0
1/1/2015 3:00	2015	1	300	1.125	1/1/2015	12.46	0
1/1/2015 4:00	2015	1	400	1.166667	1/1/2015	12.45	0
1/1/2015 5:00	2015	1	500	1.208333	1/1/2015	12.44	0
1/1/2015 6:00	2015	1	600	1.25	1/1/2015	12.44	0
1/1/2015 7:00	2015	1	700	1.291667	1/1/2015	12.44	0
1/1/2015 8:00	2015	1	800	1.333333	1/1/2015	12.44	0
1/1/2015 9:00	2015	1	900	1.375	1/1/2015	12.6	0
1/1/2015 10:00	2015	1	1000	1.416667	1/1/2015	13.75	0
1/1/2015 11:00	2015	1	1100	1.458333	1/1/2015	13.87	0
1/1/2015 12:00	2015	1	1200	1.5	1/1/2015	13.84	0
1/1/2015 13:00	2015	1	1300	1.541667	1/1/2015	13.82	0
1/1/2015 14:00	2015	1	1400	1.583333	1/1/2015	13.81	0
1/1/2015 15:00	2015	1	1500	1.625	1/1/2015	13.8	0.06
1/1/2015 16:00	2015	1	1600	1.666667	1/1/2015	13.8	0.01
1/1/2015 17:00	2015	1	1700	1.708333	1/1/2015	13.41	0
1/1/2015 18:00	2015	1	1800	1.75	1/1/2015	12.89	0
1/1/2015 19:00	2015	1	1900	1.791667	1/1/2015	12.8	0
1/1/2015 20:00	2015	1	2000	1.833333	1/1/2015	12.76	0
1/1/2015 21:00	2015	1	2100	1.875	1/1/2015	12.72	0
1/1/2015 22:00	2015	1	2200	1.916667	1/1/2015	12.7	0
1/1/2015 23:00	2015	1	2300	1.958333	1/1/2015	12.67	0
1/2/2015 0:00	2015	2	0	2	1/2/2015	12.64	0
1/2/2015 1:00	2015	2	100	2.041667	1/2/2015	12.61	0
1/2/2015 2:00	2015	2	200	2.083333	1/2/2015	12.59	0
1/2/2015 3:00	2015	2	300	2.125	1/2/2015	12.55	0
1/2/2015 4:00	2015	2	400	2.166667	1/2/2015	12.51	0
1/2/2015 5:00	2015	2	500	2.208333	1/2/2015	12.47	0
1/2/2015 6:00	2015	2	600	2.25	1/2/2015	12.44	0
1/2/2015 7:00	2015	2	700	2.291667	1/2/2015	12.43	0
1/2/2015 8:00	2015	2	800	2.333333	1/2/2015	12.43	0
1/2/2015 9:00	2015	2	900	2.375	1/2/2015	13.09	0
1/2/2015 10:00	2015	2	1000	2.416667	1/2/2015	13.9	0
1/2/2015 11:00	2015	2	1100	2.458333	1/2/2015	13.86	0.01
1/2/2015 12:00	2015	2	1200	2.5	1/2/2015	13.82	0.06
1/2/2015 13:00	2015	2	1300	2.541667	1/2/2015	13.78	0.03
1/2/2015 14:00	2015	2	1400	2.583333	1/2/2015	13.75	0
1/2/2015 15:00	2015	2	1500	2.625	1/2/2015	13.75	0
1/2/2015 16:00	2015	2	1600	2.666667	1/2/2015	13.75	0
1/2/2015 17:00	2015	2	1700	2.708333	1/2/2015	13.81	0
1/2/2015 18:00	2015	2	1800	2.75	1/2/2015	12.94	0

1/2/2015 19:00	2015	2	1900	2.791667	1/2/2015	12.78	0
1/2/2015 20:00	2015	2	2000	2.833333	1/2/2015	12.72	0
1/2/2015 21:00	2015	2	2100	2.875	1/2/2015	12.68	0
1/2/2015 22:00	2015	2	2200	2.916667	1/2/2015	12.65	0
1/2/2015 23:00	2015	2	2300	2.958333	1/2/2015	12.62	0
1/3/2015 0:00	2015	3	0	3	1/3/2015	12.6	0
1/3/2015 1:00	2015	3	100	3.041667	1/3/2015	12.58	0
1/3/2015 2:00	2015	3	200	3.083333	1/3/2015	12.57	0
1/3/2015 3:00	2015	3	300	3.125	1/3/2015	12.55	0
1/3/2015 4:00	2015	3	400	3.166667	1/3/2015	12.53	0
1/3/2015 5:00	2015	3	500	3.208333	1/3/2015	12.5	0
1/3/2015 6:00	2015	3	600	3.25	1/3/2015	12.47	0
1/3/2015 7:00	2015	3	700	3.291667	1/3/2015	12.44	0
1/3/2015 8:00	2015	3	800	3.333333	1/3/2015	12.71	0
1/3/2015 9:00	2015	3	900	3.375	1/3/2015	13.89	0
1/3/2015 10:00	2015	3	1000	3.416667	1/3/2015	13.84	0
1/3/2015 11:00	2015	3	1100	3.458333	1/3/2015	13.81	0
1/3/2015 12:00	2015	3	1200	3.5	1/3/2015	13.8	0
1/3/2015 13:00	2015	3	1300	3.541667	1/3/2015	13.79	0
1/3/2015 14:00	2015	3	1400	3.583333	1/3/2015	13.76	0
1/3/2015 15:00	2015	3	1500	3.625	1/3/2015	13.74	0
1/3/2015 16:00	2015	3	1600	3.666667	1/3/2015	13.74	0
1/3/2015 17:00	2015	3	1700	3.708333	1/3/2015	13.76	0
1/3/2015 18:00	2015	3	1800	3.75	1/3/2015	12.95	0
1/3/2015 19:00	2015	3	1900	3.791667	1/3/2015	12.83	0
1/3/2015 20:00	2015	3	2000	3.833333	1/3/2015	12.79	0
1/3/2015 21:00	2015	3	2100	3.875	1/3/2015	12.76	0
1/3/2015 22:00	2015	3	2200	3.916667	1/3/2015	12.73	0
1/3/2015 23:00	2015	3	2300	3.958333	1/3/2015	12.71	0
1/4/2015 0:00	2015	4	0	4	1/4/2015	12.69	0
1/4/2015 1:00	2015	4	100	4.041667	1/4/2015	12.66	0
1/4/2015 2:00	2015	4	200	4.083333	1/4/2015	12.63	0
1/4/2015 3:00	2015	4	300	4.125	1/4/2015	12.59	0
1/4/2015 4:00	2015	4	400	4.166667	1/4/2015	12.55	0
1/4/2015 5:00	2015	4	500	4.208333	1/4/2015	12.51	0
1/4/2015 6:00	2015	4	600	4.25	1/4/2015	12.47	0
1/4/2015 7:00	2015	4	700	4.291667	1/4/2015	12.42	0
1/4/2015 8:00	2015	4	800	4.333333	1/4/2015	12.76	0
1/4/2015 9:00	2015	4	900	4.375	1/4/2015	14.04	0
1/4/2015 10:00	2015	4	1000	4.416667	1/4/2015	13.97	0
1/4/2015 11:00	2015	4	1100	4.458333	1/4/2015	13.88	0
1/4/2015 12:00	2015	4	1200	4.5	1/4/2015	13.81	0
1/4/2015 13:00	2015	4	1300	4.541667	1/4/2015	13.78	0
1/4/2015 14:00	2015	4	1400	4.583333	1/4/2015	13.76	0
1/4/2015 15:00	2015	4	1500	4.625	1/4/2015	13.75	0
1/4/2015 16:00	2015	4	1600	4.666667	1/4/2015	13.77	0
1/4/2015 17:00	2015	4	1700	4.708333	1/4/2015	13.8	0

1/4/2015 18:00	2015	4	1800	4.75	1/4/2015	12.99	0
1/4/2015 19:00	2015	4	1900	4.791667	1/4/2015	12.82	0
1/4/2015 20:00	2015	4	2000	4.833333	1/4/2015	12.77	0
1/4/2015 21:00	2015	4	2100	4.875	1/4/2015	12.73	0
1/4/2015 22:00	2015	4	2200	4.916667	1/4/2015	12.7	0
1/4/2015 23:00	2015	4	2300	4.958333	1/4/2015	12.68	0
1/5/2015 0:00	2015	5	0	5	1/5/2015	12.65	0
1/5/2015 1:00	2015	5	100	5.041667	1/5/2015	12.62	0
1/5/2015 2:00	2015	5	200	5.083333	1/5/2015	12.59	0
1/5/2015 3:00	2015	5	300	5.125	1/5/2015	12.56	0
1/5/2015 4:00	2015	5	400	5.166667	1/5/2015	12.52	0
1/5/2015 5:00	2015	5	500	5.208333	1/5/2015	12.48	0
1/5/2015 6:00	2015	5	600	5.25	1/5/2015	12.44	0
1/5/2015 7:00	2015	5	700	5.291667	1/5/2015	12.41	0
1/5/2015 8:00	2015	5	800	5.333333	1/5/2015	12.71	0
1/5/2015 9:00	2015	5	900	5.375	1/5/2015	14	0
1/5/2015 10:00	2015	5	1000	5.416667	1/5/2015	13.92	0
1/5/2015 11:00	2015	5	1100	5.458333	1/5/2015	13.83	0
1/5/2015 12:00	2015	5	1200	5.5	1/5/2015	13.76	0
1/5/2015 13:00	2015	5	1300	5.541667	1/5/2015	13.72	0
1/5/2015 14:00	2015	5	1400	5.583333	1/5/2015	13.69	0
1/5/2015 15:00	2015	5	1500	5.625	1/5/2015	13.69	0
1/5/2015 16:00	2015	5	1600	5.666667	1/5/2015	13.71	0
1/5/2015 17:00	2015	5	1700	5.708333	1/5/2015	13.77	0
1/5/2015 18:00	2015	5	1800	5.75	1/5/2015	13	0
1/5/2015 19:00	2015	5	1900	5.791667	1/5/2015	12.82	0
1/5/2015 20:00	2015	5	2000	5.833333	1/5/2015	12.77	0
1/5/2015 21:00	2015	5	2100	5.875	1/5/2015	12.73	0
1/5/2015 22:00	2015	5	2200	5.916667	1/5/2015	12.7	0
1/5/2015 23:00	2015	5	2300	5.958333	1/5/2015	12.68	0
1/6/2015 0:00	2015	6	0	6	1/6/2015	12.65	0
1/6/2015 1:00	2015	6	100	6.041667	1/6/2015	12.63	0
1/6/2015 2:00	2015	6	200	6.083333	1/6/2015	12.6	0
1/6/2015 3:00	2015	6	300	6.125	1/6/2015	12.58	0
1/6/2015 4:00	2015	6	400	6.166667	1/6/2015	12.55	0
1/6/2015 5:00	2015	6	500	6.208333	1/6/2015	12.52	0
1/6/2015 6:00	2015	6	600	6.25	1/6/2015	12.49	0
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1/6/2015 8:00	2015	6	800	6.333333	1/6/2015	12.7	0
1/6/2015 9:00	2015	6	900	6.375	1/6/2015	13.94	0
1/6/2015 10:00	2015	6	1000	6.416667	1/6/2015	13.86	0
1/6/2015 11:00	2015	6	1100	6.458333	1/6/2015	13.77	0
1/6/2015 12:00	2015	6	1200	6.5	1/6/2015	13.7	0
1/6/2015 13:00	2015	6	1300	6.541667	1/6/2015	13.67	0
1/6/2015 14:00	2015	6	1400	6.583333	1/6/2015	13.62	0
1/6/2015 15:00	2015	6	1500	6.625	1/6/2015	13.59	0
1/6/2015 16:00	2015	6	1600	6.666667	1/6/2015	13.62	0

1/6/2015 17:00	2015	6	1700	6.708333	1/6/2015	13.68	0
1/6/2015 18:00	2015	6	1800	6.75	1/6/2015	12.97	0
1/6/2015 19:00	2015	6	1900	6.791667	1/6/2015	12.82	0
1/6/2015 20:00	2015	6	2000	6.833333	1/6/2015	12.78	0
1/6/2015 21:00	2015	6	2100	6.875	1/6/2015	12.74	0
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1/7/2015 2:00	2015	7	200	7.083333	1/7/2015	12.63	0
1/7/2015 3:00	2015	7	300	7.125	1/7/2015	12.61	0
1/7/2015 4:00	2015	7	400	7.166667	1/7/2015	12.59	0
1/7/2015 5:00	2015	7	500	7.208333	1/7/2015	12.57	0
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1/7/2015 12:00	2015	7	1200	7.5	1/7/2015	13.65	0
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1/7/2015 19:00	2015	7	1900	7.791667	1/7/2015	12.82	0
1/7/2015 20:00	2015	7	2000	7.833333	1/7/2015	12.77	0
1/7/2015 21:00	2015	7	2100	7.875	1/7/2015	12.74	0
1/7/2015 22:00	2015	7	2200	7.916667	1/7/2015	12.72	0
1/7/2015 23:00	2015	7	2300	7.958333	1/7/2015	12.69	0
1/8/2015 0:00	2015	8	0	8	1/8/2015	12.67	0
1/8/2015 1:00	2015	8	100	8.041667	1/8/2015	12.66	0
1/8/2015 2:00	2015	8	200	8.083333	1/8/2015	12.64	0
1/8/2015 3:00	2015	8	300	8.125	1/8/2015	12.62	0
1/8/2015 4:00	2015	8	400	8.166667	1/8/2015	12.6	0
1/8/2015 5:00	2015	8	500	8.208333	1/8/2015	12.57	0
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1/8/2015 9:00	2015	8	900	8.375	1/8/2015	13.86	0
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1/8/2015 14:00	2015	8	1400	8.583333	1/8/2015	13.56	0
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1/8/2015 16:00	2015	8	1600	8.666667	1/8/2015	13.57	0
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1/8/2015 18:00	2015	8	1800	8.75	1/8/2015	12.99	0
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1/8/2015 20:00	2015	8	2000	8.833333	1/8/2015	12.78	0
1/8/2015 21:00	2015	8	2100	8.875	1/8/2015	12.75	0
1/8/2015 22:00	2015	8	2200	8.916667	1/8/2015	12.72	0
1/8/2015 23:00	2015	8	2300	8.958333	1/8/2015	12.7	0
1/9/2015 0:00	2015	9	0	9	1/9/2015	12.68	0
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1/9/2015 5:00	2015	9	500	9.208333	1/9/2015	12.58	0
1/9/2015 6:00	2015	9	600	9.25	1/9/2015	12.55	0
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1/9/2015 9:00	2015	9	900	9.375	1/9/2015	13.85	0
1/9/2015 10:00	2015	9	1000	9.416667	1/9/2015	13.77	0
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1/9/2015 13:00	2015	9	1300	9.541667	1/9/2015	13.6	0
1/9/2015 14:00	2015	9	1400	9.583333	1/9/2015	13.56	0
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1/9/2015 17:00	2015	9	1700	9.708333	1/9/2015	13.62	0
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1/9/2015 19:00	2015	9	1900	9.791667	1/9/2015	12.83	0
1/9/2015 20:00	2015	9	2000	9.833333	1/9/2015	12.78	0
1/9/2015 21:00	2015	9	2100	9.875	1/9/2015	12.75	0
1/9/2015 22:00	2015	9	2200	9.916667	1/9/2015	12.72	0
1/9/2015 23:00	2015	9	2300	9.958333	1/9/2015	12.7	0
1/10/2015 0:00	2015	10	0	10	1/10/2015	12.68	0
1/10/2015 1:00	2015	10	100	10.04167	1/10/2015	12.66	0
1/10/2015 2:00	2015	10	200	10.08333	1/10/2015	12.64	0
1/10/2015 3:00	2015	10	300	10.125	1/10/2015	12.63	0
1/10/2015 4:00	2015	10	400	10.16667	1/10/2015	12.61	0
1/10/2015 5:00	2015	10	500	10.20833	1/10/2015	12.58	0
1/10/2015 6:00	2015	10	600	10.25	1/10/2015	12.56	0
1/10/2015 7:00	2015	10	700	10.29167	1/10/2015	12.54	0
1/10/2015 8:00	2015	10	800	10.33333	1/10/2015	12.52	0
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1/10/2015 13:00	2015	10	1300	10.54167	1/10/2015	13.64	0
1/10/2015 14:00	2015	10	1400	10.58333	1/10/2015	13.63	0

1/10/2015 15:00	2015	10	1500	10.625	1/10/2015	13.58	0.01
1/10/2015 16:00	2015	10	1600	10.66667	1/10/2015	13.65	0
1/10/2015 17:00	2015	10	1700	10.70833	1/10/2015	13.14	0
1/10/2015 18:00	2015	10	1800	10.75	1/10/2015	12.88	0
1/10/2015 19:00	2015	10	1900	10.79167	1/10/2015	12.82	0.01
1/10/2015 20:00	2015	10	2000	10.83333	1/10/2015	12.79	0.02
1/10/2015 21:00	2015	10	2100	10.875	1/10/2015	12.76	0.01
1/10/2015 22:00	2015	10	2200	10.91667	1/10/2015	12.74	0
1/10/2015 23:00	2015	10	2300	10.95833	1/10/2015	12.71	0
1/11/2015 0:00	2015	11	0	11	1/11/2015	12.69	0
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1/11/2015 11:00	2015	11	1100	11.45833	1/11/2015	13.64	0
1/11/2015 12:00	2015	11	1200	11.5	1/11/2015	13.57	0
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1/11/2015 15:00	2015	11	1500	11.625	1/11/2015	13.37	0.03
1/11/2015 16:00	2015	11	1600	11.66667	1/11/2015	13.53	0
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1/11/2015 21:00	2015	11	2100	11.875	1/11/2015	12.76	0.01
1/11/2015 22:00	2015	11	2200	11.91667	1/11/2015	12.74	0
1/11/2015 23:00	2015	11	2300	11.95833	1/11/2015	12.72	0
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1/12/2015 1:00	2015	12	100	12.04167	1/12/2015	12.69	0
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1/12/2015 7:00	2015	12	700	12.29167	1/12/2015	12.52	0.01
1/12/2015 8:00	2015	12	800	12.33333	1/12/2015	12.52	0
1/12/2015 9:00	2015	12	900	12.375	1/12/2015	12.59	0
1/12/2015 10:00	2015	12	1000	12.41667	1/12/2015	13.15	0
1/12/2015 11:00	2015	12	1100	12.45833	1/12/2015	13.53	0
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1/12/2015 14:00	2015	12	1400	12.58333	1/12/2015	13.55	0
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1/12/2015 19:00	2015	12	1900	12.79167	1/12/2015	12.83	0
1/12/2015 20:00	2015	12	2000	12.83333	1/12/2015	12.8	0
1/12/2015 21:00	2015	12	2100	12.875	1/12/2015	12.77	0
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1/12/2015 23:00	2015	12	2300	12.95833	1/12/2015	12.73	0.03
1/13/2015 0:00	2015	13	0	13	1/13/2015	12.71	0
1/13/2015 1:00	2015	13	100	13.04167	1/13/2015	12.69	0.01
1/13/2015 2:00	2015	13	200	13.08333	1/13/2015	12.67	0.01
1/13/2015 3:00	2015	13	300	13.125	1/13/2015	12.64	0
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1/13/2015 5:00	2015	13	500	13.20833	1/13/2015	12.59	0.02
1/13/2015 6:00	2015	13	600	13.25	1/13/2015	12.55	0
1/13/2015 7:00	2015	13	700	13.29167	1/13/2015	12.53	0
1/13/2015 8:00	2015	13	800	13.33333	1/13/2015	12.51	0
1/13/2015 9:00	2015	13	900	13.375	1/13/2015	12.66	0
1/13/2015 10:00	2015	13	1000	13.41667	1/13/2015	13.42	0
1/13/2015 11:00	2015	13	1100	13.45833	1/13/2015	13.67	0
1/13/2015 12:00	2015	13	1200	13.5	1/13/2015	13.6	0
1/13/2015 13:00	2015	13	1300	13.54167	1/13/2015	13.54	0
1/13/2015 14:00	2015	13	1400	13.58333	1/13/2015	13.58	0.01
1/13/2015 15:00	2015	13	1500	13.625	1/13/2015	13.61	0
1/13/2015 16:00	2015	13	1600	13.66667	1/13/2015	13.61	0
1/13/2015 17:00	2015	13	1700	13.70833	1/13/2015	13.08	0.01
1/13/2015 18:00	2015	13	1800	13.75	1/13/2015	12.88	0
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1/13/2015 20:00	2015	13	2000	13.83333	1/13/2015	12.77	0
1/13/2015 21:00	2015	13	2100	13.875	1/13/2015	12.74	0
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1/13/2015 23:00	2015	13	2300	13.95833	1/13/2015	12.7	0
1/14/2015 0:00	2015	14	0	14	1/14/2015	12.68	0
1/14/2015 1:00	2015	14	100	14.04167	1/14/2015	12.66	0
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1/14/2015 4:00	2015	14	400	14.16667	1/14/2015	12.59	0.01
1/14/2015 5:00	2015	14	500	14.20833	1/14/2015	12.55	0
1/14/2015 6:00	2015	14	600	14.25	1/14/2015	12.52	0
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1/14/2015 8:00	2015	14	800	14.33333	1/14/2015	12.49	0
1/14/2015 9:00	2015	14	900	14.375	1/14/2015	12.58	0
1/14/2015 10:00	2015	14	1000	14.41667	1/14/2015	12.88	0.09
1/14/2015 11:00	2015	14	1100	14.45833	1/14/2015	13.28	0.04
1/14/2015 12:00	2015	14	1200	14.5	1/14/2015	13.56	0

1/14/2015 13:00	2015	14	1300	14.54167	1/14/2015	13.53	0
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1/14/2015 15:00	2015	14	1500	14.625	1/14/2015	13.64	0
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1/14/2015 17:00	2015	14	1700	14.70833	1/14/2015	13.67	0
1/14/2015 18:00	2015	14	1800	14.75	1/14/2015	13.09	0
1/14/2015 19:00	2015	14	1900	14.79167	1/14/2015	12.83	0
1/14/2015 20:00	2015	14	2000	14.83333	1/14/2015	12.78	0
1/14/2015 21:00	2015	14	2100	14.875	1/14/2015	12.74	0
1/14/2015 22:00	2015	14	2200	14.91667	1/14/2015	12.71	0
1/14/2015 23:00	2015	14	2300	14.95833	1/14/2015	12.68	0
1/15/2015 0:00	2015	15	0	15	1/15/2015	12.66	0
1/15/2015 1:00	2015	15	100	15.04167	1/15/2015	12.63	0
1/15/2015 2:00	2015	15	200	15.08333	1/15/2015	12.6	0
1/15/2015 3:00	2015	15	300	15.125	1/15/2015	12.56	0
1/15/2015 4:00	2015	15	400	15.16667	1/15/2015	12.52	0
1/15/2015 5:00	2015	15	500	15.20833	1/15/2015	12.48	0
1/15/2015 6:00	2015	15	600	15.25	1/15/2015	12.45	0
1/15/2015 7:00	2015	15	700	15.29167	1/15/2015	12.44	0
1/15/2015 8:00	2015	15	800	15.33333	1/15/2015	12.63	0
1/15/2015 9:00	2015	15	900	15.375	1/15/2015	13.86	0.01
1/15/2015 10:00	2015	15	1000	15.41667	1/15/2015	13.78	0
1/15/2015 11:00	2015	15	1100	15.45833	1/15/2015	13.71	0
1/15/2015 12:00	2015	15	1200	15.5	1/15/2015	13.44	0
1/15/2015 13:00	2015	15	1300	15.54167	1/15/2015	13.53	0
1/15/2015 14:00	2015	15	1400	15.58333	1/15/2015	13.53	0
1/15/2015 15:00	2015	15	1500	15.625	1/15/2015	13.52	0
1/15/2015 16:00	2015	15	1600	15.66667	1/15/2015	13.54	0
1/15/2015 17:00	2015	15	1700	15.70833	1/15/2015	13.6	0
1/15/2015 18:00	2015	15	1800	15.75	1/15/2015	13.08	0
1/15/2015 19:00	2015	15	1900	15.79167	1/15/2015	12.83	0
1/15/2015 20:00	2015	15	2000	15.83333	1/15/2015	12.77	0
1/15/2015 21:00	2015	15	2100	15.875	1/15/2015	12.74	0
1/15/2015 22:00	2015	15	2200	15.91667	1/15/2015	12.71	0
1/15/2015 23:00	2015	15	2300	15.95833	1/15/2015	12.68	0
1/16/2015 0:00	2015	16	0	16	1/16/2015	12.66	0
1/16/2015 1:00	2015	16	100	16.04167	1/16/2015	12.64	0
1/16/2015 2:00	2015	16	200	16.08333	1/16/2015	12.62	0
1/16/2015 3:00	2015	16	300	16.125	1/16/2015	12.6	0
1/16/2015 4:00	2015	16	400	16.16667	1/16/2015	12.59	0
1/16/2015 5:00	2015	16	500	16.20833	1/16/2015	12.57	0
1/16/2015 6:00	2015	16	600	16.25	1/16/2015	12.54	0
1/16/2015 7:00	2015	16	700	16.29167	1/16/2015	12.52	0
1/16/2015 8:00	2015	16	800	16.33333	1/16/2015	12.65	0
1/16/2015 9:00	2015	16	900	16.375	1/16/2015	13.89	0
1/16/2015 10:00	2015	16	1000	16.41667	1/16/2015	13.8	0
1/16/2015 11:00	2015	16	1100	16.45833	1/16/2015	13.73	0

1/16/2015 12:00	2015	16	1200	16.5	1/16/2015	13.67	0
1/16/2015 13:00	2015	16	1300	16.54167	1/16/2015	13.61	0
1/16/2015 14:00	2015	16	1400	16.58333	1/16/2015	13.56	0
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1/16/2015 21:00	2015	16	2100	16.875	1/16/2015	12.76	0
1/16/2015 22:00	2015	16	2200	16.91667	1/16/2015	12.74	0
1/16/2015 23:00	2015	16	2300	16.95833	1/16/2015	12.72	0
1/17/2015 0:00	2015	17	0	17	1/17/2015	12.7	0
1/17/2015 1:00	2015	17	100	17.04167	1/17/2015	12.67	0
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1/17/2015 12:00	2015	17	1200	17.5	1/17/2015	13.58	0
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1/17/2015 19:00	2015	17	1900	17.79167	1/17/2015	12.84	0
1/17/2015 20:00	2015	17	2000	17.83333	1/17/2015	12.79	0
1/17/2015 21:00	2015	17	2100	17.875	1/17/2015	12.76	0
1/17/2015 22:00	2015	17	2200	17.91667	1/17/2015	12.73	0
1/17/2015 23:00	2015	17	2300	17.95833	1/17/2015	12.7	0
1/18/2015 0:00	2015	18	0	18	1/18/2015	12.68	0
1/18/2015 1:00	2015	18	100	18.04167	1/18/2015	12.66	0
1/18/2015 2:00	2015	18	200	18.08333	1/18/2015	12.64	0
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1/18/2015 4:00	2015	18	400	18.16667	1/18/2015	12.6	0
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1/18/2015 6:00	2015	18	600	18.25	1/18/2015	12.56	0
1/18/2015 7:00	2015	18	700	18.29167	1/18/2015	12.53	0
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1/18/2015 11:00	2015	18	1100	18.45833	1/18/2015	13.68	0
1/18/2015 12:00	2015	18	1200	18.5	1/18/2015	13.61	0
1/18/2015 13:00	2015	18	1300	18.54167	1/18/2015	13.55	0
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1/18/2015 19:00	2015	18	1900	18.79167	1/18/2015	12.85	0
1/18/2015 20:00	2015	18	2000	18.83333	1/18/2015	12.8	0
1/18/2015 21:00	2015	18	2100	18.875	1/18/2015	12.76	0
1/18/2015 22:00	2015	18	2200	18.91667	1/18/2015	12.73	0
1/18/2015 23:00	2015	18	2300	18.95833	1/18/2015	12.71	0
1/19/2015 0:00	2015	19	0	19	1/19/2015	12.68	0
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1/19/2015 14:00	2015	19	1400	19.58333	1/19/2015	13.46	0
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1/19/2015 18:00	2015	19	1800	19.75	1/19/2015	12.98	0
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1/20/2015 0:00	2015	20	0	20	1/20/2015	12.7	0
1/20/2015 1:00	2015	20	100	20.04167	1/20/2015	12.67	0
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1/20/2015 12:00	2015	20	1200	20.5	1/20/2015	13.58	0
1/20/2015 13:00	2015	20	1300	20.54167	1/20/2015	13.57	0
1/20/2015 14:00	2015	20	1400	20.58333	1/20/2015	13.53	0
1/20/2015 15:00	2015	20	1500	20.625	1/20/2015	13.51	0
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1/20/2015 21:00	2015	20	2100	20.875	1/20/2015	12.78	0
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1/20/2015 23:00	2015	20	2300	20.95833	1/20/2015	12.73	0
1/21/2015 0:00	2015	21	0	21	1/21/2015	12.7	0
1/21/2015 1:00	2015	21	100	21.04167	1/21/2015	12.68	0
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1/21/2015 9:00	2015	21	900	21.375	1/21/2015	12.63	0
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1/21/2015 19:00	2015	21	1900	21.79167	1/21/2015	12.85	0
1/21/2015 20:00	2015	21	2000	21.83333	1/21/2015	12.78	0
1/21/2015 21:00	2015	21	2100	21.875	1/21/2015	12.74	0
1/21/2015 22:00	2015	21	2200	21.91667	1/21/2015	12.7	0
1/21/2015 23:00	2015	21	2300	21.95833	1/21/2015	12.67	0
1/22/2015 0:00	2015	22	0	22	1/22/2015	12.64	0
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1/22/2015 5:00	2015	22	500	22.20833	1/22/2015	12.48	0
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1/22/2015 11:00	2015	22	1100	22.45833	1/22/2015	13.8	0
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1/22/2015 16:00	2015	22	1600	22.66667	1/22/2015	13.65	0
1/22/2015 17:00	2015	22	1700	22.70833	1/22/2015	13.7	0
1/22/2015 18:00	2015	22	1800	22.75	1/22/2015	13.26	0
1/22/2015 19:00	2015	22	1900	22.79167	1/22/2015	12.84	0
1/22/2015 20:00	2015	22	2000	22.83333	1/22/2015	12.77	0
1/22/2015 21:00	2015	22	2100	22.875	1/22/2015	12.73	0
1/22/2015 22:00	2015	22	2200	22.91667	1/22/2015	12.69	0
1/22/2015 23:00	2015	22	2300	22.95833	1/22/2015	12.66	0
1/23/2015 0:00	2015	23	0	23	1/23/2015	12.64	0
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1/23/2015 21:00	2015	23	2100	23.875	1/23/2015	12.75	0
1/23/2015 22:00	2015	23	2200	23.91667	1/23/2015	12.71	0
1/23/2015 23:00	2015	23	2300	23.95833	1/23/2015	12.69	0
1/24/2015 0:00	2015	24	0	24	1/24/2015	12.67	0
1/24/2015 1:00	2015	24	100	24.04167	1/24/2015	12.65	0
1/24/2015 2:00	2015	24	200	24.08333	1/24/2015	12.62	0
1/24/2015 3:00	2015	24	300	24.125	1/24/2015	12.59	0
1/24/2015 4:00	2015	24	400	24.16667	1/24/2015	12.57	0
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1/24/2015 10:00	2015	24	1000	24.41667	1/24/2015	13.8	0
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1/24/2015 12:00	2015	24	1200	24.5	1/24/2015	13.63	0
1/24/2015 13:00	2015	24	1300	24.54167	1/24/2015	13.58	0
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1/24/2015 16:00	2015	24	1600	24.66667	1/24/2015	13.51	0
1/24/2015 17:00	2015	24	1700	24.70833	1/24/2015	13.57	0
1/24/2015 18:00	2015	24	1800	24.75	1/24/2015	13.23	0
1/24/2015 19:00	2015	24	1900	24.79167	1/24/2015	12.85	0
1/24/2015 20:00	2015	24	2000	24.83333	1/24/2015	12.79	0
1/24/2015 21:00	2015	24	2100	24.875	1/24/2015	12.75	0
1/24/2015 22:00	2015	24	2200	24.91667	1/24/2015	12.72	0
1/24/2015 23:00	2015	24	2300	24.95833	1/24/2015	12.69	0
1/25/2015 0:00	2015	25	0	25	1/25/2015	12.67	0
1/25/2015 1:00	2015	25	100	25.04167	1/25/2015	12.65	0
1/25/2015 2:00	2015	25	200	25.08333	1/25/2015	12.63	0
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1/25/2015 8:00	2015	25	800	25.33333	1/25/2015	12.51	0
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1/25/2015 12:00	2015	25	1200	25.5	1/25/2015	13.56	0
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1/25/2015 14:00	2015	25	1400	25.58333	1/25/2015	13.45	0
1/25/2015 15:00	2015	25	1500	25.625	1/25/2015	13.42	0
1/25/2015 16:00	2015	25	1600	25.66667	1/25/2015	13.42	0
1/25/2015 17:00	2015	25	1700	25.70833	1/25/2015	13.47	0
1/25/2015 18:00	2015	25	1800	25.75	1/25/2015	13.2	0
1/25/2015 19:00	2015	25	1900	25.79167	1/25/2015	12.87	0
1/25/2015 20:00	2015	25	2000	25.83333	1/25/2015	12.8	0
1/25/2015 21:00	2015	25	2100	25.875	1/25/2015	12.76	0
1/25/2015 22:00	2015	25	2200	25.91667	1/25/2015	12.73	0
1/25/2015 23:00	2015	25	2300	25.95833	1/25/2015	12.71	0
1/26/2015 0:00	2015	26	0	26	1/26/2015	12.68	0
1/26/2015 1:00	2015	26	100	26.04167	1/26/2015	12.66	0
1/26/2015 2:00	2015	26	200	26.08333	1/26/2015	12.64	0
1/26/2015 3:00	2015	26	300	26.125	1/26/2015	12.62	0
1/26/2015 4:00	2015	26	400	26.16667	1/26/2015	12.61	0
1/26/2015 5:00	2015	26	500	26.20833	1/26/2015	12.58	0
1/26/2015 6:00	2015	26	600	26.25	1/26/2015	12.56	0

1/26/2015 7:00	2015	26	700	26.29167	1/26/2015	12.53	0
1/26/2015 8:00	2015	26	800	26.33333	1/26/2015	12.55	0
1/26/2015 9:00	2015	26	900	26.375	1/26/2015	13.64	0
1/26/2015 10:00	2015	26	1000	26.41667	1/26/2015	13.78	0
1/26/2015 11:00	2015	26	1100	26.45833	1/26/2015	13.7	0
1/26/2015 12:00	2015	26	1200	26.5	1/26/2015	13.63	0
1/26/2015 13:00	2015	26	1300	26.54167	1/26/2015	13.58	0
1/26/2015 14:00	2015	26	1400	26.58333	1/26/2015	13.54	0
1/26/2015 15:00	2015	26	1500	26.625	1/26/2015	13.49	0
1/26/2015 16:00	2015	26	1600	26.66667	1/26/2015	13.48	0
1/26/2015 17:00	2015	26	1700	26.70833	1/26/2015	13.54	0
1/26/2015 18:00	2015	26	1800	26.75	1/26/2015	13.12	0
1/26/2015 19:00	2015	26	1900	26.79167	1/26/2015	12.86	0
1/26/2015 20:00	2015	26	2000	26.83333	1/26/2015	12.81	0
1/26/2015 21:00	2015	26	2100	26.875	1/26/2015	12.77	0
1/26/2015 22:00	2015	26	2200	26.91667	1/26/2015	12.74	0
1/26/2015 23:00	2015	26	2300	26.95833	1/26/2015	12.72	0
1/27/2015 0:00	2015	27	0	27	1/27/2015	12.7	0
1/27/2015 1:00	2015	27	100	27.04167	1/27/2015	12.69	0
1/27/2015 2:00	2015	27	200	27.08333	1/27/2015	12.67	0
1/27/2015 3:00	2015	27	300	27.125	1/27/2015	12.66	0
1/27/2015 4:00	2015	27	400	27.16667	1/27/2015	12.64	0
1/27/2015 5:00	2015	27	500	27.20833	1/27/2015	12.61	0
1/27/2015 6:00	2015	27	600	27.25	1/27/2015	12.57	0
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1/27/2015 9:00	2015	27	900	27.375	1/27/2015	13.41	0
1/27/2015 10:00	2015	27	1000	27.41667	1/27/2015	13.67	0
1/27/2015 11:00	2015	27	1100	27.45833	1/27/2015	13.6	0
1/27/2015 12:00	2015	27	1200	27.5	1/27/2015	13.51	0
1/27/2015 13:00	2015	27	1300	27.54167	1/27/2015	13.44	0
1/27/2015 14:00	2015	27	1400	27.58333	1/27/2015	13.41	0
1/27/2015 15:00	2015	27	1500	27.625	1/27/2015	13.38	0
1/27/2015 16:00	2015	27	1600	27.66667	1/27/2015	13.38	0
1/27/2015 17:00	2015	27	1700	27.70833	1/27/2015	13.41	0
1/27/2015 18:00	2015	27	1800	27.75	1/27/2015	13.18	0
1/27/2015 19:00	2015	27	1900	27.79167	1/27/2015	12.87	0
1/27/2015 20:00	2015	27	2000	27.83333	1/27/2015	12.82	0
1/27/2015 21:00	2015	27	2100	27.875	1/27/2015	12.78	0
1/27/2015 22:00	2015	27	2200	27.91667	1/27/2015	12.75	0
1/27/2015 23:00	2015	27	2300	27.95833	1/27/2015	12.72	0
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1/28/2015 1:00	2015	28	100	28.04167	1/28/2015	12.67	0
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1/28/2015 5:00	2015	28	500	28.20833	1/28/2015	12.59	0

1/28/2015 6:00	2015	28	600	28.25	1/28/2015	12.57	0
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1/28/2015 11:00	2015	28	1100	28.45833	1/28/2015	13.62	0
1/28/2015 12:00	2015	28	1200	28.5	1/28/2015	13.53	0
1/28/2015 13:00	2015	28	1300	28.54167	1/28/2015	13.46	0
1/28/2015 14:00	2015	28	1400	28.58333	1/28/2015	13.41	0
1/28/2015 15:00	2015	28	1500	28.625	1/28/2015	13.4	0
1/28/2015 16:00	2015	28	1600	28.66667	1/28/2015	13.42	0
1/28/2015 17:00	2015	28	1700	28.70833	1/28/2015	13.49	0
1/28/2015 18:00	2015	28	1800	28.75	1/28/2015	13.09	0
1/28/2015 19:00	2015	28	1900	28.79167	1/28/2015	12.86	0
1/28/2015 20:00	2015	28	2000	28.83333	1/28/2015	12.81	0
1/28/2015 21:00	2015	28	2100	28.875	1/28/2015	12.78	0
1/28/2015 22:00	2015	28	2200	28.91667	1/28/2015	12.76	0
1/28/2015 23:00	2015	28	2300	28.95833	1/28/2015	12.74	0
1/29/2015 0:00	2015	29	0	29	1/29/2015	12.72	0
1/29/2015 1:00	2015	29	100	29.04167	1/29/2015	12.7	0
1/29/2015 2:00	2015	29	200	29.08333	1/29/2015	12.68	0
1/29/2015 3:00	2015	29	300	29.125	1/29/2015	12.66	0
1/29/2015 4:00	2015	29	400	29.16667	1/29/2015	12.64	0
1/29/2015 5:00	2015	29	500	29.20833	1/29/2015	12.61	0
1/29/2015 6:00	2015	29	600	29.25	1/29/2015	12.58	0
1/29/2015 7:00	2015	29	700	29.29167	1/29/2015	12.56	0
1/29/2015 8:00	2015	29	800	29.33333	1/29/2015	12.54	0
1/29/2015 9:00	2015	29	900	29.375	1/29/2015	12.81	0
1/29/2015 10:00	2015	29	1000	29.41667	1/29/2015	13.52	0
1/29/2015 11:00	2015	29	1100	29.45833	1/29/2015	13.64	0
1/29/2015 12:00	2015	29	1200	29.5	1/29/2015	13.58	0
1/29/2015 13:00	2015	29	1300	29.54167	1/29/2015	13.53	0
1/29/2015 14:00	2015	29	1400	29.58333	1/29/2015	13.5	0
1/29/2015 15:00	2015	29	1500	29.625	1/29/2015	13.49	0
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1/29/2015 17:00	2015	29	1700	29.70833	1/29/2015	13.18	0
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1/29/2015 20:00	2015	29	2000	29.83333	1/29/2015	12.81	0.02
1/29/2015 21:00	2015	29	2100	29.875	1/29/2015	12.78	0.06
1/29/2015 22:00	2015	29	2200	29.91667	1/29/2015	12.76	0.06
1/29/2015 23:00	2015	29	2300	29.95833	1/29/2015	12.73	0.03
1/30/2015 0:00	2015	30	0	30	1/30/2015	12.71	0.05
1/30/2015 1:00	2015	30	100	30.04167	1/30/2015	12.69	0.03
1/30/2015 2:00	2015	30	200	30.08333	1/30/2015	12.66	0.03
1/30/2015 3:00	2015	30	300	30.125	1/30/2015	12.64	0.01
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1/30/2015 5:00	2015	30	500	30.20833	1/30/2015	12.58	0.01
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1/30/2015 10:00	2015	30	1000	30.41667	1/30/2015	12.6	0
1/30/2015 11:00	2015	30	1100	30.45833	1/30/2015	12.71	0
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1/30/2015 17:00	2015	30	1700	30.70833	1/30/2015	12.68	0.01
1/30/2015 18:00	2015	30	1800	30.75	1/30/2015	12.57	0.02
1/30/2015 19:00	2015	30	1900	30.79167	1/30/2015	12.55	0.01
1/30/2015 20:00	2015	30	2000	30.83333	1/30/2015	12.54	0
1/30/2015 21:00	2015	30	2100	30.875	1/30/2015	12.54	0
1/30/2015 22:00	2015	30	2200	30.91667	1/30/2015	12.53	0.01
1/30/2015 23:00	2015	30	2300	30.95833	1/30/2015	12.53	0.01
1/31/2015 0:00	2015	31	0	31	1/31/2015	12.53	0
1/31/2015 1:00	2015	31	100	31.04167	1/31/2015	12.53	0
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1/31/2015 3:00	2015	31	300	31.125	1/31/2015	12.52	0
1/31/2015 4:00	2015	31	400	31.16667	1/31/2015	12.52	0.01
1/31/2015 5:00	2015	31	500	31.20833	1/31/2015	12.51	0
1/31/2015 6:00	2015	31	600	31.25	1/31/2015	12.51	0
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1/31/2015 9:00	2015	31	900	31.375	1/31/2015	12.78	0
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1/31/2015 11:00	2015	31	1100	31.45833	1/31/2015	13.5	0
1/31/2015 12:00	2015	31	1200	31.5	1/31/2015	13.57	0
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1/31/2015 18:00	2015	31	1800	31.75	1/31/2015	13.1	0
1/31/2015 19:00	2015	31	1900	31.79167	1/31/2015	12.87	0
1/31/2015 20:00	2015	31	2000	31.83333	1/31/2015	12.82	0
1/31/2015 21:00	2015	31	2100	31.875	1/31/2015	12.79	0
1/31/2015 22:00	2015	31	2200	31.91667	1/31/2015	12.75	0
1/31/2015 23:00	2015	31	2300	31.95833	1/31/2015	12.73	0
2/1/2015 0:00	2015	32	0	32	2/1/2015	12.71	0
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2/1/2015 3:00	2015	32	300	32.125	2/1/2015	12.65	0

2/1/2015 4:00	2015	32	400	32.16667	2/1/2015	12.64	0
2/1/2015 5:00	2015	32	500	32.20833	2/1/2015	12.62	0
2/1/2015 6:00	2015	32	600	32.25	2/1/2015	12.61	0
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2/1/2015 11:00	2015	32	1100	32.45833	2/1/2015	13.66	0
2/1/2015 12:00	2015	32	1200	32.5	2/1/2015	13.56	0
2/1/2015 13:00	2015	32	1300	32.54167	2/1/2015	13.49	0
2/1/2015 14:00	2015	32	1400	32.58333	2/1/2015	13.43	0
2/1/2015 15:00	2015	32	1500	32.625	2/1/2015	13.4	0
2/1/2015 16:00	2015	32	1600	32.66667	2/1/2015	13.41	0
2/1/2015 17:00	2015	32	1700	32.70833	2/1/2015	13.46	0
2/1/2015 18:00	2015	32	1800	32.75	2/1/2015	13.26	0
2/1/2015 19:00	2015	32	1900	32.79167	2/1/2015	12.88	0
2/1/2015 20:00	2015	32	2000	32.83333	2/1/2015	12.81	0
2/1/2015 21:00	2015	32	2100	32.875	2/1/2015	12.77	0
2/1/2015 22:00	2015	32	2200	32.91667	2/1/2015	12.74	0
2/1/2015 23:00	2015	32	2300	32.95833	2/1/2015	12.71	0
2/2/2015 0:00	2015	33	0	33	2/2/2015	12.69	0
2/2/2015 1:00	2015	33	100	33.04167	2/2/2015	12.68	0
2/2/2015 2:00	2015	33	200	33.08333	2/2/2015	12.67	0
2/2/2015 3:00	2015	33	300	33.125	2/2/2015	12.66	0
2/2/2015 4:00	2015	33	400	33.16667	2/2/2015	12.64	0
2/2/2015 5:00	2015	33	500	33.20833	2/2/2015	12.62	0
2/2/2015 6:00	2015	33	600	33.25	2/2/2015	12.61	0
2/2/2015 7:00	2015	33	700	33.29167	2/2/2015	12.6	0
2/2/2015 8:00	2015	33	800	33.33333	2/2/2015	12.64	0
2/2/2015 9:00	2015	33	900	33.375	2/2/2015	13.61	0
2/2/2015 10:00	2015	33	1000	33.41667	2/2/2015	13.66	0
2/2/2015 11:00	2015	33	1100	33.45833	2/2/2015	13.59	0
2/2/2015 12:00	2015	33	1200	33.5	2/2/2015	13.52	0
2/2/2015 13:00	2015	33	1300	33.54167	2/2/2015	13.46	0
2/2/2015 14:00	2015	33	1400	33.58333	2/2/2015	13.41	0
2/2/2015 15:00	2015	33	1500	33.625	2/2/2015	13.39	0
2/2/2015 16:00	2015	33	1600	33.66667	2/2/2015	13.38	0
2/2/2015 17:00	2015	33	1700	33.70833	2/2/2015	13.42	0
2/2/2015 18:00	2015	33	1800	33.75	2/2/2015	13.25	0
2/2/2015 19:00	2015	33	1900	33.79167	2/2/2015	12.88	0
2/2/2015 20:00	2015	33	2000	33.83333	2/2/2015	12.82	0
2/2/2015 21:00	2015	33	2100	33.875	2/2/2015	12.78	0
2/2/2015 22:00	2015	33	2200	33.91667	2/2/2015	12.75	0
2/2/2015 23:00	2015	33	2300	33.95833	2/2/2015	12.73	0
2/3/2015 0:00	2015	34	0	34	2/3/2015	12.71	0
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2/3/2015 5:00	2015	34	500	34.20833	2/3/2015	12.63	0
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2/3/2015 12:00	2015	34	1200	34.5	2/3/2015	13.44	0
2/3/2015 13:00	2015	34	1300	34.54167	2/3/2015	13.38	0
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2/3/2015 16:00	2015	34	1600	34.66667	2/3/2015	13.36	0
2/3/2015 17:00	2015	34	1700	34.70833	2/3/2015	13.39	0
2/3/2015 18:00	2015	34	1800	34.75	2/3/2015	13.16	0
2/3/2015 19:00	2015	34	1900	34.79167	2/3/2015	12.87	0
2/3/2015 20:00	2015	34	2000	34.83333	2/3/2015	12.82	0
2/3/2015 21:00	2015	34	2100	34.875	2/3/2015	12.79	0
2/3/2015 22:00	2015	34	2200	34.91667	2/3/2015	12.77	0
2/3/2015 23:00	2015	34	2300	34.95833	2/3/2015	12.75	0
2/4/2015 0:00	2015	35	0	35	2/4/2015	12.73	0
2/4/2015 1:00	2015	35	100	35.04167	2/4/2015	12.71	0
2/4/2015 2:00	2015	35	200	35.08333	2/4/2015	12.69	0
2/4/2015 3:00	2015	35	300	35.125	2/4/2015	12.67	0
2/4/2015 4:00	2015	35	400	35.16667	2/4/2015	12.66	0
2/4/2015 5:00	2015	35	500	35.20833	2/4/2015	12.64	0
2/4/2015 6:00	2015	35	600	35.25	2/4/2015	12.62	0
2/4/2015 7:00	2015	35	700	35.29167	2/4/2015	12.61	0
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2/4/2015 11:00	2015	35	1100	35.45833	2/4/2015	13.44	0
2/4/2015 12:00	2015	35	1200	35.5	2/4/2015	13.38	0
2/4/2015 13:00	2015	35	1300	35.54167	2/4/2015	13.34	0
2/4/2015 14:00	2015	35	1400	35.58333	2/4/2015	13.3	0
2/4/2015 15:00	2015	35	1500	35.625	2/4/2015	13.29	0
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2/4/2015 19:00	2015	35	1900	35.79167	2/4/2015	12.88	0
2/4/2015 20:00	2015	35	2000	35.83333	2/4/2015	12.82	0
2/4/2015 21:00	2015	35	2100	35.875	2/4/2015	12.78	0
2/4/2015 22:00	2015	35	2200	35.91667	2/4/2015	12.76	0
2/4/2015 23:00	2015	35	2300	35.95833	2/4/2015	12.74	0
2/5/2015 0:00	2015	36	0	36	2/5/2015	12.71	0
2/5/2015 1:00	2015	36	100	36.04167	2/5/2015	12.69	0

2/5/2015 2:00	2015	36	200	36.08333	2/5/2015	12.67	0
2/5/2015 3:00	2015	36	300	36.125	2/5/2015	12.65	0
2/5/2015 4:00	2015	36	400	36.16667	2/5/2015	12.63	0
2/5/2015 5:00	2015	36	500	36.20833	2/5/2015	12.61	0
2/5/2015 6:00	2015	36	600	36.25	2/5/2015	12.58	0
2/5/2015 7:00	2015	36	700	36.29167	2/5/2015	12.56	0
2/5/2015 8:00	2015	36	800	36.33333	2/5/2015	12.62	0
2/5/2015 9:00	2015	36	900	36.375	2/5/2015	13.62	0
2/5/2015 10:00	2015	36	1000	36.41667	2/5/2015	13.67	0
2/5/2015 11:00	2015	36	1100	36.45833	2/5/2015	13.54	0
2/5/2015 12:00	2015	36	1200	36.5	2/5/2015	13.45	0
2/5/2015 13:00	2015	36	1300	36.54167	2/5/2015	13.4	0
2/5/2015 14:00	2015	36	1400	36.58333	2/5/2015	13.36	0
2/5/2015 15:00	2015	36	1500	36.625	2/5/2015	13.34	0
2/5/2015 16:00	2015	36	1600	36.66667	2/5/2015	13.34	0
2/5/2015 17:00	2015	36	1700	36.70833	2/5/2015	13.38	0
2/5/2015 18:00	2015	36	1800	36.75	2/5/2015	13.24	0
2/5/2015 19:00	2015	36	1900	36.79167	2/5/2015	12.88	0
2/5/2015 20:00	2015	36	2000	36.83333	2/5/2015	12.81	0
2/5/2015 21:00	2015	36	2100	36.875	2/5/2015	12.77	0
2/5/2015 22:00	2015	36	2200	36.91667	2/5/2015	12.74	0
2/5/2015 23:00	2015	36	2300	36.95833	2/5/2015	12.71	0
2/6/2015 0:00	2015	37	0	37	2/6/2015	12.68	0
2/6/2015 1:00	2015	37	100	37.04167	2/6/2015	12.66	0
2/6/2015 2:00	2015	37	200	37.08333	2/6/2015	12.63	0
2/6/2015 3:00	2015	37	300	37.125	2/6/2015	12.61	0
2/6/2015 4:00	2015	37	400	37.16667	2/6/2015	12.58	0
2/6/2015 5:00	2015	37	500	37.20833	2/6/2015	12.55	0
2/6/2015 6:00	2015	37	600	37.25	2/6/2015	12.53	0
2/6/2015 7:00	2015	37	700	37.29167	2/6/2015	12.51	0
2/6/2015 8:00	2015	37	800	37.33333	2/6/2015	12.56	0
2/6/2015 9:00	2015	37	900	37.375	2/6/2015	13.63	0
2/6/2015 10:00	2015	37	1000	37.41667	2/6/2015	13.67	0
2/6/2015 11:00	2015	37	1100	37.45833	2/6/2015	13.56	0
2/6/2015 12:00	2015	37	1200	37.5	2/6/2015	13.47	0
2/6/2015 13:00	2015	37	1300	37.54167	2/6/2015	13.41	0
2/6/2015 14:00	2015	37	1400	37.58333	2/6/2015	13.36	0
2/6/2015 15:00	2015	37	1500	37.625	2/6/2015	13.3	0
2/6/2015 16:00	2015	37	1600	37.66667	2/6/2015	13.31	0
2/6/2015 17:00	2015	37	1700	37.70833	2/6/2015	13.37	0
2/6/2015 18:00	2015	37	1800	37.75	2/6/2015	13.26	0
2/6/2015 19:00	2015	37	1900	37.79167	2/6/2015	12.89	0
2/6/2015 20:00	2015	37	2000	37.83333	2/6/2015	12.83	0
2/6/2015 21:00	2015	37	2100	37.875	2/6/2015	12.79	0
2/6/2015 22:00	2015	37	2200	37.91667	2/6/2015	12.76	0
2/6/2015 23:00	2015	37	2300	37.95833	2/6/2015	12.74	0
2/7/2015 0:00	2015	38	0	38	2/7/2015	12.72	0

2/7/2015 1:00	2015	38	100	38.04167	2/7/2015	12.7	0
2/7/2015 2:00	2015	38	200	38.08333	2/7/2015	12.68	0
2/7/2015 3:00	2015	38	300	38.125	2/7/2015	12.65	0
2/7/2015 4:00	2015	38	400	38.16667	2/7/2015	12.63	0
2/7/2015 5:00	2015	38	500	38.20833	2/7/2015	12.6	0
2/7/2015 6:00	2015	38	600	38.25	2/7/2015	12.58	0
2/7/2015 7:00	2015	38	700	38.29167	2/7/2015	12.56	0
2/7/2015 8:00	2015	38	800	38.33333	2/7/2015	12.59	0
2/7/2015 9:00	2015	38	900	38.375	2/7/2015	13.52	0
2/7/2015 10:00	2015	38	1000	38.41667	2/7/2015	13.6	0
2/7/2015 11:00	2015	38	1100	38.45833	2/7/2015	13.49	0
2/7/2015 12:00	2015	38	1200	38.5	2/7/2015	13.39	0
2/7/2015 13:00	2015	38	1300	38.54167	2/7/2015	13.34	0
2/7/2015 14:00	2015	38	1400	38.58333	2/7/2015	13.3	0
2/7/2015 15:00	2015	38	1500	38.625	2/7/2015	13.27	0
2/7/2015 16:00	2015	38	1600	38.66667	2/7/2015	13.28	0
2/7/2015 17:00	2015	38	1700	38.70833	2/7/2015	13.31	0
2/7/2015 18:00	2015	38	1800	38.75	2/7/2015	13.21	0
2/7/2015 19:00	2015	38	1900	38.79167	2/7/2015	12.89	0
2/7/2015 20:00	2015	38	2000	38.83333	2/7/2015	12.84	0
2/7/2015 21:00	2015	38	2100	38.875	2/7/2015	12.81	0
2/7/2015 22:00	2015	38	2200	38.91667	2/7/2015	12.79	0
2/7/2015 23:00	2015	38	2300	38.95833	2/7/2015	12.77	0
2/8/2015 0:00	2015	39	0	39	2/8/2015	12.75	0
2/8/2015 1:00	2015	39	100	39.04167	2/8/2015	12.73	0
2/8/2015 2:00	2015	39	200	39.08333	2/8/2015	12.71	0
2/8/2015 3:00	2015	39	300	39.125	2/8/2015	12.68	0
2/8/2015 4:00	2015	39	400	39.16667	2/8/2015	12.66	0
2/8/2015 5:00	2015	39	500	39.20833	2/8/2015	12.64	0
2/8/2015 6:00	2015	39	600	39.25	2/8/2015	12.61	0
2/8/2015 7:00	2015	39	700	39.29167	2/8/2015	12.59	0
2/8/2015 8:00	2015	39	800	39.33333	2/8/2015	12.63	0
2/8/2015 9:00	2015	39	900	39.375	2/8/2015	13.42	0
2/8/2015 10:00	2015	39	1000	39.41667	2/8/2015	13.5	0
2/8/2015 11:00	2015	39	1100	39.45833	2/8/2015	13.42	0
2/8/2015 12:00	2015	39	1200	39.5	2/8/2015	13.36	0
2/8/2015 13:00	2015	39	1300	39.54167	2/8/2015	13.32	0
2/8/2015 14:00	2015	39	1400	39.58333	2/8/2015	13.28	0
2/8/2015 15:00	2015	39	1500	39.625	2/8/2015	13.27	0
2/8/2015 16:00	2015	39	1600	39.66667	2/8/2015	13.28	0
2/8/2015 17:00	2015	39	1700	39.70833	2/8/2015	13.31	0
2/8/2015 18:00	2015	39	1800	39.75	2/8/2015	13.22	0
2/8/2015 19:00	2015	39	1900	39.79167	2/8/2015	12.88	0
2/8/2015 20:00	2015	39	2000	39.83333	2/8/2015	12.82	0
2/8/2015 21:00	2015	39	2100	39.875	2/8/2015	12.78	0
2/8/2015 22:00	2015	39	2200	39.91667	2/8/2015	12.75	0
2/8/2015 23:00	2015	39	2300	39.95833	2/8/2015	12.73	0

2/9/2015 0:00	2015	40	0	40	2/9/2015	12.71	0
2/9/2015 1:00	2015	40	100	40.04167	2/9/2015	12.69	0
2/9/2015 2:00	2015	40	200	40.08333	2/9/2015	12.67	0
2/9/2015 3:00	2015	40	300	40.125	2/9/2015	12.65	0
2/9/2015 4:00	2015	40	400	40.16667	2/9/2015	12.64	0
2/9/2015 5:00	2015	40	500	40.20833	2/9/2015	12.62	0
2/9/2015 6:00	2015	40	600	40.25	2/9/2015	12.6	0
2/9/2015 7:00	2015	40	700	40.29167	2/9/2015	12.58	0
2/9/2015 8:00	2015	40	800	40.33333	2/9/2015	12.62	0
2/9/2015 9:00	2015	40	900	40.375	2/9/2015	13.44	0
2/9/2015 10:00	2015	40	1000	40.41667	2/9/2015	13.53	0
2/9/2015 11:00	2015	40	1100	40.45833	2/9/2015	13.44	0
2/9/2015 12:00	2015	40	1200	40.5	2/9/2015	13.37	0
2/9/2015 13:00	2015	40	1300	40.54167	2/9/2015	13.3	0
2/9/2015 14:00	2015	40	1400	40.58333	2/9/2015	13.26	0
2/9/2015 15:00	2015	40	1500	40.625	2/9/2015	13.24	0
2/9/2015 16:00	2015	40	1600	40.66667	2/9/2015	13.25	0
2/9/2015 17:00	2015	40	1700	40.70833	2/9/2015	13.28	0
2/9/2015 18:00	2015	40	1800	40.75	2/9/2015	13.21	0
2/9/2015 19:00	2015	40	1900	40.79167	2/9/2015	12.89	0
2/9/2015 20:00	2015	40	2000	40.83333	2/9/2015	12.83	0
2/9/2015 21:00	2015	40	2100	40.875	2/9/2015	12.79	0
2/9/2015 22:00	2015	40	2200	40.91667	2/9/2015	12.76	0
2/9/2015 23:00	2015	40	2300	40.95833	2/9/2015	12.73	0
2/10/2015 0:00	2015	41	0	41	2/10/2015	12.7	0
2/10/2015 1:00	2015	41	100	41.04167	2/10/2015	12.67	0
2/10/2015 2:00	2015	41	200	41.08333	2/10/2015	12.64	0
2/10/2015 3:00	2015	41	300	41.125	2/10/2015	12.61	0
2/10/2015 4:00	2015	41	400	41.16667	2/10/2015	12.58	0
2/10/2015 5:00	2015	41	500	41.20833	2/10/2015	12.56	0
2/10/2015 6:00	2015	41	600	41.25	2/10/2015	12.53	0
2/10/2015 7:00	2015	41	700	41.29167	2/10/2015	12.51	0
2/10/2015 8:00	2015	41	800	41.33333	2/10/2015	12.58	0
2/10/2015 9:00	2015	41	900	41.375	2/10/2015	13.47	0
2/10/2015 10:00	2015	41	1000	41.41667	2/10/2015	13.55	0
2/10/2015 11:00	2015	41	1100	41.45833	2/10/2015	13.46	0
2/10/2015 12:00	2015	41	1200	41.5	2/10/2015	13.38	0
2/10/2015 13:00	2015	41	1300	41.54167	2/10/2015	13.35	0
2/10/2015 14:00	2015	41	1400	41.58333	2/10/2015	13.32	0
2/10/2015 15:00	2015	41	1500	41.625	2/10/2015	13.31	0
2/10/2015 16:00	2015	41	1600	41.66667	2/10/2015	13.32	0
2/10/2015 17:00	2015	41	1700	41.70833	2/10/2015	13.35	0
2/10/2015 18:00	2015	41	1800	41.75	2/10/2015	13.26	0
2/10/2015 19:00	2015	41	1900	41.79167	2/10/2015	12.89	0
2/10/2015 20:00	2015	41	2000	41.83333	2/10/2015	12.82	0
2/10/2015 21:00	2015	41	2100	41.875	2/10/2015	12.78	0
2/10/2015 22:00	2015	41	2200	41.91667	2/10/2015	12.75	0

2/10/2015 23:00	2015	41	2300	41.95833	2/10/2015	12.72	0
2/11/2015 0:00	2015	42	0	42	2/11/2015	12.69	0
2/11/2015 1:00	2015	42	100	42.04167	2/11/2015	12.67	0
2/11/2015 2:00	2015	42	200	42.08333	2/11/2015	12.64	0
2/11/2015 3:00	2015	42	300	42.125	2/11/2015	12.61	0
2/11/2015 4:00	2015	42	400	42.16667	2/11/2015	12.57	0
2/11/2015 5:00	2015	42	500	42.20833	2/11/2015	12.54	0
2/11/2015 6:00	2015	42	600	42.25	2/11/2015	12.51	0
2/11/2015 7:00	2015	42	700	42.29167	2/11/2015	12.49	0
2/11/2015 8:00	2015	42	800	42.33333	2/11/2015	12.59	0
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2/11/2015 10:00	2015	42	1000	42.41667	2/11/2015	13.65	0
2/11/2015 11:00	2015	42	1100	42.45833	2/11/2015	13.56	0
2/11/2015 12:00	2015	42	1200	42.5	2/11/2015	13.49	0
2/11/2015 13:00	2015	42	1300	42.54167	2/11/2015	13.45	0
2/11/2015 14:00	2015	42	1400	42.58333	2/11/2015	13.41	0
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2/11/2015 17:00	2015	42	1700	42.70833	2/11/2015	13.42	0
2/11/2015 18:00	2015	42	1800	42.75	2/11/2015	13.32	0
2/11/2015 19:00	2015	42	1900	42.79167	2/11/2015	12.9	0
2/11/2015 20:00	2015	42	2000	42.83333	2/11/2015	12.82	0
2/11/2015 21:00	2015	42	2100	42.875	2/11/2015	12.78	0
2/11/2015 22:00	2015	42	2200	42.91667	2/11/2015	12.74	0
2/11/2015 23:00	2015	42	2300	42.95833	2/11/2015	12.71	0
2/12/2015 0:00	2015	43	0	43	2/12/2015	12.68	0
2/12/2015 1:00	2015	43	100	43.04167	2/12/2015	12.65	0
2/12/2015 2:00	2015	43	200	43.08333	2/12/2015	12.63	0
2/12/2015 3:00	2015	43	300	43.125	2/12/2015	12.6	0
2/12/2015 4:00	2015	43	400	43.16667	2/12/2015	12.57	0
2/12/2015 5:00	2015	43	500	43.20833	2/12/2015	12.53	0
2/12/2015 6:00	2015	43	600	43.25	2/12/2015	12.5	0
2/12/2015 7:00	2015	43	700	43.29167	2/12/2015	12.47	0
2/12/2015 8:00	2015	43	800	43.33333	2/12/2015	12.65	0
2/12/2015 9:00	2015	43	900	43.375	2/12/2015	13.6	0
2/12/2015 10:00	2015	43	1000	43.41667	2/12/2015	13.71	0
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2/12/2015 12:00	2015	43	1200	43.5	2/12/2015	13.5	0
2/12/2015 13:00	2015	43	1300	43.54167	2/12/2015	13.43	0
2/12/2015 14:00	2015	43	1400	43.58333	2/12/2015	13.38	0
2/12/2015 15:00	2015	43	1500	43.625	2/12/2015	13.36	0
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2/12/2015 22:00	2015	43	2200	43.91667	2/12/2015	12.74	0
2/12/2015 23:00	2015	43	2300	43.95833	2/12/2015	12.71	0
2/13/2015 0:00	2015	44	0	44	2/13/2015	12.69	0
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2/13/2015 2:00	2015	44	200	44.08333	2/13/2015	12.65	0
2/13/2015 3:00	2015	44	300	44.125	2/13/2015	12.62	0
2/13/2015 4:00	2015	44	400	44.16667	2/13/2015	12.59	0
2/13/2015 5:00	2015	44	500	44.20833	2/13/2015	12.56	0
2/13/2015 6:00	2015	44	600	44.25	2/13/2015	12.53	0
2/13/2015 7:00	2015	44	700	44.29167	2/13/2015	12.5	0
2/13/2015 8:00	2015	44	800	44.33333	2/13/2015	12.68	0
2/13/2015 9:00	2015	44	900	44.375	2/13/2015	13.52	0
2/13/2015 10:00	2015	44	1000	44.41667	2/13/2015	13.62	0
2/13/2015 11:00	2015	44	1100	44.45833	2/13/2015	13.52	0
2/13/2015 12:00	2015	44	1200	44.5	2/13/2015	13.44	0
2/13/2015 13:00	2015	44	1300	44.54167	2/13/2015	13.38	0
2/13/2015 14:00	2015	44	1400	44.58333	2/13/2015	13.34	0
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2/13/2015 16:00	2015	44	1600	44.66667	2/13/2015	13.31	0
2/13/2015 17:00	2015	44	1700	44.70833	2/13/2015	13.35	0
2/13/2015 18:00	2015	44	1800	44.75	2/13/2015	13.28	0
2/13/2015 19:00	2015	44	1900	44.79167	2/13/2015	12.9	0
2/13/2015 20:00	2015	44	2000	44.83333	2/13/2015	12.83	0
2/13/2015 21:00	2015	44	2100	44.875	2/13/2015	12.79	0
2/13/2015 22:00	2015	44	2200	44.91667	2/13/2015	12.75	0
2/13/2015 23:00	2015	44	2300	44.95833	2/13/2015	12.72	0
2/14/2015 0:00	2015	45	0	45	2/14/2015	12.7	0
2/14/2015 1:00	2015	45	100	45.04167	2/14/2015	12.67	0
2/14/2015 2:00	2015	45	200	45.08333	2/14/2015	12.65	0
2/14/2015 3:00	2015	45	300	45.125	2/14/2015	12.62	0
2/14/2015 4:00	2015	45	400	45.16667	2/14/2015	12.59	0
2/14/2015 5:00	2015	45	500	45.20833	2/14/2015	12.56	0
2/14/2015 6:00	2015	45	600	45.25	2/14/2015	12.53	0
2/14/2015 7:00	2015	45	700	45.29167	2/14/2015	12.51	0
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2/14/2015 9:00	2015	45	900	45.375	2/14/2015	13.53	0
2/14/2015 10:00	2015	45	1000	45.41667	2/14/2015	13.61	0
2/14/2015 11:00	2015	45	1100	45.45833	2/14/2015	13.51	0
2/14/2015 12:00	2015	45	1200	45.5	2/14/2015	13.42	0
2/14/2015 13:00	2015	45	1300	45.54167	2/14/2015	13.36	0
2/14/2015 14:00	2015	45	1400	45.58333	2/14/2015	13.32	0
2/14/2015 15:00	2015	45	1500	45.625	2/14/2015	13.29	0
2/14/2015 16:00	2015	45	1600	45.66667	2/14/2015	13.3	0
2/14/2015 17:00	2015	45	1700	45.70833	2/14/2015	13.33	0
2/14/2015 18:00	2015	45	1800	45.75	2/14/2015	13.28	0
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2/14/2015 20:00	2015	45	2000	45.83333	2/14/2015	12.83	0

2/14/2015 21:00	2015	45	2100	45.875	2/14/2015	12.79	0
2/14/2015 22:00	2015	45	2200	45.91667	2/14/2015	12.75	0
2/14/2015 23:00	2015	45	2300	45.95833	2/14/2015	12.73	0
2/15/2015 0:00	2015	46	0	46	2/15/2015	12.7	0
2/15/2015 1:00	2015	46	100	46.04167	2/15/2015	12.69	0
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2/15/2015 3:00	2015	46	300	46.125	2/15/2015	12.66	0
2/15/2015 4:00	2015	46	400	46.16667	2/15/2015	12.64	0
2/15/2015 5:00	2015	46	500	46.20833	2/15/2015	12.61	0
2/15/2015 6:00	2015	46	600	46.25	2/15/2015	12.6	0
2/15/2015 7:00	2015	46	700	46.29167	2/15/2015	12.58	0
2/15/2015 8:00	2015	46	800	46.33333	2/15/2015	12.64	0
2/15/2015 9:00	2015	46	900	46.375	2/15/2015	13.3	0
2/15/2015 10:00	2015	46	1000	46.41667	2/15/2015	13.47	0
2/15/2015 11:00	2015	46	1100	46.45833	2/15/2015	13.39	0
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2/15/2015 14:00	2015	46	1400	46.58333	2/15/2015	13.27	0
2/15/2015 15:00	2015	46	1500	46.625	2/15/2015	13.25	0
2/15/2015 16:00	2015	46	1600	46.66667	2/15/2015	13.26	0
2/15/2015 17:00	2015	46	1700	46.70833	2/15/2015	13.29	0
2/15/2015 18:00	2015	46	1800	46.75	2/15/2015	13.25	0
2/15/2015 19:00	2015	46	1900	46.79167	2/15/2015	12.9	0
2/15/2015 20:00	2015	46	2000	46.83333	2/15/2015	12.83	0
2/15/2015 21:00	2015	46	2100	46.875	2/15/2015	12.79	0
2/15/2015 22:00	2015	46	2200	46.91667	2/15/2015	12.76	0
2/15/2015 23:00	2015	46	2300	46.95833	2/15/2015	12.73	0
2/16/2015 0:00	2015	47	0	47	2/16/2015	12.71	0
2/16/2015 1:00	2015	47	100	47.04167	2/16/2015	12.68	0
2/16/2015 2:00	2015	47	200	47.08333	2/16/2015	12.65	0
2/16/2015 3:00	2015	47	300	47.125	2/16/2015	12.61	0
2/16/2015 4:00	2015	47	400	47.16667	2/16/2015	12.57	0
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2/16/2015 8:00	2015	47	800	47.33333	2/16/2015	12.9	0
2/16/2015 9:00	2015	47	900	47.375	2/16/2015	13.62	0
2/16/2015 10:00	2015	47	1000	47.41667	2/16/2015	13.63	0
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2/16/2015 16:00	2015	47	1600	47.66667	2/16/2015	13.33	0
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2/16/2015 22:00	2015	47	2200	47.91667	2/16/2015	12.73	0
2/16/2015 23:00	2015	47	2300	47.95833	2/16/2015	12.7	0
2/17/2015 0:00	2015	48	0	48	2/17/2015	12.66	0
2/17/2015 1:00	2015	48	100	48.04167	2/17/2015	12.63	0
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2/17/2015 10:00	2015	48	1000	48.41667	2/17/2015	13.74	0
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2/17/2015 12:00	2015	48	1200	48.5	2/17/2015	13.54	0
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2/17/2015 16:00	2015	48	1600	48.66667	2/17/2015	13.4	0
2/17/2015 17:00	2015	48	1700	48.70833	2/17/2015	13.43	0
2/17/2015 18:00	2015	48	1800	48.75	2/17/2015	13.38	0
2/17/2015 19:00	2015	48	1900	48.79167	2/17/2015	12.91	0
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2/17/2015 21:00	2015	48	2100	48.875	2/17/2015	12.76	0
2/17/2015 22:00	2015	48	2200	48.91667	2/17/2015	12.72	0
2/17/2015 23:00	2015	48	2300	48.95833	2/17/2015	12.69	0
2/18/2015 0:00	2015	49	0	49	2/18/2015	12.66	0
2/18/2015 1:00	2015	49	100	49.04167	2/18/2015	12.64	0
2/18/2015 2:00	2015	49	200	49.08333	2/18/2015	12.62	0
2/18/2015 3:00	2015	49	300	49.125	2/18/2015	12.59	0
2/18/2015 4:00	2015	49	400	49.16667	2/18/2015	12.57	0
2/18/2015 5:00	2015	49	500	49.20833	2/18/2015	12.55	0
2/18/2015 6:00	2015	49	600	49.25	2/18/2015	12.52	0
2/18/2015 7:00	2015	49	700	49.29167	2/18/2015	12.49	0
2/18/2015 8:00	2015	49	800	49.33333	2/18/2015	13.02	0
2/18/2015 9:00	2015	49	900	49.375	2/18/2015	13.65	0
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2/18/2015 11:00	2015	49	1100	49.45833	2/18/2015	13.55	0
2/18/2015 12:00	2015	49	1200	49.5	2/18/2015	13.46	0
2/18/2015 13:00	2015	49	1300	49.54167	2/18/2015	13.39	0
2/18/2015 14:00	2015	49	1400	49.58333	2/18/2015	13.35	0
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2/18/2015 21:00	2015	49	2100	49.875	2/18/2015	12.78	0
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2/18/2015 23:00	2015	49	2300	49.95833	2/18/2015	12.73	0
2/19/2015 0:00	2015	50	0	50	2/19/2015	12.71	0
2/19/2015 1:00	2015	50	100	50.04167	2/19/2015	12.68	0
2/19/2015 2:00	2015	50	200	50.08333	2/19/2015	12.66	0
2/19/2015 3:00	2015	50	300	50.125	2/19/2015	12.63	0
2/19/2015 4:00	2015	50	400	50.16667	2/19/2015	12.6	0
2/19/2015 5:00	2015	50	500	50.20833	2/19/2015	12.56	0
2/19/2015 6:00	2015	50	600	50.25	2/19/2015	12.53	0
2/19/2015 7:00	2015	50	700	50.29167	2/19/2015	12.51	0
2/19/2015 8:00	2015	50	800	50.33333	2/19/2015	12.77	0
2/19/2015 9:00	2015	50	900	50.375	2/19/2015	13.69	0
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2/19/2015 13:00	2015	50	1300	50.54167	2/19/2015	13.36	0
2/19/2015 14:00	2015	50	1400	50.58333	2/19/2015	13.31	0
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2/20/2015 0:00	2015	51	0	51	2/20/2015	12.73	0
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2/20/2015 5:00	2015	51	500	51.20833	2/20/2015	12.61	0
2/20/2015 6:00	2015	51	600	51.25	2/20/2015	12.58	0
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2/20/2015 9:00	2015	51	900	51.375	2/20/2015	13.4	0
2/20/2015 10:00	2015	51	1000	51.41667	2/20/2015	13.52	0
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2/20/2015 18:00	2015	51	1800	51.75	2/20/2015	13.31	0
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2/20/2015 20:00	2015	51	2000	51.83333	2/20/2015	12.84	0
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2/21/2015 0:00	2015	52	0	52	2/21/2015	12.73	0
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2/21/2015 20:00	2015	52	2000	52.83333	2/21/2015	12.83	0
2/21/2015 21:00	2015	52	2100	52.875	2/21/2015	12.79	0
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2/21/2015 23:00	2015	52	2300	52.95833	2/21/2015	12.74	0
2/22/2015 0:00	2015	53	0	53	2/22/2015	12.72	0
2/22/2015 1:00	2015	53	100	53.04167	2/22/2015	12.69	0
2/22/2015 2:00	2015	53	200	53.08333	2/22/2015	12.67	0
2/22/2015 3:00	2015	53	300	53.125	2/22/2015	12.65	0
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2/22/2015 6:00	2015	53	600	53.25	2/22/2015	12.58	0
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2/22/2015 8:00	2015	53	800	53.33333	2/22/2015	12.76	0
2/22/2015 9:00	2015	53	900	53.375	2/22/2015	13.56	0
2/22/2015 10:00	2015	53	1000	53.41667	2/22/2015	13.58	0
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2/22/2015 12:00	2015	53	1200	53.5	2/22/2015	13.53	0
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2/22/2015 17:00	2015	53	1700	53.70833	2/22/2015	13.4	0
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2/22/2015 19:00	2015	53	1900	53.79167	2/22/2015	12.89	0
2/22/2015 20:00	2015	53	2000	53.83333	2/22/2015	12.83	0
2/22/2015 21:00	2015	53	2100	53.875	2/22/2015	12.79	0
2/22/2015 22:00	2015	53	2200	53.91667	2/22/2015	12.75	0
2/22/2015 23:00	2015	53	2300	53.95833	2/22/2015	12.72	0
2/23/2015 0:00	2015	54	0	54	2/23/2015	12.7	0
2/23/2015 1:00	2015	54	100	54.04167	2/23/2015	12.68	0.01
2/23/2015 2:00	2015	54	200	54.08333	2/23/2015	12.66	0.03
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2/23/2015 11:00	2015	54	1100	54.45833	2/23/2015	12.73	0
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2/23/2015 13:00	2015	54	1300	54.54167	2/23/2015	13.72	0.08
2/23/2015 14:00	2015	54	1400	54.58333	2/23/2015	13.72	0.19
2/23/2015 15:00	2015	54	1500	54.625	2/23/2015	13.73	0.16
2/23/2015 16:00	2015	54	1600	54.66667	2/23/2015	13.74	0.09
2/23/2015 17:00	2015	54	1700	54.70833	2/23/2015	13.73	0.03
2/23/2015 18:00	2015	54	1800	54.75	2/23/2015	13.58	0.02
2/23/2015 19:00	2015	54	1900	54.79167	2/23/2015	12.92	0
2/23/2015 20:00	2015	54	2000	54.83333	2/23/2015	12.82	0
2/23/2015 21:00	2015	54	2100	54.875	2/23/2015	12.78	0
2/23/2015 22:00	2015	54	2200	54.91667	2/23/2015	12.75	0
2/23/2015 23:00	2015	54	2300	54.95833	2/23/2015	12.72	0
2/24/2015 0:00	2015	55	0	55	2/24/2015	12.68	0
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2/24/2015 2:00	2015	55	200	55.08333	2/24/2015	12.6	0
2/24/2015 3:00	2015	55	300	55.125	2/24/2015	12.54	0
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2/24/2015 5:00	2015	55	500	55.20833	2/24/2015	12.5	0
2/24/2015 6:00	2015	55	600	55.25	2/24/2015	12.49	0
2/24/2015 7:00	2015	55	700	55.29167	2/24/2015	12.49	0
2/24/2015 8:00	2015	55	800	55.33333	2/24/2015	12.51	0
2/24/2015 9:00	2015	55	900	55.375	2/24/2015	12.62	0
2/24/2015 10:00	2015	55	1000	55.41667	2/24/2015	13.3	0.01
2/24/2015 11:00	2015	55	1100	55.45833	2/24/2015	13.74	0.02
2/24/2015 12:00	2015	55	1200	55.5	2/24/2015	13.72	0.06
2/24/2015 13:00	2015	55	1300	55.54167	2/24/2015	13.73	0.04
2/24/2015 14:00	2015	55	1400	55.58333	2/24/2015	13.74	0.02
2/24/2015 15:00	2015	55	1500	55.625	2/24/2015	13.74	0

2/24/2015 16:00	2015	55	1600	55.66667	2/24/2015	13.75	0
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2/24/2015 18:00	2015	55	1800	55.75	2/24/2015	13.64	0
2/24/2015 19:00	2015	55	1900	55.79167	2/24/2015	12.92	0
2/24/2015 20:00	2015	55	2000	55.83333	2/24/2015	12.81	0
2/24/2015 21:00	2015	55	2100	55.875	2/24/2015	12.77	0
2/24/2015 22:00	2015	55	2200	55.91667	2/24/2015	12.73	0
2/24/2015 23:00	2015	55	2300	55.95833	2/24/2015	12.7	0
2/25/2015 0:00	2015	56	0	56	2/25/2015	12.68	0
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2/25/2015 10:00	2015	56	1000	56.41667	2/25/2015	13.76	0
2/25/2015 11:00	2015	56	1100	56.45833	2/25/2015	13.75	0
2/25/2015 12:00	2015	56	1200	56.5	2/25/2015	13.75	0
2/25/2015 13:00	2015	56	1300	56.54167	2/25/2015	13.73	0
2/25/2015 14:00	2015	56	1400	56.58333	2/25/2015	13.7	0
2/25/2015 15:00	2015	56	1500	56.625	2/25/2015	13.65	0
2/25/2015 16:00	2015	56	1600	56.66667	2/25/2015	13.62	0
2/25/2015 17:00	2015	56	1700	56.70833	2/25/2015	13.62	0
2/25/2015 18:00	2015	56	1800	56.75	2/25/2015	13.53	0
2/25/2015 19:00	2015	56	1900	56.79167	2/25/2015	12.93	0
2/25/2015 20:00	2015	56	2000	56.83333	2/25/2015	12.84	0
2/25/2015 21:00	2015	56	2100	56.875	2/25/2015	12.8	0
2/25/2015 22:00	2015	56	2200	56.91667	2/25/2015	12.77	0
2/25/2015 23:00	2015	56	2300	56.95833	2/25/2015	12.75	0
2/26/2015 0:00	2015	57	0	57	2/26/2015	12.72	0
2/26/2015 1:00	2015	57	100	57.04167	2/26/2015	12.7	0
2/26/2015 2:00	2015	57	200	57.08333	2/26/2015	12.68	0
2/26/2015 3:00	2015	57	300	57.125	2/26/2015	12.65	0
2/26/2015 4:00	2015	57	400	57.16667	2/26/2015	12.62	0
2/26/2015 5:00	2015	57	500	57.20833	2/26/2015	12.57	0
2/26/2015 6:00	2015	57	600	57.25	2/26/2015	12.53	0
2/26/2015 7:00	2015	57	700	57.29167	2/26/2015	12.5	0
2/26/2015 8:00	2015	57	800	57.33333	2/26/2015	12.61	0
2/26/2015 9:00	2015	57	900	57.375	2/26/2015	13.6	0
2/26/2015 10:00	2015	57	1000	57.41667	2/26/2015	13.7	0
2/26/2015 11:00	2015	57	1100	57.45833	2/26/2015	13.61	0
2/26/2015 12:00	2015	57	1200	57.5	2/26/2015	13.53	0
2/26/2015 13:00	2015	57	1300	57.54167	2/26/2015	13.51	0
2/26/2015 14:00	2015	57	1400	57.58333	2/26/2015	13.51	0

2/26/2015 15:00	2015	57	1500	57.625	2/26/2015	13.5	0
2/26/2015 16:00	2015	57	1600	57.66667	2/26/2015	13.49	0
2/26/2015 17:00	2015	57	1700	57.70833	2/26/2015	13.5	0
2/26/2015 18:00	2015	57	1800	57.75	2/26/2015	13.45	0
2/26/2015 19:00	2015	57	1900	57.79167	2/26/2015	12.93	0
2/26/2015 20:00	2015	57	2000	57.83333	2/26/2015	12.84	0
2/26/2015 21:00	2015	57	2100	57.875	2/26/2015	12.79	0
2/26/2015 22:00	2015	57	2200	57.91667	2/26/2015	12.76	0
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2/27/2015 0:00	2015	58	0	58	2/27/2015	12.7	0
2/27/2015 1:00	2015	58	100	58.04167	2/27/2015	12.68	0
2/27/2015 2:00	2015	58	200	58.08333	2/27/2015	12.65	0
2/27/2015 3:00	2015	58	300	58.125	2/27/2015	12.63	0
2/27/2015 4:00	2015	58	400	58.16667	2/27/2015	12.6	0
2/27/2015 5:00	2015	58	500	58.20833	2/27/2015	12.57	0
2/27/2015 6:00	2015	58	600	58.25	2/27/2015	12.54	0
2/27/2015 7:00	2015	58	700	58.29167	2/27/2015	12.5	0
2/27/2015 8:00	2015	58	800	58.33333	2/27/2015	12.53	0
2/27/2015 9:00	2015	58	900	58.375	2/27/2015	12.63	0
2/27/2015 10:00	2015	58	1000	58.41667	2/27/2015	12.89	0
2/27/2015 11:00	2015	58	1100	58.45833	2/27/2015	13.7	0
2/27/2015 12:00	2015	58	1200	58.5	2/27/2015	13.7	0
2/27/2015 13:00	2015	58	1300	58.54167	2/27/2015	13.59	0
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2/27/2015 15:00	2015	58	1500	58.625	2/27/2015	13.56	0
2/27/2015 16:00	2015	58	1600	58.66667	2/27/2015	13.27	0
2/27/2015 17:00	2015	58	1700	58.70833	2/27/2015	13.03	0
2/27/2015 18:00	2015	58	1800	58.75	2/27/2015	12.92	0
2/27/2015 19:00	2015	58	1900	58.79167	2/27/2015	12.82	0
2/27/2015 20:00	2015	58	2000	58.83333	2/27/2015	12.78	0
2/27/2015 21:00	2015	58	2100	58.875	2/27/2015	12.75	0
2/27/2015 22:00	2015	58	2200	58.91667	2/27/2015	12.72	0
2/27/2015 23:00	2015	58	2300	58.95833	2/27/2015	12.68	0
2/28/2015 0:00	2015	59	0	59	2/28/2015	12.64	0
2/28/2015 1:00	2015	59	100	59.04167	2/28/2015	12.59	0
2/28/2015 2:00	2015	59	200	59.08333	2/28/2015	12.53	0
2/28/2015 3:00	2015	59	300	59.125	2/28/2015	12.5	0
2/28/2015 4:00	2015	59	400	59.16667	2/28/2015	12.49	0
2/28/2015 5:00	2015	59	500	59.20833	2/28/2015	12.48	0
2/28/2015 6:00	2015	59	600	59.25	2/28/2015	12.47	0
2/28/2015 7:00	2015	59	700	59.29167	2/28/2015	12.47	0
2/28/2015 8:00	2015	59	800	59.33333	2/28/2015	12.95	0
2/28/2015 9:00	2015	59	900	59.375	2/28/2015	13.69	0
2/28/2015 10:00	2015	59	1000	59.41667	2/28/2015	13.62	0
2/28/2015 11:00	2015	59	1100	59.45833	2/28/2015	13.56	0
2/28/2015 12:00	2015	59	1200	59.5	2/28/2015	13.52	0
2/28/2015 13:00	2015	59	1300	59.54167	2/28/2015	13.5	0

2/28/2015 14:00	2015	59	1400	59.58333	2/28/2015	13.48	0
2/28/2015 15:00	2015	59	1500	59.625	2/28/2015	13.47	0
2/28/2015 16:00	2015	59	1600	59.66667	2/28/2015	13.53	0
2/28/2015 17:00	2015	59	1700	59.70833	2/28/2015	13.57	0
2/28/2015 18:00	2015	59	1800	59.75	2/28/2015	13.17	0
2/28/2015 19:00	2015	59	1900	59.79167	2/28/2015	12.89	0
2/28/2015 20:00	2015	59	2000	59.83333	2/28/2015	12.83	0
2/28/2015 21:00	2015	59	2100	59.875	2/28/2015	12.8	0
2/28/2015 22:00	2015	59	2200	59.91667	2/28/2015	12.77	0
2/28/2015 23:00	2015	59	2300	59.95833	2/28/2015	12.75	0
3/1/2015 0:00	2015	60	0	60	3/1/2015	12.73	0
3/1/2015 1:00	2015	60	100	60.04167	3/1/2015	12.72	0
3/1/2015 2:00	2015	60	200	60.08333	3/1/2015	12.7	0
3/1/2015 3:00	2015	60	300	60.125	3/1/2015	12.68	0
3/1/2015 4:00	2015	60	400	60.16667	3/1/2015	12.66	0.11
3/1/2015 5:00	2015	60	500	60.20833	3/1/2015	12.63	0.11
3/1/2015 6:00	2015	60	600	60.25	3/1/2015	12.6	0.02
3/1/2015 7:00	2015	60	700	60.29167	3/1/2015	12.56	0.04
3/1/2015 8:00	2015	60	800	60.33333	3/1/2015	12.55	0.04
3/1/2015 9:00	2015	60	900	60.375	3/1/2015	12.63	0.03
3/1/2015 10:00	2015	60	1000	60.41667	3/1/2015	12.87	0.02
3/1/2015 11:00	2015	60	1100	60.45833	3/1/2015	13.05	0.06
3/1/2015 12:00	2015	60	1200	60.5	3/1/2015	13.12	0.03
3/1/2015 13:00	2015	60	1300	60.54167	3/1/2015	12.95	0.01
3/1/2015 14:00	2015	60	1400	60.58333	3/1/2015	12.75	0.04
3/1/2015 15:00	2015	60	1500	60.625	3/1/2015	12.62	0.06
3/1/2015 16:00	2015	60	1600	60.66667	3/1/2015	12.69	0.07
3/1/2015 17:00	2015	60	1700	60.70833	3/1/2015	12.71	0.05
3/1/2015 18:00	2015	60	1800	60.75	3/1/2015	12.56	0.03
3/1/2015 19:00	2015	60	1900	60.79167	3/1/2015	12.5	0.04
3/1/2015 20:00	2015	60	2000	60.83333	3/1/2015	12.49	0.03
3/1/2015 21:00	2015	60	2100	60.875	3/1/2015	12.49	0.02
3/1/2015 22:00	2015	60	2200	60.91667	3/1/2015	12.49	0.01
3/1/2015 23:00	2015	60	2300	60.95833	3/1/2015	12.49	0
3/2/2015 0:00	2015	61	0	61	3/2/2015	12.49	0.01
3/2/2015 1:00	2015	61	100	61.04167	3/2/2015	12.49	0
3/2/2015 2:00	2015	61	200	61.08333	3/2/2015	12.49	0
3/2/2015 3:00	2015	61	300	61.125	3/2/2015	12.48	0
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3/2/2015 6:00	2015	61	600	61.25	3/2/2015	12.49	0
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3/2/2015 8:00	2015	61	800	61.33333	3/2/2015	13.33	0.01
3/2/2015 9:00	2015	61	900	61.375	3/2/2015	13.59	0
3/2/2015 10:00	2015	61	1000	61.41667	3/2/2015	13.52	0.02
3/2/2015 11:00	2015	61	1100	61.45833	3/2/2015	13.48	0.11
3/2/2015 12:00	2015	61	1200	61.5	3/2/2015	13.52	0.06

3/2/2015 13:00	2015	61	1300	61.54167	3/2/2015	13.56	0.08
3/2/2015 14:00	2015	61	1400	61.58333	3/2/2015	13.66	0.03
3/2/2015 15:00	2015	61	1500	61.625	3/2/2015	13.74	0.02
3/2/2015 16:00	2015	61	1600	61.66667	3/2/2015	13.72	0
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3/2/2015 18:00	2015	61	1800	61.75	3/2/2015	13.55	0
3/2/2015 19:00	2015	61	1900	61.79167	3/2/2015	12.93	0
3/2/2015 20:00	2015	61	2000	61.83333	3/2/2015	12.84	0
3/2/2015 21:00	2015	61	2100	61.875	3/2/2015	12.8	0
3/2/2015 22:00	2015	61	2200	61.91667	3/2/2015	12.77	0
3/2/2015 23:00	2015	61	2300	61.95833	3/2/2015	12.74	0
3/3/2015 0:00	2015	62	0	62	3/3/2015	12.72	0
3/3/2015 1:00	2015	62	100	62.04167	3/3/2015	12.71	0
3/3/2015 2:00	2015	62	200	62.08333	3/3/2015	12.7	0
3/3/2015 3:00	2015	62	300	62.125	3/3/2015	12.68	0
3/3/2015 4:00	2015	62	400	62.16667	3/3/2015	12.67	0
3/3/2015 5:00	2015	62	500	62.20833	3/3/2015	12.65	0
3/3/2015 6:00	2015	62	600	62.25	3/3/2015	12.64	0
3/3/2015 7:00	2015	62	700	62.29167	3/3/2015	12.62	0
3/3/2015 8:00	2015	62	800	62.33333	3/3/2015	12.7	0
3/3/2015 9:00	2015	62	900	62.375	3/3/2015	13.64	0
3/3/2015 10:00	2015	62	1000	62.41667	3/3/2015	13.7	0
3/3/2015 11:00	2015	62	1100	62.45833	3/3/2015	13.63	0
3/3/2015 12:00	2015	62	1200	62.5	3/3/2015	13.6	0
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3/3/2015 17:00	2015	62	1700	62.70833	3/3/2015	13.55	0
3/3/2015 18:00	2015	62	1800	62.75	3/3/2015	13.43	0
3/3/2015 19:00	2015	62	1900	62.79167	3/3/2015	12.92	0
3/3/2015 20:00	2015	62	2000	62.83333	3/3/2015	12.83	0
3/3/2015 21:00	2015	62	2100	62.875	3/3/2015	12.79	0
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3/3/2015 23:00	2015	62	2300	62.95833	3/3/2015	12.73	0
3/4/2015 0:00	2015	63	0	63	3/4/2015	12.71	0
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3/4/2015 4:00	2015	63	400	63.16667	3/4/2015	12.64	0
3/4/2015 5:00	2015	63	500	63.20833	3/4/2015	12.62	0
3/4/2015 6:00	2015	63	600	63.25	3/4/2015	12.61	0
3/4/2015 7:00	2015	63	700	63.29167	3/4/2015	12.59	0
3/4/2015 8:00	2015	63	800	63.33333	3/4/2015	13.49	0
3/4/2015 9:00	2015	63	900	63.375	3/4/2015	13.81	0
3/4/2015 10:00	2015	63	1000	63.41667	3/4/2015	13.76	0
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3/4/2015 12:00	2015	63	1200	63.5	3/4/2015	13.62	0
3/4/2015 13:00	2015	63	1300	63.54167	3/4/2015	13.55	0
3/4/2015 14:00	2015	63	1400	63.58333	3/4/2015	13.51	0
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3/4/2015 17:00	2015	63	1700	63.70833	3/4/2015	13.54	0
3/4/2015 18:00	2015	63	1800	63.75	3/4/2015	13.47	0
3/4/2015 19:00	2015	63	1900	63.79167	3/4/2015	12.94	0
3/4/2015 20:00	2015	63	2000	63.83333	3/4/2015	12.82	0
3/4/2015 21:00	2015	63	2100	63.875	3/4/2015	12.77	0
3/4/2015 22:00	2015	63	2200	63.91667	3/4/2015	12.73	0
3/4/2015 23:00	2015	63	2300	63.95833	3/4/2015	12.7	0
3/5/2015 0:00	2015	64	0	64	3/5/2015	12.67	0
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3/5/2015 6:00	2015	64	600	64.25	3/5/2015	12.54	0
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3/5/2015 12:00	2015	64	1200	64.5	3/5/2015	13.6	0
3/5/2015 13:00	2015	64	1300	64.54167	3/5/2015	13.53	0
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3/5/2015 17:00	2015	64	1700	64.70833	3/5/2015	13.49	0
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3/5/2015 20:00	2015	64	2000	64.83333	3/5/2015	12.83	0
3/5/2015 21:00	2015	64	2100	64.875	3/5/2015	12.78	0
3/5/2015 22:00	2015	64	2200	64.91667	3/5/2015	12.74	0
3/5/2015 23:00	2015	64	2300	64.95833	3/5/2015	12.71	0
3/6/2015 0:00	2015	65	0	65	3/6/2015	12.68	0
3/6/2015 1:00	2015	65	100	65.04167	3/6/2015	12.66	0
3/6/2015 2:00	2015	65	200	65.08333	3/6/2015	12.63	0
3/6/2015 3:00	2015	65	300	65.125	3/6/2015	12.61	0
3/6/2015 4:00	2015	65	400	65.16667	3/6/2015	12.59	0
3/6/2015 5:00	2015	65	500	65.20833	3/6/2015	12.57	0
3/6/2015 6:00	2015	65	600	65.25	3/6/2015	12.55	0
3/6/2015 7:00	2015	65	700	65.29167	3/6/2015	12.54	0
3/6/2015 8:00	2015	65	800	65.33333	3/6/2015	13.54	0
3/6/2015 9:00	2015	65	900	65.375	3/6/2015	13.83	0
3/6/2015 10:00	2015	65	1000	65.41667	3/6/2015	13.74	0

3/6/2015 11:00	2015	65	1100	65.45833	3/6/2015	13.66	0
3/6/2015 12:00	2015	65	1200	65.5	3/6/2015	13.56	0
3/6/2015 13:00	2015	65	1300	65.54167	3/6/2015	13.49	0
3/6/2015 14:00	2015	65	1400	65.58333	3/6/2015	13.44	0
3/6/2015 15:00	2015	65	1500	65.625	3/6/2015	13.41	0
3/6/2015 16:00	2015	65	1600	65.66667	3/6/2015	13.41	0
3/6/2015 17:00	2015	65	1700	65.70833	3/6/2015	13.45	0
3/6/2015 18:00	2015	65	1800	65.75	3/6/2015	13.4	0
3/6/2015 19:00	2015	65	1900	65.79167	3/6/2015	12.96	0
3/6/2015 20:00	2015	65	2000	65.83333	3/6/2015	12.84	0
3/6/2015 21:00	2015	65	2100	65.875	3/6/2015	12.79	0
3/6/2015 22:00	2015	65	2200	65.91667	3/6/2015	12.76	0
3/6/2015 23:00	2015	65	2300	65.95833	3/6/2015	12.73	0
3/7/2015 0:00	2015	66	0	66	3/7/2015	12.7	0
3/7/2015 1:00	2015	66	100	66.04167	3/7/2015	12.67	0
3/7/2015 2:00	2015	66	200	66.08333	3/7/2015	12.65	0
3/7/2015 3:00	2015	66	300	66.125	3/7/2015	12.62	0
3/7/2015 4:00	2015	66	400	66.16667	3/7/2015	12.6	0
3/7/2015 5:00	2015	66	500	66.20833	3/7/2015	12.58	0
3/7/2015 6:00	2015	66	600	66.25	3/7/2015	12.55	0
3/7/2015 7:00	2015	66	700	66.29167	3/7/2015	12.54	0
3/7/2015 8:00	2015	66	800	66.33333	3/7/2015	13.51	0
3/7/2015 9:00	2015	66	900	66.375	3/7/2015	13.79	0
3/7/2015 10:00	2015	66	1000	66.41667	3/7/2015	13.68	0
3/7/2015 11:00	2015	66	1100	66.45833	3/7/2015	13.59	0
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3/7/2015 13:00	2015	66	1300	66.54167	3/7/2015	13.43	0
3/7/2015 14:00	2015	66	1400	66.58333	3/7/2015	13.39	0
3/7/2015 15:00	2015	66	1500	66.625	3/7/2015	13.37	0
3/7/2015 16:00	2015	66	1600	66.66667	3/7/2015	13.38	0
3/7/2015 17:00	2015	66	1700	66.70833	3/7/2015	13.42	0
3/7/2015 18:00	2015	66	1800	66.75	3/7/2015	13.38	0
3/7/2015 19:00	2015	66	1900	66.79167	3/7/2015	12.96	0
3/7/2015 20:00	2015	66	2000	66.83333	3/7/2015	12.84	0
3/7/2015 21:00	2015	66	2100	66.875	3/7/2015	12.8	0
3/7/2015 22:00	2015	66	2200	66.91667	3/7/2015	12.76	0
3/7/2015 23:00	2015	66	2300	66.95833	3/7/2015	12.73	0
3/8/2015 0:00	2015	67	0	67	3/8/2015	12.7	0
3/8/2015 1:00	2015	67	100	67.04167	3/8/2015	12.68	0
3/8/2015 2:00	2015	67	200	67.08333	3/8/2015	12.66	0
3/8/2015 3:00	2015	67	300	67.125	3/8/2015	12.64	0
3/8/2015 4:00	2015	67	400	67.16667	3/8/2015	12.61	0
3/8/2015 5:00	2015	67	500	67.20833	3/8/2015	12.59	0
3/8/2015 6:00	2015	67	600	67.25	3/8/2015	12.57	0
3/8/2015 7:00	2015	67	700	67.29167	3/8/2015	12.56	0
3/8/2015 8:00	2015	67	800	67.33333	3/8/2015	13.49	0
3/8/2015 9:00	2015	67	900	67.375	3/8/2015	13.73	0

3/8/2015 10:00	2015	67	1000	67.41667	3/8/2015	13.61	0
3/8/2015 11:00	2015	67	1100	67.45833	3/8/2015	13.5	0
3/8/2015 12:00	2015	67	1200	67.5	3/8/2015	13.42	0
3/8/2015 13:00	2015	67	1300	67.54167	3/8/2015	13.37	0
3/8/2015 14:00	2015	67	1400	67.58333	3/8/2015	13.33	0
3/8/2015 15:00	2015	67	1500	67.625	3/8/2015	13.32	0
3/8/2015 16:00	2015	67	1600	67.66667	3/8/2015	13.33	0
3/8/2015 17:00	2015	67	1700	67.70833	3/8/2015	13.36	0
3/8/2015 18:00	2015	67	1800	67.75	3/8/2015	13.32	0
3/8/2015 19:00	2015	67	1900	67.79167	3/8/2015	12.95	0
3/8/2015 20:00	2015	67	2000	67.83333	3/8/2015	12.84	0
3/8/2015 21:00	2015	67	2100	67.875	3/8/2015	12.8	0
3/8/2015 22:00	2015	67	2200	67.91667	3/8/2015	12.76	0
3/8/2015 23:00	2015	67	2300	67.95833	3/8/2015	12.73	0
3/9/2015 0:00	2015	68	0	68	3/9/2015	12.71	0
3/9/2015 1:00	2015	68	100	68.04167	3/9/2015	12.69	0
3/9/2015 2:00	2015	68	200	68.08333	3/9/2015	12.67	0
3/9/2015 3:00	2015	68	300	68.125	3/9/2015	12.65	0
3/9/2015 4:00	2015	68	400	68.16667	3/9/2015	12.63	0
3/9/2015 5:00	2015	68	500	68.20833	3/9/2015	12.6	0
3/9/2015 6:00	2015	68	600	68.25	3/9/2015	12.58	0
3/9/2015 7:00	2015	68	700	68.29167	3/9/2015	12.57	0
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3/9/2015 13:00	2015	68	1300	68.54167	3/9/2015	13.36	0
3/9/2015 14:00	2015	68	1400	68.58333	3/9/2015	13.33	0
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3/9/2015 16:00	2015	68	1600	68.66667	3/9/2015	13.32	0
3/9/2015 17:00	2015	68	1700	68.70833	3/9/2015	13.36	0
3/9/2015 18:00	2015	68	1800	68.75	3/9/2015	13.32	0
3/9/2015 19:00	2015	68	1900	68.79167	3/9/2015	12.96	0
3/9/2015 20:00	2015	68	2000	68.83333	3/9/2015	12.84	0
3/9/2015 21:00	2015	68	2100	68.875	3/9/2015	12.79	0
3/9/2015 22:00	2015	68	2200	68.91667	3/9/2015	12.75	0
3/9/2015 23:00	2015	68	2300	68.95833	3/9/2015	12.72	0
3/10/2015 0:00	2015	69	0	69	3/10/2015	12.69	0
3/10/2015 1:00	2015	69	100	69.04167	3/10/2015	12.67	0
3/10/2015 2:00	2015	69	200	69.08333	3/10/2015	12.64	0
3/10/2015 3:00	2015	69	300	69.125	3/10/2015	12.62	0
3/10/2015 4:00	2015	69	400	69.16667	3/10/2015	12.6	0
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3/10/2015 6:00	2015	69	600	69.25	3/10/2015	12.55	0
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3/10/2015 9:00	2015	69	900	69.375	3/10/2015	13.71	0
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3/10/2015 11:00	2015	69	1100	69.45833	3/10/2015	13.49	0
3/10/2015 12:00	2015	69	1200	69.5	3/10/2015	13.41	0
3/10/2015 13:00	2015	69	1300	69.54167	3/10/2015	13.35	0
3/10/2015 14:00	2015	69	1400	69.58333	3/10/2015	13.31	0
3/10/2015 15:00	2015	69	1500	69.625	3/10/2015	13.3	0
3/10/2015 16:00	2015	69	1600	69.66667	3/10/2015	13.3	0
3/10/2015 17:00	2015	69	1700	69.70833	3/10/2015	13.34	0
3/10/2015 18:00	2015	69	1800	69.75	3/10/2015	13.3	0
3/10/2015 19:00	2015	69	1900	69.79167	3/10/2015	12.95	0
3/10/2015 20:00	2015	69	2000	69.83333	3/10/2015	12.84	0
3/10/2015 21:00	2015	69	2100	69.875	3/10/2015	12.79	0
3/10/2015 22:00	2015	69	2200	69.91667	3/10/2015	12.76	0
3/10/2015 23:00	2015	69	2300	69.95833	3/10/2015	12.73	0
3/11/2015 0:00	2015	70	0	70	3/11/2015	12.71	0
3/11/2015 1:00	2015	70	100	70.04167	3/11/2015	12.68	0
3/11/2015 2:00	2015	70	200	70.08333	3/11/2015	12.65	0
3/11/2015 3:00	2015	70	300	70.125	3/11/2015	12.63	0
3/11/2015 4:00	2015	70	400	70.16667	3/11/2015	12.6	0
3/11/2015 5:00	2015	70	500	70.20833	3/11/2015	12.57	0
3/11/2015 6:00	2015	70	600	70.25	3/11/2015	12.55	0
3/11/2015 7:00	2015	70	700	70.29167	3/11/2015	12.55	0
3/11/2015 8:00	2015	70	800	70.33333	3/11/2015	13.11	0
3/11/2015 9:00	2015	70	900	70.375	3/11/2015	13.75	0
3/11/2015 10:00	2015	70	1000	70.41667	3/11/2015	13.61	0
3/11/2015 11:00	2015	70	1100	70.45833	3/11/2015	13.5	0
3/11/2015 12:00	2015	70	1200	70.5	3/11/2015	13.41	0
3/11/2015 13:00	2015	70	1300	70.54167	3/11/2015	13.36	0
3/11/2015 14:00	2015	70	1400	70.58333	3/11/2015	13.34	0
3/11/2015 15:00	2015	70	1500	70.625	3/11/2015	13.34	0
3/11/2015 16:00	2015	70	1600	70.66667	3/11/2015	13.3	0
3/11/2015 17:00	2015	70	1700	70.70833	3/11/2015	13.34	0
3/11/2015 18:00	2015	70	1800	70.75	3/11/2015	13.25	0
3/11/2015 19:00	2015	70	1900	70.79167	3/11/2015	12.94	0
3/11/2015 20:00	2015	70	2000	70.83333	3/11/2015	12.86	0
3/11/2015 21:00	2015	70	2100	70.875	3/11/2015	12.83	0
3/11/2015 22:00	2015	70	2200	70.91667	3/11/2015	12.8	0
3/11/2015 23:00	2015	70	2300	70.95833	3/11/2015	12.78	0
3/12/2015 0:00	2015	71	0	71	3/12/2015	12.76	0
3/12/2015 1:00	2015	71	100	71.04167	3/12/2015	12.73	0
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3/12/2015 3:00	2015	71	300	71.125	3/12/2015	12.68	0
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3/12/2015 5:00	2015	71	500	71.20833	3/12/2015	12.64	0
3/12/2015 6:00	2015	71	600	71.25	3/12/2015	12.63	0
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3/12/2015 10:00	2015	71	1000	71.41667	3/12/2015	13.49	0
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3/12/2015 12:00	2015	71	1200	71.5	3/12/2015	13.41	0
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3/12/2015 14:00	2015	71	1400	71.58333	3/12/2015	13.34	0
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3/12/2015 17:00	2015	71	1700	71.70833	3/12/2015	13.42	0
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3/12/2015 19:00	2015	71	1900	71.79167	3/12/2015	12.88	0
3/12/2015 20:00	2015	71	2000	71.83333	3/12/2015	12.83	0
3/12/2015 21:00	2015	71	2100	71.875	3/12/2015	12.79	0
3/12/2015 22:00	2015	71	2200	71.91667	3/12/2015	12.76	0
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3/13/2015 0:00	2015	72	0	72	3/13/2015	12.71	0
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3/13/2015 3:00	2015	72	300	72.125	3/13/2015	12.62	0
3/13/2015 4:00	2015	72	400	72.16667	3/13/2015	12.59	0
3/13/2015 5:00	2015	72	500	72.20833	3/13/2015	12.58	0
3/13/2015 6:00	2015	72	600	72.25	3/13/2015	12.56	0
3/13/2015 7:00	2015	72	700	72.29167	3/13/2015	12.56	0
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3/13/2015 12:00	2015	72	1200	72.5	3/13/2015	13.39	0
3/13/2015 13:00	2015	72	1300	72.54167	3/13/2015	13.34	0
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3/13/2015 15:00	2015	72	1500	72.625	3/13/2015	13.29	0
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3/13/2015 17:00	2015	72	1700	72.70833	3/13/2015	13.32	0
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3/13/2015 19:00	2015	72	1900	72.79167	3/13/2015	12.95	0
3/13/2015 20:00	2015	72	2000	72.83333	3/13/2015	12.86	0
3/13/2015 21:00	2015	72	2100	72.875	3/13/2015	12.82	0
3/13/2015 22:00	2015	72	2200	72.91667	3/13/2015	12.79	0
3/13/2015 23:00	2015	72	2300	72.95833	3/13/2015	12.76	0
3/14/2015 0:00	2015	73	0	73	3/14/2015	12.73	0
3/14/2015 1:00	2015	73	100	73.04167	3/14/2015	12.7	0
3/14/2015 2:00	2015	73	200	73.08333	3/14/2015	12.67	0
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3/14/2015 4:00	2015	73	400	73.16667	3/14/2015	12.61	0
3/14/2015 5:00	2015	73	500	73.20833	3/14/2015	12.58	0
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3/14/2015 7:00	2015	73	700	73.29167	3/14/2015	12.57	0
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3/14/2015 9:00	2015	73	900	73.375	3/14/2015	13.65	0
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3/14/2015 12:00	2015	73	1200	73.5	3/14/2015	13.37	0
3/14/2015 13:00	2015	73	1300	73.54167	3/14/2015	13.32	0
3/14/2015 14:00	2015	73	1400	73.58333	3/14/2015	13.28	0
3/14/2015 15:00	2015	73	1500	73.625	3/14/2015	13.27	0
3/14/2015 16:00	2015	73	1600	73.66667	3/14/2015	13.28	0
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3/14/2015 18:00	2015	73	1800	73.75	3/14/2015	13.36	0
3/14/2015 19:00	2015	73	1900	73.79167	3/14/2015	13.05	0
3/14/2015 20:00	2015	73	2000	73.83333	3/14/2015	12.87	0
3/14/2015 21:00	2015	73	2100	73.875	3/14/2015	12.81	0
3/14/2015 22:00	2015	73	2200	73.91667	3/14/2015	12.78	0
3/14/2015 23:00	2015	73	2300	73.95833	3/14/2015	12.75	0
3/15/2015 0:00	2015	74	0	74	3/15/2015	12.72	0
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3/15/2015 4:00	2015	74	400	74.16667	3/15/2015	12.61	0
3/15/2015 5:00	2015	74	500	74.20833	3/15/2015	12.58	0
3/15/2015 6:00	2015	74	600	74.25	3/15/2015	12.56	0
3/15/2015 7:00	2015	74	700	74.29167	3/15/2015	12.58	0
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3/15/2015 10:00	2015	74	1000	74.41667	3/15/2015	13.52	0
3/15/2015 11:00	2015	74	1100	74.45833	3/15/2015	13.42	0
3/15/2015 12:00	2015	74	1200	74.5	3/15/2015	13.35	0
3/15/2015 13:00	2015	74	1300	74.54167	3/15/2015	13.29	0
3/15/2015 14:00	2015	74	1400	74.58333	3/15/2015	13.26	0
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3/15/2015 17:00	2015	74	1700	74.70833	3/15/2015	13.28	0
3/15/2015 18:00	2015	74	1800	74.75	3/15/2015	13.32	0
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3/15/2015 20:00	2015	74	2000	74.83333	3/15/2015	12.86	0
3/15/2015 21:00	2015	74	2100	74.875	3/15/2015	12.81	0
3/15/2015 22:00	2015	74	2200	74.91667	3/15/2015	12.78	0
3/15/2015 23:00	2015	74	2300	74.95833	3/15/2015	12.75	0
3/16/2015 0:00	2015	75	0	75	3/16/2015	12.72	0
3/16/2015 1:00	2015	75	100	75.04167	3/16/2015	12.69	0
3/16/2015 2:00	2015	75	200	75.08333	3/16/2015	12.67	0
3/16/2015 3:00	2015	75	300	75.125	3/16/2015	12.64	0
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3/16/2015 5:00	2015	75	500	75.20833	3/16/2015	12.6	0

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3/16/2015 8:00	2015	75	800	75.33333	3/16/2015	13.54	0
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3/16/2015 10:00	2015	75	1000	75.41667	3/16/2015	13.49	0
3/16/2015 11:00	2015	75	1100	75.45833	3/16/2015	13.41	0
3/16/2015 12:00	2015	75	1200	75.5	3/16/2015	13.34	0
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3/16/2015 14:00	2015	75	1400	75.58333	3/16/2015	13.25	0
3/16/2015 15:00	2015	75	1500	75.625	3/16/2015	13.23	0
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3/16/2015 17:00	2015	75	1700	75.70833	3/16/2015	13.26	0
3/16/2015 18:00	2015	75	1800	75.75	3/16/2015	13.26	0
3/16/2015 19:00	2015	75	1900	75.79167	3/16/2015	12.95	0
3/16/2015 20:00	2015	75	2000	75.83333	3/16/2015	12.85	0
3/16/2015 21:00	2015	75	2100	75.875	3/16/2015	12.81	0
3/16/2015 22:00	2015	75	2200	75.91667	3/16/2015	12.77	0
3/16/2015 23:00	2015	75	2300	75.95833	3/16/2015	12.74	0
3/17/2015 0:00	2015	76	0	76	3/17/2015	12.72	0
3/17/2015 1:00	2015	76	100	76.04167	3/17/2015	12.69	0
3/17/2015 2:00	2015	76	200	76.08333	3/17/2015	12.67	0
3/17/2015 3:00	2015	76	300	76.125	3/17/2015	12.64	0
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3/17/2015 5:00	2015	76	500	76.20833	3/17/2015	12.59	0
3/17/2015 6:00	2015	76	600	76.25	3/17/2015	12.58	0
3/17/2015 7:00	2015	76	700	76.29167	3/17/2015	12.61	0
3/17/2015 8:00	2015	76	800	76.33333	3/17/2015	13.47	0
3/17/2015 9:00	2015	76	900	76.375	3/17/2015	13.51	0
3/17/2015 10:00	2015	76	1000	76.41667	3/17/2015	13.43	0
3/17/2015 11:00	2015	76	1100	76.45833	3/17/2015	13.36	0
3/17/2015 12:00	2015	76	1200	76.5	3/17/2015	13.29	0
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3/17/2015 15:00	2015	76	1500	76.625	3/17/2015	13.31	0
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3/17/2015 17:00	2015	76	1700	76.70833	3/17/2015	13.32	0
3/17/2015 18:00	2015	76	1800	76.75	3/17/2015	13.09	0
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3/17/2015 20:00	2015	76	2000	76.83333	3/17/2015	12.85	0
3/17/2015 21:00	2015	76	2100	76.875	3/17/2015	12.82	0
3/17/2015 22:00	2015	76	2200	76.91667	3/17/2015	12.8	0
3/17/2015 23:00	2015	76	2300	76.95833	3/17/2015	12.78	0
3/18/2015 0:00	2015	77	0	77	3/18/2015	12.76	0
3/18/2015 1:00	2015	77	100	77.04167	3/18/2015	12.73	0
3/18/2015 2:00	2015	77	200	77.08333	3/18/2015	12.7	0
3/18/2015 3:00	2015	77	300	77.125	3/18/2015	12.68	0
3/18/2015 4:00	2015	77	400	77.16667	3/18/2015	12.66	0

3/18/2015 5:00	2015	77	500	77.20833	3/18/2015	12.64	0
3/18/2015 6:00	2015	77	600	77.25	3/18/2015	12.63	0
3/18/2015 7:00	2015	77	700	77.29167	3/18/2015	12.63	0
3/18/2015 8:00	2015	77	800	77.33333	3/18/2015	12.83	0
3/18/2015 9:00	2015	77	900	77.375	3/18/2015	13.32	0
3/18/2015 10:00	2015	77	1000	77.41667	3/18/2015	13.45	0
3/18/2015 11:00	2015	77	1100	77.45833	3/18/2015	13.39	0
3/18/2015 12:00	2015	77	1200	77.5	3/18/2015	13.35	0
3/18/2015 13:00	2015	77	1300	77.54167	3/18/2015	13.32	0
3/18/2015 14:00	2015	77	1400	77.58333	3/18/2015	13.28	0
3/18/2015 15:00	2015	77	1500	77.625	3/18/2015	13.32	0
3/18/2015 16:00	2015	77	1600	77.66667	3/18/2015	13.34	0
3/18/2015 17:00	2015	77	1700	77.70833	3/18/2015	13.35	0
3/18/2015 18:00	2015	77	1800	77.75	3/18/2015	13.39	0
3/18/2015 19:00	2015	77	1900	77.79167	3/18/2015	13.05	0
3/18/2015 20:00	2015	77	2000	77.83333	3/18/2015	12.86	0
3/18/2015 21:00	2015	77	2100	77.875	3/18/2015	12.82	0
3/18/2015 22:00	2015	77	2200	77.91667	3/18/2015	12.79	0
3/18/2015 23:00	2015	77	2300	77.95833	3/18/2015	12.77	0
3/19/2015 0:00	2015	78	0	78	3/19/2015	12.75	0
3/19/2015 1:00	2015	78	100	78.04167	3/19/2015	12.73	0
3/19/2015 2:00	2015	78	200	78.08333	3/19/2015	12.71	0
3/19/2015 3:00	2015	78	300	78.125	3/19/2015	12.68	0
3/19/2015 4:00	2015	78	400	78.16667	3/19/2015	12.66	0
3/19/2015 5:00	2015	78	500	78.20833	3/19/2015	12.64	0
3/19/2015 6:00	2015	78	600	78.25	3/19/2015	12.62	0
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3/19/2015 9:00	2015	78	900	78.375	3/19/2015	13.5	0
3/19/2015 10:00	2015	78	1000	78.41667	3/19/2015	13.44	0
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3/19/2015 12:00	2015	78	1200	78.5	3/19/2015	13.45	0
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3/19/2015 15:00	2015	78	1500	78.625	3/19/2015	13.35	0
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3/19/2015 19:00	2015	78	1900	78.79167	3/19/2015	12.99	0
3/19/2015 20:00	2015	78	2000	78.83333	3/19/2015	12.85	0
3/19/2015 21:00	2015	78	2100	78.875	3/19/2015	12.8	0
3/19/2015 22:00	2015	78	2200	78.91667	3/19/2015	12.76	0
3/19/2015 23:00	2015	78	2300	78.95833	3/19/2015	12.73	0
3/20/2015 0:00	2015	79	0	79	3/20/2015	12.7	0
3/20/2015 1:00	2015	79	100	79.04167	3/20/2015	12.67	0
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3/20/2015 4:00	2015	79	400	79.16667	3/20/2015	12.59	0
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3/20/2015 6:00	2015	79	600	79.25	3/20/2015	12.54	0
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3/20/2015 9:00	2015	79	900	79.375	3/20/2015	13.61	0
3/20/2015 10:00	2015	79	1000	79.41667	3/20/2015	13.5	0
3/20/2015 11:00	2015	79	1100	79.45833	3/20/2015	13.42	0
3/20/2015 12:00	2015	79	1200	79.5	3/20/2015	13.36	0
3/20/2015 13:00	2015	79	1300	79.54167	3/20/2015	13.31	0
3/20/2015 14:00	2015	79	1400	79.58333	3/20/2015	13.28	0
3/20/2015 15:00	2015	79	1500	79.625	3/20/2015	13.26	0
3/20/2015 16:00	2015	79	1600	79.66667	3/20/2015	13.27	0
3/20/2015 17:00	2015	79	1700	79.70833	3/20/2015	13.31	0
3/20/2015 18:00	2015	79	1800	79.75	3/20/2015	13.34	0
3/20/2015 19:00	2015	79	1900	79.79167	3/20/2015	12.99	0
3/20/2015 20:00	2015	79	2000	79.83333	3/20/2015	12.85	0
3/20/2015 21:00	2015	79	2100	79.875	3/20/2015	12.8	0
3/20/2015 22:00	2015	79	2200	79.91667	3/20/2015	12.76	0
3/20/2015 23:00	2015	79	2300	79.95833	3/20/2015	12.73	0
3/21/2015 0:00	2015	80	0	80	3/21/2015	12.71	0
3/21/2015 1:00	2015	80	100	80.04167	3/21/2015	12.68	0
3/21/2015 2:00	2015	80	200	80.08333	3/21/2015	12.65	0
3/21/2015 3:00	2015	80	300	80.125	3/21/2015	12.62	0
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3/21/2015 6:00	2015	80	600	80.25	3/21/2015	12.54	0
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3/21/2015 11:00	2015	80	1100	80.45833	3/21/2015	13.4	0
3/21/2015 12:00	2015	80	1200	80.5	3/21/2015	13.33	0
3/21/2015 13:00	2015	80	1300	80.54167	3/21/2015	13.28	0
3/21/2015 14:00	2015	80	1400	80.58333	3/21/2015	13.24	0
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3/21/2015 17:00	2015	80	1700	80.70833	3/21/2015	13.25	0
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3/21/2015 20:00	2015	80	2000	80.83333	3/21/2015	12.86	0
3/21/2015 21:00	2015	80	2100	80.875	3/21/2015	12.82	0
3/21/2015 22:00	2015	80	2200	80.91667	3/21/2015	12.79	0
3/21/2015 23:00	2015	80	2300	80.95833	3/21/2015	12.76	0
3/22/2015 0:00	2015	81	0	81	3/22/2015	12.74	0
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3/22/2015 5:00	2015	81	500	81.20833	3/22/2015	12.6	0
3/22/2015 6:00	2015	81	600	81.25	3/22/2015	12.58	0
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3/22/2015 9:00	2015	81	900	81.375	3/22/2015	13.51	0
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3/22/2015 19:00	2015	81	1900	81.79167	3/22/2015	12.97	0
3/22/2015 20:00	2015	81	2000	81.83333	3/22/2015	12.86	0
3/22/2015 21:00	2015	81	2100	81.875	3/22/2015	12.81	0
3/22/2015 22:00	2015	81	2200	81.91667	3/22/2015	12.77	0
3/22/2015 23:00	2015	81	2300	81.95833	3/22/2015	12.74	0
3/23/2015 0:00	2015	82	0	82	3/23/2015	12.71	0
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3/23/2015 6:00	2015	82	600	82.25	3/23/2015	12.59	0
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3/23/2015 19:00	2015	82	1900	82.79167	3/23/2015	12.99	0
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3/23/2015 21:00	2015	82	2100	82.875	3/23/2015	12.81	0
3/23/2015 22:00	2015	82	2200	82.91667	3/23/2015	12.77	0
3/23/2015 23:00	2015	82	2300	82.95833	3/23/2015	12.74	0
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3/24/2015 6:00	2015	83	600	83.25	3/24/2015	12.58	0
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3/24/2015 17:00	2015	83	1700	83.70833	3/24/2015	13.29	0
3/24/2015 18:00	2015	83	1800	83.75	3/24/2015	13.29	0
3/24/2015 19:00	2015	83	1900	83.79167	3/24/2015	12.98	0
3/24/2015 20:00	2015	83	2000	83.83333	3/24/2015	12.86	0
3/24/2015 21:00	2015	83	2100	83.875	3/24/2015	12.81	0
3/24/2015 22:00	2015	83	2200	83.91667	3/24/2015	12.78	0
3/24/2015 23:00	2015	83	2300	83.95833	3/24/2015	12.76	0
3/25/2015 0:00	2015	84	0	84	3/25/2015	12.74	0
3/25/2015 1:00	2015	84	100	84.04167	3/25/2015	12.71	0
3/25/2015 2:00	2015	84	200	84.08333	3/25/2015	12.68	0
3/25/2015 3:00	2015	84	300	84.125	3/25/2015	12.66	0
3/25/2015 4:00	2015	84	400	84.16667	3/25/2015	12.63	0
3/25/2015 5:00	2015	84	500	84.20833	3/25/2015	12.61	0
3/25/2015 6:00	2015	84	600	84.25	3/25/2015	12.59	0
3/25/2015 7:00	2015	84	700	84.29167	3/25/2015	12.65	0
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3/25/2015 22:00	2015	84	2200	84.91667	3/25/2015	12.76	0
3/25/2015 23:00	2015	84	2300	84.95833	3/25/2015	12.73	0
3/26/2015 0:00	2015	85	0	85	3/26/2015	12.7	0

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3/26/2015 3:00	2015	85	300	85.125	3/26/2015	12.61	0
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3/26/2015 17:00	2015	85	1700	85.70833	3/26/2015	13.3	0
3/26/2015 18:00	2015	85	1800	85.75	3/26/2015	13.32	0
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3/26/2015 20:00	2015	85	2000	85.83333	3/26/2015	12.86	0
3/26/2015 21:00	2015	85	2100	85.875	3/26/2015	12.8	0
3/26/2015 22:00	2015	85	2200	85.91667	3/26/2015	12.77	0
3/26/2015 23:00	2015	85	2300	85.95833	3/26/2015	12.74	0
3/27/2015 0:00	2015	86	0	86	3/27/2015	12.71	0
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3/27/2015 9:00	2015	86	900	86.375	3/27/2015	13.54	0
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3/27/2015 11:00	2015	86	1100	86.45833	3/27/2015	13.36	0
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3/27/2015 17:00	2015	86	1700	86.70833	3/27/2015	13.22	0
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3/27/2015 21:00	2015	86	2100	86.875	3/27/2015	12.81	0
3/27/2015 22:00	2015	86	2200	86.91667	3/27/2015	12.78	0
3/27/2015 23:00	2015	86	2300	86.95833	3/27/2015	12.75	0

3/28/2015 0:00	2015	87	0	87	3/28/2015	12.72	0
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3/28/2015 5:00	2015	87	500	87.20833	3/28/2015	12.59	0
3/28/2015 6:00	2015	87	600	87.25	3/28/2015	12.58	0
3/28/2015 7:00	2015	87	700	87.29167	3/28/2015	12.67	0
3/28/2015 8:00	2015	87	800	87.33333	3/28/2015	13.5	0
3/28/2015 9:00	2015	87	900	87.375	3/28/2015	13.44	0
3/28/2015 10:00	2015	87	1000	87.41667	3/28/2015	13.35	0
3/28/2015 11:00	2015	87	1100	87.45833	3/28/2015	13.28	0
3/28/2015 12:00	2015	87	1200	87.5	3/28/2015	13.22	0
3/28/2015 13:00	2015	87	1300	87.54167	3/28/2015	13.19	0
3/28/2015 14:00	2015	87	1400	87.58333	3/28/2015	13.16	0
3/28/2015 15:00	2015	87	1500	87.625	3/28/2015	13.15	0
3/28/2015 16:00	2015	87	1600	87.66667	3/28/2015	13.16	0
3/28/2015 17:00	2015	87	1700	87.70833	3/28/2015	13.19	0
3/28/2015 18:00	2015	87	1800	87.75	3/28/2015	13.2	0
3/28/2015 19:00	2015	87	1900	87.79167	3/28/2015	12.98	0
3/28/2015 20:00	2015	87	2000	87.83333	3/28/2015	12.86	0
3/28/2015 21:00	2015	87	2100	87.875	3/28/2015	12.81	0
3/28/2015 22:00	2015	87	2200	87.91667	3/28/2015	12.77	0
3/28/2015 23:00	2015	87	2300	87.95833	3/28/2015	12.74	0
3/29/2015 0:00	2015	88	0	88	3/29/2015	12.72	0
3/29/2015 1:00	2015	88	100	88.04167	3/29/2015	12.69	0
3/29/2015 2:00	2015	88	200	88.08333	3/29/2015	12.67	0
3/29/2015 3:00	2015	88	300	88.125	3/29/2015	12.65	0
3/29/2015 4:00	2015	88	400	88.16667	3/29/2015	12.64	0
3/29/2015 5:00	2015	88	500	88.20833	3/29/2015	12.62	0
3/29/2015 6:00	2015	88	600	88.25	3/29/2015	12.62	0
3/29/2015 7:00	2015	88	700	88.29167	3/29/2015	12.7	0
3/29/2015 8:00	2015	88	800	88.33333	3/29/2015	13.42	0
3/29/2015 9:00	2015	88	900	88.375	3/29/2015	13.4	0
3/29/2015 10:00	2015	88	1000	88.41667	3/29/2015	13.33	0
3/29/2015 11:00	2015	88	1100	88.45833	3/29/2015	13.28	0
3/29/2015 12:00	2015	88	1200	88.5	3/29/2015	13.23	0
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3/29/2015 14:00	2015	88	1400	88.58333	3/29/2015	13.17	0
3/29/2015 15:00	2015	88	1500	88.625	3/29/2015	13.16	0
3/29/2015 16:00	2015	88	1600	88.66667	3/29/2015	13.17	0
3/29/2015 17:00	2015	88	1700	88.70833	3/29/2015	13.2	0
3/29/2015 18:00	2015	88	1800	88.75	3/29/2015	13.23	0
3/29/2015 19:00	2015	88	1900	88.79167	3/29/2015	13	0
3/29/2015 20:00	2015	88	2000	88.83333	3/29/2015	12.86	0
3/29/2015 21:00	2015	88	2100	88.875	3/29/2015	12.81	0
3/29/2015 22:00	2015	88	2200	88.91667	3/29/2015	12.78	0

3/29/2015 23:00	2015	88	2300	88.95833	3/29/2015	12.74	0
3/30/2015 0:00	2015	89	0	89	3/30/2015	12.72	0
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3/30/2015 6:00	2015	89	600	89.25	3/30/2015	12.62	0
3/30/2015 7:00	2015	89	700	89.29167	3/30/2015	12.72	0
3/30/2015 8:00	2015	89	800	89.33333	3/30/2015	13.37	0
3/30/2015 9:00	2015	89	900	89.375	3/30/2015	13.4	0
3/30/2015 10:00	2015	89	1000	89.41667	3/30/2015	13.33	0
3/30/2015 11:00	2015	89	1100	89.45833	3/30/2015	13.27	0
3/30/2015 12:00	2015	89	1200	89.5	3/30/2015	13.22	0
3/30/2015 13:00	2015	89	1300	89.54167	3/30/2015	13.18	0
3/30/2015 14:00	2015	89	1400	89.58333	3/30/2015	13.16	0
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3/30/2015 16:00	2015	89	1600	89.66667	3/30/2015	13.19	0
3/30/2015 17:00	2015	89	1700	89.70833	3/30/2015	13.24	0
3/30/2015 18:00	2015	89	1800	89.75	3/30/2015	13.25	0
3/30/2015 19:00	2015	89	1900	89.79167	3/30/2015	13	0
3/30/2015 20:00	2015	89	2000	89.83333	3/30/2015	12.85	0
3/30/2015 21:00	2015	89	2100	89.875	3/30/2015	12.8	0
3/30/2015 22:00	2015	89	2200	89.91667	3/30/2015	12.77	0
3/30/2015 23:00	2015	89	2300	89.95833	3/30/2015	12.74	0
3/31/2015 0:00	2015	90	0	90	3/31/2015	12.72	0
3/31/2015 1:00	2015	90	100	90.04167	3/31/2015	12.7	0
3/31/2015 2:00	2015	90	200	90.08333	3/31/2015	12.68	0
3/31/2015 3:00	2015	90	300	90.125	3/31/2015	12.66	0
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3/31/2015 5:00	2015	90	500	90.20833	3/31/2015	12.63	0
3/31/2015 6:00	2015	90	600	90.25	3/31/2015	12.62	0
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3/31/2015 9:00	2015	90	900	90.375	3/31/2015	13.38	0
3/31/2015 10:00	2015	90	1000	90.41667	3/31/2015	13.3	0
3/31/2015 11:00	2015	90	1100	90.45833	3/31/2015	13.24	0
3/31/2015 12:00	2015	90	1200	90.5	3/31/2015	13.22	0
3/31/2015 13:00	2015	90	1300	90.54167	3/31/2015	13.19	0
3/31/2015 14:00	2015	90	1400	90.58333	3/31/2015	13.15	0
3/31/2015 15:00	2015	90	1500	90.625	3/31/2015	13.15	0
3/31/2015 16:00	2015	90	1600	90.66667	3/31/2015	13.17	0
3/31/2015 17:00	2015	90	1700	90.70833	3/31/2015	13.21	0
3/31/2015 18:00	2015	90	1800	90.75	3/31/2015	13.23	0
3/31/2015 19:00	2015	90	1900	90.79167	3/31/2015	13.03	0
3/31/2015 20:00	2015	90	2000	90.83333	3/31/2015	12.86	0
3/31/2015 21:00	2015	90	2100	90.875	3/31/2015	12.81	0

3/31/2015 22:00	2015	90	2200	90.91667	3/31/2015	12.77	0
3/31/2015 23:00	2015	90	2300	90.95833	3/31/2015	12.74	0
4/1/2015 0:00	2015	91	0	91	4/1/2015	12.71	0
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4/1/2015 4:00	2015	91	400	91.16667	4/1/2015	12.61	0
4/1/2015 5:00	2015	91	500	91.20833	4/1/2015	12.6	0
4/1/2015 6:00	2015	91	600	91.25	4/1/2015	12.58	0
4/1/2015 7:00	2015	91	700	91.29167	4/1/2015	12.68	0
4/1/2015 8:00	2015	91	800	91.33333	4/1/2015	13.48	0
4/1/2015 9:00	2015	91	900	91.375	4/1/2015	13.43	0
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4/1/2015 11:00	2015	91	1100	91.45833	4/1/2015	13.29	0
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4/1/2015 13:00	2015	91	1300	91.54167	4/1/2015	13.21	0
4/1/2015 14:00	2015	91	1400	91.58333	4/1/2015	13.19	0
4/1/2015 15:00	2015	91	1500	91.625	4/1/2015	13.18	0
4/1/2015 16:00	2015	91	1600	91.66667	4/1/2015	13.19	0
4/1/2015 17:00	2015	91	1700	91.70833	4/1/2015	13.22	0
4/1/2015 18:00	2015	91	1800	91.75	4/1/2015	13.24	0
4/1/2015 19:00	2015	91	1900	91.79167	4/1/2015	13.02	0
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4/1/2015 21:00	2015	91	2100	91.875	4/1/2015	12.8	0
4/1/2015 22:00	2015	91	2200	91.91667	4/1/2015	12.77	0
4/1/2015 23:00	2015	91	2300	91.95833	4/1/2015	12.74	0
4/2/2015 0:00	2015	92	0	92	4/2/2015	12.71	0
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4/2/2015 3:00	2015	92	300	92.125	4/2/2015	12.63	0
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4/2/2015 5:00	2015	92	500	92.20833	4/2/2015	12.59	0
4/2/2015 6:00	2015	92	600	92.25	4/2/2015	12.59	0
4/2/2015 7:00	2015	92	700	92.29167	4/2/2015	12.7	0
4/2/2015 8:00	2015	92	800	92.33333	4/2/2015	13.46	0
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4/2/2015 11:00	2015	92	1100	92.45833	4/2/2015	13.33	0
4/2/2015 12:00	2015	92	1200	92.5	4/2/2015	13.28	0
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4/2/2015 20:00	2015	92	2000	92.83333	4/2/2015	12.85	0

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4/2/2015 23:00	2015	92	2300	92.95833	4/2/2015	12.71	0
4/3/2015 0:00	2015	93	0	93	4/3/2015	12.68	0
4/3/2015 1:00	2015	93	100	93.04167	4/3/2015	12.64	0
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4/3/2015 3:00	2015	93	300	93.125	4/3/2015	12.58	0
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4/3/2015 12:00	2015	93	1200	93.5	4/3/2015	13.42	0
4/3/2015 13:00	2015	93	1300	93.54167	4/3/2015	13.37	0
4/3/2015 14:00	2015	93	1400	93.58333	4/3/2015	13.34	0
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4/3/2015 17:00	2015	93	1700	93.70833	4/3/2015	13.36	0
4/3/2015 18:00	2015	93	1800	93.75	4/3/2015	13.42	0
4/3/2015 19:00	2015	93	1900	93.79167	4/3/2015	13.12	0
4/3/2015 20:00	2015	93	2000	93.83333	4/3/2015	12.86	0
4/3/2015 21:00	2015	93	2100	93.875	4/3/2015	12.8	0
4/3/2015 22:00	2015	93	2200	93.91667	4/3/2015	12.76	0
4/3/2015 23:00	2015	93	2300	93.95833	4/3/2015	12.72	0
4/4/2015 0:00	2015	94	0	94	4/4/2015	12.69	0
4/4/2015 1:00	2015	94	100	94.04167	4/4/2015	12.66	0
4/4/2015 2:00	2015	94	200	94.08333	4/4/2015	12.63	0
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4/4/2015 4:00	2015	94	400	94.16667	4/4/2015	12.56	0
4/4/2015 5:00	2015	94	500	94.20833	4/4/2015	12.52	0
4/4/2015 6:00	2015	94	600	94.25	4/4/2015	12.49	0
4/4/2015 7:00	2015	94	700	94.29167	4/4/2015	12.58	0
4/4/2015 8:00	2015	94	800	94.33333	4/4/2015	13.63	0
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4/4/2015 10:00	2015	94	1000	94.41667	4/4/2015	13.54	0
4/4/2015 11:00	2015	94	1100	94.45833	4/4/2015	13.44	0
4/4/2015 12:00	2015	94	1200	94.5	4/4/2015	13.36	0
4/4/2015 13:00	2015	94	1300	94.54167	4/4/2015	13.29	0
4/4/2015 14:00	2015	94	1400	94.58333	4/4/2015	13.25	0
4/4/2015 15:00	2015	94	1500	94.625	4/4/2015	13.22	0
4/4/2015 16:00	2015	94	1600	94.66667	4/4/2015	13.21	0
4/4/2015 17:00	2015	94	1700	94.70833	4/4/2015	13.22	0
4/4/2015 18:00	2015	94	1800	94.75	4/4/2015	13.25	0
4/4/2015 19:00	2015	94	1900	94.79167	4/4/2015	13.05	0

4/4/2015 20:00	2015	94	2000	94.83333	4/4/2015	12.88	0
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4/4/2015 22:00	2015	94	2200	94.91667	4/4/2015	12.78	0
4/4/2015 23:00	2015	94	2300	94.95833	4/4/2015	12.75	0
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4/5/2015 1:00	2015	95	100	95.04167	4/5/2015	12.7	0
4/5/2015 2:00	2015	95	200	95.08333	4/5/2015	12.67	0
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4/5/2015 5:00	2015	95	500	95.20833	4/5/2015	12.58	0
4/5/2015 6:00	2015	95	600	95.25	4/5/2015	12.56	0
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4/5/2015 12:00	2015	95	1200	95.5	4/5/2015	13.27	0
4/5/2015 13:00	2015	95	1300	95.54167	4/5/2015	13.23	0
4/5/2015 14:00	2015	95	1400	95.58333	4/5/2015	13.21	0
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4/5/2015 16:00	2015	95	1600	95.66667	4/5/2015	13.22	0
4/5/2015 17:00	2015	95	1700	95.70833	4/5/2015	13.25	0
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4/5/2015 19:00	2015	95	1900	95.79167	4/5/2015	13.07	0
4/5/2015 20:00	2015	95	2000	95.83333	4/5/2015	12.86	0
4/5/2015 21:00	2015	95	2100	95.875	4/5/2015	12.8	0
4/5/2015 22:00	2015	95	2200	95.91667	4/5/2015	12.76	0
4/5/2015 23:00	2015	95	2300	95.95833	4/5/2015	12.73	0
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4/6/2015 5:00	2015	96	500	96.20833	4/6/2015	12.58	0
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4/6/2015 12:00	2015	96	1200	96.5	4/6/2015	13.29	0
4/6/2015 13:00	2015	96	1300	96.54167	4/6/2015	13.26	0
4/6/2015 14:00	2015	96	1400	96.58333	4/6/2015	13.24	0
4/6/2015 15:00	2015	96	1500	96.625	4/6/2015	13.23	0
4/6/2015 16:00	2015	96	1600	96.66667	4/6/2015	13.25	0
4/6/2015 17:00	2015	96	1700	96.70833	4/6/2015	13.29	0
4/6/2015 18:00	2015	96	1800	96.75	4/6/2015	13.33	0

4/6/2015 19:00	2015	96	1900	96.79167	4/6/2015	13.05	0
4/6/2015 20:00	2015	96	2000	96.83333	4/6/2015	12.85	0
4/6/2015 21:00	2015	96	2100	96.875	4/6/2015	12.8	0
4/6/2015 22:00	2015	96	2200	96.91667	4/6/2015	12.77	0
4/6/2015 23:00	2015	96	2300	96.95833	4/6/2015	12.74	0
4/7/2015 0:00	2015	97	0	97	4/7/2015	12.72	0
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4/7/2015 5:00	2015	97	500	97.20833	4/7/2015	12.56	0
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4/7/2015 12:00	2015	97	1200	97.5	4/7/2015	13.34	0
4/7/2015 13:00	2015	97	1300	97.54167	4/7/2015	13.32	0
4/7/2015 14:00	2015	97	1400	97.58333	4/7/2015	13.29	0
4/7/2015 15:00	2015	97	1500	97.625	4/7/2015	13.27	0
4/7/2015 16:00	2015	97	1600	97.66667	4/7/2015	13.28	0
4/7/2015 17:00	2015	97	1700	97.70833	4/7/2015	13.32	0
4/7/2015 18:00	2015	97	1800	97.75	4/7/2015	13.39	0
4/7/2015 19:00	2015	97	1900	97.79167	4/7/2015	13.14	0
4/7/2015 20:00	2015	97	2000	97.83333	4/7/2015	12.87	0
4/7/2015 21:00	2015	97	2100	97.875	4/7/2015	12.81	0
4/7/2015 22:00	2015	97	2200	97.91667	4/7/2015	12.78	0
4/7/2015 23:00	2015	97	2300	97.95833	4/7/2015	12.76	0
4/8/2015 0:00	2015	98	0	98	4/8/2015	12.73	0
4/8/2015 1:00	2015	98	100	98.04167	4/8/2015	12.71	0
4/8/2015 2:00	2015	98	200	98.08333	4/8/2015	12.69	0
4/8/2015 3:00	2015	98	300	98.125	4/8/2015	12.66	0
4/8/2015 4:00	2015	98	400	98.16667	4/8/2015	12.63	0
4/8/2015 5:00	2015	98	500	98.20833	4/8/2015	12.6	0
4/8/2015 6:00	2015	98	600	98.25	4/8/2015	12.57	0
4/8/2015 7:00	2015	98	700	98.29167	4/8/2015	12.72	0
4/8/2015 8:00	2015	98	800	98.33333	4/8/2015	13.57	0
4/8/2015 9:00	2015	98	900	98.375	4/8/2015	13.53	0
4/8/2015 10:00	2015	98	1000	98.41667	4/8/2015	13.47	0
4/8/2015 11:00	2015	98	1100	98.45833	4/8/2015	13.41	0
4/8/2015 12:00	2015	98	1200	98.5	4/8/2015	13.36	0
4/8/2015 13:00	2015	98	1300	98.54167	4/8/2015	13.33	0
4/8/2015 14:00	2015	98	1400	98.58333	4/8/2015	13.31	0
4/8/2015 15:00	2015	98	1500	98.625	4/8/2015	13.3	0
4/8/2015 16:00	2015	98	1600	98.66667	4/8/2015	13.32	0
4/8/2015 17:00	2015	98	1700	98.70833	4/8/2015	13.36	0

4/8/2015 18:00	2015	98	1800	98.75	4/8/2015	13.37	0
4/8/2015 19:00	2015	98	1900	98.79167	4/8/2015	13.04	0
4/8/2015 20:00	2015	98	2000	98.83333	4/8/2015	12.85	0
4/8/2015 21:00	2015	98	2100	98.875	4/8/2015	12.79	0
4/8/2015 22:00	2015	98	2200	98.91667	4/8/2015	12.75	0
4/8/2015 23:00	2015	98	2300	98.95833	4/8/2015	12.72	0
4/9/2015 0:00	2015	99	0	99	4/9/2015	12.69	0
4/9/2015 1:00	2015	99	100	99.04167	4/9/2015	12.66	0
4/9/2015 2:00	2015	99	200	99.08333	4/9/2015	12.63	0
4/9/2015 3:00	2015	99	300	99.125	4/9/2015	12.6	0
4/9/2015 4:00	2015	99	400	99.16667	4/9/2015	12.56	0
4/9/2015 5:00	2015	99	500	99.20833	4/9/2015	12.52	0
4/9/2015 6:00	2015	99	600	99.25	4/9/2015	12.49	0
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4/9/2015 8:00	2015	99	800	99.33333	4/9/2015	13.75	0
4/9/2015 9:00	2015	99	900	99.375	4/9/2015	13.64	0
4/9/2015 10:00	2015	99	1000	99.41667	4/9/2015	13.53	0
4/9/2015 11:00	2015	99	1100	99.45833	4/9/2015	13.45	0
4/9/2015 12:00	2015	99	1200	99.5	4/9/2015	13.38	0
4/9/2015 13:00	2015	99	1300	99.54167	4/9/2015	13.34	0
4/9/2015 14:00	2015	99	1400	99.58333	4/9/2015	13.31	0
4/9/2015 15:00	2015	99	1500	99.625	4/9/2015	13.31	0
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4/9/2015 17:00	2015	99	1700	99.70833	4/9/2015	13.33	0
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4/9/2015 21:00	2015	99	2100	99.875	4/9/2015	12.8	0
4/9/2015 22:00	2015	99	2200	99.91667	4/9/2015	12.76	0
4/9/2015 23:00	2015	99	2300	99.95833	4/9/2015	12.73	0
4/10/2015 0:00	2015	100	0	100	4/10/2015	12.7	0
4/10/2015 1:00	2015	100	100	100.0417	4/10/2015	12.68	0
4/10/2015 2:00	2015	100	200	100.0833	4/10/2015	12.65	0
4/10/2015 3:00	2015	100	300	100.125	4/10/2015	12.62	0
4/10/2015 4:00	2015	100	400	100.1667	4/10/2015	12.59	0
4/10/2015 5:00	2015	100	500	100.2083	4/10/2015	12.55	0
4/10/2015 6:00	2015	100	600	100.25	4/10/2015	12.52	0
4/10/2015 7:00	2015	100	700	100.2917	4/10/2015	12.68	0
4/10/2015 8:00	2015	100	800	100.3333	4/10/2015	13.66	0
4/10/2015 9:00	2015	100	900	100.375	4/10/2015	13.56	0
4/10/2015 10:00	2015	100	1000	100.4167	4/10/2015	13.46	0
4/10/2015 11:00	2015	100	1100	100.4583	4/10/2015	13.38	0
4/10/2015 12:00	2015	100	1200	100.5	4/10/2015	13.32	0
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4/10/2015 14:00	2015	100	1400	100.5833	4/10/2015	13.24	0
4/10/2015 15:00	2015	100	1500	100.625	4/10/2015	13.24	0
4/10/2015 16:00	2015	100	1600	100.6667	4/10/2015	13.25	0

4/10/2015 17:00	2015	100	1700	100.7083	4/10/2015	13.29	0
4/10/2015 18:00	2015	100	1800	100.75	4/10/2015	13.33	0
4/10/2015 19:00	2015	100	1900	100.7917	4/10/2015	13.08	0
4/10/2015 20:00	2015	100	2000	100.8333	4/10/2015	12.87	0
4/10/2015 21:00	2015	100	2100	100.875	4/10/2015	12.81	0
4/10/2015 22:00	2015	100	2200	100.9167	4/10/2015	12.77	0
4/10/2015 23:00	2015	100	2300	100.9583	4/10/2015	12.75	0
4/11/2015 0:00	2015	101	0	101	4/11/2015	12.73	0
4/11/2015 1:00	2015	101	100	101.0417	4/11/2015	12.71	0
4/11/2015 2:00	2015	101	200	101.0833	4/11/2015	12.69	0
4/11/2015 3:00	2015	101	300	101.125	4/11/2015	12.67	0
4/11/2015 4:00	2015	101	400	101.1667	4/11/2015	12.64	0
4/11/2015 5:00	2015	101	500	101.2083	4/11/2015	12.62	0
4/11/2015 6:00	2015	101	600	101.25	4/11/2015	12.59	0
4/11/2015 7:00	2015	101	700	101.2917	4/11/2015	12.68	0
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4/11/2015 10:00	2015	101	1000	101.4167	4/11/2015	13.4	0
4/11/2015 11:00	2015	101	1100	101.4583	4/11/2015	13.32	0
4/11/2015 12:00	2015	101	1200	101.5	4/11/2015	13.26	0
4/11/2015 13:00	2015	101	1300	101.5417	4/11/2015	13.23	0
4/11/2015 14:00	2015	101	1400	101.5833	4/11/2015	13.22	0
4/11/2015 15:00	2015	101	1500	101.625	4/11/2015	13.23	0
4/11/2015 16:00	2015	101	1600	101.6667	4/11/2015	13.2	0
4/11/2015 17:00	2015	101	1700	101.7083	4/11/2015	13.22	0
4/11/2015 18:00	2015	101	1800	101.75	4/11/2015	13.25	0
4/11/2015 19:00	2015	101	1900	101.7917	4/11/2015	13.04	0
4/11/2015 20:00	2015	101	2000	101.8333	4/11/2015	12.87	0
4/11/2015 21:00	2015	101	2100	101.875	4/11/2015	12.81	0
4/11/2015 22:00	2015	101	2200	101.9167	4/11/2015	12.78	0
4/11/2015 23:00	2015	101	2300	101.9583	4/11/2015	12.75	0
4/12/2015 0:00	2015	102	0	102	4/12/2015	12.72	0
4/12/2015 1:00	2015	102	100	102.0417	4/12/2015	12.7	0
4/12/2015 2:00	2015	102	200	102.0833	4/12/2015	12.67	0
4/12/2015 3:00	2015	102	300	102.125	4/12/2015	12.64	0
4/12/2015 4:00	2015	102	400	102.1667	4/12/2015	12.62	0
4/12/2015 5:00	2015	102	500	102.2083	4/12/2015	12.6	0
4/12/2015 6:00	2015	102	600	102.25	4/12/2015	12.58	0
4/12/2015 7:00	2015	102	700	102.2917	4/12/2015	12.71	0
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4/12/2015 9:00	2015	102	900	102.375	4/12/2015	13.45	0
4/12/2015 10:00	2015	102	1000	102.4167	4/12/2015	13.37	0
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4/12/2015 13:00	2015	102	1300	102.5417	4/12/2015	13.24	0
4/12/2015 14:00	2015	102	1400	102.5833	4/12/2015	13.21	0
4/12/2015 15:00	2015	102	1500	102.625	4/12/2015	13.21	0

4/12/2015 16:00	2015	102	1600	102.6667	4/12/2015	13.22	0
4/12/2015 17:00	2015	102	1700	102.7083	4/12/2015	13.24	0
4/12/2015 18:00	2015	102	1800	102.75	4/12/2015	13.24	0
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4/12/2015 20:00	2015	102	2000	102.8333	4/12/2015	12.86	0
4/12/2015 21:00	2015	102	2100	102.875	4/12/2015	12.8	0
4/12/2015 22:00	2015	102	2200	102.9167	4/12/2015	12.76	0
4/12/2015 23:00	2015	102	2300	102.9583	4/12/2015	12.73	0
4/13/2015 0:00	2015	103	0	103	4/13/2015	12.7	0
4/13/2015 1:00	2015	103	100	103.0417	4/13/2015	12.67	0
4/13/2015 2:00	2015	103	200	103.0833	4/13/2015	12.64	0
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4/13/2015 5:00	2015	103	500	103.2083	4/13/2015	12.55	0
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4/13/2015 7:00	2015	103	700	103.2917	4/13/2015	12.7	0
4/13/2015 8:00	2015	103	800	103.3333	4/13/2015	13.57	0
4/13/2015 9:00	2015	103	900	103.375	4/13/2015	13.48	0
4/13/2015 10:00	2015	103	1000	103.4167	4/13/2015	13.38	0
4/13/2015 11:00	2015	103	1100	103.4583	4/13/2015	13.31	0
4/13/2015 12:00	2015	103	1200	103.5	4/13/2015	13.25	0
4/13/2015 13:00	2015	103	1300	103.5417	4/13/2015	13.21	0
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4/13/2015 20:00	2015	103	2000	103.8333	4/13/2015	12.87	0
4/13/2015 21:00	2015	103	2100	103.875	4/13/2015	12.81	0
4/13/2015 22:00	2015	103	2200	103.9167	4/13/2015	12.77	0
4/13/2015 23:00	2015	103	2300	103.9583	4/13/2015	12.74	0
4/14/2015 0:00	2015	104	0	104	4/14/2015	12.72	0
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4/14/2015 2:00	2015	104	200	104.0833	4/14/2015	12.66	0
4/14/2015 3:00	2015	104	300	104.125	4/14/2015	12.64	0
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4/14/2015 6:00	2015	104	600	104.25	4/14/2015	12.6	0
4/14/2015 7:00	2015	104	700	104.2917	4/14/2015	12.74	0
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4/14/2015 9:00	2015	104	900	104.375	4/14/2015	13.38	0
4/14/2015 10:00	2015	104	1000	104.4167	4/14/2015	13.32	0
4/14/2015 11:00	2015	104	1100	104.4583	4/14/2015	13.27	0
4/14/2015 12:00	2015	104	1200	104.5	4/14/2015	13.23	0
4/14/2015 13:00	2015	104	1300	104.5417	4/14/2015	13.2	0
4/14/2015 14:00	2015	104	1400	104.5833	4/14/2015	13.18	0

4/14/2015 15:00	2015	104	1500	104.625	4/14/2015	13.19	0
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4/14/2015 17:00	2015	104	1700	104.7083	4/14/2015	13.23	0
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4/14/2015 19:00	2015	104	1900	104.7917	4/14/2015	13.03	0
4/14/2015 20:00	2015	104	2000	104.8333	4/14/2015	12.86	0
4/14/2015 21:00	2015	104	2100	104.875	4/14/2015	12.81	0
4/14/2015 22:00	2015	104	2200	104.9167	4/14/2015	12.77	0
4/14/2015 23:00	2015	104	2300	104.9583	4/14/2015	12.74	0
4/15/2015 0:00	2015	105	0	105	4/15/2015	12.71	0
4/15/2015 1:00	2015	105	100	105.0417	4/15/2015	12.68	0
4/15/2015 2:00	2015	105	200	105.0833	4/15/2015	12.64	0
4/15/2015 3:00	2015	105	300	105.125	4/15/2015	12.6	0
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4/15/2015 5:00	2015	105	500	105.2083	4/15/2015	12.54	0
4/15/2015 6:00	2015	105	600	105.25	4/15/2015	12.52	0
4/15/2015 7:00	2015	105	700	105.2917	4/15/2015	12.68	0
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4/15/2015 10:00	2015	105	1000	105.4167	4/15/2015	13.53	0
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4/15/2015 14:00	2015	105	1400	105.5833	4/15/2015	13.3	0
4/15/2015 15:00	2015	105	1500	105.625	4/15/2015	13.31	0
4/15/2015 16:00	2015	105	1600	105.6667	4/15/2015	13.33	0
4/15/2015 17:00	2015	105	1700	105.7083	4/15/2015	13.38	0
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4/15/2015 20:00	2015	105	2000	105.8333	4/15/2015	12.84	0
4/15/2015 21:00	2015	105	2100	105.875	4/15/2015	12.78	0
4/15/2015 22:00	2015	105	2200	105.9167	4/15/2015	12.75	0
4/15/2015 23:00	2015	105	2300	105.9583	4/15/2015	12.71	0
4/16/2015 0:00	2015	106	0	106	4/16/2015	12.67	0
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4/16/2015 6:00	2015	106	600	106.25	4/16/2015	12.46	0
4/16/2015 7:00	2015	106	700	106.2917	4/16/2015	12.63	0
4/16/2015 8:00	2015	106	800	106.3333	4/16/2015	13.72	0
4/16/2015 9:00	2015	106	900	106.375	4/16/2015	13.67	0
4/16/2015 10:00	2015	106	1000	106.4167	4/16/2015	13.57	0
4/16/2015 11:00	2015	106	1100	106.4583	4/16/2015	13.5	0
4/16/2015 12:00	2015	106	1200	106.5	4/16/2015	13.43	0
4/16/2015 13:00	2015	106	1300	106.5417	4/16/2015	13.41	0

4/16/2015 14:00	2015	106	1400	106.5833	4/16/2015	13.4	0
4/16/2015 15:00	2015	106	1500	106.625	4/16/2015	13.48	0
4/16/2015 16:00	2015	106	1600	106.6667	4/16/2015	13.49	0
4/16/2015 17:00	2015	106	1700	106.7083	4/16/2015	13.46	0
4/16/2015 18:00	2015	106	1800	106.75	4/16/2015	13.5	0
4/16/2015 19:00	2015	106	1900	106.7917	4/16/2015	13.11	0
4/16/2015 20:00	2015	106	2000	106.8333	4/16/2015	12.86	0
4/16/2015 21:00	2015	106	2100	106.875	4/16/2015	12.81	0
4/16/2015 22:00	2015	106	2200	106.9167	4/16/2015	12.78	0
4/16/2015 23:00	2015	106	2300	106.9583	4/16/2015	12.75	0
4/17/2015 0:00	2015	107	0	107	4/17/2015	12.72	0
4/17/2015 1:00	2015	107	100	107.0417	4/17/2015	12.7	0
4/17/2015 2:00	2015	107	200	107.0833	4/17/2015	12.67	0
4/17/2015 3:00	2015	107	300	107.125	4/17/2015	12.64	0
4/17/2015 4:00	2015	107	400	107.1667	4/17/2015	12.6	0
4/17/2015 5:00	2015	107	500	107.2083	4/17/2015	12.55	0
4/17/2015 6:00	2015	107	600	107.25	4/17/2015	12.51	0
4/17/2015 7:00	2015	107	700	107.2917	4/17/2015	12.63	0
4/17/2015 8:00	2015	107	800	107.3333	4/17/2015	13.46	0
4/17/2015 9:00	2015	107	900	107.375	4/17/2015	13.73	0.01
4/17/2015 10:00	2015	107	1000	107.4167	4/17/2015	13.65	0
4/17/2015 11:00	2015	107	1100	107.4583	4/17/2015	13.54	0
4/17/2015 12:00	2015	107	1200	107.5	4/17/2015	13.48	0
4/17/2015 13:00	2015	107	1300	107.5417	4/17/2015	13.45	0
4/17/2015 14:00	2015	107	1400	107.5833	4/17/2015	13.4	0
4/17/2015 15:00	2015	107	1500	107.625	4/17/2015	13.42	0
4/17/2015 16:00	2015	107	1600	107.6667	4/17/2015	13.44	0
4/17/2015 17:00	2015	107	1700	107.7083	4/17/2015	13.44	0
4/17/2015 18:00	2015	107	1800	107.75	4/17/2015	13.47	0
4/17/2015 19:00	2015	107	1900	107.7917	4/17/2015	13.25	0
4/17/2015 20:00	2015	107	2000	107.8333	4/17/2015	12.9	0
4/17/2015 21:00	2015	107	2100	107.875	4/17/2015	12.84	0
4/17/2015 22:00	2015	107	2200	107.9167	4/17/2015	12.8	0
4/17/2015 23:00	2015	107	2300	107.9583	4/17/2015	12.78	0
4/18/2015 0:00	2015	108	0	108	4/18/2015	12.76	0
4/18/2015 1:00	2015	108	100	108.0417	4/18/2015	12.74	0
4/18/2015 2:00	2015	108	200	108.0833	4/18/2015	12.72	0
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4/18/2015 9:00	2015	108	900	108.375	4/18/2015	13.46	0
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4/18/2015 13:00	2015	108	1300	108.5417	4/18/2015	13.26	0
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4/18/2015 17:00	2015	108	1700	108.7083	4/18/2015	13.27	0
4/18/2015 18:00	2015	108	1800	108.75	4/18/2015	13.27	0
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4/18/2015 20:00	2015	108	2000	108.8333	4/18/2015	12.88	0
4/18/2015 21:00	2015	108	2100	108.875	4/18/2015	12.83	0
4/18/2015 22:00	2015	108	2200	108.9167	4/18/2015	12.79	0
4/18/2015 23:00	2015	108	2300	108.9583	4/18/2015	12.76	0
4/19/2015 0:00	2015	109	0	109	4/19/2015	12.74	0
4/19/2015 1:00	2015	109	100	109.0417	4/19/2015	12.71	0
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4/19/2015 19:00	2015	109	1900	109.7917	4/19/2015	13.05	0
4/19/2015 20:00	2015	109	2000	109.8333	4/19/2015	12.87	0
4/19/2015 21:00	2015	109	2100	109.875	4/19/2015	12.82	0
4/19/2015 22:00	2015	109	2200	109.9167	4/19/2015	12.78	0
4/19/2015 23:00	2015	109	2300	109.9583	4/19/2015	12.75	0
4/20/2015 0:00	2015	110	0	110	4/20/2015	12.72	0
4/20/2015 1:00	2015	110	100	110.0417	4/20/2015	12.7	0
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4/20/2015 14:00	2015	110	1400	110.5833	4/20/2015	13.18	0
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4/20/2015 19:00	2015	110	1900	110.7917	4/20/2015	13.06	0
4/20/2015 20:00	2015	110	2000	110.8333	4/20/2015	12.87	0
4/20/2015 21:00	2015	110	2100	110.875	4/20/2015	12.81	0
4/20/2015 22:00	2015	110	2200	110.9167	4/20/2015	12.77	0
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4/22/2015 2:00	2015	112	200	112.0833	4/22/2015	12.69	0
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4/24/2015 19:00	2015	114	1900	114.7917	4/24/2015	13.09	0
4/24/2015 20:00	2015	114	2000	114.8333	4/24/2015	12.87	0
4/24/2015 21:00	2015	114	2100	114.875	4/24/2015	12.82	0
4/24/2015 22:00	2015	114	2200	114.9167	4/24/2015	12.78	0
4/24/2015 23:00	2015	114	2300	114.9583	4/24/2015	12.76	0
4/25/2015 0:00	2015	115	0	115	4/25/2015	12.74	0
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4/25/2015 18:00	2015	115	1800	115.75	4/25/2015	13.28	0.09
4/25/2015 19:00	2015	115	1900	115.7917	4/25/2015	13.05	0
4/25/2015 20:00	2015	115	2000	115.8333	4/25/2015	12.83	0.03
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4/26/2015 0:00	2015	116	0	116	4/26/2015	12.7	0
4/26/2015 1:00	2015	116	100	116.0417	4/26/2015	12.68	0
4/26/2015 2:00	2015	116	200	116.0833	4/26/2015	12.65	0
4/26/2015 3:00	2015	116	300	116.125	4/26/2015	12.62	0.03
4/26/2015 4:00	2015	116	400	116.1667	4/26/2015	12.59	0.03
4/26/2015 5:00	2015	116	500	116.2083	4/26/2015	12.56	0.01
4/26/2015 6:00	2015	116	600	116.25	4/26/2015	12.54	0
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4/26/2015 14:00	2015	116	1400	116.5833	4/26/2015	13.45	0
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4/26/2015 20:00	2015	116	2000	116.8333	4/26/2015	12.9	0
4/26/2015 21:00	2015	116	2100	116.875	4/26/2015	12.84	0
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4/26/2015 23:00	2015	116	2300	116.9583	4/26/2015	12.77	0
4/27/2015 0:00	2015	117	0	117	4/27/2015	12.75	0
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4/28/2015 2:00	2015	118	200	118.0833	4/28/2015	12.67	0
4/28/2015 3:00	2015	118	300	118.125	4/28/2015	12.64	0
4/28/2015 4:00	2015	118	400	118.1667	4/28/2015	12.61	0
4/28/2015 5:00	2015	118	500	118.2083	4/28/2015	12.59	0
4/28/2015 6:00	2015	118	600	118.25	4/28/2015	12.58	0
4/28/2015 7:00	2015	118	700	118.2917	4/28/2015	12.74	0

4/28/2015 8:00	2015	118	800	118.3333	4/28/2015	13.48	0
4/28/2015 9:00	2015	118	900	118.375	4/28/2015	13.44	0
4/28/2015 10:00	2015	118	1000	118.4167	4/28/2015	13.37	0
4/28/2015 11:00	2015	118	1100	118.4583	4/28/2015	13.31	0
4/28/2015 12:00	2015	118	1200	118.5	4/28/2015	13.27	0
4/28/2015 13:00	2015	118	1300	118.5417	4/28/2015	13.22	0
4/28/2015 14:00	2015	118	1400	118.5833	4/28/2015	13.21	0
4/28/2015 15:00	2015	118	1500	118.625	4/28/2015	13.21	0
4/28/2015 16:00	2015	118	1600	118.6667	4/28/2015	13.21	0
4/28/2015 17:00	2015	118	1700	118.7083	4/28/2015	13.23	0
4/28/2015 18:00	2015	118	1800	118.75	4/28/2015	13.21	0
4/28/2015 19:00	2015	118	1900	118.7917	4/28/2015	13.05	0
4/28/2015 20:00	2015	118	2000	118.8333	4/28/2015	12.88	0
4/28/2015 21:00	2015	118	2100	118.875	4/28/2015	12.82	0
4/28/2015 22:00	2015	118	2200	118.9167	4/28/2015	12.78	0
4/28/2015 23:00	2015	118	2300	118.9583	4/28/2015	12.74	0
4/29/2015 0:00	2015	119	0	119	4/29/2015	12.71	0
4/29/2015 1:00	2015	119	100	119.0417	4/29/2015	12.68	0
4/29/2015 2:00	2015	119	200	119.0833	4/29/2015	12.65	0
4/29/2015 3:00	2015	119	300	119.125	4/29/2015	12.62	0
4/29/2015 4:00	2015	119	400	119.1667	4/29/2015	12.59	0
4/29/2015 5:00	2015	119	500	119.2083	4/29/2015	12.57	0
4/29/2015 6:00	2015	119	600	119.25	4/29/2015	12.57	0
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4/29/2015 14:00	2015	119	1400	119.5833	4/29/2015	13.16	0
4/29/2015 15:00	2015	119	1500	119.625	4/29/2015	13.17	0
4/29/2015 16:00	2015	119	1600	119.6667	4/29/2015	13.17	0
4/29/2015 17:00	2015	119	1700	119.7083	4/29/2015	13.19	0
4/29/2015 18:00	2015	119	1800	119.75	4/29/2015	13.19	0
4/29/2015 19:00	2015	119	1900	119.7917	4/29/2015	13.05	0
4/29/2015 20:00	2015	119	2000	119.8333	4/29/2015	12.88	0
4/29/2015 21:00	2015	119	2100	119.875	4/29/2015	12.82	0
4/29/2015 22:00	2015	119	2200	119.9167	4/29/2015	12.77	0
4/29/2015 23:00	2015	119	2300	119.9583	4/29/2015	12.74	0
4/30/2015 0:00	2015	120	0	120	4/30/2015	12.7	0
4/30/2015 1:00	2015	120	100	120.0417	4/30/2015	12.67	0
4/30/2015 2:00	2015	120	200	120.0833	4/30/2015	12.65	0
4/30/2015 3:00	2015	120	300	120.125	4/30/2015	12.63	0
4/30/2015 4:00	2015	120	400	120.1667	4/30/2015	12.62	0
4/30/2015 5:00	2015	120	500	120.2083	4/30/2015	12.61	0
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4/30/2015 7:00	2015	120	700	120.2917	4/30/2015	12.85	0
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4/30/2015 9:00	2015	120	900	120.375	4/30/2015	13.32	0
4/30/2015 10:00	2015	120	1000	120.4167	4/30/2015	13.27	0
4/30/2015 11:00	2015	120	1100	120.4583	4/30/2015	13.21	0
4/30/2015 12:00	2015	120	1200	120.5	4/30/2015	13.17	0
4/30/2015 13:00	2015	120	1300	120.5417	4/30/2015	13.14	0
4/30/2015 14:00	2015	120	1400	120.5833	4/30/2015	13.12	0
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4/30/2015 17:00	2015	120	1700	120.7083	4/30/2015	13.15	0
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4/30/2015 19:00	2015	120	1900	120.7917	4/30/2015	13.12	0
4/30/2015 20:00	2015	120	2000	120.8333	4/30/2015	12.89	0
4/30/2015 21:00	2015	120	2100	120.875	4/30/2015	12.83	0
4/30/2015 22:00	2015	120	2200	120.9167	4/30/2015	12.78	0
4/30/2015 23:00	2015	120	2300	120.9583	4/30/2015	12.76	0
5/1/2015 0:00	2015	121	0	121	5/1/2015	12.73	0
5/1/2015 1:00	2015	121	100	121.0417	5/1/2015	12.7	0
5/1/2015 2:00	2015	121	200	121.0833	5/1/2015	12.68	0
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5/1/2015 10:00	2015	121	1000	121.4167	5/1/2015	13.24	0
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5/1/2015 12:00	2015	121	1200	121.5	5/1/2015	13.15	0
5/1/2015 13:00	2015	121	1300	121.5417	5/1/2015	13.13	0
5/1/2015 14:00	2015	121	1400	121.5833	5/1/2015	13.16	0
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5/1/2015 16:00	2015	121	1600	121.6667	5/1/2015	13.22	0
5/1/2015 17:00	2015	121	1700	121.7083	5/1/2015	13.24	0
5/1/2015 18:00	2015	121	1800	121.75	5/1/2015	13.23	0
5/1/2015 19:00	2015	121	1900	121.7917	5/1/2015	13.06	0
5/1/2015 20:00	2015	121	2000	121.8333	5/1/2015	12.88	0
5/1/2015 21:00	2015	121	2100	121.875	5/1/2015	12.81	0
5/1/2015 22:00	2015	121	2200	121.9167	5/1/2015	12.77	0
5/1/2015 23:00	2015	121	2300	121.9583	5/1/2015	12.75	0
5/2/2015 0:00	2015	122	0	122	5/2/2015	12.72	0
5/2/2015 1:00	2015	122	100	122.0417	5/2/2015	12.7	0
5/2/2015 2:00	2015	122	200	122.0833	5/2/2015	12.68	0
5/2/2015 3:00	2015	122	300	122.125	5/2/2015	12.66	0
5/2/2015 4:00	2015	122	400	122.1667	5/2/2015	12.64	0
5/2/2015 5:00	2015	122	500	122.2083	5/2/2015	12.63	0

5/2/2015 6:00	2015	122	600	122.25	5/2/2015	12.62	0
5/2/2015 7:00	2015	122	700	122.2917	5/2/2015	12.84	0
5/2/2015 8:00	2015	122	800	122.3333	5/2/2015	13.37	0
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5/2/2015 10:00	2015	122	1000	122.4167	5/2/2015	13.25	0
5/2/2015 11:00	2015	122	1100	122.4583	5/2/2015	13.21	0
5/2/2015 12:00	2015	122	1200	122.5	5/2/2015	13.19	0
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5/2/2015 14:00	2015	122	1400	122.5833	5/2/2015	13.18	0
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5/2/2015 16:00	2015	122	1600	122.6667	5/2/2015	13.19	0
5/2/2015 17:00	2015	122	1700	122.7083	5/2/2015	13.19	0
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5/2/2015 19:00	2015	122	1900	122.7917	5/2/2015	13.15	0
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5/2/2015 21:00	2015	122	2100	122.875	5/2/2015	12.81	0
5/2/2015 22:00	2015	122	2200	122.9167	5/2/2015	12.77	0
5/2/2015 23:00	2015	122	2300	122.9583	5/2/2015	12.74	0
5/3/2015 0:00	2015	123	0	123	5/3/2015	12.71	0
5/3/2015 1:00	2015	123	100	123.0417	5/3/2015	12.68	0
5/3/2015 2:00	2015	123	200	123.0833	5/3/2015	12.65	0
5/3/2015 3:00	2015	123	300	123.125	5/3/2015	12.63	0
5/3/2015 4:00	2015	123	400	123.1667	5/3/2015	12.61	0
5/3/2015 5:00	2015	123	500	123.2083	5/3/2015	12.6	0
5/3/2015 6:00	2015	123	600	123.25	5/3/2015	12.6	0
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5/3/2015 10:00	2015	123	1000	123.4167	5/3/2015	13.26	0
5/3/2015 11:00	2015	123	1100	123.4583	5/3/2015	13.26	0
5/3/2015 12:00	2015	123	1200	123.5	5/3/2015	13.28	0
5/3/2015 13:00	2015	123	1300	123.5417	5/3/2015	13.26	0
5/3/2015 14:00	2015	123	1400	123.5833	5/3/2015	13.29	0
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5/3/2015 16:00	2015	123	1600	123.6667	5/3/2015	13.26	0
5/3/2015 17:00	2015	123	1700	123.7083	5/3/2015	13.26	0
5/3/2015 18:00	2015	123	1800	123.75	5/3/2015	13.23	0
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5/3/2015 21:00	2015	123	2100	123.875	5/3/2015	12.8	0
5/3/2015 22:00	2015	123	2200	123.9167	5/3/2015	12.76	0
5/3/2015 23:00	2015	123	2300	123.9583	5/3/2015	12.73	0
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5/4/2015 2:00	2015	124	200	124.0833	5/4/2015	12.65	0
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5/4/2015 5:00	2015	124	500	124.2083	5/4/2015	12.57	0
5/4/2015 6:00	2015	124	600	124.25	5/4/2015	12.58	0
5/4/2015 7:00	2015	124	700	124.2917	5/4/2015	12.81	0
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5/4/2015 14:00	2015	124	1400	124.5833	5/4/2015	13.38	0
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5/4/2015 17:00	2015	124	1700	124.7083	5/4/2015	13.18	0.04
5/4/2015 18:00	2015	124	1800	124.75	5/4/2015	12.96	0.05
5/4/2015 19:00	2015	124	1900	124.7917	5/4/2015	13.04	0
5/4/2015 20:00	2015	124	2000	124.8333	5/4/2015	12.84	0
5/4/2015 21:00	2015	124	2100	124.875	5/4/2015	12.8	0
5/4/2015 22:00	2015	124	2200	124.9167	5/4/2015	12.78	0
5/4/2015 23:00	2015	124	2300	124.9583	5/4/2015	12.75	0
5/5/2015 0:00	2015	125	0	125	5/5/2015	12.73	0
5/5/2015 1:00	2015	125	100	125.0417	5/5/2015	12.7	0
5/5/2015 2:00	2015	125	200	125.0833	5/5/2015	12.67	0
5/5/2015 3:00	2015	125	300	125.125	5/5/2015	12.63	0
5/5/2015 4:00	2015	125	400	125.1667	5/5/2015	12.6	0
5/5/2015 5:00	2015	125	500	125.2083	5/5/2015	12.57	0
5/5/2015 6:00	2015	125	600	125.25	5/5/2015	12.57	0
5/5/2015 7:00	2015	125	700	125.2917	5/5/2015	12.89	0
5/5/2015 8:00	2015	125	800	125.3333	5/5/2015	13.5	0
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5/5/2015 10:00	2015	125	1000	125.4167	5/5/2015	13.38	0
5/5/2015 11:00	2015	125	1100	125.4583	5/5/2015	13.33	0
5/5/2015 12:00	2015	125	1200	125.5	5/5/2015	13.29	0
5/5/2015 13:00	2015	125	1300	125.5417	5/5/2015	13.27	0
5/5/2015 14:00	2015	125	1400	125.5833	5/5/2015	13.29	0
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5/5/2015 16:00	2015	125	1600	125.6667	5/5/2015	13.28	0
5/5/2015 17:00	2015	125	1700	125.7083	5/5/2015	13.29	0
5/5/2015 18:00	2015	125	1800	125.75	5/5/2015	13.2	0
5/5/2015 19:00	2015	125	1900	125.7917	5/5/2015	13.13	0
5/5/2015 20:00	2015	125	2000	125.8333	5/5/2015	12.88	0
5/5/2015 21:00	2015	125	2100	125.875	5/5/2015	12.82	0
5/5/2015 22:00	2015	125	2200	125.9167	5/5/2015	12.79	0
5/5/2015 23:00	2015	125	2300	125.9583	5/5/2015	12.77	0
5/6/2015 0:00	2015	126	0	126	5/6/2015	12.75	0
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5/6/2015 2:00	2015	126	200	126.0833	5/6/2015	12.7	0
5/6/2015 3:00	2015	126	300	126.125	5/6/2015	12.67	0

5/6/2015 4:00	2015	126	400	126.1667	5/6/2015	12.64	0
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5/6/2015 6:00	2015	126	600	126.25	5/6/2015	12.6	0
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5/6/2015 10:00	2015	126	1000	126.4167	5/6/2015	13.39	0
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5/6/2015 12:00	2015	126	1200	126.5	5/6/2015	13.25	0
5/6/2015 13:00	2015	126	1300	126.5417	5/6/2015	13.22	0
5/6/2015 14:00	2015	126	1400	126.5833	5/6/2015	13.22	0
5/6/2015 15:00	2015	126	1500	126.625	5/6/2015	13.22	0
5/6/2015 16:00	2015	126	1600	126.6667	5/6/2015	13.22	0
5/6/2015 17:00	2015	126	1700	126.7083	5/6/2015	13.24	0
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5/6/2015 20:00	2015	126	2000	126.8333	5/6/2015	12.89	0
5/6/2015 21:00	2015	126	2100	126.875	5/6/2015	12.83	0
5/6/2015 22:00	2015	126	2200	126.9167	5/6/2015	12.79	0
5/6/2015 23:00	2015	126	2300	126.9583	5/6/2015	12.76	0
5/7/2015 0:00	2015	127	0	127	5/7/2015	12.74	0
5/7/2015 1:00	2015	127	100	127.0417	5/7/2015	12.72	0
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5/7/2015 5:00	2015	127	500	127.2083	5/7/2015	12.59	0
5/7/2015 6:00	2015	127	600	127.25	5/7/2015	12.58	0
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5/7/2015 12:00	2015	127	1200	127.5	5/7/2015	13.27	0
5/7/2015 13:00	2015	127	1300	127.5417	5/7/2015	13.23	0
5/7/2015 14:00	2015	127	1400	127.5833	5/7/2015	13.21	0
5/7/2015 15:00	2015	127	1500	127.625	5/7/2015	13.21	0
5/7/2015 16:00	2015	127	1600	127.6667	5/7/2015	13.22	0
5/7/2015 17:00	2015	127	1700	127.7083	5/7/2015	13.25	0
5/7/2015 18:00	2015	127	1800	127.75	5/7/2015	13.28	0
5/7/2015 19:00	2015	127	1900	127.7917	5/7/2015	13.13	0
5/7/2015 20:00	2015	127	2000	127.8333	5/7/2015	12.88	0
5/7/2015 21:00	2015	127	2100	127.875	5/7/2015	12.81	0
5/7/2015 22:00	2015	127	2200	127.9167	5/7/2015	12.77	0
5/7/2015 23:00	2015	127	2300	127.9583	5/7/2015	12.74	0
5/8/2015 0:00	2015	128	0	128	5/8/2015	12.71	0
5/8/2015 1:00	2015	128	100	128.0417	5/8/2015	12.69	0
5/8/2015 2:00	2015	128	200	128.0833	5/8/2015	12.65	0

5/8/2015 3:00	2015	128	300	128.125	5/8/2015	12.62	0
5/8/2015 4:00	2015	128	400	128.1667	5/8/2015	12.59	0
5/8/2015 5:00	2015	128	500	128.2083	5/8/2015	12.56	0
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5/8/2015 7:00	2015	128	700	128.2917	5/8/2015	12.89	0
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5/8/2015 9:00	2015	128	900	128.375	5/8/2015	13.48	0
5/8/2015 10:00	2015	128	1000	128.4167	5/8/2015	13.4	0
5/8/2015 11:00	2015	128	1100	128.4583	5/8/2015	13.33	0
5/8/2015 12:00	2015	128	1200	128.5	5/8/2015	13.29	0
5/8/2015 13:00	2015	128	1300	128.5417	5/8/2015	13.27	0
5/8/2015 14:00	2015	128	1400	128.5833	5/8/2015	13.28	0
5/8/2015 15:00	2015	128	1500	128.625	5/8/2015	13.35	0
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5/8/2015 19:00	2015	128	1900	128.7917	5/8/2015	13.26	0
5/8/2015 20:00	2015	128	2000	128.8333	5/8/2015	12.88	0
5/8/2015 21:00	2015	128	2100	128.875	5/8/2015	12.79	0
5/8/2015 22:00	2015	128	2200	128.9167	5/8/2015	12.75	0
5/8/2015 23:00	2015	128	2300	128.9583	5/8/2015	12.73	0
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5/9/2015 21:00	2015	129	2100	129.875	5/9/2015	12.83	0
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5/9/2015 23:00	2015	129	2300	129.9583	5/9/2015	12.77	0
5/10/2015 0:00	2015	130	0	130	5/10/2015	12.75	0
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5/10/2015 9:00	2015	130	900	130.375	5/10/2015	13.46	0
5/10/2015 10:00	2015	130	1000	130.4167	5/10/2015	13.4	0
5/10/2015 11:00	2015	130	1100	130.4583	5/10/2015	13.36	0
5/10/2015 12:00	2015	130	1200	130.5	5/10/2015	13.3	0
5/10/2015 13:00	2015	130	1300	130.5417	5/10/2015	13.26	0
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5/10/2015 20:00	2015	130	2000	130.8333	5/10/2015	12.9	0
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5/11/2015 12:00	2015	131	1200	131.5	5/11/2015	13.26	0
5/11/2015 13:00	2015	131	1300	131.5417	5/11/2015	13.22	0
5/11/2015 14:00	2015	131	1400	131.5833	5/11/2015	13.21	0
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5/11/2015 18:00	2015	131	1800	131.75	5/11/2015	13.25	0
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5/11/2015 21:00	2015	131	2100	131.875	5/11/2015	12.83	0
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5/12/2015 21:00	2015	132	2100	132.875	5/12/2015	12.82	0
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5/13/2015 1:00	2015	133	100	133.0417	5/13/2015	12.69	0
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5/13/2015 10:00	2015	133	1000	133.4167	5/13/2015	13.34	0
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5/14/2015 18:00	2015	134	1800	134.75	5/14/2015	13.33	0
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5/14/2015 21:00	2015	134	2100	134.875	5/14/2015	12.82	0
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5/15/2015 13:00	2015	135	1300	135.5417	5/15/2015	13.34	0
5/15/2015 14:00	2015	135	1400	135.5833	5/15/2015	13.29	0
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5/15/2015 20:00	2015	135	2000	135.8333	5/15/2015	12.87	0
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5/15/2015 22:00	2015	135	2200	135.9167	5/15/2015	12.78	0

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5/16/2015 20:00	2015	136	2000	136.8333	5/16/2015	12.9	0
5/16/2015 21:00	2015	136	2100	136.875	5/16/2015	12.83	0
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5/17/2015 10:00	2015	137	1000	137.4167	5/17/2015	13.36	0
5/17/2015 11:00	2015	137	1100	137.4583	5/17/2015	13.29	0
5/17/2015 12:00	2015	137	1200	137.5	5/17/2015	13.24	0
5/17/2015 13:00	2015	137	1300	137.5417	5/17/2015	13.22	0
5/17/2015 14:00	2015	137	1400	137.5833	5/17/2015	13.21	0
5/17/2015 15:00	2015	137	1500	137.625	5/17/2015	13.22	0
5/17/2015 16:00	2015	137	1600	137.6667	5/17/2015	13.22	0
5/17/2015 17:00	2015	137	1700	137.7083	5/17/2015	13.24	0
5/17/2015 18:00	2015	137	1800	137.75	5/17/2015	13.21	0
5/17/2015 19:00	2015	137	1900	137.7917	5/17/2015	13	0
5/17/2015 20:00	2015	137	2000	137.8333	5/17/2015	12.87	0
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5/18/2015 0:00	2015	138	0	138	5/18/2015	12.71	0
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5/18/2015 16:00	2015	138	1600	138.6667	5/18/2015	13.29	0
5/18/2015 17:00	2015	138	1700	138.7083	5/18/2015	13.32	0
5/18/2015 18:00	2015	138	1800	138.75	5/18/2015	13.35	0
5/18/2015 19:00	2015	138	1900	138.7917	5/18/2015	13.34	0
5/18/2015 20:00	2015	138	2000	138.8333	5/18/2015	12.97	0
5/18/2015 21:00	2015	138	2100	138.875	5/18/2015	12.84	0
5/18/2015 22:00	2015	138	2200	138.9167	5/18/2015	12.79	0
5/18/2015 23:00	2015	138	2300	138.9583	5/18/2015	12.76	0
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5/19/2015 11:00	2015	139	1100	139.4583	5/19/2015	13.3	0
5/19/2015 12:00	2015	139	1200	139.5	5/19/2015	13.26	0
5/19/2015 13:00	2015	139	1300	139.5417	5/19/2015	13.26	0
5/19/2015 14:00	2015	139	1400	139.5833	5/19/2015	13.27	0
5/19/2015 15:00	2015	139	1500	139.625	5/19/2015	13.26	0
5/19/2015 16:00	2015	139	1600	139.6667	5/19/2015	13.23	0
5/19/2015 17:00	2015	139	1700	139.7083	5/19/2015	13.23	0
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5/19/2015 21:00	2015	139	2100	139.875	5/19/2015	12.83	0
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5/19/2015 23:00	2015	139	2300	139.9583	5/19/2015	12.76	0
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5/20/2015 2:00	2015	140	200	140.0833	5/20/2015	12.67	0
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5/20/2015 14:00	2015	140	1400	140.5833	5/20/2015	13.18	0
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5/20/2015 19:00	2015	140	1900	140.7917	5/20/2015	13.19	0
5/20/2015 20:00	2015	140	2000	140.8333	5/20/2015	12.95	0
5/20/2015 21:00	2015	140	2100	140.875	5/20/2015	12.85	0
5/20/2015 22:00	2015	140	2200	140.9167	5/20/2015	12.81	0
5/20/2015 23:00	2015	140	2300	140.9583	5/20/2015	12.78	0
5/21/2015 0:00	2015	141	0	141	5/21/2015	12.75	0
5/21/2015 1:00	2015	141	100	141.0417	5/21/2015	12.72	0
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5/21/2015 6:00	2015	141	600	141.25	5/21/2015	12.61	0
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5/21/2015 12:00	2015	141	1200	141.5	5/21/2015	13.29	0
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5/21/2015 14:00	2015	141	1400	141.5833	5/21/2015	13.28	0
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5/21/2015 18:00	2015	141	1800	141.75	5/21/2015	13.33	0
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5/21/2015 20:00	2015	141	2000	141.8333	5/21/2015	12.94	0
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5/21/2015 22:00	2015	141	2200	141.9167	5/21/2015	12.8	0
5/21/2015 23:00	2015	141	2300	141.9583	5/21/2015	12.76	0
5/22/2015 0:00	2015	142	0	142	5/22/2015	12.73	0
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5/22/2015 5:00	2015	142	500	142.2083	5/22/2015	12.59	0
5/22/2015 6:00	2015	142	600	142.25	5/22/2015	12.6	0
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5/22/2015 10:00	2015	142	1000	142.4167	5/22/2015	13.35	0
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5/22/2015 13:00	2015	142	1300	142.5417	5/22/2015	13.26	0
5/22/2015 14:00	2015	142	1400	142.5833	5/22/2015	13.25	0
5/22/2015 15:00	2015	142	1500	142.625	5/22/2015	13.29	0
5/22/2015 16:00	2015	142	1600	142.6667	5/22/2015	13.3	0
5/22/2015 17:00	2015	142	1700	142.7083	5/22/2015	13.36	0
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5/22/2015 20:00	2015	142	2000	142.8333	5/22/2015	12.85	0.01
5/22/2015 21:00	2015	142	2100	142.875	5/22/2015	12.78	0
5/22/2015 22:00	2015	142	2200	142.9167	5/22/2015	12.74	0
5/22/2015 23:00	2015	142	2300	142.9583	5/22/2015	12.72	0
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5/23/2015 19:00	2015	143	1900	143.7917	5/23/2015	13.17	0
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5/23/2015 21:00	2015	143	2100	143.875	5/23/2015	12.84	0
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5/24/2015 0:00	2015	144	0	144	5/24/2015	12.75	0
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5/24/2015 20:00	2015	144	2000	144.8333	5/24/2015	12.91	0
5/24/2015 21:00	2015	144	2100	144.875	5/24/2015	12.84	0
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5/25/2015 0:00	2015	145	0	145	5/25/2015	12.77	0
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5/25/2015 7:00	2015	145	700	145.2917	5/25/2015	12.75	0.01
5/25/2015 8:00	2015	145	800	145.3333	5/25/2015	13.39	0
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5/25/2015 15:00	2015	145	1500	145.625	5/25/2015	13.24	0
5/25/2015 16:00	2015	145	1600	145.6667	5/25/2015	13.23	0
5/25/2015 17:00	2015	145	1700	145.7083	5/25/2015	13.24	0

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5/25/2015 20:00	2015	145	2000	145.8333	5/25/2015	12.94	0
5/25/2015 21:00	2015	145	2100	145.875	5/25/2015	12.85	0
5/25/2015 22:00	2015	145	2200	145.9167	5/25/2015	12.81	0
5/25/2015 23:00	2015	145	2300	145.9583	5/25/2015	12.78	0
5/26/2015 0:00	2015	146	0	146	5/26/2015	12.75	0
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5/26/2015 3:00	2015	146	300	146.125	5/26/2015	12.67	0
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5/26/2015 14:00	2015	146	1400	146.5833	5/26/2015	13.19	0
5/26/2015 15:00	2015	146	1500	146.625	5/26/2015	13.2	0
5/26/2015 16:00	2015	146	1600	146.6667	5/26/2015	13.19	0
5/26/2015 17:00	2015	146	1700	146.7083	5/26/2015	13.18	0
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5/26/2015 20:00	2015	146	2000	146.8333	5/26/2015	12.94	0
5/26/2015 21:00	2015	146	2100	146.875	5/26/2015	12.85	0
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5/27/2015 0:00	2015	147	0	147	5/27/2015	12.74	0
5/27/2015 1:00	2015	147	100	147.0417	5/27/2015	12.72	0
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5/27/2015 18:00	2015	147	1800	147.75	5/27/2015	13.19	0
5/27/2015 19:00	2015	147	1900	147.7917	5/27/2015	13.09	0
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5/27/2015 21:00	2015	147	2100	147.875	5/27/2015	12.83	0
5/27/2015 22:00	2015	147	2200	147.9167	5/27/2015	12.78	0
5/27/2015 23:00	2015	147	2300	147.9583	5/27/2015	12.75	0
5/28/2015 0:00	2015	148	0	148	5/28/2015	12.71	0
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5/28/2015 14:00	2015	148	1400	148.5833	5/28/2015	13.1	0
5/28/2015 15:00	2015	148	1500	148.625	5/28/2015	13.12	0
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5/28/2015 17:00	2015	148	1700	148.7083	5/28/2015	13.12	0
5/28/2015 18:00	2015	148	1800	148.75	5/28/2015	13.13	0
5/28/2015 19:00	2015	148	1900	148.7917	5/28/2015	13.07	0
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5/28/2015 21:00	2015	148	2100	148.875	5/28/2015	12.81	0
5/28/2015 22:00	2015	148	2200	148.9167	5/28/2015	12.77	0
5/28/2015 23:00	2015	148	2300	148.9583	5/28/2015	12.73	0
5/29/2015 0:00	2015	149	0	149	5/29/2015	12.69	0
5/29/2015 1:00	2015	149	100	149.0417	5/29/2015	12.66	0
5/29/2015 2:00	2015	149	200	149.0833	5/29/2015	12.63	0
5/29/2015 3:00	2015	149	300	149.125	5/29/2015	12.62	0
5/29/2015 4:00	2015	149	400	149.1667	5/29/2015	12.6	0
5/29/2015 5:00	2015	149	500	149.2083	5/29/2015	12.59	0
5/29/2015 6:00	2015	149	600	149.25	5/29/2015	12.63	0
5/29/2015 7:00	2015	149	700	149.2917	5/29/2015	12.88	0
5/29/2015 8:00	2015	149	800	149.3333	5/29/2015	13.34	0
5/29/2015 9:00	2015	149	900	149.375	5/29/2015	13.29	0
5/29/2015 10:00	2015	149	1000	149.4167	5/29/2015	13.24	0
5/29/2015 11:00	2015	149	1100	149.4583	5/29/2015	13.19	0
5/29/2015 12:00	2015	149	1200	149.5	5/29/2015	13.15	0
5/29/2015 13:00	2015	149	1300	149.5417	5/29/2015	13.12	0
5/29/2015 14:00	2015	149	1400	149.5833	5/29/2015	13.15	0
5/29/2015 15:00	2015	149	1500	149.625	5/29/2015	13.18	0

5/29/2015 16:00	2015	149	1600	149.6667	5/29/2015	13.19	0
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5/29/2015 18:00	2015	149	1800	149.75	5/29/2015	13.19	0
5/29/2015 19:00	2015	149	1900	149.7917	5/29/2015	13.06	0
5/29/2015 20:00	2015	149	2000	149.8333	5/29/2015	12.88	0
5/29/2015 21:00	2015	149	2100	149.875	5/29/2015	12.82	0
5/29/2015 22:00	2015	149	2200	149.9167	5/29/2015	12.79	0
5/29/2015 23:00	2015	149	2300	149.9583	5/29/2015	12.75	0
5/30/2015 0:00	2015	150	0	150	5/30/2015	12.71	0
5/30/2015 1:00	2015	150	100	150.0417	5/30/2015	12.68	0
5/30/2015 2:00	2015	150	200	150.0833	5/30/2015	12.65	0
5/30/2015 3:00	2015	150	300	150.125	5/30/2015	12.62	0
5/30/2015 4:00	2015	150	400	150.1667	5/30/2015	12.6	0
5/30/2015 5:00	2015	150	500	150.2083	5/30/2015	12.59	0
5/30/2015 6:00	2015	150	600	150.25	5/30/2015	12.62	0
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5/30/2015 8:00	2015	150	800	150.3333	5/30/2015	13.34	0
5/30/2015 9:00	2015	150	900	150.375	5/30/2015	13.29	0
5/30/2015 10:00	2015	150	1000	150.4167	5/30/2015	13.23	0
5/30/2015 11:00	2015	150	1100	150.4583	5/30/2015	13.17	0
5/30/2015 12:00	2015	150	1200	150.5	5/30/2015	13.13	0
5/30/2015 13:00	2015	150	1300	150.5417	5/30/2015	13.11	0
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5/30/2015 16:00	2015	150	1600	150.6667	5/30/2015	13.11	0
5/30/2015 17:00	2015	150	1700	150.7083	5/30/2015	13.12	0
5/30/2015 18:00	2015	150	1800	150.75	5/30/2015	13.15	0
5/30/2015 19:00	2015	150	1900	150.7917	5/30/2015	13.11	0
5/30/2015 20:00	2015	150	2000	150.8333	5/30/2015	12.91	0
5/30/2015 21:00	2015	150	2100	150.875	5/30/2015	12.82	0
5/30/2015 22:00	2015	150	2200	150.9167	5/30/2015	12.78	0
5/30/2015 23:00	2015	150	2300	150.9583	5/30/2015	12.74	0
5/31/2015 0:00	2015	151	0	151	5/31/2015	12.71	0
5/31/2015 1:00	2015	151	100	151.0417	5/31/2015	12.68	0
5/31/2015 2:00	2015	151	200	151.0833	5/31/2015	12.67	0
5/31/2015 3:00	2015	151	300	151.125	5/31/2015	12.65	0
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5/31/2015 8:00	2015	151	800	151.3333	5/31/2015	13.26	0
5/31/2015 9:00	2015	151	900	151.375	5/31/2015	13.24	0
5/31/2015 10:00	2015	151	1000	151.4167	5/31/2015	13.2	0
5/31/2015 11:00	2015	151	1100	151.4583	5/31/2015	13.14	0
5/31/2015 12:00	2015	151	1200	151.5	5/31/2015	13.14	0
5/31/2015 13:00	2015	151	1300	151.5417	5/31/2015	13.14	0
5/31/2015 14:00	2015	151	1400	151.5833	5/31/2015	13.11	0

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5/31/2015 17:00	2015	151	1700	151.7083	5/31/2015	13.1	0
5/31/2015 18:00	2015	151	1800	151.75	5/31/2015	13.11	0
5/31/2015 19:00	2015	151	1900	151.7917	5/31/2015	13.08	0
5/31/2015 20:00	2015	151	2000	151.8333	5/31/2015	12.91	0
5/31/2015 21:00	2015	151	2100	151.875	5/31/2015	12.83	0
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5/31/2015 23:00	2015	151	2300	151.9583	5/31/2015	12.75	0
6/1/2015 0:00	2015	152	0	152	6/1/2015	12.71	0
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6/1/2015 6:00	2015	152	600	152.25	6/1/2015	12.65	0
6/1/2015 7:00	2015	152	700	152.2917	6/1/2015	12.83	0
6/1/2015 8:00	2015	152	800	152.3333	6/1/2015	13.26	0
6/1/2015 9:00	2015	152	900	152.375	6/1/2015	13.24	0
6/1/2015 10:00	2015	152	1000	152.4167	6/1/2015	13.18	0
6/1/2015 11:00	2015	152	1100	152.4583	6/1/2015	13.13	0
6/1/2015 12:00	2015	152	1200	152.5	6/1/2015	13.09	0
6/1/2015 13:00	2015	152	1300	152.5417	6/1/2015	13.06	0
6/1/2015 14:00	2015	152	1400	152.5833	6/1/2015	13.06	0
6/1/2015 15:00	2015	152	1500	152.625	6/1/2015	13.08	0
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6/1/2015 20:00	2015	152	2000	152.8333	6/1/2015	12.92	0
6/1/2015 21:00	2015	152	2100	152.875	6/1/2015	12.82	0
6/1/2015 22:00	2015	152	2200	152.9167	6/1/2015	12.77	0
6/1/2015 23:00	2015	152	2300	152.9583	6/1/2015	12.74	0
6/2/2015 0:00	2015	153	0	153	6/2/2015	12.7	0
6/2/2015 1:00	2015	153	100	153.0417	6/2/2015	12.66	0
6/2/2015 2:00	2015	153	200	153.0833	6/2/2015	12.64	0
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6/2/2015 4:00	2015	153	400	153.1667	6/2/2015	12.6	0
6/2/2015 5:00	2015	153	500	153.2083	6/2/2015	12.59	0
6/2/2015 6:00	2015	153	600	153.25	6/2/2015	12.63	0
6/2/2015 7:00	2015	153	700	153.2917	6/2/2015	12.93	0
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6/2/2015 9:00	2015	153	900	153.375	6/2/2015	13.28	0
6/2/2015 10:00	2015	153	1000	153.4167	6/2/2015	13.22	0
6/2/2015 11:00	2015	153	1100	153.4583	6/2/2015	13.16	0
6/2/2015 12:00	2015	153	1200	153.5	6/2/2015	13.11	0
6/2/2015 13:00	2015	153	1300	153.5417	6/2/2015	13.09	0

6/2/2015 14:00	2015	153	1400	153.5833	6/2/2015	13.08	0
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6/2/2015 16:00	2015	153	1600	153.6667	6/2/2015	13.1	0
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6/2/2015 18:00	2015	153	1800	153.75	6/2/2015	13.12	0
6/2/2015 19:00	2015	153	1900	153.7917	6/2/2015	13.08	0
6/2/2015 20:00	2015	153	2000	153.8333	6/2/2015	12.91	0
6/2/2015 21:00	2015	153	2100	153.875	6/2/2015	12.81	0
6/2/2015 22:00	2015	153	2200	153.9167	6/2/2015	12.76	0
6/2/2015 23:00	2015	153	2300	153.9583	6/2/2015	12.72	0
6/3/2015 0:00	2015	154	0	154	6/3/2015	12.69	0
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6/3/2015 4:00	2015	154	400	154.1667	6/3/2015	12.6	0
6/3/2015 5:00	2015	154	500	154.2083	6/3/2015	12.59	0
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6/3/2015 7:00	2015	154	700	154.2917	6/3/2015	12.85	0
6/3/2015 8:00	2015	154	800	154.3333	6/3/2015	13.29	0
6/3/2015 9:00	2015	154	900	154.375	6/3/2015	13.28	0
6/3/2015 10:00	2015	154	1000	154.4167	6/3/2015	13.23	0
6/3/2015 11:00	2015	154	1100	154.4583	6/3/2015	13.18	0
6/3/2015 12:00	2015	154	1200	154.5	6/3/2015	13.12	0
6/3/2015 13:00	2015	154	1300	154.5417	6/3/2015	13.09	0
6/3/2015 14:00	2015	154	1400	154.5833	6/3/2015	13.08	0
6/3/2015 15:00	2015	154	1500	154.625	6/3/2015	13.11	0
6/3/2015 16:00	2015	154	1600	154.6667	6/3/2015	13.11	0
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6/3/2015 20:00	2015	154	2000	154.8333	6/3/2015	12.9	0
6/3/2015 21:00	2015	154	2100	154.875	6/3/2015	12.81	0
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6/3/2015 23:00	2015	154	2300	154.9583	6/3/2015	12.72	0
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6/4/2015 3:00	2015	155	300	155.125	6/4/2015	12.58	0
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6/4/2015 7:00	2015	155	700	155.2917	6/4/2015	12.83	0
6/4/2015 8:00	2015	155	800	155.3333	6/4/2015	13.36	0
6/4/2015 9:00	2015	155	900	155.375	6/4/2015	13.33	0
6/4/2015 10:00	2015	155	1000	155.4167	6/4/2015	13.26	0
6/4/2015 11:00	2015	155	1100	155.4583	6/4/2015	13.2	0
6/4/2015 12:00	2015	155	1200	155.5	6/4/2015	13.14	0

6/4/2015 13:00	2015	155	1300	155.5417	6/4/2015	13.1	0
6/4/2015 14:00	2015	155	1400	155.5833	6/4/2015	13.09	0
6/4/2015 15:00	2015	155	1500	155.625	6/4/2015	13.1	0
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6/4/2015 17:00	2015	155	1700	155.7083	6/4/2015	13.13	0
6/4/2015 18:00	2015	155	1800	155.75	6/4/2015	13.14	0
6/4/2015 19:00	2015	155	1900	155.7917	6/4/2015	12.95	0
6/4/2015 20:00	2015	155	2000	155.8333	6/4/2015	12.85	0
6/4/2015 21:00	2015	155	2100	155.875	6/4/2015	12.79	0
6/4/2015 22:00	2015	155	2200	155.9167	6/4/2015	12.76	0
6/4/2015 23:00	2015	155	2300	155.9583	6/4/2015	12.72	0
6/5/2015 0:00	2015	156	0	156	6/5/2015	12.69	0
6/5/2015 1:00	2015	156	100	156.0417	6/5/2015	12.65	0
6/5/2015 2:00	2015	156	200	156.0833	6/5/2015	12.62	0
6/5/2015 3:00	2015	156	300	156.125	6/5/2015	12.6	0
6/5/2015 4:00	2015	156	400	156.1667	6/5/2015	12.58	0
6/5/2015 5:00	2015	156	500	156.2083	6/5/2015	12.57	0
6/5/2015 6:00	2015	156	600	156.25	6/5/2015	12.57	0
6/5/2015 7:00	2015	156	700	156.2917	6/5/2015	12.87	0
6/5/2015 8:00	2015	156	800	156.3333	6/5/2015	13.38	0
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6/5/2015 10:00	2015	156	1000	156.4167	6/5/2015	13.32	0
6/5/2015 11:00	2015	156	1100	156.4583	6/5/2015	13.28	0
6/5/2015 12:00	2015	156	1200	156.5	6/5/2015	13.23	0
6/5/2015 13:00	2015	156	1300	156.5417	6/5/2015	13.2	0
6/5/2015 14:00	2015	156	1400	156.5833	6/5/2015	13.16	0
6/5/2015 15:00	2015	156	1500	156.625	6/5/2015	13.16	0
6/5/2015 16:00	2015	156	1600	156.6667	6/5/2015	13.17	0
6/5/2015 17:00	2015	156	1700	156.7083	6/5/2015	13.19	0
6/5/2015 18:00	2015	156	1800	156.75	6/5/2015	13.2	0
6/5/2015 19:00	2015	156	1900	156.7917	6/5/2015	13.02	0
6/5/2015 20:00	2015	156	2000	156.8333	6/5/2015	12.88	0
6/5/2015 21:00	2015	156	2100	156.875	6/5/2015	12.8	0.01
6/5/2015 22:00	2015	156	2200	156.9167	6/5/2015	12.76	0.1
6/5/2015 23:00	2015	156	2300	156.9583	6/5/2015	12.74	0
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6/6/2015 1:00	2015	157	100	157.0417	6/6/2015	12.69	0.02
6/6/2015 2:00	2015	157	200	157.0833	6/6/2015	12.67	0
6/6/2015 3:00	2015	157	300	157.125	6/6/2015	12.64	0
6/6/2015 4:00	2015	157	400	157.1667	6/6/2015	12.61	0
6/6/2015 5:00	2015	157	500	157.2083	6/6/2015	12.59	0
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6/6/2015 7:00	2015	157	700	157.2917	6/6/2015	13	0
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6/6/2015 9:00	2015	157	900	157.375	6/6/2015	13.35	0
6/6/2015 10:00	2015	157	1000	157.4167	6/6/2015	13.31	0
6/6/2015 11:00	2015	157	1100	157.4583	6/6/2015	13.28	0

6/6/2015 12:00	2015	157	1200	157.5	6/6/2015	13.24	0
6/6/2015 13:00	2015	157	1300	157.5417	6/6/2015	13.18	0
6/6/2015 14:00	2015	157	1400	157.5833	6/6/2015	13.16	0
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6/6/2015 16:00	2015	157	1600	157.6667	6/6/2015	13.17	0
6/6/2015 17:00	2015	157	1700	157.7083	6/6/2015	13.17	0
6/6/2015 18:00	2015	157	1800	157.75	6/6/2015	13.17	0
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6/6/2015 21:00	2015	157	2100	157.875	6/6/2015	12.83	0
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6/6/2015 23:00	2015	157	2300	157.9583	6/6/2015	12.75	0
6/7/2015 0:00	2015	158	0	158	6/7/2015	12.72	0
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6/7/2015 6:00	2015	158	600	158.25	6/7/2015	12.6	0
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6/7/2015 8:00	2015	158	800	158.3333	6/7/2015	13.34	0
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6/7/2015 11:00	2015	158	1100	158.4583	6/7/2015	13.22	0
6/7/2015 12:00	2015	158	1200	158.5	6/7/2015	13.17	0
6/7/2015 13:00	2015	158	1300	158.5417	6/7/2015	13.13	0
6/7/2015 14:00	2015	158	1400	158.5833	6/7/2015	13.12	0
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6/7/2015 16:00	2015	158	1600	158.6667	6/7/2015	13.14	0
6/7/2015 17:00	2015	158	1700	158.7083	6/7/2015	13.16	0
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6/7/2015 21:00	2015	158	2100	158.875	6/7/2015	12.83	0
6/7/2015 22:00	2015	158	2200	158.9167	6/7/2015	12.79	0
6/7/2015 23:00	2015	158	2300	158.9583	6/7/2015	12.75	0
6/8/2015 0:00	2015	159	0	159	6/8/2015	12.72	0
6/8/2015 1:00	2015	159	100	159.0417	6/8/2015	12.68	0
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6/8/2015 5:00	2015	159	500	159.2083	6/8/2015	12.57	0
6/8/2015 6:00	2015	159	600	159.25	6/8/2015	12.61	0
6/8/2015 7:00	2015	159	700	159.2917	6/8/2015	12.8	0
6/8/2015 8:00	2015	159	800	159.3333	6/8/2015	13.29	0
6/8/2015 9:00	2015	159	900	159.375	6/8/2015	13.3	0
6/8/2015 10:00	2015	159	1000	159.4167	6/8/2015	13.24	0

6/8/2015 11:00	2015	159	1100	159.4583	6/8/2015	13.18	0
6/8/2015 12:00	2015	159	1200	159.5	6/8/2015	13.14	0
6/8/2015 13:00	2015	159	1300	159.5417	6/8/2015	13.11	0
6/8/2015 14:00	2015	159	1400	159.5833	6/8/2015	13.09	0
6/8/2015 15:00	2015	159	1500	159.625	6/8/2015	13.11	0
6/8/2015 16:00	2015	159	1600	159.6667	6/8/2015	13.1	0
6/8/2015 17:00	2015	159	1700	159.7083	6/8/2015	13.1	0
6/8/2015 18:00	2015	159	1800	159.75	6/8/2015	13.12	0
6/8/2015 19:00	2015	159	1900	159.7917	6/8/2015	13.12	0
6/8/2015 20:00	2015	159	2000	159.8333	6/8/2015	12.96	0
6/8/2015 21:00	2015	159	2100	159.875	6/8/2015	12.84	0
6/8/2015 22:00	2015	159	2200	159.9167	6/8/2015	12.8	0
6/8/2015 23:00	2015	159	2300	159.9583	6/8/2015	12.76	0
6/9/2015 0:00	2015	160	0	160	6/9/2015	12.73	0
6/9/2015 1:00	2015	160	100	160.0417	6/9/2015	12.71	0
6/9/2015 2:00	2015	160	200	160.0833	6/9/2015	12.68	0
6/9/2015 3:00	2015	160	300	160.125	6/9/2015	12.66	0
6/9/2015 4:00	2015	160	400	160.1667	6/9/2015	12.64	0
6/9/2015 5:00	2015	160	500	160.2083	6/9/2015	12.63	0
6/9/2015 6:00	2015	160	600	160.25	6/9/2015	12.65	0
6/9/2015 7:00	2015	160	700	160.2917	6/9/2015	12.84	0
6/9/2015 8:00	2015	160	800	160.3333	6/9/2015	13.19	0
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6/9/2015 12:00	2015	160	1200	160.5	6/9/2015	13.18	0
6/9/2015 13:00	2015	160	1300	160.5417	6/9/2015	13.18	0
6/9/2015 14:00	2015	160	1400	160.5833	6/9/2015	13.19	0
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6/9/2015 16:00	2015	160	1600	160.6667	6/9/2015	13.24	0
6/9/2015 17:00	2015	160	1700	160.7083	6/9/2015	13.24	0
6/9/2015 18:00	2015	160	1800	160.75	6/9/2015	13.23	0
6/9/2015 19:00	2015	160	1900	160.7917	6/9/2015	13.02	0
6/9/2015 20:00	2015	160	2000	160.8333	6/9/2015	12.86	0
6/9/2015 21:00	2015	160	2100	160.875	6/9/2015	12.82	0
6/9/2015 22:00	2015	160	2200	160.9167	6/9/2015	12.79	0.01
6/9/2015 23:00	2015	160	2300	160.9583	6/9/2015	12.76	0
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6/10/2015 1:00	2015	161	100	161.0417	6/10/2015	12.71	0.01
6/10/2015 2:00	2015	161	200	161.0833	6/10/2015	12.69	0
6/10/2015 3:00	2015	161	300	161.125	6/10/2015	12.66	0
6/10/2015 4:00	2015	161	400	161.1667	6/10/2015	12.64	0
6/10/2015 5:00	2015	161	500	161.2083	6/10/2015	12.62	0
6/10/2015 6:00	2015	161	600	161.25	6/10/2015	12.65	0
6/10/2015 7:00	2015	161	700	161.2917	6/10/2015	12.88	0
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6/10/2015 9:00	2015	161	900	161.375	6/10/2015	13.33	0

6/10/2015 10:00	2015	161	1000	161.4167	6/10/2015	13.31	0
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6/10/2015 12:00	2015	161	1200	161.5	6/10/2015	13.2	0
6/10/2015 13:00	2015	161	1300	161.5417	6/10/2015	13.19	0
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6/10/2015 15:00	2015	161	1500	161.625	6/10/2015	13.22	0
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6/10/2015 17:00	2015	161	1700	161.7083	6/10/2015	13.16	0
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6/10/2015 19:00	2015	161	1900	161.7917	6/10/2015	13.09	0
6/10/2015 20:00	2015	161	2000	161.8333	6/10/2015	12.92	0
6/10/2015 21:00	2015	161	2100	161.875	6/10/2015	12.84	0
6/10/2015 22:00	2015	161	2200	161.9167	6/10/2015	12.81	0
6/10/2015 23:00	2015	161	2300	161.9583	6/10/2015	12.78	0
6/11/2015 0:00	2015	162	0	162	6/11/2015	12.76	0
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6/11/2015 2:00	2015	162	200	162.0833	6/11/2015	12.71	0
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6/11/2015 4:00	2015	162	400	162.1667	6/11/2015	12.66	0
6/11/2015 5:00	2015	162	500	162.2083	6/11/2015	12.63	0
6/11/2015 6:00	2015	162	600	162.25	6/11/2015	12.66	0
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6/11/2015 8:00	2015	162	800	162.3333	6/11/2015	13.31	0
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6/11/2015 10:00	2015	162	1000	162.4167	6/11/2015	13.28	0
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6/11/2015 14:00	2015	162	1400	162.5833	6/11/2015	13.13	0
6/11/2015 15:00	2015	162	1500	162.625	6/11/2015	13.16	0
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6/11/2015 17:00	2015	162	1700	162.7083	6/11/2015	13.18	0
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6/11/2015 19:00	2015	162	1900	162.7917	6/11/2015	13.09	0
6/11/2015 20:00	2015	162	2000	162.8333	6/11/2015	12.93	0
6/11/2015 21:00	2015	162	2100	162.875	6/11/2015	12.83	0
6/11/2015 22:00	2015	162	2200	162.9167	6/11/2015	12.79	0
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6/12/2015 5:00	2015	163	500	163.2083	6/12/2015	12.59	0
6/12/2015 6:00	2015	163	600	163.25	6/12/2015	12.62	0
6/12/2015 7:00	2015	163	700	163.2917	6/12/2015	12.79	0
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6/12/2015 11:00	2015	163	1100	163.4583	6/12/2015	13.18	0
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6/12/2015 17:00	2015	163	1700	163.7083	6/12/2015	12.86	0.12
6/12/2015 18:00	2015	163	1800	163.75	6/12/2015	12.95	0
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6/13/2015 23:00	2015	164	2300	164.9583	6/13/2015	12.73	0
6/14/2015 0:00	2015	165	0	165	6/14/2015	12.71	0
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6/14/2015 14:00	2015	165	1400	165.5833	6/14/2015	13.15	0
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6/14/2015 21:00	2015	165	2100	165.875	6/14/2015	12.79	0
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6/15/2015 21:00	2015	166	2100	166.875	6/15/2015	12.83	0
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6/16/2015 22:00	2015	167	2200	167.9167	6/16/2015	12.76	0
6/16/2015 23:00	2015	167	2300	167.9583	6/16/2015	12.73	0
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6/17/2015 14:00	2015	168	1400	168.5833	6/17/2015	13.04	0
6/17/2015 15:00	2015	168	1500	168.625	6/17/2015	13.05	0
6/17/2015 16:00	2015	168	1600	168.6667	6/17/2015	13.06	0
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6/17/2015 21:00	2015	168	2100	168.875	6/17/2015	12.8	0
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6/18/2015 8:00	2015	169	800	169.3333	6/18/2015	13.16	0
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6/18/2015 13:00	2015	169	1300	169.5417	6/18/2015	13.03	0
6/18/2015 14:00	2015	169	1400	169.5833	6/18/2015	13.02	0
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6/28/2015 21:00	2015	179	2100	179.875	6/28/2015	12.79	0
6/28/2015 22:00	2015	179	2200	179.9167	6/28/2015	12.76	0
6/28/2015 23:00	2015	179	2300	179.9583	6/28/2015	12.73	0
6/29/2015 0:00	2015	180	0	180	6/29/2015	12.71	0
6/29/2015 1:00	2015	180	100	180.0417	6/29/2015	12.68	0
6/29/2015 2:00	2015	180	200	180.0833	6/29/2015	12.66	0
6/29/2015 3:00	2015	180	300	180.125	6/29/2015	12.64	0
6/29/2015 4:00	2015	180	400	180.1667	6/29/2015	12.63	0
6/29/2015 5:00	2015	180	500	180.2083	6/29/2015	12.63	0
6/29/2015 6:00	2015	180	600	180.25	6/29/2015	12.65	0
6/29/2015 7:00	2015	180	700	180.2917	6/29/2015	12.8	0
6/29/2015 8:00	2015	180	800	180.3333	6/29/2015	13.13	0
6/29/2015 9:00	2015	180	900	180.375	6/29/2015	13.15	0
6/29/2015 10:00	2015	180	1000	180.4167	6/29/2015	13.11	0
6/29/2015 11:00	2015	180	1100	180.4583	6/29/2015	13.07	0
6/29/2015 12:00	2015	180	1200	180.5	6/29/2015	13.04	0
6/29/2015 13:00	2015	180	1300	180.5417	6/29/2015	13.02	0
6/29/2015 14:00	2015	180	1400	180.5833	6/29/2015	13.01	0
6/29/2015 15:00	2015	180	1500	180.625	6/29/2015	13.02	0
6/29/2015 16:00	2015	180	1600	180.6667	6/29/2015	13.03	0
6/29/2015 17:00	2015	180	1700	180.7083	6/29/2015	13.05	0
6/29/2015 18:00	2015	180	1800	180.75	6/29/2015	13.06	0
6/29/2015 19:00	2015	180	1900	180.7917	6/29/2015	12.9	0
6/29/2015 20:00	2015	180	2000	180.8333	6/29/2015	12.8	0
6/29/2015 21:00	2015	180	2100	180.875	6/29/2015	12.76	0
6/29/2015 22:00	2015	180	2200	180.9167	6/29/2015	12.74	0
6/29/2015 23:00	2015	180	2300	180.9583	6/29/2015	12.71	0

6/30/2015 0:00	2015	181	0	181	6/30/2015	12.69	0
6/30/2015 1:00	2015	181	100	181.0417	6/30/2015	12.66	0
6/30/2015 2:00	2015	181	200	181.0833	6/30/2015	12.65	0
6/30/2015 3:00	2015	181	300	181.125	6/30/2015	12.64	0
6/30/2015 4:00	2015	181	400	181.1667	6/30/2015	12.63	0
6/30/2015 5:00	2015	181	500	181.2083	6/30/2015	12.62	0
6/30/2015 6:00	2015	181	600	181.25	6/30/2015	12.65	0
6/30/2015 7:00	2015	181	700	181.2917	6/30/2015	12.84	0
6/30/2015 8:00	2015	181	800	181.3333	6/30/2015	13.17	0
6/30/2015 9:00	2015	181	900	181.375	6/30/2015	13.14	0
6/30/2015 10:00	2015	181	1000	181.4167	6/30/2015	13.12	0
6/30/2015 11:00	2015	181	1100	181.4583	6/30/2015	13.07	0
6/30/2015 12:00	2015	181	1200	181.5	6/30/2015	13.03	0
6/30/2015 13:00	2015	181	1300	181.5417	6/30/2015	13.01	0
6/30/2015 14:00	2015	181	1400	181.5833	6/30/2015	13	0
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6/30/2015 16:00	2015	181	1600	181.6667	6/30/2015	13.01	0
6/30/2015 17:00	2015	181	1700	181.7083	6/30/2015	13.02	0
6/30/2015 18:00	2015	181	1800	181.75	6/30/2015	13.05	0
6/30/2015 19:00	2015	181	1900	181.7917	6/30/2015	13.03	0
6/30/2015 20:00	2015	181	2000	181.8333	6/30/2015	12.86	0
6/30/2015 21:00	2015	181	2100	181.875	6/30/2015	12.79	0
6/30/2015 22:00	2015	181	2200	181.9167	6/30/2015	12.76	0
6/30/2015 23:00	2015	181	2300	181.9583	6/30/2015	12.73	0
7/1/2015 0:00	2015	182	0	182	7/1/2015	12.71	0
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7/1/2015 2:00	2015	182	200	182.0833	7/1/2015	12.67	0
7/1/2015 3:00	2015	182	300	182.125	7/1/2015	12.65	0
7/1/2015 4:00	2015	182	400	182.1667	7/1/2015	12.63	0
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7/1/2015 6:00	2015	182	600	182.25	7/1/2015	12.63	0
7/1/2015 7:00	2015	182	700	182.2917	7/1/2015	12.79	0
7/1/2015 8:00	2015	182	800	182.3333	7/1/2015	13.14	0
7/1/2015 9:00	2015	182	900	182.375	7/1/2015	13.16	0
7/1/2015 10:00	2015	182	1000	182.4167	7/1/2015	13.12	0
7/1/2015 11:00	2015	182	1100	182.4583	7/1/2015	13.08	0
7/1/2015 12:00	2015	182	1200	182.5	7/1/2015	13.04	0
7/1/2015 13:00	2015	182	1300	182.5417	7/1/2015	13.01	0
7/1/2015 14:00	2015	182	1400	182.5833	7/1/2015	12.99	0
7/1/2015 15:00	2015	182	1500	182.625	7/1/2015	13.01	0
7/1/2015 16:00	2015	182	1600	182.6667	7/1/2015	13.05	0
7/1/2015 17:00	2015	182	1700	182.7083	7/1/2015	13.08	0
7/1/2015 18:00	2015	182	1800	182.75	7/1/2015	13.1	0
7/1/2015 19:00	2015	182	1900	182.7917	7/1/2015	13.04	0
7/1/2015 20:00	2015	182	2000	182.8333	7/1/2015	12.84	0.04
7/1/2015 21:00	2015	182	2100	182.875	7/1/2015	12.77	0
7/1/2015 22:00	2015	182	2200	182.9167	7/1/2015	12.74	0

7/1/2015 23:00	2015	182	2300	182.9583	7/1/2015	12.71	0
7/2/2015 0:00	2015	183	0	183	7/2/2015	12.69	0
7/2/2015 1:00	2015	183	100	183.0417	7/2/2015	12.67	0
7/2/2015 2:00	2015	183	200	183.0833	7/2/2015	12.65	0
7/2/2015 3:00	2015	183	300	183.125	7/2/2015	12.63	0
7/2/2015 4:00	2015	183	400	183.1667	7/2/2015	12.61	0
7/2/2015 5:00	2015	183	500	183.2083	7/2/2015	12.6	0
7/2/2015 6:00	2015	183	600	183.25	7/2/2015	12.6	0
7/2/2015 7:00	2015	183	700	183.2917	7/2/2015	12.85	0
7/2/2015 8:00	2015	183	800	183.3333	7/2/2015	13.27	0
7/2/2015 9:00	2015	183	900	183.375	7/2/2015	13.22	0
7/2/2015 10:00	2015	183	1000	183.4167	7/2/2015	13.16	0
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7/2/2015 17:00	2015	183	1700	183.7083	7/2/2015	13.05	0
7/2/2015 18:00	2015	183	1800	183.75	7/2/2015	13.08	0
7/2/2015 19:00	2015	183	1900	183.7917	7/2/2015	13.01	0
7/2/2015 20:00	2015	183	2000	183.8333	7/2/2015	12.85	0
7/2/2015 21:00	2015	183	2100	183.875	7/2/2015	12.78	0
7/2/2015 22:00	2015	183	2200	183.9167	7/2/2015	12.75	0
7/2/2015 23:00	2015	183	2300	183.9583	7/2/2015	12.74	0
7/3/2015 0:00	2015	184	0	184	7/3/2015	12.72	0
7/3/2015 1:00	2015	184	100	184.0417	7/3/2015	12.69	0
7/3/2015 2:00	2015	184	200	184.0833	7/3/2015	12.67	0
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7/3/2015 4:00	2015	184	400	184.1667	7/3/2015	12.64	0
7/3/2015 5:00	2015	184	500	184.2083	7/3/2015	12.62	0
7/3/2015 6:00	2015	184	600	184.25	7/3/2015	12.64	0
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7/3/2015 8:00	2015	184	800	184.3333	7/3/2015	13.2	0
7/3/2015 9:00	2015	184	900	184.375	7/3/2015	13.16	0
7/3/2015 10:00	2015	184	1000	184.4167	7/3/2015	13.12	0
7/3/2015 11:00	2015	184	1100	184.4583	7/3/2015	13.07	0
7/3/2015 12:00	2015	184	1200	184.5	7/3/2015	13.04	0
7/3/2015 13:00	2015	184	1300	184.5417	7/3/2015	13.03	0
7/3/2015 14:00	2015	184	1400	184.5833	7/3/2015	13.04	0
7/3/2015 15:00	2015	184	1500	184.625	7/3/2015	13.08	0
7/3/2015 16:00	2015	184	1600	184.6667	7/3/2015	13.09	0
7/3/2015 17:00	2015	184	1700	184.7083	7/3/2015	13.11	0
7/3/2015 18:00	2015	184	1800	184.75	7/3/2015	13.15	0
7/3/2015 19:00	2015	184	1900	184.7917	7/3/2015	13.05	0
7/3/2015 20:00	2015	184	2000	184.8333	7/3/2015	12.84	0
7/3/2015 21:00	2015	184	2100	184.875	7/3/2015	12.79	0

7/3/2015 22:00	2015	184	2200	184.9167	7/3/2015	12.74	0.01
7/3/2015 23:00	2015	184	2300	184.9583	7/3/2015	12.71	0
7/4/2015 0:00	2015	185	0	185	7/4/2015	12.69	0
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7/4/2015 4:00	2015	185	400	185.1667	7/4/2015	12.62	0
7/4/2015 5:00	2015	185	500	185.2083	7/4/2015	12.6	0
7/4/2015 6:00	2015	185	600	185.25	7/4/2015	12.59	0
7/4/2015 7:00	2015	185	700	185.2917	7/4/2015	12.61	0
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7/4/2015 9:00	2015	185	900	185.375	7/4/2015	13.15	0
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7/4/2015 11:00	2015	185	1100	185.4583	7/4/2015	13.18	0
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7/4/2015 13:00	2015	185	1300	185.5417	7/4/2015	13.11	0.02
7/4/2015 14:00	2015	185	1400	185.5833	7/4/2015	13.15	0.02
7/4/2015 15:00	2015	185	1500	185.625	7/4/2015	13.14	0
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7/4/2015 17:00	2015	185	1700	185.7083	7/4/2015	13.14	0
7/4/2015 18:00	2015	185	1800	185.75	7/4/2015	13.15	0
7/4/2015 19:00	2015	185	1900	185.7917	7/4/2015	12.95	0
7/4/2015 20:00	2015	185	2000	185.8333	7/4/2015	12.84	0
7/4/2015 21:00	2015	185	2100	185.875	7/4/2015	12.78	0
7/4/2015 22:00	2015	185	2200	185.9167	7/4/2015	12.76	0
7/4/2015 23:00	2015	185	2300	185.9583	7/4/2015	12.74	0
7/5/2015 0:00	2015	186	0	186	7/5/2015	12.72	0
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7/5/2015 12:00	2015	186	1200	186.5	7/5/2015	13.08	0
7/5/2015 13:00	2015	186	1300	186.5417	7/5/2015	13.09	0
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7/5/2015 16:00	2015	186	1600	186.6667	7/5/2015	13.22	0
7/5/2015 17:00	2015	186	1700	186.7083	7/5/2015	13.18	0
7/5/2015 18:00	2015	186	1800	186.75	7/5/2015	13.19	0
7/5/2015 19:00	2015	186	1900	186.7917	7/5/2015	13.1	0
7/5/2015 20:00	2015	186	2000	186.8333	7/5/2015	12.85	0

7/5/2015 21:00	2015	186	2100	186.875	7/5/2015	12.8	0
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7/5/2015 23:00	2015	186	2300	186.9583	7/5/2015	12.75	0
7/6/2015 0:00	2015	187	0	187	7/6/2015	12.72	0
7/6/2015 1:00	2015	187	100	187.0417	7/6/2015	12.71	0
7/6/2015 2:00	2015	187	200	187.0833	7/6/2015	12.69	0
7/6/2015 3:00	2015	187	300	187.125	7/6/2015	12.68	0
7/6/2015 4:00	2015	187	400	187.1667	7/6/2015	12.65	0
7/6/2015 5:00	2015	187	500	187.2083	7/6/2015	12.63	0
7/6/2015 6:00	2015	187	600	187.25	7/6/2015	12.63	0
7/6/2015 7:00	2015	187	700	187.2917	7/6/2015	12.88	0
7/6/2015 8:00	2015	187	800	187.3333	7/6/2015	13.28	0
7/6/2015 9:00	2015	187	900	187.375	7/6/2015	13.22	0
7/6/2015 10:00	2015	187	1000	187.4167	7/6/2015	13.17	0
7/6/2015 11:00	2015	187	1100	187.4583	7/6/2015	13.12	0
7/6/2015 12:00	2015	187	1200	187.5	7/6/2015	13.08	0
7/6/2015 13:00	2015	187	1300	187.5417	7/6/2015	13.08	0
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7/6/2015 15:00	2015	187	1500	187.625	7/6/2015	13.16	0.09
7/6/2015 16:00	2015	187	1600	187.6667	7/6/2015	13.24	0
7/6/2015 17:00	2015	187	1700	187.7083	7/6/2015	13.21	0
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7/6/2015 19:00	2015	187	1900	187.7917	7/6/2015	13.08	0
7/6/2015 20:00	2015	187	2000	187.8333	7/6/2015	12.87	0
7/6/2015 21:00	2015	187	2100	187.875	7/6/2015	12.8	0
7/6/2015 22:00	2015	187	2200	187.9167	7/6/2015	12.76	0
7/6/2015 23:00	2015	187	2300	187.9583	7/6/2015	12.73	0
7/7/2015 0:00	2015	188	0	188	7/7/2015	12.7	0
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7/7/2015 3:00	2015	188	300	188.125	7/7/2015	12.64	0
7/7/2015 4:00	2015	188	400	188.1667	7/7/2015	12.62	0
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7/7/2015 6:00	2015	188	600	188.25	7/7/2015	12.61	0
7/7/2015 7:00	2015	188	700	188.2917	7/7/2015	12.83	0
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7/7/2015 10:00	2015	188	1000	188.4167	7/7/2015	13.18	0
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7/7/2015 15:00	2015	188	1500	188.625	7/7/2015	13.11	0.02
7/7/2015 16:00	2015	188	1600	188.6667	7/7/2015	13.21	0
7/7/2015 17:00	2015	188	1700	188.7083	7/7/2015	13.18	0
7/7/2015 18:00	2015	188	1800	188.75	7/7/2015	13.17	0
7/7/2015 19:00	2015	188	1900	188.7917	7/7/2015	13.14	0

7/7/2015 20:00	2015	188	2000	188.8333	7/7/2015	12.9	0
7/7/2015 21:00	2015	188	2100	188.875	7/7/2015	12.8	0
7/7/2015 22:00	2015	188	2200	188.9167	7/7/2015	12.77	0
7/7/2015 23:00	2015	188	2300	188.9583	7/7/2015	12.75	0
7/8/2015 0:00	2015	189	0	189	7/8/2015	12.73	0
7/8/2015 1:00	2015	189	100	189.0417	7/8/2015	12.71	0
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7/8/2015 10:00	2015	189	1000	189.4167	7/8/2015	13.19	0
7/8/2015 11:00	2015	189	1100	189.4583	7/8/2015	13.17	0
7/8/2015 12:00	2015	189	1200	189.5	7/8/2015	13.11	0
7/8/2015 13:00	2015	189	1300	189.5417	7/8/2015	13.07	0
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7/8/2015 20:00	2015	189	2000	189.8333	7/8/2015	12.9	0
7/8/2015 21:00	2015	189	2100	189.875	7/8/2015	12.8	0
7/8/2015 22:00	2015	189	2200	189.9167	7/8/2015	12.76	0
7/8/2015 23:00	2015	189	2300	189.9583	7/8/2015	12.73	0
7/9/2015 0:00	2015	190	0	190	7/9/2015	12.71	0
7/9/2015 1:00	2015	190	100	190.0417	7/9/2015	12.68	0
7/9/2015 2:00	2015	190	200	190.0833	7/9/2015	12.65	0
7/9/2015 3:00	2015	190	300	190.125	7/9/2015	12.62	0
7/9/2015 4:00	2015	190	400	190.1667	7/9/2015	12.59	0
7/9/2015 5:00	2015	190	500	190.2083	7/9/2015	12.56	0
7/9/2015 6:00	2015	190	600	190.25	7/9/2015	12.58	0
7/9/2015 7:00	2015	190	700	190.2917	7/9/2015	12.88	0
7/9/2015 8:00	2015	190	800	190.3333	7/9/2015	13.34	0
7/9/2015 9:00	2015	190	900	190.375	7/9/2015	13.28	0
7/9/2015 10:00	2015	190	1000	190.4167	7/9/2015	13.22	0
7/9/2015 11:00	2015	190	1100	190.4583	7/9/2015	13.16	0
7/9/2015 12:00	2015	190	1200	190.5	7/9/2015	13.16	0
7/9/2015 13:00	2015	190	1300	190.5417	7/9/2015	13.15	0
7/9/2015 14:00	2015	190	1400	190.5833	7/9/2015	13.14	0
7/9/2015 15:00	2015	190	1500	190.625	7/9/2015	13.14	0
7/9/2015 16:00	2015	190	1600	190.6667	7/9/2015	13.12	0
7/9/2015 17:00	2015	190	1700	190.7083	7/9/2015	13.13	0
7/9/2015 18:00	2015	190	1800	190.75	7/9/2015	13.13	0

7/9/2015 19:00	2015	190	1900	190.7917	7/9/2015	13.05	0
7/9/2015 20:00	2015	190	2000	190.8333	7/9/2015	12.89	0
7/9/2015 21:00	2015	190	2100	190.875	7/9/2015	12.79	0
7/9/2015 22:00	2015	190	2200	190.9167	7/9/2015	12.75	0
7/9/2015 23:00	2015	190	2300	190.9583	7/9/2015	12.73	0
7/10/2015 0:00	2015	191	0	191	7/10/2015	12.7	0
7/10/2015 1:00	2015	191	100	191.0417	7/10/2015	12.67	0
7/10/2015 2:00	2015	191	200	191.0833	7/10/2015	12.65	0
7/10/2015 3:00	2015	191	300	191.125	7/10/2015	12.62	0
7/10/2015 4:00	2015	191	400	191.1667	7/10/2015	12.58	0
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7/10/2015 6:00	2015	191	600	191.25	7/10/2015	12.55	0
7/10/2015 7:00	2015	191	700	191.2917	7/10/2015	12.71	0
7/10/2015 8:00	2015	191	800	191.3333	7/10/2015	13.24	0
7/10/2015 9:00	2015	191	900	191.375	7/10/2015	13.29	0
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10/27/2015 10:00	2015	300	1000	300.4167	10/27/2015	13.41	0
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10/27/2015 17:00	2015	300	1700	300.7083	10/27/2015	13.31	0
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10/27/2015 19:00	2015	300	1900	300.7917	10/27/2015	12.82	0
10/27/2015 20:00	2015	300	2000	300.8333	10/27/2015	12.79	0
10/27/2015 21:00	2015	300	2100	300.875	10/27/2015	12.76	0
10/27/2015 22:00	2015	300	2200	300.9167	10/27/2015	12.74	0
10/27/2015 23:00	2015	300	2300	300.9583	10/27/2015	12.72	0
10/28/2015 0:00	2015	301	0	301	10/28/2015	12.7	0
10/28/2015 1:00	2015	301	100	301.0417	10/28/2015	12.68	0
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10/28/2015 11:00	2015	301	1100	301.4583	10/28/2015	13.42	0
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10/28/2015 13:00	2015	301	1300	301.5417	10/28/2015	13.37	0
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10/28/2015 20:00	2015	301	2000	301.8333	10/28/2015	12.79	0
10/28/2015 21:00	2015	301	2100	301.875	10/28/2015	12.76	0
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10/28/2015 23:00	2015	301	2300	301.9583	10/28/2015	12.73	0
10/29/2015 0:00	2015	302	0	302	10/29/2015	12.71	0
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10/29/2015 14:00	2015	302	1400	302.5833	10/29/2015	13.34	0
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10/29/2015 17:00	2015	302	1700	302.7083	10/29/2015	13.5	0
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10/29/2015 23:00	2015	302	2300	302.9583	10/29/2015	12.68	0
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10/30/2015 21:00	2015	303	2100	303.875	10/30/2015	12.74	0
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11/2/2015 23:00	2015	306	2300	306.9583	11/2/2015	12.72	0
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11/3/2015 20:00	2015	307	2000	307.8333	11/3/2015	12.75	0.02
11/3/2015 21:00	2015	307	2100	307.875	11/3/2015	12.74	0.02
11/3/2015 22:00	2015	307	2200	307.9167	11/3/2015	12.71	0
11/3/2015 23:00	2015	307	2300	307.9583	11/3/2015	12.69	0
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11/4/2015 17:00	2015	308	1700	308.7083	11/4/2015	13.59	0
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11/5/2015 7:00	2015	309	700	309.2917	11/5/2015	12.42	0
11/5/2015 8:00	2015	309	800	309.3333	11/5/2015	13.62	0

11/5/2015 9:00	2015	309	900	309.375	11/5/2015	13.73	0
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11/5/2015 13:00	2015	309	1300	309.5417	11/5/2015	13.49	0
11/5/2015 14:00	2015	309	1400	309.5833	11/5/2015	13.46	0
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11/6/2015 20:00	2015	310	2000	310.8333	11/6/2015	12.76	0
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11/25/2015 23:00	2015	329	2300	329.9583	11/25/2015	12.7	0
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11/26/2015 19:00	2015	330	1900	330.7917	11/26/2015	12.81	0
11/26/2015 20:00	2015	330	2000	330.8333	11/26/2015	12.76	0
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11/27/2015 0:00	2015	331	0	331	11/27/2015	12.64	0
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12/6/2015 7:00	2015	340	700	340.2917	12/6/2015	12.42	0
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12/6/2015 11:00	2015	340	1100	340.4583	12/6/2015	13.72	0
12/6/2015 12:00	2015	340	1200	340.5	12/6/2015	13.66	0
12/6/2015 13:00	2015	340	1300	340.5417	12/6/2015	13.64	0
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12/6/2015 17:00	2015	340	1700	340.7083	12/6/2015	13.46	0
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12/26/2015 20:00	2015	360	2000	360.8333	12/26/2015	12.75	0
12/26/2015 21:00	2015	360	2100	360.875	12/26/2015	12.7	0
12/26/2015 22:00	2015	360	2200	360.9167	12/26/2015	12.67	0
12/26/2015 23:00	2015	360	2300	360.9583	12/26/2015	12.64	0
12/27/2015 0:00	2015	361	0	361	12/27/2015	12.61	0
12/27/2015 1:00	2015	361	100	361.0417	12/27/2015	12.57	0
12/27/2015 2:00	2015	361	200	361.0833	12/27/2015	12.54	0
12/27/2015 3:00	2015	361	300	361.125	12/27/2015	12.49	0
12/27/2015 4:00	2015	361	400	361.1667	12/27/2015	12.43	0
12/27/2015 5:00	2015	361	500	361.2083	12/27/2015	12.34	0
12/27/2015 6:00	2015	361	600	361.25	12/27/2015	12.29	0
12/27/2015 7:00	2015	361	700	361.2917	12/27/2015	12.27	0
12/27/2015 8:00	2015	361	800	361.3333	12/27/2015	12.75	0
12/27/2015 9:00	2015	361	900	361.375	12/27/2015	14.12	0
12/27/2015 10:00	2015	361	1000	361.4167	12/27/2015	14	0
12/27/2015 11:00	2015	361	1100	361.4583	12/27/2015	13.88	0
12/27/2015 12:00	2015	361	1200	361.5	12/27/2015	13.78	0
12/27/2015 13:00	2015	361	1300	361.5417	12/27/2015	13.71	0
12/27/2015 14:00	2015	361	1400	361.5833	12/27/2015	13.66	0
12/27/2015 15:00	2015	361	1500	361.625	12/27/2015	13.66	0
12/27/2015 16:00	2015	361	1600	361.6667	12/27/2015	13.7	0
12/27/2015 17:00	2015	361	1700	361.7083	12/27/2015	13.73	0
12/27/2015 18:00	2015	361	1800	361.75	12/27/2015	12.94	0
12/27/2015 19:00	2015	361	1900	361.7917	12/27/2015	12.81	0
12/27/2015 20:00	2015	361	2000	361.8333	12/27/2015	12.75	0
12/27/2015 21:00	2015	361	2100	361.875	12/27/2015	12.7	0
12/27/2015 22:00	2015	361	2200	361.9167	12/27/2015	12.66	0
12/27/2015 23:00	2015	361	2300	361.9583	12/27/2015	12.63	0
12/28/2015 0:00	2015	362	0	362	12/28/2015	12.61	0
12/28/2015 1:00	2015	362	100	362.0417	12/28/2015	12.58	0
12/28/2015 2:00	2015	362	200	362.0833	12/28/2015	12.57	0
12/28/2015 3:00	2015	362	300	362.125	12/28/2015	12.55	0
12/28/2015 4:00	2015	362	400	362.1667	12/28/2015	12.52	0
12/28/2015 5:00	2015	362	500	362.2083	12/28/2015	12.48	0

12/28/2015 6:00	2015	362	600	362.25	12/28/2015	12.43	0
12/28/2015 7:00	2015	362	700	362.2917	12/28/2015	12.36	0
12/28/2015 8:00	2015	362	800	362.3333	12/28/2015	12.4	0
12/28/2015 9:00	2015	362	900	362.375	12/28/2015	14.02	0
12/28/2015 10:00	2015	362	1000	362.4167	12/28/2015	13.91	0
12/28/2015 11:00	2015	362	1100	362.4583	12/28/2015	13.8	0
12/28/2015 12:00	2015	362	1200	362.5	12/28/2015	13.72	0
12/28/2015 13:00	2015	362	1300	362.5417	12/28/2015	13.65	0
12/28/2015 14:00	2015	362	1400	362.5833	12/28/2015	13.6	0
12/28/2015 15:00	2015	362	1500	362.625	12/28/2015	13.6	0
12/28/2015 16:00	2015	362	1600	362.6667	12/28/2015	13.64	0
12/28/2015 17:00	2015	362	1700	362.7083	12/28/2015	13.69	0
12/28/2015 18:00	2015	362	1800	362.75	12/28/2015	12.94	0
12/28/2015 19:00	2015	362	1900	362.7917	12/28/2015	12.82	0
12/28/2015 20:00	2015	362	2000	362.8333	12/28/2015	12.77	0
12/28/2015 21:00	2015	362	2100	362.875	12/28/2015	12.73	0
12/28/2015 22:00	2015	362	2200	362.9167	12/28/2015	12.7	0
12/28/2015 23:00	2015	362	2300	362.9583	12/28/2015	12.67	0
12/29/2015 0:00	2015	363	0	363	12/29/2015	12.64	0
12/29/2015 1:00	2015	363	100	363.0417	12/29/2015	12.62	0
12/29/2015 2:00	2015	363	200	363.0833	12/29/2015	12.61	0
12/29/2015 3:00	2015	363	300	363.125	12/29/2015	12.59	0
12/29/2015 4:00	2015	363	400	363.1667	12/29/2015	12.58	0
12/29/2015 5:00	2015	363	500	363.2083	12/29/2015	12.56	0
12/29/2015 6:00	2015	363	600	363.25	12/29/2015	12.52	0
12/29/2015 7:00	2015	363	700	363.2917	12/29/2015	12.48	0
12/29/2015 8:00	2015	363	800	363.3333	12/29/2015	12.43	0
12/29/2015 9:00	2015	363	900	363.375	12/29/2015	13.8	0
12/29/2015 10:00	2015	363	1000	363.4167	12/29/2015	13.85	0
12/29/2015 11:00	2015	363	1100	363.4583	12/29/2015	13.75	0
12/29/2015 12:00	2015	363	1200	363.5	12/29/2015	13.69	0
12/29/2015 13:00	2015	363	1300	363.5417	12/29/2015	13.63	0
12/29/2015 14:00	2015	363	1400	363.5833	12/29/2015	13.61	0
12/29/2015 15:00	2015	363	1500	363.625	12/29/2015	13.62	0
12/29/2015 16:00	2015	363	1600	363.6667	12/29/2015	13.65	0
12/29/2015 17:00	2015	363	1700	363.7083	12/29/2015	13.48	0
12/29/2015 18:00	2015	363	1800	363.75	12/29/2015	12.93	0
12/29/2015 19:00	2015	363	1900	363.7917	12/29/2015	12.82	0
12/29/2015 20:00	2015	363	2000	363.8333	12/29/2015	12.76	0
12/29/2015 21:00	2015	363	2100	363.875	12/29/2015	12.71	0
12/29/2015 22:00	2015	363	2200	363.9167	12/29/2015	12.68	0
12/29/2015 23:00	2015	363	2300	363.9583	12/29/2015	12.65	0
12/30/2015 0:00	2015	364	0	364	12/30/2015	12.63	0
12/30/2015 1:00	2015	364	100	364.0417	12/30/2015	12.62	0
12/30/2015 2:00	2015	364	200	364.0833	12/30/2015	12.6	0
12/30/2015 3:00	2015	364	300	364.125	12/30/2015	12.58	0
12/30/2015 4:00	2015	364	400	364.1667	12/30/2015	12.55	0

12/30/2015 5:00	2015	364	500	364.2083	12/30/2015	12.52	0
12/30/2015 6:00	2015	364	600	364.25	12/30/2015	12.48	0
12/30/2015 7:00	2015	364	700	364.2917	12/30/2015	12.43	0
12/30/2015 8:00	2015	364	800	364.3333	12/30/2015	12.76	0
12/30/2015 9:00	2015	364	900	364.375	12/30/2015	13.95	0
12/30/2015 10:00	2015	364	1000	364.4167	12/30/2015	13.88	0
12/30/2015 11:00	2015	364	1100	364.4583	12/30/2015	13.78	0
12/30/2015 12:00	2015	364	1200	364.5	12/30/2015	13.68	0
12/30/2015 13:00	2015	364	1300	364.5417	12/30/2015	13.62	0
12/30/2015 14:00	2015	364	1400	364.5833	12/30/2015	13.58	0
12/30/2015 15:00	2015	364	1500	364.625	12/30/2015	13.58	0
12/30/2015 16:00	2015	364	1600	364.6667	12/30/2015	13.61	0
12/30/2015 17:00	2015	364	1700	364.7083	12/30/2015	13.67	0
12/30/2015 18:00	2015	364	1800	364.75	12/30/2015	12.94	0
12/30/2015 19:00	2015	364	1900	364.7917	12/30/2015	12.82	0
12/30/2015 20:00	2015	364	2000	364.8333	12/30/2015	12.76	0
12/30/2015 21:00	2015	364	2100	364.875	12/30/2015	12.71	0
12/30/2015 22:00	2015	364	2200	364.9167	12/30/2015	12.68	0
12/30/2015 23:00	2015	364	2300	364.9583	12/30/2015	12.65	0
12/31/2015 0:00	2015	365	0	365	12/31/2015	12.62	0
12/31/2015 1:00	2015	365	100	365.0417	12/31/2015	12.6	0
12/31/2015 2:00	2015	365	200	365.0833	12/31/2015	12.59	0
12/31/2015 3:00	2015	365	300	365.125	12/31/2015	12.57	0
12/31/2015 4:00	2015	365	400	365.1667	12/31/2015	12.55	0
12/31/2015 5:00	2015	365	500	365.2083	12/31/2015	12.52	0
12/31/2015 6:00	2015	365	600	365.25	12/31/2015	12.48	0
12/31/2015 7:00	2015	365	700	365.2917	12/31/2015	12.42	0
12/31/2015 8:00	2015	365	800	365.3333	12/31/2015	12.8	0
12/31/2015 9:00	2015	365	900	365.375	12/31/2015	14.06	0
12/31/2015 10:00	2015	365	1000	365.4167	12/31/2015	13.94	0
12/31/2015 11:00	2015	365	1100	365.4583	12/31/2015	13.84	0
12/31/2015 12:00	2015	365	1200	365.5	12/31/2015	13.76	0
12/31/2015 13:00	2015	365	1300	365.5417	12/31/2015	13.69	0
12/31/2015 14:00	2015	365	1400	365.5833	12/31/2015	13.65	0
12/31/2015 15:00	2015	365	1500	365.625	12/31/2015	13.64	0
12/31/2015 16:00	2015	365	1600	365.6667	12/31/2015	13.66	0
12/31/2015 17:00	2015	365	1700	365.7083	12/31/2015	13.72	0
12/31/2015 18:00	2015	365	1800	365.75	12/31/2015	12.95	0
12/31/2015 19:00	2015	365	1900	365.7917	12/31/2015	12.83	0
12/31/2015 20:00	2015	365	2000	365.8333	12/31/2015	12.77	0
12/31/2015 21:00	2015	365	2100	365.875	12/31/2015	12.73	0
12/31/2015 22:00	2015	365	2200	365.9167	12/31/2015	12.69	0
12/31/2015 23:00	2015	365	2300	365.9583	12/31/2015	12.66	0
1/1/2016 0:00	2016	1	0	1	1/1/2016	12.62	0

Hourly Max	Hourly Min	Hourly Ave	Soil Temp	Soil Water
Air Temp	Air Temp	Air Temp	6 in	6 in
deg F	deg F	deg F	deg C	wfv
18.95	17.98	18.65	4.8	0
19.33	17.83	18.51	4.8	0.189
19.4	18.95	19.26	4.82	0.19
19.19	18.82	18.99	4.82	0
19.7	19.11	19.34	4.82	0.191
20.02	19.55	19.83	4.82	0.191
19.55	14.08	16.94	4.84	0.192
14.04	9.14	11.4	4.84	0.191
13.55	6.605	9.01	4.82	0.192
18.08	12.59	14.38	4.82	0.193
19.54	18	18.81	4.75	0.197
22	19.21	20.45	4.78	0.196
23.11	21.5	22.27	4.82	0.195
24.72	22.23	23.52	4.86	0.195
25.53	23.76	24.53	4.88	0.194
29.48	25.51	27.65	4.89	0.194
26.27	21.51	24.24	4.91	0.194
21.49	16.77	19.08	4.93	0.192
20.17	18.97	19.7	4.91	0.192
19.45	18.64	19.14	4.91	0.191
19.37	18.64	19.09	4.89	0.194
19.81	19.02	19.39	4.89	0.193
19.81	15.76	18.27	4.89	0.193
17.83	15.72	16.93	4.88	0.194
18.83	17.72	18.56	4.88	0.195
18.84	18.38	18.57	4.89	0.193
19.53	18.84	19.28	4.89	0.194
19.4	18.89	19.16	4.89	0.192
19	18.75	18.83	4.89	0.192
18.78	17.38	18.12	4.89	0.195
17.38	17.09	17.18	4.89	0.195
17.13	15.82	16.56	4.89	0.194
16.78	16.01	16.51	4.89	0.196
16.24	14.22	15.13	4.88	0.195
18.84	13.41	15.54	4.82	0.199
26.22	18.49	21.77	4.86	0.198
28.25	23.72	25.91	4.89	0.195
26.72	22.69	24.75	4.95	0.194
26.58	23.87	24.9	4.99	0.196
34.17	25.79	28.36	5	0.195
29.96	24.62	26.8	5	0.192
24.62	15.29	19.92	4.95	0.195
15.23	10.17	11.83	4.95	0.195

17.68	10.84	13.73	4.89	0.195
16.92	10.43	13.89	4.88	0.196
16.78	12.64	14.16	4.88	0.196
19.47	10.47	16.42	4.86	0.196
20.56	12.49	15.97	4.88	0.195
23.82	15.59	20.21	4.86	0.196
24.07	20.81	22.61	4.88	0.196
23.73	22.43	23	4.88	0.196
26.02	19.84	23.04	4.88	0.197
27.09	24.44	26.25	4.88	0.197
26.4	25.46	25.99	4.89	0.197
27.34	25.45	26.44	4.89	0.195
27.69	26.12	27.09	4.89	0.193
27.63	25.76	26.73	4.88	0.196
30.5	27.28	28.7	4.77	0.2
32.83	27.84	30.22	4.86	0.198
34.08	32.58	33.47	4.86	0.197
36.17	33.68	35.34	4.89	0.197
36.65	34.01	35.62	4.89	0.197
38.46	35.98	37	4.93	0.193
40.21	38.13	39.21	4.97	0.192
40.41	38.85	39.62	4.97	0.194
39.01	37.67	38.47	4.97	0.193
38.25	35.65	36.62	4.99	0.191
37.98	35.72	36.72	4.97	0.194
37.55	28.61	36.15	4.95	0.194
37.75	34.65	36.29	4.95	0.195
36.06	33.34	34.89	4.93	0.194
36.25	34.25	35.39	4.93	0.193
35.34	23.5	29.46	4.93	0.197
32.64	19.98	26.95	4.89	0.196
21.11	13.85	18.82	4.89	0.195
13.82	11.1	12.56	4.88	0.197
13.82	10.83	12.44	4.84	0.196
16.33	11.52	14.16	4.86	0.196
17.49	13.52	15.47	4.84	0.196
15.06	9.57	12.46	4.84	0.198
11.28	9.25	10.24	4.8	0.198
20.25	11.16	15.72	4.67	0.205
27.83	20.25	24.75	4.75	0.199
29.06	26.57	27.92	4.78	0.198
29.4	28.22	28.8	4.82	0.197
28.98	26.96	27.9	4.84	0.194
31.54	28.29	29.73	4.86	0.194
32.97	28.44	30.38	4.88	0.194
32.4	29.58	30.71	4.86	0.194
33.2	28.15	31.47	4.82	0.195

28.11	21.9	24.84	4.84	0.193
22.51	21.58	21.96	4.8	0.195
22.5	20.29	21.62	4.78	0.194
23.13	20.96	22.26	4.77	0.194
23.26	21.61	22.53	4.77	0.196
26.25	22.77	24.34	4.77	0.195
23.08	16.98	19.95	4.75	0.193
17.87	14.93	15.86	4.73	0.194
16.81	15	15.64	4.69	0.195
18.07	15.98	17.12	4.67	0.198
18.01	16.77	17.41	4.67	0.196
18.58	16.86	17.42	4.66	0.195
18.62	16.06	17.15	4.66	0.195
17.4	15.16	16.3	4.62	0.196
15.97	14.97	15.32	4.6	0.194
25.16	16	20.32	4.45	0.201
32.76	25.16	29.59	4.53	0.198
35.08	32.03	33.13	4.58	0.194
35.91	34.04	34.61	4.66	0.192
37.19	33.76	35.15	4.69	0.189
36.96	34.93	36	4.75	0.188
37.12	35.98	36.61	4.77	0.189
37.98	36.06	36.93	4.75	0.19
37.43	30.71	34.46	4.69	0.193
30.68	24.59	27.19	4.66	0.193
31.86	25.54	29.25	4.64	0.193
27.49	24.25	25.37	4.64	0.193
26.61	22.2	23.66	4.62	0.193
24.69	22.79	24.07	4.6	0.194
24.21	21.04	22.36	4.6	0.195
21.83	19.61	20.58	4.6	0.195
21.87	20.5	21.26	4.58	0.194
21.44	20.69	21.01	4.56	0.195
21.48	19.49	20.47	4.55	0.195
21.16	19.86	20.68	4.53	0.193
21.52	20.11	20.77	4.51	0.193
21.88	19.84	20.65	4.49	0.193
22.13	20.29	21.41	4.47	0.194
21.91	18.96	20.28	4.45	0.194
33.01	19.91	25.81	4.31	0
39.22	33.04	37.06	4.4	0.197
42.16	37.68	39.81	4.47	0.19
40.41	36.23	38.22	4.6	0.187
43.7	36.43	40.29	4.64	0.187
49	42.68	46.44	4.84	0.18
51.17	44.9	47.16	4.97	0.18
45.29	44.41	44.82	4.88	0.186

44.57	40.72	42.38	4.71	0.193
40.68	30.49	33.54	4.6	0.193
31.67	29.96	30.67	4.56	0.193
30.19	28.11	28.92	4.55	0.194
32.83	28.03	29.79	4.55	0.193
33.65	28.77	30.72	4.55	0.195
33.27	27.2	29.65	4.56	0.194
27.13	25.13	25.81	4.56	0.195
29.51	26.5	27.54	4.58	0.195
30.79	25.96	27.8	4.56	0.193
27.48	25.61	26.79	4.56	0.194
28.96	25.64	26.83	4.56	0.194
28.58	25.6	27.15	4.55	0.192
27.61	25.5	26.49	4.55	0.195
28.58	26.25	27.57	4.53	0.194
29.21	25.65	27.39	4.51	0.195
40.01	29.17	33.98	4.38	0.2
41.13	39.48	40.17	4.49	0.195
41.5	40.29	40.78	4.58	0.191
41.83	40.43	40.99	4.71	0.188
42.94	40.81	41.9	4.82	0.188
43.83	42.1	43.03	4.93	0.187
44.18	42.83	43.38	4.93	0.188
44.25	43.21	43.65	4.88	0.191
49.26	43.6	46	4.78	0.195
47.98	31.66	35.27	4.67	0.194
32.46	30.52	31.68	4.6	0.192
33.27	31.58	32.37	4.58	0.193
33.06	30.24	31.14	4.58	0.196
31.48	30.1	30.89	4.6	0.194
31.21	29.79	30.57	4.6	0.196
30.4	29.41	29.76	4.6	0.194
29.81	28.17	28.94	4.62	0.196
28.71	27.11	27.87	4.62	0.194
27.79	26.6	27.02	4.62	0.196
27.79	26.39	26.9	4.64	0.194
27.84	26.35	26.95	4.64	0.198
27.53	26.38	27.2	4.64	0.194
27.36	26.1	26.82	4.62	0.194
26.31	24.63	25.46	4.62	0.194
35.49	25.9	30.6	4.49	0.202
41.18	35.52	38.88	4.58	0.199
41.7	40.45	41.09	4.69	0.196
43.5	41.38	42.33	4.86	0.19
45.79	43.34	44.9	5.02	0.19
46.47	44.41	45.16	5.17	0.191
48.21	45.95	46.92	5.21	0.195

47.1	45.7	46.2	5.15	0.197
45.98	44.94	45.41	4.95	0.199
44.99	33.3	36.52	4.8	0.197
38.73	33.73	36.91	4.69	0.197
37.64	33.46	35.68	4.67	0.197
34.88	31.67	32.92	4.67	0.197
35.16	31.9	33.22	4.67	0.197
33.01	31.79	32.44	4.67	0.196
31.79	30.21	31.03	4.67	0.197
30.85	29.6	30.37	4.67	0.196
30.93	29.55	30.4	4.69	0.196
29.81	28.37	29.13	4.69	0.196
29.4	27.7	28.89	4.69	0.196
29.21	26.59	27.76	4.69	0.197
27.94	26.17	27.06	4.69	0.197
26.92	25.19	26.01	4.69	0.198
26.65	24.91	25.71	4.69	0.198
38.19	26.14	32.61	4.58	0.202
39.66	38.23	38.87	4.71	0.201
40.53	38.53	39.38	4.84	0.196
42.36	40.02	41.12	5	0.194
44.51	42.01	43.15	5.17	0.194
46.33	43.49	45.21	5.34	0.195
46.75	45.18	46.11	5.43	0.201
46.82	45.77	46.33	5.34	0.202
46.54	44.74	45.66	5.15	0.204
44.88	32.92	38.28	4.97	0.201
33.13	31.57	32.34	4.84	0.198
32.67	31.74	32.24	4.78	0.199
32.68	31.53	32.12	4.77	0.199
33.42	31.54	32.55	4.77	0.199
33.12	31.24	32.39	4.77	0.199
33.34	30.83	31.35	4.77	0.198
33.77	30.54	31.33	4.77	0.197
32.38	30.4	31.48	4.77	0.199
30.81	29.41	29.77	4.77	0.198
30.28	29.21	29.82	4.77	0.198
31.36	29.9	30.67	4.77	0.198
33.2	31.21	31.94	4.77	0.198
33.78	31.84	33.06	4.78	0.2
33.94	33.53	33.69	4.8	0.197
35.79	33.87	34.5	4.8	0.198
37.76	35.82	36.99	4.78	0.199
42.56	37.77	40.83	4.8	0.202
42	39.76	40.53	4.88	0.201
45.88	41	43.72	5	0.199
46	44.61	45.38	5.13	0.199

44.75	42.18	43.16	5.1	0.199
47.69	44.41	45.82	5.04	0.2
46.49	44.76	45.38	5.13	0.197
44.79	42.63	43.92	5.1	0.197
42.61	39.74	40.46	5	0.199
40.29	39.55	39.96	4.95	0.201
39.57	38.68	39.26	4.93	0.2
40.14	38.3	39.22	4.91	0.2
41.05	39.81	40.27	4.91	0.199
43.07	39.74	41.25	4.93	0.199
42.74	40.26	42.06	4.93	0.2
40.19	37.68	38.53	4.91	0.2
38.79	36.69	37.44	4.89	0.2
37.43	35.89	36.83	4.88	0.2
36.85	35.75	36.37	4.88	0.199
37.12	36.81	36.97	4.88	0.198
38.12	36.81	37.63	4.91	0.2
38.52	37.32	37.74	4.93	0.199
42.95	38.53	40.42	4.89	0.203
43.75	41.45	42.35	4.93	0.205
46.93	43.38	44.88	5.1	0.202
50.83	46.96	49.04	5.37	0.203
49.26	47.03	47.71	5.65	0.211
47.46	42.37	45.02	5.52	0.212
44.89	43.39	44.14	5.41	0.21
44.97	43.74	44.56	5.34	0.211
44.99	44.26	44.72	5.58	0.21
44.25	41.45	42.65	5.84	0.207
42.19	41.35	41.83	6.01	0.209
42.18	40.87	41.38	6.16	0.21
41.95	40.74	41.08	6.26	0.207
41.38	40.57	40.94	6.34	0.207
41.15	40.09	40.66	6.37	0.21
40.09	39.64	39.86	6.41	0.21
39.61	36.31	38.7	6.43	0.211
37.96	36.3	37.36	6.39	0.209
38.04	35.8	36.96	6.39	0.21
36.18	33.87	35.16	6.34	0.21
37.42	34.77	36.27	6.26	0.208
38.27	37.11	37.8	6.26	0.208
38.58	37.65	38.24	6.26	0.209
38.51	38.27	38.4	6.24	0.208
39.71	38.49	39.06	6.24	0.21
41.88	39.67	40.56	6.26	0.212
43.72	41.24	42.08	6.39	0.216
44.3	42.99	43.82	6.72	0.219
46.73	43.71	45.18	7.17	0.223

46.86	45.07	45.67	7.68	0.229
48.69	45.46	46.7	7.84	0.231
47.28	45.49	46.6	8.24	0.232
45.84	45.27	45.51	8.3	0.228
45.28	41.79	43.22	8.26	0.227
41.79	40.87	41.15	8.18	0.226
41.23	40.56	40.85	8.14	0.228
41.25	38.15	39.7	8.06	0.225
41.33	39.25	40.44	7.92	0.226
41.12	39.54	40.42	7.9	0.223
40.91	39.54	40.3	7.8	0.227
40.5	39.97	40.25	7.74	0.226
41.26	39.74	40.45	7.66	0.228
41.6	38.88	40.37	7.58	0.226
41.46	37.48	39.28	7.48	0.226
37.75	35.32	36.4	7.4	0.227
36.73	35.58	36.18	7.28	0.227
37.14	35.49	36.3	7.18	0.226
35.7	34.48	35.17	7.09	0.226
34.66	34.14	34.42	6.95	0.229
35.65	33.9	34.65	6.74	0.234
39.37	35.7	37.15	6.78	0.234
41.61	38.9	40.19	7.2	0.234
43.42	41.09	42.59	7.72	0.247
41.13	36.66	37.42	8.1	0.255
40.63	37.9	39.67	7.62	0.249
43.05	39.91	41.29	7.82	0.25
40.53	38.84	39.68	8.08	0.25
38.82	36.18	37.39	7.98	0.244
36.28	34.74	35.77	7.88	0.245
34.95	33.76	34.38	7.76	0.244
34.9	33.28	34.12	7.58	0.245
36.23	34.57	35.72	7.44	0.246
35.99	35.59	35.79	7.36	0.245
35.59	34.62	35.17	7.28	0.245
35.54	34.71	35.22	7.18	0.246
35.98	35.26	35.53	7.09	0.244
36.16	33.23	35.23	7.03	0.247
33.27	32.22	32.58	6.95	0.246
32.91	32.17	32.35	6.83	0.248
33.03	32.67	32.82	6.74	0.247
34.18	32.8	33.56	6.66	0.246
34.14	33.03	33.7	6.56	0.246
34.84	32.98	33.8	6.49	0.244
35.62	34.72	35.15	6.39	0.246
37.5	35.56	36.56	6.35	0.248
38.91	37.53	38.41	6.34	0.25

39.9	38.42	39.1	6.51	0.25
40.83	39.26	39.69	6.7	0.257
41.06	40.13	40.47	6.89	0.262
41.59	40.88	41.14	7.09	0.269
43.92	41.61	42.93	7.18	0.272
44.1	33.61	37.66	7.28	0.268
34.58	33.04	33.85	6.99	0.264
33.46	31.78	32.36	6.85	0.265
32.28	31.09	31.69	6.72	0.261
32.02	30.58	31.21	6.58	0.263
31.38	29.5	30.46	6.45	0.261
29.78	29.1	29.49	6.34	0.261
31.04	28.67	29.91	6.24	0.259
29.34	27.84	28.7	6.16	0.256
27.97	27.14	27.45	6.07	0.257
27.54	26.27	26.88	6.01	0.256
28.29	26.72	27.39	5.94	0.256
27.39	25.53	26.47	5.9	0.255
25.75	23.85	24.8	5.82	0.255
26.86	24.08	24.78	5.77	0.254
35.3	26.91	31.42	5.6	0.258
39.11	35.31	37.69	5.79	0.256
41.41	38.98	39.88	6.07	0.254
42.85	41.24	42.07	6.58	0.265
43.41	41.34	42.32	6.8	0.27
45.07	42.71	43.76	6.64	0.265
45.91	43.96	45.03	6.7	0.264
45.84	44.83	45.37	6.74	0.265
45.32	42.68	44.23	6.6	0.262
42.68	30.34	37.24	6.41	0.257
30.65	27.72	28.8	6.24	0.253
29.81	27.65	28.48	6.16	0.252
30.97	28.95	29.96	6.11	0.252
30.95	28.74	29.82	6.05	0.252
29.26	26.16	27.9	5.99	0.252
28.92	26.16	27.89	5.94	0.251
30.08	24.52	27.45	5.88	0.249
26.23	24.2	25.11	5.82	0.251
26.07	24.7	25.38	5.77	0.25
25.65	23.68	24.59	5.73	0.249
25.41	23	24.17	5.67	0.248
23.54	22.33	22.89	5.64	0.247
24.28	23.29	23.83	5.6	0.247
24.55	22.22	22.95	5.56	0.246
33.24	24.58	29.03	5.41	0.253
36.24	33.28	35.2	5.52	0.248
38.51	36.03	37.2	5.65	0.245

39.65	38.17	38.73	5.88	0.243
42.44	39.37	40.73	6.13	0.247
45.88	42.11	43.96	6.45	0.257
50	45.14	47.24	6.68	0.264
48.61	46.1	47.4	6.7	0.264
46.54	45.45	46.09	6.3	0.259
45.89	36.2	40.72	6.26	0.252
36.2	32.15	33.97	6.07	0.247
39.46	33.35	36.08	6.01	0.246
46.88	36.13	41.82	5.99	0.247
49.21	39.07	47.3	6.01	0.245
43.2	34.48	37.96	6.07	0.245
35.6	29.96	31.65	5.94	0.246
39.44	29.89	31.75	5.82	0.247
46.17	38.89	42.76	5.8	0.245
45.55	41.66	43.56	5.86	0.243
45.93	40.06	42.88	5.9	0.242
42.46	31.41	36.47	5.84	0.244
32.17	27.58	29.13	5.71	0.243
31.95	27.54	29.15	5.64	0.244
31.91	28.6	29.94	5.6	0.243
36.54	30.14	32.57	5.54	0.245
42.55	36.6	39.99	5.58	0.246
45.47	42.1	44.14	5.92	0.243
47.95	45.07	46.45	6.43	0.25
49.93	47.23	48.69	6.87	0.265
51.53	49.03	50.34	7.34	0.273
52.01	49.74	50.69	7.72	0.276
51.83	49.46	50.53	7.74	0.277
50.64	46.57	48.81	7.64	0.271
46.54	39.32	43.18	7.24	0.258
39.66	35.49	37.13	6.99	0.253
37.02	35.53	36.02	6.91	0.25
35.66	31.82	33.69	6.87	0.25
32.82	31.15	31.84	6.76	0.247
33.11	31.97	32.38	6.64	0.249
32.61	30.49	31.29	6.53	0.248
31.45	30.47	31.11	6.43	0.247
31.1	30.24	30.5	6.34	0.246
31.09	30.17	30.67	6.26	0.243
31.76	29.81	30.71	6.18	0.243
29.98	28.53	28.95	6.11	0.243
28.79	27.66	28.36	6.03	0.242
28.43	27.1	27.88	5.97	0.241
27.79	26.22	27.03	5.92	0.242
36.12	27.79	32.85	5.8	0.245
41	36.03	38.82	5.86	0.243

43.36	40.58	41.86	6.11	0.241
46.17	43.09	44.52	6.53	0.247
49.24	45.57	47.44	6.83	0.256
51.98	49.08	50.74	7.38	0.269
53.08	51.13	51.93	8.02	0.276
51.73	49.68	50.88	8	0.275
51.3	48.76	49.99	7.92	0.271
49.01	36.39	42.92	7.66	0.259
36.58	33.37	34.5	7.28	0.25
33.75	31.42	32.7	7.15	0.249
33.35	31.36	32.5	7.03	0.246
34.25	32.1	32.98	6.91	0.246
34.09	32.31	33.07	6.8	0.245
33.74	31.01	32.35	6.68	0.242
32.65	30.61	31.33	6.56	0.244
35.38	31.59	32.47	6.47	0.241
31.53	28.81	29.97	6.37	0.242
31.59	28.65	29.78	6.28	0.241
29.97	27.21	27.94	6.2	0.241
28.64	26.79	27.71	6.13	0.239
31.75	26.71	28.76	6.07	0.239
32.04	27.11	28.82	5.99	0.239
40.45	32.05	34.56	5.84	0.242
42.69	40.51	41.68	5.97	0.241
41.8	39.85	40.47	6.22	0.24
47.66	41.64	44.69	6.58	0.243
51.59	47.59	49.44	7.34	0.262
55	51.12	52.94	8.08	0.273
55.59	53.79	54.42	8.7	0.276
55.58	49.89	52.41	8.66	0.274
50.93	46.61	48.72	8.16	0.268
46.58	41.16	44.16	7.88	0.256
41.2	36.84	38.4	7.62	0.25
47.56	38.13	45.59	7.46	0.248
46.75	43.02	45.4	7.46	0.247
48.55	42.4	46.2	7.42	0.246
42.88	35.61	39.51	7.3	0.245
36.2	32.56	34.43	7.07	0.245
36.6	31.79	34.52	6.89	0.243
38.35	35.32	36.47	6.76	0.243
36.28	33.74	35.01	6.66	0.242
33.98	31.92	32.76	6.56	0.24
32.96	31.1	31.91	6.45	0.239
33.37	30.66	32.09	6.35	0.238
35.21	29.08	30.3	6.28	0.238
31.23	28.32	29.23	6.18	0.237
42.12	31.23	36.02	6.03	0.241

44.92	42.16	43.86	6.16	0.239
45.96	44.51	45.22	6.47	0.24
46.72	45.46	46.02	6.89	0.249
48.37	45.65	46.64	7.01	0.253
49.6	47.46	48.22	7.24	0.259
49.78	48.58	49.21	7.74	0.264
49.35	47.52	48.41	7.92	0.266
47.52	45.53	46.54	7.78	0.259
45.53	40.65	43.01	7.7	0.25
40.72	38.6	39.16	7.56	0.248
40.22	39.37	39.73	7.5	0.245
40.22	38.75	39.59	7.5	0.245
38.71	37.07	37.84	7.42	0.244
37.07	33.95	36.16	7.32	0.244
34.16	31.53	32.89	7.2	0.243
34.93	31.5	33	7.05	0.241
36.78	34.45	35.81	6.93	0.239
37.84	35.07	35.73	6.85	0.238
39.77	35.65	37.73	6.8	0.238
37.52	36.12	36.86	6.74	0.238
37.49	35.65	36.62	6.68	0.238
37.62	35.98	36.94	6.64	0.236
37.34	35.36	36.07	6.6	0.235
37.69	35.44	36.39	6.55	0.236
37.67	33.47	36.05	6.53	0.238
35.6	32.54	33.19	6.53	0.237
40.17	35.62	38.43	6.45	0.242
44.64	39.86	41.98	6.8	0.243
44.97	42.53	43.75	7.34	0.248
46	43.35	44.96	7.74	0.256
46.49	45.02	45.58	8.14	0.262
45.96	44.39	45.24	8.02	0.258
44.41	34.8	40.31	7.72	0.249
34.65	27.24	30.49	7.36	0.24
29.74	27	28.22	7.13	0.239
28.72	27.32	27.76	6.97	0.238
27.34	24.37	25.77	6.83	0.239
29.83	24.25	27.72	6.7	0.237
27.85	22	24.4	6.58	0.236
27.85	22.08	24.52	6.47	0.235
28.03	25.06	26.72	6.35	0.237
28.76	25.62	26.69	6.26	0.232
26.33	23.03	24.37	6.18	0.233
24.26	22.09	23.26	6.07	0.233
25.53	22.56	24.06	5.97	0.233
23.09	15.8	19.73	5.9	0.232
24.01	15.8	19.98	5.82	0.233

28.13	24	26.69	5.65	0.233
30.42	27.81	29.09	5.69	0.233
32.86	30.3	31.44	5.73	0.233
34.89	32.38	33.3	5.86	0.231
36.23	33.66	34.94	5.97	0.229
37.59	35.22	36.65	6.09	0.233
39.34	36.93	37.94	6.11	0.236
39.6	37.61	38.41	6.07	0.236
39.22	37.18	38.06	5.9	0.236
37.18	24.1	31.89	5.73	0.229
24.04	22.24	23.13	5.56	0.227
24.07	22.77	23.39	5.5	0.225
24.56	21.86	23.24	5.47	0.227
23.05	20.28	21.76	5.45	0.226
25.24	20.1	22.87	5.43	0.228
24.47	20.36	22.49	5.43	0.227
26.54	24.51	25.56	5.39	0.228
26.05	24.99	25.42	5.37	0.225
26.14	22.26	24.96	5.36	0.224
25.28	21.33	23.25	5.32	0.226
24.36	18.98	21.2	5.28	0.226
20.07	17.71	18.68	5.24	0.225
17.99	16.71	17.17	5.19	0.225
21.14	16.62	18.39	5.15	0.227
31.61	21.18	26.95	5.06	0.228
36.35	31.63	34.71	5.11	0.226
37.65	35.56	36.65	5.28	0.224
39.29	37.24	38.01	5.52	0.225
43.64	38.91	41.31	5.69	0.226
45.08	41.92	43.4	5.92	0.232
46.3	44.44	45.43	5.88	0.235
46.21	43.79	44.9	5.9	0.237
43.97	41.44	43.04	5.6	0.233
41.43	32.27	36.65	5.37	0.227
33.09	31	31.76	5.19	0.223
31.78	29.77	31.2	5.11	0.224
29.75	26.44	27.8	5.1	0.224
29.35	26.13	27.31	5.08	0.224
29.88	26.83	28.38	5.08	0.222
31.14	27.58	29.44	5.08	0.223
27.54	23.63	25.3	5.08	0.223
24.38	23.22	23.79	5.06	0.223
24.32	22.04	22.87	5.04	0.222
24.43	22.08	23.23	5.04	0.222
25.7	23.05	24.2	5.04	0.221
26.82	21.8	23.67	5.04	0.222
29.01	25.01	27.37	5.02	0.221

27.48	21.91	23.74	5	0.22
37.09	24.17	31.55	4.93	0.223
38.93	36.85	38.06	4.99	0.222
40.91	38.87	39.78	5.21	0.22
43.07	40.16	41.39	5.47	0.222
45.44	41.75	43.44	5.71	0.223
47.73	44.99	46.33	6.09	0.231
50.78	46.99	48.4	6.32	0.238
50.66	48.48	49.08	6.26	0.239
50.75	48.58	49.71	5.92	0.234
51.69	30.5	39.89	5.49	0.226
30.57	28.79	29.64	5.21	0.221
33.06	28.98	31.3	5.11	0.22
32.46	29.59	31.12	5.1	0.22
31.04	29.14	30.17	5.1	0.221
33.39	29.85	31.3	5.1	0.22
33.2	28.36	31.07	5.1	0.219
28.53	26.55	27.48	5.08	0.22
30.27	27.73	28.67	5.08	0.217
28.76	26.92	27.8	5.06	0.221
29.62	27.93	28.58	5.06	0.22
30.14	27.91	28.94	5.06	0.217
30.91	28.24	29.4	5.04	0.219
29.27	26.7	27.98	5.04	0.22
30.04	26.46	27.68	5.02	0.217
43.21	30.05	36.89	4.95	0.223
46.6	42.93	45.28	5.04	0.219
49.7	46.54	48.28	5.28	0.216
50.31	48.38	49.42	5.71	0.219
51.88	49.96	50.8	6.24	0.228
54.89	50.94	52.59	6.7	0.24
56.48	53.65	55.23	7.17	0.24
58.01	55.5	56.76	7.11	0.238
58.7	55.99	56.85	6.76	0.235
58.21	37.71	48.55	6.05	0.23
37.71	34.92	36.28	5.54	0.221
36.69	35.36	36.04	5.41	0.219
36.32	33.94	35.22	5.37	0.22
36.06	34.52	35.37	5.36	0.219
35.72	34.38	34.92	5.34	0.218
35.14	31.82	33.49	5.32	0.22
33.62	31.37	32.28	5.3	0.219
34.23	31.69	33.06	5.28	0.217
33.34	30.54	31.98	5.26	0.218
31.5	29.43	30.59	5.24	0.218
32.12	27.17	29.84	5.23	0.216
29.43	26.98	28.16	5.19	0.218

29.8	27.91	28.6	5.19	0.218
30.06	27.98	29.07	5.17	0.217
39.7	29.66	34.04	5.06	0.224
41.2	37.57	39.19	5.13	0.22
43.15	40.23	41.84	5.26	0.218
44.73	42.73	43.67	5.52	0.216
46.98	44.02	45.08	5.71	0.219
48.21	44.78	46.9	5.96	0.224
50.48	47.32	48.95	6.39	0.232
51.92	48.76	50.05	6.66	0.238
49.66	47.45	48.43	6.55	0.237
47.45	40.95	44.7	6.22	0.228
40.92	34.05	35.26	6.03	0.22
36.64	35.36	35.91	5.94	0.22
37.89	35.5	36.73	5.9	0.22
36.74	33.95	35.67	5.86	0.221
35.58	32.94	33.61	5.82	0.22
39.01	35.58	37.6	5.77	0.219
40.21	38.69	39.45	5.79	0.219
41.9	39.33	40.57	5.77	0.219
39.64	38.35	38.78	5.77	0.219
38.34	37.44	37.9	5.77	0.218
38.51	31.6	33.96	5.75	0.22
37.29	31.94	34.31	5.69	0.219
37.29	35.41	36.47	5.67	0.22
38.2	34.3	35.58	5.65	0.219
42.77	34.26	38.5	5.5	0.223
45.88	42.05	43.93	5.64	0.223
48.87	45.39	47.2	5.92	0.221
52.24	48.55	50.53	6.64	0.224
54.91	51.79	53.16	7.62	0.242
57.11	52.56	55.23	8.36	0.253
58.84	55.01	56.91	9.42	0.258
58.91	57.4	58.15	9.59	0.256
58.68	54.23	56.84	9.78	0.258
54.38	47.76	51.41	9.03	0.252
47.67	38.2	42.83	8.24	0.237
41.16	39.45	40.18	7.94	0.235
41.36	38.4	39.96	7.8	0.234
43.3	38.99	41.54	7.68	0.233
42.64	37.07	39.42	7.52	0.23
38.61	36.62	37.36	7.38	0.23
39.25	34.86	37.13	7.2	0.228
39.7	36.06	37.42	7.05	0.228
38.72	34.59	36.18	6.93	0.229
35.67	31.84	33.17	6.8	0.227
32.73	31.16	32.13	6.66	0.224

33.57	31.22	32.4	6.56	0.226
35.61	33.16	34.47	6.47	0.224
37.41	34.67	36.07	6.39	0.224
42.66	36.4	39.33	6.24	0.229
44.48	40.73	42.56	6.26	0.228
48.41	43.95	46.11	6.47	0.224
51.13	48.12	49.43	7.01	0.228
53.86	50.3	51.83	7.84	0.242
55.17	52.42	53.54	8.66	0.255
54.88	53.26	53.89	9.28	0.261
55.8	52.23	53.68	9.44	0.261
52.98	50.47	51.72	9.05	0.258
50.45	44.52	47.69	8.6	0.247
44.52	40.32	41.49	8.28	0.238
41.62	40.8	41.09	8.16	0.234
41.57	40.8	41.03	8.08	0.236
41.97	41.21	41.61	8	0.236
42.54	41.16	41.75	7.92	0.234
41.85	36.93	39.6	7.84	0.232
38.95	37.31	38.09	7.7	0.233
39.79	38.37	39.15	7.6	0.232
39.61	38.34	39.08	7.54	0.23
38.4	34.53	36.05	7.44	0.229
36.53	35.53	36.01	7.32	0.229
37.24	35.81	36.56	7.22	0.228
38.85	35.56	37.17	7.15	0.227
38.89	37.69	38.43	7.05	0.226
42	38.54	40.44	6.97	0.227
44	42.02	42.93	6.93	0.231
46.08	43.93	45.2	7.11	0.232
48.18	45.57	46.81	7.42	0.232
50.22	47.87	48.75	7.84	0.238
51.07	49.2	50.09	8.36	0.245
52.49	50.01	51.17	8.7	0.25
52.09	50.06	50.57	9.01	0.255
50.35	49.31	49.72	8.82	0.248
49.31	44.26	47.26	8.76	0.243
44.24	42.1	42.92	8.58	0.239
42.11	41.79	41.98	8.48	0.237
42.42	41.62	41.95	8.42	0.238
41.66	40.99	41.3	8.36	0.237
41.13	40.94	41.05	8.32	0.235
41.02	40.13	40.56	8.26	0.235
40.45	40.18	40.29	8.22	0.235
40.78	40.38	40.53	8.16	0.233
41.18	40.76	40.99	8.14	0.235
41.23	40.87	41.06	8.12	0.233

40.9	40.33	40.61	8.08	0.235
40.35	38.98	39.57	8.04	0.234
38.98	38.64	38.82	7.98	0.233
38.66	38.4	38.5	7.94	0.233
39.13	38.46	38.71	7.88	0.232
39.47	38.99	39.2	7.86	0.232
40.12	39.33	39.64	7.84	0.232
40.42	39.84	40.17	7.84	0.234
40.97	40.08	40.37	7.92	0.235
41	40.35	40.68	7.96	0.236
41.38	40.64	41.04	8.02	0.237
41.52	41.07	41.28	8.1	0.237
41.32	40.94	41.13	8.16	0.237
41.25	40.97	41.09	8.18	0.237
41.26	40.73	40.92	8.18	0.237
40.73	39.49	40.28	8.16	0.237
39.59	38.96	39.27	8.12	0.236
38.98	38.7	38.84	8.08	0.237
38.96	38.67	38.79	8.04	0.237
38.84	38.67	38.74	8.02	0.238
38.69	38.33	38.57	7.98	0.236
38.44	38.09	38.32	7.94	0.238
38.09	37.62	37.85	7.92	0.237
37.58	36.59	37.05	7.86	0.236
36.69	36.45	36.6	7.82	0.235
36.76	35.92	36.46	7.76	0.237
36.18	35.94	36.06	7.74	0.237
36.21	36.01	36.11	7.68	0.237
38.35	36.11	37.15	7.64	0.238
42.13	38.3	40.34	7.64	0.242
42.33	41.25	41.65	8.14	0.248
43.73	41.73	42.47	8.32	0.252
44.7	42.96	43.63	8.72	0.257
46.54	43.75	45.04	9.22	0.264
49.5	45.69	47.3	9.89	0.272
49.21	45.48	47.11	10.35	0.276
46.11	44.96	45.43	10.08	0.271
45.67	44.1	44.79	9.55	0.262
44.14	42.3	43.24	9.49	0.258
42.32	34.94	38.97	9.26	0.252
34.91	32.68	33.98	8.89	0.248
32.8	31.88	32.36	8.66	0.247
33.08	31.69	32.36	8.46	0.245
33.32	31.91	32.56	8.26	0.243
34.21	31.68	32.8	8.06	0.242
31.75	30.47	30.78	7.86	0.241
31.03	30.04	30.42	7.7	0.24

31.34	30.55	31.09	7.54	0.238
30.52	29.08	29.61	7.38	0.239
29.74	29	29.34	7.24	0.236
29.45	26.93	28.12	7.13	0.237
31.24	27.91	29.1	6.99	0.236
40.05	31.26	35.9	6.87	0.238
44.03	40.1	42.55	6.95	0.239
46.95	44.03	45.78	7.18	0.238
48.8	46.29	47.14	7.92	0.251
50.58	47.49	48.84	8.82	0.267
53.05	49.84	51.33	10.01	0.272
54.46	52.57	53.48	10.96	0.27
56.09	53.03	54.4	11.18	0.268
54.95	51.76	53.62	10.61	0.272
51.69	40.9	47.32	9.65	0.267
40.83	35.82	37.26	8.85	0.253
37.02	34.7	35.72	8.46	0.247
37.28	33.71	35.49	8.3	0.244
37.86	35.51	36.97	8.16	0.243
38.46	33.56	35.26	8	0.241
41.78	35.72	37.57	7.82	0.239
46.42	38.61	42.41	7.68	0.239
46.26	38.8	42.34	7.6	0.238
45.69	38.2	42.69	7.48	0.237
42.52	34.84	38.48	7.34	0.237
39.04	33.46	35.55	7.18	0.234
45.52	38.15	42.52	7.07	0.234
45.55	42.07	44.19	7.09	0.234
45.02	34.72	39.17	7.07	0.232
41.82	34.68	38.2	6.85	0.238
49.67	41.26	44.37	7.01	0.239
46.96	42.83	44.76	7.48	0.246
49.71	46.25	47.51	8.16	0.26
53.2	49.3	51.21	9.11	0.27
55.49	52.69	54.1	10.35	0.27
58.23	55.13	56.26	11.24	0.265
58.61	57.3	58.06	11.85	0.267
58.11	55.47	56.82	11.51	0.269
55.45	43.22	51.7	10.35	0.271
43.19	39.06	40.29	9.2	0.254
41.24	39.19	40.34	8.76	0.248
42.43	38.92	41.16	8.62	0.246
43.99	39.62	41.85	8.5	0.243
46.61	42.81	44.66	8.36	0.242
44.79	41.09	42.71	8.28	0.241
44.65	40.83	42.68	8.14	0.241
45.17	40.43	43.83	8.02	0.24

42.4	39.19	41.31	7.92	0.24
41.24	36.49	38.92	7.72	0.238
45.79	34.18	41.95	7.56	0.236
47.58	43.82	45.61	7.52	0.235
43.78	40.71	42.05	7.46	0.235
42.85	36.8	40.01	7.3	0.235
52.85	37.54	45.02	7.17	0.237
55.91	47.03	49.91	7.48	0.24
58.72	54.89	57.17	8.38	0.255
57.23	53.35	54.58	9.76	0.273
61.03	57.38	59.53	10.89	0.271
60.13	58.23	59.26	12.43	0.264
61.8	59.24	60.32	13.29	0.259
63.44	58.78	61.37	13.15	0.264
62.3	58.04	60.04	12.62	0.273
58.01	52.08	55.54	11.11	0.272
54.37	48.93	51.02	10.03	0.261
53.47	48.95	51.23	9.63	0.254
52.44	48.97	50.76	9.49	0.254
51.09	49.37	50.09	9.36	0.252
50.12	44.66	46.74	9.2	0.251
48.89	43.98	46.43	8.95	0.245
50.05	48.23	49.27	8.82	0.247
49.6	47.9	48.73	8.74	0.245
49.85	48.08	48.83	8.6	0.243
49.6	47.05	48.77	8.5	0.243
49.56	47.46	48.6	8.38	0.241
49.14	47.92	48.41	8.3	0.239
49.9	47.97	49.09	8.18	0.24
50.92	48.06	49.25	8.1	0.238
54.86	49.78	52.41	7.98	0.244
57.78	54.79	56.16	8.36	0.249
60.17	57.47	58.53	9.34	0.266
63.75	59.76	61.65	10.61	0.275
65.39	62.72	64.05	12.12	0.271
67.61	64.66	65.88	13.6	0.258
67.41	65.31	66.42	14.51	0.246
67.04	64.34	65.89	14.49	0.244
65.35	61.11	63.81	13.46	0.254
61.1	52.67	57.93	11.71	0.262
53.35	51.42	52.46	10.35	0.254
51.6	49.72	50.69	9.82	0.25
51.69	49.22	50.46	9.61	0.246
52.52	49.46	50.96	9.44	0.246
52.9	49.39	51.02	9.28	0.244
51.18	43.78	45.56	9.09	0.243
49.77	42.73	45.83	8.87	0.24

49.2	42.07	43.34	8.68	0.237
51.51	46.47	48.11	8.52	0.236
48.21	41.84	45	8.4	0.235
45.51	40.14	42.9	8.24	0.234
40.09	32.17	34.11	8.06	0.234
33.13	31.46	32.44	7.88	0.232
33.7	30.8	32.06	7.72	0.232
46.7	33.72	39.97	7.52	0.237
49.23	45.81	47.36	7.58	0.233
54.81	49.22	52.07	8	0.231
56.16	53.85	55.08	8.93	0.24
57.29	54.83	56.02	9.84	0.255
58.49	56.31	57.45	10.7	0.26
60.53	57.66	59.27	11.44	0.261
61.84	59.97	60.84	11.8	0.263
61.46	59.29	60.69	11.6	0.26
59.43	45.64	55.18	10.83	0.255
45.55	40.15	42.5	9.97	0.243
42.27	38.42	40.21	9.55	0.24
42.43	39.57	41.44	9.36	0.241
41.05	36.3	38.66	9.17	0.239
37.96	35.27	36.59	8.99	0.237
38.15	35.73	36.76	8.78	0.235
38.43	35.14	36.67	8.6	0.236
37.98	32.77	34.9	8.38	0.233
35.28	31.75	33.28	8.22	0.234
35.37	31.9	33.23	8.04	0.229
31.83	29.14	29.98	7.9	0.231
32.22	28.44	30.04	7.74	0.228
31.53	27.31	28.51	7.6	0.229
34.4	27.94	31.45	7.46	0.228
46.5	33.86	41.9	7.28	0.23
49.58	45.06	47.32	7.32	0.228
52.89	49.6	51	7.64	0.224
56.29	52.22	54.16	8.24	0.226
58.69	55.26	57.26	9.09	0.241
63.95	58.8	60.76	9.84	0.253
65.76	62.67	63.99	11.51	0.261
64.33	62.13	63.4	12.3	0.251
62.62	60.43	61.84	11.49	0.253
60.85	51.82	57.31	10.61	0.252
53.38	46.38	50.64	9.89	0.241
51.82	48.92	50.49	9.61	0.24
51.31	45.74	48.92	9.49	0.237
54.91	45.64	50.74	9.32	0.237
54.05	49.75	51.34	9.2	0.236
50.52	46.02	48.25	9.09	0.236

49.9	44.01	46.49	8.91	0.233
47.66	43.11	45.04	8.72	0.231
46.82	42.78	44.97	8.56	0.229
46.5	41.57	44.89	8.42	0.23
48	39.57	44.59	8.28	0.228
46.75	38.56	42.08	8.14	0.227
41.54	36.93	39.49	7.96	0.228
44.47	36.47	41.1	7.82	0.227
49.81	43.11	46.77	7.66	0.23
55.27	49.41	52.28	7.74	0.227
59.64	54.68	56.84	8.16	0.223
65.56	59.85	62.93	9.22	0.232
64.6	61.34	62.91	10.53	0.246
71.09	63.3	66.77	11.47	0.252
71.79	68.36	69.61	12.85	0.25
68.88	66.64	67.65	13.17	0.24
66.77	64.58	65.89	12.48	0.245
64.64	61.15	62.95	11.55	0.248
61.87	59.92	60.79	10.92	0.244
60.58	59	59.97	10.68	0.242
59.5	58.14	58.73	10.57	0.241
58.43	57.72	58.06	10.46	0.24
58.16	56.84	57.56	10.38	0.239
57.2	53.83	55.87	10.27	0.237
55.98	53.62	55.2	10.14	0.236
55.92	54.66	55.28	10.03	0.235
56	54.92	55.44	9.99	0.234
56.52	54.94	55.63	9.93	0.236
56.15	44.64	49.59	9.86	0.235
44.64	39.44	41.41	9.65	0.234
45.79	42.73	44.35	9.49	0.232
47.19	44.59	45.66	9.34	0.23
53.79	47.18	50.59	9.2	0.236
57.42	53.75	55.74	9.4	0.233
60.29	56.91	58.23	10.01	0.229
62.81	59.51	60.65	10.94	0.239
64.46	60.67	62.14	11.87	0.249
65.53	62.46	63.99	12.8	0.257
66.01	63.74	64.98	13.58	0.257
66.35	64.08	65.27	13.86	0.258
65.83	63.81	64.7	13.55	0.257
64.16	55.59	60.8	12.76	0.255
55.55	47.07	50.53	11.98	0.247
51.31	47.31	49.05	11.47	0.245
50.11	47.05	48.39	11.27	0.241
49.18	45.06	46.89	11.09	0.24
49.45	45.46	48.07	10.92	0.24

50.59	46.44	48.38	10.72	0.238
54.77	46.23	50.1	10.57	0.237
54.8	52.86	53.8	10.44	0.236
54.03	52.59	53.31	10.33	0.236
54.16	52.93	53.49	10.23	0.234
53.95	49.47	52.47	10.14	0.235
51.15	43.83	45.88	10.01	0.231
44.71	43.67	44.15	9.84	0.232
46.16	40.25	43.42	9.68	0.232
52.81	43.82	48.46	9.47	0.236
56.81	52.61	54.63	9.57	0.233
59.88	56.12	58.04	10.08	0.227
65.12	59.85	62.43	11.03	0.235
69.6	63.91	67.43	12.39	0.254
70.95	68.38	69.78	14.03	0.26
71.62	69.91	70.66	14.88	0.253
70.6	68.84	69.74	14.96	0.252
69.61	66.84	68.19	14.27	0.254
66.82	62.26	64.58	13.15	0.253
62.18	52.4	55.74	12.32	0.247
54.03	51.16	52.69	11.78	0.244
53.18	51.28	52.19	11.55	0.241
52.73	49.1	50.89	11.38	0.241
50.16	47.99	48.95	11.16	0.239
48.24	39.42	42.36	10.92	0.236
44.03	39.05	41.86	10.66	0.236
44.58	39.21	42.55	10.42	0.233
43.35	38.68	40.87	10.2	0.233
41.14	35.2	38.42	9.99	0.231
41	30.34	36.77	9.76	0.23
40.2	31.52	35.47	9.53	0.229
36.46	30.73	33.39	9.32	0.228
51.06	35.05	43.24	9.11	0.227
53.79	50.19	51.56	8.93	0.229
56.56	53.72	54.83	8.97	0.228
58.85	55.79	57.3	9.34	0.221
60.45	57.93	59.23	10.12	0.217
59.97	57.68	58.79	10.89	0.225
61.44	57.91	59.6	11.4	0.233
61.63	58.9	60.24	11.91	0.237
63.13	60.04	61.6	12.16	0.24
62.15	58.79	60.46	12.12	0.239
58.78	54.55	56.65	11.71	0.24
54.52	48.31	51.29	11.44	0.235
49.77	46.76	48.54	11.22	0.236
46.92	44.41	45.52	11.05	0.234
48.21	40.76	44.97	10.87	0.234

43.18	39.94	41.7	10.68	0.233
41.19	38.3	39.92	10.46	0.232
38.88	33.92	36.97	10.27	0.231
37.07	33.02	34.08	10.06	0.229
34.9	30.74	32.87	9.84	0.229
30.95	28.87	30.14	9.63	0.226
36.09	29.14	33.62	9.42	0.226
36.72	31.64	34.61	9.22	0.225
35.34	30.76	33.47	9.01	0.224
39.44	28.67	32	8.8	0.226
44.35	39.48	42.3	8.58	0.226
47.57	44.39	46.22	8.54	0.223
50.08	47.11	48.65	8.6	0.222
52.09	48.92	50.56	8.87	0.216
53.72	50.49	52.07	9.22	0.212
55.71	52.55	54.16	9.7	0.211
56.72	54.21	55.43	10.16	0.211
57.38	55.47	56.2	10.46	0.218
57	55.01	55.86	10.63	0.221
55.3	49.56	52.8	10.61	0.225
49.56	43.94	47.05	10.59	0.225
44.48	40.17	42.29	10.44	0.227
40.9	39.26	39.9	10.29	0.227
40.02	32.78	34.68	10.14	0.226
34.18	29.71	31.8	9.95	0.228
35.17	29.77	32.52	9.74	0.226
34.82	26.94	31.41	9.55	0.224
34.99	33.84	34.49	9.36	0.225
34.35	31.86	33.03	9.17	0.222
32.91	29.97	31.12	8.99	0.223
30.6	25.76	28.1	8.78	0.221
26.3	22.24	24.67	8.6	0.219
26.09	22.42	24.24	8.44	0.219
28.68	24.16	25.72	8.26	0.221
42.12	28.73	36.94	8.08	0.221
46.08	41.28	43.22	8.04	0.22
50.75	45.8	48.07	8.06	0.215
53.8	49.32	51.4	8.32	0.21
55.46	52.34	53.9	8.8	0.207
57.8	54.27	55.96	9.42	0.205
57.85	55.36	56.61	10.12	0.207
57.13	55.09	55.99	10.57	0.214
56.12	54.54	55.3	10.74	0.221
54.97	48	52.84	10.68	0.226
47.96	36.35	40.55	10.61	0.223
36.68	35.32	35.87	10.44	0.226
37.81	35.77	36.95	10.31	0.226

38.92	37.04	38.09	10.14	0.226
38.87	37.62	38.34	9.97	0.225
40.36	38.06	38.77	9.8	0.225
39.98	37.89	38.76	9.61	0.223
38.92	36.22	37.14	9.47	0.222
38.42	35.96	37.06	9.3	0.223
36.56	34.25	35.87	9.13	0.22
34.67	30.22	32.56	8.99	0.22
31.08	29.31	30.21	8.82	0.22
31.35	29.84	30.54	8.66	0.218
37.65	30.26	33.36	8.48	0.219
48.27	37.69	44.89	8.3	0.222
51.8	48.16	50.11	8.32	0.218
53.44	51.63	52.35	8.5	0.215
56.09	52.55	54.33	8.93	0.206
60.1	55.16	57.49	9.61	0.203
61.87	58.42	60.13	10.4	0.204
62.93	60.47	61.62	11.11	0.215
64.84	62.07	62.83	11.6	0.22
64.46	62.25	62.97	11.71	0.225
62.66	48.79	60	11.49	0.228
49.27	44.67	46.57	11.22	0.225
49.15	45.16	47.82	11	0.227
45.14	41.9	43.66	10.89	0.228
44.88	39.77	41.18	10.72	0.226
40.73	38.1	39.04	10.53	0.229
43.09	38.16	39.98	10.35	0.225
43.16	39.43	41.58	10.18	0.224
39.4	37.05	37.78	9.99	0.224
37.67	35.97	36.57	9.82	0.224
36.35	34.09	35.29	9.65	0.222
35.19	33.63	34.38	9.47	0.223
35.32	32.15	34.03	9.3	0.22
34.26	30.69	32.71	9.13	0.219
39.34	31.12	33.72	8.95	0.22
49.78	39.38	46.43	8.74	0.223
51.48	48.8	50.01	8.74	0.219
54.79	50.89	53.01	8.93	0.213
57.9	54.44	55.99	9.4	0.207
60.95	57.06	58.76	10.12	0.202
62.86	59.9	61.38	10.96	0.206
64.15	61.91	63.14	11.69	0.217
64.86	63.22	64.03	12.09	0.223
64.57	62.33	63.81	12.21	0.227
62.78	55.33	60.48	11.96	0.229
55.3	44.73	46.7	11.69	0.226
46.59	44.8	45.51	11.44	0.23

46.15	43.07	44.63	11.29	0.228
45.37	43.08	44.12	11.13	0.229
52.55	43.46	45.83	10.96	0.227
52.95	48.21	49.94	10.81	0.225
52.49	48.85	50.58	10.68	0.225
55.69	46.13	50.07	10.55	0.225
53.7	46.3	51.15	10.42	0.225
53.88	51.06	53.03	10.31	0.223
54.67	53.04	53.84	10.23	0.222
55.4	52.49	54.25	10.16	0.221
52.65	48.43	50.14	10.1	0.221
54.17	44.11	47.12	9.99	0.22
56.7	49.39	53.7	9.84	0.225
61.44	56.48	59.23	9.95	0.22
64.5	61.28	62.66	10.38	0.214
66.5	63.78	65.14	11.03	0.204
67.55	65.19	66.48	11.82	0.205
69.06	66.52	67.83	12.53	0.21
70.08	67.68	68.88	13.06	0.217
69.1	67.08	68.24	13.24	0.22
68.05	65.24	66.6	13.06	0.222
65.3	59.85	62.74	12.66	0.228
59.91	53.37	56.8	12.39	0.226
55.1	51.7	52.91	12.14	0.231
52.54	49.24	50.71	11.98	0.23
50.56	47.41	48.64	11.82	0.229
48.16	46.41	47.6	11.62	0.228
47.29	45.43	46.39	11.44	0.229
46.87	39.06	44.08	11.24	0.227
38.93	33.21	35.65	11.05	0.226
33.87	27.82	31.05	10.83	0.226
32.66	27.96	30.01	10.59	0.224
36.08	28.67	32.35	10.33	0.224
35.75	32.42	34.63	10.12	0.222
33.79	28.19	30.51	9.89	0.222
38.45	28.32	31.71	9.63	0.22
49.88	38.46	44.76	9.38	0.223
55.94	49.93	52.82	9.32	0.222
60.39	54.67	57.21	9.42	0.214
62.69	60.08	61.17	9.8	0.206
62.42	60.64	61.46	10.42	0.2
65.04	61.27	63.09	10.87	0.197
65.23	62.58	63.58	11.33	0.199
63.81	61.48	62.32	11.55	0.203
61.72	58.28	60.18	11.58	0.211
58.23	53.44	56.12	11.53	0.221
53.4	47.47	49.73	11.51	0.222

47.44	37.97	43.1	11.38	0.224
42.1	37.47	40.04	11.2	0.224
38.71	29.77	33.76	11	0.225
29.78	25.37	27.26	10.79	0.224
32.19	25.87	27.62	10.53	0.224
32.38	27.16	30.26	10.27	0.224
27.03	21.23	23.19	10.03	0.222
24.07	21.67	23.33	9.78	0.22
23.71	20.51	21.91	9.55	0.219
24.41	19.5	20.7	9.32	0.218
25.91	21.6	23.66	9.09	0.217
24.32	20.72	21.96	8.89	0.216
31.08	19.63	23.54	8.66	0.218
38.91	31.12	36.77	8.46	0.219
41.22	38.08	39.69	8.4	0.215
44.78	41.03	42.92	8.38	0.212
47.7	43.3	44.92	8.5	0.211
49.27	45.59	47.15	8.82	0.206
51.19	47.57	49.46	9.3	0.204
53.13	49.67	51.34	9.84	0.201
53.91	51.23	52.3	10.33	0.206
55.77	52.56	53.76	10.68	0.211
53.85	44.59	49.86	10.83	0.216
44.56	32.11	37.45	10.89	0.218
32.05	29.76	31.04	10.76	0.219
29.79	28.43	29.23	10.61	0.222
30.71	27.11	28.81	10.42	0.221
34.76	27.17	30.5	10.2	0.221
41.41	34.04	37.28	9.99	0.219
42.11	37	41.23	9.78	0.217
36.86	32.09	34.47	9.57	0.217
43.52	30.22	37.28	9.38	0.215
44.8	42.3	43.84	9.2	0.216
42.59	38.63	41.43	9.07	0.212
38.48	30.59	33.43	8.93	0.211
30.78	22.74	26.83	8.78	0.213
34.39	22.67	26.74	8.58	0.214
46.47	34.42	41.68	8.42	0.214
50.59	46.3	48.57	8.4	0.211
50.45	48.11	49.13	8.48	0.206
53.94	48.92	51.39	8.72	0.204
57.63	52.55	55.55	9.17	0.196
58.46	55.68	57.19	9.82	0.187
58.97	56.04	57.65	10.38	0.192
60.03	57.95	59.13	10.87	0.196
60.39	58.99	59.62	11.22	0.203
60.14	51.66	57.36	11.31	0.213

51.59	39.29	41.97	11.33	0.217
42.52	40.09	41.16	11.18	0.219
44.09	42.14	43.18	11.05	0.221
43.79	40.81	42.13	10.89	0.221
45.49	40.95	44.03	10.72	0.22
45.14	39.4	42.43	10.57	0.219
43.4	38.88	41.32	10.38	0.218
43.56	33.27	38.81	10.2	0.219
34.47	32.63	33.51	10.03	0.217
35.15	32.1	32.91	9.86	0.217
36.23	33.87	34.83	9.7	0.216
34.76	32.05	33.5	9.53	0.216
32.34	30.24	31.39	9.38	0.214
41.54	31.26	35.97	9.22	0.213
46.44	41.44	44.89	9.03	0.216
50.91	46.26	48.49	9.01	0.215
55.15	50.51	53.2	9.11	0.21
58.9	54.74	56.97	9.44	0.205
62.71	58.16	59.93	10.01	0.193
66.49	61.49	64.26	10.72	0.182
68.02	64.29	66.05	11.44	0.179
70.87	65.8	68.63	12.03	0.184
70.61	67.98	69.25	12.39	0.192
68.49	63.3	66.37	12.39	0.207
63.66	48.41	55.45	12.27	0.217
51.82	45.16	48.84	12.07	0.222
54.67	49.09	51	11.93	0.227
55.58	47.83	51.49	11.8	0.224
54.07	47.44	51.78	11.62	0.223
54.12	52.96	53.46	11.49	0.224
53.41	52.07	52.73	11.36	0.222
52.9	51.48	52.23	11.2	0.221
52.91	51.68	52.34	11.09	0.22
52.41	40.82	46.17	10.96	0.219
42.4	39.56	41.07	10.83	0.218
42.88	40.29	41.42	10.68	0.219
43.19	42.05	42.68	10.55	0.216
51.2	42.84	48.16	10.44	0.217
53.22	51.16	52.02	10.27	0.221
57.51	53.15	55.31	10.27	0.218
60.94	57.59	58.82	10.42	0.214
63.18	59.9	61.48	10.7	0.208
64.94	61.52	63.09	11.09	0.203
65.73	63.4	64.68	11.55	0.197
66.7	64.52	65.44	11.96	0.197
66.02	63.19	64.04	12.23	0.202
63.69	61.96	62.88	12.34	0.209

62.02	58.02	60.11	12.39	0.217
58.27	52.95	56	12.37	0.221
55.01	49.59	52.26	12.25	0.223
52.04	49.31	50.74	12.14	0.222
52.4	50.96	51.78	11.98	0.225
52.09	50.37	51.23	11.87	0.223
51.41	50.46	50.9	11.73	0.222
51.13	49.86	50.46	11.6	0.222
51.31	43.3	49.16	11.47	0.221
50.86	49.91	50.46	11.31	0.22
50.73	44.49	48.59	11.2	0.219
50.3	44.75	48.68	11.07	0.219
50.25	38.91	41.12	10.96	0.22
43.3	39.37	41.14	10.81	0.219
46.82	40.33	42.85	10.61	0.221
53.94	46.57	51.36	10.46	0.221
57.44	53.83	55.59	10.46	0.217
60.19	56.3	58.13	10.59	0.213
62.54	58.52	60.37	10.87	0.205
62.98	59.83	61.43	11.31	0.196
63.77	60.72	62.44	11.78	0.193
64.29	60.91	63.02	12.18	0.193
64.34	62.42	63.44	12.5	0.198
63.56	60.28	61.94	12.66	0.207
60.47	56.07	58.69	12.62	0.219
56.04	48.94	52.28	12.57	0.22
49.35	48.04	48.61	12.41	0.225
49.05	45.7	47.84	12.27	0.223
47.18	45.85	46.46	12.12	0.223
47.43	45.66	46.73	11.96	0.223
46.69	42.89	44.86	11.78	0.223
47.09	45.13	45.85	11.62	0.22
46.16	43.44	44.73	11.47	0.221
44.78	42.45	43.62	11.33	0.219
46.16	43.32	44.78	11.2	0.219
46.46	44.39	45.49	11.09	0.218
44.74	39.92	41.42	11	0.22
39.94	38.84	39.45	10.89	0.216
41.97	38.7	39.59	10.79	0.217
42.63	41.26	42.02	10.63	0.221
45.12	42.18	43.63	10.66	0.218
47.03	44.73	46.04	10.7	0.217
49.21	46.68	48.16	10.81	0.217
57.26	48.83	52.38	10.96	0.215
58.04	55.87	56.85	11.18	0.216
59.37	56.91	58.17	11.47	0.211
58.19	56.35	57.14	11.8	0.208

56.74	52.8	54.92	11.98	0.212
53.04	48.16	49.96	12.05	0.219
49.01	39.07	46.96	12.03	0.219
39.01	36.13	37.16	11.91	0.222
36.37	34.63	35.72	11.76	0.221
34.65	32.3	33.39	11.58	0.22
35.82	32.32	35	11.42	0.22
35.87	35.63	35.73	11.24	0.219
35.8	33.61	34.98	11.11	0.216
33.85	33.06	33.48	10.98	0.218
33.71	32.25	32.75	10.85	0.218
32.3	31.79	32.03	10.7	0.216
31.81	31.65	31.72	10.55	0.216
31.75	31.46	31.65	10.4	0.214
31.48	30.05	30.73	10.25	0.212
30.15	29.9	30.03	10.1	0.213
31.46	29.87	30.41	9.97	0.213
32.48	30.57	31.26	9.84	0.212
34.4	31.39	32.94	9.72	0.212
36.31	31.41	33.77	9.55	0.215
36.08	31.91	33.78	9.44	0.214
33.15	31.12	31.96	9.36	0.211
34.93	32.97	33.76	9.26	0.212
34.89	31.62	33.41	9.17	0.211
34.04	30.65	32.25	9.09	0.209
32.06	30.65	31.29	9.05	0.207
31.41	30.72	30.97	9.03	0.205
31.03	30.83	30.95	8.91	0.208
30.94	30.59	30.76	8.82	0.206
30.6	30.22	30.43	8.74	0.205
30.31	29.07	29.81	8.68	0.207
29.19	28.98	29.06	8.64	0.207
29.26	28.65	29.03	8.58	0.205
28.69	26.16	27.64	8.52	0.206
28.2	26.13	27.59	8.48	0.205
28.89	28.2	28.62	8.42	0.205
28.89	28.53	28.7	8.38	0.205
28.53	28.16	28.32	8.34	0.206
28.58	28.3	28.42	8.3	0.205
28.88	28.25	28.49	8.26	0.205
30.6	28.82	29.26	8.2	0.205
31.81	28.98	30.54	8.14	0.208
29.71	28.73	29.27	8.08	0.21
29.88	29.34	29.56	8.08	0.207
30.62	29.71	30.03	8.06	0.207
32.65	30.59	31.73	8.04	0.205
35.17	32.27	33.84	8.02	0.207

35.87	34.41	34.97	8	0.203
36.19	32.78	34.31	7.96	0.204
34.45	25.55	30.99	7.94	0.204
34.42	26.34	30.49	7.96	0.202
27.41	21.52	24.9	7.88	0.203
30.33	21.97	26.99	7.82	0.206
33.1	24.12	28.15	7.78	0.203
33.82	29.29	32.27	7.76	0.206
33.73	32.08	32.93	7.76	0.203
34.02	32.4	33.27	7.74	0.206
34.6	32.21	33.16	7.72	0.204
34.19	32.25	33.29	7.7	0.204
33.84	31.4	32.49	7.7	0.204
34.85	31.15	32.98	7.68	0.205
37.49	33.72	35.39	7.66	0.204
36.44	33.27	34.55	7.64	0.203
37.4	32.5	34.68	7.56	0.205
38.08	34.11	35.87	7.54	0.209
38.87	37.52	38.27	7.56	0.206
41.17	38.22	39.62	7.56	0.207
41.76	40.35	40.87	7.56	0.205
42.21	40.14	41.31	7.56	0.205
43.49	40.91	42.12	7.56	0.205
47.11	42.89	45.36	7.58	0.204
50.79	46.32	48.73	7.52	0.204
50.27	49.63	49.99	7.32	0.249
49.88	45.59	48.37	7.11	0.243
45.9	39.95	41.88	7.09	0.236
42.28	40.33	41.26	7.01	0.236
41.74	38.82	39.92	7.03	0.238
41.4	39.52	40.45	7.07	0.24
42.22	39.93	41.02	7.09	0.238
41.33	38.71	40.11	7.11	0.237
40.9	39.02	39.76	7.11	0.238
41.3	36.57	39.36	7.13	0.236
38.65	34.79	37.16	7.13	0.238
36.97	34.71	35.67	7.13	0.236
35.82	33.55	34.55	7.11	0.236
36.82	33.45	35.1	7.11	0.234
36.98	29.62	32.99	7.11	0.235
37.29	34.12	34.86	7.09	0.234
40.4	34.52	37.75	6.99	0.237
42.55	38.11	40.45	7.05	0.235
46.62	42.41	44.5	7.11	0.229
50.93	46.37	48.29	7.26	0.224
49.77	47.73	48.59	7.42	0.223
51.65	48.45	49.98	7.58	0.225

53.6	49.21	50.87	7.84	0.225
52.8	49.83	51.04	8.14	0.222
52.26	50.64	51.39	8.34	0.225
50.85	45.51	48.9	8.46	0.229
45.56	39.38	42.91	8.54	0.23
40.97	38.27	39.89	8.46	0.233
39.64	38.01	38.89	8.36	0.232
39.97	36.09	38.25	8.26	0.234
38.79	35.39	36.75	8.12	0.232
37.89	32.29	34.61	7.98	0.231
34.03	28.65	30.56	7.86	0.231
29.62	27.59	28.77	7.76	0.228
30.86	28.58	30.01	7.68	0.228
29.78	27.03	28.77	7.62	0.23
27.77	26.37	26.88	7.56	0.23
29.22	26.83	27.88	7.48	0.228
29.62	29.22	29.43	7.44	0.226
31.92	29.29	30.63	7.4	0.228
33.95	31.94	33.42	7.34	0.226
36.37	33.65	34.62	7.3	0.224
36.85	35.68	36.29	7.18	0.228
39.35	35.82	37.22	7.22	0.228
43.07	38.7	41.46	7.3	0.225
42.93	40.89	41.69	7.56	0.219
41.63	40.65	41	7.76	0.225
42.06	40.8	41.43	8.04	0.225
42.19	39.94	40.98	8.18	0.225
39.92	38.33	38.9	8.26	0.228
38.33	36.04	36.82	8.3	0.229
36.76	36.07	36.26	8.26	0.227
36.35	36.01	36.17	8.22	0.228
36.13	34.7	35.58	8.18	0.227
35.77	34.77	35.39	8.14	0.228
35.37	33.25	34.43	8.08	0.227
33.39	31.44	32.11	8.02	0.227
32.74	31.29	32.07	7.94	0.228
32.24	27.88	30.1	7.84	0.227
29.78	28.11	29	7.74	0.224
32.18	29.53	31.13	7.66	0.227
33	31.22	32.02	7.6	0.227
41.12	31.7	38.3	7.52	0.222
42.16	40.11	40.89	7.46	0.225
44.61	41.24	42.99	7.34	0.228
46.42	43.7	44.99	7.4	0.223
48.79	46.08	47.33	7.5	0.217
48.8	46.23	47.56	7.78	0.213
49.33	46.99	47.93	8.1	0.213

50.98	46.85	49.49	8.38	0.216
50.9	46.94	48.27	8.85	0.214
47.94	45.77	46.96	8.93	0.224
46.68	43.96	45.8	9.03	0.229
44.68	43.89	44.45	9.07	0.229
44.5	43.11	43.85	9.07	0.228
43.68	42.26	43.17	8.99	0.228
43.35	41.83	42.51	8.87	0.229
42.67	41.44	42.19	8.74	0.229
43.26	41.98	42.68	8.62	0.227
43.61	42.81	43.21	8.5	0.228
43.61	41.32	42.7	8.42	0.225
41.77	39.81	41.11	8.32	0.226
41.26	38.75	40.18	8.26	0.227
38.82	35.66	37.97	8.2	0.226
36.52	34.77	35.72	8.14	0.226
36.73	35.6	36.05	8.08	0.225
36.21	35	35.43	8	0.228
35.87	34.57	35.17	7.92	0.225
36.06	35.05	35.55	7.86	0.226
36.73	35.08	36.03	7.78	0.231
36.23	34.77	35.27	7.76	0.234
35.25	32.56	33.41	7.76	0.238
32.89	32.54	32.69	7.78	0.239
32.92	32.39	32.6	7.74	0.242
32.77	32.53	32.65	7.66	0.24
33.01	32.56	32.81	7.58	0.239
33.7	32.7	33.09	7.52	0.237
33.63	32.7	33	7.52	0.235
33.54	32.99	33.18	7.48	0.233
33.63	33.27	33.47	7.44	0.234
33.82	33.56	33.71	7.38	0.233
34.23	33.73	33.88	7.36	0.232
33.77	33.46	33.63	7.32	0.229
33.66	33.32	33.51	7.32	0.227
33.87	33.56	33.67	7.3	0.227
33.85	33.54	33.73	7.28	0.225
33.81	32.84	33.55	7.26	0.227
33.87	32.19	32.66	7.24	0.226
44.17	33.52	40.6	7.22	0.225
44.96	41.4	43.62	7.22	0.225
44.83	39.85	41.72	7.2	0.221
44.76	42.1	43.13	7.13	0.229
46.11	43.62	45.13	7.18	0.224
43.78	41.98	42.8	7.3	0.217
41.79	33.69	35.32	7.38	0.224
36.71	34.94	35.53	7.44	0.227

35.34	33.33	34.3	7.54	0.229
35.12	33.37	34.14	7.58	0.234
36.28	34.72	35.35	7.6	0.234
39.42	35.39	37.2	7.64	0.23
40.1	38.47	39.29	7.74	0.225
39.82	36.25	38.29	7.82	0.225
36.8	34.48	35.45	7.84	0.222
36.7	34.86	35.66	7.72	0.225
36.68	33.9	35.28	7.62	0.224
35.27	32.98	34.26	7.5	0.225
34.33	29.98	31.34	7.38	0.225
34.77	31.49	33.13	7.3	0.224
34.87	33.25	34.17	7.24	0.221
34.02	32.43	33.1	7.18	0.218
35.03	32.08	33.67	7.13	0.218
34.09	32.39	33.17	7.09	0.218
34.07	31.71	32.94	7.03	0.218
31.71	30.52	31.11	6.99	0.218
31.5	30.71	31.16	6.93	0.217
31.69	30.6	31.18	6.91	0.216
35.7	31.53	34.25	6.82	0.222
41.15	35.56	38.07	6.89	0.215
42.44	38.95	40.32	7.09	0.211
41.18	38.13	39.26	7.32	0.209
43.78	39.29	41.44	7.52	0.213
44.85	39.41	42.16	7.98	0.216
44.79	40.12	42.76	8.4	0.22
44.06	40.26	42.91	8.56	0.227
43.79	42.09	42.72	8.7	0.233
42.47	37.37	40.05	8.66	0.229
37.49	34.12	35.65	8.58	0.224
35.59	33.12	34.19	8.42	0.225
34.48	33.54	34.03	8.28	0.224
34.84	33.65	34.25	8.12	0.225
34.69	30.95	33.58	7.96	0.223
32.92	31.14	32.39	7.8	0.224
31.7	29.66	30.32	7.68	0.22
30.55	29.58	30.18	7.56	0.22
29.86	28.98	29.55	7.44	0.221
29.9	29.4	29.6	7.36	0.217
30.32	29.4	29.94	7.28	0.218
30.84	28.63	29.96	7.2	0.216
28.64	26.64	27.39	7.13	0.217
30.71	27.12	28.98	6.95	0.22
33.09	30.4	31.93	6.93	0.222
35.91	32.7	33.95	6.97	0.217
36.96	34.94	35.83	7.03	0.213

39.25	36.17	37.79	7.22	0.211
41.47	38.05	39.58	7.68	0.211
42.84	40.01	41.1	8.26	0.221
44.31	41.51	43.15	8.74	0.231
45.58	43.06	44.31	9.07	0.238
45.58	43.39	44.38	9.22	0.236
44.12	41.37	43.21	9.15	0.233
41.33	31.34	36.36	9.11	0.229
33.09	26.68	29.32	8.93	0.225
27.16	25.74	26.31	8.72	0.227
26.35	24.51	25.47	8.52	0.223
25.82	23.35	24.88	8.32	0.224
25.94	23.78	24.66	8.12	0.222
24.56	23.31	23.89	7.94	0.221
23.75	22.47	22.99	7.78	0.219
23.04	20.39	21.49	7.64	0.22
22.69	20.61	21.38	7.52	0.22
20.72	19.12	19.59	7.4	0.218
22.34	17.74	19.06	7.28	0.217
23.2	18.8	21.09	7.17	0.217
32.19	19.49	25.64	6.99	0.22
35.09	32.22	33.39	6.95	0.22
39.48	34.74	37.31	6.99	0.216
41.15	38.37	39.78	7.03	0.215
44.15	40.32	41.97	7.18	0.212
47.77	42.32	44.73	7.48	0.211
49.44	45.1	46.88	8.04	0.217
49.7	47.33	48.46	8.64	0.226
52.43	48.61	50.11	9.09	0.235
52.61	49.82	50.88	9.3	0.236
50.47	45.6	48.75	9.24	0.236
45.6	31.61	38.56	9.15	0.226
31.59	28.34	29.74	8.95	0.225
29.61	28.56	29.14	8.78	0.225
29.51	28.15	28.73	8.58	0.225
29.85	28.46	29.11	8.38	0.223
29.71	27.07	28.59	8.18	0.222
27.49	24.87	26.09	8	0.22
26.35	24.13	25.52	7.84	0.217
25.06	24.1	24.61	7.7	0.219
24.47	23.11	23.78	7.56	0.218
26.98	24.24	25.32	7.44	0.217
24.3	22.22	23.2	7.34	0.216
24.88	21.47	22.67	7.24	0.215
35.76	24.85	28.48	7.05	0.22
38.34	35.32	37	7.03	0.218
40.57	37.57	39.04	7.05	0.215

44.04	39.92	41.63	7.13	0.213
47.12	42.99	44.82	7.32	0.21
50.24	46.33	48.28	7.82	0.211
53.25	49.31	51.24	8.54	0.224
54.16	51.62	53.1	9.24	0.235
55.05	53.13	53.89	9.7	0.241
55.33	53.87	54.56	9.78	0.241
55.08	51.57	53.49	9.63	0.237
51.57	43.25	46.46	9.47	0.226
43.47	36.93	41.78	9.24	0.223
41.86	33.54	37.06	9.05	0.223
41.09	36.1	39.05	8.87	0.223
36.27	29.56	32.21	8.66	0.221
30.89	29.43	30.15	8.46	0.224
30.74	29.19	29.95	8.26	0.221
29.97	28.79	29.19	8.08	0.219
29.19	27.84	28.43	7.94	0.22
32.12	27.34	28.74	7.8	0.217
28.95	26.15	27.79	7.66	0.218
27.96	25.64	26.7	7.54	0.214
28.61	25.66	26.61	7.44	0.214
40.41	26.76	33.14	7.24	0.22
42.91	40.43	42.29	7.22	0.217
44.68	42.44	43.48	7.26	0.213
48.18	44.43	45.91	7.36	0.212
52.11	46.79	49.26	7.74	0.208
53.93	50.18	52.07	8.46	0.215
55.38	52.62	53.75	9.3	0.228
57.25	53.93	55.37	9.93	0.238
57.93	54.81	56.2	10.29	0.242
57.36	55.79	56.72	10.33	0.241
57.41	55.15	56.13	10.12	0.238
56.03	39.43	44.79	9.91	0.227
42.82	39.38	40.84	9.65	0.226
43.05	37.99	41.24	9.49	0.224
37.96	33.51	35.37	9.3	0.226
36.16	31.98	33.41	9.07	0.222
37.33	34.96	36.23	8.87	0.222
39.04	34.62	37.03	8.66	0.221
34.62	31.53	33.39	8.46	0.22
32.52	31.36	31.84	8.28	0.219
33.26	31.46	32.24	8.12	0.217
34.38	31.15	32.48	7.98	0.217
34.11	31.78	33.26	7.86	0.215
32.43	30.48	31.25	7.74	0.216
43.78	31.62	36.73	7.54	0.221
51.21	43.82	48.8	7.5	0.217

53.82	49.77	51.57	7.62	0.212
55.98	53.68	54.79	7.94	0.207
57.36	55.08	56.1	8.62	0.21
59.49	56.47	58	9.55	0.22
62.11	58.66	60.3	10.5	0.236
62.86	60.51	61.53	11.18	0.243
62.82	60.39	61.87	11.4	0.242
62.62	59.77	61.39	11.33	0.239
60.47	56.09	58.15	10.89	0.236
56.09	42.66	47.93	10.57	0.229
42.92	41.45	42.31	10.27	0.228
41.55	39.77	40.82	10.08	0.228
44.3	39.19	40.76	9.86	0.225
42.85	38.46	40.43	9.65	0.226
43.02	40.71	41.82	9.44	0.224
42.15	39.79	41.1	9.26	0.221
41.53	37.41	39.76	9.05	0.221
42.53	38.71	40.64	8.87	0.219
40.33	38.06	39.19	8.7	0.218
39.73	34.89	37.76	8.54	0.217
36.18	32.87	34.16	8.36	0.216
38.39	32.38	34.89	8.22	0.216
46.11	34.45	40.18	8.02	0.218
52.67	46.14	50.49	7.98	0.221
54.46	52.09	53.27	8.12	0.214
55.77	53.32	54.48	8.5	0.21
57.39	54.41	55.89	9.13	0.209
59.41	55.68	57.65	10.01	0.211
61.21	57.73	59.66	10.81	0.219
62.22	59.37	61.02	11.44	0.227
61.83	60.01	61.02	11.73	0.228
61.72	59.57	60.61	11.71	0.23
60.23	56.08	58.53	11.38	0.231
56.08	41.28	49.83	11.13	0.225
46.5	41	44.22	10.85	0.226
46.42	35.58	41.35	10.63	0.226
36.08	34.6	35.36	10.4	0.227
35.8	34.48	35.26	10.16	0.224
36.35	34.71	35.76	9.91	0.224
36.44	34.5	35.69	9.65	0.222
35.08	34.13	34.51	9.42	0.223
34.37	33.3	33.81	9.2	0.222
33.9	31.66	32.63	8.99	0.22
32.55	31.49	31.94	8.78	0.219
32.22	29.38	30.97	8.62	0.218
31.62	28.93	29.69	8.46	0.217
47.21	31.62	37.57	8.22	0.22

49.9	46.99	48.29	8.16	0.22
53.77	49.39	51.33	8.2	0.214
56.96	53.22	54.47	8.42	0.209
59.07	55.29	57.1	9.01	0.202
61.53	57.96	59.39	9.89	0.201
62.36	59.51	60.97	10.76	0.208
63.65	60.94	62.37	11.51	0.214
64.29	61.91	62.95	11.93	0.222
63.77	61.56	62.61	12	0.227
62.37	58.56	60.81	11.76	0.227
58.56	41.32	49.29	11.53	0.225
41.36	39.47	40.36	11.24	0.229
40.84	39.57	40.31	11.03	0.228
43.05	40.84	41.55	10.81	0.23
42.98	40.4	41.58	10.57	0.226
42.95	39.3	40.72	10.31	0.227
39.54	33.88	35.6	10.08	0.223
37.15	35.31	36.24	9.84	0.223
36.11	34.04	35.3	9.63	0.221
34.11	32.48	33.39	9.42	0.222
32.79	29.97	31.31	9.22	0.221
31.73	29.95	31.09	9.01	0.219
33.14	31.08	31.76	8.85	0.218
41.68	33.19	37.84	8.64	0.219
49.06	41.68	45.58	8.5	0.221
52.02	47.29	49.67	8.52	0.219
57.51	51.8	54.24	8.78	0.213
59.72	56.23	57.78	9.42	0.205
60.8	58.25	59.47	10.14	0.202
63.3	59.02	61.29	10.83	0.206
67.54	61.33	63.87	11.2	0.216
68.73	64.46	66.12	12	0.218
65.33	64.38	64.77	12.27	0.224
64.34	59.87	61.73	12	0.228
59.91	53.66	56.58	11.8	0.227
55.03	52.93	54.08	11.64	0.227
53.86	52.07	53.31	11.49	0.228
53.91	51.8	52.96	11.33	0.227
54.24	52.38	53.5	11.22	0.229
55.27	52.67	53.86	11.09	0.226
53.95	51.19	52.07	10.98	0.225
52.25	48.14	50.13	10.83	0.223
55.3	48.18	52.63	10.7	0.225
51.59	48.45	50.18	10.61	0.225
53.91	50.9	52.24	10.5	0.221
51.6	50.31	51.1	10.44	0.22
50.96	47.68	49.38	10.35	0.222

52.35	48.16	50.13	10.25	0.221
55.37	52.31	54.18	10.18	0.223
56.71	54.48	55.56	10.18	0.225
57.03	55.21	56	10.44	0.217
58.86	55.19	57.32	10.7	0.215
59.47	56.54	57.66	11.16	0.212
60.97	57.32	58.76	11.69	0.211
58.98	55.92	57.42	12.05	0.215
57.89	55.83	56.81	11.98	0.223
56.88	55.43	56.22	12.05	0.227
55.88	53.04	54.38	12.07	0.225
53.04	48.93	51.34	12	0.225
48.89	46.89	47.8	11.82	0.228
47.58	39.16	42.7	11.62	0.23
40.99	37.09	39.01	11.4	0.228
45.04	41	43.59	11.2	0.227
43.35	41.23	42.27	11.05	0.228
43.41	40.97	41.79	10.87	0.225
41.52	34.94	36.82	10.7	0.225
39.13	33.13	35.45	10.53	0.223
40.64	38.34	39.27	10.35	0.221
42.29	40.47	41.47	10.18	0.223
40.71	34.19	39.01	10.08	0.222
35.53	33.81	34.48	9.93	0.221
48.8	35.4	43.01	9.7	0.223
50.53	47.59	48.97	9.63	0.222
54.42	50.59	52.05	9.72	0.218
57.65	52.91	55.23	9.99	0.214
59.78	56.37	58.05	10.55	0.205
62.25	58.91	60.58	11.38	0.202
64.33	59.99	62.03	12.25	0.203
64.53	59.68	62.48	12.71	0.216
64.9	61.72	63.39	13.08	0.224
65.59	61.38	63.18	13.27	0.228
63.64	57.64	59.87	12.99	0.23
58.43	56.87	57.57	12.73	0.229
58.01	54.11	55.16	12.59	0.231
55.18	50.64	53.44	12.46	0.231
51.34	47.24	49.26	12.27	0.232
47.49	41.65	44.78	12.05	0.231
44.21	38.82	41.65	11.82	0.231
39.63	37.68	38.63	11.6	0.229
39.26	35.8	37.34	11.38	0.227
36.73	35.18	35.85	11.16	0.226
35.87	33.68	34.66	10.94	0.225
33.68	32.03	32.97	10.74	0.224
32.56	31.43	32.1	10.53	0.223

33.08	30.78	31.46	10.33	0.222
49.27	33.13	41.3	10.06	0.226
50.63	48.02	49.12	9.97	0.223
55.91	50.41	52.79	10.06	0.22
58.74	54.78	56.91	10.35	0.215
62.09	57.68	59.67	10.96	0.208
64.44	60.33	62.64	11.87	0.206
65.57	61.72	63.88	12.85	0.21
65.86	63.33	64.38	13.55	0.224
65.57	62.84	64.18	13.84	0.233
65.12	62.84	63.91	13.91	0.234
63.65	61.59	62.72	13.67	0.235
61.67	53.04	57.37	13.43	0.234
53.04	43.94	47	13.17	0.234
45.39	43.89	44.66	12.89	0.235
45.53	43.69	44.47	12.69	0.233
44.39	43.27	43.85	12.46	0.232
44.45	39.18	41.96	12.23	0.232
40.39	38.3	39.38	12	0.231
40.95	37.51	39.54	11.76	0.23
40	36.76	38.32	11.53	0.227
37.72	35.72	36.52	11.33	0.225
36.73	34.7	35.74	11.13	0.227
35.12	33.72	34.57	10.94	0.225
35.51	34.11	34.49	10.74	0.223
51.77	35.55	42.97	10.46	0.226
52.73	51.39	52	10.4	0.224
57.31	52.47	55.2	10.53	0.221
60.29	56.54	58.6	10.89	0.214
64.42	59.63	62.1	11.67	0.207
66.53	62.03	64.48	12.76	0.207
67.96	64.92	66.13	13.69	0.217
69.2	65.72	67.54	14.37	0.228
68.46	66.67	67.63	14.74	0.234
68.3	66.37	67.32	14.69	0.236
67.65	64.04	66.36	14.39	0.234
64	49.18	57.59	14.1	0.235
50.99	47.96	49.22	13.69	0.235
50.72	47.09	48	13.43	0.236
51.19	46.81	48.27	13.22	0.234
50.96	43.76	45.41	12.99	0.233
44.24	41.31	42.99	12.76	0.233
43.66	41.28	42.35	12.53	0.231
47.3	43.7	45.9	12.3	0.231
48.85	44.22	46.18	12.09	0.229
48.43	46.16	47.32	11.91	0.227
47.92	37.66	42.49	11.73	0.223

40.49	30.55	34.1	11.53	0.224
39.01	31.45	34.33	11.31	0.227
54.98	39.04	46.77	11.03	0.229
55.47	53.17	54.18	10.98	0.226
56.77	53.42	54.83	11.09	0.221
60.19	56.32	58.21	11.44	0.215
65.51	59.37	62.7	12.14	0.208
67.24	63.69	65.3	13.2	0.202
68.08	64.98	66.72	14	0.21
70.16	66.75	68.34	14.78	0.218
70.68	68.12	69.19	15.23	0.225
69.99	68.13	68.93	15.21	0.23
68.94	64.96	67.31	14.88	0.234
64.94	48.61	57.55	14.51	0.235
48.72	46.17	47.56	14.15	0.236
48.85	46.17	48.1	13.88	0.235
50.08	48.64	49.41	13.67	0.234
51.24	48.81	50.24	13.46	0.234
51.42	47.87	49.44	13.22	0.234
50.57	46.84	49.28	13.01	0.232
51.74	48.38	50	12.8	0.23
50.75	39.1	45.02	12.62	0.231
42.94	38.86	40.76	12.41	0.228
44.61	40.89	42.39	12.21	0.229
47.3	42.98	44.53	12.03	0.227
47	45.04	45.88	11.87	0.226
58.71	47.03	54.11	11.64	0.229
58.32	56.06	57.19	11.64	0.224
63.51	57.58	60.45	11.82	0.219
66.24	62.39	64	12.27	0.212
68.92	64.54	66.93	13.06	0.203
70.15	66.01	67.69	14.05	0.201
68.59	65.89	66.72	14.2	0.217
67.07	66.16	66.58	14.15	0.227
67.2	66.27	66.77	14.27	0.231
66.38	65.93	66.15	14.37	0.231
65.93	63.69	64.86	14.37	0.231
63.67	61.01	61.93	14.29	0.229
61.21	60.21	60.71	14.15	0.232
60.83	59.98	60.42	14.03	0.232
61.03	59.64	60.36	13.93	0.231
59.93	58.96	59.47	13.81	0.23
59.19	55.67	56.97	13.69	0.23
57.3	54.38	55.71	13.55	0.231
57.2	55.17	56.66	13.41	0.231
57.16	56.19	56.75	13.32	0.23
56.49	53.17	54.96	13.22	0.229

55.52	52.15	54.07	13.1	0.229
54.46	51.93	52.82	12.99	0.228
52.69	49.72	51.22	12.87	0.227
53.84	49.67	51.12	12.76	0.228
57.54	53.55	56.05	12.64	0.229
60.17	57.58	58.8	12.66	0.226
63.74	59.73	61.23	12.87	0.225
64.45	62.07	62.98	13.24	0.217
66.25	62.94	64.2	13.65	0.212
67.82	62.98	65.68	14.17	0.21
64.52	55.95	59.88	14.69	0.212
62.55	59.09	60.58	14.22	0.227
60.7	58.01	58.87	14.51	0.224
59.87	57.25	58.72	14.32	0.23
57.23	54.54	55.77	14.27	0.23
54.91	51.08	52.59	14.13	0.232
52.46	51.37	51.98	13.96	0.233
53.26	52.03	52.66	13.81	0.232
53.28	52.06	52.8	13.67	0.229
52.53	51.92	52.17	13.55	0.23
52.23	51.3	51.74	13.41	0.23
51.77	51.01	51.44	13.29	0.231
51.1	49.83	50.48	13.2	0.228
50.04	49.29	49.67	13.08	0.228
49.47	48.44	49.05	12.99	0.227
48.66	47.86	48.22	12.87	0.227
48.02	47.81	47.9	12.78	0.226
49.72	48	48.88	12.64	0.228
55.32	49.65	51.9	12.55	0.231
56.61	53.94	55.22	12.69	0.226
55.25	53.78	54.33	12.87	0.223
55.65	54.38	54.9	12.94	0.223
57.23	54.54	55.79	13.1	0.224
58	55.88	57.02	13.34	0.221
61.69	57.59	59.74	13.67	0.216
62.07	58.86	60.69	14.34	0.211
62.46	58.78	60.93	14.47	0.22
60.53	58.22	59.59	14.32	0.228
58.18	44.72	52.97	14.22	0.229
45.58	39.43	40.55	14.03	0.231
45.47	37.97	40.67	13.79	0.231
44.64	36.79	40.34	13.58	0.232
38.3	36.73	37.54	13.32	0.229
37.48	36.04	36.83	13.08	0.23
38.06	35.01	37.11	12.85	0.227
41.31	35.01	37.86	12.62	0.227
44.2	35.25	37.92	12.41	0.227

44.24	36.43	40	12.21	0.223
41.02	36.13	37.76	12	0.224
39.77	34.59	36.63	11.82	0.222
37.4	33.34	34.79	11.64	0.221
50.74	37.41	44.57	11.38	0.226
54.44	50.58	52.35	11.31	0.222
56.74	53.77	55.17	11.44	0.218
58.15	55.25	56.77	11.76	0.211
61.21	57.18	59.02	12.32	0.205
62.58	58.73	60.84	13.08	0.197
64.8	60.99	62.31	13.86	0.194
65.4	61.69	63.83	14.56	0.197
66.06	63.46	64.83	14.88	0.208
65.36	62.8	64.02	14.96	0.219
63.42	60.47	62.15	14.83	0.226
60.47	51.83	56.17	14.74	0.228
51.81	47.05	49.05	14.54	0.23
47.02	40.41	43.2	14.29	0.232
47	39.42	43.63	14.05	0.231
49.81	44.71	47.63	13.81	0.232
47.79	42.56	44.59	13.58	0.228
42.49	37.34	38.87	13.36	0.229
38.61	36.62	37.45	13.13	0.228
38.37	36.4	37.51	12.92	0.227
38.85	36.45	37.57	12.71	0.224
39.11	34.6	36.95	12.5	0.224
37.1	33.59	34.5	12.32	0.224
36.01	32.08	33.91	12.12	0.221
50.58	36.04	44.11	11.87	0.226
55.06	50.69	53.32	11.82	0.221
57.3	54.2	55.44	11.91	0.22
60.82	56.4	58.8	12.21	0.214
63.94	59.68	61.95	12.78	0.206
66.81	62.7	64.39	13.67	0.192
68.12	65.31	66.65	14.71	0.186
70.99	66	68.82	15.53	0.19
72.04	69.33	70.72	15.97	0.204
71.13	68.21	69.52	16.07	0.213
69.37	66.93	67.97	15.76	0.225
66.95	56.89	62.66	15.53	0.229
58.9	54.87	56.36	15.31	0.231
60.05	53.68	58.01	15.06	0.233
58.29	54.78	56.92	14.88	0.233
57.76	53.82	56.66	14.69	0.232
56.28	53.49	54.56	14.49	0.231
53.69	50.62	52.48	14.29	0.23
54.22	49.92	52.31	14.1	0.228

54.31	45.99	48.89	13.93	0.229
47.27	42.65	44.86	13.72	0.229
49.99	44.77	48.17	13.53	0.226
50.91	47.43	49.59	13.34	0.225
50.32	46.9	47.96	13.17	0.225
54.37	50.36	52.62	12.96	0.229
54.85	53.28	54.05	12.94	0.225
60.01	53.51	55.98	12.96	0.224
69.79	59.25	64.9	13.1	0.219
70.01	67.1	68.51	13.88	0.2
73.54	67.37	70.12	14.91	0.18
73.49	68.44	70.34	15.58	0.183
73.08	68.02	70.7	15.66	0.204
71.34	67.32	68.94	16.04	0.209
69.56	66.77	68.36	15.89	0.221
67.62	61.95	65.47	15.81	0.226
61.89	57.35	59.11	15.66	0.228
57.67	52.41	55.02	15.41	0.233
53.98	48.46	51.53	15.18	0.233
49.99	45.02	47.44	14.96	0.233
51.41	44.52	46.62	14.69	0.232
54.69	51.54	53.4	14.47	0.23
53.99	49.44	52.67	14.29	0.23
53.2	48.16	51.17	14.1	0.227
52.68	47.79	50.59	13.93	0.228
51.71	49.47	50.78	13.79	0.226
51.02	49.35	50.22	13.65	0.227
50.33	48.94	49.51	13.5	0.226
50.65	49.12	49.77	13.36	0.223
57.44	50.64	53.71	13.13	0.227
61.64	57.33	59.14	13.13	0.225
64.62	60.66	62.64	13.24	0.218
66.85	64.14	65.17	13.55	0.209
69.25	65.23	66.77	14.03	0.204
69.78	66.67	68.03	14.66	0.194
70.68	67.79	69.24	15.23	0.193
71.29	68.73	70	15.64	0.197
71.58	67.85	69.19	15.87	0.202
68.78	65.87	67.27	15.87	0.214
66.16	63	64.57	15.71	0.221
63	58.67	60.68	15.58	0.227
59.38	53.19	57.52	15.41	0.23
55.99	49.91	52.57	15.21	0.23
54.46	50.02	52	14.98	0.229
52.81	47.95	50.1	14.76	0.229
52.9	50.59	51.96	14.56	0.228
52.39	51.45	51.89	14.37	0.228

52.28	49.14	51.44	14.17	0.226
52.12	47.52	50.89	14.03	0.227
51.55	45.99	49.53	13.86	0.225
51.05	42.25	47.81	13.69	0.224
44.42	40.73	42.19	13.53	0.224
44.22	36.98	40.51	13.34	0.224
53.39	37.19	45.62	13.06	0.228
55.57	52.32	53.74	13.01	0.224
60.03	55.42	57.93	13.1	0.221
62.81	59.75	61.06	13.39	0.212
65.1	61.64	63.13	13.81	0.208
65.63	62.48	64.03	14.44	0.201
67.9	63.99	65.52	14.93	0.203
68.54	63.02	65.3	15.46	0.201
67.14	64.13	65.52	15.76	0.21
69.17	65.39	67.59	15.89	0.218
67.24	63.02	64.93	16.12	0.22
63	54.56	58.66	15.99	0.225
57.2	52.02	53.51	15.79	0.23
55.63	51.4	52.57	15.56	0.233
57.12	53.14	55.64	15.38	0.232
56.24	54.43	55.13	15.21	0.231
54.78	53.67	54.17	15.03	0.229
54.17	50.42	52.05	14.83	0.228
52.51	49.01	50.93	14.66	0.227
50.56	48.99	49.72	14.51	0.226
50.51	47.33	49.32	14.37	0.226
48.82	44.27	46.42	14.22	0.225
46.97	43.01	44.77	14.08	0.225
47.37	41.95	44.6	13.88	0.226
52.43	47.37	50.43	13.65	0.226
55.58	52.25	54.01	13.62	0.224
58.53	54.22	56.03	13.69	0.219
60.68	57	58.79	13.91	0.217
63.58	58.89	61.33	14.32	0.211
64.5	60.53	62.25	14.86	0.205
66.03	62.05	63.24	15.41	0.201
65.72	62.94	64.23	15.89	0.203
65.52	62.99	64.19	16.23	0.209
65.3	61.34	63.04	16.38	0.218
62.92	59.93	61.21	16.36	0.225
60.39	51.33	56.56	16.33	0.23
51.26	42.16	44.63	16.15	0.229
43.64	40.72	41.9	15.89	0.233
43.61	40.75	42.08	15.61	0.232
46.56	38.5	42.96	15.36	0.232
43.53	39.53	42.35	15.11	0.229

41.33	35.7	37.83	14.83	0.23
40.78	31.38	34.24	14.59	0.227
32.74	30.79	31.77	14.32	0.227
32.32	30.62	31.41	14.08	0.225
34.79	30.62	32.5	13.84	0.225
30.78	29.07	29.84	13.6	0.224
36.02	28.93	30.49	13.39	0.222
48.74	36.09	45.09	13.1	0.224
51.21	48.62	49.8	13.01	0.222
53.57	50.37	51.88	13.06	0.218
56.57	52.32	54.2	13.27	0.215
58.97	54.73	56.87	13.65	0.213
61.13	57.05	58.9	14.22	0.206
64.22	59.28	61.37	14.86	0.204
64.54	61.99	63.21	15.53	0.196
65.65	62.87	64.37	15.92	0.205
65.99	63.33	64.3	16.2	0.212
64.35	61.83	62.86	16.25	0.222
61.83	45.29	55.87	16.25	0.226
45.86	44.7	45.27	16.07	0.23
46.42	45.11	45.65	15.84	0.23
47.43	44.87	46.21	15.61	0.232
46.62	43.21	45.09	15.38	0.23
43.56	41.69	42.73	15.13	0.23
41.97	40.73	41.43	14.88	0.227
42.01	41.05	41.56	14.66	0.225
41.72	39.23	40.64	14.44	0.227
39.74	36.67	37.78	14.22	0.224
38.39	35.87	37.13	14	0.225
37.48	35.3	36.25	13.81	0.225
42.36	36.57	38.04	13.62	0.225
58.32	42.41	50.9	13.36	0.223
59.04	57.09	57.95	13.34	0.221
61.19	58.03	59.48	13.46	0.215
65.68	60.75	63.15	13.74	0.213
69.21	64.62	66.65	14.25	0.205
71.53	67.7	69.29	15.01	0.191
73.36	69.22	71.27	15.87	0.181
74.53	71.14	72.87	16.59	0.177
75.82	73.58	74.58	17.12	0.188
75.54	73.24	74.18	17.36	0.204
73.71	70.99	72.5	17.31	0.217
70.99	55.09	64.34	17.17	0.224
59.18	51.7	53.65	16.91	0.231
60.44	52.53	56.39	16.67	0.234
61.53	57.27	59.02	16.46	0.232
61.18	53.77	55.51	16.25	0.232

60.16	52.76	55.27	16.02	0.232
59.72	51.53	55.4	15.81	0.228
58.61	48.82	51.42	15.61	0.229
50.61	48.61	49.35	15.41	0.229
49.72	47.49	48.77	15.18	0.226
48.98	46.06	47.24	14.98	0.226
48.17	46.22	47.2	14.81	0.225
52.51	45.71	48.12	14.61	0.224
63.05	52.52	58.02	14.39	0.227
67.43	63.03	65.35	14.39	0.222
70.01	66.8	68.3	14.56	0.216
74.58	69.3	71.36	14.96	0.206
76.59	71.89	74.13	15.69	0.19
77.77	74.73	75.99	16.64	0.169
79.09	75.49	76.97	17.44	0.164
78.88	75.89	77.5	18.1	0.176
79.44	76.35	77.77	18.35	0.193
77.92	75.79	76.65	18.29	0.208
76.1	73.2	74.83	17.99	0.219
73.2	67.09	69.87	17.74	0.227
68.19	61.87	65.24	17.47	0.228
65.92	55.68	61.04	17.23	0.233
58.15	55.28	56.42	16.99	0.233
63.74	57.76	62.14	16.75	0.231
63.97	62.26	63.22	16.56	0.229
63.13	61.22	62.42	16.38	0.23
63.37	61.75	62.52	16.23	0.228
62.67	61.18	61.92	16.07	0.226
61.51	59.89	60.83	15.92	0.227
60.51	54.58	58.38	15.79	0.226
59.27	54.25	57.58	15.64	0.225
60.18	56.82	58.26	15.48	0.225
62.58	56.51	59.28	15.28	0.229
67.71	61.36	65.41	15.31	0.226
68.88	65.88	67.09	15.48	0.219
71.21	67.34	69.26	15.79	0.213
72.42	70	71.06	16.33	0.198
75.86	71.1	73	17.09	0.186
75.81	72.19	73.88	17.85	0.183
76.99	73.72	74.99	18.57	0.18
76.75	73.98	75.39	18.94	0.197
75.29	72.01	73.41	18.97	0.208
72.01	69.89	70.9	18.57	0.227
69.87	63.73	66.89	18.38	0.231
67.02	59.41	64.05	18.18	0.233
60.62	56.79	58.47	17.96	0.233
63.51	55.57	58.46	17.71	0.234

57.8	55.63	56.99	17.47	0.235
60.09	57.44	58.18	17.25	0.232
63.29	56.34	59.8	17.04	0.233
63.42	61.49	62.59	16.85	0.232
62.12	60.44	61.31	16.7	0.23
61.04	59.98	60.46	16.56	0.227
60.76	59.53	60.11	16.41	0.227
59.97	54.17	56.89	16.25	0.228
60.82	52.99	56.38	16.1	0.228
65.16	60.76	62.6	15.89	0.231
65.43	59.82	61.89	15.92	0.226
68.52	65.11	66.85	16.02	0.222
72.34	68.18	70.22	16.28	0.215
74.58	70.82	72.94	16.96	0.199
75.58	72.33	74.16	17.8	0.183
76.66	73.47	74.94	18.51	0.18
77.11	72.48	74.42	18.91	0.193
75.63	72.33	73.36	19.08	0.205
73.53	71.18	72.31	18.8	0.223
74.62	70.6	72.42	18.71	0.226
71.9	58.16	65.23	18.68	0.228
58.64	55.4	57.16	18.38	0.234
58.29	56.43	57.22	18.1	0.236
64.56	57.94	60.22	17.88	0.235
63.85	60.54	61.94	17.66	0.233
63.49	60.23	62.36	17.47	0.232
63.37	62.36	62.85	17.28	0.232
62.81	61.12	61.81	17.12	0.23
62.04	60.46	61.38	16.96	0.228
61.06	60.02	60.56	16.8	0.229
60.37	59.52	59.94	16.67	0.228
60.65	59.42	60.04	16.54	0.229
61.72	58.2	60.22	16.41	0.227
66.57	57.97	62.98	16.23	0.228
68.16	64.09	66.4	16.25	0.223
73.1	67.43	70.53	16.46	0.219
75.14	71.32	72.69	16.88	0.205
75.66	70.32	72.75	17.47	0.194
78.61	71.19	75.4	17.9	0.19
78.03	74.45	76.12	18.77	0.173
77.58	72.8	75.66	19.37	0.182
78.03	72.32	74.41	19.43	0.201
75.35	70.1	72.51	19.22	0.214
73.46	68.54	70.02	19.08	0.224
69.09	64.68	66.75	18.88	0.23
65.13	55.72	60.68	18.66	0.234
61.65	54.16	57.24	18.38	0.235

62.18	60.11	61.04	18.15	0.235
60.5	54.68	55.83	17.96	0.234
54.99	51.84	54.01	17.71	0.232
52.13	50.65	51.37	17.5	0.232
52.91	49.74	51.65	17.28	0.232
55.03	50.35	52.44	17.07	0.229
56.71	53.31	55.43	16.91	0.229
53.67	45.91	50	16.75	0.229
50.29	43.39	47.22	16.54	0.229
54.01	46.09	48.66	16.36	0.228
61.47	54.06	58.78	16.12	0.229
65.12	59.95	62.97	16.12	0.227
67.56	64.07	65.66	16.25	0.22
69.91	66.14	67.75	16.56	0.213
71.51	67.72	69.49	17.01	0.207
72.16	69.22	70.74	17.63	0.193
74.21	69.97	71.6	18.24	0.187
74.66	70.4	72.24	18.71	0.192
73.31	68.63	71.65	19.02	0.2
71.89	69.2	70.46	18.97	0.213
70.06	66.1	68.25	18.82	0.221
66.06	61.34	64.04	18.66	0.227
62.36	54.58	57.83	18.46	0.23
57.65	54.83	56.15	18.21	0.233
56.48	53.06	54.96	17.99	0.233
55.01	52.68	53.56	17.77	0.232
53.62	51.4	52.75	17.52	0.23
53.76	51.8	53.12	17.33	0.231
53.71	51.75	52.58	17.12	0.231
53.36	51.1	52.18	16.93	0.228
53.67	50.67	52.15	16.77	0.228
53.56	52.58	53.04	16.59	0.225
53.49	51.5	52.84	16.46	0.227
54.74	51.71	53.11	16.3	0.225
56.21	54.26	55	16.1	0.226
60.69	55.97	58.54	16.1	0.225
62.98	59.82	61.52	16.2	0.22
64.4	61.21	62.85	16.43	0.216
65.73	63.09	64.28	16.75	0.213
68.81	64.06	66.49	17.15	0.208
68.8	65.91	67.49	17.63	0.201
68.88	65.84	67.46	18.04	0.2
68.12	64.5	66	18.26	0.207
65.89	62.46	64.1	18.32	0.216
63.29	59	61.01	18.26	0.223
59	53.65	56.27	18.15	0.227
53.71	47.53	51.17	17.96	0.227

47.95	41.98	44.92	17.71	0.229
44.17	39.08	41.9	17.41	0.228
42.42	34.2	37.74	17.15	0.229
37.98	31.46	34.75	16.85	0.228
37.74	33.63	36.25	16.56	0.226
33.53	27.09	29.25	16.28	0.228
30.34	25.87	27.96	15.99	0.227
25.98	23.48	24.58	15.74	0.225
24.9	21.45	23.1	15.46	0.226
22.81	19.65	21.37	15.21	0.222
31.84	19.6	23.39	14.96	0.223
42.5	31.91	39.12	14.64	0.223
45.86	41.82	43.34	14.54	0.218
48.53	43.94	45.81	14.56	0.217
49.67	45.82	47.46	14.74	0.213
51.71	47.5	49.51	15.06	0.213
54.46	49.92	51.97	15.53	0.212
55.04	51.78	53.45	16.02	0.213
56.58	53.11	54.88	16.54	0.212
57.74	54.74	56.26	16.99	0.212
57.46	55.1	56.26	17.31	0.217
56.14	53.58	54.85	17.47	0.223
53.58	47.07	51.25	17.52	0.223
47.04	37	39.86	17.44	0.225
37.13	35.81	36.42	17.2	0.227
37.5	36.43	36.83	16.96	0.225
38.37	33.87	36.04	16.72	0.226
34.76	32.48	33.59	16.46	0.227
33.54	32.5	33	16.2	0.225
37.65	31.38	34.46	15.97	0.223
31.21	27.23	27.97	15.71	0.223
28.94	27.1	28.04	15.48	0.225
28.94	26.2	27.5	15.26	0.222
29.19	26.09	26.86	15.03	0.222
33.48	26.09	28.89	14.81	0.22
46.17	33.48	41.73	14.54	0.221
47.96	45.33	46.54	14.49	0.217
51.52	47.8	49.42	14.54	0.214
56.16	51.05	53.26	14.74	0.213
59.6	54.77	57.25	15.13	0.209
63.75	58.24	61.05	15.71	0.203
68.82	63.33	65.54	16.41	0.197
74.05	67.41	70.25	17.12	0.189
74.68	68.62	71.18	17.77	0.189
72.21	69.05	70.69	18.18	0.196
69.99	66.22	68.5	18.29	0.209
66.16	57.79	62.74	18.26	0.219

57.75	51.99	54.32	18.1	0.223
53.19	50.1	51.45	17.88	0.227
55.61	51.93	54.24	17.66	0.227
54.85	51.8	53.84	17.44	0.227
53.76	50.54	52.18	17.25	0.225
52.64	48.37	50.52	17.04	0.225
50.23	46.56	48.59	16.83	0.224
49.72	46.93	48.2	16.62	0.223
50.12	46.41	47.55	16.41	0.224
51.85	42.51	47.6	16.23	0.222
44.42	39.53	42.43	16.04	0.223
48.51	38.98	42.56	15.84	0.222
58.58	48.62	54.77	15.61	0.221
59.18	56.13	57.58	15.58	0.219
64.38	58.09	62.19	15.69	0.216
68.54	63.73	65.65	15.99	0.209
69.29	65.55	67.17	16.43	0.205
70.6	67.15	68.9	17.04	0.197
71.62	67.94	69.41	17.63	0.187
71.12	68.41	69.8	18.1	0.191
71.77	67.29	69.55	18.4	0.2
69.59	66.6	67.99	18.54	0.21
67.57	62.56	65.45	18.6	0.217
62.88	57.06	60.08	18.54	0.222
57.14	47.36	51.87	18.38	0.227
50.35	45.72	48.04	18.1	0.227
53.43	46.69	49.07	17.85	0.229
53.8	51.25	52.42	17.6	0.227
52.82	50.58	51.49	17.36	0.225
53.13	50.24	51.69	17.12	0.224
53.63	50.23	52.08	16.91	0.224
52.54	43.26	49.72	16.7	0.221
50.7	44.22	48.04	16.46	0.222
48.74	40.23	44.94	16.25	0.222
49.64	41.26	45.38	16.04	0.222
50.56	43.6	46.89	15.84	0.223
56.18	48.07	53.72	15.61	0.222
59.93	55.87	57.77	15.58	0.217
63.66	59.18	61.37	15.69	0.213
65.66	62.15	63.66	15.94	0.21
66.97	64.05	65.5	16.36	0.205
68	64.25	66.08	16.88	0.2
69.05	65.68	67.46	17.36	0.201
68.69	66.23	67.38	17.82	0.198
68.21	64.22	66.66	18.1	0.206
65.81	61.35	63.43	18.18	0.21
61.62	58.38	59.92	18.18	0.218

58.38	54.98	56.74	18.13	0.221
55.17	53.16	54.39	17.96	0.223
53.99	51.46	52.61	17.77	0.225
53.4	51.51	52.39	17.52	0.224
52.91	50.87	51.68	17.31	0.223
51.93	50.73	51.2	17.09	0.223
51.04	49.38	50.4	16.88	0.22
50.73	45.31	48.65	16.64	0.223
49.74	41.54	45.74	16.41	0.221
46.41	41.18	44.15	16.2	0.221
46.78	33.18	37.79	15.99	0.22
48.3	42.97	46.28	15.76	0.219
50.45	42.6	47.08	15.56	0.217
54.84	50.48	53.1	15.36	0.219
58.91	54.35	56.02	15.33	0.215
62.19	57.75	59.78	15.43	0.213
63.37	58.97	61.77	15.71	0.209
62.51	58.56	60.32	16.1	0.206
65.96	59.78	62.4	16.41	0.21
66.33	61.3	63.64	16.8	0.207
66.98	63.21	65.04	17.17	0.204
65.49	61.46	63.59	17.44	0.206
63	59.43	61.35	17.6	0.212
59.43	56.9	58	17.63	0.217
56.9	53.77	55.59	17.6	0.22
54.1	52.17	53.14	17.52	0.221
53.71	52.23	53.06	17.33	0.223
53.2	51.32	52.47	17.15	0.223
51.64	49.95	50.97	16.96	0.22
51.32	49.74	50.64	16.77	0.221
50.96	49.24	50.15	16.59	0.22
50.57	48.52	49.39	16.41	0.219
49.65	45.35	46.53	16.25	0.219
46.02	43.8	44.88	16.1	0.218
44.28	43.26	43.86	15.92	0.219
43.96	43.01	43.55	15.79	0.219
44.64	43.11	43.76	15.61	0.218
47.78	44.65	46.24	15.41	0.218
50.63	47.67	49.1	15.38	0.217
52.8	49.6	51.31	15.41	0.214
56.71	51.83	53.29	15.56	0.211
57.92	53.02	55.5	15.81	0.208
59.83	55.45	57.4	16.15	0.206
60.99	57	59.03	16.54	0.203
60.78	58.06	59.28	16.91	0.206
60.22	56.97	58.28	17.17	0.207
57.55	53.74	56.02	17.33	0.214

54.51	50.55	52.45	17.36	0.218
50.76	46.4	48.41	17.36	0.22
46.41	42.85	44.69	17.2	0.22
43.13	39.54	42.13	16.96	0.221
42.19	37.97	39.72	16.72	0.221
38.78	35.77	36.72	16.46	0.221
37.38	32.77	34.69	16.2	0.22
34.35	31.74	32.86	15.94	0.218
33.27	30.59	31.79	15.69	0.22
33.62	31.14	32.49	15.43	0.218
31.76	27.62	29.77	15.21	0.217
28.04	25.95	26.79	14.98	0.217
27.35	23.73	25.79	14.76	0.216
35.62	23.13	27.62	14.51	0.217
44.55	35.69	42.09	14.27	0.217
47.6	43.82	45.83	14.2	0.209
50.99	46.64	48.57	14.27	0.209
52.99	48.82	50.75	14.54	0.205
55.66	50.44	52.83	14.93	0.206
57.78	52.93	54.73	15.48	0.203
59.72	54.46	56.67	16.04	0.205
60.43	55.76	58.58	16.59	0.206
62.25	57.97	59.62	17.07	0.209
60.92	58.82	59.58	17.41	0.208
60.08	58.02	58.77	17.6	0.214
58.22	49.43	54.66	17.69	0.218
49.41	38.07	41.14	17.58	0.222
39.05	36.27	38.25	17.36	0.225
41.91	36.34	39.82	17.09	0.224
42.43	39.5	41.19	16.83	0.221
42.36	39.81	41.14	16.56	0.221
43.71	39.02	40.53	16.33	0.221
44.55	41.26	42.95	16.1	0.22
42.53	40.53	41.65	15.89	0.218
41.77	35.51	38.55	15.69	0.217
38.51	32.92	36.3	15.48	0.216
35.1	31.31	32.92	15.28	0.216
42.3	33.9	37.01	15.06	0.217
53.76	42.37	49.64	14.81	0.22
54.73	51.88	53.46	14.76	0.213
57.71	54.16	55.77	14.86	0.208
60.26	55.8	58.17	15.11	0.206
62.46	58.91	60.97	15.53	0.202
65.18	60.24	62.23	16.12	0.199
67.81	62.91	64.65	16.75	0.194
67.87	64.91	66.42	17.33	0.193
67.91	65.27	66.42	17.74	0.198

67.06	64.61	65.59	18.01	0.205
65.41	62.02	63.68	18.13	0.215
62	54.21	59.26	18.13	0.22
54.23	46.38	49.96	18.01	0.223
49.96	46.31	48.39	17.77	0.221
55.32	48.04	52.65	17.55	0.223
55.31	53.31	54.42	17.33	0.221
54.78	53.6	54.3	17.12	0.22
54.55	53.55	54.11	16.93	0.219
54.19	53.45	53.84	16.77	0.218
54.08	51.82	53.1	16.62	0.218
52.91	51.28	51.99	16.49	0.219
51.5	46.56	49.4	16.38	0.216
48	45.71	47.01	16.23	0.217
50.19	44.17	47.07	16.1	0.22
56.17	50.03	52.32	15.92	0.219
60.65	56.13	57.66	15.87	0.22
62.63	58.91	60.58	15.94	0.213
64.94	60.84	63.17	16.2	0.209
67	62.99	64.91	16.72	0.197
69.44	63.22	66.21	17.28	0.193
70	65.59	68.02	17.85	0.19
72.81	66.41	69.93	18.26	0.197
72.79	69.46	70.93	18.71	0.192
71.19	68.31	69.61	19.05	0.196
69.73	66.46	68.01	19.05	0.207
66.47	61.42	63.95	18.97	0.219
61.44	52.36	56.35	18.77	0.224
54.73	52.28	53.84	18.54	0.226
55.26	52.68	54.13	18.29	0.226
56.33	53.31	54.3	18.07	0.226
57.08	56.05	56.5	17.85	0.225
56.24	54.29	55.15	17.63	0.224
54.85	53.42	54.11	17.44	0.223
54.39	53.16	53.72	17.28	0.221
53.69	50.24	52.29	17.09	0.223
52.36	48.9	50.66	16.93	0.223
49.15	45.91	47.17	16.75	0.22
52.52	46.65	49.24	16.56	0.218
56.63	52.55	54.51	16.38	0.225
60.92	56.17	58.41	16.33	0.217
64.17	59.33	61.2	16.43	0.214
65.23	61.77	63.61	16.67	0.208
68.05	63.39	65.69	17.07	0.204
68.5	65.72	67.04	17.6	0.199
70.92	66.71	68.96	18.15	0.192
71.6	68.23	70.1	18.68	0.191

71.51	68.09	69.94	19	0.199
71.27	68.84	70.18	19.22	0.204
69.61	66.9	68.55	19.28	0.213
67.01	58.47	63.65	19.22	0.218
58.42	46	50.3	19.02	0.221
46.56	45.57	46.14	18.74	0.226
48.72	44.52	45.78	18.46	0.228
48.66	45.15	47.37	18.18	0.228
50.91	44.04	48.87	17.93	0.225
45.94	42.01	43.61	17.66	0.225
42.31	40.66	41.23	17.39	0.224
41.46	40.22	40.83	17.15	0.221
43.71	40.55	41.62	16.91	0.22
45.7	41.36	43.03	16.7	0.223
44.25	36.93	39.37	16.49	0.219
50.27	36.98	42.31	16.25	0.219
59.22	50.35	56.28	16.04	0.22
62.2	58.41	60.02	16.02	0.216
64.74	60.77	62.87	16.15	0.209
69.17	64.09	65.9	16.51	0.207
69.65	66.74	67.98	17.04	0.2
71.49	68.55	69.66	17.74	0.19
73.67	70.19	71.9	18.46	0.181
73.67	70.25	72.14	19.08	0.182
74.99	71.97	73.32	19.51	0.188
74.5	72.5	73.3	19.75	0.202
74.37	70.74	72.32	19.83	0.212
70.74	60.38	66.66	19.78	0.216
60.3	56.27	58.6	19.57	0.223
61.82	54.91	57.76	19.31	0.227
62.29	55.37	58.87	19.08	0.227
59.82	56.97	58.48	18.82	0.225
59.25	56.97	58.7	18.6	0.225
61.18	56.04	59.56	18.4	0.224
59.86	58.29	59.02	18.21	0.222
59.78	58.46	58.98	18.04	0.222
59.13	57.71	58.5	17.88	0.222
59.04	57.56	58.1	17.74	0.221
58.14	52.66	55.18	17.58	0.222
56.72	53	55.09	17.41	0.222
62.32	56.62	60.17	17.25	0.222
65.39	62.02	63.68	17.28	0.217
67.85	64.65	66.53	17.41	0.212
70.89	67.18	68.72	17.69	0.207
72.55	68.55	70.52	18.1	0.202
74.12	70.11	71.96	18.63	0.191
74.44	71.05	72.96	19.17	0.186

75.35	70.84	72.85	19.51	0.191
73.06	69.41	71.17	19.75	0.198
71.77	68.46	69.88	19.81	0.205
69.65	65.77	67.58	19.75	0.215
65.79	62.26	63.96	19.63	0.219
62.74	60.5	61.46	19.48	0.221
60.75	57.97	59.52	19.28	0.224
59.42	57.16	58.45	19.05	0.226
58.36	52.39	56.58	18.85	0.225
52.33	45.05	48.13	18.6	0.225
45.23	40.71	42.79	18.35	0.225
40.92	38.6	39.76	18.07	0.225
38.72	36.98	37.77	17.82	0.226
37.22	33.85	35.46	17.55	0.226
34.21	32.77	33.48	17.31	0.225
34.12	31.38	33.32	17.04	0.223
34.45	31.27	32.8	16.77	0.221
38.58	34.4	36.73	16.49	0.223
42.89	38.13	40.21	16.38	0.217
43.64	41.44	42.47	16.38	0.215
46.66	42.67	44.8	16.56	0.215
50.67	45.26	47.95	16.91	0.214
54.94	48.18	52.36	17.33	0.21
58.67	51.52	54.21	17.88	0.209
56.42	51.77	54.29	18.38	0.21
56.04	52.11	53.6	18.68	0.215
53.29	49.67	51.36	18.88	0.22
50.82	45.17	48.52	18.91	0.224
45.31	39.72	42.38	18.85	0.224
39.74	38.5	38.93	18.66	0.226
39.12	37.83	38.44	18.38	0.226
39.19	36.48	38.28	18.13	0.226
36.83	31.53	33.63	17.85	0.223
32.02	22.97	25.19	17.55	0.224
25.85	23.65	24.7	17.25	0.226
25.43	24.17	24.69	16.99	0.226
25.62	22.3	23.94	16.72	0.223
27.13	21.71	23.75	16.43	0.222
27.82	22.93	26.61	16.17	0.219
27.42	24.34	26.68	15.94	0.22
33.89	23.66	29.18	15.69	0.218
37.75	33.69	35.84	15.43	0.218
40.97	36.77	38.63	15.33	0.214
43.2	39.02	41.12	15.36	0.211
45.23	40.47	43.02	15.56	0.207
46.11	42.58	44.6	15.92	0.211
49.11	44.34	46.03	16.36	0.209

49.4	43.92	46.67	16.8	0.21
45.73	41.87	43.68	17.15	0.215
45.48	40.53	42.65	17.33	0.216
46.89	44.71	45.79	17.47	0.216
45.96	43.62	44.13	17.55	0.218
44.03	43.36	43.68	17.58	0.22
43.36	42.21	42.81	17.52	0.219
42.25	38.71	41.75	17.41	0.219
39.02	34.94	35.96	17.23	0.22
35.21	31.86	33.83	17.04	0.219
32.63	31.69	32	16.85	0.22
32.9	32.54	32.68	16.67	0.218
32.77	32.25	32.58	16.46	0.218
32.32	31.64	32	16.28	0.215
31.94	31.18	31.48	16.1	0.217
31.58	27.75	29.55	15.89	0.216
30.86	27.85	28.79	15.66	0.216
33.82	29.66	32.28	15.46	0.214
33.31	31.02	31.55	15.21	0.215
39.52	33.38	37.43	15.06	0.214
45.51	39.07	42.22	15.01	0.212
48.02	45.31	46.73	15.08	0.208
50.15	46.81	48.15	15.26	0.208
53.5	47.57	50.64	15.48	0.206
54.79	50.53	51.98	15.79	0.206
53.69	49.82	51.18	16.04	0.207
55.21	50.27	52.54	16.25	0.21
53.83	50.79	52.33	16.41	0.211
53.2	51.99	52.45	16.51	0.215
52.83	50.08	51.7	16.56	0.215
50.14	45.61	47.98	16.56	0.213
48.83	45.68	47.36	16.46	0.215
50.73	48.59	49.68	16.33	0.215
51.17	49.51	50.43	16.2	0.214
49.75	46.22	47.2	16.07	0.214
48.97	46.22	47.61	15.94	0.214
48.52	44.69	46.6	15.84	0.214
47.96	44.8	46.25	15.74	0.215
48.31	46.82	47.59	15.61	0.211
48.28	44.21	46.58	15.51	0.21
47.22	44.22	45.9	15.41	0.213
49.31	45.72	47.55	15.28	0.21
54.63	49.13	51.88	15.16	0.213
59.39	54.56	57.04	15.21	0.208
61.25	58.63	60.11	15.36	0.207
63.98	60.42	62.18	15.69	0.201
65.2	61.71	63.8	16.17	0.196

69.29	63.09	65.81	16.77	0.191
69.82	63.86	66.14	17.31	0.191
70.52	64.83	66.68	17.66	0.199
68.24	65.42	66.68	17.93	0.206
71.55	67.03	69.4	18.13	0.21
70.66	66.52	68.6	18.4	0.206
66.65	61.57	64.24	18.49	0.212
62.04	54.89	57.75	18.38	0.217
55.91	54.13	55.23	18.18	0.219
55.78	53.27	54.47	17.99	0.22
54.2	52.33	53.54	17.77	0.219
53.49	51.17	52.23	17.55	0.221
53.02	49.92	51.92	17.36	0.22
53.04	50.99	51.84	17.17	0.218
52.49	46.99	50.66	16.99	0.218
47	37.57	42	16.8	0.217
41.59	37.09	38.73	16.59	0.218
40.47	35.63	37.74	16.38	0.216
49.31	37.14	43.25	16.15	0.217
54.06	49.1	51.64	15.94	0.217
58.14	54.06	56.4	15.94	0.213
61.22	57.49	59.37	16.07	0.208
63.58	59.68	61.7	16.38	0.207
65.67	62.3	63.96	16.85	0.201
67.54	63.18	64.53	17.41	0.197
67.06	63.55	65.08	17.8	0.206
70.59	66.16	67.6	18.13	0.205
70.84	65.82	68.27	18.51	0.201
67.62	64.47	65.93	18.77	0.204
65.06	62.54	63.69	18.77	0.214
62.85	59.85	61.98	18.77	0.217
61.29	56.06	59.07	18.68	0.217
57.79	50.19	52.95	18.51	0.22
51.5	46.59	48.98	18.29	0.222
54.89	49.94	52	18.07	0.222
54.28	51.6	52.95	17.85	0.222
54.63	52.34	53.42	17.66	0.219
54.09	50.45	52.25	17.47	0.22
53.13	50.54	51.85	17.28	0.218
54.59	50.99	52.77	17.09	0.219
57.67	51.97	55.68	16.93	0.216
57.48	54.92	56.39	16.8	0.217
60.53	56.15	58.58	16.67	0.214
64.35	60.39	62.16	16.54	0.215
68.24	63.99	66.07	16.59	0.212
70.4	67.24	68.61	16.77	0.207
72.99	68.72	70.62	17.15	0.202

72.87	69.25	71.13	17.74	0.185
74.96	68.84	71.65	18.29	0.176
75.33	68.93	72.22	18.85	0.171
73.94	68.04	70.97	19.28	0.177
72.46	68.02	70.52	19.37	0.194
72.17	69.82	70.95	19.54	0.204
70.64	67.76	69.22	19.63	0.208
67.79	63.52	65.53	19.54	0.217
63.52	56.4	59.75	19.4	0.22
60.85	53.76	55.75	19.17	0.224
54.87	52.66	53.64	18.94	0.223
55.75	53.71	54.88	18.68	0.221
56.43	53.24	54.91	18.46	0.223
58.55	55.48	56.44	18.24	0.221
59.68	56.1	58.38	18.04	0.221
59.19	57.76	58.33	17.88	0.218
58.41	57.11	57.83	17.71	0.218
58.11	56.5	57.26	17.58	0.219
57.27	55.05	56.46	17.41	0.218
60.66	56.43	58.72	17.25	0.217
63.84	60.08	61.6	17.15	0.216
66.49	62.38	63.84	17.17	0.215
69.05	65.13	66.62	17.33	0.209
69.26	64.72	66.31	17.66	0.199
67.74	63.8	64.9	17.96	0.194
67.24	65.26	66.03	17.99	0.206
66.74	63.56	64.91	18.15	0.209
68.92	65.23	66.93	18.29	0.21
67.53	64.94	65.97	18.54	0.205
70.24	66.78	68.29	18.63	0.21
69.9	65.35	67.36	18.8	0.214
65.41	60.12	63.77	18.77	0.215
60.39	58.37	59.11	18.74	0.217
59.57	56.84	57.71	18.6	0.221
58.13	55.42	56.73	18.46	0.218
56.05	52.82	54.54	18.26	0.22
55.76	50.71	53.88	18.1	0.22
54.33	49.12	52.05	17.9	0.219
50.64	44.16	47.03	17.69	0.222
45.03	42.72	43.59	17.5	0.22
44.85	42.49	43.61	17.28	0.217
48.78	42.64	45.88	17.07	0.22
47.54	43.46	44.95	16.88	0.218
56.04	43.28	49.24	16.67	0.217
62.5	56.07	60.38	16.49	0.218
64.1	61.94	62.93	16.54	0.21
67.29	62.62	64.32	16.7	0.209

68.08	64.23	66.5	17.04	0.203
69.14	65.21	67.36	17.58	0.199
71.71	65.74	68.51	18.24	0.191
71.54	67.35	69.6	19.02	0.181
71.1	66.73	69.11	19.6	0.184
70.08	66.86	68.61	19.92	0.197
68.35	64.43	66.78	20.13	0.208
65.76	61.36	63.68	20.19	0.214
61.68	57.24	59.51	20.13	0.221
57.39	44.92	50.52	19.92	0.226
48.85	45.6	47.5	19.63	0.227
47.94	44.18	46.32	19.31	0.226
45.39	42.7	44.31	19	0.226
49.36	44.82	48.09	18.71	0.224
48.82	47.12	47.78	18.43	0.221
50.06	47.42	48.8	18.21	0.221
49.59	42.53	46.43	18.01	0.219
47.32	43.99	45.88	17.8	0.221
47.85	38.01	44.26	17.6	0.219
39	35.81	37.32	17.39	0.218
55.45	35.9	46.88	17.17	0.219
57.23	52.88	54.54	16.99	0.218
58.74	55.39	57.06	16.99	0.214
63	57.18	59.32	17.15	0.21
66.12	61.21	63.99	17.5	0.206
67.95	63.06	65.17	17.93	0.203
67.07	62.03	64.3	18.43	0.205
69.21	62.31	66.05	18.85	0.206
68.84	63.65	66.05	19.43	0.201
66.79	63.6	65.29	19.81	0.201
67.06	63.8	65.1	20.01	0.205
64.65	60.65	62.39	20.1	0.213
60.7	54.64	58.25	20.01	0.219
54.76	50.99	52.57	19.86	0.224
51.61	48.64	50.11	19.6	0.226
51.42	47.93	50.28	19.34	0.226
49.63	46.91	48.47	19.08	0.225
50.09	48.01	49.34	18.82	0.222
49.9	48.38	49.22	18.57	0.221
48.79	47.84	48.33	18.35	0.222
48.83	47.98	48.45	18.13	0.22
48.62	47.23	47.98	17.93	0.218
48.03	47.26	47.68	17.74	0.218
47.99	46.79	47.26	17.58	0.217
49.96	46.9	48.45	17.39	0.217
52.98	49.76	51.07	17.23	0.217
55.85	50.7	53.03	17.17	0.215

58.87	52.65	54.98	17.23	0.213
59.7	51.95	56.35	17.31	0.21
62.05	57.33	59.67	17.58	0.209
64.33	51.72	59.71	17.99	0.205
61.68	52.01	58.34	18.29	0.206
62.94	58.8	61.03	18.57	0.209
63.37	58.97	61.06	18.85	0.21
63.13	59.83	61.3	19.08	0.211
60.59	56.66	58.56	19.2	0.215
56.93	51.23	53.97	19.22	0.217
51.3	49.55	50.37	19.11	0.22
50.09	49.05	49.55	18.94	0.223
50.4	49.28	49.96	18.74	0.221
50.15	48.9	49.66	18.51	0.219
50.33	48.3	49.18	18.32	0.219
49.04	47.79	48.44	18.13	0.218
48.97	48.1	48.58	17.93	0.218
48.93	48.05	48.46	17.77	0.216
48.47	47.13	47.95	17.6	0.215
47.52	44.89	46.51	17.44	0.215
46.62	43	45.05	17.28	0.217
50.66	44.64	47.71	17.09	0.218
55.44	50.59	52.92	16.93	0.218
59.08	53.81	55.75	16.93	0.214
59.89	54.01	56.31	17.04	0.213
61.92	57.99	59.71	17.23	0.208
62.78	57.25	59.86	17.6	0.207
59.07	55.35	57.35	18.01	0.209
59.68	53.3	57.34	18.24	0.212
59.75	49.4	54.43	18.43	0.215
52.72	47.21	49.64	18.54	0.217
53.81	45.89	50.8	18.57	0.219
45.89	42.71	44.2	18.6	0.221
45.58	44.46	45.04	18.49	0.22
45.13	42.65	43.27	18.35	0.22
43.28	40.64	41.76	18.13	0.217
43.05	41.03	41.94	17.9	0.22
41.32	37.57	38.58	17.66	0.22
38.72	37.25	37.88	17.41	0.219
39.65	37.23	38.24	17.15	0.218
40.63	39.39	40.11	16.88	0.216
39.94	38.77	39.44	16.64	0.215
38.84	38.56	38.71	16.41	0.212
38.93	38.57	38.79	16.2	0.211
39.08	38.56	38.77	15.99	0.212
40.54	39.05	39.56	15.79	0.208
41.64	40.49	41.18	15.56	0.214

45.03	41.39	43	15.48	0.21
49.93	44.43	46.62	15.46	0.209
51.49	47.2	48.94	15.53	0.21
51.07	47.18	49.16	15.69	0.208
53.11	48.06	50.72	15.84	0.209
53.68	49.69	50.98	15.97	0.207
53.39	49.53	50.96	16.17	0.208
51.12	47.85	49.12	16.36	0.21
49.68	46.42	47.62	16.43	0.211
55.49	49.58	52.95	16.43	0.216
55.44	50.42	53.64	16.43	0.213
50.42	45.13	48.47	16.43	0.209
46.13	44.59	45.3	16.25	0.21
45.32	43.73	44.43	16.04	0.21
44.71	42.56	43.43	15.84	0.211
42.94	41.37	42.29	15.61	0.211
42.64	41.26	42.04	15.38	0.21
43.12	40.04	41.4	15.18	0.208
41.81	39.5	40.37	14.96	0.206
40.96	38.27	39.95	14.76	0.207
41.48	39.43	40.33	14.59	0.205
41.64	38.18	39.89	14.39	0.206
46.91	40.6	44.06	14.22	0.204
50.02	46.85	48.53	14.03	0.207
55.33	49.11	52.59	14.05	0.204
56.52	53.06	54.87	14.29	0.202
59.74	55.25	57.26	14.76	0.201
61.99	58.51	59.98	15.38	0.199
63.23	58.66	61.07	16.17	0.197
65.04	60.24	62.16	16.93	0.199
65.92	60.82	64.03	17.52	0.207
66.37	62.61	64.3	18.1	0.206
67.32	62.32	64.11	18.51	0.212
63.38	62.16	62.84	18.68	0.219
62.15	59.02	60.9	18.77	0.219
59.02	49.45	52.22	18.66	0.22
50.66	48.44	49.71	18.4	0.222
52.93	48.23	50.51	18.15	0.219
52.6	46.81	48.75	17.88	0.221
50.15	44.73	46.35	17.58	0.219
45.03	43	43.74	17.31	0.219
45.58	43.91	44.55	17.04	0.218
47.12	43.7	45.22	16.77	0.214
50.57	43.35	46.48	16.54	0.215
50.78	48.49	49.85	16.33	0.215
48.7	41.69	45.71	16.15	0.213
54.13	47.3	51.2	15.94	0.212

57.87	53.87	56.06	15.76	0.215
59.43	57.02	58.2	15.76	0.213
62.11	58.42	59.94	16.02	0.207
64.2	60.79	62.38	16.64	0.202
67.16	62.86	64.92	17.12	0.2
68.69	65.36	66.9	18.01	0.193
70.75	66.74	68.28	18.94	0.186
72.99	68.1	70.32	19.63	0.195
71.67	69.55	70.56	20.1	0.207
72.08	69.73	70.85	20.46	0.212
72.22	69.07	70.13	20.61	0.221
69.26	61.86	66.81	20.55	0.225
61.82	52.36	56.26	20.37	0.227
52.35	50.37	51.35	20.07	0.23
52.76	50.71	51.94	19.72	0.228
51.8	50.22	50.96	19.4	0.226
51.53	50.51	51.08	19.08	0.226
50.83	48.39	49.55	18.77	0.226
51.26	45.1	47.56	18.46	0.225
48.3	45.15	46.87	18.18	0.222
49.7	43.93	46.52	17.9	0.221
49.28	43.11	46.12	17.66	0.22
48.11	44.05	45.7	17.41	0.221
54.72	48.08	51.51	17.15	0.217
57.15	54.38	55.32	16.93	0.22
61.63	57.13	59.37	16.93	0.215
67.14	61.32	64.17	17.17	0.213
71.63	66.46	68.58	17.63	0.206
73.27	69.46	71.25	18.46	0.197
74.76	71.06	72.43	19.46	0.183
77.39	71.56	74.3	20.37	0.18
78.08	73.56	75.97	20.91	0.191
77.69	75.2	76.53	21.31	0.203
76.91	74.35	75.65	21.59	0.213
75.92	73.62	74.72	21.59	0.223
74.05	66.68	71.22	21.47	0.226
66.64	54.67	59.5	21.28	0.229
56.4	53.55	54.3	20.91	0.233
55.95	51.93	53.47	20.58	0.232
58.37	52.89	56.18	20.25	0.231
58.09	54.71	56.16	19.95	0.23
58.72	57.54	58.13	19.66	0.228
63.42	58.64	60.89	19.4	0.226
63.25	61.57	62.47	19.17	0.224
62.81	61.24	62.12	18.97	0.223
62.06	60.83	61.43	18.77	0.223
61.88	56.5	58.76	18.57	0.222

62.63	56.52	59.09	18.35	0.223
68.37	62.69	66.17	18.18	0.221
71.32	68.17	69.8	18.29	0.216
72.89	70.18	71.62	18.57	0.211
76.31	72.49	74.25	19.11	0.203
78.32	74.82	76.36	20.01	0.183
79.56	75.49	77.32	21	0.166
81.1	76.73	79.01	21.84	0.172
83.1	78.12	80.1	22.55	0.175
81.4	78.49	79.68	22.68	0.195
80.7	77.6	78.74	22.71	0.205
79.06	75.61	77.24	22.45	0.218
75.59	70.95	73.99	22.16	0.227
71.56	64.3	69.78	21.91	0.228
65.39	63.77	64.47	21.59	0.23
70.36	63.53	68.68	21.25	0.23
69.58	67.43	68.38	21.03	0.23
67.91	66.6	67.34	20.79	0.227
67.39	65.89	66.7	20.55	0.228
66.8	65.08	65.8	20.31	0.226
65.24	64.13	64.61	20.1	0.225
64.55	60.73	63.39	19.89	0.227
61.35	56.79	58.83	19.69	0.223
58.9	55.37	56.99	19.46	0.225
67.98	56.02	62.39	19.22	0.223
70.31	67.49	69.03	19.05	0.223
73.24	69.56	71.84	19.11	0.218
75.96	72.88	74.29	19.4	0.211
78.47	74.45	76.34	20.01	0.195
81.5	75.38	78.26	20.91	0.179
81.7	76.63	78.45	21.65	0.179
80.8	76.03	77.74	21.94	0.192
78.14	75.74	76.66	21.81	0.213
76.14	74.77	75.47	21.78	0.217
75.94	75.22	75.54	21.72	0.222
75.66	72.19	74.26	21.62	0.221
72.19	66.29	69.28	21.53	0.223
66.38	61.05	64.14	21.28	0.226
61.73	58.7	59.81	21	0.226
67.15	58.74	64.27	20.73	0.227
66.78	65.74	66.31	20.52	0.226
67.09	65.49	66.15	20.31	0.223
66.84	65.41	66.04	20.13	0.224
66.06	64.43	65.32	19.95	0.223
65.53	64.11	64.69	19.81	0.222
64.72	59.41	63.15	19.63	0.219
60.23	56.12	58.81	19.46	0.22

56.8	54.39	55.32	19.28	0.222
67.23	56.45	62.58	19.08	0.222
70.6	67.25	68.96	18.97	0.223
72.99	70.38	71.66	19.05	0.215
75.86	72.01	73.9	19.37	0.207
77.12	72.41	74.62	19.86	0.2
77.87	71.86	74.78	20.37	0.192
75.43	71.56	73.52	20.67	0.202
76.59	72.65	74.29	21.1	0.198
77.18	72.11	74.78	21.37	0.201
77.03	73.17	74.26	21.69	0.204
77.27	68.91	73.85	21.81	0.209
70.12	65.99	67.89	21.87	0.212
70.78	65.78	68.57	21.59	0.226
65.76	57.64	62.25	21.5	0.223
60.46	57.76	58.56	21.19	0.228
61.28	55.84	58.35	20.94	0.226
57.68	54.18	55.85	20.67	0.225
56.79	54.52	55.67	20.43	0.225
56.9	54.52	55.41	20.19	0.225
57.99	55.15	56.31	19.98	0.224
62.24	56.79	59.08	19.78	0.221
58.07	53.49	55.97	19.6	0.221
58.98	53.39	56.94	19.4	0.22
59.82	54.95	58.69	19.25	0.22
64.71	58.98	60.83	19.11	0.22
68.57	60.4	63.93	19	0.218
67.95	64.4	66.39	19.08	0.216
69.72	67.09	68.22	19.34	0.21
69.98	64.2	66.16	19.75	0.206
67.79	59.18	64.88	19.95	0.213
71.13	65.75	68.04	20.13	0.215
68.71	58.43	61.54	20.49	0.211
68.51	61.76	65.57	20.34	0.22
71.36	65.9	67.9	20.67	0.217
69.56	65.92	67.36	20.91	0.214
68.35	61.71	65.29	21.03	0.215
61.69	54.39	60.15	21.03	0.222
55.17	52.64	54.04	20.88	0.222
52.82	51.03	51.81	20.67	0.225
51.21	49.01	49.87	20.4	0.225
49.33	48.04	48.76	20.13	0.225
52.31	48.36	49.84	19.86	0.225
51.66	45.02	48.56	19.63	0.224
53.48	50.53	52.52	19.4	0.222
53.4	46.09	49.26	19.2	0.22
48.27	42.02	44.73	18.97	0.22

46.22	42.02	43.56	18.74	0.22
48.49	45.15	47.35	18.54	0.219
52.86	48.45	50.73	18.38	0.219
54.08	52.86	53.52	18.18	0.219
57.24	53.36	55.89	18.15	0.218
58.51	56.03	57.01	18.21	0.216
57.82	55.77	56.63	18.29	0.214
60.12	56.27	58.29	18.4	0.215
59.61	51.28	54.55	18.6	0.211
61.23	53.1	58.36	18.71	0.216
62.01	57.85	60.2	19	0.212
63.35	57.93	61.11	19.25	0.215
61.93	50.51	56.34	19.48	0.217
52.43	50.26	51.24	19.54	0.22
53.02	50.59	51.57	19.43	0.223
52.22	49.26	50.54	19.34	0.219
51.15	49.25	50.46	19.14	0.221
51.3	50.44	50.9	18.91	0.22
51.15	48.82	49.74	18.71	0.221
49.22	47.39	48.37	18.49	0.218
50.3	48.15	49.51	18.26	0.217
50.27	49.47	49.87	18.07	0.218
49.76	48.68	49.29	17.9	0.215
48.96	47.7	48.27	17.74	0.215
47.93	46.5	47.27	17.58	0.215
48.95	46.91	48.07	17.41	0.216
49.34	47.56	48.47	17.25	0.213
54.4	49.26	51.81	17.07	0.216
57.71	54.11	55.78	17.09	0.214
59.95	57.1	58.6	17.28	0.208
61.8	57.89	59.94	17.63	0.206
64.43	59.55	61.72	18.13	0.199
63.73	54.57	59.69	18.74	0.197
64.23	59.12	61.42	19.05	0.208
64.7	58.69	61.95	19.37	0.211
65.37	61.13	63.79	19.66	0.213
63.21	59.35	61.19	19.89	0.215
59.58	55.55	56.95	19.98	0.223
57.31	55.22	56.48	19.86	0.226
56.62	55.8	56.25	19.81	0.225
57.3	55.99	56.66	19.6	0.224
56.55	55.31	56.02	19.43	0.222
55.63	53.73	54.37	19.2	0.222
54.12	53.15	53.52	18.97	0.221
53.78	52.74	53.26	18.77	0.218
53.69	52.64	53.25	18.57	0.218
53.51	51.23	52.38	18.4	0.218

51.57	49.54	50.59	18.24	0.217
52.18	49.53	50.96	18.04	0.217
49.51	43.8	46.85	17.9	0.215
52.53	48.95	51.45	17.71	0.216
54.24	52.38	53.29	17.55	0.218
57.73	54.11	56.58	17.55	0.216
61.45	57.35	58.98	17.69	0.212
67.91	59.99	63.19	17.99	0.208
69.61	65.51	67.61	18.6	0.198
69.41	66.16	67.66	19.54	0.18
70.49	66.43	68.31	19.83	0.2
71.11	67.28	68.85	20.31	0.205
69.61	66.38	67.98	20.55	0.213
69.86	64.59	67.5	20.82	0.216
67.76	63.96	65.59	20.82	0.222
64.34	60.08	62.37	20.76	0.226
60.06	54.24	56.75	20.67	0.225
57.13	55.44	56.48	20.4	0.226
56.32	55.17	55.73	20.16	0.224
55.63	54.45	55.13	19.89	0.224
54.87	53.24	54.09	19.63	0.222
54.3	51.16	52.62	19.4	0.222
53.36	45.49	50.17	19.17	0.221
50.9	42.54	47.97	18.94	0.218
43.99	41.03	42.77	18.71	0.22
42.17	37.61	39.9	18.46	0.22
40.02	35.4	37.47	18.21	0.217
52.65	40.02	47.08	17.93	0.217
54.08	51.96	52.78	17.69	0.218
56.88	53.57	55.15	17.69	0.215
60.16	56.02	57.97	17.85	0.209
62.47	58.38	60.65	18.24	0.206
65.07	60.7	63.08	18.88	0.203
68.54	63.7	65.41	19.69	0.196
71.64	66.54	68.87	20.4	0.196
70.92	67.15	68.93	21	0.2
68.88	65.11	66.75	21.25	0.209
66.11	62.54	64.74	21.4	0.219
62.8	59.3	61.1	21.44	0.224
60.46	56.6	58.78	21.34	0.225
56.57	53.21	55.16	21.19	0.226
54.62	49.83	51.93	20.91	0.225
54.35	47.54	50.62	20.61	0.224
51.93	47.02	49.69	20.31	0.225
49.44	45.66	47.97	20.01	0.223
47.43	43.39	45.23	19.72	0.223
46.55	37.57	42.03	19.43	0.221

49.92	46.02	47.95	19.17	0.219
46.67	42.04	44.42	18.91	0.219
44.69	34.3	39.13	18.66	0.22
41.02	31.72	36.92	18.38	0.217
51.59	37.7	44.31	18.1	0.218
53.68	50.29	51.68	17.85	0.217
56.62	52.73	54.63	17.85	0.213
60.03	54.49	56.93	17.99	0.209
60.33	55.9	58.23	18.35	0.208
60.49	56.76	58.7	18.82	0.205
64.42	58.59	61.51	19.37	0.206
62.82	48.22	56.04	19.83	0.209
56.44	46.69	50.31	20.16	0.215
50.53	45.96	48.78	20.28	0.222
46.73	43.95	45.14	20.31	0.222
51.57	45.66	48.92	20.22	0.222
49.46	43.21	46.48	20.13	0.222
43.21	39.9	41.67	19.95	0.22
39.89	38.84	39.14	19.69	0.221
40.21	38.7	39.53	19.4	0.218
39.77	38.77	39.4	19.11	0.218
39.87	39.29	39.55	18.85	0.216
39.99	34.93	38.06	18.63	0.216
35.35	34.78	35.05	18.4	0.216
35.01	31.96	33.51	18.18	0.215
35.33	31.84	33.5	17.99	0.214
35.04	32.72	33.66	17.77	0.215
35.1	32.5	33.49	17.52	0.212
39.52	34.02	36.08	17.28	0.214
43.72	39.49	42.11	17.07	0.214
48.41	42.71	45.94	17.01	0.211
51.89	47.5	49.31	17.09	0.208
52.74	49.55	51.13	17.36	0.207
53.62	48.89	50.52	17.77	0.206
51.54	44.92	47.42	18.07	0.207
51.45	45.98	48.51	18.35	0.21
52.12	46.18	48.62	18.57	0.21
53.87	50.16	51.95	18.77	0.212
54.21	50.58	52.33	18.94	0.212
54.23	52.01	53.13	19.05	0.213
52.52	50.13	51.36	19.11	0.216
50.22	46.93	48.72	19.08	0.215
46.94	39.11	43.05	18.94	0.217
47.3	39.27	44.55	18.71	0.216
47.56	47.13	47.33	18.51	0.213
47.5	43.99	45.59	18.35	0.212
46.19	43.34	44.9	18.15	0.212

44.08	43.38	43.78	17.99	0.211
43.78	41.62	42.82	17.82	0.212
42.76	41.11	41.87	17.63	0.212
42.21	41.28	41.87	17.47	0.212
42.77	41.8	42.28	17.28	0.21
46.5	42.8	44.59	17.12	0.211
51.86	46.31	48.91	16.93	0.211
55.1	51.39	53.3	16.96	0.208
57.16	52.94	54.07	17.15	0.205
60.21	54.32	56.93	17.44	0.202
62.78	57.03	59.32	17.9	0.198
63.12	58.49	61.04	18.57	0.19
65.42	60.61	63.38	19.28	0.182
66.5	61.12	64.27	19.83	0.188
67.64	62.86	65.3	20.07	0.203
66.28	62.63	64.13	20.43	0.209
64.54	62.44	63.05	20.58	0.216
66.2	61.49	63.67	20.61	0.219
61.53	50.42	54.44	20.52	0.219
55.59	51.83	54.49	20.31	0.222
54.98	51.93	53.59	20.07	0.22
54.2	51.68	52.91	19.81	0.221
53.45	50.81	52.42	19.54	0.217
52.62	41.95	49.03	19.28	0.217
41.91	40.44	41.08	19	0.216
41.49	40.25	40.67	18.74	0.216
40.61	37.55	38.97	18.49	0.216
38.68	36.31	37.64	18.21	0.215
40.21	35.42	36.75	17.99	0.213
56.36	40.26	48.65	17.71	0.213
57.22	54.62	55.87	17.52	0.213
60.15	56.36	57.83	17.55	0.209
64.92	58.74	61.97	17.74	0.206
68.24	64.15	65.86	18.15	0.201
70.91	64.22	67.84	18.74	0.197
72.35	67.16	69.63	19.46	0.191
73.01	68.69	70.59	20.07	0.188
75.21	69.63	72.32	20.49	0.196
75.24	71.38	73.18	20.94	0.201
75.93	71.86	74.02	21.28	0.2
71.86	69.59	70.57	21.4	0.209
70.54	67.24	69.45	21.34	0.217
67.68	57.3	60.45	21.28	0.218
62.57	57.67	59.74	21	0.222
61.52	56.73	59.56	20.79	0.222
62.11	56.78	58.9	20.55	0.222
56.69	49.35	52.11	20.28	0.219

55.2	48.87	51.03	19.98	0.22
51.7	48.07	49.85	19.72	0.219
52.62	43.82	47.6	19.48	0.217
50.45	44.04	47.55	19.22	0.218
50.53	43.48	47.24	18.97	0.214
52.93	44.32	48.69	18.74	0.216
61.33	51.15	55.78	18.51	0.214
65.16	60.31	63.04	18.32	0.217
67.75	63.11	65.55	18.4	0.209
72.54	66.6	69.94	18.66	0.203
74.32	70.54	72.05	19.11	0.195
74.23	70.81	73.16	19.72	0.194
75.49	72.02	73.85	20.46	0.181
75.82	71.49	73.43	21.1	0.183
73.04	70.43	71.6	21.53	0.191
72.87	67.98	70.23	21.69	0.204
68.12	65.66	66.68	21.72	0.212
65.89	63.56	64.57	21.62	0.219
63.56	61.28	62.57	21.53	0.219
61.26	57.79	59.7	21.37	0.219
59.19	56.69	58.06	21.1	0.219
60.04	54.69	58.02	20.85	0.22
59.93	56.71	58.09	20.61	0.219
58.29	54.93	56.9	20.34	0.216
56.41	53.5	54.97	20.1	0.217
55.18	52.13	53.5	19.86	0.218
54.89	52.24	53.67	19.63	0.215
52.83	49.83	51.3	19.43	0.214
51.97	44.69	48.65	19.2	0.214
47.48	42	45	18.97	0.213
56.3	47.27	53.01	18.74	0.213
57.33	55.02	55.94	18.54	0.214
60.32	56.82	58.24	18.57	0.21
63.73	58.44	61.21	18.71	0.206
67.8	62.15	64.71	19.14	0.202
70.27	65.48	67.92	19.78	0.195
73.31	68.28	70.07	20.49	0.185
75.17	70.74	72.96	21.19	0.181
73.79	70.68	72.1	21.91	0.177
72.86	70.08	71.7	22.1	0.193
72.64	68.27	70.28	22.32	0.202
68.84	66.96	67.9	22.32	0.212
67.82	64.12	65.96	22.22	0.217
64.12	60.08	61.79	22.1	0.218
61.17	59.56	60.25	21.84	0.22
60.83	57.43	59.42	21.59	0.22
59.34	56.1	57.51	21.34	0.221

56.12	52.38	54.01	21.1	0.219
56.75	52.29	54.57	20.85	0.219
55.95	52.37	54.54	20.61	0.218
54.74	51.81	53.67	20.4	0.217
55	49.8	52.62	20.22	0.215
51.05	48.57	49.76	20.01	0.216
50.53	48	48.77	19.83	0.217
54.35	49.42	51.4	19.63	0.213
54.24	51.84	52.48	19.46	0.215
63.49	54.23	58.38	19.31	0.216
66.88	62.18	64.68	19.37	0.21
63.8	57.08	60.77	19.57	0.21
67.52	57.08	62.36	19.72	0.212
69.77	64.57	66.57	20.13	0.206
69.66	63.35	66.29	20.49	0.205
67.67	64.04	65.98	20.91	0.205
68.99	63.05	65.04	21.07	0.211
66.33	61.7	62.96	21.19	0.214
63.62	60.49	61.75	21.22	0.218
61.42	56.05	58.4	21.19	0.219
56	52.24	54.12	21.1	0.218
53.46	50.71	52.17	20.91	0.219
52.95	50.27	51.82	20.67	0.218
51.91	49.22	50.39	20.46	0.218
49.4	44.17	46.01	20.22	0.217
45	43.09	44.03	19.98	0.215
44.57	43.17	43.72	19.75	0.217
44.35	41.67	43.37	19.54	0.213
44.75	40.46	42.94	19.34	0.214
42.07	39.72	40.7	19.11	0.212
43.21	40.66	41.62	18.91	0.212
43.08	40.49	41.78	18.71	0.211
44.68	42.42	43.52	18.51	0.213
47.77	44.65	46.04	18.35	0.215
48.16	46.23	47.36	18.35	0.211
54.94	47.84	49.93	18.4	0.208
59.08	53.75	56.02	18.54	0.206
58.89	53.74	55.51	18.88	0.202
59.86	53.26	56.72	19.2	0.203
53.27	46.95	49.79	19.51	0.204
51.99	46.92	49.29	19.57	0.214
52.88	47.84	50.03	19.75	0.214
50.77	47.66	49.27	19.78	0.215
47.78	45.99	46.91	19.78	0.214
46.03	44.69	45.44	19.69	0.214
46.14	41.9	43.6	19.51	0.212
42.41	39.89	41.39	19.34	0.216

41.56	40.58	41.23	19.14	0.214
40.75	38.8	39.64	18.94	0.213
40.66	39.66	40.2	18.74	0.211
41.38	40.2	40.74	18.54	0.211
40.82	40.35	40.63	18.38	0.209
40.8	40.35	40.62	18.21	0.209
40.76	39.92	40.61	18.01	0.208
40.94	39.8	40.42	17.88	0.208
43.41	39.89	41.95	17.66	0.208
47.28	42.92	45.19	17.47	0.21
50.43	45.42	48.09	17.44	0.206
53.92	49.34	51.67	17.55	0.205
58.02	51.91	55.15	17.8	0.2
60.22	54.11	57.13	18.26	0.196
60.83	50.85	56.57	18.8	0.191
62.94	56.33	59.72	19.11	0.197
63.05	58.72	61.22	19.48	0.201
62.18	57.89	60.59	19.81	0.204
62.34	57.42	60.37	20.07	0.205
60.55	56.67	59.01	20.19	0.21
57.12	53.94	55.44	20.25	0.213
54.2	51.21	52.92	20.19	0.211
51.32	50.15	50.82	20.01	0.215
50.94	50.08	50.46	19.78	0.213
50.58	47.12	48.22	19.57	0.213
49.77	46.69	47.8	19.31	0.212
49.88	48.85	49.42	19.08	0.213
49.65	48.48	49.03	18.85	0.212
48.87	47.84	48.43	18.68	0.209
48.59	46.13	47.9	18.49	0.209
46.01	41.79	43.14	18.32	0.208
44.29	42.26	43.32	18.13	0.209
50.59	43.11	46.9	17.9	0.209
53.63	50.43	52.06	17.74	0.208
59.15	53.56	56.14	17.77	0.206
60.82	55.95	58.33	17.96	0.199
64.37	59.88	62.24	18.4	0.193
67.13	61.67	64.06	19.08	0.186
70.38	64.1	66.58	19.83	0.181
70.72	66.5	68.71	20.49	0.184
70.96	66.9	69.14	21.03	0.187
71.45	68.04	69.58	21.31	0.196
70.55	66.57	67.68	21.62	0.205
69.26	64.88	66.4	21.69	0.212
65	58.25	62.67	21.65	0.215
59.68	55.04	57.75	21.47	0.218
58.05	53.53	55.87	21.25	0.218

55.43	52.4	53.91	21	0.218
54.12	51.01	52.35	20.7	0.217
51.69	49.58	50.59	20.43	0.213
56.77	49.79	53.63	20.16	0.215
55.09	47.53	49.69	19.92	0.215
49.34	44.76	47.3	19.69	0.212
53.68	46.35	49	19.43	0.212
48.51	45	46.96	19.22	0.213
49.88	45.02	46.97	19.02	0.209
53.85	49.95	52.84	18.8	0.211
55.87	53.27	54.08	18.66	0.212
62.25	55.57	59.42	18.68	0.207
64.39	61.37	62.76	18.8	0.204
65.6	61.91	63.55	19.05	0.201
64.54	62.31	63.1	19.25	0.203
69.73	61.76	64.99	19.48	0.204
69.75	63.77	66.56	19.81	0.199
69.21	62.57	65.19	20.13	0.197
64	57.12	60	20.34	0.201
62.4	55.32	58.62	20.43	0.209
61.98	54.84	57.83	20.46	0.212
63.49	58.3	61.21	20.46	0.213
58.3	47.53	52.86	20.46	0.209
50.85	46.8	48.36	20.28	0.213
48.02	45.39	46.71	20.07	0.214
51.98	45.99	49.28	19.83	0.212
48.83	46.68	47.72	19.6	0.211
47.8	40	43.67	19.37	0.211
43.07	37.5	40.32	19.14	0.212
38.03	36.58	37.35	18.88	0.21
37.89	36.49	37.12	18.66	0.209
37.34	36.01	36.74	18.43	0.21
42.43	36.79	38.72	18.21	0.205
54.28	42.45	48.81	17.99	0.208
58.75	54.17	57.16	17.8	0.207
61.48	58.1	59.53	17.85	0.203
64.58	57.95	61.13	18.1	0.197
66.46	60.7	62.76	18.54	0.192
68.26	62.67	64.89	19.05	0.187
66.87	62.95	64.46	19.6	0.184
69.89	64.35	66.68	19.78	0.196
71.44	65.72	68.4	20.13	0.196
71.35	67.31	69.58	20.52	0.191
70.68	66.46	68.73	20.88	0.193
69.05	63.51	66.82	21	0.201
65.12	61.85	63.69	21	0.21
61.85	57.2	59.16	20.97	0.213

57.43	54.54	55.8	20.79	0.214
56.12	54.76	55.57	20.58	0.214
55.15	53.68	54.31	20.34	0.21
54.39	50.51	53.34	20.1	0.214
53.03	49.06	50.83	19.86	0.211
50.44	49.07	49.5	19.63	0.211
51.27	42.35	47.39	19.4	0.209
43.01	38.63	40.89	19.14	0.208
39.88	38.41	38.95	18.91	0.21
48.09	39.09	41.52	18.66	0.206
57.87	48.12	53.45	18.4	0.207
61.87	57.64	59.44	18.26	0.209
62.97	60.49	61.78	18.32	0.202
65.09	61.07	63.34	18.51	0.198
67.38	63.3	65.2	18.88	0.191
69.59	65.02	67.52	19.46	0.186
71.36	67.83	69.68	20.1	0.18
73.59	69.23	71.13	20.91	0.166
72.69	70.19	71.17	21.4	0.173
73.56	70.21	71.52	21.59	0.191
74.35	71.19	72.84	21.94	0.19
73.4	70.49	71.94	22.07	0.197
71.25	66.86	69.15	21.97	0.206
66.84	61.46	63.82	21.87	0.21
62.2	61.21	61.71	21.69	0.213
61.77	59.25	60.57	21.47	0.213
60.37	54.63	58.06	21.25	0.213
59.19	55.28	57.67	21.03	0.213
59.12	57.3	58.28	20.79	0.212
58.79	57.22	58	20.61	0.21
59.77	56.21	58.27	20.43	0.209
57	55.4	56.32	20.22	0.209
55.51	52.55	53.55	20.04	0.208
53.02	48.27	50.25	19.86	0.206
54.2	48.94	51.43	19.69	0.208
56.83	54.22	55.96	19.48	0.207
58.99	56.81	57.98	19.37	0.209
63.94	58.74	62.07	19.37	0.209
67.91	63.66	64.65	19.43	0.203
69.59	66.68	68.34	19.63	0.2
69.26	66.04	67.38	19.89	0.196
69.51	66.66	68.15	20.07	0.198
67.36	65.79	66.55	20.34	0.197
69.22	66.74	68.19	20.49	0.199
68.54	66.2	67.16	20.61	0.2
66.31	63.78	64.57	20.61	0.206
65.44	61.48	63.47	20.61	0.205

61.46	57.24	59.66	20.58	0.206
57.19	53.48	55.92	20.4	0.209
53.78	47.79	50.39	20.22	0.207
48.54	46.19	47.14	19.98	0.209
47.35	45.08	46.06	19.75	0.208
50.96	43.32	46.49	19.51	0.207
51.72	46.85	48.98	19.28	0.206
51.18	46.58	48.44	19.08	0.205
51.38	48.98	50.22	18.91	0.204
49.79	47.62	48.77	18.74	0.205
47.94	43.09	45.36	18.57	0.201
52.44	43.49	48.01	18.4	0.203
55.66	51.36	53.4	18.24	0.207
59.64	55.47	56.8	18.26	0.202
62.99	58.34	60.35	18.43	0.197
64.02	59.43	61.39	18.8	0.192
68.98	62.36	65.17	19.17	0.193
69.02	63.56	66.03	19.6	0.192
69.55	59.02	66.47	20.04	0.194
66.9	56.48	59.32	20.43	0.192
66.9	51.88	61.18	20.64	0.198
54.85	48.43	52.69	20.79	0.205
48.64	44.16	45.57	20.79	0.21
45.58	42.23	44.57	20.73	0.209
45.07	42.81	43.51	20.55	0.21
43.75	39.88	42.07	20.28	0.21
40.75	39.56	40.17	20.01	0.209
40.11	37.98	39.34	19.69	0.21
40.18	38.44	39.02	19.37	0.208
39.78	37.14	38.69	19.08	0.205
40.6	38.44	39.09	18.82	0.206
40.6	37.68	39.27	18.57	0.204
43.99	37.62	40.26	18.35	0.204
44.04	42.36	43.38	18.13	0.202
43.61	39.01	40.36	17.9	0.2
46.3	41.81	45.12	17.69	0.203
50.32	46.05	48.18	17.52	0.203
52.11	48.52	50.5	17.5	0.2
57.72	51.53	54.28	17.52	0.199
59.98	56.36	57.95	17.71	0.193
61.9	57.35	59.35	18.04	0.19
63.91	59.41	61.48	18.43	0.187
64.66	60.61	62.45	18.88	0.184
65.18	60.34	61.84	19.22	0.19
63.73	59.49	61.72	19.48	0.197
63.13	59.57	60.64	19.66	0.198
59.99	58.55	59	19.78	0.202

59.51	56.83	58.1	19.83	0.203
56.87	54.36	55.83	19.81	0.201
54.55	51.63	53.19	19.69	0.205
54.41	51.64	53.71	19.54	0.206
54.12	49.25	51.31	19.37	0.202
52.89	49.78	51.23	19.2	0.205
50.96	50.15	50.62	19.02	0.204
51.3	50.53	50.89	18.88	0.203
51.3	49.33	50.39	18.71	0.203
51.05	49.44	50.16	18.57	0.201
51.3	49.51	50.8	18.4	0.201
50.85	49.15	49.77	18.26	0.2
51.82	49.51	50.94	18.13	0.199
53.68	51.19	52	17.99	0.202
56.69	53.7	54.87	17.99	0.201
58	56.43	57.13	18.04	0.2
58.47	52.37	55.55	18.13	0.197
59.4	53.28	56.81	18.18	0.198
64.86	57.57	60.46	18.32	0.197
66.4	60.82	63.49	18.63	0.189
62.88	59.19	61.31	19.11	0.18
67.18	59.25	64.37	19.22	0.192
67.27	63.04	64.66	19.63	0.19
63.89	60.7	62.42	19.81	0.195
62.66	54.99	59.68	19.86	0.199
54.96	52.26	53.29	19.92	0.204
56.28	53.71	55.25	19.78	0.204
56.28	54.26	55.61	19.66	0.204
54.59	50.85	52.49	19.51	0.206
54.2	50.82	52.17	19.31	0.205
54.2	49.79	51.13	19.14	0.205
54.41	51.55	53.35	19	0.203
54.35	51.6	53.16	18.85	0.201
54.06	52.53	53.59	18.68	0.202
52.45	50.58	51.42	18.57	0.201
50.79	48.34	49.58	18.43	0.2
49.9	48.59	49.17	18.29	0.202
51.78	49.72	50.54	18.1	0.203
55.72	51.78	53.82	18.07	0.203
61.15	55.17	58.32	18.1	0.2
65.01	59.7	62.1	18.26	0.194
69.82	62.45	65.68	18.63	0.186
70.15	63.71	67.13	19.25	0.173
71.23	66.81	69.13	19.72	0.171
70.66	67.62	69.24	20.1	0.179
70.77	67.68	69.65	20.37	0.188
71.25	67.96	69.83	20.67	0.196

71.29	69.4	70.19	20.85	0.199
70.01	66.59	68.21	20.91	0.203
66.59	59.37	63.59	20.85	0.207
59.62	57.05	58.19	20.7	0.209
58.58	55.69	56.89	20.49	0.21
58.51	56.01	57.09	20.28	0.21
58.81	55.8	57.63	20.07	0.207
58.6	57.76	58.23	19.86	0.207
58.65	57.39	57.93	19.66	0.205
59.28	57.05	57.89	19.48	0.204
59.51	57.25	58.07	19.31	0.204
58.01	54.95	56.85	19.14	0.204
57.7	54.08	55.41	18.97	0.203
61.98	57.28	59.52	18.8	0.204
66.38	60.65	64.07	18.68	0.204
70.75	64.77	66.89	18.82	0.196
70.57	67.24	69.04	19.08	0.192
73.05	67.32	69.76	19.46	0.186
74.41	69	71.59	19.89	0.184
77	70.45	73.42	20.43	0.18
76.8	71.41	73.77	21.07	0.18
77.44	72.93	74.36	21.34	0.187
78.97	73.76	76.85	21.56	0.194
77.44	73.51	75.79	22.03	0.19
75.72	72.19	73.9	22	0.199
72.95	68.83	71.12	21.84	0.205
68.85	64.7	67.3	21.75	0.207
64.72	63.09	63.91	21.56	0.208
63.82	62.14	63.15	21.34	0.211
63.19	58.6	59.77	21.13	0.21
63.63	58.8	62.65	20.88	0.21
62.91	58.39	61.14	20.67	0.209
62.18	60.93	61.44	20.46	0.207
61.79	61.16	61.5	20.28	0.205
61.59	56.85	59.21	20.1	0.205
59.29	54.37	56.98	19.92	0.205
57.35	53.53	55.21	19.75	0.204
64.12	54.23	59.41	19.54	0.204
66.94	63.92	65.51	19.4	0.206
69.71	66.37	68.12	19.54	0.199
72.05	68.35	70.13	19.86	0.19
73.49	71.08	72.13	20.49	0.173
76.32	72.27	73.91	21.22	0.165
77.39	73.31	75.29	22.16	0.159
82.1	74.51	76.69	22.87	0.166
81.8	75.1	78.65	23.17	0.179
78.23	75.12	76.67	23.2	0.19

77.51	74.71	76.03	23.14	0.199
78.99	74.67	76.92	23.17	0.205
76.39	71.05	73.86	23.27	0.205
71.18	66.27	68.92	22.97	0.209
67.8	63.53	65.23	22.68	0.209
64.17	62.96	63.61	22.42	0.212
65.51	61.12	63.15	22.13	0.212
65.28	60.02	63.61	21.87	0.21
65.14	63.95	64.49	21.65	0.21
64.84	63.65	64.25	21.4	0.208
64.15	62.48	63.25	21.19	0.205
63.1	61.79	62.34	20.97	0.206
62.32	60	61.04	20.79	0.203
61.36	56.7	60.21	20.58	0.205
66.1	56.31	61.17	20.37	0.204
68.81	66.01	67.27	20.25	0.204
72.08	67.82	70.17	20.37	0.197
74.05	71.03	72.88	20.73	0.185
77.99	72.78	74.62	21.44	0.166
78.97	74.83	76.75	22.32	0.153
82.4	76.45	78.93	23.14	0.153
82.4	77.43	79.62	24.15	0.153
84.7	78.45	81.5	24.35	0.17
84.9	80.9	82.3	24.6	0.181
83.7	80.4	81.6	24.84	0.184
82.1	79.03	80.3	24.67	0.194
79.62	74.45	77.59	24.32	0.202
75.24	63.75	69	23.98	0.208
65.38	63.49	64.4	23.6	0.213
65.67	64.31	65.01	23.3	0.216
67.75	63.15	65.01	23.04	0.214
66.39	61.18	63.41	22.74	0.213
62.99	59.02	60.69	22.45	0.211
60.13	53.14	55.24	22.16	0.209
54.59	52.8	53.7	21.87	0.207
52.88	50.53	51.36	21.62	0.208
51.58	48.3	49.89	21.34	0.207
54.94	47.58	50.25	21.1	0.206
67.9	54.94	61.84	20.85	0.206
70.21	67.58	68.64	20.73	0.205
71.63	69.32	70.37	20.82	0.198
74.08	70.05	71.81	21.1	0.191
77.82	72.19	75.04	21.65	0.179
79.09	74.78	76.58	22.48	0.161
81.7	75.7	78.06	23.54	0.145
79.41	75.84	77.42	23.77	0.17
76.08	71.05	74.14	23.54	0.191

77.2	74.56	76.19	23.47	0.199
79.54	76.35	77.56	23.6	0.197
80.5	76.28	78.93	23.74	0.195
76.45	70.43	73.89	23.67	0.199
70.39	66.06	67.84	23.44	0.207
69.01	66.35	67.51	23.2	0.208
69.36	65.83	68.18	23.04	0.206
65.79	58.95	62.65	22.84	0.207
59.98	56.94	58.59	22.55	0.208
57.51	52.79	56.28	22.32	0.211
53.37	50.65	51.77	22.07	0.208
51.91	49.82	50.64	21.81	0.207
50.86	48.9	49.97	21.56	0.206
49.51	47.16	48.62	21.34	0.206
54.72	47.38	49.54	21.1	0.207
68.83	54.76	62.86	20.88	0.206
70.92	68.04	69.34	20.76	0.205
75.25	70.48	73.1	20.88	0.195
78.56	74.41	76.13	21.22	0.187
82.8	76.27	79.12	21.84	0.172
83.9	79.24	81.2	22.77	0.151
84.8	79.4	81.4	24.01	0.131
85.8	80.3	83.4	24.18	0.163
88.2	83	85.1	25.06	0.158
86.2	82.3	83.5	25.13	0.173
84.1	81.4	82.7	24.84	0.188
83.5	81.2	82	24.84	0.193
84.5	78.69	81.3	24.6	0.199
78.66	66.96	72.01	24.42	0.202
69.37	66.54	67.76	24.04	0.208
67.28	66.23	66.84	23.74	0.211
67.03	63.31	65.48	23.5	0.208
73.1	65.61	71.21	23.27	0.208
73.17	71.44	72.39	23.1	0.208
72.5	70.79	71.51	22.87	0.206
71.46	69.77	70.81	22.71	0.204
71.4	63.65	68.39	22.48	0.205
64.86	60.5	62.34	22.29	0.206
63.51	58.19	60.35	22.03	0.205
71.6	60.15	65.25	21.81	0.205
77.46	71.68	74.94	21.69	0.204
77.75	75.43	76.43	21.84	0.196
81.4	76	78.7	22.19	0.183
84.6	80.7	83	22.87	0.161
83.9	81.2	82.1	23.7	0.147
88	82.4	84.7	23.7	0.172
87.3	83.9	84.7	24.67	0.154

87.5	84.4	85.3	24.63	0.167
89.9	84.9	86.7	24.77	0.175
89.5	85.9	87.6	25.13	0.171
88.7	84.7	86.8	25.34	0.175
86.4	80	83.5	25.13	0.184
80.2	74.18	77.1	24.74	0.194
75.45	73.01	74.06	24.32	0.205
74.4	72.92	73.71	24.04	0.206
73.95	70.55	72.53	23.87	0.206
72.37	69.84	70.6	23.64	0.206
71.64	67.36	69.87	23.4	0.206
70.74	64.9	67.83	23.17	0.204
64.78	59.74	61.6	22.91	0.206
64.8	57.68	60.67	22.68	0.206
64.06	56.58	60.46	22.45	0.205
65.59	60.11	62.26	22.22	0.203
71.86	61.83	67.79	22	0.202
77.01	70.76	73.57	21.91	0.2
80.2	76.09	78.39	22.07	0.193
85.1	79.05	82.9	22.51	0.178
86.6	82.8	84.6	23.34	0.15
88.3	84.4	86.3	24.46	0.122
88.6	85.4	86.8	25.7	0.112
89.1	85.7	87.2	26.4	0.131
89.5	85.4	87.4	26.63	0.148
88.7	85.7	87.3	26.26	0.169
87.2	85.1	86.1	26.18	0.175
85.5	81.2	83	26.07	0.187
81.5	77.67	79.46	25.63	0.195
77.62	74.12	75.95	25.34	0.202
74.61	70.56	72.67	25.02	0.203
72.34	70.12	71.13	24.7	0.207
70.74	64.45	67.55	24.42	0.206
65.39	57.57	61.52	24.11	0.206
67.73	61.9	64.95	23.74	0.209
66.51	52.97	57.69	23.5	0.204
62.39	56.93	59.56	23.2	0.204
56.91	52.15	54.57	22.94	0.206
62.49	51.06	57.16	22.64	0.204
60.47	51.36	56.24	22.42	0.203
67.31	56.57	63.96	22.16	0.202
70.77	66.89	68.4	22.03	0.199
73.98	70.05	72.15	22.1	0.196
77.6	73.14	75.18	22.35	0.187
82.5	75.95	79.54	22.87	0.174
84.9	81.4	82.7	23.84	0.147
87.7	82.2	84	24.98	0.118

87.6	84	85.3	25.81	0.12
87.8	84	86	26.14	0.139
87	84.3	85.4	26	0.162
86.5	83.3	84.5	26.07	0.169
83.9	80.9	82.6	26.07	0.18
80.8	76.6	78.91	25.81	0.189
76.67	68.23	73.06	25.52	0.197
68.19	61.09	63.59	25.16	0.203
62.47	59.2	61.04	24.77	0.207
66.34	62.2	63.52	24.46	0.208
68.69	61.42	66.7	24.18	0.205
63.01	55.79	60.67	23.91	0.202
64.13	60.5	62.34	23.6	0.201
61.09	56.7	59.11	23.37	0.202
62.22	54.67	58.78	23.07	0.199
63.23	58.5	60.43	22.81	0.199
63.98	54.19	59.31	22.58	0.2
68.56	61.65	64.97	22.35	0.199
70.31	67.57	69.35	22.22	0.197
72.14	69.57	70.68	22.29	0.19
74.64	71.07	72.95	22.51	0.183
80.2	73.62	75.92	22.94	0.174
84.8	78.34	81.1	23.81	0.149
84.6	80.6	82	24.98	0.115
85.1	81.3	82.9	25.7	0.117
84.2	81.2	82.7	25.96	0.138
84.1	81.3	82.5	25.85	0.163
83.1	80.7	81.8	25.92	0.174
81.1	78.32	79.93	25.92	0.179
78.92	74.16	76.73	25.78	0.188
74.14	65.08	70.47	25.52	0.195
66.48	56.3	63.04	25.2	0.202
65.52	54.7	60.39	24.81	0.205
66.9	62.14	65.08	24.49	0.206
62.79	48.02	52.92	24.25	0.204
50.45	47.61	49.09	23.87	0.202
50.29	45.64	47.69	23.54	0.202
49.93	45.77	48.36	23.24	0.202
51.96	46.13	48.39	22.94	0.201
52.14	44.05	48.38	22.64	0.2
54.01	48.38	50.94	22.35	0.2
61.64	54.03	58.82	22.1	0.197
64.95	61.51	63	21.84	0.198
70.2	64.71	67.36	21.87	0.189
73.38	68.91	71.16	22.1	0.185
79.39	72.24	76.26	22.55	0.175
82.7	76.59	79.15	23.3	0.156

85.8	80.8	83.3	24.46	0.126
86.1	81.9	83.6	25.31	0.117
85.6	82.2	84	25.81	0.129
85.4	80.1	82.5	25.92	0.15
81.6	77.3	79.12	25.85	0.172
78.63	71.64	75.24	25.67	0.183
71.6	68.95	69.95	25.52	0.191
68.91	65.35	67.34	25.27	0.196
67.12	64.43	65.75	25.02	0.2
65	63.21	64.33	24.77	0.198
64.52	61.26	62.64	24.53	0.199
61.34	55.71	58.68	24.29	0.197
55.71	50.24	53.73	23.98	0.201
51.84	49.32	50.52	23.7	0.2
50.72	48.58	49.74	23.44	0.201
51.01	46.82	48.76	23.2	0.196
48.43	45.84	47.42	22.94	0.197
52.31	48.24	50.38	22.71	0.197
58.75	52.31	54.72	22.51	0.195
60.48	57.73	58.57	22.29	0.195
63.85	59.94	61.75	22.29	0.191
67.55	61.99	64.09	22.32	0.188
73.26	64.64	67.78	22.45	0.185
76.54	68.67	70.98	22.71	0.183
78.87	72.53	75.59	23.1	0.176
79.8	75.2	77.47	23.64	0.169
79.51	74.74	77.13	24.18	0.16
78.97	73.26	75.07	24.35	0.17
76.95	71.25	73.47	24.46	0.18
74.19	69.05	71.91	24.53	0.186
70.12	57.17	66.5	24.63	0.188
60.21	57.17	58.6	24.46	0.195
60	54.45	57.82	24.25	0.2
54.8	53.53	54.22	24.04	0.2
55.19	53.39	54.25	23.81	0.2
53.86	53.28	53.64	23.6	0.199
54.34	53.28	53.87	23.34	0.198
53.49	52.66	53.13	23.07	0.193
53.53	52.8	53.21	22.81	0.193
53.06	52.01	52.45	22.58	0.195
52.97	51.24	52.29	22.35	0.196
52.38	50.72	51.14	22.13	0.192
55.52	52.42	54.14	21.91	0.195
59.85	55.37	57.25	21.69	0.197
63.43	59.66	61.71	21.72	0.193
65.59	61.03	63.13	21.84	0.189
66.66	62.92	64.62	22.16	0.186

75.17	65.67	71.86	22.51	0.185
77.25	73.47	75.59	23.17	0.173
77.83	74.51	76.04	23.98	0.16
78.28	75.86	76.83	24.42	0.166
77.63	75.12	76.33	24.63	0.179
77.37	74.67	76.05	24.91	0.185
75.6	72.73	74.26	25.09	0.188
73.17	70.13	71.84	25.02	0.194
70.11	62.49	66.02	24.91	0.197
62.89	56.53	61.02	24.67	0.198
58.19	55.64	56.84	24.35	0.201
58.36	54.63	56.69	24.01	0.202
57.98	54.01	55.38	23.7	0.198
57.28	52.85	55.34	23.4	0.199
55.24	47.53	51.64	23.07	0.197
50.48	46.24	48.43	22.74	0.197
48.46	43.37	45.86	22.45	0.195
45.26	42.4	43.58	22.13	0.193
51.12	42.35	45.21	21.84	0.192
60.35	51.19	57.16	21.56	0.193
62.38	58.77	60.5	21.34	0.193
65.51	61.77	63.64	21.37	0.185
68.73	64.37	66.58	21.56	0.184
72.24	68.54	70.4	22.03	0.178
75.1	70.75	72.84	22.77	0.167
77.01	73.24	74.63	23.87	0.143
78.32	75.06	76.71	24.6	0.146
80.2	75.66	78.08	25.16	0.153
81.1	75.7	78.44	25.34	0.171
79.76	75.66	78.63	25.52	0.184
79.88	77.18	78.18	25.7	0.186
78.04	74.87	76.46	25.7	0.192
74.87	67.42	71.28	25.59	0.193
67.94	65.82	67.03	25.31	0.198
65.96	63.46	64.62	25.06	0.199
63.48	57.62	61.92	24.74	0.199
61.2	56.63	59.03	24.42	0.199
59.04	52.98	56.93	24.11	0.196
53.24	51.68	52.33	23.81	0.197
52.53	50.19	51.64	23.54	0.195
50.76	48.99	50.04	23.24	0.195
49.24	47.99	48.64	22.97	0.193
54.81	47.85	50.04	22.71	0.194
66.82	54.88	61.78	22.42	0.192
68.28	65.61	66.83	22.26	0.192
72.08	67.52	69.13	22.32	0.186
75.1	70.57	72.52	22.55	0.178

78.71	74.48	76.21	23.07	0.171
82.4	76.4	79.44	23.84	0.156
84.2	80.1	82.2	24.81	0.143
86	82	83.6	25.85	0.128
86.5	82.2	84.2	26.44	0.14
87.5	83.7	85.7	26.44	0.161
86.9	82.6	85.3	26.74	0.167
86.1	83.5	85.1	26.86	0.174
84.4	81.9	82.9	26.78	0.182
83.1	75.35	79.14	26.59	0.188
75.35	68.94	71.52	26.33	0.193
70.85	67.59	69.08	26	0.197
69.91	67.28	68.76	25.7	0.2
69.17	65.79	67	25.45	0.198
70.87	67.43	69.25	25.16	0.198
68.88	66.64	67.58	24.95	0.196
69.03	65.16	67.4	24.74	0.195
65.39	63.65	64.7	24.53	0.195
65.29	63.29	64.05	24.35	0.192
64.16	62.26	63.18	24.15	0.193
68.6	63.92	66.75	23.94	0.194
70.63	68.52	69.48	23.81	0.193
72.35	70.28	71.5	23.77	0.192
75.81	72.32	73.64	23.84	0.186
79.33	75.29	77.26	24.01	0.18
78.75	76.7	77.75	24.39	0.167
77.18	75.91	76.49	24.46	0.17
77.09	75.47	76.07	24.6	0.176
75.65	75.12	75.36	24.63	0.178
76.21	71.25	73.51	24.6	0.185
74.12	72.46	73.25	24.56	0.187
74.23	72.62	73.47	24.56	0.185
72.71	70.58	71.73	24.6	0.184
70.84	68.58	69.55	24.53	0.184
68.6	62.62	65.44	24.35	0.188
62.62	57.75	59.55	24.18	0.191
58.33	57.85	58.07	23.94	0.191
58.87	58.15	58.58	23.77	0.192
58.68	57.85	58.08	23.64	0.189
58.38	57.68	58.01	23.47	0.19
57.96	56.99	57.54	23.34	0.191
57.05	56.36	56.79	23.17	0.189
56.55	56.21	56.37	23	0.187
56.73	56.02	56.26	22.87	0.191
59	56.71	57.63	22.71	0.19
60.08	58.63	59.47	22.55	0.193
63.49	59.61	61.69	22.58	0.188

66.48	61.88	63.32	22.64	0.184
70.45	65.99	68.19	22.77	0.183
75.42	69	72.66	23.2	0.173
75.17	70.54	73.43	23.81	0.159
75.22	66.95	73.38	24.08	0.167
73.19	64.96	69.97	24.04	0.181
79.46	70.97	75.61	24.25	0.181
79	76.39	77.68	24.7	0.176
78.3	75.4	76.34	24.95	0.176
76.48	73.15	74.7	24.84	0.184
73.24	70.39	71.49	24.7	0.19
70.48	65.98	69.31	24.53	0.196
69.25	66.68	68.57	24.35	0.198
68.14	66	67.05	24.18	0.195
66.45	64.54	65.4	23.98	0.195
65.13	61.23	63.13	23.81	0.195
64.88	61.93	63.93	23.6	0.194
64.29	61.36	63.16	23.4	0.192
64.59	63.19	64.12	23.24	0.191
64.55	60.23	61.96	23.1	0.19
62.25	58.35	59.7	22.91	0.192
61.17	58.54	59.82	22.68	0.193
65.5	61.17	63.12	22.58	0.19
68.39	64.85	66.88	22.74	0.183
73.7	63.56	67.51	22.97	0.18
77.79	71.66	74.75	23.24	0.173
78.86	73.37	75.94	24.39	0.149
79.61	76.14	78.1	25.09	0.157
79.85	73.46	76.28	25.89	0.167
81.1	73.47	78.2	25.31	0.184
80.9	74.48	77.43	25.67	0.184
78.06	73.06	74.41	25.67	0.186
78.76	75.66	77.2	25.52	0.189
76.83	73.58	75.01	25.52	0.189
73.6	69.68	71.48	25.34	0.194
70.16	64.39	67.07	25.13	0.194
65.89	57.63	62.72	24.88	0.197
58.62	57.11	57.67	24.6	0.197
57.89	56.81	57.41	24.32	0.196
58.51	53.78	55.25	24.08	0.196
54.78	52.95	53.89	23.84	0.195
54.54	52.78	53.52	23.6	0.193
54.04	52.2	53.12	23.37	0.19
52.55	50.85	52.02	23.14	0.191
57.29	49.65	53.05	22.91	0.191
64.28	57.31	61.99	22.71	0.19
67.97	63.87	66.09	22.68	0.19

70.68	67.82	69.49	22.68	0.184
72.48	69.05	71.07	23.04	0.174
75.52	71.69	73.31	23.64	0.163
78.93	73.42	75.93	24.63	0.151
78.39	74.9	75.97	25.78	0.146
81.7	75.68	78.29	25.81	0.172
80.4	76.35	77.88	26.37	0.174
77.44	52.11	68.5	25.92	0.188
58.01	51.84	54.42	25.23	0.198
63.95	57.8	60.99	24.29	0.202
64.59	62.67	63.46	23.47	0.196
63.89	62.42	63.07	22.97	0.193
63.69	61.98	62.81	22.64	0.189
63.79	61.87	62.63	22.39	0.189
63.05	60.79	62.19	22.16	0.19
63.79	59.86	61.61	21.94	0.187
60.79	59.21	59.96	21.75	0.189
60	57.94	58.96	21.56	0.189
59.47	57.38	58.25	21.37	0.185
57.54	55.67	56.4	21.19	0.188
59.4	55.11	55.94	20.97	0.185
61.26	55.65	57.44	20.79	0.185
69.92	61.22	65.71	20.61	0.186
72.68	69.92	71.26	20.58	0.183
75.68	72.34	74.02	20.91	0.174
76.99	74.06	75.69	21.5	0.165
79.76	75.91	77.42	22.39	0.167
80.5	77.44	78.87	23.47	0.177
84.1	79.44	81.4	24.56	0.199
83.7	80.9	82.4	25.41	0.217
84.6	81.5	82.9	25.59	0.219
83.3	79.93	81.4	25.63	0.214
82.4	80.2	81	25.34	0.214
82.1	69.04	73.37	25.16	0.209
73.32	65.27	69	24.63	0.206
72.14	64.41	67.56	24.15	0.204
65.08	62.7	63.74	23.87	0.199
64.37	59.83	62.97	23.5	0.2
64.39	58.99	61.22	23.14	0.198
67.59	62.32	66.12	22.81	0.197
66.8	59.88	62.74	22.55	0.194
61.67	57.86	59.41	22.22	0.192
62.2	54.31	57.71	21.94	0.191
63.23	58.96	61.25	21.65	0.193
59.28	55.96	57.33	21.44	0.19
60.75	54.56	56.88	21.19	0.189
67.93	60.79	63.82	20.97	0.188

74.39	67.73	70.59	20.88	0.187
74.73	72.59	73.57	21.22	0.179
75.72	73.23	74.17	21.84	0.174
79.47	75.01	76.88	22.35	0.175
82.6	77.87	80.2	23.81	0.197
83.3	80	81.7	25.02	0.215
82.6	80.7	81.6	25.13	0.222
86	81.2	83.6	25.13	0.222
88.2	84.2	86.2	25.7	0.223
87	84.8	85.8	26.29	0.23
86.5	82	83.7	26.4	0.228
82.2	74.57	78.71	25.92	0.218
77.89	71.39	74.75	25.41	0.213
71.35	68.86	70.16	25.09	0.209
74.89	70.31	72.9	24.7	0.209
73.73	69.15	71.47	24.46	0.206
71.6	66.67	68.62	24.15	0.202
69.39	64.8	66.55	23.84	0.203
65.1	61.03	62.66	23.5	0.199
62.64	59.65	60.79	23.2	0.201
59.57	58.88	59.22	22.91	0.201
59.42	56.7	58.2	22.64	0.198
62.08	56.21	58.16	22.35	0.2
74.89	62.12	68.68	22.1	0.198
76.17	73.76	74.64	22.03	0.196
78.76	76.09	77.57	22.42	0.187
81.3	78.01	79.23	23.14	0.179
83.8	79.81	81.7	24.11	0.189
86.1	83.1	84.6	25.45	0.207
89.1	81.6	85	26.97	0.226
91	84.7	87.6	27.28	0.233
90.6	87.1	89.3	28.06	0.231
88.8	85.1	86.9	28.02	0.226
90.2	88.1	89	28.14	0.229
89.3	85	86.9	28.3	0.228
85	80.8	82.3	27.71	0.222
82.3	79.41	81.4	27.2	0.221
79.41	72.52	74.82	26.82	0.216
73.73	71.77	72.6	26.26	0.217
79.17	71.9	74.98	25.85	0.215
78.68	76.65	77.91	25.59	0.215
77.19	75.78	76.49	25.34	0.21
76.96	75.83	76.22	25.09	0.208
76.49	75.7	76.13	24.84	0.206
76.3	74.94	75.55	24.63	0.207
76.02	67.53	73.72	24.39	0.203
72.14	67.74	70.1	24.15	0.203

78.08	72.14	75.66	23.87	0.206
80.6	77.55	78.8	23.87	0.202
81.1	78.8	79.93	24.22	0.19
84.9	80.6	82.8	24.77	0.186
89.4	84.5	87.8	25.89	0.182
92	87.8	89.6	27.71	0.189
91.7	88.6	90.4	29.45	0.2
93.2	89.5	91.2	30.43	0.203
93.6	91	92.2	30.61	0.207
93.7	90.8	92.1	30	0.214
92.5	89.8	91.1	29.92	0.22
91	88	89.3	29.75	0.222
88.3	84.9	86.7	29.03	0.22
85	80.1	82.4	28.38	0.219
81.3	71.25	76.7	27.75	0.222
74.09	69.94	70.98	27.09	0.218
79.26	71.38	74.74	26.74	0.219
77.2	73.62	75.93	26.44	0.217
77.43	76.21	76.81	26.18	0.214
76.61	75.79	76.2	25.89	0.21
76.21	75.12	75.66	25.63	0.21
75.6	74.41	75.02	25.38	0.21
75.79	73.81	74.63	25.13	0.205
75.07	68.43	73.77	24.88	0.208
77.74	75.09	76.35	24.67	0.208
81.4	77.65	79.33	24.6	0.206
84.6	80.9	82.8	24.88	0.191
86.4	83.5	85.1	25.59	0.176
89	84.8	86.6	26.78	0.156
90.5	86.6	88.7	28.34	0.154
92.2	88.4	90.4	29.96	0.16
93.4	89.8	91.3	31.05	0.169
93.6	91.1	92.3	31.28	0.179
94	91.4	92.6	30.57	0.195
92.9	91.1	92.2	30.52	0.2
92.3	89.9	91.2	30.22	0.206
90	86.3	88.2	29.62	0.21
86.8	82.2	84.7	28.99	0.212
82.3	77.67	79.76	28.42	0.216
78.1	76.58	77.52	27.9	0.218
78.72	76.91	77.78	27.55	0.216
78.77	71.27	75.95	27.2	0.214
78.73	71.07	73.51	26.86	0.213
78.9	77.51	78.21	26.55	0.213
77.86	76.12	77.14	26.33	0.211
77.39	76.12	76.7	26.11	0.209
77.34	75.67	76.59	25.85	0.208

77.72	70.2	75.8	25.63	0.209
80	72.61	76.09	25.41	0.206
83.7	79.97	81.7	25.31	0.203
86.9	83.5	85	25.63	0.191
89.2	86.5	87.4	26.33	0.166
90.6	87.2	89.1	27.51	0.141
93.1	89.4	91	29.03	0.131
94.2	90.2	92.1	30.79	0.142
95.6	90.6	93.5	32.05	0.157
95.6	92.5	94	32.43	0.161
95.6	93.2	94.5	31.41	0.183
95.5	92.3	93.6	31.23	0.195
93	90.4	91.9	30.92	0.198
90.4	87	88.8	30.17	0.206
87.1	83.6	85.2	29.54	0.208
83.8	80	82.1	28.95	0.212
81.8	79.12	80.7	28.5	0.215
81.2	75.85	79.69	28.14	0.213
78.67	71.79	75.81	27.78	0.212
78.34	76.58	77.46	27.39	0.213
77.72	73.82	76.89	27.12	0.21
76.23	69.09	70.65	26.86	0.211
71.29	65.8	68.63	26.48	0.21
68.47	62	65.13	26.18	0.21
65.42	61.94	63.45	25.85	0.209
75.49	64.21	70.64	25.52	0.209
82	75.49	78.86	25.38	0.209
84.8	81.6	83.4	25.52	0.2
87.3	83.9	85.7	25.96	0.18
90.3	86.6	88.7	26.93	0.148
93.6	88.4	90.3	28.1	0.122
94.8	90.4	92	29.79	0.113
95.7	90.9	93.2	31.37	0.121
96.3	92.5	94.1	31.82	0.139
96.3	93.5	94.8	31.19	0.168
96.3	93.7	94.6	31.19	0.174
95.1	92.6	93.6	31.01	0.184
93.3	89.4	91.4	30.39	0.192
89.3	82	86.4	29.7	0.201
84.8	75.77	80.5	29.12	0.207
76.29	72.27	74.21	28.58	0.211
81.1	72.85	76.4	28.14	0.212
81.1	70.98	75.61	27.82	0.213
79.96	70.79	73.71	27.51	0.21
78.75	70.11	75.04	27.2	0.209
71.75	68.03	70.08	26.93	0.208
69.07	66.42	67.72	26.63	0.21

77.98	66.4	68.97	26.33	0.207
79.24	77.15	78.11	26.07	0.207
81.4	78.9	80.4	25.92	0.204
84.9	81.4	83	25.85	0.199
88.9	84.7	86.8	26.07	0.189
90.4	87.9	89	26.63	0.163
92.9	89.4	91.6	27.51	0.137
94.3	91.4	92.7	28.63	0.113
95.9	92.2	93.9	30.05	0.102
96.7	93.9	95	31.1	0.113
99.1	94	96.9	31.78	0.121
99.7	96	97.4	31.64	0.144
97.9	96.1	96.9	31.73	0.157
96.8	94.6	95.6	31.55	0.165
94.9	91.4	93.3	30.83	0.177
91.4	86	88.2	30.13	0.195
87.5	81.2	83.9	29.49	0.2
85.3	83.1	84.3	29.08	0.205
83.5	82.3	83	28.75	0.204
82.6	81.2	81.9	28.46	0.204
81.9	80.6	81.2	28.18	0.205
81.7	79.11	81	27.9	0.201
79.85	73.84	75.46	27.63	0.201
75.81	73.11	74.33	27.32	0.205
77.88	71.31	74.3	27.01	0.204
76.84	69.11	72.69	26.78	0.203
79.66	75.53	77.88	26.52	0.203
83.2	78.97	81.4	26.44	0.196
86.9	83	85	26.63	0.188
90.4	86.1	88.3	27.09	0.167
92.8	89.5	91.2	27.9	0.137
95.1	91.5	93.3	29.16	0.093
95.8	92.5	94.5	30.61	0.075
97.4	94	95.5	31.78	0.093
97.8	94.4	96.3	32.52	0.103
96.9	94.4	95.6	31.87	0.14
96.5	93.8	94.8	31.68	0.153
94.1	91.6	92.9	31.5	0.163
91.8	88.5	90.3	30.83	0.178
88.5	83.9	86.2	30.17	0.19
84.3	79.04	80.8	29.62	0.198
80.6	76.57	78.34	29.12	0.202
81	77.66	79.69	28.75	0.204
78.86	76.02	77.63	28.46	0.203
77.1	71.6	76.18	28.14	0.201
73.2	69.84	71.3	27.82	0.2
71.83	68.62	69.95	27.51	0.204

69.06	64.92	67.3	27.2	0.203
66.39	60.78	64.21	26.93	0.203
70.74	64.77	66.94	26.63	0.202
77.42	70.41	74.54	26.37	0.201
82	77.44	80.4	26.26	0.198
86.1	81.1	84	26.48	0.186
87.2	83.4	85.2	26.97	0.167
88.5	84.8	86.4	27.63	0.148
92.4	86.6	89.4	28.54	0.119
95.7	90	92.7	30.09	0.08
98.4	92.7	95.2	32.01	0.057
98.9	94.3	96.3	32.57	0.09
98.5	93.6	96.2	31.91	0.128
96.4	94.3	95.6	31.64	0.149
95.8	92.5	94.1	31.41	0.155
93.2	89.4	91.3	31.01	0.171
89.4	79.53	85.3	30.43	0.181
79.48	74.97	77.07	29.79	0.196
75.48	74.15	74.83	29.24	0.202
80.3	74.13	77.12	28.91	0.202
80.8	79.84	80.4	28.63	0.203
80.3	78.53	79.32	28.42	0.199
79.28	78.19	78.7	28.18	0.196
78.7	77.15	78.27	27.94	0.198
77.24	71.48	73.03	27.71	0.198
77.81	74.12	75.56	27.43	0.196
76.58	66.58	70.01	27.2	0.199
78.89	69.13	75.72	26.89	0.198
84.6	78.09	81.9	26.86	0.195
86.8	82.2	84.3	27.16	0.18
89.6	85.8	87.5	27.63	0.161
91	88	89.4	28.3	0.137
92.4	88.7	90.1	28.99	0.12
93.9	89.9	91.8	29.83	0.108
94.9	91.1	92.9	31.05	0.086
95.4	91.5	93	31.28	0.109
94.9	90.7	92.1	31.01	0.136
91.8	90	90.7	30.48	0.162
93.8	89.5	91.5	30	0.178
93.2	89.5	91.3	30.05	0.176
89.5	80.1	85	29.87	0.179
81.9	75.51	77.57	29.28	0.191
79.4	75.99	77.81	28.91	0.199
82.1	74.86	78.86	28.63	0.197
75.55	68.01	70.71	28.42	0.196
74.2	66.58	71.08	28.02	0.199
74.39	69.18	72.03	27.78	0.198

70.39	68.45	69.37	27.55	0.198
69.15	68.28	68.83	27.32	0.198
68.24	66.89	67.44	27.09	0.197
69.31	64.83	66.81	26.86	0.195
78.83	67.38	73.53	26.59	0.195
82.3	78.83	79.97	26.52	0.191
84.5	82.1	83	26.74	0.182
88.9	84.6	86.6	27.28	0.161
90.8	87	88.8	28.3	0.12
91	85.1	88.5	29.08	0.109
85.6	80.1	83.2	28.99	0.148
88	80.7	86	28.54	0.175
94	87.2	90.7	28.75	0.171
94.1	89.9	92.4	29.66	0.143
93.8	89.8	91.6	30.09	0.138
91	89.6	90.2	30.05	0.152
89.6	87.1	88.6	29.79	0.171
87.1	82	84.3	29.54	0.18
82	77.51	80.4	29.2	0.186
77.43	73.44	75.35	28.87	0.195
73.99	71.9	72.99	28.5	0.197
74.87	71.59	73.31	28.22	0.196
75.47	71.68	74.11	27.94	0.199
77.58	74.57	76.11	27.75	0.196
79.29	75.37	77.57	27.55	0.194
79.7	77.34	78.82	27.39	0.192
78.7	66.19	76.3	27.2	0.189
66.7	61.48	63.99	26.97	0.191
78.03	66.76	72.99	26.63	0.193
79.23	76.83	77.74	26.55	0.191
84.5	79.03	82	26.74	0.182
87.5	83.8	85.7	27.24	0.161
90.1	86.5	88	28.06	0.132
93.8	88.1	90.5	29.16	0.1
94.4	90.4	92.3	30.48	0.07
95.3	91.9	93.5	31.55	0.077
96.8	92	94	32.24	0.092
98.6	93.4	95.1	32.15	0.114
94.9	92.4	93.9	32.19	0.132
93.7	90.7	92.5	31.68	0.153
93.2	90.1	91.9	31.01	0.174
90.1	77.65	85.1	30.65	0.177
77.55	72.5	74.27	30.09	0.192
72.91	71.15	72.06	29.58	0.199
72.04	68.75	70.56	29.2	0.202
70.74	69.49	70.08	28.91	0.199
72.23	67.97	70.15	28.58	0.199

73.62	70.16	71.35	28.3	0.199
72.26	70.09	71.27	28.06	0.198
73.12	68.98	71.08	27.82	0.193
73.3	68.37	70.41	27.55	0.195
74.85	68.27	71.21	27.32	0.194
83.3	74.88	79.4	27.09	0.194
87.9	83.3	86.1	27.09	0.187
88.7	86	87.3	27.36	0.174
90.9	88.2	89.4	27.78	0.157
92.4	88.7	90.8	28.63	0.126
94.7	90.6	92.8	29.7	0.093
97.5	93.6	95.2	31.1	0.064
98.9	94.4	96.5	32.38	0.064
98.4	95	96.8	33	0.079
98.9	96.3	97.6	32.66	0.11
99.2	95.8	97.1	32.52	0.129
97.8	95.4	96.5	32.52	0.138
96.8	93.4	95.2	31.91	0.156
93.4	84.4	88.7	31.37	0.176
85.6	74.6	81	30.74	0.19
83.3	73.35	75.99	30.17	0.196
86.4	75.9	78.92	29.83	0.199
80	75.02	78.12	29.58	0.196
79.6	76.82	78.3	29.28	0.195
81.4	77.15	78.86	29.03	0.194
81.6	80.4	81.1	28.83	0.19
81.4	79.89	80.6	28.63	0.189
80.3	78.38	79.82	28.42	0.189
79.8	75.84	78.67	28.18	0.189
78.25	72.17	74.59	27.94	0.19
82.9	76	79.33	27.78	0.187
87.8	82.9	85.5	27.98	0.177
90.2	87.3	88.6	28.5	0.151
94.1	89.3	91.9	29.58	0.106
94.9	91.5	93.2	31.19	0.04
97.7	93.2	95.5	33.19	0
100.1	93.2	96.4	34.03	0.038
94	92.6	93.1	33.14	0.112
94.7	90.6	92.3	31.55	0.155
95.3	90	93.2	31.28	0.165
95	92.5	93.9	31.64	0.149
94.6	88.8	91.1	31.55	0.155
89.1	85.2	87.4	31.05	0.17
86.5	84.7	85.8	30.57	0.181
85.9	82.2	84	30.26	0.185
83.3	78.83	80.8	30	0.188
78.73	76.45	77.21	29.66	0.189

76.85	75.25	75.93	29.33	0.192
76.06	69.73	73.04	29.03	0.191
69.94	64.41	66.75	28.75	0.189
68.79	63.79	66.45	28.42	0.193
67.81	63.17	65.58	28.14	0.193
66.26	60.72	62.75	27.9	0.193
74.48	66.29	71.09	27.59	0.192
76.82	73.89	75.27	27.51	0.189
83.4	76.35	79.41	27.63	0.181
86.3	82.1	84.1	27.98	0.169
88.9	85	87.1	28.79	0.138
91.5	87.3	89.5	30.22	0.076
93.5	90	91.9	31.78	0.046
95	91.1	92.9	32.52	0.067
95.4	92.3	93.8	32.66	0.1
94.6	89.1	91.6	32.52	0.125
93.6	89.5	91.7	31.91	0.149
92.4	89.9	90.9	32.01	0.147
90.3	85.9	88.1	31.82	0.159
85.9	83.7	85.2	31.28	0.175
83.9	79.4	81.8	30.87	0.184
79.8	77.53	79.03	30.48	0.188
80.3	76.64	78.84	30.09	0.191
80.7	77.06	79.47	29.83	0.19
79.69	74.54	75.97	29.58	0.189
79.84	75.27	78.98	29.28	0.19
75.5	72.7	74.11	29.08	0.188
77.2	72.7	75.72	28.83	0.19
77.01	75.95	76.57	28.63	0.188
76.21	71.79	75.19	28.42	0.187
79.02	73.35	76.91	28.22	0.187
82.4	78.92	80.6	28.1	0.185
85	82	83.4	28.3	0.175
88.1	84.3	85.6	28.79	0.155
90.3	85.5	88.1	29.49	0.128
92.4	87.9	90.2	30.61	0.1
95.7	89.5	92.3	31.78	0.075
96.2	92.3	93.8	32.9	0.071
97.8	90.8	94.5	33.58	0.082
95.2	89.3	91.3	33.24	0.117
92.9	89.9	91	32.52	0.147
90.8	88.3	89.5	32.33	0.155
88.4	81.3	86	31.87	0.167
83.6	81.1	82.3	31.28	0.18
82.1	79.68	80.5	30.83	0.187
80.9	78.44	79.68	30.52	0.187
78.69	78.03	78.37	30.22	0.188

78.34	77.33	78	29.96	0.188
77.76	76.91	77.37	29.7	0.187
77.62	76.58	77.04	29.49	0.187
77.14	76.02	76.59	29.28	0.187
76.11	74.78	75.36	29.03	0.186
75.28	74.27	74.82	28.83	0.186
75.98	74.23	74.83	28.63	0.186
79.72	75.93	77.48	28.42	0.186
85	79.63	82.1	28.34	0.184
86.7	82.4	84.5	28.63	0.17
89.4	84.3	86.4	28.99	0.158
92.3	88.7	90.1	29.49	0.139
94.6	90	92.1	30.96	0.076
96.9	92.5	94.1	32.62	0.035
98.6	93.8	95.9	33.98	0.046
99.2	93.4	96.1	34.28	0.077
99	96.4	97.3	33.14	0.123
97.9	94.1	95.9	33.29	0.125
95.1	93.7	94.3	32.81	0.144
93.9	88.6	92	32.24	0.159
88.6	84.9	86.6	31.82	0.172
84.8	82.9	83.8	31.37	0.18
83.5	82.6	83	30.96	0.184
82.8	80.4	81.7	30.7	0.185
80.9	79.66	80.2	30.43	0.183
80.3	79.24	79.71	30.13	0.183
80.3	76.76	78.84	29.87	0.186
77.74	73.86	75.69	29.66	0.186
76.68	72.65	74.15	29.37	0.188
77.05	72.57	74.78	29.12	0.186
75.19	72.21	73.91	28.91	0.185
78.31	74.07	76.13	28.71	0.184
80.8	78.1	79.19	28.58	0.183
84	80.2	81.8	28.75	0.175
87.1	83	84.4	29.08	0.159
89.8	85	87.2	29.75	0.135
92.3	87.1	89.5	30.92	0.087
93.5	90.7	91.9	32.76	0.031
96.7	91.8	94.6	34.69	0.022
95.9	92	93.4	35.21	0.056
93.1	85.3	89.2	33	0.137
87.1	85.2	86.1	31.82	0.166
87	84.9	85.8	31.46	0.173
85.2	83.3	84.3	31.32	0.178
84	72.05	82.1	31.1	0.178
75.7	71.38	73.1	30.65	0.183
76.91	72.91	74.88	30.13	0.19

76.68	68.84	73.15	29.87	0.188
70.52	68.75	69.53	29.49	0.187
72.76	70.57	71.68	29.16	0.191
73.57	70.73	72.17	28.91	0.188
72.09	66.58	69.17	28.67	0.187
66.89	64.74	65.67	28.42	0.187
66.03	63.77	65.24	28.18	0.187
67.59	64.17	66.67	27.9	0.184
68.21	65.67	67.32	27.71	0.187
73.91	68.21	70.28	27.47	0.188
79.4	73.8	77.07	27.47	0.18
83.6	79.22	81.4	27.75	0.168
88.3	83.2	85	28.38	0.148
90.8	85.5	88.2	29.58	0.113
90.3	86.2	88.3	31.5	0.079
94.4	89.9	91.9	31.5	0.124
95.2	89.8	92.5	32.9	0.116
95.3	89.7	92.6	32.71	0.136
90.3	73.52	84.1	32.33	0.152
84	79.02	82.3	31.05	0.178
85	82.4	83.8	30.65	0.183
82.4	79.02	80.6	30.61	0.184
79.02	76.85	77.92	30.48	0.19
77.23	76.32	76.73	30.05	0.189
77.02	76.13	76.59	29.79	0.189
78.81	76.72	77.9	29.58	0.187
79.6	78.36	78.81	29.37	0.186
79.33	74.59	76.69	29.16	0.183
76.49	73.19	75.07	28.95	0.183
76.87	74.68	76.09	28.75	0.181
76.21	74.91	75.81	28.58	0.178
75.65	73.93	74.86	28.46	0.181
79.04	75.54	76.97	28.22	0.181
81.2	77.43	79.68	28.14	0.178
86.1	81.1	83.7	28.34	0.169
88.1	83.1	85.3	28.79	0.152
90.6	86.9	88.2	29.49	0.125
91.3	87.6	89.1	31.1	0.073
92.7	88.2	90.3	31.78	0.1
90.6	86.2	88.6	32.19	0.115
87.1	84.7	85.8	31.23	0.15
85.5	80.2	83.8	30.7	0.167
81.4	79.13	80.1	30.48	0.174
82.5	80.6	81.6	30.17	0.18
82	79.8	80.7	30.13	0.179
79.83	77.96	78.8	30	0.176
78.1	66.02	69.61	29.7	0.181

67.28	64.98	65.96	29.28	0.185
66.72	65.23	65.88	28.95	0.186
66.68	65.44	66	28.75	0.183
68.81	66.23	67.2	28.54	0.185
67.76	65.75	66.56	28.34	0.181
67.59	65.65	66.4	28.14	0.18
67.66	65.67	66.59	27.94	0.181
66.93	64.24	65.28	27.75	0.18
66.37	64.22	65.31	27.55	0.179
67.19	65.46	65.86	27.39	0.179
68.35	67.06	67.61	27.24	0.18
67.76	65.86	66.63	27.05	0.181
74.25	67.51	71.02	27.01	0.179
81	74.07	77.66	27.32	0.169
82.4	78.61	80.6	27.98	0.146
82	73.4	79.38	28.83	0.134
80	72.51	76.65	28.46	0.168
81.3	77.46	79.64	28.63	0.17
83.3	78.9	81.7	28.91	0.171
80.8	74.32	77.04	29.08	0.173
78.51	74.32	76.82	28.87	0.18
77.72	73.57	75.61	28.83	0.18
74.83	71.26	73.08	28.67	0.18
72.72	70.05	71.48	28.5	0.182
73.06	68.59	70.39	28.3	0.183
70.52	68.28	68.98	28.06	0.183
74.3	68.69	71.71	27.86	0.183
72.43	69.17	70.94	27.71	0.182
74.18	69.54	72.51	27.55	0.179
74.11	70.6	73.06	27.43	0.177
72.63	68.72	70.22	27.32	0.176
73.19	71.92	72.8	27.16	0.178
72.94	72.01	72.42	27.01	0.176
73.35	71.88	72.43	26.89	0.177
77.89	72.53	74.17	26.74	0.177
81.3	75.93	79.11	26.78	0.173
84.5	80.2	81.9	27.28	0.155
86	82.1	83.9	28.14	0.134
87	81.9	83.7	29.37	0.116
85.9	82.3	83.7	29.41	0.148
86.7	82.2	83.3	28.99	0.165
85.5	69.26	73.6	28.87	0.176
79.33	69.14	73.76	28.34	0.186
80.3	75.31	77.31	28.38	0.183
77.98	73.4	74.97	28.5	0.178
74.74	72.52	73.51	28.3	0.18
74.72	73.28	74.33	28.18	0.18

74.73	68.29	72.28	27.98	0.178
69.02	67.74	68.24	27.78	0.177
70.57	68.1	69.46	27.55	0.182
69.6	68.22	69	27.39	0.178
72.21	69.45	70.61	27.24	0.177
76.28	71.35	73.13	27.12	0.177
73.39	64.64	67.04	26.97	0.177
64.66	63.79	64.16	26.82	0.176
70.23	64.35	67.14	26.67	0.176
67.51	64.96	65.84	26.55	0.174
68.48	65.94	67.05	26.37	0.176
75.59	68.41	72.29	26.22	0.178
78.52	73.12	75.42	26.44	0.168
82.4	78	80	26.82	0.153
84.5	80.3	82.3	27.67	0.132
85.1	79.95	83.3	28.75	0.119
84.3	80	81.6	29.62	0.132
81.2	67.79	75.72	28.95	0.164
68.78	64.92	66.56	28.1	0.182
74.12	68.76	71.18	27.94	0.185
80.5	73.75	77.09	28.06	0.182
80.9	77.27	79.4	28.26	0.178
78.95	73.04	76.32	28.18	0.177
73	67.57	70.69	28.02	0.179
67.97	63.35	65.53	27.75	0.181
63.94	59.24	61.46	27.47	0.184
64.14	59.86	62.62	27.2	0.182
61.46	59.1	60.55	26.93	0.18
64.67	59.09	61.61	26.67	0.179
61.67	58.54	60.18	26.4	0.177
66.9	59.23	62.15	26.18	0.179
59.71	58.83	59.25	25.96	0.176
61.1	58.83	59.79	25.74	0.178
66.73	60.38	62.02	25.52	0
71.84	65.62	69.26	25.31	0
74.87	71.74	73.02	25.16	0.176
78.09	74.54	76.41	25.34	0.165
79.86	75.4	77.9	25.85	0.15
80.9	76.1	78.28	26.52	0.142
85.1	78.37	81.1	27.28	0.143
85.3	77.44	80.1	27.55	0.158
86.8	82.4	84.9	28.18	0.16
86.3	67.06	76.94	29.08	0.163
77.31	70.26	74.2	27.78	0.184
82.3	77	80.1	27.82	0.184
81.7	78.7	79.87	28.22	0.178
81.2	74.46	78.1	28.1	0.18

74.48	70.2	72.24	27.94	0.18
70.7	68.67	69.67	27.67	0.183
71	68.58	69.63	27.43	0.182
69.92	67.53	68.58	27.24	0.18
72.81	66.11	69.07	27.05	0.181
68.85	65.75	66.73	26.82	0.18
66.37	61.61	64.28	26.59	0.178
61.67	58.7	60.42	26.37	0.177
59.96	57.26	58.82	26.14	0.179
57.75	56.33	57.2	25.96	0.176
61.43	56.11	57.53	25.74	0.177
71.55	61.49	67.38	25.49	0.179
77.54	71.66	75.29	25.38	0.177
78	73.62	75.81	25.59	0.167
81.9	77.31	79.07	26	0.157
83.6	76.88	79.82	26.48	0.152
90	81.5	85.2	27.32	0.143
88.7	84.7	86.5	28.79	0.144
89.7	78.68	83	29.08	0.165
84.2	77.69	79.27	28.34	0.177
84.2	74.55	78.14	28.34	0.178
86.6	83.2	85	28.58	0.176
85.5	82.2	83.6	28.99	0.172
82.8	79.79	81.1	28.87	0.173
79.82	72.35	76.24	28.67	0.179
72.37	63.46	67.17	28.38	0.181
66.91	63.71	65.67	28.06	0.185
64.93	59.69	61.92	27.78	0.184
59.78	55.75	57.38	27.47	0.181
56.8	55.51	56.25	27.2	0.181
56.32	54.41	55.23	26.93	0.18
54.95	52.36	53.84	26.63	0.18
53.16	51.21	52.09	26.37	0.177
51.98	50.01	50.78	26.11	0.178
56.02	49.33	51.29	25.85	0.178
66.6	56.13	62.61	25.56	0
71.09	66.49	69.12	25.38	0.177
74.8	70.25	71.88	25.45	0.172
79.88	73.19	76.51	25.7	0.159
81.5	77.56	79.49	26.37	0.146
80.1	77.04	78.48	26.82	0.149
83.2	78.01	80.2	27.01	0.154
82.6	77.99	79.77	27.59	0.15
85.3	78.37	81.6	27.94	0.153
83.5	79.68	81.7	28.46	0.149
81.8	78.53	80.2	28.71	0.155
80.8	77.37	78.92	28.75	0.164

78.28	74.08	75.94	28.71	0.172
74.06	68.54	71.88	28.54	0.176
68.52	64.11	66.52	28.3	0.178
67.52	59.89	64.09	28.02	0.178
61.76	58.18	60.29	27.67	0.181
63.76	56.76	59.71	27.36	0.178
63.17	58.37	60.89	27.05	0.18
61.59	56.94	59.2	26.74	0.177
56.86	51.65	54.02	26.44	0.18
54.41	50.71	52.54	26.14	0.176
54.28	48.37	50.68	25.85	0.175
50.43	48.58	49.48	25.56	0.175
66.83	50.3	61.88	25.27	0
72.77	66.43	69.42	25.06	0.174
75.2	71.32	72.57	25.09	0.168
54.25	49.6	52.07	16.36	0.205
55.06	53.5	54.18	16.2	0.204
58.45	54.98	56.73	16.02	0.206
61.42	58.45	59.8	15.99	0.214
64.97	61.26	62.86	16.43	0.23
68.25	64.67	66.14	17.33	0.249
69.33	67.45	68.45	18.74	0.245
70.56	68.39	69.56	20.13	0.223
71.93	69.06	70.31	20.85	0.212
71.74	67.23	68.87	20.88	0.219
67.38	67.01	67.16	19.46	0.242
67.05	63.61	65.72	18.71	0.251
63.57	60.73	61.6	18.4	0.241
60.97	57.56	58.72	18.07	0.228
58.95	56.67	57.61	17.88	0.223
58.86	55.31	57.26	17.71	0.22
56.82	53.63	55.32	17.52	0.215
55.65	53.6	54.55	17.33	0.21
56.27	53.21	55.11	17.15	0.208
55.72	52.2	53.42	16.99	0.206
52.44	50.41	51.16	16.8	0.201
51.67	49.47	50.81	16.59	0.201
49.65	43.37	47.19	16.43	0.199
47.1	40.47	43.84	16.25	0.198
44.72	41.98	43.44	16.07	0.194
45.12	43.54	44.41	15.94	0.195
49.17	43.12	45.11	15.79	0.196
52.51	49.2	50.71	15.61	0.2
55.57	52.53	53.98	15.79	0.199
56.37	54.64	55.55	16.02	0.19
57.59	55.17	56.1	16.17	0.195

61.73	57.22	59.47	16.49	0.196
65.53	61.15	63.72	17.41	0.204
63.94	61.24	62.95	17.99	0.202
63.15	59.99	61.34	17.82	0.201
61.81	57.71	60.34	17.77	0.199
57.71	52.55	54.8	17.77	0.197
54.54	52.34	53.15	17.66	0.199
54.03	48.98	51.92	17.52	0.198
55.12	48.98	51.58	17.39	0.198
57.98	55.25	56.77	17.25	0.197
56.08	52.46	54.07	17.15	0.196
54.4	47.71	50.05	17.01	0.195
53.9	47.52	49.92	16.83	0.196
55.67	51.95	54.33	16.67	0.195
54.41	50.58	52.68	16.56	0.194
53.4	49.46	51.3	16.43	0.192
51.28	49.4	50.4	16.33	0.193
53.16	49.87	51.85	16.23	0.192
51.72	47.75	49.41	16.15	0.191
49.64	48.32	48.81	16.04	0.193
51.26	48.43	49.65	15.97	0.194
52.44	51.26	51.82	15.92	0.196
53.26	52.34	52.84	15.99	0.199
54.12	51.74	52.77	16.1	0.197
54.97	53.19	53.93	16.43	0.192
54.04	51.89	52.82	16.59	0.204
52.02	43.2	47.16	16.62	0.201
47	44.66	45.5	16.49	0.201
48.69	47	47.92	16.41	0.206
47.54	44.78	46.19	16.49	0.199
44.78	44.12	44.45	16.36	0.197
44.36	44.09	44.23	16.2	0.197
45.2	44.27	44.64	16.04	0.196
45.5	43.56	44.59	15.92	0.194
43.58	42.94	43.2	15.79	0.195
43.03	42.46	42.72	15.69	0.195
42.67	42.4	42.52	15.58	0.193
42.43	41.74	42.03	15.48	0.195
41.84	41.29	41.45	15.38	0.193
41.79	41.4	41.67	15.28	0.192
42.09	41.72	41.93	15.13	0.192
42.4	42.05	42.31	14.98	0.19
42.45	42.12	42.29	14.88	0.192
43.33	42.09	42.59	14.81	0.191
47.15	43.23	45.15	14.61	0.2
50.26	46.94	48.24	14.66	0.198
50.11	48.41	49.11	14.91	0.198

51.36	49.24	50.22	15.01	0.204
54.33	50.55	52.2	15.23	0.207
56.19	51.21	54.28	15.56	0.215
56.57	54.8	55.52	16.1	0.228
56.56	54.29	55.61	16.23	0.231
55.85	52.89	54.49	16.15	0.223
52.85	39.84	47.14	16.1	0.211
39.9	38.13	39.13	15.94	0.201
41.88	39.54	40.79	15.79	0.2
42.18	38.01	39.54	15.61	0.197
44.57	37.69	41.5	15.38	0.196
45.48	43.25	44.29	15.16	0.196
46.86	41.42	44.14	14.96	0.195
44.54	41.45	43.65	14.74	0.195
44.61	42.06	43.73	14.54	0.191
45.22	40.85	42.34	14.37	0.189
44.01	40.49	42.73	14.2	0.189
43.71	41.79	42.64	14.03	0.19
41.91	36.64	39.34	13.86	0.189
40.18	36.12	38.13	13.69	0.187
48.96	36.34	42.25	13.46	0.193
52.6	48.57	51.08	13.41	0.191
54.84	52.27	53.66	13.62	0.186
58.24	54.62	56.06	14.17	0.201
58.99	57.22	58.1	14.69	0.224
60.29	57.75	58.93	15.33	0.236
63.5	58.7	61	16.2	0.239
63.66	61.27	62.71	16.96	0.238
64.56	62.72	63.43	16.83	0.241
64.48	60.46	62.83	16.43	0.239
60.42	45.93	53.07	16.15	0.226
47.34	44.6	46.01	15.94	0.211
48.12	44.15	45.44	15.87	0.206
49.19	47.35	48.28	15.76	0.205
48.99	47.86	48.32	15.61	0.205
50.26	47.49	49.04	15.46	0.204
49.65	48.16	48.86	15.28	0.199
55.35	47.61	52.33	15.13	0.199
54.72	51.37	52.88	14.98	0.199
52.04	46.79	49.11	14.86	0.2
53.22	46.01	49.48	14.71	0.196
50.36	45.95	48.69	14.56	0.196
48.08	45.58	47.03	14.44	0.195
47.22	38.53	43.5	14.29	0.194
49.93	38.49	42.82	14.05	0.2
55.42	49.96	53.56	13.98	0.198
58.75	55.45	56.9	14.25	0.199

63.3	58.44	60.49	14.88	0.217
66.25	62.78	64.29	15.66	0.238
67.72	65.9	66.6	16.91	0.245
71.92	66.97	69.35	17.9	0.236
73.05	70.28	71.83	18.85	0.234
71.68	69.35	70.35	18.77	0.238
70.55	65.13	68.05	17.88	0.25
65.13	53.89	58.96	17.15	0.243
53.99	50.31	51.89	16.67	0.226
56.98	51.9	53.85	16.51	0.219
59.99	55.41	57.63	16.41	0.216
57.9	54.38	56.04	16.28	0.216
56.98	51.21	54.39	16.1	0.213
54.87	50.46	52.87	15.87	0.209
60.31	53.07	56.43	15.69	0.209
60.92	59.79	60.44	15.58	0.208
60.88	53.3	59.41	15.51	0.208
55.2	51.99	53.6	15.38	0.208
55.02	46.42	50.66	15.21	0.205
48.65	40.9	44.96	15.01	0.203
45.49	37.28	40.96	14.81	0.2
52.68	36.94	44.84	14.51	0.206
57.54	52.54	55.29	14.47	0.203
62.21	56.97	60.04	14.71	0.208
65.53	60.35	62.74	15.38	0.227
69.78	62.94	65.14	16.15	0.245
72.3	65.42	69.61	17.25	0.248
73.55	68.92	70.95	18.32	0.237
72.8	69.64	71.23	18.77	0.237
70.03	67.68	68.84	18.26	0.246
68.02	63.78	65.88	17.41	0.245
63.8	58.46	60.41	16.85	0.235
59.21	58.06	58.77	16.56	0.223
58.38	56.09	57.16	16.41	0.219
57.37	54.77	56.47	16.23	0.216
55.37	52.56	53.79	16.02	0.213
56.66	52.59	54.86	15.84	0.21
55.58	54.18	54.92	15.69	0.208
57.26	54.38	55.57	15.53	0.209
57.06	55.56	56.36	15.38	0.207
57.02	55.64	56.35	15.28	0.207
56.12	53.68	54.71	15.21	0.206
53.87	52.41	53.26	15.11	0.204
53.94	52.32	53.03	14.98	0.204
52.64	51.5	52.16	14.88	0.202
56.07	52.28	54.12	14.69	0.207
58.1	55.88	56.69	14.74	0.207

60.35	57.65	58.67	14.93	0.209
60.97	52.42	58.75	15.28	0.216
60.79	48.66	55.48	15.26	0.218
59.85	52.15	55.9	15.36	0.221
60.11	52.46	55.61	15.48	0.221
58.52	51.73	54.02	15.71	0.224
52.42	46.21	48.81	15.66	0.215
48.52	44.92	46.41	15.61	0.212
45.43	44.58	44.88	15.61	0.209
45.31	43.54	44.4	15.51	0.209
44.17	42.82	43.41	15.36	0.208
43.46	41.01	42.42	15.18	0.206
41.72	40.69	41.11	14.98	0.202
41.29	38.75	40.07	14.78	0.202
40.59	36.95	38.85	14.59	0.203
40.49	34.62	38.26	14.37	0.2
38.71	36.08	37.53	14.17	0.198
38.02	35.88	37.06	13.98	0.2
37.17	35.34	36.4	13.79	0.197
38.63	35.41	37.34	13.65	0.195
38.74	36.01	37.26	13.5	0.196
35.99	35.03	35.53	13.39	0.196
37.95	35.2	36.6	13.24	0.194
43.08	37.95	39.61	13.1	0.196
45.12	40.9	43.28	13.08	0.2
45.57	43.24	44.2	13.34	0.195
47.85	43.03	45.21	13.39	0.202
43	32.75	36.81	13.55	0.205
41.17	33.49	38.27	13.36	0.203
39.43	32.61	34.28	13.48	0.202
36.35	33.49	34.85	13.39	0.203
35.82	34.04	34.92	13.32	0.2
35.6	33.9	34.8	13.29	0.193
35.65	33.77	34.52	13.1	0.194
33.98	32.26	33.31	12.94	0.195
33.27	31.3	32.23	12.76	0.195
33.82	32.14	32.91	12.59	0.195
33.78	31.69	32.82	12.46	0.194
33.41	31.55	32.36	12.32	0.194
33.3	31.76	32.69	12.18	0.193
32.6	30.85	31.88	12.05	0.193
32.88	32.09	32.47	11.91	0.193
33.34	32.47	33.05	11.78	0.193
33.14	31.87	32.55	11.67	0.19
33.07	32.04	32.52	11.58	0.193
33.05	32.47	32.78	11.47	0.19
35.07	33	33.8	11.27	0.196

36.58	34.76	35.56	11.24	0.197
38.86	36.34	37.44	11.24	0.192
41.47	38	39.79	11.36	0.19
43.1	40.18	41.86	11.58	0.194
45.43	42.58	43.89	11.89	0.206
46.49	44.54	45.3	12.18	0.221
46.65	44.94	45.73	12.32	0.226
46.84	44.56	45.56	12.32	0.221
45.79	42.36	44	12.37	0.217
42.32	39.07	40.22	12.43	0.206
40.27	36.71	38.69	12.41	0.204
37.29	34.31	35.41	12.34	0.201
36.96	35.97	36.46	12.25	0.201
39.19	35.25	37.34	12.14	0.201
36.44	34.43	35.46	12	0.2
36.7	35.02	36.32	11.87	0.197
35.28	33.2	34.57	11.76	0.197
37.03	33.62	35.61	11.62	0.197
36.86	32.95	35.76	11.49	0.199
34.53	30.28	32.22	11.38	0.195
31.39	27.17	29.16	11.27	0.196
30.45	27.23	28.98	11.16	0.197
27.82	25.5	26.58	11.07	0.198
34.99	26.47	29.87	10.87	0.201
39.63	35.04	38.08	10.85	0.2
41.05	39.33	40.21	10.92	0.196
43.67	40.54	42.05	11.05	0.196
44.82	42.9	44.01	11.22	0.202
46.38	44.12	45.15	11.53	0.216
47.5	45.81	46.46	11.91	0.229
48.54	46.65	47.54	12.16	0.234
49.02	47.66	48.13	12.37	0.233
48.16	45.12	46.89	12.43	0.225
45.07	35.66	40.66	12.57	0.213
35.63	31.91	32.82	12.59	0.206
36.97	32.39	34.78	12.55	0.205
36.03	32.96	34.83	12.43	0.208
36	28.18	33.48	12.3	0.205
29.19	26.23	27.47	12.14	0.202
26.21	25.13	25.65	11.96	0.204
25.55	24.47	24.86	11.78	0.203
25.2	23.93	24.57	11.62	0.201
25.54	22.95	24.23	11.47	0.199
23.16	21.66	22.24	11.31	0.197
23.55	21.45	22.65	11.18	0.198
23.18	21.3	22.04	11.07	0.197
22.38	21.43	21.92	10.96	0.197

32.66	21.81	26.09	10.76	0.201
36.19	32.69	35.26	10.7	0.2
40.41	36.09	38.15	10.7	0.201
43.75	39.86	42.06	10.79	0.197
45.67	43.15	44.22	10.92	0.2
47.51	44.56	45.97	11.13	0.206
48.55	46.19	47.45	11.33	0.22
49.35	47.26	48.41	11.53	0.225
49.08	47.56	48.3	11.73	0.227
47.95	44.22	46.55	11.85	0.22
44.18	31.19	37.94	12	0.209
31.87	29.43	30.28	12.03	0.206
30.1	28.83	29.39	12	0.206
30.3	28.05	29.38	11.89	0.202
32.01	28.03	29.59	11.76	0.202
31.97	28.55	29.95	11.6	0.201
29.31	27.51	28.14	11.44	0.202
29.16	27.44	28.42	11.31	0.2
27.65	26.65	27.22	11.18	0.2
27.69	26.36	27.11	11.05	0.199
26.75	25.1	26.13	10.94	0.199
26.5	24.99	25.77	10.83	0.198
26.01	24.68	25.21	10.74	0.197
25.56	24.82	25.14	10.63	0.196
34.5	25.32	28.48	10.44	0.203
38.72	34.54	37.69	10.4	0.203
41.21	38.53	39.54	10.44	0.198
44.34	40.94	42.55	10.57	0.194
47.73	44.15	46.25	10.83	0.2
50.21	47.58	48.91	11.18	0.215
52.37	49.62	51.01	11.51	0.231
53.79	51.47	52.65	11.78	0.235
55.18	53.1	53.88	12.03	0.237
54.67	49.98	52.91	12.05	0.231
49.94	36.92	42.27	12.12	0.218
36.94	34.81	35.88	12.12	0.21
36.9	34.42	35.84	12.12	0.208
36.21	33.14	34.4	12.05	0.205
34.47	32.67	33.51	11.96	0.205
33.13	31.9	32.51	11.82	0.203
32.88	31.48	32.45	11.69	0.204
33.43	31.11	32.05	11.53	0.204
32.18	30.66	31.57	11.4	0.201
32.44	30.54	31.41	11.27	0.201
35.14	29.97	31.34	11.13	0.203
35.81	29.99	32.05	11	0.202
32.24	29.09	30.92	10.89	0.2

32.74	28.74	30.1	10.79	0.199
38.5	27.91	33.48	10.59	0.204
43.56	38.54	41.6	10.55	0.203
48.76	43.19	45.85	10.61	0.2
51.77	48.55	50.34	10.89	0.2
56.95	51.08	53.19	11.11	0.208
62.14	57.23	60.25	11.62	0.226
63.96	61	62.42	12.07	0.241
63.22	60.08	61.75	12.85	0.249
61.5	58.71	60.32	12.85	0.248
58.71	54.42	57.05	12.59	0.241
54.64	50.53	52.34	12.39	0.224
51.98	50	51.11	12.3	0.215
51.25	48.28	50.08	12.25	0.215
52.2	46.29	49.84	12.16	0.213
51.5	42.76	46.2	12.03	0.208
52.12	46.35	48.89	11.89	0.209
49.3	43.48	46.13	11.8	0.207
48.93	42.96	46.32	11.67	0.206
49.07	43.68	46.24	11.53	0.204
49.12	42.66	47.01	11.42	0.203
48.27	40.81	44.78	11.31	0.202
45.38	41.39	43.74	11.2	0.204
44.3	39.71	41.74	11.09	0.202
44.87	41.97	43.66	11	0.201
46.79	42.75	45.23	10.81	0.206
50.08	46.79	48.33	10.85	0.204
51.03	48.5	49.8	11.05	0.205
51.66	46.51	49.65	11.27	0.21
47.2	41.4	43.12	11.36	0.215
48.73	40.16	45.14	11.33	0.215
43.68	33.11	37.86	11.51	0.217
40.55	33.28	37.9	11.36	0.212
40.26	32.1	35.58	11.49	0.207
37.28	36.06	36.54	11.36	0.209
36.44	35.23	35.9	11.4	0.202
36.77	35.67	36.24	11.27	0.201
36.42	35.4	35.94	11.11	0.2
35.79	34.73	35.27	10.98	0.199
35.62	34.81	35.29	10.83	0.199
35.46	34.57	35	10.72	0.2
35.17	34.52	34.85	10.59	0.199
35.16	33.84	34.63	10.48	0.197
33.99	32.64	33.2	10.4	0.196
32.72	31.44	32.09	10.29	0.196
32.26	31.19	31.72	10.2	0.196
32	31.3	31.68	10.12	0.196

31.78	30.54	31.11	10.03	0.195
31.23	29.69	30.56	9.95	0.196
32.4	30.76	31.51	9.76	0.2
35.81	32.35	34.03	9.76	0.199
40	35.86	37.82	9.8	0.197
42.66	39.56	40.63	9.99	0.195
44.54	42.17	43.15	10.27	0.198
46.07	44.22	45.34	10.55	0.211
47.64	45.05	46.54	10.87	0.227
51.07	47.32	48.56	11.13	0.231
49.67	47.48	48.65	11.18	0.228
49.65	43.07	47.09	11.11	0.219
43.04	28.66	34.69	11.18	0.208
28.63	26.92	27.61	11.16	0.202
29.01	27.04	28	11.09	0.201
32.53	29.05	30.73	10.98	0.203
29.93	27.51	28.67	10.85	0.201
28	25.82	27.15	10.7	0.2
27.44	24.58	25.76	10.55	0.199
31.02	25.07	27.56	10.4	0.199
25.71	20.27	21.66	10.25	0.197
20.8	18.98	19.94	10.12	0.198
22.74	19.15	20.39	10.01	0.196
20.82	19.29	20.17	9.89	0.196
21.28	18.3	20.03	9.78	0.195
18.58	17.12	17.86	9.7	0.195
28.62	16.71	21.43	9.47	0.201
34.96	28.65	32.7	9.44	0.199
38.46	34.34	36.62	9.44	0.196
40.13	38.16	39.18	9.53	0.197
43.22	39.74	41.56	9.68	0.197
44.48	41.89	43.24	9.86	0.199
46.73	43.46	45.17	9.99	0.209
46.95	45.35	46.2	9.97	0.212
47.03	45.19	46	9.95	0.213
46.49	40.87	44.26	9.99	0.208
40.84	27.57	32.61	10.14	0.199
28.02	26.12	26.95	10.16	0.197
31.49	28.04	30.22	10.16	0.199
31.66	26.91	30.09	10.1	0.198
27.78	25.39	26.33	10.01	0.199
27.83	25.52	26.25	9.91	0.198
28.14	25.65	27.08	9.8	0.197
27.07	25	26.33	9.72	0.195
25.69	24.1	25.02	9.61	0.195
24.47	23.87	24.25	9.53	0.193
24.03	22.52	23.48	9.44	0.193

24.17	22.31	22.93	9.38	0.194
23.98	22.45	22.97	9.3	0.194
23.52	22.38	22.83	9.22	0.191
32.07	22.91	26.04	9.03	0.198
38.65	32.11	36.93	9.03	0.197
40.43	38.38	39.25	9.07	0.196
43.73	40.24	41.81	9.17	0.192
46.27	43.37	44.63	9.38	0.192
49.19	45.36	47.26	9.63	0.199
50.59	48.04	49.36	9.82	0.21
51.94	49.25	50.66	9.91	0.217
52.02	50.41	51.21	9.95	0.219
51.34	46.38	49.67	9.91	0.212
46.32	31.72	35.41	9.95	0.2
33.7	31.32	32.65	9.97	0.197
32.5	29.5	31.17	9.97	0.198
32.25	28.2	29.85	9.91	0.197
31.52	27.09	28.61	9.82	0.196
29.83	26.94	28.74	9.74	0.195
28.87	27.03	28.22	9.63	0.196
28.14	26.54	27.16	9.55	0.197
27.43	25.51	26.43	9.47	0.193
26.65	25.28	26.03	9.36	0.193
26.62	24.69	25.3	9.28	0.193
24.79	22.65	23.77	9.22	0.195
24.12	23.02	23.66	9.13	0.192
23.87	22.97	23.38	9.07	0.191
31.71	23.38	26.11	8.87	0.199
37.93	31.78	36.58	8.87	0.198
41.49	37.88	39.42	8.91	0.195
43.74	40.8	42.42	9.03	0.193
46.93	43.22	44.99	9.28	0.193
49.35	46.19	47.95	9.61	0.199
51.25	48.74	49.91	9.89	0.215
52.64	50.24	51.43	9.95	0.219
52.46	50.89	51.62	9.97	0.219
52.85	46.62	50.91	9.93	0.213
46.56	32.67	36.08	9.99	0.201
33.28	31.96	32.5	10.01	0.198
32.87	30.16	31.43	10.01	0.199
31.44	29.87	30.38	9.97	0.198
31.78	29.6	30.7	9.86	0.197
31.28	29.66	30.31	9.78	0.196
30	28.05	29.05	9.68	0.195
28.4	26.97	27.65	9.55	0.197
27.71	25.42	26.96	9.47	0.197
27.12	25.65	26.36	9.36	0.195

27	24.79	25.89	9.28	0.193
27.56	26.11	26.94	9.2	0.194
27.34	25.63	26.54	9.11	0.192
26.44	25.3	25.89	9.03	0.191
33.32	25.55	29.35	8.95	0.194
37.44	32.75	35.37	8.82	0.197
42.68	37.22	40.37	8.78	0.198
46.02	42.16	44.01	8.97	0.194
50.08	46.08	47.78	9.3	0.192
51.73	49.3	50.21	9.63	0.202
52.73	50.15	51.59	9.49	0.209
51.48	48.6	50.39	9.74	0.216
48.6	47.88	48.13	9.76	0.209
49.44	46.99	48.01	9.84	0.207
48.96	42.68	45.59	9.97	0.205
46.6	42.98	44.81	9.99	0.201
47.08	44.77	45.81	10.03	0.199
46.93	44.93	45.82	10.08	0.201
47.24	43.65	45.58	10.06	0.2
44.6	42.71	43.89	10.06	0.2
44.88	40.54	42.19	10.03	0.2
42.7	40.85	41.61	10.01	0.197
41.78	39.04	40.78	9.99	0.199
39.49	35.58	37.56	9.95	0.197
37.3	35.06	35.95	9.91	0.198
37.2	35.8	36.47	9.84	0.2
36.25	30.16	33.8	9.74	0.197
31.38	29.74	30.51	9.63	0.198
32.95	29.35	31.14	9.42	0.201
33.22	31.8	32.38	9.34	0.201
34.9	32.12	33.73	9.34	0.2
36.23	34.11	35.07	9.38	0.198
38.99	35.64	37.08	9.42	0.196
39.94	35.43	37.11	9.55	0.198
39.13	35.77	37.73	9.49	0.2
39.46	34.3	37.76	9.63	0.202
37.59	33.17	34.81	9.65	0.205
34.04	33.1	33.54	9.59	0.199
33.42	32.26	32.86	9.61	0.194
32.85	32.19	32.53	9.55	0.196
32.63	32.09	32.39	9.44	0.195
32.41	31.98	32.22	9.36	0.197
32.14	31.28	31.88	9.28	0.195
31.43	30.23	31	9.2	0.194
30.66	29.23	29.74	9.11	0.194
30.28	29.31	29.83	9.01	0.193
30.69	29.17	30	8.95	0.194

29.9	28.96	29.35	8.87	0.192
29.64	28.5	29.06	8.8	0.193
29.76	28.59	29.12	8.72	0.193
30.49	28.52	29.18	8.66	0.192
28.63	28.07	28.36	8.6	0.191
30.03	28.09	28.86	8.42	0.199
35.23	29.77	32.61	8.42	0.198
36.94	35.22	35.97	8.5	0.194
41.02	36.54	38.21	8.62	0.19
44.84	39.24	41.39	8.8	0.189
46.52	44.39	45.43	9.09	0.195
47.07	44.55	45.63	9.26	0.205
47.03	45.23	45.94	9.2	0.21
46.28	43.99	45.09	9.09	0.209
44.31	41.17	42.59	8.97	0.205
41.25	38.65	39.8	9.03	0.196
38.83	37.6	38.14	9.03	0.194
37.81	36.84	37.23	9.03	0.195
37.66	36.79	37.21	8.99	0.196
37.88	36.96	37.43	8.93	0.195
38.89	36.97	38.08	8.87	0.193
38.52	37.61	38.1	8.82	0.195
39.68	38.19	39.19	8.78	0.195
38.98	37.45	38.27	8.74	0.195
40.1	37.85	39.02	8.68	0.192
40.85	39	39.9	8.66	0.193
41.8	39.74	40.93	8.64	0.192
40.2	37.69	38.91	8.6	0.192
39.27	37.66	38.25	8.58	0.192
40.49	37.86	39.32	8.46	0.197
44.68	40.46	42.37	8.5	0.198
50.52	44.33	47.32	8.68	0.195
53.46	49.94	51.38	9.13	0.198
54.96	51.69	53.24	9.78	0.212
58.38	54.1	56.49	10.59	0.228
59.05	57.16	58.12	11.44	0.231
58.99	57.51	58.33	11.67	0.227
58.7	56.71	57.54	11.42	0.228
56.88	51.67	54.46	10.92	0.227
51.68	49.37	50.4	10.61	0.215
50.06	47.42	48.79	10.5	0.209
48.34	45.47	46.61	10.46	0.207
46.82	41.58	44.38	10.4	0.205
45.67	39.66	42.03	10.29	0.204
41.25	35.97	38.72	10.18	0.203
36.76	33.08	35.3	10.03	0.202
35.48	32.19	33.78	9.91	0.201

33.34	28.8	30.72	9.76	0.201
30.12	28.39	29.15	9.59	0.199
29.5	28.13	28.6	9.44	0.196
28.41	27.56	27.98	9.32	0.198
27.86	24.98	26.52	9.2	0.196
26.45	24.39	25.31	9.07	0.196
33.59	24.69	27.55	8.85	0.199
41.58	33.63	39.02	8.8	0.198
45.11	41.46	43.69	8.85	0.194
47.86	44.89	46.46	9.09	0.193
51.1	47.7	49.44	9.44	0.2
53.27	50.49	51.81	9.93	0.214
57.54	52.38	55.48	10.5	0.226
59.22	56.63	57.77	10.94	0.23
58.79	57.35	58.02	11.03	0.232
57.79	49.99	54.99	10.79	0.226
49.9	36.22	42.11	10.61	0.212
37.94	35.49	36.41	10.46	0.205
38.02	35.61	36.82	10.42	0.203
42.09	35.38	37.68	10.33	0.203
49.33	37.78	43.61	10.23	0.202
50.88	46.72	48.7	10.12	0.202
49.44	46.57	47.64	10.03	0.2
48.74	43.91	47.37	9.97	0.199
50.77	41.97	46.77	9.89	0.202
47.5	44.36	45.59	9.84	0.2
48.42	40.25	45.86	9.78	0.199
49.61	38.2	42.61	9.72	0.198
50.09	37.1	44.1	9.63	0.198
50.76	49.22	49.8	9.57	0.195
49.37	38.43	41.64	9.4	0.201
53.89	44.18	50.89	9.42	0.203
57.62	53.89	56.06	9.72	0.199
59.5	53.01	55.48	10.42	0.206
58.43	55.15	56.73	10.98	0.224
57.38	55.29	56.08	11.55	0.232
60.62	57.26	59.5	12.16	0.236
61.77	59.22	60.33	12.57	0.235
60.92	58.82	59.68	12.46	0.235
59.13	53.54	57.55	11.93	0.23
53.5	40.61	44.18	11.58	0.217
43.64	39.67	41.04	11.36	0.21
44.36	35.87	38.12	11.27	0.209
45.81	41.56	44.14	11.13	0.208
42.3	32.07	36.15	11	0.205
34.98	30.79	33.05	10.85	0.206
33.68	28.81	30.96	10.68	0.206

31.54	26.98	29.05	10.48	0.203
28.96	24.21	26.87	10.29	0.202
31.8	24.36	26.5	10.1	0.201
33.15	24.23	28.55	9.93	0.198
24.16	21.99	22.73	9.74	0.198
23.52	21.63	22.41	9.57	0.199
23.23	19.77	21.25	9.4	0.197
29.1	21.3	23.53	9.13	0.201
39.83	29.17	36.68	9.05	0.2
42.93	39.66	41.22	9.03	0.199
44.68	42.39	43.6	9.11	0.194
46.72	44	45.52	9.34	0.194
48.69	46.06	47.32	9.59	0.198
49.58	47.07	48.49	9.84	0.206
51.52	49.18	50.17	9.99	0.213
52.22	49.61	50.69	10.12	0.213
50.56	47.36	49.36	10.06	0.208
47.2	31.3	33.06	10.06	0.197
33.54	31.6	32.65	9.99	0.199
32.17	26.46	30.5	9.95	0.2
26.45	24.86	25.48	9.82	0.197
28.59	25.68	26.52	9.68	0.198
28.83	24.5	26.53	9.53	0.198
26.26	23.73	24.95	9.38	0.197
26.84	23.27	24.71	9.22	0.196
23.86	22.27	23.06	9.09	0.196
23.09	20.73	21.91	8.95	0.196
22.66	20.08	21.31	8.82	0.196
22.5	20.26	21.68	8.7	0.193
20.63	19.5	20.19	8.6	0.194
20.74	19.44	20.15	8.5	0.192
27.02	18.74	20.93	8.26	0.198
37.67	27.07	35.03	8.24	0.196
40.02	37.67	38.65	8.26	0.195
42.36	38.86	40.52	8.34	0.19
44.68	41.27	42.59	8.48	0.19
45.91	43.9	44.7	8.66	0.187
48.44	44.81	46.77	8.82	0.194
49.42	47.35	48.35	8.89	0.195
49.65	48.34	48.89	8.91	0.198
48.45	41.93	46.39	8.89	0.199
41.9	26.84	32.27	9.01	0.194
27.21	26.06	26.56	8.99	0.194
28.11	26.14	27.19	8.97	0.197
27.87	25.79	26.84	8.91	0.194
26.33	24.82	25.63	8.82	0.196
26.78	24.85	25.5	8.72	0.195

25.91	23.73	24.72	8.62	0.194
24.03	23.13	23.5	8.52	0.194
24.56	23.02	23.77	8.42	0.193
24.12	21.41	22.94	8.32	0.191
22.88	22.36	22.61	8.26	0.192
22.56	20.74	21.91	8.18	0.19
21.63	20.47	21	8.1	0.189
21.5	19.17	20.59	8.04	0.189
30.81	19.29	23.41	7.84	0.196
40.6	30.84	37.45	7.82	0.193
42.53	40.27	41.53	7.88	0.192
45.9	42.24	43.96	8.02	0.188
47.42	44.85	46.08	8.24	0.183
50.27	46.5	48.5	8.5	0.184
52.08	49.23	50.73	8.78	0.192
53.66	51.12	52.32	8.89	0.197
54.41	52.64	53.25	8.87	0.201
53.03	44.94	50.04	8.82	0.2
44.9	31.59	36.23	8.89	0.192
32.56	30.83	31.38	8.87	0.192
31.5	28.27	29.31	8.89	0.195
30.06	27.98	29.11	8.82	0.196
37.22	28.63	31.34	8.74	0.193
37.99	29.66	33.74	8.66	0.194
35.92	27.76	31.19	8.56	0.192
37.12	29.15	32.81	8.46	0.192
30.47	27.1	28.5	8.38	0.193
31.37	24.69	26.87	8.28	0.19
27.66	24.05	25.59	8.2	0.191
25.85	23.27	24.51	8.12	0.193
24.44	22.34	23.56	8.04	0.191
27.84	23.23	24.45	7.98	0.189
32.73	24.23	27.22	7.8	0.194
47.36	32.76	41.97	7.78	0.195
49.78	47	48.29	7.84	0.192
52.82	49.42	51.16	8.02	0.189
55.55	52.18	53.33	8.4	0.183
61.81	55.22	60.2	8.87	0.187
62.42	60.33	61.49	9.3	0.201
62.46	59.87	61.07	9.44	0.207
60.71	58.22	59.56	9.44	0.209
58.44	52.58	55.91	9.32	0.206
52.7	48.19	51.24	9.3	0.197
51.07	47.58	49.56	9.3	0.197
50.17	46.92	48.95	9.3	0.195
49.19	47.12	48.09	9.3	0.195
49.19	46.82	48.1	9.28	0.194

49.13	44.52	46.41	9.22	0.196
48.86	42.45	46.1	9.13	0.196
50.75	44.74	48.47	9.09	0.194
51.77	48.31	50.4	9.07	0.195
52.16	49.76	51.25	9.07	0.195
51.08	48.48	49.86	9.07	0.194
51.78	50.33	50.94	9.05	0.194
51.51	50.13	50.88	9.11	0.194
52.93	50.9	51.61	9.13	0.192
52.77	51	52.03	9.2	0.19
54.69	51.39	52.62	9.15	0.195
56.71	53.55	55.2	9.3	0.199
57.09	55.34	56.2	9.78	0.192
58.24	56.02	57.06	10.08	0.196
58.52	56.47	57.32	10.42	0.201
57.15	54.99	56.23	10.59	0.203
56.55	54.05	54.98	10.68	0.205
54.8	50.07	52.6	10.68	0.204
50.36	47.07	48.79	10.55	0.204
47.19	43.25	45.49	10.5	0.2
44.86	42.92	43.76	10.42	0.198
43.71	41.4	42.78	10.33	0.201
43.91	40.41	42.51	10.25	0.2
44.26	42.66	43.4	10.16	0.199
43.35	41.35	42.37	10.06	0.199
41.85	37.19	39.76	9.93	0.199
37.42	34.91	36.56	9.8	0.198
37.13	33.97	35.74	9.65	0.195
36.51	30.89	33.74	9.53	0.196
36.12	33.95	35.27	9.4	0.195
34.95	31.35	33.46	9.24	0.195
34.41	24.27	29.28	9.11	0.195
27.51	21.12	24.08	8.95	0.194
29.1	23.39	25.88	8.78	0.195
40.35	29.14	35.77	8.58	0.199
39.28	35.38	36.8	8.56	0.196
42.5	37.09	38.97	8.52	0.193
45.24	41.98	43.33	8.58	0.187
45.88	41.7	44.6	8.72	0.187
47.58	44.71	46.05	9.09	0.181
49.19	46.68	47.39	9.38	0.185
48.16	46.42	47.2	9.47	0.191
46.9	38.43	44.65	9.49	0.194
38.34	29.15	31.73	9.59	0.194
37.55	30.41	34.69	9.53	0.197
37.87	30.6	35.26	9.47	0.195
36.15	28.48	31.54	9.36	0.196

33.65	27.01	31.48	9.24	0.196
33.82	29.52	32.69	9.09	0.195
30.28	24.36	28.6	8.95	0.194
30.19	22.07	25.79	8.8	0.193
29.19	18.56	22.2	8.66	0.193
26.16	19.69	23.22	8.52	0.191
21.66	18.16	20.02	8.4	0.193
21.18	18.34	20.06	8.28	0.192
21.63	20.18	20.83	8.18	0.19
21.12	17.6	19.55	8.08	0.191
23.45	15.38	18.57	7.9	0.192
33.5	23.46	29.62	7.8	0.194
36.59	33.43	35.04	7.78	0.191
38.76	35.83	37.13	7.78	0.188
40.94	37.84	39.39	7.86	0.185
43.9	39.7	41.32	8.02	0.18
43.68	40.38	41.47	7.98	0.183
42.39	39.12	40.38	7.94	0.186
40	36.47	38.73	7.98	0.186
39.28	36.01	36.75	8.1	0.187
36.41	31.83	34.83	8.18	0.187
31.76	28.39	29.31	8.2	0.189
31.04	28.2	29.14	8.16	0.189
31.11	24.96	27.9	8.1	0.189
28.63	23.92	26.85	8.02	0.189
28.53	26.23	27.04	7.94	0.186
30.09	28.65	29.52	7.88	0.188
29.64	28.46	28.99	7.8	0.19
29.36	27.28	28.57	7.74	0.188
29.09	22.66	24.93	7.68	0.187
25.18	17.03	21.02	7.6	0.188
23.1	19.07	21.67	7.54	0.186
24.7	19.33	23.06	7.48	0.187
24.61	16.45	20.11	7.42	0.185
29.92	16.04	22.77	7.32	0.188
33.21	29.99	31.93	7.2	0.193
33.6	31.97	32.7	7.26	0.189
37.17	32.78	34.5	7.32	0.186
37.02	34.28	35.61	7.42	0.182
37.82	35.13	36.16	7.42	0.184
39.88	36.02	38.25	7.38	0.183
40.2	36.15	38.77	7.48	0.181
42.61	38.82	39.9	7.58	0.183
40.82	34.3	36.49	7.64	0.185
34.85	21.82	28.14	7.76	0.182
23.15	21.74	22.31	7.78	0.186
28.4	23.19	26.25	7.76	0.186

31.78	28.4	30.09	7.74	0.187
31.83	29.85	30.66	7.7	0.186
31.07	28.58	29.84	7.64	0.189
29.14	27.58	28.31	7.58	0.187
28.31	26.84	27.63	7.52	0.189
28.05	23.82	26.81	7.46	0.187
24.3	17.95	21.68	7.4	0.187
18.47	15.13	16.72	7.36	0.186
22.43	18.1	19.96	7.3	0.186
23.59	22.12	22.8	7.26	0.186
24.47	22.59	23.61	7.22	0.186
25.78	23.55	24.85	7.17	0.186
29.09	25.81	27.87	7.07	0.189
30.85	28.99	29.97	7.05	0.19
33.8	30.39	31.68	7.07	0.187
36.61	33.05	34.42	7.11	0.184
40.28	35.35	37.34	7.18	0.181
43.76	39.86	42.21	7.36	0.176
43.38	41.75	42.52	7.54	0.174
42.53	41.05	41.77	7.58	0.177
41.16	36.2	39.5	7.6	0.185
36.25	32.18	34.3	7.72	0.182
32.8	28.47	30.62	7.68	0.189
30.52	29.63	30.1	7.64	0.187
30.14	26.53	28.55	7.58	0.187
26.74	24.08	25.59	7.52	0.189
24.7	23.78	24.21	7.44	0.188
25.64	24.01	24.93	7.36	0.19
26.51	25.64	26.09	7.3	0.188
26.7	25.78	26.36	7.24	0.187
26.39	25.64	26.08	7.18	0.186
26.21	24.86	25.42	7.13	0.184
25.6	22.93	24.55	7.09	0.185
25.51	24.16	25.01	7.03	0.186
25.29	19.91	22.06	6.99	0.186
24.9	19.8	21.49	6.87	0.188
30.19	24.91	28.28	6.82	0.19
33.39	30.09	31.69	6.85	0.188
36.95	33.1	35.38	6.91	0.185
38.08	35.79	36.86	6.97	0.18
39.82	37.37	38.6	7.07	0.175
40.67	38.78	39.91	7.18	0.172
42.11	39.44	40.6	7.17	0.174
43.58	40.73	41.99	7.11	0.179
40.99	31.02	37.66	7.11	0.182
30.93	24.53	28.11	7.18	0.182
28.15	21.9	24.27	7.15	0.185

28.98	22.16	24.59	7.13	0.186
29.77	18.48	23.84	7.09	0.185
27.4	18.56	22.58	7.05	0.185
30.14	22.04	26.93	6.99	0.186
27.18	21.68	23.67	6.95	0.186
28.52	23.36	27.11	6.91	0.187
24.17	22.26	23.11	6.87	0.185
24.21	16.22	20.63	6.82	0.183
17.82	14.18	15.87	6.78	0.185
17.13	14.28	15.69	6.72	0.187
17.85	15.97	16.83	6.68	0.186
18.46	15.65	17.21	6.64	0.184
19.88	14.84	15.97	6.55	0.188
32.78	19.94	27.72	6.49	0.187
36.09	32.82	34.3	6.53	0.187
39.68	35.4	37.23	6.58	0.183
40.7	38.47	39.53	6.7	0.179
42.19	39.79	40.93	6.82	0.173
43.14	41.2	42.1	6.91	0.17
43.76	42.36	43.07	6.89	0.174
44.27	42.85	43.66	6.78	0.176
43.47	36.29	41.33	6.64	0.179
36.22	21.16	23.81	6.68	0.177
24.99	23.12	24	6.62	0.183
25.78	23.16	24.2	6.62	0.183
24.58	23.09	23.69	6.62	0.184
24.65	22.7	23.85	6.62	0.185
23.66	22.56	23.24	6.6	0.184
23.66	22.92	23.23	6.58	0.183
23.13	20.34	21.76	6.56	0.183
20.49	17.86	19.05	6.53	0.185
19	16	17.2	6.49	0.186
16.9	15.61	16.32	6.45	0.183
17.4	15.69	16.44	6.41	0.184
16.87	14.62	15.76	6.37	0.183
17.12	14.52	15.79	6.34	0.182
19.8	12.93	15.43	6.26	0.183
30.21	19.84	27.22	6.18	0.188
33.54	29.96	31.89	6.22	0.186
36.76	33.26	35.35	6.3	0.182
39.57	36.51	38	6.37	0.178
42.21	38.69	40.68	6.49	0.175
44.23	41.29	42.91	6.6	0.171
45.35	43.43	44.25	6.62	0.172
44.77	42.98	44.14	6.53	0.176
42.98	35.49	39.95	6.39	0.181
35.46	21.04	24.55	6.37	0.18

21.79	19.96	20.83	6.3	0.181
22.31	19.05	20.74	6.28	0.184
22.16	20.84	21.6	6.28	0.184
24.05	20.02	21.63	6.28	0.183
22.7	20.58	21.35	6.3	0.184
21.46	20.45	21.04	6.3	0.184
21.71	19.18	20.48	6.28	0.184
20.78	18.52	19.78	6.26	0.182
22.4	19.62	20.75	6.24	0.183
21.95	18.14	19.84	6.22	0.182
19.6	14.7	17.25	6.18	0.181
20.06	14.45	16.25	6.14	0.184
18.2	14.76	16.45	6.13	0.183
20.84	14.8	16.23	6.05	0.185
31.41	20.84	27.43	5.97	0.187
34.09	31.17	32.34	6.03	0.186
37.2	33.48	35.12	6.09	0.183
39.88	36.95	38.26	6.18	0.179
41.82	38.78	40.38	6.28	0.175
45.57	41.39	42.8	6.3	0.174
47.16	43.41	45.21	6.32	0.176
47.2	44.78	46.08	6.34	0.175
46.18	39.19	43.37	6.24	0.179
39.16	26.77	30.11	6.2	0.177
28.63	25.74	27.07	6.11	0.181
30.68	27.12	29.24	6.11	0.181
27.54	26.02	26.88	6.11	0.182
27.38	25.85	26.78	6.11	0.182
26.68	24.64	25.37	6.13	0.181
27.94	25.14	26.46	6.11	0.183
28.7	27.47	28.2	6.13	0.182
27.92	21.87	24.1	6.14	0.183
24.51	21.34	22.99	6.13	0.184
23.73	22.13	23.03	6.11	0.184
23.93	21.25	22.67	6.11	0.183
21.45	19.68	20.53	6.09	0.184
21.44	19.8	20.61	6.07	0
27.69	20.53	23.44	6.03	0
35.69	27.69	32.02	5.96	0.188
39.92	35.69	38.09	5.99	0.185
46.58	39.29	42.3	6.05	0.184
47.27	45.04	45.91	6.2	0.176
48	46.25	47	6.35	0.172
46.99	45.62	46.2	6.35	0.173
50.68	46.6	48.47	6.32	0.175
56.46	49.96	53.77	6.32	0.177
54.68	51.91	53.25	6.39	0.176

52.17	49.64	50.8	6.37	0.178
50	47.45	48.57	6.37	0.18
48.41	44.69	47.69	6.39	0.18
50.13	47.91	48.87	6.45	0.181
51.5	48.16	50.06	6.49	0.18
51.37	44.48	47.55	6.55	0.18
46.63	44.49	45.32	6.55	0.18
45.41	41.16	43.43	6.56	0.182
44.84	34.98	40.16	6.56	0.181
35.38	34	34.73	6.53	0.183
40.43	34.12	38.66	6.51	0.184
41.22	35.49	38.67	6.47	0.182
35.45	32.74	34.15	6.45	0.183
35.26	33.62	34.56	6.41	0.182
37.24	33.58	35.71	6.37	0.186
44.16	35.26	40.62	6.28	0.188
48.49	44.16	46.11	6.35	0.183
50.23	47.41	48.95	6.47	0.178
51.13	48.76	49.78	6.72	0.17
50.81	48.8	49.71	7.01	0.159
51.07	49	50.08	7.24	0.16
51.21	49	50.16	7.4	0.168
50.62	48.39	49.59	7.44	0.176
48.73	41.36	46.12	7.5	0.186
41.34	31.27	34.27	7.64	0.182
31.77	30.17	30.96	7.64	0.187
33.58	30.29	32.27	7.6	0.188
33.15	27.5	30.63	7.54	0.19
28.24	27.08	27.68	7.42	0.189
28.31	25.23	26.8	7.32	0.188
27.16	23.79	25.32	7.2	0.188
24.19	22.34	23.39	7.09	0.186
22.81	20.18	21.08	6.97	0.187
22.13	19.53	20.88	6.89	0.187
20.04	18.04	19.11	6.8	0.185
19.98	16.93	18.04	6.72	0.185
20.11	16	16.94	6.62	0.185
16.56	14.37	15.43	6.56	0.186
22.38	14.83	17.02	6.47	0.188
31.83	22.45	29.21	6.35	0.191
34.63	31.66	33.07	6.37	0.188
38.4	34.48	36.74	6.43	0.183
40.62	37.78	39.07	6.45	0.184
41.79	38.7	39.96	6.45	0.184
41.87	40.48	41.17	6.49	0.182
43.24	41.3	42.07	6.47	0.179
43.49	42.07	42.58	6.49	0.181

42.72	34.25	38.65	6.56	0.183
34.24	26.32	28.51	6.66	0.182
31.52	26.07	27.2	6.62	0.181
32.36	29.73	31.14	6.6	0.179
30.95	26.2	28.79	6.56	0.182
26.99	25.68	26.48	6.53	0.183
30.84	23.51	25.79	6.49	0.184
26.9	23.66	25.77	6.43	0.183
28.25	23.7	25.87	6.39	0.184
26.76	24.3	25.24	6.35	0.186
27.84	21.66	25.28	6.32	0.185
21.63	19.53	20.4	6.28	0.182
22.97	20.31	21.67	6.24	0.182
20.49	18.12	19.5	6.2	0.183
20.09	17.56	18.91	6.14	0.183
23.8	18.71	20.86	6.11	0.184
37	23.77	31.83	6.01	0.187
39.64	37	38.71	6.05	0.186
41.92	39.37	40.77	6.13	0.182
42.49	40.93	41.56	6.22	0.178
45.19	41.78	43.21	6.34	0.17
48.92	44.69	46.41	6.49	0.165
48.64	46	46.74	6.47	0.17
48.84	45.61	47.25	6.37	0.177
46.99	38.13	44.7	6.35	0.18
38.06	27.97	30.95	6.43	0.18
36.31	28.3	31.27	6.41	0.181
34.56	27.92	32.37	6.39	0.181
30.64	25.27	27.96	6.37	0.181
32.77	27.93	30.61	6.35	0.183
33.45	28.56	30.55	6.34	0.182
33.18	28.94	30.92	6.3	0.184
31.36	26.57	28.61	6.28	0.184
30.6	26.89	28.58	6.24	0.183
34.19	28.85	31.02	6.2	0.182
33.18	26.75	29.6	6.18	0.182
26.71	24.94	25.8	6.16	0.182
25.21	23.66	24.64	6.13	0.182
26.76	23.31	24.41	6.09	0.186
28.67	24.58	26.97	6.05	0.183
34.93	27.38	31.42	5.94	0.187
43.43	34.72	40.1	5.97	0.187
46.26	43.35	45.09	6.09	0.181
51.18	45.91	48.35	6.32	0.175
53.37	50.35	51.7	6.6	0.164
53.95	51.95	52.97	6.91	0.159
55.14	53.25	54.13	6.93	0.167

57.07	54.09	54.74	6.95	0.176
57.51	46.81	54.21	6.89	0.183
46.78	37.64	40.19	6.97	0.179
40.93	38.64	39.81	6.97	0.183
41.16	38.19	39.59	7.01	0.187
39.72	38.35	39.17	7.03	0.186
39.36	36.5	37.9	7.01	0.187
39.41	37.52	38.26	6.97	0.186
38.5	36.9	38.04	6.93	0.187
37.38	33.65	35.24	6.89	0.185
33.61	31.47	32.61	6.85	0.185
31.85	29.62	30.81	6.8	0.187
30	28.18	29.34	6.72	0.185
31.16	29.28	29.99	6.66	0.185
31.54	29.17	30.21	6.58	0.186
29.17	27.37	28.34	6.53	0.186
32.85	27.65	29.18	6.47	0.185
41.32	32.89	36.85	6.34	0.19
45.33	41.34	43.31	6.37	0.189
48.55	45.33	47.01	6.43	0.184
51.12	48.14	49.91	6.6	0.18
51.92	50.14	51.21	6.82	0.177
51.8	50.3	50.97	7.03	0.178
53.04	50.83	51.58	7.24	0.181
51.3	48.43	49.76	7.44	0.184
48.4	42.9	45.82	7.6	0.186
44.15	34.24	37.92	7.68	0.187
45.2	35.02	40.54	7.64	0.188
57.9	40.47	43.68	7.62	0.189
59.5	45.82	52.92	7.58	0.191
58.99	41.41	46.11	7.54	0.19
57.55	40.21	49.28	7.5	0.188
56.12	49.71	54.03	7.46	0.188
54.28	49.08	51.51	7.48	0.187
56.69	46.89	52.66	7.48	0.185
57.1	36.7	43.52	7.52	0.19
44.63	35.68	41	7.48	0.186
53.93	39.49	44.73	7.42	0.191
47.49	36.14	43.12	7.36	0.188
37.2	32.08	34.14	7.3	0.19
36.36	32.31	33.96	7.18	0.188
45.91	33.24	41.61	7.01	0.193
52.18	45.38	48.93	7.01	0.19
66.73	51.63	62	7.22	0.182
68.43	66.19	67.41	7.98	0.162
69.57	66.89	68.11	8.85	0.165
68.52	65.94	67.4	9.28	0.185

67.43	65.43	66.33	9.3	0.192
66.22	63.78	65.28	9.09	0.195
63.88	57.68	60.72	8.99	0.198
57.68	55.59	56.58	8.91	0.194
56.09	53.84	55.26	8.87	0.194
54.61	53.82	54.15	8.87	0.194
54.75	53.15	54.08	8.91	0.195
57.02	54.23	55.7	8.91	0.193
57.15	55.45	56.17	8.95	0.194
55.96	54.01	54.8	8.97	0.196
54.21	52.3	53.4	8.97	0.194
52.77	51.09	51.75	8.97	0.194
52	50.49	51.03	8.93	0.193
50.87	49.92	50.5	8.91	0.193
50.51	49.26	49.97	8.87	0.193
49.62	48.76	49.18	8.85	0.192
49.82	47.59	48.72	8.78	0.193
49.13	47.24	48.19	8.74	0.195
51.53	48.96	50.38	8.62	0.197
51.82	51.02	51.43	8.68	0.195
52.19	51.43	51.77	8.76	0.195
53.78	50.81	51.94	8.85	0.195
53.4	50.99	52.03	9.05	0.19
51.84	49.12	50.5	9.22	0.188
49.47	46.47	48.12	9.26	0.193
47.26	43.43	45.61	9.24	0.195
44.44	40.28	43.2	9.28	0.196
42.7	40.01	41.53	9.26	0.195
41.81	39.38	40.26	9.17	0.195
39.81	38.89	39.43	9.09	0.196
39.51	36.92	38.63	9.01	0.194
38.99	37.5	38.48	8.91	0.193
38.87	37.05	38	8.8	0.193
37.24	35.5	36.58	8.68	0.194
35.52	34.52	34.94	8.6	0.192
35.14	34.01	34.44	8.52	0.191
35.23	31.88	34.22	8.44	0.193
31.88	31.13	31.36	8.36	0.191
32.08	31.47	31.87	8.26	0.191
31.96	31.62	31.76	8.18	0.192
32.22	31.91	32.09	8.1	0.191
31.98	31.55	31.68	8.04	0.19
31.75	31.13	31.4	7.96	0.191
31.69	31.31	31.46	7.88	0.189
33.21	31.69	32.39	7.8	0.192
35.61	33.19	34.39	7.68	0.197
36.28	35.64	36.01	7.7	0.194

39.68	35.77	37.39	7.7	0.191
40.9	38.55	39.44	7.68	0.19
41.14	38.73	40.36	7.68	0.187
41.04	36.23	38.44	7.72	0.187
36.2	33.19	34.33	7.76	0.187
34.06	32.38	33.06	7.68	0.188
33.34	31.3	31.9	7.62	0.188
32.81	30.85	32.07	7.52	0.187
31.04	30.05	30.53	7.42	0.189
30.97	29.23	30	7.3	0.19
29.87	28.25	29.09	7.22	0.186
28.42	27.03	27.92	7.13	0.189
28.46	27.56	28.11	7.03	0.186
28.15	27.45	27.77	6.95	0.188
29.16	27.77	28.28	6.87	0.187
29.12	28.15	28.63	6.8	0.187
29.43	25.25	28.38	6.72	0.185
29.42	25.69	27.39	6.64	0.186
31.8	28.67	30.33	6.56	0.185
35.54	31.83	33.42	6.43	0.191
39.34	35.52	37.47	6.45	0.188
42.45	39.22	40.21	6.49	0.185
45.93	41.33	43.49	6.56	0.179
47.13	45.39	46.04	6.74	0.172
49.35	47.09	48.32	6.95	0.165
51.5	48.99	50.32	6.95	0.168
52.09	49.09	50.07	6.82	0.178
49.27	41.43	46.63	6.78	0.181
41.38	33.74	36.54	6.85	0.18
36.22	29.27	33.33	6.83	0.184
46.49	28.94	39.89	6.82	0.186
47.04	43.53	45.71	6.82	0.185
43.53	40.11	40.76	6.83	0.185
41.49	40.14	40.81	6.82	0.184
41.84	39.47	40.88	6.82	0.186
41.74	37.58	39.45	6.8	0.185
39.17	36.09	37.65	6.8	0.185
37.47	36.11	36.67	6.76	0.185
37.69	35.74	37.05	6.74	0.184
37.14	34.4	36.01	6.72	0.186
36.18	34.14	35.22	6.7	0.183
35.4	32.46	33.31	6.66	0.184
33.15	31.36	32.06	6.62	0.186
32.55	28.1	29.96	6.58	0.185
31.88	29.15	30.99	6.51	0.189
34.04	31.71	32.86	6.49	0.19
35.39	32.75	33.67	6.55	0.184

36.14	34.45	35.06	6.6	0.183
35.65	34.09	34.86	6.66	0.182
35.87	30.69	33.95	6.68	0.182
34.53	26.96	30	6.76	0.182
27.89	26.98	27.5	6.74	0.184
27.49	26.7	27.13	6.74	0.183
27.23	25.27	26.51	6.68	0.187
26.37	25.55	25.94	6.62	0.185
25.91	24.08	24.97	6.56	0.186
25.57	24.66	25.26	6.53	0.186
25.6	24.72	25.27	6.47	0.185
25.14	24.58	24.85	6.41	0.186
24.93	24.28	24.61	6.37	0.187
24.83	24.26	24.54	6.32	0.184
24.35	22.93	23.66	6.26	0.185
23.98	22.63	23.45	6.22	0.185
23.59	22.74	23.16	6.18	0.185
23.62	22.47	23.07	6.14	0.184
22.93	20.84	22.03	6.11	0.184
23.02	22.27	22.58	6.05	0.186
23.84	22.63	23.25	5.92	0
26.34	23.86	25.1	5.96	0.186
28.84	25.93	27.55	5.96	0.183
30.14	28.34	29.02	5.99	0.181
30.97	29.33	30.17	6.01	0.18
32.18	29.88	30.82	6.05	0.179
31.96	30.33	31.1	6.03	0.179
30.81	29.11	30.01	5.99	0.18
29.29	26.63	28.24	5.92	0.183
26.97	26.42	26.7	5.96	0.179
27.2	26.37	26.75	5.88	0.18
27.13	26.21	26.68	5.86	0
26.47	25.5	25.97	5.84	0
25.99	24.65	25.34	5.82	0.181
25.32	24.44	24.94	5.79	0
24.9	24.03	24.56	5.79	0
24.9	23.8	24.22	5.75	0
23.96	22.84	23.29	5.73	0
23.48	20.39	22.5	5.69	0
22.72	19.66	21.41	5.67	0
21.61	20.33	21	5.64	0
21.52	19.87	20.68	5.62	0
20.02	16.95	18.25	5.58	0
18.98	16.47	17.28	5.52	0
25.65	18.91	22.18	5.41	0
29.01	25.65	27.51	5.45	0
31.2	28.36	29.61	5.49	0

32.45	30.58	31.52	5.54	0
34.87	32.13	33.41	5.62	0.176
36.82	34.7	35.92	5.71	0.17
37.63	36.06	36.79	5.73	0.174
36.63	32.85	34.85	5.64	0.178
32.87	28.39	30.78	5.52	0
28.36	26.08	27.15	5.54	0
29.94	26.28	28.32	5.47	0
29.4	25.98	27.65	5.47	0
29.74	28.81	29.39	5.47	0
29.25	26.5	27.84	5.47	0
27.17	25.46	26.37	5.47	0
26.93	25.28	26.23	5.45	0
26.72	25.18	25.89	5.45	0
28.18	24.37	26.43	5.43	0
26.63	22.61	24.27	5.41	0
27.3	24.77	25.68	5.37	0
26.13	24.9	25.44	5.36	0
25.9	24.23	25.09	5.34	0
25.65	24.74	25.23	5.32	0
25.79	23.22	24.65	5.28	0
29.26	25.42	27.53	5.19	0
33.65	28.86	31.79	5.21	0
33.66	29.83	31.65	5.26	0
37.05	32.14	34.46	5.36	0
38.14	35.92	36.87	5.45	0
39.48	37.14	38.44	5.56	0.172
40.05	38.3	39.17	5.56	0.172
39.98	38.14	39.08	5.49	0
38.44	32.16	36.36	5.39	0
32.14	21.42	25.08	5.41	0
23.3	21.29	21.91	5.32	0
23.13	21.16	22.14	5.3	0
21.59	20.58	21.1	5.3	0
24.33	21.2	22.32	5.3	0
27.04	20.44	23.65	5.3	0
26.06	22.45	24.1	5.32	0
23.84	20.91	22.46	5.32	0
23.82	20.63	21.92	5.3	0
20.92	19.36	20.25	5.28	0
20.62	18.56	19.61	5.26	0
20.07	17.43	19.26	5.23	0
18.36	16.71	17.32	5.21	0
17.36	15.57	16.12	5.17	0
17.8	14.87	15.95	5.13	0
27.55	17.84	23.99	5	0
31.28	27.29	29.12	5.06	0

33.89	31.13	32.59	5.11	0
38.13	33.48	35.49	5.21	0
40.85	37.12	38.75	5.32	0
43.18	39.75	41.24	5.47	0
44.47	42.42	43.33	5.5	0
44.37	42.26	43.32	5.43	0
42.38	35.53	40.17	5.32	0
35.49	22.79	28.03	5.3	0
23.09	21.25	22.21	5.21	0
22.09	20.54	21.26	5.17	0
21.66	20.29	20.97	5.17	0
21.66	19.97	21.12	5.17	0
22.16	19.89	20.81	5.19	0
21.12	19.75	20.36	5.19	0
21.92	20.51	20.98	5.19	0
21.88	20.42	21.1	5.19	0
20.69	19.57	20.17	5.19	0
20.54	19.45	20.01	5.17	0
20.47	19.25	19.98	5.13	0
20.45	19.04	19.67	5.11	0
19.51	17.55	18.54	5.08	0
19.56	17.32	18.45	5.06	0
27.94	19.58	24	4.95	0
32.75	27.97	30.97	4.91	0
34.66	32.16	32.89	4.97	0
36.57	34.52	35.86	5.04	0
38.42	36.06	36.87	5.17	0
39.43	37.56	38.57	5.26	0
43.38	38.31	39.84	5.24	0
44.06	42.45	43.35	5.26	0
43.11	30.35	39.67	5.24	0
33.2	26.21	28.61	5.21	0
32.34	27.05	29.65	5.11	0
31.52	26.4	29.32	5.11	0
35.82	26.78	32.05	5.11	0
40.91	29.74	33.27	5.11	0
43.36	34.69	37.91	5.13	0
36.6	32.6	34.81	5.15	0
43.82	33.03	39.03	5.17	0
44.17	38.3	41.17	5.19	0
42.26	39.76	41.02	5.19	0
40.63	38.35	39.46	5.19	0
39.53	35.23	37.11	5.21	0
37.56	33.19	35.83	5.19	0
34.71	30.13	32.44	5.19	0
33.72	28.82	30.92	5.17	0
35.91	33.27	34.79	5.1	0

39.62	35.87	37.51	5.13	0
40.48	39.02	39.73	5.24	0
41.21	39.26	40.05	5.36	0
43.03	40.2	41.5	5.45	0
43.27	41.13	42.37	5.6	0
42.54	40.33	41.6	5.58	0
41.15	38.78	39.59	5.43	0
39.72	36.45	38.48	5.34	0
36.45	35.24	35.75	5.32	0
36.65	35.24	35.88	5.26	0
36.91	35.01	35.96	5.28	0
34.99	33.4	34.3	5.28	0
34.86	30.81	32.67	5.26	0
30.8	25.25	28.29	5.24	0
27.13	24.01	25.13	5.23	0
32.47	24.47	27.63	5.21	0
32.47	29.9	31.16	5.21	0
31.91	27.58	29.21	5.23	0
27.58	26.26	26.78	5.23	0
26.47	25.24	25.76	5.23	0
27.21	25.49	26.1	5.21	0
30.4	26.83	27.91	5.21	0
37.7	27.31	32.69	5.21	0
38.19	30.96	33.58	5.08	0
39.01	32.83	36.67	5.19	0
42.01	38.79	40.13	5.26	0
45.02	41.04	43.11	5.37	0
45.42	43.2	44.44	5.49	0
49.65	44.8	47.62	5.58	0.173
50.71	48.48	49.3	5.8	0.167
49.87	48.4	48.95	5.69	0
48.38	37.68	44.11	5.6	0
42.57	35.2	38.78	5.52	0
42.91	39.29	41.35	5.52	0
42.45	39.43	40.72	5.54	0
42.2	39.59	40.92	5.52	0
41.89	38.58	40.5	5.54	0
39.95	38.83	39.44	5.54	0
40.05	38.92	39.38	5.54	0
41.24	39.43	40.16	5.54	0
41.46	38.64	39.58	5.54	0
41.98	38.88	40.75	5.54	0
40.57	39.39	39.89	5.54	0
40.23	39.25	39.73	5.56	0
41.56	37.36	39.17	5.56	0
37.6	36.17	36.92	5.58	0
40.52	36.43	37.99	5.58	0

40.46	37.92	38.76	5.56	0
45.18	39.41	41.68	5.52	0
47.31	43.58	45.8	5.62	0
48.27	45.48	47.04	5.9	0.175
48.31	43.89	46.38	6.26	0.174
49.8	45.81	47.07	6.41	0.176
46.7	45.43	46.01	6.45	0.179
46.49	45.04	45.68	6.47	0.184
45.03	43.72	44.42	6.6	0.185
43.92	43.02	43.32	6.66	0.182
43.16	42.6	42.83	6.66	0.183
42.98	42.09	42.61	6.7	0.183
43.16	42.38	42.82	6.7	0.186
43.32	42.58	42.88	6.7	0.186
43.23	42	42.75	6.72	0.186
43.21	42.32	42.85	6.7	0.187
42.94	41.3	42.07	6.68	0.187
42.83	41.37	42.4	6.68	0.185
43.15	41.07	42.05	6.68	0.187
42	39.94	41.17	6.66	0.186
41.01	38.76	40.12	6.64	0.184
41.59	38.93	40.92	6.6	0.187
40.76	34.04	39.13	6.56	0.186
34.1	29.15	31.27	6.51	0.186
43.47	34.16	38.88	6.3	0
47.36	41.46	44.93	6.35	0.19
49.14	46.53	47.94	6.51	0.182
51.06	46.59	49.08	6.93	0.175
49.62	45.53	46.76	7.13	0.18
46.13	44.32	45.49	6.95	0.186
47.48	45.44	45.97	7.03	0.188
46.61	45.57	45.9	7.11	0.19
46.37	43.7	45.23	7.15	0.19
43.77	42.74	43.28	7.24	0.187
42.83	40.47	41.54	7.2	0.188
40.54	37.74	39.04	7.15	0.189
37.71	31.87	33.71	7.09	0.189
34.11	31.75	32.85	6.97	0.191
33.77	30.81	32.52	6.87	0.189
32.09	30.09	31.17	6.78	0.188
31.09	27.07	29.95	6.66	0.188
27.04	20.89	23.11	6.56	0.186
21.25	19.34	20.41	6.43	0.186
25.88	21.23	24.09	6.32	0
26.48	20.21	22.77	6.24	0
24.79	21.55	23.36	6.14	0
25.14	22.45	23.84	6.07	0

26.41	19.71	22.8	5.97	0
30.85	26.39	28.95	5.8	0
33.42	30.72	31.48	5.8	0
35.54	33.13	33.92	5.8	0
40.37	34.66	36.45	5.84	0
50.88	38.65	46.15	5.92	0
50.56	47.92	48.96	6.49	0.172
49.44	47.91	48.58	6.7	0.177
49.35	46.47	47.72	6.64	0.185
46.63	42.99	44.69	6.56	0.189
43.18	41.02	42.14	6.62	0.183
41.57	40.14	40.85	6.62	0.183
41.25	39.42	40.42	6.6	0.186
41.26	39.03	40.32	6.58	0.186
40.27	37.19	38.96	6.55	0.186
40.34	38.34	39.4	6.47	0.187
40.71	39.72	40.14	6.43	0.186
40.32	37.95	39.46	6.39	0.185
38.83	37.3	38.22	6.34	0.185
39.15	38.03	38.81	6.28	0.185
38.96	37.2	38.26	6.28	0
37.51	36	36.88	6.26	0.184
36.52	34.83	35.74	6.22	0.185
35.72	25	29.2	6.18	0
29.64	28.22	29.21	6.13	0
29.41	27.4	28.71	6.03	0
29.96	28.22	29.06	5.86	0
32.22	29.8	30.74	5.9	0
32.48	28.86	30.32	5.94	0
33.23	29.57	31.97	5.94	0
32.49	29.57	30.58	5.96	0
33.13	29.53	31.28	5.9	0
33.53	30.19	31.85	5.9	0
31.78	28.53	30.04	5.88	0
28.62	25.66	27.27	5.92	0
25.83	21.73	24.36	5.82	0
23.89	21.66	22.85	5.75	0
24.46	21.9	23.08	5.69	0
22.31	21.2	21.69	5.65	0
21.69	20.31	20.99	5.58	0
21	19.96	20.53	5.54	0
20.89	18.15	19.64	5.49	0
18.36	16.73	17.71	5.45	0
17.71	15.85	16.84	5.39	0
19.46	17.65	18.78	5.36	0
20.74	19.22	19.86	5.32	0
20.36	17.86	19.3	5.3	0

20.59	17.88	19.73	5.24	0
19.96	18.41	19.12	5.21	0
23.69	18.89	20.98	5.13	0
25.57	23.57	24.49	5.08	0
26.51	25.07	25.78	5.11	0
28.22	26.07	27.14	5.13	0
29.76	27.24	28.22	5.13	0
30.13	27.84	29.05	5.15	0
30.46	28.42	29.25	5.13	0
29.67	26.63	28.01	5.1	0
27.47	24.91	25.92	5.06	0
25.04	23.09	24.22	5.1	0
23.2	21.11	22.21	5.04	0
21.7	18.92	20.11	5.02	0
20.89	18.53	20.05	5	0
20.71	19.47	20.23	4.99	0
20.29	19.18	19.76	4.97	0
20.6	16.95	19.41	4.93	0
17.06	11.07	13.57	4.91	0
18.63	13.39	16.62	4.86	0
16.61	12.21	14.65	4.82	0
12.88	9.28	10.9	4.8	0
12.85	10.1	11.71	4.75	0
11.56	9.13	10.07	4.69	0
11.33	8.81	10.11	4.64	0
12.6	8.53	10.22	4.58	0
24.37	12.38	17.55	4.4	0
25.97	23.39	24.83	4.47	0
27.92	25.74	26.74	4.49	0
29.8	27.15	28.4	4.55	0
32.01	28.77	30.41	4.62	0
34.29	31.33	32.58	4.73	0
34.38	33.04	33.77	4.77	0
34.93	33.16	33.87	4.73	0
33.54	28.57	31.88	4.66	0
28.52	16.44	21.57	4.66	0
17.09	15.61	16.08	4.6	0
18.2	15.62	16.79	4.56	0
16.67	14.68	15.7	4.58	0
16.38	14.31	15.5	4.55	0
18.35	14.04	16.14	4.53	0
18.5	14.92	16.21	4.51	0
20.78	16.5	17.55	4.47	0
20.71	18.47	19.11	4.45	0
19.22	13.72	16.16	4.44	0
16.45	14.07	15.25	4.4	0
17.6	15.62	16.53	4.36	0

19.51	15.36	17.15	4.35	0
18.71	15.28	17.39	4.33	0
15.45	11.83	13.4	4.29	0
27.18	14.12	21.41	4.2	0
28.28	26.63	27.22	4.2	0
30.25	27.65	28.82	4.27	0
34.92	30.18	32.62	4.36	0
37.94	34.61	36.09	4.51	0
40.23	37.27	38.8	4.67	0
40.23	38.29	39.2	4.71	0
39.2	37.09	38.38	4.67	0
38.63	34.63	37.21	4.56	0
34.58	26.52	31.36	4.56	0
32.71	27.68	30.56	4.49	0
30.7	27.19	28.76	4.49	0
29.71	26.76	28.17	4.49	0
28.67	26.48	27.48	4.49	0
28.08	22.38	25.33	4.49	0
24.79	15.95	17.87	4.49	0
25.87	18.99	22.29	4.47	0
28.36	25.67	27.14	4.47	0
28.61	27.9	28.13	4.47	0
27.97	26.09	27.13	4.47	0
26.09	22.33	24.29	4.47	0
25.07	21.15	23.23	4.45	0
25.05	21.96	23.88	4.44	0
21.96	14.45	17.72	4.44	0
26.37	15.27	21.19	4.35	0
31.67	26.41	29.42	4.35	0
33.73	31.1	32.44	4.44	0
37.12	33.27	34.6	4.55	0
38.8	36	36.86	4.71	0
38.97	36.06	37.34	4.86	0
40.51	37.52	38.78	4.75	0
40.04	36.6	38.37	4.71	0
39.04	33.94	36.06	4.66	0
33.93	28.1	31.81	4.6	0
28.15	21.35	23.68	4.55	0
26.19	19.68	22.3	4.51	0
25.93	24.23	25.17	4.49	0
25.6	21.92	23.23	4.49	0
29.41	21.67	25.17	4.51	0
29.47	28.12	29.02	4.49	0
28.84	24.42	26.62	4.49	0
27.84	25.27	26.7	4.47	0
27.73	19.24	25.9	4.45	0
27.96	17.84	22.19	4.42	0

27.54	20.36	23.94	4.38	0
27.91	26.65	27.2	4.36	0
27.8	26.41	27.07	4.35	0
27.59	24.65	26.62	4.29	0
27.31	22.15	25.13	4.13	0
30.69	26.46	28.67	4.2	0
35.42	30.72	33.01	4.26	0
37.93	34.45	36.15	4.38	0
40.11	36.62	38.33	4.55	0
42.32	38.86	40.29	4.77	0
43.01	40.53	41.58	4.77	0
44.61	39.58	41.61	4.69	0
40.04	34.04	37.69	4.53	0
33.99	26.43	28.5	4.51	0
27.17	21.36	24.4	4.44	0
21.98	19.47	20.92	4.42	0
23.87	20.33	21.7	4.4	0
23.49	18.1	21.1	4.4	0
24.74	17.08	21.01	4.4	0
28.27	21.21	24.72	4.38	0
30.21	24.67	28.34	4.36	0
28.64	25.23	26.45	4.35	0
26.53	23.85	25.51	4.33	0
25.79	17.99	21.61	4.29	0
21.5	16.78	19.72	4.26	0
18.19	12.62	14.96	4.22	0
15.05	10.98	13.22	4.17	0
14.66	12.15	12.93	4.09	0
28.07	14.47	21.1	3.93	0
28.69	27.49	28.12	4	0
30.92	28.18	29.53	4.02	0
32.76	29.99	31.35	4.06	0
34.74	31.76	33.36	4.18	0
36.45	33.59	35.06	4.31	0
38.11	35.51	37.05	4.38	0
38.62	36.29	37.08	4.4	0
36.49	32.46	35.18	4.33	0
32.42	26.49	28.2	4.35	0
27.37	25.8	26.79	4.29	0
25.77	23.77	24.67	4.29	0
24.47	22.27	23.42	4.27	0
22.61	20.32	21.21	4.27	0
20.32	14.92	17.94	4.24	0
20.28	17.91	19.54	4.2	0

Soil Temp	Soil Water	Soil Temp	Soil Water
20 in	20 in	40 in	40 in
deg C	wfv	deg C	wfv
7.6	0	10.7	0
7.58	0	10.7	0
7.58	0	10.7	0
7.58	0	10.68	0
7.56	0	10.68	0
7.56	0	10.66	0
7.54	0	10.66	0
7.54	0	10.63	0
7.5	0	10.63	0
7.48	0	10.59	0
7.4	0	10.5	0
7.44	0	10.55	0
7.46	0	10.59	0
7.5	0	10.61	0
7.5	0	10.61	0
7.5	0	10.63	0
7.5	0	10.63	0
7.52	0	10.63	0
7.5	0	10.61	0
7.48	0	10.59	0
7.46	0	10.57	0
7.42	0	10.55	0
7.42	0	10.53	0
7.4	0	10.53	0
7.38	0	10.5	0
7.38	0	10.5	0
7.38	0	10.5	0
7.36	0	10.5	0
7.36	0	10.48	0
7.36	0	10.48	0
7.36	0	10.46	0
7.34	0	10.46	0
7.34	0	10.44	0
7.3	0	10.42	0
7.24	0	10.33	0
7.28	0	10.38	0
7.32	0	10.42	0
7.36	0	10.46	0
7.4	0	10.5	0
7.4	0	10.5	0
7.4	0	10.5	0
7.34	0	10.44	0
7.32	0	10.44	0

7.26	0	10.35	0
7.24	0	10.33	0
7.22	0	10.31	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.27	0
7.2	0	10.27	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.29	0
7.2	0	10.27	0
7.07	0	10.12	0
7.17	0	10.23	0
7.18	0	10.25	0
7.2	0	10.27	0
7.22	0	10.29	0
7.24	0	10.31	0
7.26	0	10.33	0
7.28	0	10.33	0
7.26	0	10.31	0
7.26	0	10.33	0
7.24	0	10.29	0
7.2	0	10.27	0
7.2	0	10.27	0
7.18	0	10.25	0
7.17	0	10.23	0
7.15	0	10.2	0
7.13	0	10.16	0
7.11	0	10.16	0
7.09	0	10.12	0
7.07	0	10.1	0
7.05	0	10.08	0
7.05	0	10.08	0
7.03	0	10.06	0
7.01	0	10.03	0
6.87	0	9.89	0
6.97	0	9.99	0
7.03	0	10.06	0
7.09	0	10.12	0
7.11	0	10.14	0
7.15	0	10.16	0
7.17	0	10.2	0
7.15	0	10.16	0
7.11	0	10.12	0

7.11	0	10.14	0
7.07	0	10.08	0
7.03	0	10.06	0
7.01	0	10.01	0
6.99	0	10.01	0
6.99	0	9.99	0
6.99	0	9.99	0
6.97	0	9.97	0
6.93	0	9.95	0
6.93	0	9.93	0
6.93	0	9.95	0
6.93	0	9.93	0
6.93	0	9.93	0
6.91	0	9.91	0
6.89	0	9.89	0
6.78	0	9.76	0
6.87	0	9.86	0
6.93	0	9.93	0
7.03	0	10.03	0
7.09	0	10.1	0
7.15	0	10.16	0
7.15	0	10.16	0
7.11	0	10.12	0
7.03	0	10.03	0
6.99	0	9.99	0
6.93	0	9.93	0
6.91	0	9.91	0
6.89	0	9.89	0
6.87	0	9.86	0
6.85	0	9.84	0
6.85	0	9.82	0
6.83	0	9.82	0
6.83	0	9.8	0
6.82	0	9.8	0
6.82	0	9.8	0
6.8	0	9.78	0
6.8	0	9.8	0
6.8	0	9.78	0
6.8	0	9.78	0
6.66	0	9.63	0
6.76	0	9.74	0
6.87	0	9.84	0
7.01	0	10.01	0
7.07	0	10.08	0
7.26	0	10.29	0
7.38	0	10.42	0
7.26	0	10.29	0

7.05	0	10.06	0
6.91	0	9.91	0
6.83	0	9.82	0
6.8	0	9.78	0
6.78	0	9.76	0
6.76	0	9.74	0
6.76	0	9.74	0
6.74	0	9.72	0
6.74	0	9.72	0
6.74	0	9.72	0
6.72	0	9.7	0
6.72	0	9.7	0
6.7	0	9.68	0
6.7	0	9.68	0
6.7	0	9.68	0
6.68	0	9.65	0
6.56	0	9.53	0
6.7	0	9.65	0
6.82	0	9.8	0
6.97	0	9.95	0
7.07	0	10.08	0
7.18	0	10.18	0
7.17	0	10.18	0
7.11	0	10.1	0
6.97	0	9.95	0
6.82	0	9.8	0
6.72	0	9.7	0
6.68	0	9.65	0
6.68	0	9.63	0
6.66	0	9.61	0
6.64	0	9.61	0
6.64	0	9.59	0
6.62	0	9.59	0
6.62	0	9.57	0
6.62	0	9.57	0
6.62	0	9.57	0
6.6	0	9.55	0
6.6	0	9.55	0
6.6	0	9.55	0
6.58	0	9.53	0
6.47	0	9.4	0
6.58	0	9.51	0
6.72	0	9.65	0
6.91	0	9.86	0
7.09	0	10.06	0
7.24	0	10.23	0
7.26	0	10.25	0

7.18	0	10.16	0
6.97	0	9.93	0
6.8	0	9.72	0
6.66	0	9.59	0
6.62	0	9.53	0
6.6	0	9.53	0
6.58	0	9.51	0
6.58	0	9.49	0
6.58	0	9.49	0
6.56	0	9.47	0
6.56	0	9.47	0
6.56	0	9.47	0
6.55	0	9.44	0
6.55	0	9.42	0
6.55	0	9.42	0
6.53	0	9.42	0
6.53	0	9.4	0
6.41	0	9.28	0
6.53	0	9.4	0
6.66	0	9.55	0
6.83	0	9.76	0
7.01	0	9.93	0
7.18	0	10.12	0
7.26	0	10.2	0
7.15	0	10.08	0
6.97	0	9.86	0
6.78	0	9.65	0
6.62	0	9.49	0
6.56	0	9.42	0
6.55	0	9.4	0
6.55	0	9.38	0
6.55	0	9.38	0
6.55	0	9.38	0
6.53	0	9.36	0
6.53	0	9.36	0
6.51	0	9.36	0
6.51	0	9.34	0
6.51	0	9.34	0
6.51	0	9.34	0
6.53	0	9.36	0
6.55	0	9.36	0
6.55	0	9.36	0
6.55	0	9.34	0
6.56	0	9.36	0
6.64	0	9.44	0
6.76	0	9.57	0
6.89	0	9.72	0

6.85	0	9.68	0
6.8	0	9.61	0
6.89	0	9.72	0
6.83	0	9.65	0
6.74	0	9.55	0
6.7	0	9.49	0
6.68	0	9.47	0
6.64	0	9.44	0
6.64	0	9.42	0
6.64	0	9.42	0
6.64	0	9.42	0
6.62	0	9.38	0
6.58	0	9.36	0
6.58	0	9.34	0
6.56	0	9.32	0
6.56	0	9.32	0
6.58	0	9.36	0
6.6	0	9.36	0
6.56	0	9.3	0
6.6	0	9.34	0
6.76	0	9.51	0
7.05	0	9.82	0
7.32	0	10.14	0
7.17	0	9.93	0
6.99	0	9.74	0
6.82	0	9.57	0
6.89	0	9.63	0
6.91	0	9.63	0
6.82	0	9.53	0
6.78	0	9.49	0
6.76	0	9.49	0
6.76	0	9.47	0
6.76	0	9.47	0
6.76	0	9.47	0
6.76	0	9.44	0
6.7	0	9.38	0
6.7	0	9.38	0
6.66	0	9.32	0
6.66	0	9.3	0
6.7	0	9.34	0
6.74	0	9.36	0
6.78	0	9.38	0
6.78	0	9.38	0
6.8	0	9.38	0
6.91	0	9.49	0
7.11	0	9.72	0
7.34	0	9.95	0

7.6	0	10.2	0
7.46	0	10.06	0
7.58	0	10.16	0
7.42	0	9.95	0
7.2	0	9.72	0
7.07	0	9.57	0
7.03	0	9.51	0
7.01	0	9.49	0
6.95	0	9.4	0
7.03	0	9.47	0
7.03	0	9.47	0
7.05	0	9.47	0
7.07	0	9.47	0
7.07	0	9.44	0
7.07	0	9.4	0
7.07	0	9.4	0
7.03	0	9.34	0
7.03	0	9.32	0
7.05	0	9.32	0
7.01	0	9.26	0
6.91	0	9.13	0
7.07	0	9.28	0
7.56	0	9.8	0
8.04	0	10.29	0
8.28	0	10.53	0
7.58	0	9.76	0
7.54	0	9.7	0
7.6	0	9.74	0
7.34	0	9.47	0
7.22	0	9.32	0
7.17	0	9.26	0
7.13	0	9.2	0
7.15	0	9.22	0
7.22	0	9.28	0
7.26	0	9.3	0
7.26	0	9.3	0
7.28	0	9.3	0
7.32	0	9.32	0
7.32	0	9.3	0
7.28	0	9.26	0
7.28	0	9.26	0
7.3	0	9.26	0
7.32	0	9.26	0
7.32	0	9.26	0
7.32	0	9.24	0
7.34	0	9.26	0
7.4	0	9.3	0

7.58	0	9.49	0
7.72	0	9.61	0
7.8	0	9.72	0
7.88	0	9.78	0
7.84	0	9.72	0
7.8	0	9.7	0
7.46	0	9.32	0
7.36	0	9.22	0
7.32	0	9.17	0
7.32	0	9.17	0
7.32	0	9.17	0
7.3	0	9.15	0
7.3	0	9.13	0
7.3	0	9.13	0
7.28	0	9.11	0
7.26	0	9.09	0
7.28	0	9.09	0
7.28	0	9.11	0
7.26	0	9.09	0
7.24	0	9.05	0
7.15	0	8.95	0
7.38	0	9.22	0
7.72	0	9.57	0
8.3	0	10.18	0
8.56	0	10.44	0
8.4	0	10.29	0
8.42	0	10.31	0
8.3	0	10.18	0
7.98	0	9.86	0
7.62	0	9.47	0
7.36	0	9.2	0
7.26	0	9.11	0
7.24	0	9.09	0
7.24	0	9.09	0
7.24	0	9.09	0
7.22	0	9.07	0
7.22	0	9.07	0
7.2	0	9.07	0
7.2	0	9.05	0
7.2	0	9.05	0
7.2	0	9.05	0
7.18	0	9.05	0
7.2	0	9.05	0
7.18	0	9.05	0
7.09	0	8.95	0
7.22	0	9.09	0
7.4	0	9.28	0

7.68	0	9.57	0
7.96	0	9.86	0
8.32	0	10.27	0
8.56	0	10.53	0
8.46	0	10.44	0
7.92	0	9.84	0
7.72	0	9.65	0
7.42	0	9.32	0
7.32	0	9.22	0
7.3	0	9.22	0
7.34	0	9.26	0
7.44	0	9.36	0
7.32	0	9.26	0
7.24	0	9.17	0
7.26	0	9.17	0
7.34	0	9.28	0
7.42	0	9.36	0
7.4	0	9.34	0
7.3	0	9.24	0
7.24	0	9.17	0
7.22	0	9.15	0
7.2	0	9.13	0
7.26	0	9.2	0
7.64	0	9.61	0
8.2	0	10.2	0
8.68	0	10.72	0
9.07	0	11.13	0
9.26	0	11.33	0
8.97	0	11.03	0
8.54	0	10.57	0
7.9	0	9.89	0
7.5	0	9.47	0
7.38	0	9.34	0
7.34	0	9.32	0
7.3	0	9.26	0
7.26	0	9.22	0
7.24	0	9.22	0
7.24	0	9.22	0
7.24	0	9.22	0
7.24	0	9.2	0
7.24	0	9.2	0
7.24	0	9.17	0
7.24	0	9.17	0
7.24	0	9.17	0
7.18	0	9.09	0
7.3	0	9.22	0

7.6	0	9.53	0
8.08	0	10.06	0
8.44	0	10.44	0
8.95	0	10.96	0
9.4	0	11.44	0
9.03	0	11.07	0
8.58	0	10.57	0
8.08	0	10.03	0
7.56	0	9.49	0
7.4	0	9.3	0
7.34	0	9.26	0
7.36	0	9.26	0
7.34	0	9.26	0
7.34	0	9.24	0
7.34	0	9.24	0
7.34	0	9.24	0
7.32	0	9.22	0
7.32	0	9.2	0
7.32	0	9.2	0
7.32	0	9.2	0
7.32	0	9.17	0
7.32	0	9.17	0
7.22	0	9.07	0
7.42	0	9.28	0
7.72	0	9.59	0
8.16	0	10.06	0
8.97	0	10.92	0
9.63	0	11.62	0
9.99	0	12	0
9.53	0	11.51	0
8.62	0	10.55	0
8.1	0	9.99	0
7.72	0	9.57	0
7.54	0	9.38	0
7.58	0	9.44	0
7.64	0	9.49	0
7.62	0	9.47	0
7.48	0	9.32	0
7.42	0	9.26	0
7.42	0	9.24	0
7.44	0	9.26	0
7.44	0	9.26	0
7.42	0	9.24	0
7.42	0	9.24	0
7.42	0	9.22	0
7.4	0	9.2	0
7.32	0	9.11	0

7.54	0	9.32	0
7.9	0	9.72	0
8.42	0	10.25	0
8.56	0	10.4	0
8.72	0	10.57	0
9.01	0	10.87	0
8.87	0	10.72	0
8.42	0	10.25	0
8.12	0	9.91	0
7.84	0	9.61	0
7.74	0	9.51	0
7.74	0	9.53	0
7.72	0	9.49	0
7.68	0	9.44	0
7.62	0	9.38	0
7.54	0	9.32	0
7.56	0	9.32	0
7.6	0	9.36	0
7.64	0	9.38	0
7.66	0	9.4	0
7.66	0	9.42	0
7.68	0	9.42	0
7.7	0	9.44	0
7.68	0	9.42	0
7.7	0	9.44	0
7.7	0	9.44	0
7.64	0	9.36	0
7.96	0	9.7	0
8.38	0	10.12	0
8.56	0	10.35	0
8.76	0	10.53	0
8.46	0	10.23	0
8.06	0	9.8	0
7.7	0	9.42	0
7.56	0	9.26	0
7.52	0	9.24	0
7.52	0	9.22	0
7.52	0	9.22	0
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7.48	0	9.15	0
7.48	0	9.15	0
7.48	0	9.15	0

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7.48	0	9.15	0
7.62	0	9.3	0
7.8	0	9.49	0
7.96	0	9.68	0
8.12	0	9.84	0
8.18	0	9.91	0
8.16	0	9.89	0
7.98	0	9.7	0
7.8	0	9.51	0
7.6	0	9.32	0
7.52	0	9.24	0
7.5	0	9.22	0
7.48	0	9.2	0
7.46	0	9.2	0
7.46	0	9.2	0
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7.46	0	9.22	0
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7.24	0	9.22	0
7.22	0	9.22	0
7.22	0	9.22	0
7.22	0	9.22	0

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7.22	0	9.24	0
7.48	0	9.51	0
7.76	0	9.82	0
8.02	0	10.12	0
8.42	0	10.55	0
8.66	0	10.83	0
8.58	0	10.74	0
8.18	0	10.31	0
7.68	0	9.78	0
7.32	0	9.4	0
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7.01	0	9.22	0
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6.99	0	9.2	0
6.97	0	9.17	0

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6.87	0	9.07	0
6.97	0	9.15	0
7.13	0	9.34	0
7.4	0	9.63	0
7.62	0	9.86	0
7.86	0	10.12	0
8.28	0	10.57	0
8.42	0	10.72	0
8.08	0	10.35	0
7.54	0	9.78	0
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7.03	0	9.22	0
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7.05	0	9.22	0
7.36	0	9.55	0
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8.82	0	11.11	0
9.26	0	11.58	0
9.91	0	12.27	0
9.63	0	11.98	0
9.47	0	11.78	0
8.42	0	10.66	0
7.5	0	9.68	0
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7.07	0	9.13	0
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7.09	0	9.11	0

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7.13	0	9.09	0
7.07	0	9.03	0
7.18	0	9.13	0
7.5	0	9.44	0
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9.38	0	11.42	0
9.59	0	11.64	0
9.38	0	11.38	0
8.66	0	10.61	0
8	0	9.91	0
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7.92	0	9.61	0
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7.8	0	9.38	0
7.8	0	9.38	0
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7.8	0	9.36	0
7.82	0	9.36	0
7.84	0	9.38	0
7.88	0	9.4	0

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7.86	0	9.34	0
7.84	0	9.34	0
7.86	0	9.32	0
7.88	0	9.34	0
7.9	0	9.36	0
7.94	0	9.38	0
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8.06	0	9.49	0
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8.62	0	9.95	0
8.68	0	9.99	0
8.91	0	10.23	0
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9.38	0	10.7	0
8.72	0	10.01	0
8.62	0	9.93	0
8.42	0	9.7	0
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8.06	0	9.32	0
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8.04	0	9.28	0
8.04	0	9.28	0
8.02	0	9.26	0
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8.04	0	9.24	0
8.04	0	9.22	0
8.04	0	9.22	0
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9.8	0	11.03	0
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11.69	0	12.99	0
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11.6	0	12.92	0
10.16	0	11.42	0
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8.42	0	9.61	0

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8.42	0	9.61	0
8.38	0	9.55	0
8.34	0	9.51	0
8.76	0	9.95	0
9.76	0	10.96	0
11.09	0	12.37	0
12	0	13.34	0
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13.65	0	15.03	0
13.01	0	14.39	0
12.12	0	13.43	0
10.4	0	11.67	0
9.26	0	10.46	0
8.89	0	10.08	0
8.82	0	10.01	0
8.8	0	9.99	0
8.76	0	9.95	0
8.64	0	9.82	0
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11.36	0	12.57	0
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13.88	0	15.18	0
14.39	0	15.74	0
14	0	15.31	0
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10.81	0	11.96	0
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8.72	0	9.78	0
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9.22	0	10.18	0
10.16	0	11.16	0
10.92	0	11.91	0
11.42	0	12.46	0
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9.95	0	10.87	0
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12.69	0	13.72	0
11.4	0	12.39	0
10.25	0	11.18	0
9.38	0	10.29	0
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8.97	0	9.89	0
8.99	0	9.91	0
9.01	0	9.93	0

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8.93	0	9.82	0
8.91	0	9.8	0
8.91	0	9.8	0
8.93	0	9.82	0
8.91	0	9.8	0
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9.42	0	10.12	0
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9.38	0	10.06	0

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9.51	0	10.14	0
9.53	0	10.14	0
9.57	0	10.16	0
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9.95	0	10.4	0
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9.95	0	10.23	0
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9.93	0	10.2	0
9.95	0	10.18	0
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9.95	0	10.18	0
9.95	0	10.18	0
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10.08	0	10.55	0
10.08	0	10.57	0
10.08	0	10.57	0
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11.96	0	12.55	0
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10.35	0	10.92	0

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10.4	0	10.94	0
10.38	0	10.92	0
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12.41	0	12.94	0
12.55	0	13.08	0
12.32	0	12.87	0
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11.58	0	11.93	0
11.67	0	12.03	0
11.51	0	11.87	0
11.24	0	11.6	0
10.98	0	11.33	0
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10.83	0	10.81	0
10.94	0	10.92	0
11.16	0	11.11	0
11.47	0	11.42	0
11.98	0	11.96	0
12.66	0	12.62	0
13.08	0.161	13.03	0
13.22	0.167	13.15	0
13.06	0.171	13.01	0
12.59	0	12.55	0
12.07	0	12.03	0
11.69	0	11.64	0
11.31	0	11.27	0
11.2	0	11.16	0
11.2	0	11.13	0
11.2	0	11.13	0
11.2	0	11.11	0
11.2	0	11.11	0
11.2	0	11.11	0
11.24	0	11.11	0
11.27	0	11.13	0
11.29	0	11.13	0

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11.29	0	11.09	0
11.2	0	11	0
11.36	0	11.13	0
11.55	0	11.33	0
11.87	0	11.62	0
12.32	0	12.07	0
12.99	0	12.73	0
13.29	0.155	13.06	0
13.55	0.158	13.29	0
13.48	0.164	13.24	0
13.06	0.166	12.83	0
12.5	0	12.25	0
12.05	0	11.8	0
11.73	0	11.47	0
11.62	0	11.36	0
11.6	0	11.36	0
11.62	0	11.36	0
11.62	0	11.36	0
11.64	0	11.36	0
11.64	0	11.36	0
11.69	0	11.38	0
11.69	0	11.36	0
11.69	0	11.33	0
11.71	0	11.33	0
11.76	0	11.36	0
11.69	0	11.29	0
11.85	0	11.42	0
12.09	0	11.67	0
12.43	0	12	0
12.99	0	12.55	0
13.55	0.149	13.1	0
13.24	0	12.8	0
12.83	0	12.37	0
12.69	0	12.23	0
12.59	0	12.16	0
12.5	0	12.05	0
12.43	0	11.98	0
12.32	0	11.87	0
12.27	0	11.82	0
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12.27	0	11.8	0
12.25	0	11.8	0
12.23	0	11.76	0
12.23	0	11.73	0
12.23	0	11.73	0
12.25	0	11.76	0

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12.25	0	11.73	0
12.25	0	11.71	0
12.23	0	11.69	0
12.23	0	11.67	0
12.34	0	11.78	0
12.53	0	11.96	0
12.83	0	12.23	0
13.06	0	12.46	0
13.39	0	12.78	0
13.62	0	13.01	0
12.89	0	12.3	0
13.03	0	12.41	0
12.78	0	12.16	0
12.69	0	12.07	0
12.57	0	11.98	0
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12.5	0	11.89	0
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12.59	0	11.91	0
12.57	0	11.91	0
12.57	0	11.89	0
12.76	0	12.07	0
12.89	0	12.21	0
12.85	0	12.16	0
12.89	0	12.21	0
13.03	0	12.34	0
13.22	0	12.53	0
13.65	0	12.96	0
13.5	0	12.8	0
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12.94	0	12.27	0
12.78	0	12.12	0
12.69	0	12.03	0
12.64	0	11.98	0
12.64	0	11.98	0
12.66	0	11.98	0
12.66	0	12	0
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12.69	0	12.03	0

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12.71	0	12.03	0
12.71	0	12.05	0
12.71	0	12.05	0
12.62	0	11.96	0
12.76	0	12.07	0
12.94	0	12.25	0
13.13	0	12.48	0
13.41	0	12.76	0
13.79	0	13.13	0
14.05	0	13.41	0
14.22	0.147	13.6	0
14.03	0.154	13.41	0
13.67	0	13.08	0
13.32	0	12.73	0
13.1	0	12.55	0
12.94	0	12.39	0
12.83	0	12.3	0
12.78	0	12.25	0
12.78	0	12.25	0
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12.8	0	12.25	0
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12.83	0	12.27	0
12.83	0	12.27	0
12.76	0	12.21	0
12.87	0	12.32	0
13.06	0	12.48	0
13.24	0	12.69	0
13.55	0	12.99	0
14	0	13.43	0
14.51	0.136	13.96	0
14.76	0.136	14.2	0
14.64	0.147	14.1	0
14.32	0.154	13.79	0
13.74	0	13.24	0
13.43	0	12.92	0
13.22	0	12.71	0
13.1	0	12.62	0
13.1	0	12.62	0
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13.13	0	12.62	0
13.1	0	12.62	0
13.1	0	12.59	0

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13.1	0	12.57	0
13.08	0	12.55	0
13.1	0	12.55	0
13.13	0	12.57	0
13.1	0	12.5	0
13.2	0	12.62	0
13.29	0	12.69	0
13.43	0	12.83	0
14.05	0	13.43	0
14.74	0.132	14.1	0
14.93	0.132	14.29	0
14.56	0.148	13.93	0
14.56	0.15	13.93	0
14.15	0	13.53	0
13.91	0	13.29	0
13.67	0	13.06	0
13.5	0	12.87	0
13.41	0	12.8	0
13.36	0	12.76	0
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13.34	0	12.71	0
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13.41	0	12.78	0
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13.46	0	12.78	0
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13.74	0	13.01	0
13.96	0	13.24	0
14.22	0	13.5	0
14.54	0	13.81	0
14.76	0.141	14.03	0
14.76	0.143	14.05	0
14.66	0.145	13.93	0
14.39	0	13.69	0
14.08	0	13.39	0
13.91	0	13.22	0
13.77	0	13.08	0
13.72	0	13.01	0
13.65	0	12.96	0
13.62	0	12.94	0
13.62	0	12.94	0
13.65	0	12.94	0

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13.69	0	12.99	0
13.69	0	12.96	0
13.69	0	12.96	0
13.69	0	12.94	0
13.67	0	12.92	0
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13.86	0	13.1	0
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13.98	0	13.27	0
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13.93	0	13.2	0
13.93	0	13.2	0
13.93	0	13.17	0
13.91	0	13.15	0
13.86	0	13.08	0
13.98	0	13.2	0
14.13	0	13.36	0
14.27	0	13.48	0
14.47	0	13.67	0
14.64	0	13.86	0
14.78	0	13.98	0
14.83	0	14.05	0
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14.05	0	13.29	0
14.05	0	13.29	0
14.05	0	13.29	0

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14.05	0	13.27	0
14.08	0	13.27	0
14.08	0	13.24	0
14.08	0	13.24	0
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14.56	0	13.72	0
14.71	0	13.88	0
14.93	0	14.13	0
15.26	0	14.44	0
15.58	0.13	14.78	0
15.79	0.124	14.98	0
15.79	0.131	14.98	0
15.58	0.143	14.81	0
15.23	0	14.47	0
14.93	0	14.17	0
14.69	0	13.93	0
14.54	0	13.79	0
14.54	0	13.79	0
14.54	0	13.79	0

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14.54	0	13.79	0
14.54	0	13.77	0
14.54	0	13.77	0
14.56	0	13.74	0
14.56	0	13.77	0
14.56	0	13.74	0
14.54	0	13.69	0
14.71	0	13.86	0
14.93	0	14.08	0
15.23	0	14.37	0
15.66	0.139	14.78	0
16.23	0.118	15.36	0
16.59	0.109	15.69	0
16.75	0.117	15.84	0
16.56	0.133	15.66	0
16.17	0.146	15.28	0
15.66	0.155	14.81	0
15.33	0	14.47	0
15.08	0	14.22	0
14.96	0	14.1	0
14.91	0	14.03	0
14.88	0	14	0
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14.98	0	14.03	0
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14.96	0	13.98	0
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15.31	0	14.29	0
15.53	0	14.49	0
15.87	0	14.81	0
16.25	0.132	15.21	0
16.54	0.127	15.48	0
16.8	0.12	15.74	0
16.72	0.133	15.66	0
16.41	0.143	15.33	0
15.84	0	14.78	0
15.58	0	14.54	0
15.43	0	14.39	0
15.36	0	14.29	0
15.28	0	14.22	0

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15.31	0	14.2	0
15.31	0	14.2	0
15.36	0	14.22	0
15.41	0	14.27	0
15.41	0	14.27	0
15.43	0	14.25	0
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15.43	0	14.22	0
15.38	0	14.17	0
15.53	0	14.29	0
15.71	0	14.47	0
15.89	0	14.61	0
16.33	0.144	15.06	0
16.83	0.127	15.53	0
17.12	0.121	15.79	0
17.04	0.131	15.71	0
16.85	0.141	15.56	0
16.33	0.157	15.03	0
16.15	0	14.86	0
16.07	0	14.78	0
15.84	0	14.56	0
15.74	0	14.44	0
15.71	0	14.42	0
15.74	0	14.44	0
15.76	0	14.44	0
15.81	0	14.47	0
15.84	0	14.49	0
15.84	0	14.49	0
15.87	0	14.49	0
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15.89	0	14.49	0
15.87	0	14.44	0
16.02	0	14.56	0
16.23	0	14.78	0
16.56	0	15.11	0
16.93	0.139	15.43	0
17.04	0.135	15.56	0
17.58	0.115	16.07	0
17.77	0.12	16.25	0
17.44	0.137	15.94	0
16.99	0.149	15.51	0
16.7	0.159	15.23	0
16.46	0	15.01	0
16.3	0	14.86	0
16.17	0	14.74	0

16.15	0	14.69	0
16.15	0	14.69	0
16.15	0	14.69	0
16.12	0	14.66	0
16.12	0	14.64	0
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16.17	0	14.66	0
16.2	0	14.69	0
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16.3	0	14.74	0
16.49	0	14.91	0
16.72	0	15.13	0
16.96	0	15.38	0
17.28	0.14	15.69	0
17.55	0.133	15.94	0
17.63	0.134	16.04	0
17.58	0.139	15.99	0
17.25	0.152	15.69	0
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16.46	0	14.93	0
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16.83	0	15.33	0
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18.85	0	17.99	0
18.97	0	18.13	0
19.08	0	18.24	0
19.22	0	18.4	0
19.57	0	18.77	0
20.1	0	19.31	0
19.89	0	19.11	0
19.89	0	19.11	0
19.69	0	18.91	0
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19.17	0	18.43	0
19.08	0	18.35	0
18.97	0	18.24	0
18.94	0	18.21	0
18.94	0	18.21	0
18.91	0	18.21	0
18.91	0	18.18	0
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19.28	0	18.51	0
19.51	0	18.74	0
19.81	0	19.05	0
19.95	0	19.2	0
19.98	0	19.22	0
19.69	0	18.97	0
19.48	0	18.74	0
19.28	0	18.57	0
19.14	0	18.4	0
19.08	0	18.35	0
19	0	18.29	0
18.94	0	18.24	0
18.94	0	18.21	0
18.94	0	18.21	0
18.91	0	18.18	0
18.91	0	18.18	0

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18.94	0	18.18	0
18.94	0	18.15	0
18.91	0	18.13	0
18.88	0	18.1	0
18.88	0	18.1	0
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19.08	0	18.32	0
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19	0	18.21	0
18.97	0	18.21	0
19	0	18.21	0
19	0	18.24	0
18.97	0	18.21	0
18.97	0	18.18	0
18.94	0	18.15	0
18.94	0	18.15	0
18.94	0	18.15	0
18.91	0	18.15	0
18.88	0	18.13	0
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18.88	0	18.29	0
18.91	0	18.29	0
18.91	0	18.32	0
18.88	0	18.29	0

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18.82	0	18.26	0
18.8	0	18.26	0
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19.69	0	19.25	0
19.69	0	19.22	0
19.37	0	18.94	0
19.28	0	18.85	0
19.11	0	18.68	0
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18.91	0	18.51	0
18.8	0	18.4	0
18.77	0	18.38	0
18.77	0	18.38	0
18.77	0	18.38	0
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18.91	0	18.51	0
18.88	0	18.46	0
18.88	0	18.43	0
18.85	0	18.43	0

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19.22	0	18.66	0
19.48	0	18.91	0
19.69	0	19.11	0
19.92	0	19.37	0
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19.69	0	19.14	0
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19.05	0	18.4	0
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19.05	0	18.38	0
19.05	0	18.35	0
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19.69	0	18.94	0
19.51	0	18.77	0
19.43	0	18.68	0
19.31	0	18.54	0
19.28	0	18.51	0
19.28	0	18.51	0

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19.43	0	18.51	0

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19.25	0	18.43	0
19.34	0	18.54	0
19.46	0	18.63	0
19.57	0	18.8	0
19.78	0	19	0
19.89	0	19.14	0
19.78	0	19.02	0
19.78	0	19.05	0
19.75	0	19.05	0
19.69	0	19	0
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19.46	0	18.8	0
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19.63	0	19.05	0
19.92	0	19.34	0
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19.98	0	19.46	0
19.86	0	19.34	0
19.63	0	19.11	0
19.48	0	18.97	0
19.34	0	18.85	0
19.28	0	18.77	0

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19.22	0	18.63	0
19.34	0	18.74	0
19.48	0	18.85	0
19.63	0	19.02	0
19.63	0	19	0
19.63	0	19	0
19.78	0	19.17	0
19.86	0	19.25	0
19.78	0	19.17	0
19.63	0	19	0
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19.6	0	18.97	0
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19.92	0	19.31	0
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19.86	0	19.28	0
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20.04	0	19.46	0
19.83	0	19.28	0
19.63	0	19.08	0
19.51	0	18.97	0

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19.34	0	18.8	0
19.31	0	18.77	0
19.31	0	18.77	0
19.31	0	18.74	0
19.28	0	18.74	0
19.28	0	18.71	0
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20.49	0	19.92	0
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19.86	0	19.28	0
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19.51	0	18.97	0
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19.6	0	18.94	0
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19.89	0	19.2	0
19.86	0	19.17	0
19.78	0	19.08	0
19.72	0	19.02	0

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19.57	0	18.85	0
19.51	0	18.8	0
19.48	0	18.74	0
19.46	0	18.74	0
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19.69	0	18.97	0
19.86	0	19.14	0
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19.83	0	19.22	0
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19.92	0	19.34	0
19.81	0	19.25	0
19.75	0	19.2	0
19.63	0	19.08	0

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19.48	0	18.97	0
19.43	0	18.91	0
19.37	0	18.91	0
19.34	0	18.88	0
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19.28	0	18.82	0
19.25	0	18.82	0
19.31	0	18.88	0
19.37	0	18.94	0
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19.98	0	19.72	0
19.92	0	19.66	0

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19.31	0	19.05	0
19.22	0	18.97	0
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19.98	0	19.69	0
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20.43	0	20.13	0
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19.81	0	19.48	0
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21.19	0	20.7	0
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19.89	0	19.34	0
19.69	0	19.14	0
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19.95	0	19.05	0
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19.95	0	19	0
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19.92	0	18.94	0
19.95	0	18.94	0
19.95	0	18.91	0
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22	0	20.79	0
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21.16	0	19.92	0

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22	0	20.55	0
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22.29	0	20.64	0
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21.53	0	19.78	0
21.94	0	20.19	0
22.61	0	20.79	0
23.37	0	21.56	0
24.18	0.054	22.32	0
24.39	0.069	22.51	0
24.18	0.085	22.29	0
23.44	0	21.59	0
23.07	0	21.25	0
22.71	0	20.91	0
22.19	0	20.4	0
21.94	0	20.16	0
21.75	0	19.95	0
21.62	0	19.83	0
21.56	0	19.81	0
21.53	0	19.72	0
21.44	0	19.63	0
21.44	0	19.63	0
21.44	0	19.6	0
21.44	0	19.6	0
21.4	0	19.57	0
21.44	0	19.6	0
21.44	0	19.57	0
21.56	0	19.66	0
21.78	0	19.86	0
22.03	0	20.1	0
22.39	0	20.46	0
23	0	21.03	0
23.7	0	21.72	0

24.04	0	22.03	0
23.94	0	21.94	0
23.4	0	21.44	0
23.17	0	21.19	0
22.94	0	20.97	0
22.58	0	20.64	0
22.26	0	20.34	0
22	0	20.07	0
21.81	0	19.92	0
21.78	0	19.86	0
21.78	0	19.86	0
21.81	0	19.86	0
21.78	0	19.83	0
21.78	0	19.86	0
21.78	0	19.83	0
21.78	0	19.83	0
21.81	0	19.83	0
21.81	0	19.83	0
21.91	0	19.92	0
22.1	0	20.1	0
22.32	0	20.31	0
22.61	0	20.58	0
23.17	0	21.13	0
23.91	0	21.81	0
24.15	0	22.03	0
23.94	0	21.84	0
23.47	0	21.4	0
23.24	0	21.19	0
23	0	20.97	0
22.74	0	20.73	0
22.48	0	20.49	0
22.26	0	20.25	0
22.07	0	20.1	0
22	0	20.04	0
22.03	0	20.07	0
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21.94	0	19.95	0
21.94	0	19.95	0
21.97	0	19.95	0
21.97	0	19.95	0
22	0	19.98	0
22.03	0	20.01	0
22.22	0	20.19	0
22.48	0	20.43	0
22.74	0	20.7	0
23.17	0	21.1	0

23.87	0	21.78	0
24.22	0	22.07	0
24.15	0	22.07	0
23.84	0	21.75	0
23.4	0	21.34	0
23.04	0	20.97	0
22.74	0	20.73	0
22.55	0	20.55	0
22.48	0	20.49	0
22.42	0	20.46	0
22.42	0	20.43	0
22.39	0	20.4	0
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22.81	0	20.79	0
22.97	0	20.94	0
23.27	0	21.22	0
23.47	0	21.47	0
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22.91	0	20.91	0
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22.39	0	20.49	0
22.48	0	20.61	0
22.64	0	20.73	0
22.74	0	20.85	0

22.84	0	20.97	0
23.17	0	21.28	0
23.6	0	21.72	0
23.57	0	21.72	0
23.37	0	21.5	0
23.27	0	21.44	0
23.14	0	21.31	0
22.94	0	21.13	0
22.77	0	20.97	0
22.61	0	20.85	0
22.51	0	20.76	0
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22.77	0	21.03	0
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23.74	0	22.03	0
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22.61	0	21	0
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22.48	0	20.85	0
22.48	0	20.85	0
22.48	0	20.85	0
22.55	0	20.91	0
22.74	0	21.1	0
23	0	21.31	0

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23.74	0	22.07	0
24.25	0	22.55	0
24.77	0	23.07	0
24.81	0	23.1	0
24.32	0	22.64	0
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23.98	0	22.29	0
23.7	0	22.03	0
23.44	0	21.78	0
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23	0	21.34	0
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22.87	0	21.22	0
22.84	0	21.22	0
22.87	0	21.22	0
22.87	0	21.22	0
22.91	0	21.22	0
22.91	0	21.22	0
22.91	0	21.22	0
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23	0	21.22	0
22.97	0	21.22	0
22.94	0	21.16	0
23.07	0	21.28	0

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23.57	0	21.81	0
23.98	0	22.22	0
23.91	0	22.16	0
23.6	0	21.87	0
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22.97	0	21.4	0
22.94	0	21.4	0
22.94	0	21.4	0
23.1	0	21.56	0

23.24	0	21.65	0
23.57	0	22	0
23.98	0	22.42	0
24.63	0	23.04	0
25.31	0	23.7	0
24.84	0	23.27	0
24.98	0	23.4	0
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24.74	0	23.3	0
25.16	0	23.77	0
25.38	0	23.98	0
24.91	0	23.57	0
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22.97	0	21.72	0
22.97	0	21.72	0
22.91	0	21.69	0
22.84	0	21.65	0
22.84	0	21.62	0
22.87	0	21.69	0
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22.84	0	21.62	0
22.84	0	21.62	0
22.84	0	21.62	0
22.81	0	21.62	0
22.81	0	21.62	0

22.87	0	21.69	0
23.27	0	22.07	0
23.74	0	22.55	0
23.81	0	22.64	0
24.7	0	23.54	0
25.23	0	24.04	0
24.63	0	23.5	0
24.18	0	23.07	0
24.42	0	23.3	0
24.6	0	23.5	0
24.32	0	23.24	0
23.67	0	22.58	0
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23.07	0	22	0
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23.04	0	21.97	0
23	0	21.94	0
22.94	0	21.87	0
22.87	0	21.78	0
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22.97	0	21.84	0
23.4	0	22.29	0
23.98	0	22.84	0
24.53	0	23.37	0
25.2	0	24.04	0
25.92	0.155	24.74	0
25.52	0	24.35	0
25.7	0	24.53	0
25.13	0	23.98	0
24.81	0	23.67	0
24.74	0	23.6	0
24.08	0	22.94	0
23.67	0	22.51	0
23.47	0	22.35	0
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23.14	0	21.97	0
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23.27	0	22.07	0
23.27	0	22.03	0
23.27	0	22.03	0
23.3	0	22.03	0
23.24	0	21.97	0

23.2	0	21.91	0
23.4	0	22.1	0
23.81	0	22.48	0
24.25	0	22.91	0
24.98	0	23.6	0
26.26	0	24.81	0
27.28	0.115	25.81	0
27.59	0.116	26.11	0
27.2	0.118	25.7	0
26.22	0.126	24.74	0
25.81	0	24.35	0
25.41	0	23.98	0
24.74	0	23.27	0
24.22	0	22.74	0
23.81	0	22.35	0
23.47	0	22.03	0
23.47	0	21.97	0
23.5	0	22	0
23.57	0	22.07	0
23.6	0	22.07	0
23.64	0	22.03	0
23.64	0	22.03	0
23.64	0	22	0
23.64	0	22	0
23.67	0	22	0
23.81	0	22.1	0
24.18	0	22.48	0
24.81	0	23.04	0
25.67	0	23.87	0
26.7	0	24.84	0
27.63	0.076	25.74	0
28.06	0.079	26.11	0
27.75	0.086	25.81	0
26.67	0	24.77	0
26.29	0	24.42	0
25.89	0	24.01	0
25.23	0	23.4	0
24.74	0	22.87	0
24.35	0	22.51	0
24.15	0	22.29	0
24.08	0	22.22	0
24.08	0	22.19	0
24.04	0	22.16	0
24.04	0	22.13	0
24.11	0	22.16	0
24.15	0	22.16	0
24.15	0	22.16	0

24.18	0	22.16	0
24.18	0	22.16	0
24.29	0	22.22	0
24.7	0	22.61	0
25.34	0	23.2	0
26.22	0	24.01	0
27.32	0	25.06	0
28.42	0.054	26.07	0
29.03	0.066	26.67	0
28.87	0.067	26.48	0
27.55	0.09	25.23	0
27.05	0	24.77	0
26.55	0	24.32	0
25.85	0	23.64	0
25.27	0	23.07	0
24.91	0	22.71	0
24.74	0	22.51	0
24.67	0	22.45	0
24.63	0	22.42	0
24.56	0	22.32	0
24.56	0	22.32	0
24.56	0	22.32	0
24.53	0	22.26	0
24.46	0	22.16	0
24.42	0	22.1	0
24.42	0	22.1	0
24.53	0	22.16	0
24.84	0	22.45	0
25.31	0	22.91	0
26.11	0	23.64	0
26.89	0	24.39	0
28.02	0	25.41	0
28.99	0.035	26.29	0
28.83	0.054	26.14	0
27.78	0	25.2	0
27.47	0	24.88	0
27.09	0	24.53	0
26.4	0	23.91	0
25.81	0	23.37	0
25.38	0	22.94	0
25.09	0	22.64	0
24.95	0	22.51	0
24.95	0	22.51	0
24.95	0	22.48	0
24.91	0	22.45	0
24.95	0	22.48	0
24.91	0	22.42	0

24.91	0	22.39	0
24.91	0	22.39	0
25.02	0	22.48	0
25.16	0	22.61	0
25.52	0	22.94	0
26.07	0	23.44	0
26.74	0	24.04	0
27.47	0	24.74	0
28.42	0	25.63	0
28.91	0.033	26.07	0
29.08	0.04	26.22	0
28.46	0.059	25.7	0
28.14	0	25.38	0
27.75	0	25.02	0
26.97	0	24.29	0
26.29	0	23.67	0
25.81	0	23.24	0
25.63	0	23.04	0
25.56	0	23	0
25.56	0	22.97	0
25.52	0	22.94	0
25.52	0	22.94	0
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25.41	0	22.81	0
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25.85	0	23.17	0
26.29	0	23.57	0
26.97	0	24.22	0
27.9	0	25.09	0
28.95	0	26.03	0
29.62	0.019	26.63	0
29.83	0.025	26.82	0
28.83	0	25.89	0
28.34	0	25.45	0
27.9	0	25.06	0
27.2	0	24.42	0
26.59	0	23.87	0
26.18	0	23.47	0
25.92	0	23.24	0
25.81	0	23.14	0
25.81	0	23.14	0
25.78	0	23.07	0
25.74	0	23.04	0
25.67	0	22.97	0

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25.63	0	22.91	0
25.59	0	22.87	0
25.59	0	22.87	0
25.74	0	23	0
26.11	0	23.34	0
26.63	0	23.81	0
27.12	0	24.25	0
27.71	0	24.81	0
28.79	0	25.85	0
30.17	0	27.09	0
30.17	0.014	27.09	0
29.16	0	26.18	0
28.54	0	25.63	0
28.1	0	25.23	0
27.59	0	24.74	0
27.01	0	24.22	0
26.48	0	23.74	0
26.14	0	23.44	0
26.07	0	23.34	0
26.07	0	23.34	0
26.14	0	23.4	0
26.14	0	23.4	0
26.14	0	23.4	0
26.14	0	23.4	0
26.07	0	23.34	0
26.07	0	23.34	0
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26.11	0	23.37	0
26.59	0	23.77	0
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27.59	0	24.7	0
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29.28	0	26.29	0
28.71	0	25.78	0
27.94	0	25.09	0
27.36	0	24.56	0
27.36	0	24.56	0
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26.26	0	23.54	0

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26.67	0	23.91	0
27.2	0	24.42	0
28.02	0	25.2	0
28.46	0	25.59	0
27.94	0	25.13	0
27.2	0	24.46	0
27.32	0	24.56	0
28.14	0	25.31	0
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26.74	0	24.08	0
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26.44	0	23.81	0
26.44	0	23.81	0
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27.9	0	25.2	0
28.71	0	25.96	0
29.58	0	26.78	0
30.13	0	27.32	0
30.3	0.021	27.43	0
29.75	0	26.97	0
29.41	0	26.67	0
28.67	0	26	0
27.9	0	25.31	0
27.51	0	24.91	0
27.05	0	24.46	0
26.7	0	24.15	0
26.59	0	24.04	0
26.52	0	23.98	0
26.52	0	23.98	0

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26.52	0	23.94	0
26.52	0	23.98	0
26.52	0	23.94	0
26.52	0	23.94	0
26.52	0	23.94	0
26.7	0	24.15	0
27.12	0	24.53	0
27.59	0	24.95	0
28.22	0	25.56	0
28.99	0	26.26	0
29.92	0	27.16	0
30.7	0	27.82	0
30.79	0.006	27.94	0
30.05	0	27.24	0
29.54	0	26.82	0
29.24	0	26.52	0
28.54	0	25.89	0
27.94	0	25.34	0
27.39	0	24.81	0
27.01	0	24.46	0
26.89	0	24.35	0
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26.89	0	24.35	0
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26.97	0	24.39	0
27.01	0	24.39	0
26.97	0	24.39	0
26.97	0	24.35	0
26.97	0	24.35	0
27.32	0	24.67	0
27.9	0	25.2	0
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31.59	0	28.63	0
31.96	0	28.95	0
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28.75	0	26.03	0
28.63	0	25.92	0
28.14	0	25.45	0
27.78	0	25.09	0
27.59	0	24.95	0
27.51	0	24.88	0
27.36	0	24.74	0

27.24	0	24.6	0
27.2	0	24.56	0
27.12	0	24.46	0
27.01	0	24.35	0
27.01	0	24.32	0
26.97	0	24.32	0
26.93	0	24.29	0
27.09	0	24.39	0
27.39	0	24.67	0
27.75	0	25.02	0
28.42	0	25.67	0
29.58	0	26.74	0
30.7	0	27.78	0
30.96	0	28.02	0
30.65	0	27.71	0
30.09	0	27.24	0
29.2	0	26.4	0
29.12	0	26.33	0
28.83	0	26.07	0
28.26	0	25.56	0
27.94	0	25.23	0
27.71	0	25.02	0
27.55	0	24.88	0
27.47	0	24.84	0
27.47	0	24.81	0
27.39	0	24.77	0
27.43	0	24.77	0
27.39	0	24.7	0
27.39	0	24.7	0
27.39	0	24.7	0
27.39	0	24.7	0
27.47	0	24.81	0
27.82	0	25.13	0
28.34	0	25.59	0
28.87	0	26.11	0
29.7	0	26.86	0
30.43	0	27.55	0
31.1	0	28.18	0
31.32	0	28.38	0
30.57	0	27.67	0
29.62	0	26.78	0
29.28	0	26.52	0
28.79	0	26.03	0
28.22	0	25.56	0
27.94	0	25.27	0
27.82	0	25.16	0
27.78	0	25.09	0

27.71	0	25.02	0
27.67	0	25.02	0
27.67	0	24.98	0
27.67	0	24.98	0
27.63	0	24.95	0
27.63	0	24.95	0
27.59	0	24.91	0
27.59	0	24.91	0
27.75	0	25.02	0
28.1	0	25.38	0
28.5	0	25.74	0
28.91	0	26.14	0
30.22	0	27.36	0
31.55	0	28.58	0
32.33	0	29.33	0
32.15	0.013	29.12	0
30.7	0	27.82	0
30.52	0	27.63	0
29.83	0	27.05	0
29.2	0	26.44	0
28.79	0	26.03	0
28.42	0	25.7	0
28.18	0	25.49	0
28.1	0	25.41	0
28.02	0	25.34	0
27.94	0	25.27	0
27.9	0	25.23	0
27.9	0	25.2	0
27.82	0	25.13	0
27.78	0	25.09	0
27.78	0	25.09	0
27.78	0	25.09	0
27.86	0	25.16	0
28.14	0	25.41	0
28.54	0	25.78	0
29.16	0	26.37	0
30.17	0	27.32	0
31.64	0	28.67	0
33.09	0	30	0
33.09	0	30	0
30.57	0	27.67	0
29.24	0	26.44	0
28.83	0	26.07	0
28.67	0	25.92	0
28.54	0	25.81	0
28.26	0	25.56	0
27.94	0	25.27	0

27.94	0	25.27	0
27.9	0	25.2	0
27.86	0	25.16	0
27.9	0	25.2	0
27.86	0	25.16	0
27.82	0	25.13	0
27.78	0	25.13	0
27.78	0	25.09	0
27.75	0	25.06	0
27.75	0	25.06	0
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28.95	0	26.18	0
30	0	27.2	0
31.55	0	28.67	0
31.01	0	28.18	0
31.96	0.058	29.03	0
31.32	0	28.46	0
30.52	0	27.75	0
28.99	0	26.29	0
28.54	0	25.89	0
28.46	0	25.85	0
28.46	0	25.85	0
28.18	0	25.63	0
28.14	0	25.56	0
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28.06	0	25.52	0
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27.98	0	25.45	0
28.06	0	25.56	0
28.38	0	25.85	0
28.87	0	26.29	0
29.49	0	26.89	0
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29.87	0	27.28	0
29.12	0	26.59	0
28.83	0	26.29	0
28.46	0	26	0
28.5	0	26.03	0
28.42	0	25.96	0
28.26	0	25.81	0

27.98	0	25.56	0
27.86	0	25.41	0
27.82	0	25.41	0
27.86	0	25.45	0
27.86	0	25.49	0
27.9	0	25.45	0
27.86	0	25.49	0
27.9	0	25.49	0
27.86	0	25.45	0
27.86	0	25.45	0
27.82	0	25.45	0
27.82	0	25.45	0
27.9	0	25.52	0
28.22	0	25.81	0
28.91	0	26.52	0
29.49	0	27.09	0
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28.63	0	26.29	0
28.63	0	26.29	0
28.26	0	25.96	0
28.22	0	25.92	0
28.1	0	25.81	0
27.98	0	25.74	0
27.94	0	25.7	0
27.86	0	25.67	0
27.82	0	25.63	0
27.82	0	25.63	0
27.82	0	25.67	0
27.86	0	25.7	0
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27.82	0	25.7	0
27.82	0	25.67	0
27.9	0	25.81	0
28.46	0	26.37	0
29.28	0	27.12	0
30.3	0	28.14	0
29.87	0	27.71	0
28.99	0	26.93	0
28.58	0	26.55	0
27.86	0	25.85	0
27.9	0	25.89	0
28.1	0	26.11	0
27.98	0	26	0
27.9	0	25.92	0

27.82	0	25.89	0
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27.71	0	25.78	0
27.67	0	25.74	0
27.67	0	25.74	0
27.67	0	25.78	0
27.71	0	25.78	0
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28.99	0	27.47	0
29.49	0	27.98	0
27.71	0	26.22	0
27.55	0	26.11	0
27.94	0	26.48	0
27.78	0	26.33	0

27.59	0	26.14	0
27.36	0	25.92	0
27.24	0	25.81	0
27.2	0	25.78	0
27.16	0	25.78	0
27.12	0	25.74	0
27.09	0	25.74	0
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27.01	0	25.67	0
27.01	0	25.63	0
26.97	0	25.59	0
26.89	0	25.56	0
27.01	0	25.67	0
27.32	0	26	0
27.71	0	26.4	0
28.06	0	26.74	0
28.63	0	27.32	0
29.79	0	28.46	0
29.45	0	28.18	0
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27.86	0	26.59	0
28.1	0	26.86	0
27.82	0	26.59	0
27.51	0	26.29	0
27.2	0	26	0
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26.89	0	25.7	0
26.86	0	25.67	0
26.82	0	25.63	0
26.82	0	25.59	0
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26.74	0	25.56	0
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27.75	0	26.55	0
27.94	0	26.78	0
27.94	0	26.78	0
28.1	0	26.93	0
28.02	0	26.86	0
27.78	0	26.63	0

27.47	0	26.33	0
27.2	0	26.07	0
27.01	0	25.85	0
26.86	0	25.7	0
26.78	0	25.63	0
26.74	0	25.59	0
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18.6	0	20.4	0
18.51	0	20.31	0
18.66	0	20.43	0
19.2	0	21.03	0
20.25	0	22.16	0
21.75	0	23.84	0
23.07	0	25.31	0
23.47	0	25.74	0
22.97	0	25.2	0
20.97	0	22.97	0
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19.31	0	21.16	0
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18.6	0	20.37	0
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18.43	0	20.16	0
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18.38	0	20.07	0
18.38	0	20.04	0
18.29	0	19.98	0
18.54	0	20.25	0
18.77	0	20.49	0
18.85	0	20.58	0

18.97	0	20.7	0
19.72	0	21.53	0
19.95	0	21.78	0
19.28	0	21.07	0
18.88	0	20.61	0
18.66	0	20.37	0
18.46	0	20.13	0
18.38	0	20.04	0
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18.32	0	20.01	0
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18.32	0	19.98	0
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18.24	0	19.89	0
18.26	0	19.89	0
18.32	0	19.98	0
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18.71	0	20.37	0
18.51	0	20.16	0
18.26	0	19.89	0
18.15	0	19.81	0
18.29	0	19.92	0
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18.15	0	19.81	0
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18.15	0	19.81	0
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18.07	0	19.75	0
18.07	0	19.75	0
18.07	0	19.75	0
18.04	0	19.72	0
17.88	0	19.57	0
17.99	0	19.69	0
18.24	0	19.98	0

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18.35	0	20.1	0
18.54	0	20.34	0
18.91	0	20.73	0
18.77	0	20.61	0
18.38	0	20.19	0
18.1	0	19.89	0
17.85	0	19.63	0
17.77	0	19.54	0
17.74	0	19.54	0
17.71	0	19.51	0
17.69	0	19.48	0
17.69	0	19.51	0
17.69	0	19.48	0
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17.63	0	19.48	0
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17.58	0	19.43	0
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17.9	0	19.83	0
18.57	0	20.58	0
19.11	0	21.16	0
19.63	0	21.75	0
20.19	0	22.39	0
20.46	0	22.71	0
19.69	0	21.87	0
18.68	0	20.79	0
17.96	0	20.01	0
17.55	0	19.57	0
17.41	0	19.43	0
17.36	0	19.4	0
17.36	0	19.4	0
17.36	0	19.4	0
17.33	0	19.4	0
17.31	0	19.37	0
17.31	0	19.37	0
17.31	0	19.37	0
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17.25	0	19.31	0
17.23	0	19.28	0
17.09	0	19.14	0
17.17	0	19.25	0
17.58	0	19.69	0

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19.2	0	21.5	0
20.37	0	22.81	0
21.07	0	23.6	0
21.5	0	24.04	0
20.79	0	23.27	0
19.28	0	21.62	0
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17.07	0	19.14	0
17.04	0	19.08	0
16.88	0	18.91	0
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17.12	0	19.11	0
17.09	0	19.08	0
17.07	0	19.02	0
17.04	0	19	0
16.91	0	18.88	0
17.07	0	19.02	0

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17.74	0	19.78	0
17.63	0	19.63	0
17.6	0	19.6	0
17.5	0	19.48	0
17.5	0	19.48	0
17.25	0	19.2	0
17.04	0	18.97	0
17.04	0	18.97	0
16.96	0	18.91	0
16.93	0	18.85	0
16.91	0	18.85	0
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16.83	0	18.74	0
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16.72	0	18.66	0
16.7	0	18.63	0
16.64	0	18.57	0
16.72	0	18.66	0
17.01	0	19	0
17.04	0	19	0
17.07	0	19.05	0
16.67	0	18.63	0
16.75	0	18.71	0
16.62	0	18.57	0
16.59	0	18.57	0
16.67	0	18.68	0
16.59	0	18.6	0
16.54	0	18.57	0
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16.46	0	18.49	0
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16.3	0	18.43	0
16.3	0	18.43	0
16.25	0	18.43	0
16.12	0	18.29	0

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16.25	0	18.46	0
16.43	0	18.68	0
16.72	0	19.02	0
17.04	0	19.4	0
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15.13	0	17.96	0
15.11	0	17.93	0
15.11	0	17.93	0
15.08	0	17.9	0
15.06	0	17.9	0
15.06	0	17.88	0

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14.96	0	17.8	0
15.06	0	17.9	0
15.23	0	18.1	0
15.43	0	18.38	0
15.76	0	18.71	0
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14.86	0	17.9	0
15.21	0	18.32	0
15.64	0	18.8	0
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15.79	0	19	0
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14.34	0	17.44	0
14.74	0	17.88	0
15.03	0	18.21	0
15.48	0	18.74	0
15.74	0	19.02	0
16.2	0	19.57	0
15.79	0	19.11	0
15.11	0	18.32	0
14.61	0	17.77	0
14.37	0	17.5	0
14.29	0	17.41	0
14.22	0	17.36	0
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14.05	0	17.17	0
14.08	0	17.17	0
14.03	0	17.12	0
14.03	0	17.12	0
14	0	17.07	0
13.91	0	16.96	0
14.03	0	17.09	0
14.27	0	17.39	0
14.51	0	17.66	0
14.54	0	17.69	0
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14.08	0	17.15	0
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13.79	0	16.85	0
13.74	0	16.8	0
13.72	0	16.77	0
13.69	0	16.75	0

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13.67	0	16.72	0
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13.58	0	16.64	0
13.67	0	16.77	0
13.96	0	17.09	0
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12.96	0	16.15	0
12.94	0	16.15	0
12.92	0	16.12	0
12.89	0	16.1	0

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12.85	0	16.07	0
12.69	0	15.89	0
12.76	0	15.97	0
12.87	0	16.1	0
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13.36	0	16.8	0
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12.62	0	15.97	0
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12.25	0	15.58	0
12.23	0	15.56	0

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11.89	0	15.16	0
11.87	0	15.16	0
11.96	0	15.23	0
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11.91	0	15.16	0
11.91	0	15.16	0
11.89	0	15.13	0
11.87	0	15.11	0
11.85	0	15.08	0
11.82	0	15.06	0

11.82	0	15.06	0
11.8	0	15.03	0
11.78	0	15.01	0
11.78	0	15.01	0
11.76	0	14.98	0
11.6	0	14.81	0
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11.29	0	14.17	0
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11.24	0	14.1	0

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11.2	0	14	0
11.2	0	14	0
11.2	0	13.98	0
11.22	0	13.96	0
11.09	0	13.81	0
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11.16	0	13.79	0
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11.09	0	13.69	0
11.18	0	13.81	0
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12.03	0	14.74	0
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10.96	0	13.67	0
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8.4	0	11.51	0
8.38	0	11.51	0
8.38	0	11.49	0
8.38	0	11.49	0
8.38	0	11.47	0
8.36	0	11.42	0
8.32	0	11.38	0
8.4	0	11.44	0
8.5	0	11.53	0
8.58	0	11.62	0
8.6	0	11.64	0
8.66	0	11.71	0
8.64	0	11.69	0
8.62	0	11.64	0

8.58	0	11.58	0
8.56	0	11.58	0
8.48	0	11.47	0
8.44	0	11.44	0
8.44	0	11.42	0
8.42	0	11.42	0
8.42	0	11.4	0
8.4	0	11.38	0
8.38	0	11.36	0
8.38	0	11.36	0
8.36	0	11.33	0
8.36	0	11.33	0
8.36	0	11.31	0
8.34	0	11.31	0
8.34	0	11.29	0
8.32	0	11.27	0
8.24	0	11.18	0
8.32	0	11.27	0
8.44	0	11.4	0
8.56	0	11.53	0
8.7	0	11.69	0
8.87	0	11.87	0
8.85	0	11.85	0
8.7	0	11.69	0
8.56	0	11.55	0
8.5	0	11.49	0
8.38	0	11.33	0
8.34	0	11.29	0
8.3	0	11.27	0
8.28	0	11.24	0
8.28	0	11.24	0
8.28	0	11.24	0
8.28	0	11.22	0
8.28	0	11.2	0
8.26	0	11.2	0
8.26	0	11.2	0
8.26	0	11.2	0
8.24	0	11.18	0
8.22	0	11.18	0
8.22	0	11.16	0
8.12	0	11.05	0
8.18	0	11.11	0
8.3	0	11.27	0
8.56	0	11.53	0
8.89	0	11.89	0
9.2	0	12.25	0
9.15	0	12.18	0

8.95	0	11.98	0
8.66	0	11.64	0
8.5	0	11.47	0
8.32	0	11.27	0
8.26	0	11.2	0
8.24	0	11.18	0
8.22	0	11.16	0
8.22	0	11.16	0
8.2	0	11.16	0
8.2	0	11.13	0
8.18	0	11.11	0
8.18	0	11.09	0
8.16	0	11.09	0
8.16	0	11.07	0
8.18	0	11.07	0
8.16	0	11.07	0
8.14	0	11.03	0
8.06	0	10.94	0
8.16	0	11.03	0
8.26	0	11.13	0
8.44	0	11.33	0
8.6	0	11.51	0
8.66	0	11.53	0
8.62	0	11.51	0
8.56	0	11.42	0
8.46	0	11.33	0
8.36	0	11.2	0
8.26	0	11.09	0
8.24	0	11.07	0
8.24	0	11.05	0
8.28	0	11.09	0
8.26	0	11.07	0
8.26	0	11.07	0
8.3	0	11.11	0
8.3	0	11.09	0
8.32	0	11.11	0
8.26	0	11.03	0
8.24	0	10.98	0
8.26	0	11	0
8.24	0	10.98	0
8.22	0	10.94	0
8.14	0	10.83	0
8.22	0	10.94	0
8.5	0	11.22	0
9.26	0	12.05	0
10.03	0	12.89	0
10.27	0	13.1	0

9.99	0	12.8	0
9.44	0	12.21	0
9.07	0	11.8	0
8.78	0	11.47	0
8.6	0	11.27	0
8.54	0	11.2	0
8.54	0	11.18	0
8.52	0	11.16	0
8.56	0	11.18	0
8.58	0	11.2	0
8.56	0	11.16	0
8.56	0	11.13	0
8.52	0	11.09	0
8.52	0	11.07	0
8.52	0	11.05	0
8.52	0	11.03	0
8.5	0	11	0
8.5	0	10.98	0
8.44	0	10.89	0
8.56	0	11	0
8.64	0	11.09	0
8.72	0	11.13	0
8.89	0	11.29	0
8.95	0	11.33	0
8.87	0	11.24	0
8.76	0	11.11	0
8.72	0	11.07	0
8.68	0	11	0
8.66	0	10.94	0
8.64	0	10.92	0
8.64	0	10.89	0
8.62	0	10.85	0
8.64	0	10.85	0
8.64	0	10.85	0
8.66	0	10.85	0
8.66	0	10.83	0
8.68	0	10.83	0
8.7	0	10.83	0
8.7	0	10.83	0
8.7	0	10.81	0
8.72	0	10.81	0
8.72	0	10.81	0
8.74	0	10.81	0
8.74	0	10.81	0
8.72	0	10.76	0
8.66	0	10.7	0
8.74	0	10.76	0

8.78	0	10.81	0
8.8	0	10.83	0
8.82	0	10.83	0
8.87	0	10.85	0
8.89	0	10.87	0
8.8	0	10.79	0
8.78	0	10.76	0
8.76	0	10.74	0
8.76	0	10.74	0
8.74	0	10.72	0
8.74	0	10.72	0
8.74	0	10.72	0
8.74	0	10.72	0
8.74	0	10.7	0
8.72	0	10.7	0
8.72	0	10.7	0
8.72	0	10.7	0
8.72	0	10.7	0
8.7	0	10.68	0
8.64	0	10.61	0
8.7	0	10.7	0
8.78	0	10.79	0
8.91	0	10.94	0
9.13	0	11.16	0
9.38	0	11.44	0
9.36	0	11.42	0
9.15	0	11.22	0
9.01	0	11.07	0
8.91	0	10.96	0
8.76	0	10.81	0
8.7	0	10.76	0
8.7	0	10.79	0
8.72	0	10.81	0
8.72	0	10.81	0
8.7	0	10.81	0
8.7	0	10.81	0
8.68	0	10.79	0
8.66	0	10.79	0
8.64	0	10.76	0
8.64	0	10.79	0
8.64	0	10.79	0
8.62	0	10.79	0
8.62	0	10.76	0
8.6	0	10.74	0
8.54	0	10.7	0
8.54	0	10.7	0
8.64	0	10.81	0

8.7	0	10.89	0
8.76	0	10.96	0
8.72	0	10.94	0
8.7	0	10.92	0
8.6	0	10.83	0
8.56	0	10.79	0
8.52	0	10.74	0
8.5	0	10.72	0
8.48	0	10.72	0
8.46	0	10.7	0
8.46	0	10.7	0
8.46	0	10.7	0
8.44	0	10.7	0
8.42	0	10.7	0
8.42	0	10.68	0
8.42	0	10.68	0
8.4	0	10.68	0
8.4	0	10.68	0
8.38	0	10.68	0
8.36	0	10.66	0
8.26	0	10.55	0
8.34	0	10.63	0
8.38	0	10.68	0
8.42	0	10.74	0
8.48	0	10.81	0
8.52	0	10.87	0
8.52	0	10.87	0
8.46	0	10.83	0
8.4	0	10.74	0
8.42	0	10.79	0
8.34	0	10.7	0
8.3	0	10.68	0
8.3	0	10.68	0
8.26	0	10.66	0
8.26	0	10.63	0
8.24	0	10.63	0
8.22	0	10.63	0
8.22	0	10.63	0
8.2	0	10.61	0
8.18	0	10.61	0
8.16	0	10.61	0
8.16	0	10.59	0
8.14	0	10.61	0
8.12	0	10.57	0
8.02	0	10.48	0
8.08	0	10.55	0
8.14	0	10.63	0

8.22	0	10.72	0
8.32	0	10.85	0
8.44	0	10.98	0
8.44	0	11	0
8.34	0	10.87	0
8.2	0	10.74	0
8.18	0	10.72	0
8.08	0	10.63	0
8.06	0	10.61	0
8.04	0	10.59	0
8.02	0	10.61	0
8	0	10.59	0
7.98	0	10.57	0
7.98	0	10.57	0
7.96	0	10.55	0
7.94	0	10.55	0
7.92	0	10.55	0
7.92	0	10.53	0
7.9	0	10.53	0
7.88	0	10.53	0
7.88	0	10.53	0
7.78	0	10.42	0
7.84	0	10.48	0
7.92	0	10.57	0
8	0	10.68	0
8.12	0	10.81	0
8.22	0	10.92	0
8.2	0	10.92	0
8.12	0	10.83	0
7.98	0	10.68	0
7.96	0	10.66	0
7.82	0	10.55	0
7.78	0	10.5	0
7.76	0	10.46	0
7.74	0	10.46	0
7.72	0	10.46	0
7.72	0	10.46	0
7.7	0	10.44	0
7.7	0	10.44	0
7.68	0	10.44	0
7.68	0	10.42	0
7.66	0	10.4	0
7.64	0	10.4	0
7.64	0	10.4	0
7.62	0	10.38	0
7.5	0	10.25	0
7.6	0	10.35	0

7.66	0	10.44	0
7.76	0	10.55	0
7.9	0	10.72	0
8.06	0	10.89	0
8.06	0	10.89	0
7.96	0	10.79	0
7.8	0	10.61	0
7.76	0	10.57	0
7.62	0	10.42	0
7.58	0	10.38	0
7.54	0	10.35	0
7.54	0	10.33	0
7.52	0	10.33	0
7.5	0	10.31	0
7.48	0	10.31	0
7.48	0	10.31	0
7.48	0	10.31	0
7.46	0	10.29	0
7.46	0	10.27	0
7.44	0	10.27	0
7.44	0	10.27	0
7.44	0	10.27	0
7.36	0	10.18	0
7.36	0	10.18	0
7.44	0	10.27	0
7.52	0	10.35	0
7.62	0	10.48	0
7.72	0	10.59	0
7.66	0	10.53	0
7.68	0	10.53	0
7.62	0	10.48	0
7.56	0	10.42	0
7.42	0	10.29	0
7.4	0	10.25	0
7.38	0	10.23	0
7.36	0	10.23	0
7.36	0	10.23	0
7.38	0	10.25	0
7.38	0	10.25	0
7.38	0	10.25	0
7.36	0	10.25	0
7.36	0	10.25	0
7.36	0	10.25	0
7.36	0	10.23	0
7.34	0	10.23	0
7.32	0	10.2	0
7.24	0	10.1	0

7.26	0	10.14	0
7.38	0	10.27	0
7.5	0	10.42	0
7.6	0	10.53	0
7.74	0	10.68	0
7.74	0	10.66	0
7.56	0	10.48	0
7.44	0	10.33	0
7.38	0	10.27	0
7.32	0	10.2	0
7.3	0	10.2	0
7.28	0	10.18	0
7.26	0	10.16	0
7.22	0	10.12	0
7.18	0	10.08	0
7.17	0	10.06	0
7.17	0	10.03	0
7.17	0	10.06	0
7.17	0	10.06	0
7.15	0	10.03	0
7.15	0	10.03	0
7.15	0	10.01	0
7.13	0	10.01	0
7.01	0	9.86	0
7.13	0	9.99	0
7.2	0	10.08	0
7.32	0	10.2	0
7.46	0	10.35	0
7.56	0	10.44	0
7.78	0	10.7	0
7.62	0	10.53	0
7.44	0	10.33	0
7.28	0	10.16	0
7.2	0	10.06	0
7.18	0	10.03	0
7.17	0	10.01	0
7.17	0	10.01	0
7.17	0	10.01	0
7.17	0	10.01	0
7.17	0	10.01	0
7.17	0	10.01	0
7.17	0	9.99	0
7.17	0	9.99	0
7.17	0	9.99	0
7.18	0	10.01	0
7.17	0	9.99	0
7.17	0	9.97	0

7.15	0	9.95	0
7.11	0	9.91	0
7.18	0	9.99	0
7.44	0	10.27	0
7.74	0	10.59	0
7.76	0	10.61	0
7.62	0	10.44	0
7.46	0	10.27	0
7.42	0	10.23	0
7.34	0	10.14	0
7.26	0	10.06	0
7.24	0	10.03	0
7.22	0	9.99	0
7.2	0	9.97	0
7.2	0	9.97	0
7.18	0	9.93	0
7.18	0	9.93	0
7.18	0	9.91	0
7.2	0	9.93	0
7.18	0	9.91	0
7.18	0	9.89	0
7.18	0	9.86	0
7.18	0	9.86	0
7.15	0	9.82	0
7.01	0	9.63	0
7.15	0	9.8	0
7.38	0	10.03	0
7.86	0	10.53	0
8	0	10.68	0
7.7	0	10.33	0
7.62	0	10.25	0
7.56	0	10.16	0
7.46	0	10.06	0
7.48	0	10.03	0
7.38	0	9.93	0
7.32	0	9.86	0
7.26	0	9.8	0
7.22	0	9.74	0
7.22	0	9.72	0
7.22	0	9.72	0
7.22	0	9.72	0
7.22	0	9.7	0
7.2	0	9.65	0
7.2	0	9.63	0
7.22	0	9.65	0
7.22	0	9.65	0
7.24	0	9.65	0

7.22	0	9.63	0
7.13	0	9.51	0
7.22	0	9.59	0
7.28	0	9.65	0
7.38	0	9.74	0
7.5	0	9.86	0
8.12	0	10.55	0
8.24	0	10.66	0
7.96	0	10.33	0
7.66	0	10.03	0
7.54	0	9.89	0
7.44	0	9.78	0
7.4	0	9.74	0
7.38	0	9.72	0
7.36	0	9.7	0
7.34	0	9.68	0
7.36	0	9.68	0
7.38	0	9.7	0
7.36	0	9.68	0
7.34	0	9.65	0
7.36	0	9.68	0
7.38	0	9.7	0
7.38	0	9.68	0
7.36	0	9.65	0
7.34	0	9.63	0
7.3	0	9.57	0
7.18	0	9.47	0
7.28	0	9.57	0
7.36	0	9.65	0
7.42	0	9.7	0
7.44	0	9.72	0
7.36	0	9.63	0
7.36	0	9.63	0
7.34	0	9.61	0
7.38	0	9.65	0
7.3	0	9.57	0
7.26	0	9.53	0
7.26	0	9.53	0
7.26	0	9.51	0
7.24	0	9.51	0
7.24	0	9.49	0
7.22	0	9.49	0
7.22	0	9.49	0
7.2	0	9.47	0
7.2	0	9.47	0
7.22	0	9.49	0
7.22	0	9.49	0

7.22	0	9.49	0
7.2	0	9.49	0
7.15	0	9.42	0
7.13	0	9.38	0
7.18	0	9.47	0
7.24	0	9.53	0
7.26	0	9.55	0
7.3	0	9.59	0
7.28	0	9.59	0
7.26	0	9.55	0
7.2	0	9.53	0
7.24	0	9.55	0
7.18	0	9.51	0
7.15	0	9.49	0
7.13	0	9.47	0
7.11	0	9.44	0
7.11	0	9.44	0
7.09	0	9.44	0
7.09	0	9.44	0
7.05	0	9.42	0
7.03	0	9.4	0
7.03	0	9.4	0
7.01	0	9.38	0
7.01	0	9.38	0
6.99	0	9.38	0
6.97	0	9.36	0
6.83	0	9.22	0
6.95	0	9.36	0
7.01	0	9.42	0
7.09	0	9.51	0
7.18	0	9.61	0
7.28	0	9.74	0
7.3	0	9.76	0
7.22	0	9.68	0
7.11	0	9.57	0
7.09	0	9.55	0
6.99	0	9.44	0
6.93	0	9.4	0
6.91	0	9.38	0
6.89	0	9.38	0
6.87	0	9.38	0
6.87	0	9.38	0
6.87	0	9.36	0
6.85	0	9.38	0
6.87	0	9.38	0
6.85	0	9.38	0
6.83	0	9.36	0

6.83	0	9.36	0
6.83	0	9.38	0
6.82	0	9.36	0
6.74	0	9.28	0
6.76	0	9.32	0
6.85	0	9.4	0
6.95	0	9.55	0
7.09	0	9.68	0
7.22	0	9.82	0
7.22	0	9.84	0
7.13	0	9.76	0
6.97	0	9.57	0
6.91	0	9.53	0
6.82	0	9.42	0
6.78	0	9.4	0
6.76	0	9.36	0
6.74	0	9.36	0
6.72	0	9.36	0
6.7	0	9.34	0
6.68	0	9.32	0
6.7	0	9.34	0
6.7	0	9.36	0
6.7	0	9.38	0
6.7	0	9.38	0
6.68	0	9.36	0
6.68	0	9.36	0
6.66	0	9.34	0
6.56	0	9.24	0
6.58	0	9.26	0
6.68	0	9.38	0
6.82	0	9.53	0
6.95	0	9.68	0
7.09	0	9.84	0
6.95	0	9.68	0
6.87	0	9.61	0
6.82	0	9.55	0
6.72	0	9.44	0
6.62	0	9.36	0
6.56	0	9.3	0
6.55	0	9.26	0
6.53	0	9.26	0
6.51	0	9.26	0
6.51	0	9.24	0
6.51	0	9.24	0
6.51	0	9.24	0
6.49	0	9.24	0
6.49	0	9.22	0

6.47	0	9.2	0
6.45	0	9.2	0
6.47	0	9.22	0
6.45	0	9.2	0
6.32	0	9.05	0
6.41	0	9.17	0
6.49	0	9.26	0
6.64	0	9.4	0
6.82	0	9.59	0
7.01	0	9.8	0
6.95	0	9.76	0
6.85	0	9.65	0
6.64	0	9.4	0
6.58	0	9.34	0
6.47	0	9.22	0
6.41	0	9.17	0
6.39	0	9.13	0
6.37	0	9.13	0
6.35	0	9.11	0
6.35	0	9.11	0
6.34	0	9.09	0
6.35	0	9.11	0
6.35	0	9.09	0
6.34	0	9.09	0
6.32	0	9.07	0
6.32	0	9.07	0
6.3	0	9.05	0
6.28	0	9.03	0
6.13	0	8.89	0
6.26	0	9.01	0
6.32	0	9.09	0
6.37	0	9.13	0
6.49	0	9.26	0
6.58	0	9.36	0
6.62	0	9.4	0
6.56	0	9.38	0
6.45	0	9.24	0
6.41	0	9.2	0
6.34	0	9.09	0
6.3	0	9.05	0
6.26	0	9.03	0
6.26	0	9.01	0
6.22	0	8.99	0
6.2	0	8.97	0

Time stamp	YEAR	DAY OF YEAR	HOUR	TIME	DATE	Battery Voltage V	Precip inches
1/1/2016 0:00	2016	1	0	1	1/1/2016	12.62	0
1/1/2016 1:00	2016	1	100	1.041667	1/1/2016	12.6	0
1/1/2016 2:00	2016	1	200	1.083333	1/1/2016	12.57	0
1/1/2016 3:00	2016	1	300	1.125	1/1/2016	12.54	0
1/1/2016 4:00	2016	1	400	1.166667	1/1/2016	12.51	0
1/1/2016 5:00	2016	1	500	1.208333	1/1/2016	12.46	0
1/1/2016 6:00	2016	1	600	1.25	1/1/2016	12.41	0
1/1/2016 7:00	2016	1	700	1.291667	1/1/2016	12.35	0
1/1/2016 8:00	2016	1	800	1.333333	1/1/2016	12.32	0
1/1/2016 9:00	2016	1	900	1.375	1/1/2016	12.72	0
1/1/2016 10:00	2016	1	1000	1.416667	1/1/2016	13.74	0
1/1/2016 11:00	2016	1	1100	1.458333	1/1/2016	13.95	0
1/1/2016 12:00	2016	1	1200	1.5	1/1/2016	13.84	0
1/1/2016 13:00	2016	1	1300	1.541667	1/1/2016	13.77	0
1/1/2016 14:00	2016	1	1400	1.583333	1/1/2016	13.72	0
1/1/2016 15:00	2016	1	1500	1.625	1/1/2016	13.69	0
1/1/2016 16:00	2016	1	1600	1.666667	1/1/2016	13.69	0
1/1/2016 17:00	2016	1	1700	1.708333	1/1/2016	13.75	0
1/1/2016 18:00	2016	1	1800	1.75	1/1/2016	12.97	0
1/1/2016 19:00	2016	1	1900	1.791667	1/1/2016	12.83	0
1/1/2016 20:00	2016	1	2000	1.833333	1/1/2016	12.77	0
1/1/2016 21:00	2016	1	2100	1.875	1/1/2016	12.72	0
1/1/2016 22:00	2016	1	2200	1.916667	1/1/2016	12.68	0
1/1/2016 23:00	2016	1	2300	1.958333	1/1/2016	12.64	0
1/2/2016 0:00	2016	2	0	2	1/2/2016	12.61	0
1/2/2016 1:00	2016	2	100	2.041667	1/2/2016	12.58	0
1/2/2016 2:00	2016	2	200	2.083333	1/2/2016	12.55	0
1/2/2016 3:00	2016	2	300	2.125	1/2/2016	12.51	0
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1/2/2016 5:00	2016	2	500	2.208333	1/2/2016	12.4	0
1/2/2016 6:00	2016	2	600	2.25	1/2/2016	12.35	0
1/2/2016 7:00	2016	2	700	2.291667	1/2/2016	12.32	0
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1/2/2016 9:00	2016	2	900	2.375	1/2/2016	13.67	0
1/2/2016 10:00	2016	2	1000	2.416667	1/2/2016	13.99	0
1/2/2016 11:00	2016	2	1100	2.458333	1/2/2016	13.88	0
1/2/2016 12:00	2016	2	1200	2.5	1/2/2016	13.77	0
1/2/2016 13:00	2016	2	1300	2.541667	1/2/2016	13.67	0
1/2/2016 14:00	2016	2	1400	2.583333	1/2/2016	13.62	0
1/2/2016 15:00	2016	2	1500	2.625	1/2/2016	13.61	0
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1/2/2016 18:00	2016	2	1800	2.75	1/2/2016	12.94	0
1/2/2016 19:00	2016	2	1900	2.791667	1/2/2016	12.82	0

1/2/2016 20:00	2016	2	2000	2.833333	1/2/2016	12.77	0
1/2/2016 21:00	2016	2	2100	2.875	1/2/2016	12.72	0
1/2/2016 22:00	2016	2	2200	2.916667	1/2/2016	12.69	0
1/2/2016 23:00	2016	2	2300	2.958333	1/2/2016	12.66	0
1/3/2016 0:00	2016	3	0	3	1/3/2016	12.64	0
1/3/2016 1:00	2016	3	100	3.041667	1/3/2016	12.61	0
1/3/2016 2:00	2016	3	200	3.083333	1/3/2016	12.58	0
1/3/2016 3:00	2016	3	300	3.125	1/3/2016	12.55	0
1/3/2016 4:00	2016	3	400	3.166667	1/3/2016	12.52	0
1/3/2016 5:00	2016	3	500	3.208333	1/3/2016	12.49	0
1/3/2016 6:00	2016	3	600	3.25	1/3/2016	12.44	0
1/3/2016 7:00	2016	3	700	3.291667	1/3/2016	12.38	0
1/3/2016 8:00	2016	3	800	3.333333	1/3/2016	12.46	0
1/3/2016 9:00	2016	3	900	3.375	1/3/2016	12.88	0
1/3/2016 10:00	2016	3	1000	3.416667	1/3/2016	13.91	0
1/3/2016 11:00	2016	3	1100	3.458333	1/3/2016	13.84	0
1/3/2016 12:00	2016	3	1200	3.5	1/3/2016	13.77	0
1/3/2016 13:00	2016	3	1300	3.541667	1/3/2016	13.68	0
1/3/2016 14:00	2016	3	1400	3.583333	1/3/2016	13.67	0
1/3/2016 15:00	2016	3	1500	3.625	1/3/2016	13.67	0
1/3/2016 16:00	2016	3	1600	3.666667	1/3/2016	13.66	0
1/3/2016 17:00	2016	3	1700	3.708333	1/3/2016	13.4	0
1/3/2016 18:00	2016	3	1800	3.75	1/3/2016	12.91	0
1/3/2016 19:00	2016	3	1900	3.791667	1/3/2016	12.83	0
1/3/2016 20:00	2016	3	2000	3.833333	1/3/2016	12.78	0
1/3/2016 21:00	2016	3	2100	3.875	1/3/2016	12.75	0
1/3/2016 22:00	2016	3	2200	3.916667	1/3/2016	12.72	0
1/3/2016 23:00	2016	3	2300	3.958333	1/3/2016	12.7	0
1/4/2016 0:00	2016	4	0	4	1/4/2016	12.68	0
1/4/2016 1:00	2016	4	100	4.041667	1/4/2016	12.65	0
1/4/2016 2:00	2016	4	200	4.083333	1/4/2016	12.63	0
1/4/2016 3:00	2016	4	300	4.125	1/4/2016	12.6	0
1/4/2016 4:00	2016	4	400	4.166667	1/4/2016	12.56	0
1/4/2016 5:00	2016	4	500	4.208333	1/4/2016	12.51	0
1/4/2016 6:00	2016	4	600	4.25	1/4/2016	12.46	0
1/4/2016 7:00	2016	4	700	4.291667	1/4/2016	12.42	0
1/4/2016 8:00	2016	4	800	4.333333	1/4/2016	12.4	0
1/4/2016 9:00	2016	4	900	4.375	1/4/2016	12.47	0
1/4/2016 10:00	2016	4	1000	4.416667	1/4/2016	12.75	0
1/4/2016 11:00	2016	4	1100	4.458333	1/4/2016	13.52	0
1/4/2016 12:00	2016	4	1200	4.5	1/4/2016	13.77	0.01
1/4/2016 13:00	2016	4	1300	4.541667	1/4/2016	13.66	0
1/4/2016 14:00	2016	4	1400	4.583333	1/4/2016	13.7	0
1/4/2016 15:00	2016	4	1500	4.625	1/4/2016	13.72	0
1/4/2016 16:00	2016	4	1600	4.666667	1/4/2016	13.34	0
1/4/2016 17:00	2016	4	1700	4.708333	1/4/2016	13.01	0
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1/4/2016 19:00	2016	4	1900	4.791667	1/4/2016	12.8	0
1/4/2016 20:00	2016	4	2000	4.833333	1/4/2016	12.76	0
1/4/2016 21:00	2016	4	2100	4.875	1/4/2016	12.73	0
1/4/2016 22:00	2016	4	2200	4.916667	1/4/2016	12.7	0
1/4/2016 23:00	2016	4	2300	4.958333	1/4/2016	12.67	0
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1/5/2016 4:00	2016	5	400	5.166667	1/5/2016	12.45	0
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1/5/2016 6:00	2016	5	600	5.25	1/5/2016	12.42	0
1/5/2016 7:00	2016	5	700	5.291667	1/5/2016	12.41	0
1/5/2016 8:00	2016	5	800	5.333333	1/5/2016	12.42	0
1/5/2016 9:00	2016	5	900	5.375	1/5/2016	13.24	0
1/5/2016 10:00	2016	5	1000	5.416667	1/5/2016	13.53	0
1/5/2016 11:00	2016	5	1100	5.458333	1/5/2016	13.71	0
1/5/2016 12:00	2016	5	1200	5.5	1/5/2016	13.72	0
1/5/2016 13:00	2016	5	1300	5.541667	1/5/2016	13.66	0
1/5/2016 14:00	2016	5	1400	5.583333	1/5/2016	13.69	0
1/5/2016 15:00	2016	5	1500	5.625	1/5/2016	13.67	0
1/5/2016 16:00	2016	5	1600	5.666667	1/5/2016	13.29	0
1/5/2016 17:00	2016	5	1700	5.708333	1/5/2016	13.09	0
1/5/2016 18:00	2016	5	1800	5.75	1/5/2016	12.88	0
1/5/2016 19:00	2016	5	1900	5.791667	1/5/2016	12.81	0
1/5/2016 20:00	2016	5	2000	5.833333	1/5/2016	12.78	0.01
1/5/2016 21:00	2016	5	2100	5.875	1/5/2016	12.75	0
1/5/2016 22:00	2016	5	2200	5.916667	1/5/2016	12.72	0
1/5/2016 23:00	2016	5	2300	5.958333	1/5/2016	12.7	0
1/6/2016 0:00	2016	6	0	6	1/6/2016	12.68	0
1/6/2016 1:00	2016	6	100	6.041667	1/6/2016	12.65	0
1/6/2016 2:00	2016	6	200	6.083333	1/6/2016	12.63	0
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1/6/2016 4:00	2016	6	400	6.166667	1/6/2016	12.55	0
1/6/2016 5:00	2016	6	500	6.208333	1/6/2016	12.49	0
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1/6/2016 7:00	2016	6	700	6.291667	1/6/2016	12.43	0.01
1/6/2016 8:00	2016	6	800	6.333333	1/6/2016	12.42	0.01
1/6/2016 9:00	2016	6	900	6.375	1/6/2016	12.69	0
1/6/2016 10:00	2016	6	1000	6.416667	1/6/2016	13.7	0
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1/6/2016 12:00	2016	6	1200	6.5	1/6/2016	13.7	0
1/6/2016 13:00	2016	6	1300	6.541667	1/6/2016	13.68	0
1/6/2016 14:00	2016	6	1400	6.583333	1/6/2016	13.58	0
1/6/2016 15:00	2016	6	1500	6.625	1/6/2016	13.55	0
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1/6/2016 18:00	2016	6	1800	6.75	1/6/2016	12.99	0
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1/6/2016 20:00	2016	6	2000	6.833333	1/6/2016	12.79	0
1/6/2016 21:00	2016	6	2100	6.875	1/6/2016	12.75	0
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1/6/2016 23:00	2016	6	2300	6.958333	1/6/2016	12.71	0
1/7/2016 0:00	2016	7	0	7	1/7/2016	12.69	0
1/7/2016 1:00	2016	7	100	7.041667	1/7/2016	12.67	0
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1/7/2016 8:00	2016	7	800	7.333333	1/7/2016	12.47	0
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1/7/2016 13:00	2016	7	1300	7.541667	1/7/2016	13.39	0
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1/7/2016 15:00	2016	7	1500	7.625	1/7/2016	13.73	0
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1/7/2016 19:00	2016	7	1900	7.791667	1/7/2016	12.81	0
1/7/2016 20:00	2016	7	2000	7.833333	1/7/2016	12.77	0
1/7/2016 21:00	2016	7	2100	7.875	1/7/2016	12.73	0
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1/7/2016 23:00	2016	7	2300	7.958333	1/7/2016	12.68	0
1/8/2016 0:00	2016	8	0	8	1/8/2016	12.65	0
1/8/2016 1:00	2016	8	100	8.041667	1/8/2016	12.63	0
1/8/2016 2:00	2016	8	200	8.083333	1/8/2016	12.6	0
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1/8/2016 4:00	2016	8	400	8.166667	1/8/2016	12.52	0
1/8/2016 5:00	2016	8	500	8.208333	1/8/2016	12.46	0
1/8/2016 6:00	2016	8	600	8.25	1/8/2016	12.41	0
1/8/2016 7:00	2016	8	700	8.291667	1/8/2016	12.39	0
1/8/2016 8:00	2016	8	800	8.333333	1/8/2016	12.4	0
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1/8/2016 11:00	2016	8	1100	8.458333	1/8/2016	13.77	0
1/8/2016 12:00	2016	8	1200	8.5	1/8/2016	13.76	0
1/8/2016 13:00	2016	8	1300	8.541667	1/8/2016	13.73	0
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1/8/2016 15:00	2016	8	1500	8.625	1/8/2016	13.65	0
1/8/2016 16:00	2016	8	1600	8.666667	1/8/2016	13.65	0

1/8/2016 17:00	2016	8	1700	8.708333	1/8/2016	13.53	0
1/8/2016 18:00	2016	8	1800	8.75	1/8/2016	12.94	0
1/8/2016 19:00	2016	8	1900	8.791667	1/8/2016	12.82	0
1/8/2016 20:00	2016	8	2000	8.833333	1/8/2016	12.78	0
1/8/2016 21:00	2016	8	2100	8.875	1/8/2016	12.74	0
1/8/2016 22:00	2016	8	2200	8.916667	1/8/2016	12.71	0
1/8/2016 23:00	2016	8	2300	8.958333	1/8/2016	12.69	0
1/9/2016 0:00	2016	9	0	9	1/9/2016	12.67	0
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1/9/2016 2:00	2016	9	200	9.083333	1/9/2016	12.62	0
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1/9/2016 4:00	2016	9	400	9.166667	1/9/2016	12.57	0
1/9/2016 5:00	2016	9	500	9.208333	1/9/2016	12.54	0
1/9/2016 6:00	2016	9	600	9.25	1/9/2016	12.49	0
1/9/2016 7:00	2016	9	700	9.291667	1/9/2016	12.43	0
1/9/2016 8:00	2016	9	800	9.333333	1/9/2016	12.7	0
1/9/2016 9:00	2016	9	900	9.375	1/9/2016	13.93	0
1/9/2016 10:00	2016	9	1000	9.416667	1/9/2016	13.86	0
1/9/2016 11:00	2016	9	1100	9.458333	1/9/2016	13.78	0
1/9/2016 12:00	2016	9	1200	9.5	1/9/2016	13.71	0
1/9/2016 13:00	2016	9	1300	9.541667	1/9/2016	13.65	0
1/9/2016 14:00	2016	9	1400	9.583333	1/9/2016	13.61	0
1/9/2016 15:00	2016	9	1500	9.625	1/9/2016	13.6	0
1/9/2016 16:00	2016	9	1600	9.666667	1/9/2016	13.62	0
1/9/2016 17:00	2016	9	1700	9.708333	1/9/2016	13.71	0
1/9/2016 18:00	2016	9	1800	9.75	1/9/2016	13.04	0
1/9/2016 19:00	2016	9	1900	9.791667	1/9/2016	12.84	0
1/9/2016 20:00	2016	9	2000	9.833333	1/9/2016	12.79	0
1/9/2016 21:00	2016	9	2100	9.875	1/9/2016	12.75	0
1/9/2016 22:00	2016	9	2200	9.916667	1/9/2016	12.73	0
1/9/2016 23:00	2016	9	2300	9.958333	1/9/2016	12.7	0
1/10/2016 0:00	2016	10	0	10	1/10/2016	12.68	0
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1/10/2016 2:00	2016	10	200	10.08333	1/10/2016	12.63	0
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1/10/2016 6:00	2016	10	600	10.25	1/10/2016	12.54	0
1/10/2016 7:00	2016	10	700	10.29167	1/10/2016	12.5	0
1/10/2016 8:00	2016	10	800	10.33333	1/10/2016	12.48	0
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1/10/2016 12:00	2016	10	1200	10.5	1/10/2016	13.66	0
1/10/2016 13:00	2016	10	1300	10.54167	1/10/2016	13.66	0
1/10/2016 14:00	2016	10	1400	10.58333	1/10/2016	13.71	0
1/10/2016 15:00	2016	10	1500	10.625	1/10/2016	13.73	0

1/10/2016 16:00	2016	10	1600	10.66667	1/10/2016	13.37	0
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1/10/2016 18:00	2016	10	1800	10.75	1/10/2016	12.85	0
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1/10/2016 21:00	2016	10	2100	10.875	1/10/2016	12.72	0
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1/10/2016 23:00	2016	10	2300	10.95833	1/10/2016	12.64	0
1/11/2016 0:00	2016	11	0	11	1/11/2016	12.61	0
1/11/2016 1:00	2016	11	100	11.04167	1/11/2016	12.57	0
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1/11/2016 9:00	2016	11	900	11.375	1/11/2016	14.04	0
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1/11/2016 19:00	2016	11	1900	11.79167	1/11/2016	12.83	0
1/11/2016 20:00	2016	11	2000	11.83333	1/11/2016	12.76	0
1/11/2016 21:00	2016	11	2100	11.875	1/11/2016	12.71	0
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1/12/2016 0:00	2016	12	0	12	1/12/2016	12.61	0
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1/21/2016 14:00	2016	21	1400	21.58333	1/21/2016	13.51	0
1/21/2016 15:00	2016	21	1500	21.625	1/21/2016	13.5	0
1/21/2016 16:00	2016	21	1600	21.66667	1/21/2016	13.53	0
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1/21/2016 18:00	2016	21	1800	21.75	1/21/2016	13.23	0
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1/21/2016 20:00	2016	21	2000	21.83333	1/21/2016	12.79	0
1/21/2016 21:00	2016	21	2100	21.875	1/21/2016	12.75	0
1/21/2016 22:00	2016	21	2200	21.91667	1/21/2016	12.71	0
1/21/2016 23:00	2016	21	2300	21.95833	1/21/2016	12.69	0
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1/22/2016 8:00	2016	22	800	22.33333	1/22/2016	12.56	0
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1/22/2016 12:00	2016	22	1200	22.5	1/22/2016	13.67	0
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1/22/2016 21:00	2016	22	2100	22.875	1/22/2016	12.77	0
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1/22/2016 23:00	2016	22	2300	22.95833	1/22/2016	12.71	0
1/23/2016 0:00	2016	23	0	23	1/23/2016	12.68	0
1/23/2016 1:00	2016	23	100	23.04167	1/23/2016	12.66	0
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1/24/2016 22:00	2016	24	2200	24.91667	1/24/2016	12.73	0
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1/25/2016 1:00	2016	25	100	25.04167	1/25/2016	12.67	0
1/25/2016 2:00	2016	25	200	25.08333	1/25/2016	12.65	0
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1/29/2016 20:00	2016	29	2000	29.83333	1/29/2016	12.86	0
1/29/2016 21:00	2016	29	2100	29.875	1/29/2016	12.83	0
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1/29/2016 23:00	2016	29	2300	29.95833	1/29/2016	12.78	0
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1/31/2016 19:00	2016	31	1900	31.79167	1/31/2016	12.86	0
1/31/2016 20:00	2016	31	2000	31.83333	1/31/2016	12.81	0
1/31/2016 21:00	2016	31	2100	31.875	1/31/2016	12.78	0
1/31/2016 22:00	2016	31	2200	31.91667	1/31/2016	12.76	0.01
1/31/2016 23:00	2016	31	2300	31.95833	1/31/2016	12.74	0.22
2/1/2016 0:00	2016	32	0	32	2/1/2016	12.71	0.05
2/1/2016 1:00	2016	32	100	32.04167	2/1/2016	12.69	0
2/1/2016 2:00	2016	32	200	32.08333	2/1/2016	12.67	0
2/1/2016 3:00	2016	32	300	32.125	2/1/2016	12.64	0
2/1/2016 4:00	2016	32	400	32.16667	2/1/2016	12.62	0

2/1/2016 5:00	2016	32	500	32.20833	2/1/2016	12.59	0
2/1/2016 6:00	2016	32	600	32.25	2/1/2016	12.56	0
2/1/2016 7:00	2016	32	700	32.29167	2/1/2016	12.53	0
2/1/2016 8:00	2016	32	800	32.33333	2/1/2016	12.79	0
2/1/2016 9:00	2016	32	900	32.375	2/1/2016	13.84	0
2/1/2016 10:00	2016	32	1000	32.41667	2/1/2016	13.8	0
2/1/2016 11:00	2016	32	1100	32.45833	2/1/2016	13.78	0
2/1/2016 12:00	2016	32	1200	32.5	2/1/2016	13.77	0
2/1/2016 13:00	2016	32	1300	32.54167	2/1/2016	13.7	0
2/1/2016 14:00	2016	32	1400	32.58333	2/1/2016	13.68	0
2/1/2016 15:00	2016	32	1500	32.625	2/1/2016	13.68	0
2/1/2016 16:00	2016	32	1600	32.66667	2/1/2016	13.7	0
2/1/2016 17:00	2016	32	1700	32.70833	2/1/2016	13.47	0
2/1/2016 18:00	2016	32	1800	32.75	2/1/2016	13.17	0
2/1/2016 19:00	2016	32	1900	32.79167	2/1/2016	12.85	0
2/1/2016 20:00	2016	32	2000	32.83333	2/1/2016	12.79	0
2/1/2016 21:00	2016	32	2100	32.875	2/1/2016	12.74	0
2/1/2016 22:00	2016	32	2200	32.91667	2/1/2016	12.71	0
2/1/2016 23:00	2016	32	2300	32.95833	2/1/2016	12.68	0
2/2/2016 0:00	2016	33	0	33	2/2/2016	12.65	0
2/2/2016 1:00	2016	33	100	33.04167	2/2/2016	12.62	0
2/2/2016 2:00	2016	33	200	33.08333	2/2/2016	12.58	0
2/2/2016 3:00	2016	33	300	33.125	2/2/2016	12.55	0
2/2/2016 4:00	2016	33	400	33.16667	2/2/2016	12.5	0
2/2/2016 5:00	2016	33	500	33.20833	2/2/2016	12.45	0
2/2/2016 6:00	2016	33	600	33.25	2/2/2016	12.42	0
2/2/2016 7:00	2016	33	700	33.29167	2/2/2016	12.41	0
2/2/2016 8:00	2016	33	800	33.33333	2/2/2016	13.01	0
2/2/2016 9:00	2016	33	900	33.375	2/2/2016	14	0
2/2/2016 10:00	2016	33	1000	33.41667	2/2/2016	13.93	0
2/2/2016 11:00	2016	33	1100	33.45833	2/2/2016	13.85	0
2/2/2016 12:00	2016	33	1200	33.5	2/2/2016	13.77	0
2/2/2016 13:00	2016	33	1300	33.54167	2/2/2016	13.71	0
2/2/2016 14:00	2016	33	1400	33.58333	2/2/2016	13.67	0
2/2/2016 15:00	2016	33	1500	33.625	2/2/2016	13.67	0
2/2/2016 16:00	2016	33	1600	33.66667	2/2/2016	13.7	0
2/2/2016 17:00	2016	33	1700	33.70833	2/2/2016	13.77	0
2/2/2016 18:00	2016	33	1800	33.75	2/2/2016	13.38	0
2/2/2016 19:00	2016	33	1900	33.79167	2/2/2016	12.86	0
2/2/2016 20:00	2016	33	2000	33.83333	2/2/2016	12.79	0
2/2/2016 21:00	2016	33	2100	33.875	2/2/2016	12.75	0
2/2/2016 22:00	2016	33	2200	33.91667	2/2/2016	12.72	0
2/2/2016 23:00	2016	33	2300	33.95833	2/2/2016	12.69	0
2/3/2016 0:00	2016	34	0	34	2/3/2016	12.66	0
2/3/2016 1:00	2016	34	100	34.04167	2/3/2016	12.63	0
2/3/2016 2:00	2016	34	200	34.08333	2/3/2016	12.6	0
2/3/2016 3:00	2016	34	300	34.125	2/3/2016	12.56	0

2/3/2016 4:00	2016	34	400	34.16667	2/3/2016	12.52	0
2/3/2016 5:00	2016	34	500	34.20833	2/3/2016	12.47	0
2/3/2016 6:00	2016	34	600	34.25	2/3/2016	12.41	0
2/3/2016 7:00	2016	34	700	34.29167	2/3/2016	12.38	0
2/3/2016 8:00	2016	34	800	34.33333	2/3/2016	13.07	0
2/3/2016 9:00	2016	34	900	34.375	2/3/2016	14.06	0
2/3/2016 10:00	2016	34	1000	34.41667	2/3/2016	13.95	0
2/3/2016 11:00	2016	34	1100	34.45833	2/3/2016	13.85	0
2/3/2016 12:00	2016	34	1200	34.5	2/3/2016	13.75	0
2/3/2016 13:00	2016	34	1300	34.54167	2/3/2016	13.68	0
2/3/2016 14:00	2016	34	1400	34.58333	2/3/2016	13.63	0
2/3/2016 15:00	2016	34	1500	34.625	2/3/2016	13.63	0
2/3/2016 16:00	2016	34	1600	34.66667	2/3/2016	13.66	0
2/3/2016 17:00	2016	34	1700	34.70833	2/3/2016	13.72	0
2/3/2016 18:00	2016	34	1800	34.75	2/3/2016	13.36	0
2/3/2016 19:00	2016	34	1900	34.79167	2/3/2016	12.86	0
2/3/2016 20:00	2016	34	2000	34.83333	2/3/2016	12.78	0
2/3/2016 21:00	2016	34	2100	34.875	2/3/2016	12.73	0
2/3/2016 22:00	2016	34	2200	34.91667	2/3/2016	12.69	0
2/3/2016 23:00	2016	34	2300	34.95833	2/3/2016	12.66	0
2/4/2016 0:00	2016	35	0	35	2/4/2016	12.63	0
2/4/2016 1:00	2016	35	100	35.04167	2/4/2016	12.6	0
2/4/2016 2:00	2016	35	200	35.08333	2/4/2016	12.58	0
2/4/2016 3:00	2016	35	300	35.125	2/4/2016	12.55	0
2/4/2016 4:00	2016	35	400	35.16667	2/4/2016	12.52	0
2/4/2016 5:00	2016	35	500	35.20833	2/4/2016	12.48	0
2/4/2016 6:00	2016	35	600	35.25	2/4/2016	12.42	0
2/4/2016 7:00	2016	35	700	35.29167	2/4/2016	12.38	0
2/4/2016 8:00	2016	35	800	35.33333	2/4/2016	12.55	0
2/4/2016 9:00	2016	35	900	35.375	2/4/2016	13.34	0
2/4/2016 10:00	2016	35	1000	35.41667	2/4/2016	13.93	0
2/4/2016 11:00	2016	35	1100	35.45833	2/4/2016	13.82	0
2/4/2016 12:00	2016	35	1200	35.5	2/4/2016	13.71	0
2/4/2016 13:00	2016	35	1300	35.54167	2/4/2016	13.62	0
2/4/2016 14:00	2016	35	1400	35.58333	2/4/2016	13.57	0
2/4/2016 15:00	2016	35	1500	35.625	2/4/2016	13.56	0
2/4/2016 16:00	2016	35	1600	35.66667	2/4/2016	13.59	0
2/4/2016 17:00	2016	35	1700	35.70833	2/4/2016	13.67	0
2/4/2016 18:00	2016	35	1800	35.75	2/4/2016	13.36	0
2/4/2016 19:00	2016	35	1900	35.79167	2/4/2016	12.87	0
2/4/2016 20:00	2016	35	2000	35.83333	2/4/2016	12.8	0
2/4/2016 21:00	2016	35	2100	35.875	2/4/2016	12.74	0
2/4/2016 22:00	2016	35	2200	35.91667	2/4/2016	12.71	0
2/4/2016 23:00	2016	35	2300	35.95833	2/4/2016	12.68	0
2/5/2016 0:00	2016	36	0	36	2/5/2016	12.66	0
2/5/2016 1:00	2016	36	100	36.04167	2/5/2016	12.63	0
2/5/2016 2:00	2016	36	200	36.08333	2/5/2016	12.61	0

2/5/2016 3:00	2016	36	300	36.125	2/5/2016	12.58	0
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2/5/2016 5:00	2016	36	500	36.20833	2/5/2016	12.52	0
2/5/2016 6:00	2016	36	600	36.25	2/5/2016	12.48	0
2/5/2016 7:00	2016	36	700	36.29167	2/5/2016	12.43	0
2/5/2016 8:00	2016	36	800	36.33333	2/5/2016	13.04	0
2/5/2016 9:00	2016	36	900	36.375	2/5/2016	14	0
2/5/2016 10:00	2016	36	1000	36.41667	2/5/2016	13.88	0
2/5/2016 11:00	2016	36	1100	36.45833	2/5/2016	13.77	0
2/5/2016 12:00	2016	36	1200	36.5	2/5/2016	13.68	0
2/5/2016 13:00	2016	36	1300	36.54167	2/5/2016	13.62	0
2/5/2016 14:00	2016	36	1400	36.58333	2/5/2016	13.58	0
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2/5/2016 16:00	2016	36	1600	36.66667	2/5/2016	13.59	0
2/5/2016 17:00	2016	36	1700	36.70833	2/5/2016	13.65	0
2/5/2016 18:00	2016	36	1800	36.75	2/5/2016	13.36	0
2/5/2016 19:00	2016	36	1900	36.79167	2/5/2016	12.88	0
2/5/2016 20:00	2016	36	2000	36.83333	2/5/2016	12.8	0
2/5/2016 21:00	2016	36	2100	36.875	2/5/2016	12.75	0
2/5/2016 22:00	2016	36	2200	36.91667	2/5/2016	12.71	0
2/5/2016 23:00	2016	36	2300	36.95833	2/5/2016	12.68	0
2/6/2016 0:00	2016	37	0	37	2/6/2016	12.65	0
2/6/2016 1:00	2016	37	100	37.04167	2/6/2016	12.63	0
2/6/2016 2:00	2016	37	200	37.08333	2/6/2016	12.6	0
2/6/2016 3:00	2016	37	300	37.125	2/6/2016	12.58	0
2/6/2016 4:00	2016	37	400	37.16667	2/6/2016	12.55	0
2/6/2016 5:00	2016	37	500	37.20833	2/6/2016	12.52	0
2/6/2016 6:00	2016	37	600	37.25	2/6/2016	12.48	0
2/6/2016 7:00	2016	37	700	37.29167	2/6/2016	12.43	0
2/6/2016 8:00	2016	37	800	37.33333	2/6/2016	13.12	0
2/6/2016 9:00	2016	37	900	37.375	2/6/2016	14.01	0
2/6/2016 10:00	2016	37	1000	37.41667	2/6/2016	13.88	0
2/6/2016 11:00	2016	37	1100	37.45833	2/6/2016	13.77	0
2/6/2016 12:00	2016	37	1200	37.5	2/6/2016	13.68	0
2/6/2016 13:00	2016	37	1300	37.54167	2/6/2016	13.6	0
2/6/2016 14:00	2016	37	1400	37.58333	2/6/2016	13.55	0
2/6/2016 15:00	2016	37	1500	37.625	2/6/2016	13.52	0
2/6/2016 16:00	2016	37	1600	37.66667	2/6/2016	13.55	0
2/6/2016 17:00	2016	37	1700	37.70833	2/6/2016	13.61	0
2/6/2016 18:00	2016	37	1800	37.75	2/6/2016	13.33	0
2/6/2016 19:00	2016	37	1900	37.79167	2/6/2016	12.88	0
2/6/2016 20:00	2016	37	2000	37.83333	2/6/2016	12.81	0
2/6/2016 21:00	2016	37	2100	37.875	2/6/2016	12.75	0
2/6/2016 22:00	2016	37	2200	37.91667	2/6/2016	12.72	0
2/6/2016 23:00	2016	37	2300	37.95833	2/6/2016	12.69	0
2/7/2016 0:00	2016	38	0	38	2/7/2016	12.66	0
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2/7/2016 2:00	2016	38	200	38.08333	2/7/2016	12.61	0
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2/7/2016 4:00	2016	38	400	38.16667	2/7/2016	12.57	0
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2/7/2016 7:00	2016	38	700	38.29167	2/7/2016	12.45	0
2/7/2016 8:00	2016	38	800	38.33333	2/7/2016	13.09	0
2/7/2016 9:00	2016	38	900	38.375	2/7/2016	13.96	0
2/7/2016 10:00	2016	38	1000	38.41667	2/7/2016	13.82	0
2/7/2016 11:00	2016	38	1100	38.45833	2/7/2016	13.69	0
2/7/2016 12:00	2016	38	1200	38.5	2/7/2016	13.59	0
2/7/2016 13:00	2016	38	1300	38.54167	2/7/2016	13.52	0
2/7/2016 14:00	2016	38	1400	38.58333	2/7/2016	13.46	0
2/7/2016 15:00	2016	38	1500	38.625	2/7/2016	13.44	0
2/7/2016 16:00	2016	38	1600	38.66667	2/7/2016	13.46	0
2/7/2016 17:00	2016	38	1700	38.70833	2/7/2016	13.52	0
2/7/2016 18:00	2016	38	1800	38.75	2/7/2016	13.29	0
2/7/2016 19:00	2016	38	1900	38.79167	2/7/2016	12.89	0
2/7/2016 20:00	2016	38	2000	38.83333	2/7/2016	12.82	0
2/7/2016 21:00	2016	38	2100	38.875	2/7/2016	12.77	0
2/7/2016 22:00	2016	38	2200	38.91667	2/7/2016	12.73	0
2/7/2016 23:00	2016	38	2300	38.95833	2/7/2016	12.7	0
2/8/2016 0:00	2016	39	0	39	2/8/2016	12.67	0
2/8/2016 1:00	2016	39	100	39.04167	2/8/2016	12.65	0
2/8/2016 2:00	2016	39	200	39.08333	2/8/2016	12.63	0
2/8/2016 3:00	2016	39	300	39.125	2/8/2016	12.61	0
2/8/2016 4:00	2016	39	400	39.16667	2/8/2016	12.59	0
2/8/2016 5:00	2016	39	500	39.20833	2/8/2016	12.56	0
2/8/2016 6:00	2016	39	600	39.25	2/8/2016	12.53	0
2/8/2016 7:00	2016	39	700	39.29167	2/8/2016	12.5	0
2/8/2016 8:00	2016	39	800	39.33333	2/8/2016	13.11	0
2/8/2016 9:00	2016	39	900	39.375	2/8/2016	13.89	0
2/8/2016 10:00	2016	39	1000	39.41667	2/8/2016	13.76	0
2/8/2016 11:00	2016	39	1100	39.45833	2/8/2016	13.63	0
2/8/2016 12:00	2016	39	1200	39.5	2/8/2016	13.53	0
2/8/2016 13:00	2016	39	1300	39.54167	2/8/2016	13.46	0
2/8/2016 14:00	2016	39	1400	39.58333	2/8/2016	13.42	0
2/8/2016 15:00	2016	39	1500	39.625	2/8/2016	13.4	0
2/8/2016 16:00	2016	39	1600	39.66667	2/8/2016	13.42	0
2/8/2016 17:00	2016	39	1700	39.70833	2/8/2016	13.47	0
2/8/2016 18:00	2016	39	1800	39.75	2/8/2016	13.26	0
2/8/2016 19:00	2016	39	1900	39.79167	2/8/2016	12.9	0
2/8/2016 20:00	2016	39	2000	39.83333	2/8/2016	12.83	0
2/8/2016 21:00	2016	39	2100	39.875	2/8/2016	12.78	0
2/8/2016 22:00	2016	39	2200	39.91667	2/8/2016	12.74	0
2/8/2016 23:00	2016	39	2300	39.95833	2/8/2016	12.71	0
2/9/2016 0:00	2016	40	0	40	2/9/2016	12.69	0

2/9/2016 1:00	2016	40	100	40.04167	2/9/2016	12.66	0
2/9/2016 2:00	2016	40	200	40.08333	2/9/2016	12.64	0
2/9/2016 3:00	2016	40	300	40.125	2/9/2016	12.62	0
2/9/2016 4:00	2016	40	400	40.16667	2/9/2016	12.6	0
2/9/2016 5:00	2016	40	500	40.20833	2/9/2016	12.58	0
2/9/2016 6:00	2016	40	600	40.25	2/9/2016	12.55	0
2/9/2016 7:00	2016	40	700	40.29167	2/9/2016	12.52	0
2/9/2016 8:00	2016	40	800	40.33333	2/9/2016	13.11	0
2/9/2016 9:00	2016	40	900	40.375	2/9/2016	13.85	0
2/9/2016 10:00	2016	40	1000	40.41667	2/9/2016	13.72	0
2/9/2016 11:00	2016	40	1100	40.45833	2/9/2016	13.59	0
2/9/2016 12:00	2016	40	1200	40.5	2/9/2016	13.5	0
2/9/2016 13:00	2016	40	1300	40.54167	2/9/2016	13.44	0
2/9/2016 14:00	2016	40	1400	40.58333	2/9/2016	13.39	0
2/9/2016 15:00	2016	40	1500	40.625	2/9/2016	13.38	0
2/9/2016 16:00	2016	40	1600	40.66667	2/9/2016	13.4	0
2/9/2016 17:00	2016	40	1700	40.70833	2/9/2016	13.45	0
2/9/2016 18:00	2016	40	1800	40.75	2/9/2016	13.26	0
2/9/2016 19:00	2016	40	1900	40.79167	2/9/2016	12.9	0
2/9/2016 20:00	2016	40	2000	40.83333	2/9/2016	12.83	0
2/9/2016 21:00	2016	40	2100	40.875	2/9/2016	12.78	0
2/9/2016 22:00	2016	40	2200	40.91667	2/9/2016	12.74	0
2/9/2016 23:00	2016	40	2300	40.95833	2/9/2016	12.71	0
2/10/2016 0:00	2016	41	0	41	2/10/2016	12.69	0
2/10/2016 1:00	2016	41	100	41.04167	2/10/2016	12.66	0
2/10/2016 2:00	2016	41	200	41.08333	2/10/2016	12.64	0
2/10/2016 3:00	2016	41	300	41.125	2/10/2016	12.62	0
2/10/2016 4:00	2016	41	400	41.16667	2/10/2016	12.6	0
2/10/2016 5:00	2016	41	500	41.20833	2/10/2016	12.57	0
2/10/2016 6:00	2016	41	600	41.25	2/10/2016	12.55	0
2/10/2016 7:00	2016	41	700	41.29167	2/10/2016	12.52	0
2/10/2016 8:00	2016	41	800	41.33333	2/10/2016	13.15	0
2/10/2016 9:00	2016	41	900	41.375	2/10/2016	13.86	0
2/10/2016 10:00	2016	41	1000	41.41667	2/10/2016	13.72	0
2/10/2016 11:00	2016	41	1100	41.45833	2/10/2016	13.59	0
2/10/2016 12:00	2016	41	1200	41.5	2/10/2016	13.5	0
2/10/2016 13:00	2016	41	1300	41.54167	2/10/2016	13.43	0
2/10/2016 14:00	2016	41	1400	41.58333	2/10/2016	13.38	0
2/10/2016 15:00	2016	41	1500	41.625	2/10/2016	13.38	0
2/10/2016 16:00	2016	41	1600	41.66667	2/10/2016	13.39	0
2/10/2016 17:00	2016	41	1700	41.70833	2/10/2016	13.45	0
2/10/2016 18:00	2016	41	1800	41.75	2/10/2016	13.34	0
2/10/2016 19:00	2016	41	1900	41.79167	2/10/2016	12.91	0
2/10/2016 20:00	2016	41	2000	41.83333	2/10/2016	12.83	0
2/10/2016 21:00	2016	41	2100	41.875	2/10/2016	12.78	0
2/10/2016 22:00	2016	41	2200	41.91667	2/10/2016	12.75	0
2/10/2016 23:00	2016	41	2300	41.95833	2/10/2016	12.72	0

2/11/2016 0:00	2016	42	0	42	2/11/2016	12.69	0
2/11/2016 1:00	2016	42	100	42.04167	2/11/2016	12.67	0
2/11/2016 2:00	2016	42	200	42.08333	2/11/2016	12.64	0
2/11/2016 3:00	2016	42	300	42.125	2/11/2016	12.62	0
2/11/2016 4:00	2016	42	400	42.16667	2/11/2016	12.6	0
2/11/2016 5:00	2016	42	500	42.20833	2/11/2016	12.58	0
2/11/2016 6:00	2016	42	600	42.25	2/11/2016	12.55	0
2/11/2016 7:00	2016	42	700	42.29167	2/11/2016	12.52	0
2/11/2016 8:00	2016	42	800	42.33333	2/11/2016	13.17	0
2/11/2016 9:00	2016	42	900	42.375	2/11/2016	13.86	0
2/11/2016 10:00	2016	42	1000	42.41667	2/11/2016	13.72	0
2/11/2016 11:00	2016	42	1100	42.45833	2/11/2016	13.58	0
2/11/2016 12:00	2016	42	1200	42.5	2/11/2016	13.49	0
2/11/2016 13:00	2016	42	1300	42.54167	2/11/2016	13.41	0
2/11/2016 14:00	2016	42	1400	42.58333	2/11/2016	13.36	0
2/11/2016 15:00	2016	42	1500	42.625	2/11/2016	13.34	0
2/11/2016 16:00	2016	42	1600	42.66667	2/11/2016	13.36	0
2/11/2016 17:00	2016	42	1700	42.70833	2/11/2016	13.41	0
2/11/2016 18:00	2016	42	1800	42.75	2/11/2016	13.24	0
2/11/2016 19:00	2016	42	1900	42.79167	2/11/2016	12.9	0
2/11/2016 20:00	2016	42	2000	42.83333	2/11/2016	12.83	0
2/11/2016 21:00	2016	42	2100	42.875	2/11/2016	12.79	0
2/11/2016 22:00	2016	42	2200	42.91667	2/11/2016	12.75	0
2/11/2016 23:00	2016	42	2300	42.95833	2/11/2016	12.72	0
2/12/2016 0:00	2016	43	0	43	2/12/2016	12.7	0
2/12/2016 1:00	2016	43	100	43.04167	2/12/2016	12.67	0
2/12/2016 2:00	2016	43	200	43.08333	2/12/2016	12.65	0
2/12/2016 3:00	2016	43	300	43.125	2/12/2016	12.63	0
2/12/2016 4:00	2016	43	400	43.16667	2/12/2016	12.6	0
2/12/2016 5:00	2016	43	500	43.20833	2/12/2016	12.58	0
2/12/2016 6:00	2016	43	600	43.25	2/12/2016	12.55	0
2/12/2016 7:00	2016	43	700	43.29167	2/12/2016	12.52	0
2/12/2016 8:00	2016	43	800	43.33333	2/12/2016	13.14	0
2/12/2016 9:00	2016	43	900	43.375	2/12/2016	13.83	0
2/12/2016 10:00	2016	43	1000	43.41667	2/12/2016	13.7	0
2/12/2016 11:00	2016	43	1100	43.45833	2/12/2016	13.58	0
2/12/2016 12:00	2016	43	1200	43.5	2/12/2016	13.49	0
2/12/2016 13:00	2016	43	1300	43.54167	2/12/2016	13.41	0
2/12/2016 14:00	2016	43	1400	43.58333	2/12/2016	13.36	0
2/12/2016 15:00	2016	43	1500	43.625	2/12/2016	13.34	0
2/12/2016 16:00	2016	43	1600	43.66667	2/12/2016	13.35	0
2/12/2016 17:00	2016	43	1700	43.70833	2/12/2016	13.39	0
2/12/2016 18:00	2016	43	1800	43.75	2/12/2016	13.24	0
2/12/2016 19:00	2016	43	1900	43.79167	2/12/2016	12.91	0
2/12/2016 20:00	2016	43	2000	43.83333	2/12/2016	12.84	0
2/12/2016 21:00	2016	43	2100	43.875	2/12/2016	12.79	0
2/12/2016 22:00	2016	43	2200	43.91667	2/12/2016	12.76	0

2/12/2016 23:00	2016	43	2300	43.95833	2/12/2016	12.73	0
2/13/2016 0:00	2016	44	0	44	2/13/2016	12.7	0
2/13/2016 1:00	2016	44	100	44.04167	2/13/2016	12.68	0
2/13/2016 2:00	2016	44	200	44.08333	2/13/2016	12.66	0
2/13/2016 3:00	2016	44	300	44.125	2/13/2016	12.64	0
2/13/2016 4:00	2016	44	400	44.16667	2/13/2016	12.61	0
2/13/2016 5:00	2016	44	500	44.20833	2/13/2016	12.59	0
2/13/2016 6:00	2016	44	600	44.25	2/13/2016	12.56	0
2/13/2016 7:00	2016	44	700	44.29167	2/13/2016	12.53	0
2/13/2016 8:00	2016	44	800	44.33333	2/13/2016	13.17	0
2/13/2016 9:00	2016	44	900	44.375	2/13/2016	13.8	0
2/13/2016 10:00	2016	44	1000	44.41667	2/13/2016	13.66	0
2/13/2016 11:00	2016	44	1100	44.45833	2/13/2016	13.54	0
2/13/2016 12:00	2016	44	1200	44.5	2/13/2016	13.45	0
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2/13/2016 16:00	2016	44	1600	44.66667	2/13/2016	13.31	0
2/13/2016 17:00	2016	44	1700	44.70833	2/13/2016	13.35	0
2/13/2016 18:00	2016	44	1800	44.75	2/13/2016	13.24	0
2/13/2016 19:00	2016	44	1900	44.79167	2/13/2016	12.91	0
2/13/2016 20:00	2016	44	2000	44.83333	2/13/2016	12.85	0
2/13/2016 21:00	2016	44	2100	44.875	2/13/2016	12.8	0
2/13/2016 22:00	2016	44	2200	44.91667	2/13/2016	12.77	0
2/13/2016 23:00	2016	44	2300	44.95833	2/13/2016	12.74	0
2/14/2016 0:00	2016	45	0	45	2/14/2016	12.72	0
2/14/2016 1:00	2016	45	100	45.04167	2/14/2016	12.69	0
2/14/2016 2:00	2016	45	200	45.08333	2/14/2016	12.68	0
2/14/2016 3:00	2016	45	300	45.125	2/14/2016	12.65	0
2/14/2016 4:00	2016	45	400	45.16667	2/14/2016	12.63	0
2/14/2016 5:00	2016	45	500	45.20833	2/14/2016	12.6	0
2/14/2016 6:00	2016	45	600	45.25	2/14/2016	12.57	0
2/14/2016 7:00	2016	45	700	45.29167	2/14/2016	12.54	0
2/14/2016 8:00	2016	45	800	45.33333	2/14/2016	13.13	0
2/14/2016 9:00	2016	45	900	45.375	2/14/2016	13.76	0
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2/14/2016 13:00	2016	45	1300	45.54167	2/14/2016	13.36	0
2/14/2016 14:00	2016	45	1400	45.58333	2/14/2016	13.31	0
2/14/2016 15:00	2016	45	1500	45.625	2/14/2016	13.3	0
2/14/2016 16:00	2016	45	1600	45.66667	2/14/2016	13.32	0
2/14/2016 17:00	2016	45	1700	45.70833	2/14/2016	13.36	0
2/14/2016 18:00	2016	45	1800	45.75	2/14/2016	13.28	0
2/14/2016 19:00	2016	45	1900	45.79167	2/14/2016	12.92	0
2/14/2016 20:00	2016	45	2000	45.83333	2/14/2016	12.86	0
2/14/2016 21:00	2016	45	2100	45.875	2/14/2016	12.82	0

2/14/2016 22:00	2016	45	2200	45.91667	2/14/2016	12.79	0
2/14/2016 23:00	2016	45	2300	45.95833	2/14/2016	12.76	0
2/15/2016 0:00	2016	46	0	46	2/15/2016	12.74	0
2/15/2016 1:00	2016	46	100	46.04167	2/15/2016	12.71	0
2/15/2016 2:00	2016	46	200	46.08333	2/15/2016	12.68	0
2/15/2016 3:00	2016	46	300	46.125	2/15/2016	12.65	0
2/15/2016 4:00	2016	46	400	46.16667	2/15/2016	12.63	0
2/15/2016 5:00	2016	46	500	46.20833	2/15/2016	12.6	0
2/15/2016 6:00	2016	46	600	46.25	2/15/2016	12.58	0
2/15/2016 7:00	2016	46	700	46.29167	2/15/2016	12.54	0
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2/15/2016 9:00	2016	46	900	46.375	2/15/2016	13.74	0
2/15/2016 10:00	2016	46	1000	46.41667	2/15/2016	13.61	0
2/15/2016 11:00	2016	46	1100	46.45833	2/15/2016	13.5	0
2/15/2016 12:00	2016	46	1200	46.5	2/15/2016	13.41	0
2/15/2016 13:00	2016	46	1300	46.54167	2/15/2016	13.35	0
2/15/2016 14:00	2016	46	1400	46.58333	2/15/2016	13.32	0
2/15/2016 15:00	2016	46	1500	46.625	2/15/2016	13.3	0
2/15/2016 16:00	2016	46	1600	46.66667	2/15/2016	13.31	0
2/15/2016 17:00	2016	46	1700	46.70833	2/15/2016	13.35	0
2/15/2016 18:00	2016	46	1800	46.75	2/15/2016	13.31	0
2/15/2016 19:00	2016	46	1900	46.79167	2/15/2016	12.93	0
2/15/2016 20:00	2016	46	2000	46.83333	2/15/2016	12.85	0
2/15/2016 21:00	2016	46	2100	46.875	2/15/2016	12.81	0
2/15/2016 22:00	2016	46	2200	46.91667	2/15/2016	12.77	0
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2/16/2016 0:00	2016	47	0	47	2/16/2016	12.71	0
2/16/2016 1:00	2016	47	100	47.04167	2/16/2016	12.69	0
2/16/2016 2:00	2016	47	200	47.08333	2/16/2016	12.67	0
2/16/2016 3:00	2016	47	300	47.125	2/16/2016	12.64	0
2/16/2016 4:00	2016	47	400	47.16667	2/16/2016	12.62	0
2/16/2016 5:00	2016	47	500	47.20833	2/16/2016	12.6	0
2/16/2016 6:00	2016	47	600	47.25	2/16/2016	12.57	0
2/16/2016 7:00	2016	47	700	47.29167	2/16/2016	12.54	0
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2/16/2016 9:00	2016	47	900	47.375	2/16/2016	13.77	0
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2/16/2016 11:00	2016	47	1100	47.45833	2/16/2016	13.5	0
2/16/2016 12:00	2016	47	1200	47.5	2/16/2016	13.41	0
2/16/2016 13:00	2016	47	1300	47.54167	2/16/2016	13.34	0
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2/16/2016 15:00	2016	47	1500	47.625	2/16/2016	13.29	0
2/16/2016 16:00	2016	47	1600	47.66667	2/16/2016	13.29	0
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2/16/2016 18:00	2016	47	1800	47.75	2/16/2016	13.27	0
2/16/2016 19:00	2016	47	1900	47.79167	2/16/2016	12.92	0
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2/16/2016 22:00	2016	47	2200	47.91667	2/16/2016	12.76	0
2/16/2016 23:00	2016	47	2300	47.95833	2/16/2016	12.73	0
2/17/2016 0:00	2016	48	0	48	2/17/2016	12.7	0
2/17/2016 1:00	2016	48	100	48.04167	2/17/2016	12.68	0
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2/17/2016 3:00	2016	48	300	48.125	2/17/2016	12.64	0
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2/17/2016 5:00	2016	48	500	48.20833	2/17/2016	12.58	0
2/17/2016 6:00	2016	48	600	48.25	2/17/2016	12.55	0
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2/17/2016 10:00	2016	48	1000	48.41667	2/17/2016	13.64	0
2/17/2016 11:00	2016	48	1100	48.45833	2/17/2016	13.52	0
2/17/2016 12:00	2016	48	1200	48.5	2/17/2016	13.43	0
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2/17/2016 15:00	2016	48	1500	48.625	2/17/2016	13.27	0
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2/17/2016 17:00	2016	48	1700	48.70833	2/17/2016	13.3	0
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2/17/2016 19:00	2016	48	1900	48.79167	2/17/2016	12.94	0
2/17/2016 20:00	2016	48	2000	48.83333	2/17/2016	12.87	0
2/17/2016 21:00	2016	48	2100	48.875	2/17/2016	12.83	0
2/17/2016 22:00	2016	48	2200	48.91667	2/17/2016	12.8	0
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2/18/2016 0:00	2016	49	0	49	2/18/2016	12.76	0
2/18/2016 1:00	2016	49	100	49.04167	2/18/2016	12.74	0
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2/18/2016 3:00	2016	49	300	49.125	2/18/2016	12.71	0
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2/18/2016 6:00	2016	49	600	49.25	2/18/2016	12.63	0
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2/18/2016 9:00	2016	49	900	49.375	2/18/2016	13.5	0
2/18/2016 10:00	2016	49	1000	49.41667	2/18/2016	13.48	0
2/18/2016 11:00	2016	49	1100	49.45833	2/18/2016	13.43	0
2/18/2016 12:00	2016	49	1200	49.5	2/18/2016	13.37	0
2/18/2016 13:00	2016	49	1300	49.54167	2/18/2016	13.33	0
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2/19/2016 6:00	2016	50	600	50.25	2/19/2016	12.57	0
2/19/2016 7:00	2016	50	700	50.29167	2/19/2016	12.54	0
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2/19/2016 9:00	2016	50	900	50.375	2/19/2016	13.34	0
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2/19/2016 11:00	2016	50	1100	50.45833	2/19/2016	13.53	0
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2/19/2016 13:00	2016	50	1300	50.54167	2/19/2016	13.4	0
2/19/2016 14:00	2016	50	1400	50.58333	2/19/2016	13.32	0
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2/19/2016 19:00	2016	50	1900	50.79167	2/19/2016	12.94	0
2/19/2016 20:00	2016	50	2000	50.83333	2/19/2016	12.86	0
2/19/2016 21:00	2016	50	2100	50.875	2/19/2016	12.82	0
2/19/2016 22:00	2016	50	2200	50.91667	2/19/2016	12.79	0
2/19/2016 23:00	2016	50	2300	50.95833	2/19/2016	12.75	0
2/20/2016 0:00	2016	51	0	51	2/20/2016	12.72	0
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2/20/2016 2:00	2016	51	200	51.08333	2/20/2016	12.68	0
2/20/2016 3:00	2016	51	300	51.125	2/20/2016	12.65	0
2/20/2016 4:00	2016	51	400	51.16667	2/20/2016	12.63	0
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2/20/2016 6:00	2016	51	600	51.25	2/20/2016	12.57	0
2/20/2016 7:00	2016	51	700	51.29167	2/20/2016	12.55	0
2/20/2016 8:00	2016	51	800	51.33333	2/20/2016	13.2	0
2/20/2016 9:00	2016	51	900	51.375	2/20/2016	13.69	0
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2/20/2016 13:00	2016	51	1300	51.54167	2/20/2016	13.31	0
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2/20/2016 21:00	2016	51	2100	51.875	2/20/2016	12.8	0
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2/20/2016 23:00	2016	51	2300	51.95833	2/20/2016	12.73	0
2/21/2016 0:00	2016	52	0	52	2/21/2016	12.71	0
2/21/2016 1:00	2016	52	100	52.04167	2/21/2016	12.68	0
2/21/2016 2:00	2016	52	200	52.08333	2/21/2016	12.66	0
2/21/2016 3:00	2016	52	300	52.125	2/21/2016	12.64	0
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2/21/2016 6:00	2016	52	600	52.25	2/21/2016	12.55	0
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2/21/2016 9:00	2016	52	900	52.375	2/21/2016	13.73	0
2/21/2016 10:00	2016	52	1000	52.41667	2/21/2016	13.59	0
2/21/2016 11:00	2016	52	1100	52.45833	2/21/2016	13.47	0
2/21/2016 12:00	2016	52	1200	52.5	2/21/2016	13.39	0
2/21/2016 13:00	2016	52	1300	52.54167	2/21/2016	13.33	0
2/21/2016 14:00	2016	52	1400	52.58333	2/21/2016	13.3	0
2/21/2016 15:00	2016	52	1500	52.625	2/21/2016	13.28	0
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2/21/2016 17:00	2016	52	1700	52.70833	2/21/2016	13.32	0
2/21/2016 18:00	2016	52	1800	52.75	2/21/2016	13.33	0
2/21/2016 19:00	2016	52	1900	52.79167	2/21/2016	12.94	0
2/21/2016 20:00	2016	52	2000	52.83333	2/21/2016	12.85	0
2/21/2016 21:00	2016	52	2100	52.875	2/21/2016	12.81	0
2/21/2016 22:00	2016	52	2200	52.91667	2/21/2016	12.78	0
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2/22/2016 2:00	2016	53	200	53.08333	2/22/2016	12.68	0
2/22/2016 3:00	2016	53	300	53.125	2/22/2016	12.66	0
2/22/2016 4:00	2016	53	400	53.16667	2/22/2016	12.63	0
2/22/2016 5:00	2016	53	500	53.20833	2/22/2016	12.61	0
2/22/2016 6:00	2016	53	600	53.25	2/22/2016	12.57	0
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2/22/2016 9:00	2016	53	900	53.375	2/22/2016	13.66	0
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2/22/2016 12:00	2016	53	1200	53.5	2/22/2016	13.39	0
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2/22/2016 14:00	2016	53	1400	53.58333	2/22/2016	13.31	0
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2/22/2016 23:00	2016	53	2300	53.95833	2/22/2016	12.74	0
2/23/2016 0:00	2016	54	0	54	2/23/2016	12.71	0
2/23/2016 1:00	2016	54	100	54.04167	2/23/2016	12.68	0
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2/23/2016 10:00	2016	54	1000	54.41667	2/23/2016	13.7	0
2/23/2016 11:00	2016	54	1100	54.45833	2/23/2016	13.62	0
2/23/2016 12:00	2016	54	1200	54.5	2/23/2016	13.54	0
2/23/2016 13:00	2016	54	1300	54.54167	2/23/2016	13.48	0
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2/24/2016 0:00	2016	55	0	55	2/24/2016	12.67	0
2/24/2016 1:00	2016	55	100	55.04167	2/24/2016	12.65	0
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2/24/2016 4:00	2016	55	400	55.16667	2/24/2016	12.57	0
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2/24/2016 6:00	2016	55	600	55.25	2/24/2016	12.48	0
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2/24/2016 9:00	2016	55	900	55.375	2/24/2016	13.88	0
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2/27/2016 13:00	2016	58	1300	58.54167	2/27/2016	13.31	0
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2/28/2016 9:00	2016	59	900	59.375	2/28/2016	13.56	0
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2/28/2016 11:00	2016	59	1100	59.45833	2/28/2016	13.38	0
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2/29/2016 21:00	2016	60	2100	60.875	2/29/2016	12.82	0
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3/1/2016 10:00	2016	61	1000	61.41667	3/1/2016	13.43	0
3/1/2016 11:00	2016	61	1100	61.45833	3/1/2016	13.37	0
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3/2/2016 16:00	2016	62	1600	62.66667	3/2/2016	13.2	0
3/2/2016 17:00	2016	62	1700	62.70833	3/2/2016	13.23	0
3/2/2016 18:00	2016	62	1800	62.75	3/2/2016	13.28	0
3/2/2016 19:00	2016	62	1900	62.79167	3/2/2016	12.97	0
3/2/2016 20:00	2016	62	2000	62.83333	3/2/2016	12.86	0
3/2/2016 21:00	2016	62	2100	62.875	3/2/2016	12.82	0
3/2/2016 22:00	2016	62	2200	62.91667	3/2/2016	12.78	0
3/2/2016 23:00	2016	62	2300	62.95833	3/2/2016	12.75	0
3/3/2016 0:00	2016	63	0	63	3/3/2016	12.72	0
3/3/2016 1:00	2016	63	100	63.04167	3/3/2016	12.7	0
3/3/2016 2:00	2016	63	200	63.08333	3/3/2016	12.67	0
3/3/2016 3:00	2016	63	300	63.125	3/3/2016	12.65	0
3/3/2016 4:00	2016	63	400	63.16667	3/3/2016	12.63	0
3/3/2016 5:00	2016	63	500	63.20833	3/3/2016	12.6	0
3/3/2016 6:00	2016	63	600	63.25	3/3/2016	12.58	0
3/3/2016 7:00	2016	63	700	63.29167	3/3/2016	12.56	0
3/3/2016 8:00	2016	63	800	63.33333	3/3/2016	13.11	0
3/3/2016 9:00	2016	63	900	63.375	3/3/2016	13.61	0
3/3/2016 10:00	2016	63	1000	63.41667	3/3/2016	13.47	0
3/3/2016 11:00	2016	63	1100	63.45833	3/3/2016	13.36	0
3/3/2016 12:00	2016	63	1200	63.5	3/3/2016	13.29	0

3/3/2016 13:00	2016	63	1300	63.54167	3/3/2016	13.24	0
3/3/2016 14:00	2016	63	1400	63.58333	3/3/2016	13.22	0
3/3/2016 15:00	2016	63	1500	63.625	3/3/2016	13.21	0
3/3/2016 16:00	2016	63	1600	63.66667	3/3/2016	13.22	0
3/3/2016 17:00	2016	63	1700	63.70833	3/3/2016	13.26	0
3/3/2016 18:00	2016	63	1800	63.75	3/3/2016	13.22	0
3/3/2016 19:00	2016	63	1900	63.79167	3/3/2016	12.94	0
3/3/2016 20:00	2016	63	2000	63.83333	3/3/2016	12.86	0
3/3/2016 21:00	2016	63	2100	63.875	3/3/2016	12.81	0
3/3/2016 22:00	2016	63	2200	63.91667	3/3/2016	12.78	0
3/3/2016 23:00	2016	63	2300	63.95833	3/3/2016	12.75	0
3/4/2016 0:00	2016	64	0	64	3/4/2016	12.73	0
3/4/2016 1:00	2016	64	100	64.04167	3/4/2016	12.71	0
3/4/2016 2:00	2016	64	200	64.08333	3/4/2016	12.68	0
3/4/2016 3:00	2016	64	300	64.125	3/4/2016	12.65	0
3/4/2016 4:00	2016	64	400	64.16667	3/4/2016	12.61	0
3/4/2016 5:00	2016	64	500	64.20833	3/4/2016	12.58	0
3/4/2016 6:00	2016	64	600	64.25	3/4/2016	12.54	0
3/4/2016 7:00	2016	64	700	64.29167	3/4/2016	12.53	0
3/4/2016 8:00	2016	64	800	64.33333	3/4/2016	13.05	0
3/4/2016 9:00	2016	64	900	64.375	3/4/2016	13.66	0
3/4/2016 10:00	2016	64	1000	64.41667	3/4/2016	13.53	0
3/4/2016 11:00	2016	64	1100	64.45833	3/4/2016	13.41	0
3/4/2016 12:00	2016	64	1200	64.5	3/4/2016	13.32	0
3/4/2016 13:00	2016	64	1300	64.54167	3/4/2016	13.27	0
3/4/2016 14:00	2016	64	1400	64.58333	3/4/2016	13.23	0
3/4/2016 15:00	2016	64	1500	64.625	3/4/2016	13.22	0
3/4/2016 16:00	2016	64	1600	64.66667	3/4/2016	13.22	0
3/4/2016 17:00	2016	64	1700	64.70833	3/4/2016	13.25	0
3/4/2016 18:00	2016	64	1800	64.75	3/4/2016	13.25	0
3/4/2016 19:00	2016	64	1900	64.79167	3/4/2016	12.95	0
3/4/2016 20:00	2016	64	2000	64.83333	3/4/2016	12.86	0
3/4/2016 21:00	2016	64	2100	64.875	3/4/2016	12.81	0
3/4/2016 22:00	2016	64	2200	64.91667	3/4/2016	12.78	0
3/4/2016 23:00	2016	64	2300	64.95833	3/4/2016	12.75	0
3/5/2016 0:00	2016	65	0	65	3/5/2016	12.73	0
3/5/2016 1:00	2016	65	100	65.04167	3/5/2016	12.7	0
3/5/2016 2:00	2016	65	200	65.08333	3/5/2016	12.68	0
3/5/2016 3:00	2016	65	300	65.125	3/5/2016	12.65	0
3/5/2016 4:00	2016	65	400	65.16667	3/5/2016	12.63	0
3/5/2016 5:00	2016	65	500	65.20833	3/5/2016	12.6	0
3/5/2016 6:00	2016	65	600	65.25	3/5/2016	12.58	0
3/5/2016 7:00	2016	65	700	65.29167	3/5/2016	12.55	0
3/5/2016 8:00	2016	65	800	65.33333	3/5/2016	13.39	0
3/5/2016 9:00	2016	65	900	65.375	3/5/2016	13.59	0
3/5/2016 10:00	2016	65	1000	65.41667	3/5/2016	13.49	0
3/5/2016 11:00	2016	65	1100	65.45833	3/5/2016	13.41	0

3/5/2016 12:00	2016	65	1200	65.5	3/5/2016	13.34	0
3/5/2016 13:00	2016	65	1300	65.54167	3/5/2016	13.31	0
3/5/2016 14:00	2016	65	1400	65.58333	3/5/2016	13.28	0
3/5/2016 15:00	2016	65	1500	65.625	3/5/2016	13.25	0
3/5/2016 16:00	2016	65	1600	65.66667	3/5/2016	13.24	0
3/5/2016 17:00	2016	65	1700	65.70833	3/5/2016	13.27	0
3/5/2016 18:00	2016	65	1800	65.75	3/5/2016	13.26	0
3/5/2016 19:00	2016	65	1900	65.79167	3/5/2016	12.95	0
3/5/2016 20:00	2016	65	2000	65.83333	3/5/2016	12.87	0
3/5/2016 21:00	2016	65	2100	65.875	3/5/2016	12.83	0
3/5/2016 22:00	2016	65	2200	65.91667	3/5/2016	12.8	0
3/5/2016 23:00	2016	65	2300	65.95833	3/5/2016	12.77	0
3/6/2016 0:00	2016	66	0	66	3/6/2016	12.75	0
3/6/2016 1:00	2016	66	100	66.04167	3/6/2016	12.73	0
3/6/2016 2:00	2016	66	200	66.08333	3/6/2016	12.7	0
3/6/2016 3:00	2016	66	300	66.125	3/6/2016	12.68	0
3/6/2016 4:00	2016	66	400	66.16667	3/6/2016	12.65	0
3/6/2016 5:00	2016	66	500	66.20833	3/6/2016	12.63	0
3/6/2016 6:00	2016	66	600	66.25	3/6/2016	12.61	0
3/6/2016 7:00	2016	66	700	66.29167	3/6/2016	12.59	0
3/6/2016 8:00	2016	66	800	66.33333	3/6/2016	12.74	0
3/6/2016 9:00	2016	66	900	66.375	3/6/2016	13.51	0
3/6/2016 10:00	2016	66	1000	66.41667	3/6/2016	13.46	0
3/6/2016 11:00	2016	66	1100	66.45833	3/6/2016	13.38	0
3/6/2016 12:00	2016	66	1200	66.5	3/6/2016	13.32	0
3/6/2016 13:00	2016	66	1300	66.54167	3/6/2016	13.28	0
3/6/2016 14:00	2016	66	1400	66.58333	3/6/2016	13.26	0
3/6/2016 15:00	2016	66	1500	66.625	3/6/2016	13.25	0
3/6/2016 16:00	2016	66	1600	66.66667	3/6/2016	13.28	0
3/6/2016 17:00	2016	66	1700	66.70833	3/6/2016	13.32	0
3/6/2016 18:00	2016	66	1800	66.75	3/6/2016	13.32	0
3/6/2016 19:00	2016	66	1900	66.79167	3/6/2016	12.93	0
3/6/2016 20:00	2016	66	2000	66.83333	3/6/2016	12.84	0.06
3/6/2016 21:00	2016	66	2100	66.875	3/6/2016	12.79	0.04
3/6/2016 22:00	2016	66	2200	66.91667	3/6/2016	12.75	0
3/6/2016 23:00	2016	66	2300	66.95833	3/6/2016	12.71	0
3/7/2016 0:00	2016	67	0	67	3/7/2016	12.69	0
3/7/2016 1:00	2016	67	100	67.04167	3/7/2016	12.66	0
3/7/2016 2:00	2016	67	200	67.08333	3/7/2016	12.64	0
3/7/2016 3:00	2016	67	300	67.125	3/7/2016	12.61	0
3/7/2016 4:00	2016	67	400	67.16667	3/7/2016	12.59	0
3/7/2016 5:00	2016	67	500	67.20833	3/7/2016	12.56	0
3/7/2016 6:00	2016	67	600	67.25	3/7/2016	12.53	0
3/7/2016 7:00	2016	67	700	67.29167	3/7/2016	12.51	0
3/7/2016 8:00	2016	67	800	67.33333	3/7/2016	13.52	0
3/7/2016 9:00	2016	67	900	67.375	3/7/2016	13.73	0
3/7/2016 10:00	2016	67	1000	67.41667	3/7/2016	13.61	0

3/7/2016 11:00	2016	67	1100	67.45833	3/7/2016	13.5	0
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3/7/2016 13:00	2016	67	1300	67.54167	3/7/2016	13.38	0
3/7/2016 14:00	2016	67	1400	67.58333	3/7/2016	13.39	0
3/7/2016 15:00	2016	67	1500	67.625	3/7/2016	13.43	0
3/7/2016 16:00	2016	67	1600	67.66667	3/7/2016	13.4	0
3/7/2016 17:00	2016	67	1700	67.70833	3/7/2016	13.41	0
3/7/2016 18:00	2016	67	1800	67.75	3/7/2016	13.4	0
3/7/2016 19:00	2016	67	1900	67.79167	3/7/2016	12.95	0
3/7/2016 20:00	2016	67	2000	67.83333	3/7/2016	12.85	0
3/7/2016 21:00	2016	67	2100	67.875	3/7/2016	12.81	0
3/7/2016 22:00	2016	67	2200	67.91667	3/7/2016	12.77	0
3/7/2016 23:00	2016	67	2300	67.95833	3/7/2016	12.74	0
3/8/2016 0:00	2016	68	0	68	3/8/2016	12.72	0
3/8/2016 1:00	2016	68	100	68.04167	3/8/2016	12.69	0
3/8/2016 2:00	2016	68	200	68.08333	3/8/2016	12.67	0
3/8/2016 3:00	2016	68	300	68.125	3/8/2016	12.64	0
3/8/2016 4:00	2016	68	400	68.16667	3/8/2016	12.61	0
3/8/2016 5:00	2016	68	500	68.20833	3/8/2016	12.57	0
3/8/2016 6:00	2016	68	600	68.25	3/8/2016	12.53	0
3/8/2016 7:00	2016	68	700	68.29167	3/8/2016	12.5	0
3/8/2016 8:00	2016	68	800	68.33333	3/8/2016	13.09	0
3/8/2016 9:00	2016	68	900	68.375	3/8/2016	13.71	0
3/8/2016 10:00	2016	68	1000	68.41667	3/8/2016	13.58	0
3/8/2016 11:00	2016	68	1100	68.45833	3/8/2016	13.5	0
3/8/2016 12:00	2016	68	1200	68.5	3/8/2016	13.45	0
3/8/2016 13:00	2016	68	1300	68.54167	3/8/2016	13.38	0
3/8/2016 14:00	2016	68	1400	68.58333	3/8/2016	13.35	0
3/8/2016 15:00	2016	68	1500	68.625	3/8/2016	13.33	0
3/8/2016 16:00	2016	68	1600	68.66667	3/8/2016	13.34	0
3/8/2016 17:00	2016	68	1700	68.70833	3/8/2016	13.38	0
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3/8/2016 21:00	2016	68	2100	68.875	3/8/2016	12.79	0
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3/9/2016 0:00	2016	69	0	69	3/9/2016	12.71	0
3/9/2016 1:00	2016	69	100	69.04167	3/9/2016	12.69	0
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3/9/2016 5:00	2016	69	500	69.20833	3/9/2016	12.6	0
3/9/2016 6:00	2016	69	600	69.25	3/9/2016	12.56	0
3/9/2016 7:00	2016	69	700	69.29167	3/9/2016	12.52	0
3/9/2016 8:00	2016	69	800	69.33333	3/9/2016	13.5	0
3/9/2016 9:00	2016	69	900	69.375	3/9/2016	13.66	0

3/9/2016 10:00	2016	69	1000	69.41667	3/9/2016	13.53	0
3/9/2016 11:00	2016	69	1100	69.45833	3/9/2016	13.43	0
3/9/2016 12:00	2016	69	1200	69.5	3/9/2016	13.35	0
3/9/2016 13:00	2016	69	1300	69.54167	3/9/2016	13.3	0
3/9/2016 14:00	2016	69	1400	69.58333	3/9/2016	13.26	0
3/9/2016 15:00	2016	69	1500	69.625	3/9/2016	13.25	0
3/9/2016 16:00	2016	69	1600	69.66667	3/9/2016	13.26	0
3/9/2016 17:00	2016	69	1700	69.70833	3/9/2016	13.3	0
3/9/2016 18:00	2016	69	1800	69.75	3/9/2016	13.34	0
3/9/2016 19:00	2016	69	1900	69.79167	3/9/2016	12.98	0
3/9/2016 20:00	2016	69	2000	69.83333	3/9/2016	12.86	0
3/9/2016 21:00	2016	69	2100	69.875	3/9/2016	12.81	0
3/9/2016 22:00	2016	69	2200	69.91667	3/9/2016	12.78	0
3/9/2016 23:00	2016	69	2300	69.95833	3/9/2016	12.75	0
3/10/2016 0:00	2016	70	0	70	3/10/2016	12.72	0
3/10/2016 1:00	2016	70	100	70.04167	3/10/2016	12.69	0
3/10/2016 2:00	2016	70	200	70.08333	3/10/2016	12.67	0
3/10/2016 3:00	2016	70	300	70.125	3/10/2016	12.65	0
3/10/2016 4:00	2016	70	400	70.16667	3/10/2016	12.62	0
3/10/2016 5:00	2016	70	500	70.20833	3/10/2016	12.59	0
3/10/2016 6:00	2016	70	600	70.25	3/10/2016	12.55	0
3/10/2016 7:00	2016	70	700	70.29167	3/10/2016	12.54	0
3/10/2016 8:00	2016	70	800	70.33333	3/10/2016	13.56	0
3/10/2016 9:00	2016	70	900	70.375	3/10/2016	13.66	0
3/10/2016 10:00	2016	70	1000	70.41667	3/10/2016	13.53	0
3/10/2016 11:00	2016	70	1100	70.45833	3/10/2016	13.43	0
3/10/2016 12:00	2016	70	1200	70.5	3/10/2016	13.35	0
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3/10/2016 15:00	2016	70	1500	70.625	3/10/2016	13.24	0
3/10/2016 16:00	2016	70	1600	70.66667	3/10/2016	13.25	0
3/10/2016 17:00	2016	70	1700	70.70833	3/10/2016	13.29	0
3/10/2016 18:00	2016	70	1800	70.75	3/10/2016	13.33	0
3/10/2016 19:00	2016	70	1900	70.79167	3/10/2016	13	0
3/10/2016 20:00	2016	70	2000	70.83333	3/10/2016	12.87	0
3/10/2016 21:00	2016	70	2100	70.875	3/10/2016	12.82	0
3/10/2016 22:00	2016	70	2200	70.91667	3/10/2016	12.78	0
3/10/2016 23:00	2016	70	2300	70.95833	3/10/2016	12.75	0
3/11/2016 0:00	2016	71	0	71	3/11/2016	12.73	0
3/11/2016 1:00	2016	71	100	71.04167	3/11/2016	12.71	0
3/11/2016 2:00	2016	71	200	71.08333	3/11/2016	12.68	0
3/11/2016 3:00	2016	71	300	71.125	3/11/2016	12.66	0
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3/11/2016 6:00	2016	71	600	71.25	3/11/2016	12.56	0
3/11/2016 7:00	2016	71	700	71.29167	3/11/2016	12.56	0
3/11/2016 8:00	2016	71	800	71.33333	3/11/2016	13.53	0

3/11/2016 9:00	2016	71	900	71.375	3/11/2016	13.6	0
3/11/2016 10:00	2016	71	1000	71.41667	3/11/2016	13.53	0
3/11/2016 11:00	2016	71	1100	71.45833	3/11/2016	13.46	0
3/11/2016 12:00	2016	71	1200	71.5	3/11/2016	13.4	0
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3/11/2016 15:00	2016	71	1500	71.625	3/11/2016	13.3	0
3/11/2016 16:00	2016	71	1600	71.66667	3/11/2016	13.32	0
3/11/2016 17:00	2016	71	1700	71.70833	3/11/2016	13.36	0
3/11/2016 18:00	2016	71	1800	71.75	3/11/2016	13.2	0
3/11/2016 19:00	2016	71	1900	71.79167	3/11/2016	12.96	0
3/11/2016 20:00	2016	71	2000	71.83333	3/11/2016	12.87	0
3/11/2016 21:00	2016	71	2100	71.875	3/11/2016	12.84	0
3/11/2016 22:00	2016	71	2200	71.91667	3/11/2016	12.8	0
3/11/2016 23:00	2016	71	2300	71.95833	3/11/2016	12.78	0
3/12/2016 0:00	2016	72	0	72	3/12/2016	12.75	0
3/12/2016 1:00	2016	72	100	72.04167	3/12/2016	12.72	0
3/12/2016 2:00	2016	72	200	72.08333	3/12/2016	12.69	0
3/12/2016 3:00	2016	72	300	72.125	3/12/2016	12.67	0
3/12/2016 4:00	2016	72	400	72.16667	3/12/2016	12.65	0
3/12/2016 5:00	2016	72	500	72.20833	3/12/2016	12.61	0
3/12/2016 6:00	2016	72	600	72.25	3/12/2016	12.56	0
3/12/2016 7:00	2016	72	700	72.29167	3/12/2016	12.57	0
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3/12/2016 9:00	2016	72	900	72.375	3/12/2016	13.7	0.02
3/12/2016 10:00	2016	72	1000	72.41667	3/12/2016	13.67	0
3/12/2016 11:00	2016	72	1100	72.45833	3/12/2016	13.6	0
3/12/2016 12:00	2016	72	1200	72.5	3/12/2016	13.52	0
3/12/2016 13:00	2016	72	1300	72.54167	3/12/2016	13.45	0
3/12/2016 14:00	2016	72	1400	72.58333	3/12/2016	13.41	0
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3/12/2016 17:00	2016	72	1700	72.70833	3/12/2016	13.43	0
3/12/2016 18:00	2016	72	1800	72.75	3/12/2016	13.4	0
3/12/2016 19:00	2016	72	1900	72.79167	3/12/2016	12.97	0
3/12/2016 20:00	2016	72	2000	72.83333	3/12/2016	12.86	0
3/12/2016 21:00	2016	72	2100	72.875	3/12/2016	12.82	0
3/12/2016 22:00	2016	72	2200	72.91667	3/12/2016	12.79	0
3/12/2016 23:00	2016	72	2300	72.95833	3/12/2016	12.76	0
3/13/2016 0:00	2016	73	0	73	3/13/2016	12.74	0
3/13/2016 1:00	2016	73	100	73.04167	3/13/2016	12.72	0
3/13/2016 2:00	2016	73	200	73.08333	3/13/2016	12.69	0
3/13/2016 3:00	2016	73	300	73.125	3/13/2016	12.67	0
3/13/2016 4:00	2016	73	400	73.16667	3/13/2016	12.63	0
3/13/2016 5:00	2016	73	500	73.20833	3/13/2016	12.58	0
3/13/2016 6:00	2016	73	600	73.25	3/13/2016	12.53	0
3/13/2016 7:00	2016	73	700	73.29167	3/13/2016	12.53	0

3/13/2016 8:00	2016	73	800	73.33333	3/13/2016	13.5	0
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3/13/2016 10:00	2016	73	1000	73.41667	3/13/2016	13.55	0
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3/13/2016 12:00	2016	73	1200	73.5	3/13/2016	13.35	0
3/13/2016 13:00	2016	73	1300	73.54167	3/13/2016	13.29	0
3/13/2016 14:00	2016	73	1400	73.58333	3/13/2016	13.26	0
3/13/2016 15:00	2016	73	1500	73.625	3/13/2016	13.27	0
3/13/2016 16:00	2016	73	1600	73.66667	3/13/2016	13.28	0
3/13/2016 17:00	2016	73	1700	73.70833	3/13/2016	13.33	0
3/13/2016 18:00	2016	73	1800	73.75	3/13/2016	13.37	0
3/13/2016 19:00	2016	73	1900	73.79167	3/13/2016	13.01	0
3/13/2016 20:00	2016	73	2000	73.83333	3/13/2016	12.87	0
3/13/2016 21:00	2016	73	2100	73.875	3/13/2016	12.82	0
3/13/2016 22:00	2016	73	2200	73.91667	3/13/2016	12.78	0
3/13/2016 23:00	2016	73	2300	73.95833	3/13/2016	12.75	0
3/14/2016 0:00	2016	74	0	74	3/14/2016	12.73	0
3/14/2016 1:00	2016	74	100	74.04167	3/14/2016	12.71	0
3/14/2016 2:00	2016	74	200	74.08333	3/14/2016	12.69	0
3/14/2016 3:00	2016	74	300	74.125	3/14/2016	12.67	0
3/14/2016 4:00	2016	74	400	74.16667	3/14/2016	12.64	0
3/14/2016 5:00	2016	74	500	74.20833	3/14/2016	12.61	0
3/14/2016 6:00	2016	74	600	74.25	3/14/2016	12.57	0
3/14/2016 7:00	2016	74	700	74.29167	3/14/2016	12.55	0
3/14/2016 8:00	2016	74	800	74.33333	3/14/2016	13.27	0
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3/14/2016 10:00	2016	74	1000	74.41667	3/14/2016	13.48	0
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3/14/2016 12:00	2016	74	1200	74.5	3/14/2016	13.33	0
3/14/2016 13:00	2016	74	1300	74.54167	3/14/2016	13.28	0
3/14/2016 14:00	2016	74	1400	74.58333	3/14/2016	13.25	0
3/14/2016 15:00	2016	74	1500	74.625	3/14/2016	13.24	0
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3/14/2016 17:00	2016	74	1700	74.70833	3/14/2016	13.3	0
3/14/2016 18:00	2016	74	1800	74.75	3/14/2016	13.31	0
3/14/2016 19:00	2016	74	1900	74.79167	3/14/2016	12.98	0
3/14/2016 20:00	2016	74	2000	74.83333	3/14/2016	12.87	0
3/14/2016 21:00	2016	74	2100	74.875	3/14/2016	12.83	0
3/14/2016 22:00	2016	74	2200	74.91667	3/14/2016	12.8	0
3/14/2016 23:00	2016	74	2300	74.95833	3/14/2016	12.77	0
3/15/2016 0:00	2016	75	0	75	3/15/2016	12.74	0
3/15/2016 1:00	2016	75	100	75.04167	3/15/2016	12.72	0
3/15/2016 2:00	2016	75	200	75.08333	3/15/2016	12.69	0
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3/15/2016 4:00	2016	75	400	75.16667	3/15/2016	12.62	0
3/15/2016 5:00	2016	75	500	75.20833	3/15/2016	12.58	0
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3/15/2016 7:00	2016	75	700	75.29167	3/15/2016	12.54	0
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3/15/2016 9:00	2016	75	900	75.375	3/15/2016	13.61	0
3/15/2016 10:00	2016	75	1000	75.41667	3/15/2016	13.52	0
3/15/2016 11:00	2016	75	1100	75.45833	3/15/2016	13.45	0
3/15/2016 12:00	2016	75	1200	75.5	3/15/2016	13.39	0
3/15/2016 13:00	2016	75	1300	75.54167	3/15/2016	13.33	0
3/15/2016 14:00	2016	75	1400	75.58333	3/15/2016	13.3	0
3/15/2016 15:00	2016	75	1500	75.625	3/15/2016	13.28	0
3/15/2016 16:00	2016	75	1600	75.66667	3/15/2016	13.29	0
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3/15/2016 19:00	2016	75	1900	75.79167	3/15/2016	13.01	0
3/15/2016 20:00	2016	75	2000	75.83333	3/15/2016	12.87	0
3/15/2016 21:00	2016	75	2100	75.875	3/15/2016	12.82	0
3/15/2016 22:00	2016	75	2200	75.91667	3/15/2016	12.78	0
3/15/2016 23:00	2016	75	2300	75.95833	3/15/2016	12.76	0
3/16/2016 0:00	2016	76	0	76	3/16/2016	12.74	0
3/16/2016 1:00	2016	76	100	76.04167	3/16/2016	12.72	0
3/16/2016 2:00	2016	76	200	76.08333	3/16/2016	12.7	0
3/16/2016 3:00	2016	76	300	76.125	3/16/2016	12.67	0
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3/16/2016 6:00	2016	76	600	76.25	3/16/2016	12.57	0
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3/16/2016 10:00	2016	76	1000	76.41667	3/16/2016	13.49	0
3/16/2016 11:00	2016	76	1100	76.45833	3/16/2016	13.42	0
3/16/2016 12:00	2016	76	1200	76.5	3/16/2016	13.34	0
3/16/2016 13:00	2016	76	1300	76.54167	3/16/2016	13.29	0
3/16/2016 14:00	2016	76	1400	76.58333	3/16/2016	13.27	0
3/16/2016 15:00	2016	76	1500	76.625	3/16/2016	13.26	0
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3/16/2016 19:00	2016	76	1900	76.79167	3/16/2016	13.01	0
3/16/2016 20:00	2016	76	2000	76.83333	3/16/2016	12.86	0
3/16/2016 21:00	2016	76	2100	76.875	3/16/2016	12.81	0
3/16/2016 22:00	2016	76	2200	76.91667	3/16/2016	12.77	0
3/16/2016 23:00	2016	76	2300	76.95833	3/16/2016	12.73	0
3/17/2016 0:00	2016	77	0	77	3/17/2016	12.71	0
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3/17/2016 6:00	2016	77	600	77.25	3/17/2016	12.53	0
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3/17/2016 8:00	2016	77	800	77.33333	3/17/2016	13.6	0
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3/17/2016 12:00	2016	77	1200	77.5	3/17/2016	13.32	0
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3/17/2016 19:00	2016	77	1900	77.79167	3/17/2016	13.01	0
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3/17/2016 21:00	2016	77	2100	77.875	3/17/2016	12.83	0
3/17/2016 22:00	2016	77	2200	77.91667	3/17/2016	12.8	0
3/17/2016 23:00	2016	77	2300	77.95833	3/17/2016	12.77	0
3/18/2016 0:00	2016	78	0	78	3/18/2016	12.74	0
3/18/2016 1:00	2016	78	100	78.04167	3/18/2016	12.72	0
3/18/2016 2:00	2016	78	200	78.08333	3/18/2016	12.7	0
3/18/2016 3:00	2016	78	300	78.125	3/18/2016	12.67	0
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3/18/2016 6:00	2016	78	600	78.25	3/18/2016	12.57	0
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3/18/2016 9:00	2016	78	900	78.375	3/18/2016	13.51	0
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3/18/2016 11:00	2016	78	1100	78.45833	3/18/2016	13.32	0
3/18/2016 12:00	2016	78	1200	78.5	3/18/2016	13.27	0
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3/18/2016 19:00	2016	78	1900	78.79167	3/18/2016	12.99	0
3/18/2016 20:00	2016	78	2000	78.83333	3/18/2016	12.87	0
3/18/2016 21:00	2016	78	2100	78.875	3/18/2016	12.82	0
3/18/2016 22:00	2016	78	2200	78.91667	3/18/2016	12.79	0
3/18/2016 23:00	2016	78	2300	78.95833	3/18/2016	12.76	0
3/19/2016 0:00	2016	79	0	79	3/19/2016	12.73	0
3/19/2016 1:00	2016	79	100	79.04167	3/19/2016	12.7	0
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3/19/2016 9:00	2016	79	900	79.375	3/19/2016	13.58	0
3/19/2016 10:00	2016	79	1000	79.41667	3/19/2016	13.46	0
3/19/2016 11:00	2016	79	1100	79.45833	3/19/2016	13.37	0
3/19/2016 12:00	2016	79	1200	79.5	3/19/2016	13.29	0
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3/19/2016 17:00	2016	79	1700	79.70833	3/19/2016	13.28	0
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3/19/2016 19:00	2016	79	1900	79.79167	3/19/2016	12.97	0
3/19/2016 20:00	2016	79	2000	79.83333	3/19/2016	12.86	0
3/19/2016 21:00	2016	79	2100	79.875	3/19/2016	12.81	0
3/19/2016 22:00	2016	79	2200	79.91667	3/19/2016	12.78	0
3/19/2016 23:00	2016	79	2300	79.95833	3/19/2016	12.75	0
3/20/2016 0:00	2016	80	0	80	3/20/2016	12.72	0
3/20/2016 1:00	2016	80	100	80.04167	3/20/2016	12.69	0
3/20/2016 2:00	2016	80	200	80.08333	3/20/2016	12.66	0
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3/20/2016 4:00	2016	80	400	80.16667	3/20/2016	12.59	0
3/20/2016 5:00	2016	80	500	80.20833	3/20/2016	12.55	0
3/20/2016 6:00	2016	80	600	80.25	3/20/2016	12.52	0
3/20/2016 7:00	2016	80	700	80.29167	3/20/2016	12.57	0
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3/20/2016 13:00	2016	80	1300	80.54167	3/20/2016	13.25	0
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3/20/2016 19:00	2016	80	1900	80.79167	3/20/2016	13.03	0
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3/20/2016 21:00	2016	80	2100	80.875	3/20/2016	12.84	0
3/20/2016 22:00	2016	80	2200	80.91667	3/20/2016	12.81	0
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3/21/2016 6:00	2016	81	600	81.25	3/21/2016	12.59	0
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3/21/2016 18:00	2016	81	1800	81.75	3/21/2016	13.23	0
3/21/2016 19:00	2016	81	1900	81.79167	3/21/2016	12.98	0
3/21/2016 20:00	2016	81	2000	81.83333	3/21/2016	12.87	0
3/21/2016 21:00	2016	81	2100	81.875	3/21/2016	12.83	0
3/21/2016 22:00	2016	81	2200	81.91667	3/21/2016	12.8	0
3/21/2016 23:00	2016	81	2300	81.95833	3/21/2016	12.77	0
3/22/2016 0:00	2016	82	0	82	3/22/2016	12.74	0
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3/22/2016 3:00	2016	82	300	82.125	3/22/2016	12.65	0
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3/22/2016 6:00	2016	82	600	82.25	3/22/2016	12.59	0
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3/22/2016 19:00	2016	82	1900	82.79167	3/22/2016	12.97	0
3/22/2016 20:00	2016	82	2000	82.83333	3/22/2016	12.84	0
3/22/2016 21:00	2016	82	2100	82.875	3/22/2016	12.79	0
3/22/2016 22:00	2016	82	2200	82.91667	3/22/2016	12.76	0
3/22/2016 23:00	2016	82	2300	82.95833	3/22/2016	12.73	0
3/23/2016 0:00	2016	83	0	83	3/23/2016	12.7	0
3/23/2016 1:00	2016	83	100	83.04167	3/23/2016	12.67	0
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3/23/2016 5:00	2016	83	500	83.20833	3/23/2016	12.53	0
3/23/2016 6:00	2016	83	600	83.25	3/23/2016	12.5	0
3/23/2016 7:00	2016	83	700	83.29167	3/23/2016	12.55	0
3/23/2016 8:00	2016	83	800	83.33333	3/23/2016	13.66	0
3/23/2016 9:00	2016	83	900	83.375	3/23/2016	13.68	0
3/23/2016 10:00	2016	83	1000	83.41667	3/23/2016	13.58	0
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3/23/2016 12:00	2016	83	1200	83.5	3/23/2016	13.41	0
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3/23/2016 14:00	2016	83	1400	83.58333	3/23/2016	13.31	0
3/23/2016 15:00	2016	83	1500	83.625	3/23/2016	13.3	0
3/23/2016 16:00	2016	83	1600	83.66667	3/23/2016	13.32	0
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3/23/2016 18:00	2016	83	1800	83.75	3/23/2016	13.37	0
3/23/2016 19:00	2016	83	1900	83.79167	3/23/2016	13.03	0
3/23/2016 20:00	2016	83	2000	83.83333	3/23/2016	12.86	0
3/23/2016 21:00	2016	83	2100	83.875	3/23/2016	12.81	0
3/23/2016 22:00	2016	83	2200	83.91667	3/23/2016	12.77	0
3/23/2016 23:00	2016	83	2300	83.95833	3/23/2016	12.74	0
3/24/2016 0:00	2016	84	0	84	3/24/2016	12.71	0
3/24/2016 1:00	2016	84	100	84.04167	3/24/2016	12.69	0
3/24/2016 2:00	2016	84	200	84.08333	3/24/2016	12.67	0
3/24/2016 3:00	2016	84	300	84.125	3/24/2016	12.64	0
3/24/2016 4:00	2016	84	400	84.16667	3/24/2016	12.6	0
3/24/2016 5:00	2016	84	500	84.20833	3/24/2016	12.55	0
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3/24/2016 12:00	2016	84	1200	84.5	3/24/2016	13.38	0
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3/24/2016 19:00	2016	84	1900	84.79167	3/24/2016	13.01	0
3/24/2016 20:00	2016	84	2000	84.83333	3/24/2016	12.88	0
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3/24/2016 22:00	2016	84	2200	84.91667	3/24/2016	12.79	0
3/24/2016 23:00	2016	84	2300	84.95833	3/24/2016	12.76	0
3/25/2016 0:00	2016	85	0	85	3/25/2016	12.73	0
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3/25/2016 11:00	2016	85	1100	85.45833	3/25/2016	13.37	0
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3/25/2016 13:00	2016	85	1300	85.54167	3/25/2016	13.24	0
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3/25/2016 19:00	2016	85	1900	85.79167	3/25/2016	13.01	0
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3/26/2016 6:00	2016	86	600	86.25	3/26/2016	12.59	0
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3/26/2016 9:00	2016	86	900	86.375	3/26/2016	13.53	0
3/26/2016 10:00	2016	86	1000	86.41667	3/26/2016	13.47	0
3/26/2016 11:00	2016	86	1100	86.45833	3/26/2016	13.4	0
3/26/2016 12:00	2016	86	1200	86.5	3/26/2016	13.36	0
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3/26/2016 19:00	2016	86	1900	86.79167	3/26/2016	13.01	0
3/26/2016 20:00	2016	86	2000	86.83333	3/26/2016	12.85	0
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4/1/2016 22:00	2016	92	2200	92.91667	4/1/2016	12.77	0
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4/2/2016 0:00	2016	93	0	93	4/2/2016	12.7	0
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4/2/2016 13:00	2016	93	1300	93.54167	4/2/2016	13.28	0
4/2/2016 14:00	2016	93	1400	93.58333	4/2/2016	13.25	0
4/2/2016 15:00	2016	93	1500	93.625	4/2/2016	13.23	0
4/2/2016 16:00	2016	93	1600	93.66667	4/2/2016	13.24	0
4/2/2016 17:00	2016	93	1700	93.70833	4/2/2016	13.28	0
4/2/2016 18:00	2016	93	1800	93.75	4/2/2016	13.29	0
4/2/2016 19:00	2016	93	1900	93.79167	4/2/2016	13.02	0
4/2/2016 20:00	2016	93	2000	93.83333	4/2/2016	12.88	0
4/2/2016 21:00	2016	93	2100	93.875	4/2/2016	12.82	0
4/2/2016 22:00	2016	93	2200	93.91667	4/2/2016	12.77	0
4/2/2016 23:00	2016	93	2300	93.95833	4/2/2016	12.74	0
4/3/2016 0:00	2016	94	0	94	4/3/2016	12.71	0
4/3/2016 1:00	2016	94	100	94.04167	4/3/2016	12.69	0
4/3/2016 2:00	2016	94	200	94.08333	4/3/2016	12.66	0
4/3/2016 3:00	2016	94	300	94.125	4/3/2016	12.64	0
4/3/2016 4:00	2016	94	400	94.16667	4/3/2016	12.61	0
4/3/2016 5:00	2016	94	500	94.20833	4/3/2016	12.58	0
4/3/2016 6:00	2016	94	600	94.25	4/3/2016	12.54	0
4/3/2016 7:00	2016	94	700	94.29167	4/3/2016	12.61	0
4/3/2016 8:00	2016	94	800	94.33333	4/3/2016	13.58	0
4/3/2016 9:00	2016	94	900	94.375	4/3/2016	13.54	0
4/3/2016 10:00	2016	94	1000	94.41667	4/3/2016	13.42	0
4/3/2016 11:00	2016	94	1100	94.45833	4/3/2016	13.33	0
4/3/2016 12:00	2016	94	1200	94.5	4/3/2016	13.26	0
4/3/2016 13:00	2016	94	1300	94.54167	4/3/2016	13.21	0
4/3/2016 14:00	2016	94	1400	94.58333	4/3/2016	13.18	0
4/3/2016 15:00	2016	94	1500	94.625	4/3/2016	13.18	0
4/3/2016 16:00	2016	94	1600	94.66667	4/3/2016	13.19	0
4/3/2016 17:00	2016	94	1700	94.70833	4/3/2016	13.22	0
4/3/2016 18:00	2016	94	1800	94.75	4/3/2016	13.23	0
4/3/2016 19:00	2016	94	1900	94.79167	4/3/2016	13.01	0
4/3/2016 20:00	2016	94	2000	94.83333	4/3/2016	12.88	0

4/3/2016 21:00	2016	94	2100	94.875	4/3/2016	12.82	0
4/3/2016 22:00	2016	94	2200	94.91667	4/3/2016	12.78	0
4/3/2016 23:00	2016	94	2300	94.95833	4/3/2016	12.75	0
4/4/2016 0:00	2016	95	0	95	4/4/2016	12.72	0
4/4/2016 1:00	2016	95	100	95.04167	4/4/2016	12.69	0
4/4/2016 2:00	2016	95	200	95.08333	4/4/2016	12.66	0
4/4/2016 3:00	2016	95	300	95.125	4/4/2016	12.63	0
4/4/2016 4:00	2016	95	400	95.16667	4/4/2016	12.6	0
4/4/2016 5:00	2016	95	500	95.20833	4/4/2016	12.58	0
4/4/2016 6:00	2016	95	600	95.25	4/4/2016	12.55	0
4/4/2016 7:00	2016	95	700	95.29167	4/4/2016	12.73	0
4/4/2016 8:00	2016	95	800	95.33333	4/4/2016	13.6	0
4/4/2016 9:00	2016	95	900	95.375	4/4/2016	13.49	0
4/4/2016 10:00	2016	95	1000	95.41667	4/4/2016	13.4	0
4/4/2016 11:00	2016	95	1100	95.45833	4/4/2016	13.31	0
4/4/2016 12:00	2016	95	1200	95.5	4/4/2016	13.26	0
4/4/2016 13:00	2016	95	1300	95.54167	4/4/2016	13.2	0
4/4/2016 14:00	2016	95	1400	95.58333	4/4/2016	13.16	0
4/4/2016 15:00	2016	95	1500	95.625	4/4/2016	13.14	0
4/4/2016 16:00	2016	95	1600	95.66667	4/4/2016	13.15	0
4/4/2016 17:00	2016	95	1700	95.70833	4/4/2016	13.18	0
4/4/2016 18:00	2016	95	1800	95.75	4/4/2016	13.2	0
4/4/2016 19:00	2016	95	1900	95.79167	4/4/2016	13.01	0
4/4/2016 20:00	2016	95	2000	95.83333	4/4/2016	12.89	0
4/4/2016 21:00	2016	95	2100	95.875	4/4/2016	12.84	0
4/4/2016 22:00	2016	95	2200	95.91667	4/4/2016	12.79	0
4/4/2016 23:00	2016	95	2300	95.95833	4/4/2016	12.76	0
4/5/2016 0:00	2016	96	0	96	4/5/2016	12.72	0
4/5/2016 1:00	2016	96	100	96.04167	4/5/2016	12.69	0
4/5/2016 2:00	2016	96	200	96.08333	4/5/2016	12.66	0
4/5/2016 3:00	2016	96	300	96.125	4/5/2016	12.63	0
4/5/2016 4:00	2016	96	400	96.16667	4/5/2016	12.6	0
4/5/2016 5:00	2016	96	500	96.20833	4/5/2016	12.58	0
4/5/2016 6:00	2016	96	600	96.25	4/5/2016	12.56	0
4/5/2016 7:00	2016	96	700	96.29167	4/5/2016	12.64	0
4/5/2016 8:00	2016	96	800	96.33333	4/5/2016	13.44	0
4/5/2016 9:00	2016	96	900	96.375	4/5/2016	13.42	0
4/5/2016 10:00	2016	96	1000	96.41667	4/5/2016	13.33	0
4/5/2016 11:00	2016	96	1100	96.45833	4/5/2016	13.26	0
4/5/2016 12:00	2016	96	1200	96.5	4/5/2016	13.2	0
4/5/2016 13:00	2016	96	1300	96.54167	4/5/2016	13.18	0
4/5/2016 14:00	2016	96	1400	96.58333	4/5/2016	13.17	0
4/5/2016 15:00	2016	96	1500	96.625	4/5/2016	13.17	0
4/5/2016 16:00	2016	96	1600	96.66667	4/5/2016	13.19	0
4/5/2016 17:00	2016	96	1700	96.70833	4/5/2016	13.22	0
4/5/2016 18:00	2016	96	1800	96.75	4/5/2016	13.26	0
4/5/2016 19:00	2016	96	1900	96.79167	4/5/2016	13.05	0

4/5/2016 20:00	2016	96	2000	96.83333	4/5/2016	12.87	0
4/5/2016 21:00	2016	96	2100	96.875	4/5/2016	12.82	0
4/5/2016 22:00	2016	96	2200	96.91667	4/5/2016	12.78	0
4/5/2016 23:00	2016	96	2300	96.95833	4/5/2016	12.74	0
4/6/2016 0:00	2016	97	0	97	4/6/2016	12.71	0
4/6/2016 1:00	2016	97	100	97.04167	4/6/2016	12.67	0
4/6/2016 2:00	2016	97	200	97.08333	4/6/2016	12.63	0
4/6/2016 3:00	2016	97	300	97.125	4/6/2016	12.59	0
4/6/2016 4:00	2016	97	400	97.16667	4/6/2016	12.56	0
4/6/2016 5:00	2016	97	500	97.20833	4/6/2016	12.53	0
4/6/2016 6:00	2016	97	600	97.25	4/6/2016	12.51	0
4/6/2016 7:00	2016	97	700	97.29167	4/6/2016	12.63	0
4/6/2016 8:00	2016	97	800	97.33333	4/6/2016	13.53	0
4/6/2016 9:00	2016	97	900	97.375	4/6/2016	13.54	0
4/6/2016 10:00	2016	97	1000	97.41667	4/6/2016	13.43	0
4/6/2016 11:00	2016	97	1100	97.45833	4/6/2016	13.34	0
4/6/2016 12:00	2016	97	1200	97.5	4/6/2016	13.27	0
4/6/2016 13:00	2016	97	1300	97.54167	4/6/2016	13.23	0
4/6/2016 14:00	2016	97	1400	97.58333	4/6/2016	13.19	0
4/6/2016 15:00	2016	97	1500	97.625	4/6/2016	13.18	0
4/6/2016 16:00	2016	97	1600	97.66667	4/6/2016	13.19	0
4/6/2016 17:00	2016	97	1700	97.70833	4/6/2016	13.21	0
4/6/2016 18:00	2016	97	1800	97.75	4/6/2016	13.25	0
4/6/2016 19:00	2016	97	1900	97.79167	4/6/2016	13.04	0
4/6/2016 20:00	2016	97	2000	97.83333	4/6/2016	12.87	0
4/6/2016 21:00	2016	97	2100	97.875	4/6/2016	12.81	0
4/6/2016 22:00	2016	97	2200	97.91667	4/6/2016	12.77	0
4/6/2016 23:00	2016	97	2300	97.95833	4/6/2016	12.74	0
4/7/2016 0:00	2016	98	0	98	4/7/2016	12.71	0
4/7/2016 1:00	2016	98	100	98.04167	4/7/2016	12.68	0
4/7/2016 2:00	2016	98	200	98.08333	4/7/2016	12.64	0
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4/7/2016 6:00	2016	98	600	98.25	4/7/2016	12.53	0
4/7/2016 7:00	2016	98	700	98.29167	4/7/2016	12.63	0
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4/7/2016 9:00	2016	98	900	98.375	4/7/2016	13.5	0
4/7/2016 10:00	2016	98	1000	98.41667	4/7/2016	13.4	0
4/7/2016 11:00	2016	98	1100	98.45833	4/7/2016	13.32	0
4/7/2016 12:00	2016	98	1200	98.5	4/7/2016	13.25	0
4/7/2016 13:00	2016	98	1300	98.54167	4/7/2016	13.2	0
4/7/2016 14:00	2016	98	1400	98.58333	4/7/2016	13.17	0
4/7/2016 15:00	2016	98	1500	98.625	4/7/2016	13.2	0
4/7/2016 16:00	2016	98	1600	98.66667	4/7/2016	13.21	0
4/7/2016 17:00	2016	98	1700	98.70833	4/7/2016	13.22	0
4/7/2016 18:00	2016	98	1800	98.75	4/7/2016	13.25	0

4/7/2016 19:00	2016	98	1900	98.79167	4/7/2016	13	0
4/7/2016 20:00	2016	98	2000	98.83333	4/7/2016	12.88	0
4/7/2016 21:00	2016	98	2100	98.875	4/7/2016	12.83	0
4/7/2016 22:00	2016	98	2200	98.91667	4/7/2016	12.81	0
4/7/2016 23:00	2016	98	2300	98.95833	4/7/2016	12.78	0
4/8/2016 0:00	2016	99	0	99	4/8/2016	12.76	0
4/8/2016 1:00	2016	99	100	99.04167	4/8/2016	12.73	0
4/8/2016 2:00	2016	99	200	99.08333	4/8/2016	12.71	0
4/8/2016 3:00	2016	99	300	99.125	4/8/2016	12.67	0
4/8/2016 4:00	2016	99	400	99.16667	4/8/2016	12.64	0
4/8/2016 5:00	2016	99	500	99.20833	4/8/2016	12.61	0
4/8/2016 6:00	2016	99	600	99.25	4/8/2016	12.6	0
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4/8/2016 8:00	2016	99	800	99.33333	4/8/2016	12.7	0.03
4/8/2016 9:00	2016	99	900	99.375	4/8/2016	13.33	0
4/8/2016 10:00	2016	99	1000	99.41667	4/8/2016	13.44	0
4/8/2016 11:00	2016	99	1100	99.45833	4/8/2016	13.4	0
4/8/2016 12:00	2016	99	1200	99.5	4/8/2016	13.37	0
4/8/2016 13:00	2016	99	1300	99.54167	4/8/2016	13.39	0
4/8/2016 14:00	2016	99	1400	99.58333	4/8/2016	13.37	0
4/8/2016 15:00	2016	99	1500	99.625	4/8/2016	13.32	0
4/8/2016 16:00	2016	99	1600	99.66667	4/8/2016	13.35	0
4/8/2016 17:00	2016	99	1700	99.70833	4/8/2016	13.35	0
4/8/2016 18:00	2016	99	1800	99.75	4/8/2016	13.23	0
4/8/2016 19:00	2016	99	1900	99.79167	4/8/2016	12.94	0.01
4/8/2016 20:00	2016	99	2000	99.83333	4/8/2016	12.85	0
4/8/2016 21:00	2016	99	2100	99.875	4/8/2016	12.81	0
4/8/2016 22:00	2016	99	2200	99.91667	4/8/2016	12.78	0
4/8/2016 23:00	2016	99	2300	99.95833	4/8/2016	12.76	0
4/9/2016 0:00	2016	100	0	100	4/9/2016	12.74	0
4/9/2016 1:00	2016	100	100	100.0417	4/9/2016	12.71	0
4/9/2016 2:00	2016	100	200	100.0833	4/9/2016	12.69	0
4/9/2016 3:00	2016	100	300	100.125	4/9/2016	12.66	0
4/9/2016 4:00	2016	100	400	100.1667	4/9/2016	12.62	0
4/9/2016 5:00	2016	100	500	100.2083	4/9/2016	12.58	0
4/9/2016 6:00	2016	100	600	100.25	4/9/2016	12.55	0
4/9/2016 7:00	2016	100	700	100.2917	4/9/2016	12.72	0
4/9/2016 8:00	2016	100	800	100.3333	4/9/2016	13.53	0
4/9/2016 9:00	2016	100	900	100.375	4/9/2016	13.48	0
4/9/2016 10:00	2016	100	1000	100.4167	4/9/2016	13.4	0
4/9/2016 11:00	2016	100	1100	100.4583	4/9/2016	13.33	0
4/9/2016 12:00	2016	100	1200	100.5	4/9/2016	13.31	0
4/9/2016 13:00	2016	100	1300	100.5417	4/9/2016	13.27	0
4/9/2016 14:00	2016	100	1400	100.5833	4/9/2016	13.24	0
4/9/2016 15:00	2016	100	1500	100.625	4/9/2016	13.23	0
4/9/2016 16:00	2016	100	1600	100.6667	4/9/2016	13.22	0
4/9/2016 17:00	2016	100	1700	100.7083	4/9/2016	13.25	0

4/9/2016 18:00	2016	100	1800	100.75	4/9/2016	13.29	0
4/9/2016 19:00	2016	100	1900	100.7917	4/9/2016	13.11	0
4/9/2016 20:00	2016	100	2000	100.8333	4/9/2016	12.89	0
4/9/2016 21:00	2016	100	2100	100.875	4/9/2016	12.83	0
4/9/2016 22:00	2016	100	2200	100.9167	4/9/2016	12.8	0
4/9/2016 23:00	2016	100	2300	100.9583	4/9/2016	12.77	0
4/10/2016 0:00	2016	101	0	101	4/10/2016	12.75	0
4/10/2016 1:00	2016	101	100	101.0417	4/10/2016	12.72	0
4/10/2016 2:00	2016	101	200	101.0833	4/10/2016	12.7	0
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4/10/2016 4:00	2016	101	400	101.1667	4/10/2016	12.65	0
4/10/2016 5:00	2016	101	500	101.2083	4/10/2016	12.62	0
4/10/2016 6:00	2016	101	600	101.25	4/10/2016	12.58	0
4/10/2016 7:00	2016	101	700	101.2917	4/10/2016	12.7	0
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4/10/2016 9:00	2016	101	900	101.375	4/10/2016	13.44	0
4/10/2016 10:00	2016	101	1000	101.4167	4/10/2016	13.39	0
4/10/2016 11:00	2016	101	1100	101.4583	4/10/2016	13.38	0
4/10/2016 12:00	2016	101	1200	101.5	4/10/2016	13.36	0
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4/10/2016 17:00	2016	101	1700	101.7083	4/10/2016	13.42	0
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4/10/2016 19:00	2016	101	1900	101.7917	4/10/2016	13.14	0
4/10/2016 20:00	2016	101	2000	101.8333	4/10/2016	12.87	0
4/10/2016 21:00	2016	101	2100	101.875	4/10/2016	12.82	0
4/10/2016 22:00	2016	101	2200	101.9167	4/10/2016	12.78	0
4/10/2016 23:00	2016	101	2300	101.9583	4/10/2016	12.75	0
4/11/2016 0:00	2016	102	0	102	4/11/2016	12.73	0
4/11/2016 1:00	2016	102	100	102.0417	4/11/2016	12.71	0
4/11/2016 2:00	2016	102	200	102.0833	4/11/2016	12.69	0
4/11/2016 3:00	2016	102	300	102.125	4/11/2016	12.67	0
4/11/2016 4:00	2016	102	400	102.1667	4/11/2016	12.64	0
4/11/2016 5:00	2016	102	500	102.2083	4/11/2016	12.62	0
4/11/2016 6:00	2016	102	600	102.25	4/11/2016	12.59	0
4/11/2016 7:00	2016	102	700	102.2917	4/11/2016	12.67	0
4/11/2016 8:00	2016	102	800	102.3333	4/11/2016	13.48	0
4/11/2016 9:00	2016	102	900	102.375	4/11/2016	13.51	0
4/11/2016 10:00	2016	102	1000	102.4167	4/11/2016	13.43	0
4/11/2016 11:00	2016	102	1100	102.4583	4/11/2016	13.37	0
4/11/2016 12:00	2016	102	1200	102.5	4/11/2016	13.32	0
4/11/2016 13:00	2016	102	1300	102.5417	4/11/2016	13.3	0
4/11/2016 14:00	2016	102	1400	102.5833	4/11/2016	13.29	0
4/11/2016 15:00	2016	102	1500	102.625	4/11/2016	13.28	0
4/11/2016 16:00	2016	102	1600	102.6667	4/11/2016	13.28	0

4/11/2016 17:00	2016	102	1700	102.7083	4/11/2016	13.29	0
4/11/2016 18:00	2016	102	1800	102.75	4/11/2016	13.31	0
4/11/2016 19:00	2016	102	1900	102.7917	4/11/2016	13.03	0
4/11/2016 20:00	2016	102	2000	102.8333	4/11/2016	12.88	0
4/11/2016 21:00	2016	102	2100	102.875	4/11/2016	12.84	0
4/11/2016 22:00	2016	102	2200	102.9167	4/11/2016	12.81	0
4/11/2016 23:00	2016	102	2300	102.9583	4/11/2016	12.78	0
4/12/2016 0:00	2016	103	0	103	4/12/2016	12.76	0
4/12/2016 1:00	2016	103	100	103.0417	4/12/2016	12.74	0
4/12/2016 2:00	2016	103	200	103.0833	4/12/2016	12.71	0
4/12/2016 3:00	2016	103	300	103.125	4/12/2016	12.69	0
4/12/2016 4:00	2016	103	400	103.1667	4/12/2016	12.66	0
4/12/2016 5:00	2016	103	500	103.2083	4/12/2016	12.63	0
4/12/2016 6:00	2016	103	600	103.25	4/12/2016	12.59	0
4/12/2016 7:00	2016	103	700	103.2917	4/12/2016	12.67	0
4/12/2016 8:00	2016	103	800	103.3333	4/12/2016	13.47	0
4/12/2016 9:00	2016	103	900	103.375	4/12/2016	13.45	0
4/12/2016 10:00	2016	103	1000	103.4167	4/12/2016	13.37	0
4/12/2016 11:00	2016	103	1100	103.4583	4/12/2016	13.3	0
4/12/2016 12:00	2016	103	1200	103.5	4/12/2016	13.24	0
4/12/2016 13:00	2016	103	1300	103.5417	4/12/2016	13.2	0
4/12/2016 14:00	2016	103	1400	103.5833	4/12/2016	13.2	0
4/12/2016 15:00	2016	103	1500	103.625	4/12/2016	13.19	0
4/12/2016 16:00	2016	103	1600	103.6667	4/12/2016	13.25	0
4/12/2016 17:00	2016	103	1700	103.7083	4/12/2016	13.3	0
4/12/2016 18:00	2016	103	1800	103.75	4/12/2016	13.14	0
4/12/2016 19:00	2016	103	1900	103.7917	4/12/2016	12.97	0
4/12/2016 20:00	2016	103	2000	103.8333	4/12/2016	12.86	0
4/12/2016 21:00	2016	103	2100	103.875	4/12/2016	12.81	0
4/12/2016 22:00	2016	103	2200	103.9167	4/12/2016	12.78	0
4/12/2016 23:00	2016	103	2300	103.9583	4/12/2016	12.76	0
4/13/2016 0:00	2016	104	0	104	4/13/2016	12.74	0
4/13/2016 1:00	2016	104	100	104.0417	4/13/2016	12.71	0
4/13/2016 2:00	2016	104	200	104.0833	4/13/2016	12.69	0
4/13/2016 3:00	2016	104	300	104.125	4/13/2016	12.66	0
4/13/2016 4:00	2016	104	400	104.1667	4/13/2016	12.63	0
4/13/2016 5:00	2016	104	500	104.2083	4/13/2016	12.6	0
4/13/2016 6:00	2016	104	600	104.25	4/13/2016	12.58	0
4/13/2016 7:00	2016	104	700	104.2917	4/13/2016	12.68	0
4/13/2016 8:00	2016	104	800	104.3333	4/13/2016	13.35	0
4/13/2016 9:00	2016	104	900	104.375	4/13/2016	13.41	0
4/13/2016 10:00	2016	104	1000	104.4167	4/13/2016	13.34	0
4/13/2016 11:00	2016	104	1100	104.4583	4/13/2016	13.27	0
4/13/2016 12:00	2016	104	1200	104.5	4/13/2016	13.23	0
4/13/2016 13:00	2016	104	1300	104.5417	4/13/2016	13.19	0
4/13/2016 14:00	2016	104	1400	104.5833	4/13/2016	13.21	0
4/13/2016 15:00	2016	104	1500	104.625	4/13/2016	13.24	0

4/13/2016 16:00	2016	104	1600	104.6667	4/13/2016	13.24	0
4/13/2016 17:00	2016	104	1700	104.7083	4/13/2016	13.21	0
4/13/2016 18:00	2016	104	1800	104.75	4/13/2016	13.23	0
4/13/2016 19:00	2016	104	1900	104.7917	4/13/2016	13.12	0
4/13/2016 20:00	2016	104	2000	104.8333	4/13/2016	12.9	0
4/13/2016 21:00	2016	104	2100	104.875	4/13/2016	12.84	0
4/13/2016 22:00	2016	104	2200	104.9167	4/13/2016	12.8	0
4/13/2016 23:00	2016	104	2300	104.9583	4/13/2016	12.77	0
4/14/2016 0:00	2016	105	0	105	4/14/2016	12.75	0
4/14/2016 1:00	2016	105	100	105.0417	4/14/2016	12.72	0
4/14/2016 2:00	2016	105	200	105.0833	4/14/2016	12.69	0
4/14/2016 3:00	2016	105	300	105.125	4/14/2016	12.67	0
4/14/2016 4:00	2016	105	400	105.1667	4/14/2016	12.63	0
4/14/2016 5:00	2016	105	500	105.2083	4/14/2016	12.6	0
4/14/2016 6:00	2016	105	600	105.25	4/14/2016	12.57	0
4/14/2016 7:00	2016	105	700	105.2917	4/14/2016	12.74	0
4/14/2016 8:00	2016	105	800	105.3333	4/14/2016	13.45	0
4/14/2016 9:00	2016	105	900	105.375	4/14/2016	13.44	0
4/14/2016 10:00	2016	105	1000	105.4167	4/14/2016	13.35	0
4/14/2016 11:00	2016	105	1100	105.4583	4/14/2016	13.28	0
4/14/2016 12:00	2016	105	1200	105.5	4/14/2016	13.23	0
4/14/2016 13:00	2016	105	1300	105.5417	4/14/2016	13.2	0
4/14/2016 14:00	2016	105	1400	105.5833	4/14/2016	13.18	0
4/14/2016 15:00	2016	105	1500	105.625	4/14/2016	13.18	0
4/14/2016 16:00	2016	105	1600	105.6667	4/14/2016	13.2	0
4/14/2016 17:00	2016	105	1700	105.7083	4/14/2016	13.23	0
4/14/2016 18:00	2016	105	1800	105.75	4/14/2016	13.23	0
4/14/2016 19:00	2016	105	1900	105.7917	4/14/2016	13.04	0
4/14/2016 20:00	2016	105	2000	105.8333	4/14/2016	12.87	0
4/14/2016 21:00	2016	105	2100	105.875	4/14/2016	12.82	0
4/14/2016 22:00	2016	105	2200	105.9167	4/14/2016	12.79	0
4/14/2016 23:00	2016	105	2300	105.9583	4/14/2016	12.76	0
4/15/2016 0:00	2016	106	0	106	4/15/2016	12.72	0
4/15/2016 1:00	2016	106	100	106.0417	4/15/2016	12.69	0
4/15/2016 2:00	2016	106	200	106.0833	4/15/2016	12.65	0
4/15/2016 3:00	2016	106	300	106.125	4/15/2016	12.62	0
4/15/2016 4:00	2016	106	400	106.1667	4/15/2016	12.59	0
4/15/2016 5:00	2016	106	500	106.2083	4/15/2016	12.56	0
4/15/2016 6:00	2016	106	600	106.25	4/15/2016	12.54	0
4/15/2016 7:00	2016	106	700	106.2917	4/15/2016	12.7	0
4/15/2016 8:00	2016	106	800	106.3333	4/15/2016	13.44	0
4/15/2016 9:00	2016	106	900	106.375	4/15/2016	13.45	0
4/15/2016 10:00	2016	106	1000	106.4167	4/15/2016	13.38	0
4/15/2016 11:00	2016	106	1100	106.4583	4/15/2016	13.32	0
4/15/2016 12:00	2016	106	1200	106.5	4/15/2016	13.31	0
4/15/2016 13:00	2016	106	1300	106.5417	4/15/2016	13.36	0
4/15/2016 14:00	2016	106	1400	106.5833	4/15/2016	13.31	0

4/15/2016 15:00	2016	106	1500	106.625	4/15/2016	13.3	0
4/15/2016 16:00	2016	106	1600	106.6667	4/15/2016	13.36	0
4/15/2016 17:00	2016	106	1700	106.7083	4/15/2016	13.39	0
4/15/2016 18:00	2016	106	1800	106.75	4/15/2016	13.41	0
4/15/2016 19:00	2016	106	1900	106.7917	4/15/2016	12.92	0.03
4/15/2016 20:00	2016	106	2000	106.8333	4/15/2016	12.82	0
4/15/2016 21:00	2016	106	2100	106.875	4/15/2016	12.77	0
4/15/2016 22:00	2016	106	2200	106.9167	4/15/2016	12.74	0.03
4/15/2016 23:00	2016	106	2300	106.9583	4/15/2016	12.71	0.01
4/16/2016 0:00	2016	107	0	107	4/16/2016	12.69	0.06
4/16/2016 1:00	2016	107	100	107.0417	4/16/2016	12.67	0.06
4/16/2016 2:00	2016	107	200	107.0833	4/16/2016	12.65	0
4/16/2016 3:00	2016	107	300	107.125	4/16/2016	12.62	0
4/16/2016 4:00	2016	107	400	107.1667	4/16/2016	12.59	0
4/16/2016 5:00	2016	107	500	107.2083	4/16/2016	12.55	0
4/16/2016 6:00	2016	107	600	107.25	4/16/2016	12.52	0
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4/16/2016 8:00	2016	107	800	107.3333	4/16/2016	13.56	0
4/16/2016 9:00	2016	107	900	107.375	4/16/2016	13.65	0
4/16/2016 10:00	2016	107	1000	107.4167	4/16/2016	13.55	0
4/16/2016 11:00	2016	107	1100	107.4583	4/16/2016	13.51	0
4/16/2016 12:00	2016	107	1200	107.5	4/16/2016	13.5	0
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4/16/2016 18:00	2016	107	1800	107.75	4/16/2016	13.45	0
4/16/2016 19:00	2016	107	1900	107.7917	4/16/2016	13.15	0
4/16/2016 20:00	2016	107	2000	107.8333	4/16/2016	12.9	0
4/16/2016 21:00	2016	107	2100	107.875	4/16/2016	12.85	0
4/16/2016 22:00	2016	107	2200	107.9167	4/16/2016	12.83	0
4/16/2016 23:00	2016	107	2300	107.9583	4/16/2016	12.8	0
4/17/2016 0:00	2016	108	0	108	4/17/2016	12.78	0
4/17/2016 1:00	2016	108	100	108.0417	4/17/2016	12.76	0
4/17/2016 2:00	2016	108	200	108.0833	4/17/2016	12.73	0
4/17/2016 3:00	2016	108	300	108.125	4/17/2016	12.69	0
4/17/2016 4:00	2016	108	400	108.1667	4/17/2016	12.66	0
4/17/2016 5:00	2016	108	500	108.2083	4/17/2016	12.61	0
4/17/2016 6:00	2016	108	600	108.25	4/17/2016	12.57	0
4/17/2016 7:00	2016	108	700	108.2917	4/17/2016	12.68	0
4/17/2016 8:00	2016	108	800	108.3333	4/17/2016	13.23	0
4/17/2016 9:00	2016	108	900	108.375	4/17/2016	13.6	0
4/17/2016 10:00	2016	108	1000	108.4167	4/17/2016	13.56	0
4/17/2016 11:00	2016	108	1100	108.4583	4/17/2016	13.54	0
4/17/2016 12:00	2016	108	1200	108.5	4/17/2016	13.5	0
4/17/2016 13:00	2016	108	1300	108.5417	4/17/2016	13.44	0

4/17/2016 14:00	2016	108	1400	108.5833	4/17/2016	13.38	0
4/17/2016 15:00	2016	108	1500	108.625	4/17/2016	13.36	0
4/17/2016 16:00	2016	108	1600	108.6667	4/17/2016	13.37	0
4/17/2016 17:00	2016	108	1700	108.7083	4/17/2016	13.39	0
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4/17/2016 19:00	2016	108	1900	108.7917	4/17/2016	13.09	0
4/17/2016 20:00	2016	108	2000	108.8333	4/17/2016	12.89	0
4/17/2016 21:00	2016	108	2100	108.875	4/17/2016	12.83	0
4/17/2016 22:00	2016	108	2200	108.9167	4/17/2016	12.79	0
4/17/2016 23:00	2016	108	2300	108.9583	4/17/2016	12.77	0
4/18/2016 0:00	2016	109	0	109	4/18/2016	12.75	0
4/18/2016 1:00	2016	109	100	109.0417	4/18/2016	12.72	0
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4/18/2016 3:00	2016	109	300	109.125	4/18/2016	12.65	0
4/18/2016 4:00	2016	109	400	109.1667	4/18/2016	12.62	0
4/18/2016 5:00	2016	109	500	109.2083	4/18/2016	12.57	0
4/18/2016 6:00	2016	109	600	109.25	4/18/2016	12.53	0
4/18/2016 7:00	2016	109	700	109.2917	4/18/2016	12.76	0
4/18/2016 8:00	2016	109	800	109.3333	4/18/2016	13.37	0
4/18/2016 9:00	2016	109	900	109.375	4/18/2016	13.58	0
4/18/2016 10:00	2016	109	1000	109.4167	4/18/2016	13.48	0
4/18/2016 11:00	2016	109	1100	109.4583	4/18/2016	13.4	0
4/18/2016 12:00	2016	109	1200	109.5	4/18/2016	13.33	0
4/18/2016 13:00	2016	109	1300	109.5417	4/18/2016	13.29	0
4/18/2016 14:00	2016	109	1400	109.5833	4/18/2016	13.28	0
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4/18/2016 19:00	2016	109	1900	109.7917	4/18/2016	13.08	0
4/18/2016 20:00	2016	109	2000	109.8333	4/18/2016	12.89	0
4/18/2016 21:00	2016	109	2100	109.875	4/18/2016	12.83	0
4/18/2016 22:00	2016	109	2200	109.9167	4/18/2016	12.79	0
4/18/2016 23:00	2016	109	2300	109.9583	4/18/2016	12.75	0
4/19/2016 0:00	2016	110	0	110	4/19/2016	12.73	0
4/19/2016 1:00	2016	110	100	110.0417	4/19/2016	12.7	0
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4/19/2016 4:00	2016	110	400	110.1667	4/19/2016	12.61	0
4/19/2016 5:00	2016	110	500	110.2083	4/19/2016	12.57	0
4/19/2016 6:00	2016	110	600	110.25	4/19/2016	12.54	0
4/19/2016 7:00	2016	110	700	110.2917	4/19/2016	12.68	0
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4/19/2016 13:00	2016	110	1300	110.5417	4/19/2016	13.23	0
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4/19/2016 15:00	2016	110	1500	110.625	4/19/2016	13.19	0
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4/19/2016 17:00	2016	110	1700	110.7083	4/19/2016	13.22	0
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4/19/2016 19:00	2016	110	1900	110.7917	4/19/2016	13.03	0
4/19/2016 20:00	2016	110	2000	110.8333	4/19/2016	12.89	0
4/19/2016 21:00	2016	110	2100	110.875	4/19/2016	12.83	0
4/19/2016 22:00	2016	110	2200	110.9167	4/19/2016	12.79	0
4/19/2016 23:00	2016	110	2300	110.9583	4/19/2016	12.76	0
4/20/2016 0:00	2016	111	0	111	4/20/2016	12.74	0
4/20/2016 1:00	2016	111	100	111.0417	4/20/2016	12.71	0
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4/20/2016 4:00	2016	111	400	111.1667	4/20/2016	12.62	0
4/20/2016 5:00	2016	111	500	111.2083	4/20/2016	12.59	0
4/20/2016 6:00	2016	111	600	111.25	4/20/2016	12.58	0
4/20/2016 7:00	2016	111	700	111.2917	4/20/2016	12.72	0
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4/20/2016 12:00	2016	111	1200	111.5	4/20/2016	13.19	0
4/20/2016 13:00	2016	111	1300	111.5417	4/20/2016	13.15	0
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4/20/2016 17:00	2016	111	1700	111.7083	4/20/2016	13.16	0
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4/20/2016 19:00	2016	111	1900	111.7917	4/20/2016	13.04	0
4/20/2016 20:00	2016	111	2000	111.8333	4/20/2016	12.87	0
4/20/2016 21:00	2016	111	2100	111.875	4/20/2016	12.82	0
4/20/2016 22:00	2016	111	2200	111.9167	4/20/2016	12.78	0
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4/21/2016 0:00	2016	112	0	112	4/21/2016	12.71	0
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4/21/2016 5:00	2016	112	500	112.2083	4/21/2016	12.6	0
4/21/2016 6:00	2016	112	600	112.25	4/21/2016	12.59	0
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4/21/2016 8:00	2016	112	800	112.3333	4/21/2016	13.31	0
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4/21/2016 10:00	2016	112	1000	112.4167	4/21/2016	13.29	0
4/21/2016 11:00	2016	112	1100	112.4583	4/21/2016	13.24	0

4/21/2016 12:00	2016	112	1200	112.5	4/21/2016	13.2	0
4/21/2016 13:00	2016	112	1300	112.5417	4/21/2016	13.16	0
4/21/2016 14:00	2016	112	1400	112.5833	4/21/2016	13.13	0
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4/21/2016 16:00	2016	112	1600	112.6667	4/21/2016	13.14	0
4/21/2016 17:00	2016	112	1700	112.7083	4/21/2016	13.17	0
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4/21/2016 19:00	2016	112	1900	112.7917	4/21/2016	13.15	0
4/21/2016 20:00	2016	112	2000	112.8333	4/21/2016	12.89	0
4/21/2016 21:00	2016	112	2100	112.875	4/21/2016	12.83	0
4/21/2016 22:00	2016	112	2200	112.9167	4/21/2016	12.79	0
4/21/2016 23:00	2016	112	2300	112.9583	4/21/2016	12.76	0
4/22/2016 0:00	2016	113	0	113	4/22/2016	12.73	0
4/22/2016 1:00	2016	113	100	113.0417	4/22/2016	12.7	0
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4/22/2016 5:00	2016	113	500	113.2083	4/22/2016	12.58	0
4/22/2016 6:00	2016	113	600	113.25	4/22/2016	12.57	0
4/22/2016 7:00	2016	113	700	113.2917	4/22/2016	12.72	0
4/22/2016 8:00	2016	113	800	113.3333	4/22/2016	13.24	0
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4/22/2016 10:00	2016	113	1000	113.4167	4/22/2016	13.28	0
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4/22/2016 12:00	2016	113	1200	113.5	4/22/2016	13.17	0
4/22/2016 13:00	2016	113	1300	113.5417	4/22/2016	13.14	0
4/22/2016 14:00	2016	113	1400	113.5833	4/22/2016	13.13	0
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4/22/2016 17:00	2016	113	1700	113.7083	4/22/2016	13.16	0
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4/22/2016 19:00	2016	113	1900	113.7917	4/22/2016	13.06	0
4/22/2016 20:00	2016	113	2000	113.8333	4/22/2016	12.87	0
4/22/2016 21:00	2016	113	2100	113.875	4/22/2016	12.81	0
4/22/2016 22:00	2016	113	2200	113.9167	4/22/2016	12.77	0
4/22/2016 23:00	2016	113	2300	113.9583	4/22/2016	12.73	0
4/23/2016 0:00	2016	114	0	114	4/23/2016	12.69	0
4/23/2016 1:00	2016	114	100	114.0417	4/23/2016	12.65	0
4/23/2016 2:00	2016	114	200	114.0833	4/23/2016	12.62	0
4/23/2016 3:00	2016	114	300	114.125	4/23/2016	12.6	0
4/23/2016 4:00	2016	114	400	114.1667	4/23/2016	12.59	0
4/23/2016 5:00	2016	114	500	114.2083	4/23/2016	12.58	0
4/23/2016 6:00	2016	114	600	114.25	4/23/2016	12.58	0
4/23/2016 7:00	2016	114	700	114.2917	4/23/2016	12.7	0
4/23/2016 8:00	2016	114	800	114.3333	4/23/2016	13.09	0
4/23/2016 9:00	2016	114	900	114.375	4/23/2016	13.37	0
4/23/2016 10:00	2016	114	1000	114.4167	4/23/2016	13.31	0

4/23/2016 11:00	2016	114	1100	114.4583	4/23/2016	13.27	0
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4/23/2016 13:00	2016	114	1300	114.5417	4/23/2016	13.21	0
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4/23/2016 15:00	2016	114	1500	114.625	4/23/2016	13.21	0
4/23/2016 16:00	2016	114	1600	114.6667	4/23/2016	13.21	0
4/23/2016 17:00	2016	114	1700	114.7083	4/23/2016	13.24	0
4/23/2016 18:00	2016	114	1800	114.75	4/23/2016	13.22	0
4/23/2016 19:00	2016	114	1900	114.7917	4/23/2016	13.04	0
4/23/2016 20:00	2016	114	2000	114.8333	4/23/2016	12.86	0
4/23/2016 21:00	2016	114	2100	114.875	4/23/2016	12.8	0
4/23/2016 22:00	2016	114	2200	114.9167	4/23/2016	12.76	0
4/23/2016 23:00	2016	114	2300	114.9583	4/23/2016	12.73	0
4/24/2016 0:00	2016	115	0	115	4/24/2016	12.7	0
4/24/2016 1:00	2016	115	100	115.0417	4/24/2016	12.68	0
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4/24/2016 5:00	2016	115	500	115.2083	4/24/2016	12.55	0
4/24/2016 6:00	2016	115	600	115.25	4/24/2016	12.54	0
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4/24/2016 9:00	2016	115	900	115.375	4/24/2016	13.44	0
4/24/2016 10:00	2016	115	1000	115.4167	4/24/2016	13.35	0
4/24/2016 11:00	2016	115	1100	115.4583	4/24/2016	13.29	0
4/24/2016 12:00	2016	115	1200	115.5	4/24/2016	13.23	0
4/24/2016 13:00	2016	115	1300	115.5417	4/24/2016	13.19	0
4/24/2016 14:00	2016	115	1400	115.5833	4/24/2016	13.17	0
4/24/2016 15:00	2016	115	1500	115.625	4/24/2016	13.17	0
4/24/2016 16:00	2016	115	1600	115.6667	4/24/2016	13.17	0
4/24/2016 17:00	2016	115	1700	115.7083	4/24/2016	13.19	0
4/24/2016 18:00	2016	115	1800	115.75	4/24/2016	13.18	0
4/24/2016 19:00	2016	115	1900	115.7917	4/24/2016	13.02	0
4/24/2016 20:00	2016	115	2000	115.8333	4/24/2016	12.86	0
4/24/2016 21:00	2016	115	2100	115.875	4/24/2016	12.81	0
4/24/2016 22:00	2016	115	2200	115.9167	4/24/2016	12.77	0
4/24/2016 23:00	2016	115	2300	115.9583	4/24/2016	12.73	0
4/25/2016 0:00	2016	116	0	116	4/25/2016	12.7	0
4/25/2016 1:00	2016	116	100	116.0417	4/25/2016	12.66	0
4/25/2016 2:00	2016	116	200	116.0833	4/25/2016	12.63	0
4/25/2016 3:00	2016	116	300	116.125	4/25/2016	12.6	0
4/25/2016 4:00	2016	116	400	116.1667	4/25/2016	12.57	0
4/25/2016 5:00	2016	116	500	116.2083	4/25/2016	12.56	0
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4/25/2016 7:00	2016	116	700	116.2917	4/25/2016	12.92	0
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4/25/2016 10:00	2016	116	1000	116.4167	4/25/2016	13.37	0
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4/25/2016 13:00	2016	116	1300	116.5417	4/25/2016	13.4	0
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4/25/2016 15:00	2016	116	1500	116.625	4/25/2016	13.54	0
4/25/2016 16:00	2016	116	1600	116.6667	4/25/2016	13.5	0
4/25/2016 17:00	2016	116	1700	116.7083	4/25/2016	13.45	0
4/25/2016 18:00	2016	116	1800	116.75	4/25/2016	13.42	0
4/25/2016 19:00	2016	116	1900	116.7917	4/25/2016	13.11	0
4/25/2016 20:00	2016	116	2000	116.8333	4/25/2016	12.87	0
4/25/2016 21:00	2016	116	2100	116.875	4/25/2016	12.81	0
4/25/2016 22:00	2016	116	2200	116.9167	4/25/2016	12.77	0
4/25/2016 23:00	2016	116	2300	116.9583	4/25/2016	12.74	0
4/26/2016 0:00	2016	117	0	117	4/26/2016	12.71	0
4/26/2016 1:00	2016	117	100	117.0417	4/26/2016	12.69	0
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4/26/2016 9:00	2016	117	900	117.375	4/26/2016	13.58	0
4/26/2016 10:00	2016	117	1000	117.4167	4/26/2016	13.52	0
4/26/2016 11:00	2016	117	1100	117.4583	4/26/2016	13.45	0
4/26/2016 12:00	2016	117	1200	117.5	4/26/2016	13.38	0
4/26/2016 13:00	2016	117	1300	117.5417	4/26/2016	13.32	0
4/26/2016 14:00	2016	117	1400	117.5833	4/26/2016	13.29	0
4/26/2016 15:00	2016	117	1500	117.625	4/26/2016	13.28	0
4/26/2016 16:00	2016	117	1600	117.6667	4/26/2016	13.28	0
4/26/2016 17:00	2016	117	1700	117.7083	4/26/2016	13.32	0
4/26/2016 18:00	2016	117	1800	117.75	4/26/2016	13.32	0
4/26/2016 19:00	2016	117	1900	117.7917	4/26/2016	13.09	0
4/26/2016 20:00	2016	117	2000	117.8333	4/26/2016	12.89	0
4/26/2016 21:00	2016	117	2100	117.875	4/26/2016	12.84	0
4/26/2016 22:00	2016	117	2200	117.9167	4/26/2016	12.81	0
4/26/2016 23:00	2016	117	2300	117.9583	4/26/2016	12.78	0
4/27/2016 0:00	2016	118	0	118	4/27/2016	12.76	0
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4/27/2016 14:00	2016	118	1400	118.5833	4/27/2016	13.28	0
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4/27/2016 17:00	2016	118	1700	118.7083	4/27/2016	13.29	0
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4/27/2016 21:00	2016	118	2100	118.875	4/27/2016	12.83	0
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4/27/2016 23:00	2016	118	2300	118.9583	4/27/2016	12.77	0
4/28/2016 0:00	2016	119	0	119	4/28/2016	12.76	0
4/28/2016 1:00	2016	119	100	119.0417	4/28/2016	12.74	0
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4/28/2016 4:00	2016	119	400	119.1667	4/28/2016	12.67	0
4/28/2016 5:00	2016	119	500	119.2083	4/28/2016	12.63	0
4/28/2016 6:00	2016	119	600	119.25	4/28/2016	12.6	0
4/28/2016 7:00	2016	119	700	119.2917	4/28/2016	12.77	0
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4/28/2016 9:00	2016	119	900	119.375	4/28/2016	13.47	0
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4/28/2016 13:00	2016	119	1300	119.5417	4/28/2016	13.32	0
4/28/2016 14:00	2016	119	1400	119.5833	4/28/2016	13.31	0
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4/28/2016 16:00	2016	119	1600	119.6667	4/28/2016	13.32	0
4/28/2016 17:00	2016	119	1700	119.7083	4/28/2016	13.37	0
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4/28/2016 19:00	2016	119	1900	119.7917	4/28/2016	13.19	0
4/28/2016 20:00	2016	119	2000	119.8333	4/28/2016	12.88	0
4/28/2016 21:00	2016	119	2100	119.875	4/28/2016	12.82	0
4/28/2016 22:00	2016	119	2200	119.9167	4/28/2016	12.78	0
4/28/2016 23:00	2016	119	2300	119.9583	4/28/2016	12.75	0
4/29/2016 0:00	2016	120	0	120	4/29/2016	12.73	0
4/29/2016 1:00	2016	120	100	120.0417	4/29/2016	12.71	0
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4/29/2016 5:00	2016	120	500	120.2083	4/29/2016	12.62	0
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4/29/2016 12:00	2016	120	1200	120.5	4/29/2016	13.34	0
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4/29/2016 14:00	2016	120	1400	120.5833	4/29/2016	13.27	0
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4/29/2016 19:00	2016	120	1900	120.7917	4/29/2016	13.07	0
4/29/2016 20:00	2016	120	2000	120.8333	4/29/2016	12.89	0
4/29/2016 21:00	2016	120	2100	120.875	4/29/2016	12.84	0
4/29/2016 22:00	2016	120	2200	120.9167	4/29/2016	12.81	0
4/29/2016 23:00	2016	120	2300	120.9583	4/29/2016	12.78	0
4/30/2016 0:00	2016	121	0	121	4/30/2016	12.76	0
4/30/2016 1:00	2016	121	100	121.0417	4/30/2016	12.73	0
4/30/2016 2:00	2016	121	200	121.0833	4/30/2016	12.7	0
4/30/2016 3:00	2016	121	300	121.125	4/30/2016	12.68	0
4/30/2016 4:00	2016	121	400	121.1667	4/30/2016	12.65	0
4/30/2016 5:00	2016	121	500	121.2083	4/30/2016	12.62	0
4/30/2016 6:00	2016	121	600	121.25	4/30/2016	12.6	0
4/30/2016 7:00	2016	121	700	121.2917	4/30/2016	12.91	0
4/30/2016 8:00	2016	121	800	121.3333	4/30/2016	13.48	0
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4/30/2016 10:00	2016	121	1000	121.4167	4/30/2016	13.46	0
4/30/2016 11:00	2016	121	1100	121.4583	4/30/2016	13.44	0.03
4/30/2016 12:00	2016	121	1200	121.5	4/30/2016	13.46	0.01
4/30/2016 13:00	2016	121	1300	121.5417	4/30/2016	13.36	0
4/30/2016 14:00	2016	121	1400	121.5833	4/30/2016	13.4	0
4/30/2016 15:00	2016	121	1500	121.625	4/30/2016	13.21	0
4/30/2016 16:00	2016	121	1600	121.6667	4/30/2016	12.97	0.14
4/30/2016 17:00	2016	121	1700	121.7083	4/30/2016	12.89	0.09
4/30/2016 18:00	2016	121	1800	121.75	4/30/2016	12.83	0.15
4/30/2016 19:00	2016	121	1900	121.7917	4/30/2016	12.81	0.02
4/30/2016 20:00	2016	121	2000	121.8333	4/30/2016	12.77	0
4/30/2016 21:00	2016	121	2100	121.875	4/30/2016	12.75	0.03
4/30/2016 22:00	2016	121	2200	121.9167	4/30/2016	12.72	0.02
4/30/2016 23:00	2016	121	2300	121.9583	4/30/2016	12.69	0
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5/1/2016 6:00	2016	122	600	122.25	5/1/2016	12.54	0.03

5/1/2016 7:00	2016	122	700	122.2917	5/1/2016	12.57	0.01
5/1/2016 8:00	2016	122	800	122.3333	5/1/2016	12.7	0.06
5/1/2016 9:00	2016	122	900	122.375	5/1/2016	13.11	0.02
5/1/2016 10:00	2016	122	1000	122.4167	5/1/2016	13.53	0
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5/1/2016 12:00	2016	122	1200	122.5	5/1/2016	13.63	0
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5/1/2016 17:00	2016	122	1700	122.7083	5/1/2016	13.51	0
5/1/2016 18:00	2016	122	1800	122.75	5/1/2016	13.49	0
5/1/2016 19:00	2016	122	1900	122.7917	5/1/2016	13.36	0
5/1/2016 20:00	2016	122	2000	122.8333	5/1/2016	12.95	0
5/1/2016 21:00	2016	122	2100	122.875	5/1/2016	12.87	0
5/1/2016 22:00	2016	122	2200	122.9167	5/1/2016	12.83	0
5/1/2016 23:00	2016	122	2300	122.9583	5/1/2016	12.8	0
5/2/2016 0:00	2016	123	0	123	5/2/2016	12.77	0
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5/2/2016 6:00	2016	123	600	123.25	5/2/2016	12.62	0
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5/2/2016 10:00	2016	123	1000	123.4167	5/2/2016	13.53	0
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5/2/2016 22:00	2016	123	2200	123.9167	5/2/2016	12.82	0
5/2/2016 23:00	2016	123	2300	123.9583	5/2/2016	12.79	0
5/3/2016 0:00	2016	124	0	124	5/3/2016	12.76	0
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5/3/2016 9:00	2016	124	900	124.375	5/3/2016	13.53	0
5/3/2016 10:00	2016	124	1000	124.4167	5/3/2016	13.43	0
5/3/2016 11:00	2016	124	1100	124.4583	5/3/2016	13.37	0
5/3/2016 12:00	2016	124	1200	124.5	5/3/2016	13.31	0
5/3/2016 13:00	2016	124	1300	124.5417	5/3/2016	13.26	0
5/3/2016 14:00	2016	124	1400	124.5833	5/3/2016	13.24	0
5/3/2016 15:00	2016	124	1500	124.625	5/3/2016	13.26	0
5/3/2016 16:00	2016	124	1600	124.6667	5/3/2016	13.25	0
5/3/2016 17:00	2016	124	1700	124.7083	5/3/2016	13.27	0
5/3/2016 18:00	2016	124	1800	124.75	5/3/2016	13.25	0
5/3/2016 19:00	2016	124	1900	124.7917	5/3/2016	13.1	0
5/3/2016 20:00	2016	124	2000	124.8333	5/3/2016	12.9	0
5/3/2016 21:00	2016	124	2100	124.875	5/3/2016	12.84	0
5/3/2016 22:00	2016	124	2200	124.9167	5/3/2016	12.8	0
5/3/2016 23:00	2016	124	2300	124.9583	5/3/2016	12.77	0
5/4/2016 0:00	2016	125	0	125	5/4/2016	12.75	0
5/4/2016 1:00	2016	125	100	125.0417	5/4/2016	12.72	0
5/4/2016 2:00	2016	125	200	125.0833	5/4/2016	12.7	0
5/4/2016 3:00	2016	125	300	125.125	5/4/2016	12.67	0
5/4/2016 4:00	2016	125	400	125.1667	5/4/2016	12.64	0
5/4/2016 5:00	2016	125	500	125.2083	5/4/2016	12.61	0
5/4/2016 6:00	2016	125	600	125.25	5/4/2016	12.61	0
5/4/2016 7:00	2016	125	700	125.2917	5/4/2016	12.81	0
5/4/2016 8:00	2016	125	800	125.3333	5/4/2016	13.22	0
5/4/2016 9:00	2016	125	900	125.375	5/4/2016	13.43	0
5/4/2016 10:00	2016	125	1000	125.4167	5/4/2016	13.35	0
5/4/2016 11:00	2016	125	1100	125.4583	5/4/2016	13.3	0
5/4/2016 12:00	2016	125	1200	125.5	5/4/2016	13.24	0
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5/4/2016 14:00	2016	125	1400	125.5833	5/4/2016	13.16	0
5/4/2016 15:00	2016	125	1500	125.625	5/4/2016	13.17	0
5/4/2016 16:00	2016	125	1600	125.6667	5/4/2016	13.17	0
5/4/2016 17:00	2016	125	1700	125.7083	5/4/2016	13.18	0
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5/4/2016 19:00	2016	125	1900	125.7917	5/4/2016	13.06	0
5/4/2016 20:00	2016	125	2000	125.8333	5/4/2016	12.89	0
5/4/2016 21:00	2016	125	2100	125.875	5/4/2016	12.84	0
5/4/2016 22:00	2016	125	2200	125.9167	5/4/2016	12.8	0
5/4/2016 23:00	2016	125	2300	125.9583	5/4/2016	12.77	0
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5/5/2016 1:00	2016	126	100	126.0417	5/5/2016	12.7	0
5/5/2016 2:00	2016	126	200	126.0833	5/5/2016	12.68	0
5/5/2016 3:00	2016	126	300	126.125	5/5/2016	12.65	0
5/5/2016 4:00	2016	126	400	126.1667	5/5/2016	12.63	0

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5/5/2016 7:00	2016	126	700	126.2917	5/5/2016	12.81	0
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5/5/2016 10:00	2016	126	1000	126.4167	5/5/2016	13.32	0
5/5/2016 11:00	2016	126	1100	126.4583	5/5/2016	13.25	0
5/5/2016 12:00	2016	126	1200	126.5	5/5/2016	13.2	0
5/5/2016 13:00	2016	126	1300	126.5417	5/5/2016	13.17	0
5/5/2016 14:00	2016	126	1400	126.5833	5/5/2016	13.16	0
5/5/2016 15:00	2016	126	1500	126.625	5/5/2016	13.17	0
5/5/2016 16:00	2016	126	1600	126.6667	5/5/2016	13.16	0
5/5/2016 17:00	2016	126	1700	126.7083	5/5/2016	13.18	0
5/5/2016 18:00	2016	126	1800	126.75	5/5/2016	13.23	0
5/5/2016 19:00	2016	126	1900	126.7917	5/5/2016	13.2	0
5/5/2016 20:00	2016	126	2000	126.8333	5/5/2016	12.92	0
5/5/2016 21:00	2016	126	2100	126.875	5/5/2016	12.84	0
5/5/2016 22:00	2016	126	2200	126.9167	5/5/2016	12.79	0
5/5/2016 23:00	2016	126	2300	126.9583	5/5/2016	12.76	0
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5/6/2016 4:00	2016	127	400	127.1667	5/6/2016	12.63	0
5/6/2016 5:00	2016	127	500	127.2083	5/6/2016	12.61	0
5/6/2016 6:00	2016	127	600	127.25	5/6/2016	12.6	0
5/6/2016 7:00	2016	127	700	127.2917	5/6/2016	12.77	0
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5/6/2016 9:00	2016	127	900	127.375	5/6/2016	13.45	0
5/6/2016 10:00	2016	127	1000	127.4167	5/6/2016	13.36	0
5/6/2016 11:00	2016	127	1100	127.4583	5/6/2016	13.31	0
5/6/2016 12:00	2016	127	1200	127.5	5/6/2016	13.27	0
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5/6/2016 19:00	2016	127	1900	127.7917	5/6/2016	13.11	0
5/6/2016 20:00	2016	127	2000	127.8333	5/6/2016	12.88	0
5/6/2016 21:00	2016	127	2100	127.875	5/6/2016	12.82	0
5/6/2016 22:00	2016	127	2200	127.9167	5/6/2016	12.78	0
5/6/2016 23:00	2016	127	2300	127.9583	5/6/2016	12.75	0
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5/7/2016 2:00	2016	128	200	128.0833	5/7/2016	12.67	0
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5/7/2016 6:00	2016	128	600	128.25	5/7/2016	12.57	0
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5/7/2016 11:00	2016	128	1100	128.4583	5/7/2016	13.4	0
5/7/2016 12:00	2016	128	1200	128.5	5/7/2016	13.37	0
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5/7/2016 16:00	2016	128	1600	128.6667	5/7/2016	13.32	0
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5/7/2016 19:00	2016	128	1900	128.7917	5/7/2016	13.22	0
5/7/2016 20:00	2016	128	2000	128.8333	5/7/2016	12.91	0
5/7/2016 21:00	2016	128	2100	128.875	5/7/2016	12.85	0
5/7/2016 22:00	2016	128	2200	128.9167	5/7/2016	12.82	0
5/7/2016 23:00	2016	128	2300	128.9583	5/7/2016	12.79	0
5/8/2016 0:00	2016	129	0	129	5/8/2016	12.76	0
5/8/2016 1:00	2016	129	100	129.0417	5/8/2016	12.74	0
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5/8/2016 10:00	2016	129	1000	129.4167	5/8/2016	13.39	0
5/8/2016 11:00	2016	129	1100	129.4583	5/8/2016	13.33	0
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5/8/2016 17:00	2016	129	1700	129.7083	5/8/2016	13.39	0
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5/8/2016 21:00	2016	129	2100	129.875	5/8/2016	12.82	0
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5/9/2016 0:00	2016	130	0	130	5/9/2016	12.75	0
5/9/2016 1:00	2016	130	100	130.0417	5/9/2016	12.74	0
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5/9/2016 21:00	2016	130	2100	130.875	5/9/2016	12.84	0
5/9/2016 22:00	2016	130	2200	130.9167	5/9/2016	12.8	0
5/9/2016 23:00	2016	130	2300	130.9583	5/9/2016	12.77	0
5/10/2016 0:00	2016	131	0	131	5/10/2016	12.74	0
5/10/2016 1:00	2016	131	100	131.0417	5/10/2016	12.71	0
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5/10/2016 10:00	2016	131	1000	131.4167	5/10/2016	13.29	0
5/10/2016 11:00	2016	131	1100	131.4583	5/10/2016	13.24	0
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5/10/2016 14:00	2016	131	1400	131.5833	5/10/2016	13.15	0
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5/10/2016 16:00	2016	131	1600	131.6667	5/10/2016	13.18	0
5/10/2016 17:00	2016	131	1700	131.7083	5/10/2016	13.19	0
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5/10/2016 19:00	2016	131	1900	131.7917	5/10/2016	13.08	0
5/10/2016 20:00	2016	131	2000	131.8333	5/10/2016	12.89	0
5/10/2016 21:00	2016	131	2100	131.875	5/10/2016	12.83	0
5/10/2016 22:00	2016	131	2200	131.9167	5/10/2016	12.78	0
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5/11/2016 17:00	2016	132	1700	132.7083	5/11/2016	13.21	0
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5/11/2016 19:00	2016	132	1900	132.7917	5/11/2016	13.12	0
5/11/2016 20:00	2016	132	2000	132.8333	5/11/2016	12.9	0
5/11/2016 21:00	2016	132	2100	132.875	5/11/2016	12.83	0
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5/12/2016 0:00	2016	133	0	133	5/12/2016	12.72	0
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5/12/2016 11:00	2016	133	1100	133.4583	5/12/2016	13.25	0
5/12/2016 12:00	2016	133	1200	133.5	5/12/2016	13.21	0
5/12/2016 13:00	2016	133	1300	133.5417	5/12/2016	13.18	0
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5/12/2016 15:00	2016	133	1500	133.625	5/12/2016	13.18	0
5/12/2016 16:00	2016	133	1600	133.6667	5/12/2016	13.17	0
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5/12/2016 19:00	2016	133	1900	133.7917	5/12/2016	13.11	0
5/12/2016 20:00	2016	133	2000	133.8333	5/12/2016	12.91	0
5/12/2016 21:00	2016	133	2100	133.875	5/12/2016	12.83	0
5/12/2016 22:00	2016	133	2200	133.9167	5/12/2016	12.79	0
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5/13/2016 0:00	2016	134	0	134	5/13/2016	12.72	0

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5/13/2016 12:00	2016	134	1200	134.5	5/13/2016	13.16	0
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5/13/2016 15:00	2016	134	1500	134.625	5/13/2016	13.13	0
5/13/2016 16:00	2016	134	1600	134.6667	5/13/2016	13.12	0
5/13/2016 17:00	2016	134	1700	134.7083	5/13/2016	13.12	0
5/13/2016 18:00	2016	134	1800	134.75	5/13/2016	13.14	0
5/13/2016 19:00	2016	134	1900	134.7917	5/13/2016	13.11	0
5/13/2016 20:00	2016	134	2000	134.8333	5/13/2016	12.91	0
5/13/2016 21:00	2016	134	2100	134.875	5/13/2016	12.83	0
5/13/2016 22:00	2016	134	2200	134.9167	5/13/2016	12.79	0
5/13/2016 23:00	2016	134	2300	134.9583	5/13/2016	12.75	0
5/14/2016 0:00	2016	135	0	135	5/14/2016	12.72	0
5/14/2016 1:00	2016	135	100	135.0417	5/14/2016	12.69	0
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5/14/2016 4:00	2016	135	400	135.1667	5/14/2016	12.63	0
5/14/2016 5:00	2016	135	500	135.2083	5/14/2016	12.62	0
5/14/2016 6:00	2016	135	600	135.25	5/14/2016	12.65	0
5/14/2016 7:00	2016	135	700	135.2917	5/14/2016	12.77	0
5/14/2016 8:00	2016	135	800	135.3333	5/14/2016	13.18	0
5/14/2016 9:00	2016	135	900	135.375	5/14/2016	13.31	0
5/14/2016 10:00	2016	135	1000	135.4167	5/14/2016	13.25	0
5/14/2016 11:00	2016	135	1100	135.4583	5/14/2016	13.22	0
5/14/2016 12:00	2016	135	1200	135.5	5/14/2016	13.21	0
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5/14/2016 14:00	2016	135	1400	135.5833	5/14/2016	13.23	0
5/14/2016 15:00	2016	135	1500	135.625	5/14/2016	13.18	0
5/14/2016 16:00	2016	135	1600	135.6667	5/14/2016	13.2	0
5/14/2016 17:00	2016	135	1700	135.7083	5/14/2016	13.24	0
5/14/2016 18:00	2016	135	1800	135.75	5/14/2016	13.18	0
5/14/2016 19:00	2016	135	1900	135.7917	5/14/2016	13.05	0
5/14/2016 20:00	2016	135	2000	135.8333	5/14/2016	12.91	0
5/14/2016 21:00	2016	135	2100	135.875	5/14/2016	12.83	0
5/14/2016 22:00	2016	135	2200	135.9167	5/14/2016	12.79	0
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5/15/2016 0:00	2016	136	0	136	5/15/2016	12.72	0
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5/15/2016 5:00	2016	136	500	136.2083	5/15/2016	12.57	0
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5/15/2016 13:00	2016	136	1300	136.5417	5/15/2016	13.18	0
5/15/2016 14:00	2016	136	1400	136.5833	5/15/2016	13.17	0
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5/15/2016 17:00	2016	136	1700	136.7083	5/15/2016	13.18	0
5/15/2016 18:00	2016	136	1800	136.75	5/15/2016	13.2	0
5/15/2016 19:00	2016	136	1900	136.7917	5/15/2016	13.12	0
5/15/2016 20:00	2016	136	2000	136.8333	5/15/2016	12.91	0
5/15/2016 21:00	2016	136	2100	136.875	5/15/2016	12.84	0
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5/16/2016 9:00	2016	137	900	137.375	5/16/2016	13.31	0
5/16/2016 10:00	2016	137	1000	137.4167	5/16/2016	13.26	0
5/16/2016 11:00	2016	137	1100	137.4583	5/16/2016	13.2	0
5/16/2016 12:00	2016	137	1200	137.5	5/16/2016	13.18	0
5/16/2016 13:00	2016	137	1300	137.5417	5/16/2016	13.18	0
5/16/2016 14:00	2016	137	1400	137.5833	5/16/2016	13.2	0
5/16/2016 15:00	2016	137	1500	137.625	5/16/2016	13.22	0
5/16/2016 16:00	2016	137	1600	137.6667	5/16/2016	13.25	0
5/16/2016 17:00	2016	137	1700	137.7083	5/16/2016	13.26	0
5/16/2016 18:00	2016	137	1800	137.75	5/16/2016	13.26	0
5/16/2016 19:00	2016	137	1900	137.7917	5/16/2016	13.1	0
5/16/2016 20:00	2016	137	2000	137.8333	5/16/2016	12.87	0
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5/16/2016 22:00	2016	137	2200	137.9167	5/16/2016	12.76	0

5/16/2016 23:00	2016	137	2300	137.9583	5/16/2016	12.73	0
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5/17/2016 1:00	2016	138	100	138.0417	5/17/2016	12.69	0
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5/17/2016 4:00	2016	138	400	138.1667	5/17/2016	12.59	0
5/17/2016 5:00	2016	138	500	138.2083	5/17/2016	12.57	0
5/17/2016 6:00	2016	138	600	138.25	5/17/2016	12.61	0
5/17/2016 7:00	2016	138	700	138.2917	5/17/2016	13.12	0
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5/17/2016 10:00	2016	138	1000	138.4167	5/17/2016	13.3	0
5/17/2016 11:00	2016	138	1100	138.4583	5/17/2016	13.29	0
5/17/2016 12:00	2016	138	1200	138.5	5/17/2016	13.12	0.01
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5/17/2016 14:00	2016	138	1400	138.5833	5/17/2016	13.39	0.01
5/17/2016 15:00	2016	138	1500	138.625	5/17/2016	13.37	0
5/17/2016 16:00	2016	138	1600	138.6667	5/17/2016	13.32	0
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5/17/2016 19:00	2016	138	1900	138.7917	5/17/2016	13.17	0
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5/17/2016 21:00	2016	138	2100	138.875	5/17/2016	12.83	0
5/17/2016 22:00	2016	138	2200	138.9167	5/17/2016	12.8	0
5/17/2016 23:00	2016	138	2300	138.9583	5/17/2016	12.77	0
5/18/2016 0:00	2016	139	0	139	5/18/2016	12.74	0
5/18/2016 1:00	2016	139	100	139.0417	5/18/2016	12.71	0
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5/18/2016 12:00	2016	139	1200	139.5	5/18/2016	13.32	0
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5/18/2016 14:00	2016	139	1400	139.5833	5/18/2016	13.25	0
5/18/2016 15:00	2016	139	1500	139.625	5/18/2016	13.14	0
5/18/2016 16:00	2016	139	1600	139.6667	5/18/2016	13.37	0
5/18/2016 17:00	2016	139	1700	139.7083	5/18/2016	13.37	0
5/18/2016 18:00	2016	139	1800	139.75	5/18/2016	13.35	0
5/18/2016 19:00	2016	139	1900	139.7917	5/18/2016	13.17	0
5/18/2016 20:00	2016	139	2000	139.8333	5/18/2016	12.91	0
5/18/2016 21:00	2016	139	2100	139.875	5/18/2016	12.83	0

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5/19/2016 0:00	2016	140	0	140	5/19/2016	12.75	0
5/19/2016 1:00	2016	140	100	140.0417	5/19/2016	12.72	0
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5/19/2016 5:00	2016	140	500	140.2083	5/19/2016	12.62	0
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5/19/2016 12:00	2016	140	1200	140.5	5/19/2016	13.25	0
5/19/2016 13:00	2016	140	1300	140.5417	5/19/2016	13.22	0
5/19/2016 14:00	2016	140	1400	140.5833	5/19/2016	13.19	0
5/19/2016 15:00	2016	140	1500	140.625	5/19/2016	13.19	0
5/19/2016 16:00	2016	140	1600	140.6667	5/19/2016	13.19	0
5/19/2016 17:00	2016	140	1700	140.7083	5/19/2016	13.17	0
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5/19/2016 19:00	2016	140	1900	140.7917	5/19/2016	13.15	0
5/19/2016 20:00	2016	140	2000	140.8333	5/19/2016	12.92	0
5/19/2016 21:00	2016	140	2100	140.875	5/19/2016	12.85	0
5/19/2016 22:00	2016	140	2200	140.9167	5/19/2016	12.81	0
5/19/2016 23:00	2016	140	2300	140.9583	5/19/2016	12.79	0
5/20/2016 0:00	2016	141	0	141	5/20/2016	12.77	0
5/20/2016 1:00	2016	141	100	141.0417	5/20/2016	12.74	0
5/20/2016 2:00	2016	141	200	141.0833	5/20/2016	12.71	0
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5/20/2016 5:00	2016	141	500	141.2083	5/20/2016	12.63	0
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5/20/2016 12:00	2016	141	1200	141.5	5/20/2016	13.19	0
5/20/2016 13:00	2016	141	1300	141.5417	5/20/2016	13.16	0
5/20/2016 14:00	2016	141	1400	141.5833	5/20/2016	13.16	0
5/20/2016 15:00	2016	141	1500	141.625	5/20/2016	13.17	0
5/20/2016 16:00	2016	141	1600	141.6667	5/20/2016	13.18	0
5/20/2016 17:00	2016	141	1700	141.7083	5/20/2016	13.19	0
5/20/2016 18:00	2016	141	1800	141.75	5/20/2016	13.21	0
5/20/2016 19:00	2016	141	1900	141.7917	5/20/2016	13.13	0
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5/20/2016 22:00	2016	141	2200	141.9167	5/20/2016	12.79	0
5/20/2016 23:00	2016	141	2300	141.9583	5/20/2016	12.76	0
5/21/2016 0:00	2016	142	0	142	5/21/2016	12.73	0
5/21/2016 1:00	2016	142	100	142.0417	5/21/2016	12.71	0
5/21/2016 2:00	2016	142	200	142.0833	5/21/2016	12.68	0
5/21/2016 3:00	2016	142	300	142.125	5/21/2016	12.65	0
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5/21/2016 5:00	2016	142	500	142.2083	5/21/2016	12.6	0
5/21/2016 6:00	2016	142	600	142.25	5/21/2016	12.62	0
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5/21/2016 13:00	2016	142	1300	142.5417	5/21/2016	13.15	0
5/21/2016 14:00	2016	142	1400	142.5833	5/21/2016	13.15	0
5/21/2016 15:00	2016	142	1500	142.625	5/21/2016	13.18	0
5/21/2016 16:00	2016	142	1600	142.6667	5/21/2016	13.19	0
5/21/2016 17:00	2016	142	1700	142.7083	5/21/2016	13.2	0
5/21/2016 18:00	2016	142	1800	142.75	5/21/2016	13.21	0
5/21/2016 19:00	2016	142	1900	142.7917	5/21/2016	13.13	0
5/21/2016 20:00	2016	142	2000	142.8333	5/21/2016	12.91	0
5/21/2016 21:00	2016	142	2100	142.875	5/21/2016	12.82	0
5/21/2016 22:00	2016	142	2200	142.9167	5/21/2016	12.78	0
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5/22/2016 22:00	2016	143	2200	143.9167	5/22/2016	12.79	0
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5/23/2016 0:00	2016	144	0	144	5/23/2016	12.72	0
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5/23/2016 14:00	2016	144	1400	144.5833	5/23/2016	13.14	0
5/23/2016 15:00	2016	144	1500	144.625	5/23/2016	13.16	0
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5/23/2016 23:00	2016	144	2300	144.9583	5/23/2016	12.75	0
5/24/2016 0:00	2016	145	0	145	5/24/2016	12.72	0
5/24/2016 1:00	2016	145	100	145.0417	5/24/2016	12.69	0
5/24/2016 2:00	2016	145	200	145.0833	5/24/2016	12.65	0
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5/24/2016 13:00	2016	145	1300	145.5417	5/24/2016	13.16	0
5/24/2016 14:00	2016	145	1400	145.5833	5/24/2016	13.15	0
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5/24/2016 16:00	2016	145	1600	145.6667	5/24/2016	13.18	0
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5/24/2016 18:00	2016	145	1800	145.75	5/24/2016	13.22	0

5/24/2016 19:00	2016	145	1900	145.7917	5/24/2016	13.12	0
5/24/2016 20:00	2016	145	2000	145.8333	5/24/2016	12.91	0
5/24/2016 21:00	2016	145	2100	145.875	5/24/2016	12.82	0
5/24/2016 22:00	2016	145	2200	145.9167	5/24/2016	12.79	0
5/24/2016 23:00	2016	145	2300	145.9583	5/24/2016	12.75	0
5/25/2016 0:00	2016	146	0	146	5/25/2016	12.72	0
5/25/2016 1:00	2016	146	100	146.0417	5/25/2016	12.69	0
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5/25/2016 3:00	2016	146	300	146.125	5/25/2016	12.63	0
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5/25/2016 5:00	2016	146	500	146.2083	5/25/2016	12.56	0
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5/25/2016 12:00	2016	146	1200	146.5	5/25/2016	13.22	0
5/25/2016 13:00	2016	146	1300	146.5417	5/25/2016	13.18	0
5/25/2016 14:00	2016	146	1400	146.5833	5/25/2016	13.16	0
5/25/2016 15:00	2016	146	1500	146.625	5/25/2016	13.18	0
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5/25/2016 21:00	2016	146	2100	146.875	5/25/2016	12.83	0
5/25/2016 22:00	2016	146	2200	146.9167	5/25/2016	12.79	0
5/25/2016 23:00	2016	146	2300	146.9583	5/25/2016	12.75	0
5/26/2016 0:00	2016	147	0	147	5/26/2016	12.72	0
5/26/2016 1:00	2016	147	100	147.0417	5/26/2016	12.69	0
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5/26/2016 13:00	2016	147	1300	147.5417	5/26/2016	13.21	0
5/26/2016 14:00	2016	147	1400	147.5833	5/26/2016	13.28	0
5/26/2016 15:00	2016	147	1500	147.625	5/26/2016	13.33	0
5/26/2016 16:00	2016	147	1600	147.6667	5/26/2016	13.29	0
5/26/2016 17:00	2016	147	1700	147.7083	5/26/2016	13.28	0

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5/26/2016 20:00	2016	147	2000	147.8333	5/26/2016	12.95	0
5/26/2016 21:00	2016	147	2100	147.875	5/26/2016	12.85	0
5/26/2016 22:00	2016	147	2200	147.9167	5/26/2016	12.81	0
5/26/2016 23:00	2016	147	2300	147.9583	5/26/2016	12.79	0
5/27/2016 0:00	2016	148	0	148	5/27/2016	12.76	0
5/27/2016 1:00	2016	148	100	148.0417	5/27/2016	12.74	0
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5/27/2016 9:00	2016	148	900	148.375	5/27/2016	13.36	0
5/27/2016 10:00	2016	148	1000	148.4167	5/27/2016	13.29	0
5/27/2016 11:00	2016	148	1100	148.4583	5/27/2016	13.23	0
5/27/2016 12:00	2016	148	1200	148.5	5/27/2016	13.17	0
5/27/2016 13:00	2016	148	1300	148.5417	5/27/2016	13.13	0
5/27/2016 14:00	2016	148	1400	148.5833	5/27/2016	13.14	0
5/27/2016 15:00	2016	148	1500	148.625	5/27/2016	13.16	0
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5/27/2016 19:00	2016	148	1900	148.7917	5/27/2016	13.16	0
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5/27/2016 22:00	2016	148	2200	148.9167	5/27/2016	12.8	0
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5/28/2016 23:00	2016	149	2300	149.9583	5/28/2016	12.75	0
5/29/2016 0:00	2016	150	0	150	5/29/2016	12.72	0
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5/30/2016 0:00	2016	151	0	151	5/30/2016	12.72	0
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5/30/2016 10:00	2016	151	1000	151.4167	5/30/2016	13.22	0
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5/30/2016 14:00	2016	151	1400	151.5833	5/30/2016	13.09	0
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5/30/2016 21:00	2016	151	2100	151.875	5/30/2016	12.81	0
5/30/2016 22:00	2016	151	2200	151.9167	5/30/2016	12.77	0
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5/31/2016 0:00	2016	152	0	152	5/31/2016	12.7	0
5/31/2016 1:00	2016	152	100	152.0417	5/31/2016	12.67	0
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5/31/2016 21:00	2016	152	2100	152.875	5/31/2016	12.81	0
5/31/2016 22:00	2016	152	2200	152.9167	5/31/2016	12.77	0
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6/1/2016 19:00	2016	153	1900	153.7917	6/1/2016	13.05	0
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6/1/2016 21:00	2016	153	2100	153.875	6/1/2016	12.82	0
6/1/2016 22:00	2016	153	2200	153.9167	6/1/2016	12.78	0
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6/2/2016 0:00	2016	154	0	154	6/2/2016	12.69	0
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6/2/2016 21:00	2016	154	2100	154.875	6/2/2016	12.81	0
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6/3/2016 0:00	2016	155	0	155	6/3/2016	12.69	0
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6/3/2016 6:00	2016	155	600	155.25	6/3/2016	12.63	0
6/3/2016 7:00	2016	155	700	155.2917	6/3/2016	12.85	0
6/3/2016 8:00	2016	155	800	155.3333	6/3/2016	13.25	0
6/3/2016 9:00	2016	155	900	155.375	6/3/2016	13.22	0
6/3/2016 10:00	2016	155	1000	155.4167	6/3/2016	13.16	0
6/3/2016 11:00	2016	155	1100	155.4583	6/3/2016	13.11	0
6/3/2016 12:00	2016	155	1200	155.5	6/3/2016	13.07	0
6/3/2016 13:00	2016	155	1300	155.5417	6/3/2016	13.05	0

6/3/2016 14:00	2016	155	1400	155.5833	6/3/2016	13.03	0
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6/3/2016 16:00	2016	155	1600	155.6667	6/3/2016	13.05	0
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6/3/2016 19:00	2016	155	1900	155.7917	6/3/2016	13.03	0
6/3/2016 20:00	2016	155	2000	155.8333	6/3/2016	12.89	0
6/3/2016 21:00	2016	155	2100	155.875	6/3/2016	12.81	0
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6/3/2016 23:00	2016	155	2300	155.9583	6/3/2016	12.72	0
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6/4/2016 1:00	2016	156	100	156.0417	6/4/2016	12.65	0
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6/4/2016 3:00	2016	156	300	156.125	6/4/2016	12.61	0
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6/4/2016 5:00	2016	156	500	156.2083	6/4/2016	12.6	0
6/4/2016 6:00	2016	156	600	156.25	6/4/2016	12.64	0
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6/4/2016 8:00	2016	156	800	156.3333	6/4/2016	13.24	0
6/4/2016 9:00	2016	156	900	156.375	6/4/2016	13.22	0
6/4/2016 10:00	2016	156	1000	156.4167	6/4/2016	13.16	0
6/4/2016 11:00	2016	156	1100	156.4583	6/4/2016	13.11	0
6/4/2016 12:00	2016	156	1200	156.5	6/4/2016	13.07	0
6/4/2016 13:00	2016	156	1300	156.5417	6/4/2016	13.04	0
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6/4/2016 23:00	2016	156	2300	156.9583	6/4/2016	12.72	0
6/5/2016 0:00	2016	157	0	157	6/5/2016	12.69	0
6/5/2016 1:00	2016	157	100	157.0417	6/5/2016	12.66	0
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6/5/2016 9:00	2016	157	900	157.375	6/5/2016	13.22	0
6/5/2016 10:00	2016	157	1000	157.4167	6/5/2016	13.16	0
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6/5/2016 13:00	2016	157	1300	157.5417	6/5/2016	13.04	0
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6/6/2016 8:00	2016	158	800	158.3333	6/6/2016	13.24	0
6/6/2016 9:00	2016	158	900	158.375	6/6/2016	13.2	0
6/6/2016 10:00	2016	158	1000	158.4167	6/6/2016	13.14	0
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6/6/2016 12:00	2016	158	1200	158.5	6/6/2016	13.05	0
6/6/2016 13:00	2016	158	1300	158.5417	6/6/2016	13.02	0
6/6/2016 14:00	2016	158	1400	158.5833	6/6/2016	13.01	0
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6/6/2016 19:00	2016	158	1900	158.7917	6/6/2016	12.98	0
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6/6/2016 22:00	2016	158	2200	158.9167	6/6/2016	12.75	0
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6/7/2016 0:00	2016	159	0	159	6/7/2016	12.69	0
6/7/2016 1:00	2016	159	100	159.0417	6/7/2016	12.66	0
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6/7/2016 20:00	2016	159	2000	159.8333	6/7/2016	12.88	0
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6/9/2016 0:00	2016	161	0	161	6/9/2016	12.72	0
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6/9/2016 21:00	2016	161	2100	161.875	6/9/2016	12.81	0
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6/10/2016 11:00	2016	162	1100	162.4583	6/10/2016	13.09	0
6/10/2016 12:00	2016	162	1200	162.5	6/10/2016	13.07	0
6/10/2016 13:00	2016	162	1300	162.5417	6/10/2016	13.05	0
6/10/2016 14:00	2016	162	1400	162.5833	6/10/2016	13.05	0
6/10/2016 15:00	2016	162	1500	162.625	6/10/2016	13.05	0
6/10/2016 16:00	2016	162	1600	162.6667	6/10/2016	13.05	0
6/10/2016 17:00	2016	162	1700	162.7083	6/10/2016	13.08	0
6/10/2016 18:00	2016	162	1800	162.75	6/10/2016	13.1	0
6/10/2016 19:00	2016	162	1900	162.7917	6/10/2016	13.01	0
6/10/2016 20:00	2016	162	2000	162.8333	6/10/2016	12.88	0
6/10/2016 21:00	2016	162	2100	162.875	6/10/2016	12.8	0
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6/11/2016 22:00	2016	163	2200	163.9167	6/11/2016	12.77	0
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6/12/2016 17:00	2016	164	1700	164.7083	6/12/2016	13.14	0
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6/12/2016 21:00	2016	164	2100	164.875	6/12/2016	12.8	0
6/12/2016 22:00	2016	164	2200	164.9167	6/12/2016	12.76	0
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6/13/2016 14:00	2016	165	1400	165.5833	6/13/2016	13.08	0
6/13/2016 15:00	2016	165	1500	165.625	6/13/2016	13.11	0
6/13/2016 16:00	2016	165	1600	165.6667	6/13/2016	13.1	0
6/13/2016 17:00	2016	165	1700	165.7083	6/13/2016	13.11	0
6/13/2016 18:00	2016	165	1800	165.75	6/13/2016	13.1	0
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6/13/2016 21:00	2016	165	2100	165.875	6/13/2016	12.8	0
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6/14/2016 9:00	2016	166	900	166.375	6/14/2016	13.26	0
6/14/2016 10:00	2016	166	1000	166.4167	6/14/2016	13.2	0
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6/14/2016 13:00	2016	166	1300	166.5417	6/14/2016	13.08	0
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6/15/2016 13:00	2016	167	1300	167.5417	6/15/2016	13.07	0
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6/16/2016 12:00	2016	168	1200	168.5	6/16/2016	13.09	0
6/16/2016 13:00	2016	168	1300	168.5417	6/16/2016	13.06	0
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6/16/2016 15:00	2016	168	1500	168.625	6/16/2016	13.07	0
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6/16/2016 22:00	2016	168	2200	168.9167	6/16/2016	12.76	0
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6/17/2016 13:00	2016	169	1300	169.5417	6/17/2016	13.06	0
6/17/2016 14:00	2016	169	1400	169.5833	6/17/2016	13.04	0
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6/23/2016 21:00	2016	175	2100	175.875	6/23/2016	12.8	0
6/23/2016 22:00	2016	175	2200	175.9167	6/23/2016	12.77	0
6/23/2016 23:00	2016	175	2300	175.9583	6/23/2016	12.74	0
6/24/2016 0:00	2016	176	0	176	6/24/2016	12.72	0
6/24/2016 1:00	2016	176	100	176.0417	6/24/2016	12.7	0
6/24/2016 2:00	2016	176	200	176.0833	6/24/2016	12.68	0
6/24/2016 3:00	2016	176	300	176.125	6/24/2016	12.65	0
6/24/2016 4:00	2016	176	400	176.1667	6/24/2016	12.64	0
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6/24/2016 6:00	2016	176	600	176.25	6/24/2016	12.63	0
6/24/2016 7:00	2016	176	700	176.2917	6/24/2016	12.75	0
6/24/2016 8:00	2016	176	800	176.3333	6/24/2016	13.19	0
6/24/2016 9:00	2016	176	900	176.375	6/24/2016	13.19	0
6/24/2016 10:00	2016	176	1000	176.4167	6/24/2016	13.13	0
6/24/2016 11:00	2016	176	1100	176.4583	6/24/2016	13.07	0
6/24/2016 12:00	2016	176	1200	176.5	6/24/2016	13.03	0
6/24/2016 13:00	2016	176	1300	176.5417	6/24/2016	13	0
6/24/2016 14:00	2016	176	1400	176.5833	6/24/2016	13	0
6/24/2016 15:00	2016	176	1500	176.625	6/24/2016	13.01	0
6/24/2016 16:00	2016	176	1600	176.6667	6/24/2016	13.01	0
6/24/2016 17:00	2016	176	1700	176.7083	6/24/2016	13.02	0
6/24/2016 18:00	2016	176	1800	176.75	6/24/2016	13.05	0
6/24/2016 19:00	2016	176	1900	176.7917	6/24/2016	13.01	0
6/24/2016 20:00	2016	176	2000	176.8333	6/24/2016	12.88	0
6/24/2016 21:00	2016	176	2100	176.875	6/24/2016	12.79	0
6/24/2016 22:00	2016	176	2200	176.9167	6/24/2016	12.76	0
6/24/2016 23:00	2016	176	2300	176.9583	6/24/2016	12.74	0
6/25/2016 0:00	2016	177	0	177	6/25/2016	12.72	0
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6/25/2016 9:00	2016	177	900	177.375	6/25/2016	13.15	0
6/25/2016 10:00	2016	177	1000	177.4167	6/25/2016	13.11	0
6/25/2016 11:00	2016	177	1100	177.4583	6/25/2016	13.06	0
6/25/2016 12:00	2016	177	1200	177.5	6/25/2016	13.02	0
6/25/2016 13:00	2016	177	1300	177.5417	6/25/2016	13	0
6/25/2016 14:00	2016	177	1400	177.5833	6/25/2016	13.02	0
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6/25/2016 17:00	2016	177	1700	177.7083	6/25/2016	13.05	0
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6/25/2016 19:00	2016	177	1900	177.7917	6/25/2016	12.96	0
6/25/2016 20:00	2016	177	2000	177.8333	6/25/2016	12.85	0
6/25/2016 21:00	2016	177	2100	177.875	6/25/2016	12.78	0
6/25/2016 22:00	2016	177	2200	177.9167	6/25/2016	12.75	0
6/25/2016 23:00	2016	177	2300	177.9583	6/25/2016	12.73	0
6/26/2016 0:00	2016	178	0	178	6/26/2016	12.71	0
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6/26/2016 10:00	2016	178	1000	178.4167	6/26/2016	13.12	0
6/26/2016 11:00	2016	178	1100	178.4583	6/26/2016	13.08	0
6/26/2016 12:00	2016	178	1200	178.5	6/26/2016	13.04	0
6/26/2016 13:00	2016	178	1300	178.5417	6/26/2016	13.02	0
6/26/2016 14:00	2016	178	1400	178.5833	6/26/2016	13.01	0
6/26/2016 15:00	2016	178	1500	178.625	6/26/2016	13.02	0
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6/26/2016 19:00	2016	178	1900	178.7917	6/26/2016	13.01	0
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6/26/2016 23:00	2016	178	2300	178.9583	6/26/2016	12.73	0
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6/27/2016 14:00	2016	179	1400	179.5833	6/27/2016	13.01	0
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6/27/2016 18:00	2016	179	1800	179.75	6/27/2016	12.97	0
6/27/2016 19:00	2016	179	1900	179.7917	6/27/2016	12.84	0
6/27/2016 20:00	2016	179	2000	179.8333	6/27/2016	12.78	0
6/27/2016 21:00	2016	179	2100	179.875	6/27/2016	12.75	0
6/27/2016 22:00	2016	179	2200	179.9167	6/27/2016	12.74	0
6/27/2016 23:00	2016	179	2300	179.9583	6/27/2016	12.72	0
6/28/2016 0:00	2016	180	0	180	6/28/2016	12.69	0
6/28/2016 1:00	2016	180	100	180.0417	6/28/2016	12.66	0
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6/28/2016 19:00	2016	180	1900	180.7917	6/28/2016	13.1	0
6/28/2016 20:00	2016	180	2000	180.8333	6/28/2016	12.9	0
6/28/2016 21:00	2016	180	2100	180.875	6/28/2016	12.8	0
6/28/2016 22:00	2016	180	2200	180.9167	6/28/2016	12.77	0
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6/29/2016 20:00	2016	181	2000	181.8333	6/29/2016	12.84	0
6/29/2016 21:00	2016	181	2100	181.875	6/29/2016	12.78	0
6/29/2016 22:00	2016	181	2200	181.9167	6/29/2016	12.75	0
6/29/2016 23:00	2016	181	2300	181.9583	6/29/2016	12.74	0
6/30/2016 0:00	2016	182	0	182	6/30/2016	12.72	0
6/30/2016 1:00	2016	182	100	182.0417	6/30/2016	12.7	0
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6/30/2016 10:00	2016	182	1000	182.4167	6/30/2016	13.18	0
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6/30/2016 12:00	2016	182	1200	182.5	6/30/2016	13.17	0
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6/30/2016 14:00	2016	182	1400	182.5833	6/30/2016	13.19	0
6/30/2016 15:00	2016	182	1500	182.625	6/30/2016	13.18	0
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6/30/2016 17:00	2016	182	1700	182.7083	6/30/2016	13.15	0
6/30/2016 18:00	2016	182	1800	182.75	6/30/2016	13.16	0
6/30/2016 19:00	2016	182	1900	182.7917	6/30/2016	13.1	0
6/30/2016 20:00	2016	182	2000	182.8333	6/30/2016	12.87	0
6/30/2016 21:00	2016	182	2100	182.875	6/30/2016	12.81	0
6/30/2016 22:00	2016	182	2200	182.9167	6/30/2016	12.79	0
6/30/2016 23:00	2016	182	2300	182.9583	6/30/2016	12.77	0

7/1/2016 0:00	2016	183	0	183	7/1/2016	12.76	0
7/1/2016 1:00	2016	183	100	183.0417	7/1/2016	12.74	0
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7/1/2016 5:00	2016	183	500	183.2083	7/1/2016	12.65	0
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7/1/2016 12:00	2016	183	1200	183.5	7/1/2016	13.09	0
7/1/2016 13:00	2016	183	1300	183.5417	7/1/2016	13.09	0
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7/1/2016 15:00	2016	183	1500	183.625	7/1/2016	13.1	0
7/1/2016 16:00	2016	183	1600	183.6667	7/1/2016	13.12	0
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7/1/2016 20:00	2016	183	2000	183.8333	7/1/2016	12.95	0
7/1/2016 21:00	2016	183	2100	183.875	7/1/2016	12.82	0
7/1/2016 22:00	2016	183	2200	183.9167	7/1/2016	12.78	0
7/1/2016 23:00	2016	183	2300	183.9583	7/1/2016	12.75	0
7/2/2016 0:00	2016	184	0	184	7/2/2016	12.73	0
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7/2/2016 3:00	2016	184	300	184.125	7/2/2016	12.67	0
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7/2/2016 5:00	2016	184	500	184.2083	7/2/2016	12.63	0
7/2/2016 6:00	2016	184	600	184.25	7/2/2016	12.71	0
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7/2/2016 8:00	2016	184	800	184.3333	7/2/2016	12.74	0
7/2/2016 9:00	2016	184	900	184.375	7/2/2016	13.29	0
7/2/2016 10:00	2016	184	1000	184.4167	7/2/2016	13.25	0
7/2/2016 11:00	2016	184	1100	184.4583	7/2/2016	13.19	0
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7/2/2016 14:00	2016	184	1400	184.5833	7/2/2016	13.11	0.06
7/2/2016 15:00	2016	184	1500	184.625	7/2/2016	13.11	0.13
7/2/2016 16:00	2016	184	1600	184.6667	7/2/2016	12.98	0
7/2/2016 17:00	2016	184	1700	184.7083	7/2/2016	13.25	0
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7/2/2016 19:00	2016	184	1900	184.7917	7/2/2016	13.23	0
7/2/2016 20:00	2016	184	2000	184.8333	7/2/2016	12.91	0
7/2/2016 21:00	2016	184	2100	184.875	7/2/2016	12.82	0
7/2/2016 22:00	2016	184	2200	184.9167	7/2/2016	12.78	0

7/2/2016 23:00	2016	184	2300	184.9583	7/2/2016	12.75	0
7/3/2016 0:00	2016	185	0	185	7/3/2016	12.73	0
7/3/2016 1:00	2016	185	100	185.0417	7/3/2016	12.72	0
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7/3/2016 3:00	2016	185	300	185.125	7/3/2016	12.67	0
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7/3/2016 6:00	2016	185	600	185.25	7/3/2016	12.62	0
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7/3/2016 10:00	2016	185	1000	185.4167	7/3/2016	13.17	0
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7/3/2016 12:00	2016	185	1200	185.5	7/3/2016	13.09	0
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7/3/2016 21:00	2016	185	2100	185.875	7/3/2016	12.8	0
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7/4/2016 0:00	2016	186	0	186	7/4/2016	12.72	0
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7/4/2016 8:00	2016	186	800	186.3333	7/4/2016	13.17	0
7/4/2016 9:00	2016	186	900	186.375	7/4/2016	13.19	0
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7/4/2016 13:00	2016	186	1300	186.5417	7/4/2016	13.03	0
7/4/2016 14:00	2016	186	1400	186.5833	7/4/2016	13.02	0
7/4/2016 15:00	2016	186	1500	186.625	7/4/2016	13.04	0
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7/4/2016 17:00	2016	186	1700	186.7083	7/4/2016	13.05	0
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7/4/2016 19:00	2016	186	1900	186.7917	7/4/2016	13.01	0
7/4/2016 20:00	2016	186	2000	186.8333	7/4/2016	12.88	0
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7/4/2016 22:00	2016	186	2200	186.9167	7/4/2016	12.75	0
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7/5/2016 0:00	2016	187	0	187	7/5/2016	12.7	0
7/5/2016 1:00	2016	187	100	187.0417	7/5/2016	12.67	0
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7/5/2016 3:00	2016	187	300	187.125	7/5/2016	12.62	0
7/5/2016 4:00	2016	187	400	187.1667	7/5/2016	12.61	0
7/5/2016 5:00	2016	187	500	187.2083	7/5/2016	12.6	0
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7/5/2016 9:00	2016	187	900	187.375	7/5/2016	13.19	0
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7/5/2016 13:00	2016	187	1300	187.5417	7/5/2016	13.02	0
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7/6/2016 0:00	2016	188	0	188	7/6/2016	12.69	0
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7/6/2016 18:00	2016	188	1800	188.75	7/6/2016	13.05	0
7/6/2016 19:00	2016	188	1900	188.7917	7/6/2016	13.03	0
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7/6/2016 23:00	2016	188	2300	188.9583	7/6/2016	12.73	0
7/7/2016 0:00	2016	189	0	189	7/7/2016	12.7	0
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7/7/2016 19:00	2016	189	1900	189.7917	7/7/2016	12.98	0
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7/7/2016 21:00	2016	189	2100	189.875	7/7/2016	12.78	0
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7/8/2016 0:00	2016	190	0	190	7/8/2016	12.69	0
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7/11/2016 5:00	2016	193	500	193.2083	7/11/2016	12.57	0
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7/14/2016 1:00	2016	196	100	196.0417	7/14/2016	12.67	0
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7/14/2016 14:00	2016	196	1400	196.5833	7/14/2016	13	0
7/14/2016 15:00	2016	196	1500	196.625	7/14/2016	13.01	0
7/14/2016 16:00	2016	196	1600	196.6667	7/14/2016	13.01	0

7/14/2016 17:00	2016	196	1700	196.7083	7/14/2016	13.01	0
7/14/2016 18:00	2016	196	1800	196.75	7/14/2016	13.01	0
7/14/2016 19:00	2016	196	1900	196.7917	7/14/2016	12.95	0
7/14/2016 20:00	2016	196	2000	196.8333	7/14/2016	12.84	0
7/14/2016 21:00	2016	196	2100	196.875	7/14/2016	12.77	0
7/14/2016 22:00	2016	196	2200	196.9167	7/14/2016	12.74	0
7/14/2016 23:00	2016	196	2300	196.9583	7/14/2016	12.72	0
7/15/2016 0:00	2016	197	0	197	7/15/2016	12.69	0
7/15/2016 1:00	2016	197	100	197.0417	7/15/2016	12.67	0
7/15/2016 2:00	2016	197	200	197.0833	7/15/2016	12.64	0
7/15/2016 3:00	2016	197	300	197.125	7/15/2016	12.62	0
7/15/2016 4:00	2016	197	400	197.1667	7/15/2016	12.61	0
7/15/2016 5:00	2016	197	500	197.2083	7/15/2016	12.6	0
7/15/2016 6:00	2016	197	600	197.25	7/15/2016	12.62	0
7/15/2016 7:00	2016	197	700	197.2917	7/15/2016	12.74	0
7/15/2016 8:00	2016	197	800	197.3333	7/15/2016	13.09	0
7/15/2016 9:00	2016	197	900	197.375	7/15/2016	13.15	0
7/15/2016 10:00	2016	197	1000	197.4167	7/15/2016	13.1	0
7/15/2016 11:00	2016	197	1100	197.4583	7/15/2016	13.05	0
7/15/2016 12:00	2016	197	1200	197.5	7/15/2016	13.02	0
7/15/2016 13:00	2016	197	1300	197.5417	7/15/2016	13	0
7/15/2016 14:00	2016	197	1400	197.5833	7/15/2016	12.99	0
7/15/2016 15:00	2016	197	1500	197.625	7/15/2016	13	0
7/15/2016 16:00	2016	197	1600	197.6667	7/15/2016	13	0
7/15/2016 17:00	2016	197	1700	197.7083	7/15/2016	13.01	0
7/15/2016 18:00	2016	197	1800	197.75	7/15/2016	13	0
7/15/2016 19:00	2016	197	1900	197.7917	7/15/2016	12.95	0
7/15/2016 20:00	2016	197	2000	197.8333	7/15/2016	12.84	0
7/15/2016 21:00	2016	197	2100	197.875	7/15/2016	12.76	0
7/15/2016 22:00	2016	197	2200	197.9167	7/15/2016	12.73	0
7/15/2016 23:00	2016	197	2300	197.9583	7/15/2016	12.71	0
7/16/2016 0:00	2016	198	0	198	7/16/2016	12.69	0
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7/16/2016 2:00	2016	198	200	198.0833	7/16/2016	12.64	0
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7/16/2016 10:00	2016	198	1000	198.4167	7/16/2016	13.11	0
7/16/2016 11:00	2016	198	1100	198.4583	7/16/2016	13.07	0
7/16/2016 12:00	2016	198	1200	198.5	7/16/2016	13.04	0
7/16/2016 13:00	2016	198	1300	198.5417	7/16/2016	13.02	0
7/16/2016 14:00	2016	198	1400	198.5833	7/16/2016	13.01	0
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7/16/2016 16:00	2016	198	1600	198.6667	7/16/2016	13.02	0
7/16/2016 17:00	2016	198	1700	198.7083	7/16/2016	13.03	0
7/16/2016 18:00	2016	198	1800	198.75	7/16/2016	13.04	0
7/16/2016 19:00	2016	198	1900	198.7917	7/16/2016	13.01	0
7/16/2016 20:00	2016	198	2000	198.8333	7/16/2016	12.87	0
7/16/2016 21:00	2016	198	2100	198.875	7/16/2016	12.78	0
7/16/2016 22:00	2016	198	2200	198.9167	7/16/2016	12.74	0
7/16/2016 23:00	2016	198	2300	198.9583	7/16/2016	12.72	0
7/17/2016 0:00	2016	199	0	199	7/17/2016	12.7	0
7/17/2016 1:00	2016	199	100	199.0417	7/17/2016	12.68	0
7/17/2016 2:00	2016	199	200	199.0833	7/17/2016	12.66	0
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7/17/2016 10:00	2016	199	1000	199.4167	7/17/2016	13.11	0
7/17/2016 11:00	2016	199	1100	199.4583	7/17/2016	13.07	0
7/17/2016 12:00	2016	199	1200	199.5	7/17/2016	13.06	0
7/17/2016 13:00	2016	199	1300	199.5417	7/17/2016	13.05	0
7/17/2016 14:00	2016	199	1400	199.5833	7/17/2016	13.03	0
7/17/2016 15:00	2016	199	1500	199.625	7/17/2016	13.03	0
7/17/2016 16:00	2016	199	1600	199.6667	7/17/2016	13.05	0
7/17/2016 17:00	2016	199	1700	199.7083	7/17/2016	13.06	0
7/17/2016 18:00	2016	199	1800	199.75	7/17/2016	13.08	0
7/17/2016 19:00	2016	199	1900	199.7917	7/17/2016	12.93	0
7/17/2016 20:00	2016	199	2000	199.8333	7/17/2016	12.81	0
7/17/2016 21:00	2016	199	2100	199.875	7/17/2016	12.76	0
7/17/2016 22:00	2016	199	2200	199.9167	7/17/2016	12.73	0
7/17/2016 23:00	2016	199	2300	199.9583	7/17/2016	12.72	0
7/18/2016 0:00	2016	200	0	200	7/18/2016	12.7	0
7/18/2016 1:00	2016	200	100	200.0417	7/18/2016	12.68	0
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7/18/2016 4:00	2016	200	400	200.1667	7/18/2016	12.61	0
7/18/2016 5:00	2016	200	500	200.2083	7/18/2016	12.6	0
7/18/2016 6:00	2016	200	600	200.25	7/18/2016	12.6	0
7/18/2016 7:00	2016	200	700	200.2917	7/18/2016	12.95	0
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7/18/2016 11:00	2016	200	1100	200.4583	7/18/2016	13.11	0
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7/18/2016 17:00	2016	200	1700	200.7083	7/18/2016	13.15	0
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7/18/2016 19:00	2016	200	1900	200.7917	7/18/2016	13.02	0
7/18/2016 20:00	2016	200	2000	200.8333	7/18/2016	12.86	0
7/18/2016 21:00	2016	200	2100	200.875	7/18/2016	12.79	0
7/18/2016 22:00	2016	200	2200	200.9167	7/18/2016	12.76	0
7/18/2016 23:00	2016	200	2300	200.9583	7/18/2016	12.74	0
7/19/2016 0:00	2016	201	0	201	7/19/2016	12.72	0
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7/19/2016 4:00	2016	201	400	201.1667	7/19/2016	12.65	0
7/19/2016 5:00	2016	201	500	201.2083	7/19/2016	12.62	0
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7/19/2016 21:00	2016	201	2100	201.875	7/19/2016	12.82	0
7/19/2016 22:00	2016	201	2200	201.9167	7/19/2016	12.79	0
7/19/2016 23:00	2016	201	2300	201.9583	7/19/2016	12.77	0
7/20/2016 0:00	2016	202	0	202	7/20/2016	12.74	0
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7/20/2016 6:00	2016	202	600	202.25	7/20/2016	12.66	0
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7/21/2016 12:00	2016	203	1200	203.5	7/21/2016	13.08	0
7/21/2016 13:00	2016	203	1300	203.5417	7/21/2016	13.05	0
7/21/2016 14:00	2016	203	1400	203.5833	7/21/2016	13.05	0
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7/21/2016 17:00	2016	203	1700	203.7083	7/21/2016	12.97	0
7/21/2016 18:00	2016	203	1800	203.75	7/21/2016	13.13	0
7/21/2016 19:00	2016	203	1900	203.7917	7/21/2016	12.93	0
7/21/2016 20:00	2016	203	2000	203.8333	7/21/2016	12.82	0
7/21/2016 21:00	2016	203	2100	203.875	7/21/2016	12.77	0
7/21/2016 22:00	2016	203	2200	203.9167	7/21/2016	12.75	0
7/21/2016 23:00	2016	203	2300	203.9583	7/21/2016	12.73	0
7/22/2016 0:00	2016	204	0	204	7/22/2016	12.72	0
7/22/2016 1:00	2016	204	100	204.0417	7/22/2016	12.69	0
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7/22/2016 21:00	2016	204	2100	204.875	7/22/2016	12.79	0
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7/22/2016 23:00	2016	204	2300	204.9583	7/22/2016	12.74	0
7/23/2016 0:00	2016	205	0	205	7/23/2016	12.72	0
7/23/2016 1:00	2016	205	100	205.0417	7/23/2016	12.71	0
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7/23/2016 13:00	2016	205	1300	205.5417	7/23/2016	13.02	0
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7/23/2016 19:00	2016	205	1900	205.7917	7/23/2016	12.87	0
7/23/2016 20:00	2016	205	2000	205.8333	7/23/2016	12.78	0.07
7/23/2016 21:00	2016	205	2100	205.875	7/23/2016	12.74	0
7/23/2016 22:00	2016	205	2200	205.9167	7/23/2016	12.71	0
7/23/2016 23:00	2016	205	2300	205.9583	7/23/2016	12.69	0
7/24/2016 0:00	2016	206	0	206	7/24/2016	12.66	0
7/24/2016 1:00	2016	206	100	206.0417	7/24/2016	12.64	0
7/24/2016 2:00	2016	206	200	206.0833	7/24/2016	12.62	0
7/24/2016 3:00	2016	206	300	206.125	7/24/2016	12.61	0
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7/24/2016 16:00	2016	206	1600	206.6667	7/24/2016	12.99	0.17
7/24/2016 17:00	2016	206	1700	206.7083	7/24/2016	12.84	0.01
7/24/2016 18:00	2016	206	1800	206.75	7/24/2016	12.83	0
7/24/2016 19:00	2016	206	1900	206.7917	7/24/2016	12.76	0.01
7/24/2016 20:00	2016	206	2000	206.8333	7/24/2016	12.71	0
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7/24/2016 22:00	2016	206	2200	206.9167	7/24/2016	12.66	0
7/24/2016 23:00	2016	206	2300	206.9583	7/24/2016	12.64	0
7/25/2016 0:00	2016	207	0	207	7/25/2016	12.61	0
7/25/2016 1:00	2016	207	100	207.0417	7/25/2016	12.58	0
7/25/2016 2:00	2016	207	200	207.0833	7/25/2016	12.55	0
7/25/2016 3:00	2016	207	300	207.125	7/25/2016	12.54	0
7/25/2016 4:00	2016	207	400	207.1667	7/25/2016	12.53	0
7/25/2016 5:00	2016	207	500	207.2083	7/25/2016	12.53	0
7/25/2016 6:00	2016	207	600	207.25	7/25/2016	12.54	0
7/25/2016 7:00	2016	207	700	207.2917	7/25/2016	12.75	0
7/25/2016 8:00	2016	207	800	207.3333	7/25/2016	13.29	0
7/25/2016 9:00	2016	207	900	207.375	7/25/2016	13.25	0
7/25/2016 10:00	2016	207	1000	207.4167	7/25/2016	13.18	0
7/25/2016 11:00	2016	207	1100	207.4583	7/25/2016	13.11	0
7/25/2016 12:00	2016	207	1200	207.5	7/25/2016	13.06	0
7/25/2016 13:00	2016	207	1300	207.5417	7/25/2016	13.05	0
7/25/2016 14:00	2016	207	1400	207.5833	7/25/2016	13.09	0
7/25/2016 15:00	2016	207	1500	207.625	7/25/2016	13.08	0
7/25/2016 16:00	2016	207	1600	207.6667	7/25/2016	13.04	0
7/25/2016 17:00	2016	207	1700	207.7083	7/25/2016	13.03	0
7/25/2016 18:00	2016	207	1800	207.75	7/25/2016	12.92	0
7/25/2016 19:00	2016	207	1900	207.7917	7/25/2016	12.88	0
7/25/2016 20:00	2016	207	2000	207.8333	7/25/2016	12.77	0
7/25/2016 21:00	2016	207	2100	207.875	7/25/2016	12.75	0
7/25/2016 22:00	2016	207	2200	207.9167	7/25/2016	12.74	0
7/25/2016 23:00	2016	207	2300	207.9583	7/25/2016	12.72	0
7/26/2016 0:00	2016	208	0	208	7/26/2016	12.7	0
7/26/2016 1:00	2016	208	100	208.0417	7/26/2016	12.68	0
7/26/2016 2:00	2016	208	200	208.0833	7/26/2016	12.65	0
7/26/2016 3:00	2016	208	300	208.125	7/26/2016	12.62	0
7/26/2016 4:00	2016	208	400	208.1667	7/26/2016	12.59	0
7/26/2016 5:00	2016	208	500	208.2083	7/26/2016	12.57	0
7/26/2016 6:00	2016	208	600	208.25	7/26/2016	12.57	0
7/26/2016 7:00	2016	208	700	208.2917	7/26/2016	12.71	0
7/26/2016 8:00	2016	208	800	208.3333	7/26/2016	13.16	0
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7/26/2016 11:00	2016	208	1100	208.4583	7/26/2016	13.14	0
7/26/2016 12:00	2016	208	1200	208.5	7/26/2016	13.13	0
7/26/2016 13:00	2016	208	1300	208.5417	7/26/2016	13.07	0
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7/26/2016 15:00	2016	208	1500	208.625	7/26/2016	13.05	0
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7/26/2016 18:00	2016	208	1800	208.75	7/26/2016	13.05	0
7/26/2016 19:00	2016	208	1900	208.7917	7/26/2016	13.02	0
7/26/2016 20:00	2016	208	2000	208.8333	7/26/2016	12.84	0
7/26/2016 21:00	2016	208	2100	208.875	7/26/2016	12.77	0
7/26/2016 22:00	2016	208	2200	208.9167	7/26/2016	12.74	0
7/26/2016 23:00	2016	208	2300	208.9583	7/26/2016	12.73	0
7/27/2016 0:00	2016	209	0	209	7/27/2016	12.71	0
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7/27/2016 7:00	2016	209	700	209.2917	7/27/2016	12.75	0
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7/27/2016 10:00	2016	209	1000	209.4167	7/27/2016	13.12	0
7/27/2016 11:00	2016	209	1100	209.4583	7/27/2016	13.07	0
7/27/2016 12:00	2016	209	1200	209.5	7/27/2016	13.04	0
7/27/2016 13:00	2016	209	1300	209.5417	7/27/2016	13.02	0
7/27/2016 14:00	2016	209	1400	209.5833	7/27/2016	13.01	0
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7/27/2016 17:00	2016	209	1700	209.7083	7/27/2016	13.03	0
7/27/2016 18:00	2016	209	1800	209.75	7/27/2016	13.02	0
7/27/2016 19:00	2016	209	1900	209.7917	7/27/2016	12.96	0
7/27/2016 20:00	2016	209	2000	209.8333	7/27/2016	12.82	0
7/27/2016 21:00	2016	209	2100	209.875	7/27/2016	12.76	0
7/27/2016 22:00	2016	209	2200	209.9167	7/27/2016	12.74	0
7/27/2016 23:00	2016	209	2300	209.9583	7/27/2016	12.72	0
7/28/2016 0:00	2016	210	0	210	7/28/2016	12.7	0
7/28/2016 1:00	2016	210	100	210.0417	7/28/2016	12.68	0
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7/28/2016 7:00	2016	210	700	210.2917	7/28/2016	12.73	0
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7/28/2016 10:00	2016	210	1000	210.4167	7/28/2016	13.1	0
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7/28/2016 12:00	2016	210	1200	210.5	7/28/2016	13.01	0
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7/28/2016 14:00	2016	210	1400	210.5833	7/28/2016	12.99	0
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7/28/2016 21:00	2016	210	2100	210.875	7/28/2016	12.76	0
7/28/2016 22:00	2016	210	2200	210.9167	7/28/2016	12.73	0
7/28/2016 23:00	2016	210	2300	210.9583	7/28/2016	12.72	0
7/29/2016 0:00	2016	211	0	211	7/29/2016	12.7	0
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7/29/2016 5:00	2016	211	500	211.2083	7/29/2016	12.61	0
7/29/2016 6:00	2016	211	600	211.25	7/29/2016	12.61	0
7/29/2016 7:00	2016	211	700	211.2917	7/29/2016	12.74	0
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7/29/2016 9:00	2016	211	900	211.375	7/29/2016	13.14	0
7/29/2016 10:00	2016	211	1000	211.4167	7/29/2016	13.09	0
7/29/2016 11:00	2016	211	1100	211.4583	7/29/2016	13.06	0
7/29/2016 12:00	2016	211	1200	211.5	7/29/2016	13.03	0
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7/29/2016 19:00	2016	211	1900	211.7917	7/29/2016	12.99	0
7/29/2016 20:00	2016	211	2000	211.8333	7/29/2016	12.82	0
7/29/2016 21:00	2016	211	2100	211.875	7/29/2016	12.77	0
7/29/2016 22:00	2016	211	2200	211.9167	7/29/2016	12.74	0
7/29/2016 23:00	2016	211	2300	211.9583	7/29/2016	12.73	0
7/30/2016 0:00	2016	212	0	212	7/30/2016	12.71	0
7/30/2016 1:00	2016	212	100	212.0417	7/30/2016	12.69	0
7/30/2016 2:00	2016	212	200	212.0833	7/30/2016	12.67	0
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7/30/2016 6:00	2016	212	600	212.25	7/30/2016	12.6	0
7/30/2016 7:00	2016	212	700	212.2917	7/30/2016	12.84	0
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7/30/2016 11:00	2016	212	1100	212.4583	7/30/2016	13.07	0
7/30/2016 12:00	2016	212	1200	212.5	7/30/2016	13.05	0
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7/30/2016 16:00	2016	212	1600	212.6667	7/30/2016	12.87	0
7/30/2016 17:00	2016	212	1700	212.7083	7/30/2016	12.81	0
7/30/2016 18:00	2016	212	1800	212.75	7/30/2016	12.8	0
7/30/2016 19:00	2016	212	1900	212.7917	7/30/2016	12.74	0
7/30/2016 20:00	2016	212	2000	212.8333	7/30/2016	12.72	0
7/30/2016 21:00	2016	212	2100	212.875	7/30/2016	12.69	0
7/30/2016 22:00	2016	212	2200	212.9167	7/30/2016	12.67	0
7/30/2016 23:00	2016	212	2300	212.9583	7/30/2016	12.64	0
7/31/2016 0:00	2016	213	0	213	7/31/2016	12.61	0
7/31/2016 1:00	2016	213	100	213.0417	7/31/2016	12.59	0
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7/31/2016 3:00	2016	213	300	213.125	7/31/2016	12.56	0
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7/31/2016 5:00	2016	213	500	213.2083	7/31/2016	12.54	0
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7/31/2016 7:00	2016	213	700	213.2917	7/31/2016	12.7	0
7/31/2016 8:00	2016	213	800	213.3333	7/31/2016	13.23	0
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7/31/2016 10:00	2016	213	1000	213.4167	7/31/2016	13.18	0
7/31/2016 11:00	2016	213	1100	213.4583	7/31/2016	13.11	0
7/31/2016 12:00	2016	213	1200	213.5	7/31/2016	13.07	0
7/31/2016 13:00	2016	213	1300	213.5417	7/31/2016	13.03	0
7/31/2016 14:00	2016	213	1400	213.5833	7/31/2016	13.02	0
7/31/2016 15:00	2016	213	1500	213.625	7/31/2016	13.03	0
7/31/2016 16:00	2016	213	1600	213.6667	7/31/2016	13.05	0
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7/31/2016 18:00	2016	213	1800	213.75	7/31/2016	13.08	0
7/31/2016 19:00	2016	213	1900	213.7917	7/31/2016	12.87	0
7/31/2016 20:00	2016	213	2000	213.8333	7/31/2016	12.77	0
7/31/2016 21:00	2016	213	2100	213.875	7/31/2016	12.73	0
7/31/2016 22:00	2016	213	2200	213.9167	7/31/2016	12.71	0
7/31/2016 23:00	2016	213	2300	213.9583	7/31/2016	12.69	0
8/1/2016 0:00	2016	214	0	214	8/1/2016	12.68	0
8/1/2016 1:00	2016	214	100	214.0417	8/1/2016	12.66	0
8/1/2016 2:00	2016	214	200	214.0833	8/1/2016	12.64	0
8/1/2016 3:00	2016	214	300	214.125	8/1/2016	12.62	0
8/1/2016 4:00	2016	214	400	214.1667	8/1/2016	12.59	0
8/1/2016 5:00	2016	214	500	214.2083	8/1/2016	12.57	0
8/1/2016 6:00	2016	214	600	214.25	8/1/2016	12.56	0
8/1/2016 7:00	2016	214	700	214.2917	8/1/2016	12.74	0

8/1/2016 8:00	2016	214	800	214.3333	8/1/2016	13.23	0
8/1/2016 9:00	2016	214	900	214.375	8/1/2016	13.23	0
8/1/2016 10:00	2016	214	1000	214.4167	8/1/2016	13.18	0
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8/1/2016 19:00	2016	214	1900	214.7917	8/1/2016	13.17	0
8/1/2016 20:00	2016	214	2000	214.8333	8/1/2016	12.92	0
8/1/2016 21:00	2016	214	2100	214.875	8/1/2016	12.8	0
8/1/2016 22:00	2016	214	2200	214.9167	8/1/2016	12.78	0
8/1/2016 23:00	2016	214	2300	214.9583	8/1/2016	12.76	0
8/2/2016 0:00	2016	215	0	215	8/2/2016	12.74	0
8/2/2016 1:00	2016	215	100	215.0417	8/2/2016	12.72	0
8/2/2016 2:00	2016	215	200	215.0833	8/2/2016	12.71	0
8/2/2016 3:00	2016	215	300	215.125	8/2/2016	12.69	0
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8/2/2016 5:00	2016	215	500	215.2083	8/2/2016	12.66	0
8/2/2016 6:00	2016	215	600	215.25	8/2/2016	12.64	0
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8/2/2016 10:00	2016	215	1000	215.4167	8/2/2016	13.18	0
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8/2/2016 12:00	2016	215	1200	215.5	8/2/2016	13.1	0
8/2/2016 13:00	2016	215	1300	215.5417	8/2/2016	13.12	0
8/2/2016 14:00	2016	215	1400	215.5833	8/2/2016	13.16	0
8/2/2016 15:00	2016	215	1500	215.625	8/2/2016	13.18	0
8/2/2016 16:00	2016	215	1600	215.6667	8/2/2016	13.19	0
8/2/2016 17:00	2016	215	1700	215.7083	8/2/2016	13.17	0
8/2/2016 18:00	2016	215	1800	215.75	8/2/2016	13.18	0
8/2/2016 19:00	2016	215	1900	215.7917	8/2/2016	13.11	0
8/2/2016 20:00	2016	215	2000	215.8333	8/2/2016	12.86	0
8/2/2016 21:00	2016	215	2100	215.875	8/2/2016	12.8	0
8/2/2016 22:00	2016	215	2200	215.9167	8/2/2016	12.77	0
8/2/2016 23:00	2016	215	2300	215.9583	8/2/2016	12.76	0
8/3/2016 0:00	2016	216	0	216	8/3/2016	12.75	0
8/3/2016 1:00	2016	216	100	216.0417	8/3/2016	12.73	0
8/3/2016 2:00	2016	216	200	216.0833	8/3/2016	12.72	0
8/3/2016 3:00	2016	216	300	216.125	8/3/2016	12.71	0
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8/3/2016 5:00	2016	216	500	216.2083	8/3/2016	12.68	0
8/3/2016 6:00	2016	216	600	216.25	8/3/2016	12.65	0.21

8/3/2016 7:00	2016	216	700	216.2917	8/3/2016	12.63	0
8/3/2016 8:00	2016	216	800	216.3333	8/3/2016	12.62	0.04
8/3/2016 9:00	2016	216	900	216.375	8/3/2016	12.67	0.05
8/3/2016 10:00	2016	216	1000	216.4167	8/3/2016	13.15	0
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8/3/2016 18:00	2016	216	1800	216.75	8/3/2016	13.15	0
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8/3/2016 20:00	2016	216	2000	216.8333	8/3/2016	12.81	0
8/3/2016 21:00	2016	216	2100	216.875	8/3/2016	12.77	0
8/3/2016 22:00	2016	216	2200	216.9167	8/3/2016	12.75	0
8/3/2016 23:00	2016	216	2300	216.9583	8/3/2016	12.74	0
8/4/2016 0:00	2016	217	0	217	8/4/2016	12.72	0
8/4/2016 1:00	2016	217	100	217.0417	8/4/2016	12.7	0
8/4/2016 2:00	2016	217	200	217.0833	8/4/2016	12.68	0
8/4/2016 3:00	2016	217	300	217.125	8/4/2016	12.65	0
8/4/2016 4:00	2016	217	400	217.1667	8/4/2016	12.62	0
8/4/2016 5:00	2016	217	500	217.2083	8/4/2016	12.6	0
8/4/2016 6:00	2016	217	600	217.25	8/4/2016	12.59	0
8/4/2016 7:00	2016	217	700	217.2917	8/4/2016	12.66	0
8/4/2016 8:00	2016	217	800	217.3333	8/4/2016	13.04	0
8/4/2016 9:00	2016	217	900	217.375	8/4/2016	13.29	0
8/4/2016 10:00	2016	217	1000	217.4167	8/4/2016	13.21	0
8/4/2016 11:00	2016	217	1100	217.4583	8/4/2016	13.14	0
8/4/2016 12:00	2016	217	1200	217.5	8/4/2016	13.09	0
8/4/2016 13:00	2016	217	1300	217.5417	8/4/2016	13.07	0
8/4/2016 14:00	2016	217	1400	217.5833	8/4/2016	13.09	0
8/4/2016 15:00	2016	217	1500	217.625	8/4/2016	13.1	0
8/4/2016 16:00	2016	217	1600	217.6667	8/4/2016	13.11	0
8/4/2016 17:00	2016	217	1700	217.7083	8/4/2016	13.13	0
8/4/2016 18:00	2016	217	1800	217.75	8/4/2016	13.09	0
8/4/2016 19:00	2016	217	1900	217.7917	8/4/2016	13.01	0
8/4/2016 20:00	2016	217	2000	217.8333	8/4/2016	12.82	0
8/4/2016 21:00	2016	217	2100	217.875	8/4/2016	12.77	0
8/4/2016 22:00	2016	217	2200	217.9167	8/4/2016	12.75	0
8/4/2016 23:00	2016	217	2300	217.9583	8/4/2016	12.73	0
8/5/2016 0:00	2016	218	0	218	8/5/2016	12.72	0
8/5/2016 1:00	2016	218	100	218.0417	8/5/2016	12.7	0
8/5/2016 2:00	2016	218	200	218.0833	8/5/2016	12.68	0
8/5/2016 3:00	2016	218	300	218.125	8/5/2016	12.66	0
8/5/2016 4:00	2016	218	400	218.1667	8/5/2016	12.63	0
8/5/2016 5:00	2016	218	500	218.2083	8/5/2016	12.61	0

8/5/2016 6:00	2016	218	600	218.25	8/5/2016	12.59	0
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8/5/2016 8:00	2016	218	800	218.3333	8/5/2016	13.24	0
8/5/2016 9:00	2016	218	900	218.375	8/5/2016	13.22	0
8/5/2016 10:00	2016	218	1000	218.4167	8/5/2016	13.18	0
8/5/2016 11:00	2016	218	1100	218.4583	8/5/2016	13.13	0
8/5/2016 12:00	2016	218	1200	218.5	8/5/2016	13.14	0
8/5/2016 13:00	2016	218	1300	218.5417	8/5/2016	13.17	0
8/5/2016 14:00	2016	218	1400	218.5833	8/5/2016	13.18	0
8/5/2016 15:00	2016	218	1500	218.625	8/5/2016	13.21	0
8/5/2016 16:00	2016	218	1600	218.6667	8/5/2016	13.2	0
8/5/2016 17:00	2016	218	1700	218.7083	8/5/2016	13.2	0
8/5/2016 18:00	2016	218	1800	218.75	8/5/2016	13.2	0
8/5/2016 19:00	2016	218	1900	218.7917	8/5/2016	13.08	0
8/5/2016 20:00	2016	218	2000	218.8333	8/5/2016	12.84	0
8/5/2016 21:00	2016	218	2100	218.875	8/5/2016	12.79	0
8/5/2016 22:00	2016	218	2200	218.9167	8/5/2016	12.76	0
8/5/2016 23:00	2016	218	2300	218.9583	8/5/2016	12.74	0
8/6/2016 0:00	2016	219	0	219	8/6/2016	12.73	0
8/6/2016 1:00	2016	219	100	219.0417	8/6/2016	12.71	0
8/6/2016 2:00	2016	219	200	219.0833	8/6/2016	12.7	0
8/6/2016 3:00	2016	219	300	219.125	8/6/2016	12.69	0
8/6/2016 4:00	2016	219	400	219.1667	8/6/2016	12.67	0
8/6/2016 5:00	2016	219	500	219.2083	8/6/2016	12.66	0
8/6/2016 6:00	2016	219	600	219.25	8/6/2016	12.64	0
8/6/2016 7:00	2016	219	700	219.2917	8/6/2016	12.65	0
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8/6/2016 9:00	2016	219	900	219.375	8/6/2016	13.28	0
8/6/2016 10:00	2016	219	1000	219.4167	8/6/2016	13.26	0
8/6/2016 11:00	2016	219	1100	219.4583	8/6/2016	13.23	0
8/6/2016 12:00	2016	219	1200	219.5	8/6/2016	13.19	0
8/6/2016 13:00	2016	219	1300	219.5417	8/6/2016	13.14	0
8/6/2016 14:00	2016	219	1400	219.5833	8/6/2016	13.14	0
8/6/2016 15:00	2016	219	1500	219.625	8/6/2016	13.15	0
8/6/2016 16:00	2016	219	1600	219.6667	8/6/2016	13.11	0
8/6/2016 17:00	2016	219	1700	219.7083	8/6/2016	13.11	0
8/6/2016 18:00	2016	219	1800	219.75	8/6/2016	13.13	0
8/6/2016 19:00	2016	219	1900	219.7917	8/6/2016	13	0
8/6/2016 20:00	2016	219	2000	219.8333	8/6/2016	12.83	0.62
8/6/2016 21:00	2016	219	2100	219.875	8/6/2016	12.77	0
8/6/2016 22:00	2016	219	2200	219.9167	8/6/2016	12.75	0
8/6/2016 23:00	2016	219	2300	219.9583	8/6/2016	12.73	0
8/7/2016 0:00	2016	220	0	220	8/7/2016	12.72	0
8/7/2016 1:00	2016	220	100	220.0417	8/7/2016	12.7	0
8/7/2016 2:00	2016	220	200	220.0833	8/7/2016	12.68	0
8/7/2016 3:00	2016	220	300	220.125	8/7/2016	12.66	0
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8/7/2016 5:00	2016	220	500	220.2083	8/7/2016	12.61	0
8/7/2016 6:00	2016	220	600	220.25	8/7/2016	12.59	0
8/7/2016 7:00	2016	220	700	220.2917	8/7/2016	12.7	0
8/7/2016 8:00	2016	220	800	220.3333	8/7/2016	13.23	0
8/7/2016 9:00	2016	220	900	220.375	8/7/2016	13.26	0
8/7/2016 10:00	2016	220	1000	220.4167	8/7/2016	13.2	0
8/7/2016 11:00	2016	220	1100	220.4583	8/7/2016	13.15	0
8/7/2016 12:00	2016	220	1200	220.5	8/7/2016	13.12	0
8/7/2016 13:00	2016	220	1300	220.5417	8/7/2016	13.11	0
8/7/2016 14:00	2016	220	1400	220.5833	8/7/2016	13.11	0
8/7/2016 15:00	2016	220	1500	220.625	8/7/2016	13.13	0
8/7/2016 16:00	2016	220	1600	220.6667	8/7/2016	13.1	0
8/7/2016 17:00	2016	220	1700	220.7083	8/7/2016	13.1	0
8/7/2016 18:00	2016	220	1800	220.75	8/7/2016	13.11	0
8/7/2016 19:00	2016	220	1900	220.7917	8/7/2016	12.96	0
8/7/2016 20:00	2016	220	2000	220.8333	8/7/2016	12.84	0
8/7/2016 21:00	2016	220	2100	220.875	8/7/2016	12.78	0
8/7/2016 22:00	2016	220	2200	220.9167	8/7/2016	12.76	0
8/7/2016 23:00	2016	220	2300	220.9583	8/7/2016	12.74	0
8/8/2016 0:00	2016	221	0	221	8/8/2016	12.72	0
8/8/2016 1:00	2016	221	100	221.0417	8/8/2016	12.71	0
8/8/2016 2:00	2016	221	200	221.0833	8/8/2016	12.69	0
8/8/2016 3:00	2016	221	300	221.125	8/8/2016	12.66	0
8/8/2016 4:00	2016	221	400	221.1667	8/8/2016	12.64	0
8/8/2016 5:00	2016	221	500	221.2083	8/8/2016	12.61	0
8/8/2016 6:00	2016	221	600	221.25	8/8/2016	12.59	0
8/8/2016 7:00	2016	221	700	221.2917	8/8/2016	12.71	0
8/8/2016 8:00	2016	221	800	221.3333	8/8/2016	13.21	0
8/8/2016 9:00	2016	221	900	221.375	8/8/2016	13.22	0
8/8/2016 10:00	2016	221	1000	221.4167	8/8/2016	13.17	0
8/8/2016 11:00	2016	221	1100	221.4583	8/8/2016	13.15	0
8/8/2016 12:00	2016	221	1200	221.5	8/8/2016	13.14	0
8/8/2016 13:00	2016	221	1300	221.5417	8/8/2016	13.12	0
8/8/2016 14:00	2016	221	1400	221.5833	8/8/2016	13.07	0
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8/8/2016 16:00	2016	221	1600	221.6667	8/8/2016	13.07	0
8/8/2016 17:00	2016	221	1700	221.7083	8/8/2016	13.08	0
8/8/2016 18:00	2016	221	1800	221.75	8/8/2016	13.07	0
8/8/2016 19:00	2016	221	1900	221.7917	8/8/2016	12.97	0
8/8/2016 20:00	2016	221	2000	221.8333	8/8/2016	12.83	0
8/8/2016 21:00	2016	221	2100	221.875	8/8/2016	12.78	0
8/8/2016 22:00	2016	221	2200	221.9167	8/8/2016	12.75	0
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8/9/2016 0:00	2016	222	0	222	8/9/2016	12.72	0
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8/9/2016 2:00	2016	222	200	222.0833	8/9/2016	12.67	0
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8/9/2016 4:00	2016	222	400	222.1667	8/9/2016	12.61	0
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8/9/2016 6:00	2016	222	600	222.25	8/9/2016	12.58	0
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8/9/2016 10:00	2016	222	1000	222.4167	8/9/2016	13.15	0
8/9/2016 11:00	2016	222	1100	222.4583	8/9/2016	13.11	0
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8/9/2016 20:00	2016	222	2000	222.8333	8/9/2016	12.84	0
8/9/2016 21:00	2016	222	2100	222.875	8/9/2016	12.77	0
8/9/2016 22:00	2016	222	2200	222.9167	8/9/2016	12.74	0
8/9/2016 23:00	2016	222	2300	222.9583	8/9/2016	12.72	0
8/10/2016 0:00	2016	223	0	223	8/10/2016	12.71	0
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8/10/2016 6:00	2016	223	600	223.25	8/10/2016	12.57	0
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8/10/2016 9:00	2016	223	900	223.375	8/10/2016	13.22	0
8/10/2016 10:00	2016	223	1000	223.4167	8/10/2016	13.18	0
8/10/2016 11:00	2016	223	1100	223.4583	8/10/2016	13.15	0
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8/10/2016 16:00	2016	223	1600	223.6667	8/10/2016	13.08	0
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8/10/2016 19:00	2016	223	1900	223.7917	8/10/2016	12.95	0
8/10/2016 20:00	2016	223	2000	223.8333	8/10/2016	12.81	0
8/10/2016 21:00	2016	223	2100	223.875	8/10/2016	12.77	0
8/10/2016 22:00	2016	223	2200	223.9167	8/10/2016	12.74	0
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8/11/2016 0:00	2016	224	0	224	8/11/2016	12.71	0
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8/11/2016 2:00	2016	224	200	224.0833	8/11/2016	12.67	0

8/11/2016 3:00	2016	224	300	224.125	8/11/2016	12.65	0
8/11/2016 4:00	2016	224	400	224.1667	8/11/2016	12.62	0
8/11/2016 5:00	2016	224	500	224.2083	8/11/2016	12.59	0
8/11/2016 6:00	2016	224	600	224.25	8/11/2016	12.57	0
8/11/2016 7:00	2016	224	700	224.2917	8/11/2016	12.7	0
8/11/2016 8:00	2016	224	800	224.3333	8/11/2016	13.23	0
8/11/2016 9:00	2016	224	900	224.375	8/11/2016	13.23	0
8/11/2016 10:00	2016	224	1000	224.4167	8/11/2016	13.18	0
8/11/2016 11:00	2016	224	1100	224.4583	8/11/2016	13.14	0
8/11/2016 12:00	2016	224	1200	224.5	8/11/2016	13.12	0
8/11/2016 13:00	2016	224	1300	224.5417	8/11/2016	13.16	0
8/11/2016 14:00	2016	224	1400	224.5833	8/11/2016	13.16	0
8/11/2016 15:00	2016	224	1500	224.625	8/11/2016	13.15	0
8/11/2016 16:00	2016	224	1600	224.6667	8/11/2016	13.1	0
8/11/2016 17:00	2016	224	1700	224.7083	8/11/2016	13.1	0
8/11/2016 18:00	2016	224	1800	224.75	8/11/2016	13.12	0
8/11/2016 19:00	2016	224	1900	224.7917	8/11/2016	13	0
8/11/2016 20:00	2016	224	2000	224.8333	8/11/2016	12.83	0
8/11/2016 21:00	2016	224	2100	224.875	8/11/2016	12.78	0
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8/11/2016 23:00	2016	224	2300	224.9583	8/11/2016	12.75	0
8/12/2016 0:00	2016	225	0	225	8/12/2016	12.73	0
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8/12/2016 6:00	2016	225	600	225.25	8/12/2016	12.59	0
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8/12/2016 9:00	2016	225	900	225.375	8/12/2016	13.22	0
8/12/2016 10:00	2016	225	1000	225.4167	8/12/2016	13.16	0
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8/12/2016 14:00	2016	225	1400	225.5833	8/12/2016	13.08	0
8/12/2016 15:00	2016	225	1500	225.625	8/12/2016	13.08	0
8/12/2016 16:00	2016	225	1600	225.6667	8/12/2016	13.08	0
8/12/2016 17:00	2016	225	1700	225.7083	8/12/2016	13.11	0
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8/12/2016 19:00	2016	225	1900	225.7917	8/12/2016	13.11	0
8/12/2016 20:00	2016	225	2000	225.8333	8/12/2016	12.86	0
8/12/2016 21:00	2016	225	2100	225.875	8/12/2016	12.79	0
8/12/2016 22:00	2016	225	2200	225.9167	8/12/2016	12.75	0
8/12/2016 23:00	2016	225	2300	225.9583	8/12/2016	12.73	0
8/13/2016 0:00	2016	226	0	226	8/13/2016	12.71	0
8/13/2016 1:00	2016	226	100	226.0417	8/13/2016	12.69	0

8/13/2016 2:00	2016	226	200	226.0833	8/13/2016	12.67	0
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8/13/2016 4:00	2016	226	400	226.1667	8/13/2016	12.63	0
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8/13/2016 6:00	2016	226	600	226.25	8/13/2016	12.57	0
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8/13/2016 10:00	2016	226	1000	226.4167	8/13/2016	13.19	0
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8/13/2016 19:00	2016	226	1900	226.7917	8/13/2016	12.94	0
8/13/2016 20:00	2016	226	2000	226.8333	8/13/2016	12.81	0
8/13/2016 21:00	2016	226	2100	226.875	8/13/2016	12.76	0
8/13/2016 22:00	2016	226	2200	226.9167	8/13/2016	12.74	0
8/13/2016 23:00	2016	226	2300	226.9583	8/13/2016	12.72	0
8/14/2016 0:00	2016	227	0	227	8/14/2016	12.69	0
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8/14/2016 2:00	2016	227	200	227.0833	8/14/2016	12.64	0
8/14/2016 3:00	2016	227	300	227.125	8/14/2016	12.61	0
8/14/2016 4:00	2016	227	400	227.1667	8/14/2016	12.57	0
8/14/2016 5:00	2016	227	500	227.2083	8/14/2016	12.55	0
8/14/2016 6:00	2016	227	600	227.25	8/14/2016	12.54	0
8/14/2016 7:00	2016	227	700	227.2917	8/14/2016	12.68	0
8/14/2016 8:00	2016	227	800	227.3333	8/14/2016	13.29	0
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8/14/2016 10:00	2016	227	1000	227.4167	8/14/2016	13.2	0
8/14/2016 11:00	2016	227	1100	227.4583	8/14/2016	13.14	0
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8/14/2016 13:00	2016	227	1300	227.5417	8/14/2016	13.06	0
8/14/2016 14:00	2016	227	1400	227.5833	8/14/2016	13.05	0
8/14/2016 15:00	2016	227	1500	227.625	8/14/2016	13.06	0
8/14/2016 16:00	2016	227	1600	227.6667	8/14/2016	13.06	0
8/14/2016 17:00	2016	227	1700	227.7083	8/14/2016	13.07	0
8/14/2016 18:00	2016	227	1800	227.75	8/14/2016	13.07	0
8/14/2016 19:00	2016	227	1900	227.7917	8/14/2016	12.97	0
8/14/2016 20:00	2016	227	2000	227.8333	8/14/2016	12.82	0
8/14/2016 21:00	2016	227	2100	227.875	8/14/2016	12.76	0
8/14/2016 22:00	2016	227	2200	227.9167	8/14/2016	12.74	0
8/14/2016 23:00	2016	227	2300	227.9583	8/14/2016	12.72	0
8/15/2016 0:00	2016	228	0	228	8/15/2016	12.7	0

8/15/2016 1:00	2016	228	100	228.0417	8/15/2016	12.68	0
8/15/2016 2:00	2016	228	200	228.0833	8/15/2016	12.66	0
8/15/2016 3:00	2016	228	300	228.125	8/15/2016	12.63	0
8/15/2016 4:00	2016	228	400	228.1667	8/15/2016	12.61	0
8/15/2016 5:00	2016	228	500	228.2083	8/15/2016	12.59	0
8/15/2016 6:00	2016	228	600	228.25	8/15/2016	12.59	0
8/15/2016 7:00	2016	228	700	228.2917	8/15/2016	12.71	0
8/15/2016 8:00	2016	228	800	228.3333	8/15/2016	13.19	0
8/15/2016 9:00	2016	228	900	228.375	8/15/2016	13.18	0
8/15/2016 10:00	2016	228	1000	228.4167	8/15/2016	13.13	0
8/15/2016 11:00	2016	228	1100	228.4583	8/15/2016	13.09	0
8/15/2016 12:00	2016	228	1200	228.5	8/15/2016	13.05	0
8/15/2016 13:00	2016	228	1300	228.5417	8/15/2016	13.03	0
8/15/2016 14:00	2016	228	1400	228.5833	8/15/2016	13.01	0
8/15/2016 15:00	2016	228	1500	228.625	8/15/2016	13.03	0
8/15/2016 16:00	2016	228	1600	228.6667	8/15/2016	13.03	0.03
8/15/2016 17:00	2016	228	1700	228.7083	8/15/2016	13.14	0
8/15/2016 18:00	2016	228	1800	228.75	8/15/2016	13.13	0
8/15/2016 19:00	2016	228	1900	228.7917	8/15/2016	12.97	0
8/15/2016 20:00	2016	228	2000	228.8333	8/15/2016	12.81	0
8/15/2016 21:00	2016	228	2100	228.875	8/15/2016	12.76	0
8/15/2016 22:00	2016	228	2200	228.9167	8/15/2016	12.73	0
8/15/2016 23:00	2016	228	2300	228.9583	8/15/2016	12.71	0
8/16/2016 0:00	2016	229	0	229	8/16/2016	12.69	0
8/16/2016 1:00	2016	229	100	229.0417	8/16/2016	12.67	0
8/16/2016 2:00	2016	229	200	229.0833	8/16/2016	12.65	0
8/16/2016 3:00	2016	229	300	229.125	8/16/2016	12.62	0
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8/16/2016 5:00	2016	229	500	229.2083	8/16/2016	12.57	0
8/16/2016 6:00	2016	229	600	229.25	8/16/2016	12.56	0
8/16/2016 7:00	2016	229	700	229.2917	8/16/2016	12.7	0
8/16/2016 8:00	2016	229	800	229.3333	8/16/2016	13.28	0
8/16/2016 9:00	2016	229	900	229.375	8/16/2016	13.23	0
8/16/2016 10:00	2016	229	1000	229.4167	8/16/2016	13.18	0
8/16/2016 11:00	2016	229	1100	229.4583	8/16/2016	13.14	0
8/16/2016 12:00	2016	229	1200	229.5	8/16/2016	13.09	0
8/16/2016 13:00	2016	229	1300	229.5417	8/16/2016	13.11	0
8/16/2016 14:00	2016	229	1400	229.5833	8/16/2016	13.13	0
8/16/2016 15:00	2016	229	1500	229.625	8/16/2016	13.15	0
8/16/2016 16:00	2016	229	1600	229.6667	8/16/2016	13.16	0
8/16/2016 17:00	2016	229	1700	229.7083	8/16/2016	13.06	0
8/16/2016 18:00	2016	229	1800	229.75	8/16/2016	13.21	0
8/16/2016 19:00	2016	229	1900	229.7917	8/16/2016	13.04	0
8/16/2016 20:00	2016	229	2000	229.8333	8/16/2016	12.83	0
8/16/2016 21:00	2016	229	2100	229.875	8/16/2016	12.78	0
8/16/2016 22:00	2016	229	2200	229.9167	8/16/2016	12.76	0
8/16/2016 23:00	2016	229	2300	229.9583	8/16/2016	12.73	0

8/17/2016 0:00	2016	230	0	230	8/17/2016	12.72	0
8/17/2016 1:00	2016	230	100	230.0417	8/17/2016	12.7	0
8/17/2016 2:00	2016	230	200	230.0833	8/17/2016	12.68	0
8/17/2016 3:00	2016	230	300	230.125	8/17/2016	12.66	0
8/17/2016 4:00	2016	230	400	230.1667	8/17/2016	12.63	0
8/17/2016 5:00	2016	230	500	230.2083	8/17/2016	12.61	0
8/17/2016 6:00	2016	230	600	230.25	8/17/2016	12.58	0
8/17/2016 7:00	2016	230	700	230.2917	8/17/2016	12.73	0
8/17/2016 8:00	2016	230	800	230.3333	8/17/2016	13.28	0
8/17/2016 9:00	2016	230	900	230.375	8/17/2016	13.25	0
8/17/2016 10:00	2016	230	1000	230.4167	8/17/2016	13.19	0
8/17/2016 11:00	2016	230	1100	230.4583	8/17/2016	13.14	0
8/17/2016 12:00	2016	230	1200	230.5	8/17/2016	13.08	0
8/17/2016 13:00	2016	230	1300	230.5417	8/17/2016	13.06	0
8/17/2016 14:00	2016	230	1400	230.5833	8/17/2016	13.08	0.54
8/17/2016 15:00	2016	230	1500	230.625	8/17/2016	13.26	0.05
8/17/2016 16:00	2016	230	1600	230.6667	8/17/2016	13.2	0
8/17/2016 17:00	2016	230	1700	230.7083	8/17/2016	12.88	0
8/17/2016 18:00	2016	230	1800	230.75	8/17/2016	12.92	0
8/17/2016 19:00	2016	230	1900	230.7917	8/17/2016	12.9	0
8/17/2016 20:00	2016	230	2000	230.8333	8/17/2016	12.76	0
8/17/2016 21:00	2016	230	2100	230.875	8/17/2016	12.74	0
8/17/2016 22:00	2016	230	2200	230.9167	8/17/2016	12.71	0
8/17/2016 23:00	2016	230	2300	230.9583	8/17/2016	12.7	0
8/18/2016 0:00	2016	231	0	231	8/18/2016	12.68	0
8/18/2016 1:00	2016	231	100	231.0417	8/18/2016	12.67	0
8/18/2016 2:00	2016	231	200	231.0833	8/18/2016	12.64	0
8/18/2016 3:00	2016	231	300	231.125	8/18/2016	12.61	0
8/18/2016 4:00	2016	231	400	231.1667	8/18/2016	12.57	0
8/18/2016 5:00	2016	231	500	231.2083	8/18/2016	12.54	0
8/18/2016 6:00	2016	231	600	231.25	8/18/2016	12.53	0
8/18/2016 7:00	2016	231	700	231.2917	8/18/2016	12.64	0
8/18/2016 8:00	2016	231	800	231.3333	8/18/2016	13.17	0
8/18/2016 9:00	2016	231	900	231.375	8/18/2016	13.33	0
8/18/2016 10:00	2016	231	1000	231.4167	8/18/2016	13.3	0
8/18/2016 11:00	2016	231	1100	231.4583	8/18/2016	13.26	0
8/18/2016 12:00	2016	231	1200	231.5	8/18/2016	13.22	0
8/18/2016 13:00	2016	231	1300	231.5417	8/18/2016	13.18	0
8/18/2016 14:00	2016	231	1400	231.5833	8/18/2016	13.16	0
8/18/2016 15:00	2016	231	1500	231.625	8/18/2016	13.2	0
8/18/2016 16:00	2016	231	1600	231.6667	8/18/2016	13.21	0
8/18/2016 17:00	2016	231	1700	231.7083	8/18/2016	13.09	0
8/18/2016 18:00	2016	231	1800	231.75	8/18/2016	13	0
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8/18/2016 20:00	2016	231	2000	231.8333	8/18/2016	12.78	0
8/18/2016 21:00	2016	231	2100	231.875	8/18/2016	12.75	0
8/18/2016 22:00	2016	231	2200	231.9167	8/18/2016	12.74	0

8/18/2016 23:00	2016	231	2300	231.9583	8/18/2016	12.73	0
8/19/2016 0:00	2016	232	0	232	8/19/2016	12.71	0
8/19/2016 1:00	2016	232	100	232.0417	8/19/2016	12.69	0
8/19/2016 2:00	2016	232	200	232.0833	8/19/2016	12.68	0
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8/19/2016 5:00	2016	232	500	232.2083	8/19/2016	12.58	0
8/19/2016 6:00	2016	232	600	232.25	8/19/2016	12.54	0
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8/19/2016 8:00	2016	232	800	232.3333	8/19/2016	13.26	0
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8/19/2016 10:00	2016	232	1000	232.4167	8/19/2016	13.26	0
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8/19/2016 12:00	2016	232	1200	232.5	8/19/2016	13.12	0
8/19/2016 13:00	2016	232	1300	232.5417	8/19/2016	13.09	0
8/19/2016 14:00	2016	232	1400	232.5833	8/19/2016	13.13	0
8/19/2016 15:00	2016	232	1500	232.625	8/19/2016	13.13	0
8/19/2016 16:00	2016	232	1600	232.6667	8/19/2016	13.12	0
8/19/2016 17:00	2016	232	1700	232.7083	8/19/2016	13.12	0
8/19/2016 18:00	2016	232	1800	232.75	8/19/2016	13.15	0
8/19/2016 19:00	2016	232	1900	232.7917	8/19/2016	12.99	0
8/19/2016 20:00	2016	232	2000	232.8333	8/19/2016	12.81	0
8/19/2016 21:00	2016	232	2100	232.875	8/19/2016	12.76	0.01
8/19/2016 22:00	2016	232	2200	232.9167	8/19/2016	12.72	0
8/19/2016 23:00	2016	232	2300	232.9583	8/19/2016	12.71	0
8/20/2016 0:00	2016	233	0	233	8/20/2016	12.7	0
8/20/2016 1:00	2016	233	100	233.0417	8/20/2016	12.68	0
8/20/2016 2:00	2016	233	200	233.0833	8/20/2016	12.67	0
8/20/2016 3:00	2016	233	300	233.125	8/20/2016	12.65	0
8/20/2016 4:00	2016	233	400	233.1667	8/20/2016	12.63	0
8/20/2016 5:00	2016	233	500	233.2083	8/20/2016	12.6	0
8/20/2016 6:00	2016	233	600	233.25	8/20/2016	12.58	0
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8/20/2016 8:00	2016	233	800	233.3333	8/20/2016	13.21	0
8/20/2016 9:00	2016	233	900	233.375	8/20/2016	13.29	0
8/20/2016 10:00	2016	233	1000	233.4167	8/20/2016	13.22	0
8/20/2016 11:00	2016	233	1100	233.4583	8/20/2016	13.17	0
8/20/2016 12:00	2016	233	1200	233.5	8/20/2016	13.15	0
8/20/2016 13:00	2016	233	1300	233.5417	8/20/2016	13.13	0
8/20/2016 14:00	2016	233	1400	233.5833	8/20/2016	13.09	0
8/20/2016 15:00	2016	233	1500	233.625	8/20/2016	13.12	0
8/20/2016 16:00	2016	233	1600	233.6667	8/20/2016	13.15	0
8/20/2016 17:00	2016	233	1700	233.7083	8/20/2016	13.15	0
8/20/2016 18:00	2016	233	1800	233.75	8/20/2016	13.17	0
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8/20/2016 20:00	2016	233	2000	233.8333	8/20/2016	12.81	0
8/20/2016 21:00	2016	233	2100	233.875	8/20/2016	12.77	0

8/20/2016 22:00	2016	233	2200	233.9167	8/20/2016	12.75	0
8/20/2016 23:00	2016	233	2300	233.9583	8/20/2016	12.73	0
8/21/2016 0:00	2016	234	0	234	8/21/2016	12.72	0
8/21/2016 1:00	2016	234	100	234.0417	8/21/2016	12.7	0
8/21/2016 2:00	2016	234	200	234.0833	8/21/2016	12.69	0
8/21/2016 3:00	2016	234	300	234.125	8/21/2016	12.67	0
8/21/2016 4:00	2016	234	400	234.1667	8/21/2016	12.65	0
8/21/2016 5:00	2016	234	500	234.2083	8/21/2016	12.62	0
8/21/2016 6:00	2016	234	600	234.25	8/21/2016	12.59	0
8/21/2016 7:00	2016	234	700	234.2917	8/21/2016	12.74	0
8/21/2016 8:00	2016	234	800	234.3333	8/21/2016	13.31	0
8/21/2016 9:00	2016	234	900	234.375	8/21/2016	13.26	0
8/21/2016 10:00	2016	234	1000	234.4167	8/21/2016	13.22	0
8/21/2016 11:00	2016	234	1100	234.4583	8/21/2016	13.2	0
8/21/2016 12:00	2016	234	1200	234.5	8/21/2016	13.18	0
8/21/2016 13:00	2016	234	1300	234.5417	8/21/2016	13.18	0
8/21/2016 14:00	2016	234	1400	234.5833	8/21/2016	13.17	0
8/21/2016 15:00	2016	234	1500	234.625	8/21/2016	13.15	0
8/21/2016 16:00	2016	234	1600	234.6667	8/21/2016	13.21	0
8/21/2016 17:00	2016	234	1700	234.7083	8/21/2016	13.08	0
8/21/2016 18:00	2016	234	1800	234.75	8/21/2016	13.14	0
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8/21/2016 20:00	2016	234	2000	234.8333	8/21/2016	12.78	0
8/21/2016 21:00	2016	234	2100	234.875	8/21/2016	12.75	0
8/21/2016 22:00	2016	234	2200	234.9167	8/21/2016	12.73	0
8/21/2016 23:00	2016	234	2300	234.9583	8/21/2016	12.72	0
8/22/2016 0:00	2016	235	0	235	8/22/2016	12.7	0
8/22/2016 1:00	2016	235	100	235.0417	8/22/2016	12.69	0
8/22/2016 2:00	2016	235	200	235.0833	8/22/2016	12.67	0
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8/22/2016 4:00	2016	235	400	235.1667	8/22/2016	12.63	0
8/22/2016 5:00	2016	235	500	235.2083	8/22/2016	12.6	0
8/22/2016 6:00	2016	235	600	235.25	8/22/2016	12.56	0
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8/22/2016 9:00	2016	235	900	235.375	8/22/2016	13.28	0
8/22/2016 10:00	2016	235	1000	235.4167	8/22/2016	13.19	0.01
8/22/2016 11:00	2016	235	1100	235.4583	8/22/2016	13.18	0
8/22/2016 12:00	2016	235	1200	235.5	8/22/2016	13.18	0
8/22/2016 13:00	2016	235	1300	235.5417	8/22/2016	13.18	0
8/22/2016 14:00	2016	235	1400	235.5833	8/22/2016	13.22	0
8/22/2016 15:00	2016	235	1500	235.625	8/22/2016	13.23	0
8/22/2016 16:00	2016	235	1600	235.6667	8/22/2016	13.2	0
8/22/2016 17:00	2016	235	1700	235.7083	8/22/2016	13.19	0
8/22/2016 18:00	2016	235	1800	235.75	8/22/2016	13.21	0
8/22/2016 19:00	2016	235	1900	235.7917	8/22/2016	12.98	0
8/22/2016 20:00	2016	235	2000	235.8333	8/22/2016	12.82	0

8/22/2016 21:00	2016	235	2100	235.875	8/22/2016	12.78	0
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8/22/2016 23:00	2016	235	2300	235.9583	8/22/2016	12.74	0
8/23/2016 0:00	2016	236	0	236	8/23/2016	12.73	0
8/23/2016 1:00	2016	236	100	236.0417	8/23/2016	12.71	0
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8/23/2016 6:00	2016	236	600	236.25	8/23/2016	12.6	0
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8/23/2016 9:00	2016	236	900	236.375	8/23/2016	13.31	0
8/23/2016 10:00	2016	236	1000	236.4167	8/23/2016	13.28	0
8/23/2016 11:00	2016	236	1100	236.4583	8/23/2016	13.26	0
8/23/2016 12:00	2016	236	1200	236.5	8/23/2016	13.24	0
8/23/2016 13:00	2016	236	1300	236.5417	8/23/2016	13.21	0
8/23/2016 14:00	2016	236	1400	236.5833	8/23/2016	13.21	0
8/23/2016 15:00	2016	236	1500	236.625	8/23/2016	13.17	0
8/23/2016 16:00	2016	236	1600	236.6667	8/23/2016	13.16	0
8/23/2016 17:00	2016	236	1700	236.7083	8/23/2016	13.17	0
8/23/2016 18:00	2016	236	1800	236.75	8/23/2016	13.19	0
8/23/2016 19:00	2016	236	1900	236.7917	8/23/2016	12.91	0.17
8/23/2016 20:00	2016	236	2000	236.8333	8/23/2016	12.79	0
8/23/2016 21:00	2016	236	2100	236.875	8/23/2016	12.76	0
8/23/2016 22:00	2016	236	2200	236.9167	8/23/2016	12.74	0
8/23/2016 23:00	2016	236	2300	236.9583	8/23/2016	12.72	0
8/24/2016 0:00	2016	237	0	237	8/24/2016	12.71	0
8/24/2016 1:00	2016	237	100	237.0417	8/24/2016	12.69	0
8/24/2016 2:00	2016	237	200	237.0833	8/24/2016	12.67	0
8/24/2016 3:00	2016	237	300	237.125	8/24/2016	12.66	0
8/24/2016 4:00	2016	237	400	237.1667	8/24/2016	12.64	0
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8/24/2016 6:00	2016	237	600	237.25	8/24/2016	12.58	0
8/24/2016 7:00	2016	237	700	237.2917	8/24/2016	12.72	0
8/24/2016 8:00	2016	237	800	237.3333	8/24/2016	13.35	0
8/24/2016 9:00	2016	237	900	237.375	8/24/2016	13.3	0
8/24/2016 10:00	2016	237	1000	237.4167	8/24/2016	13.25	0
8/24/2016 11:00	2016	237	1100	237.4583	8/24/2016	13.19	0
8/24/2016 12:00	2016	237	1200	237.5	8/24/2016	13.14	0
8/24/2016 13:00	2016	237	1300	237.5417	8/24/2016	13.1	0
8/24/2016 14:00	2016	237	1400	237.5833	8/24/2016	12.99	0.02
8/24/2016 15:00	2016	237	1500	237.625	8/24/2016	13.24	0
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8/24/2016 17:00	2016	237	1700	237.7083	8/24/2016	13.23	0
8/24/2016 18:00	2016	237	1800	237.75	8/24/2016	13.21	0
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8/24/2016 20:00	2016	237	2000	237.8333	8/24/2016	12.81	0
8/24/2016 21:00	2016	237	2100	237.875	8/24/2016	12.78	0
8/24/2016 22:00	2016	237	2200	237.9167	8/24/2016	12.75	0
8/24/2016 23:00	2016	237	2300	237.9583	8/24/2016	12.73	0
8/25/2016 0:00	2016	238	0	238	8/25/2016	12.71	0
8/25/2016 1:00	2016	238	100	238.0417	8/25/2016	12.69	0
8/25/2016 2:00	2016	238	200	238.0833	8/25/2016	12.67	0
8/25/2016 3:00	2016	238	300	238.125	8/25/2016	12.64	0
8/25/2016 4:00	2016	238	400	238.1667	8/25/2016	12.61	0
8/25/2016 5:00	2016	238	500	238.2083	8/25/2016	12.58	0
8/25/2016 6:00	2016	238	600	238.25	8/25/2016	12.55	0
8/25/2016 7:00	2016	238	700	238.2917	8/25/2016	12.68	0
8/25/2016 8:00	2016	238	800	238.3333	8/25/2016	13.32	0
8/25/2016 9:00	2016	238	900	238.375	8/25/2016	13.28	0
8/25/2016 10:00	2016	238	1000	238.4167	8/25/2016	13.22	0
8/25/2016 11:00	2016	238	1100	238.4583	8/25/2016	13.18	0
8/25/2016 12:00	2016	238	1200	238.5	8/25/2016	13.2	0
8/25/2016 13:00	2016	238	1300	238.5417	8/25/2016	13.25	0.03
8/25/2016 14:00	2016	238	1400	238.5833	8/25/2016	13.28	0
8/25/2016 15:00	2016	238	1500	238.625	8/25/2016	13.24	0.01
8/25/2016 16:00	2016	238	1600	238.6667	8/25/2016	13.31	0
8/25/2016 17:00	2016	238	1700	238.7083	8/25/2016	13.02	0.27
8/25/2016 18:00	2016	238	1800	238.75	8/25/2016	12.93	0
8/25/2016 19:00	2016	238	1900	238.7917	8/25/2016	12.79	0.01
8/25/2016 20:00	2016	238	2000	238.8333	8/25/2016	12.76	0.02
8/25/2016 21:00	2016	238	2100	238.875	8/25/2016	12.74	0.05
8/25/2016 22:00	2016	238	2200	238.9167	8/25/2016	12.72	0.07
8/25/2016 23:00	2016	238	2300	238.9583	8/25/2016	12.71	0
8/26/2016 0:00	2016	239	0	239	8/26/2016	12.69	0
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8/26/2016 2:00	2016	239	200	239.0833	8/26/2016	12.65	0
8/26/2016 3:00	2016	239	300	239.125	8/26/2016	12.63	0
8/26/2016 4:00	2016	239	400	239.1667	8/26/2016	12.59	0.05
8/26/2016 5:00	2016	239	500	239.2083	8/26/2016	12.55	0.01
8/26/2016 6:00	2016	239	600	239.25	8/26/2016	12.53	0.01
8/26/2016 7:00	2016	239	700	239.2917	8/26/2016	12.53	0.06
8/26/2016 8:00	2016	239	800	239.3333	8/26/2016	12.64	0
8/26/2016 9:00	2016	239	900	239.375	8/26/2016	13.28	0
8/26/2016 10:00	2016	239	1000	239.4167	8/26/2016	13.33	0
8/26/2016 11:00	2016	239	1100	239.4583	8/26/2016	13.26	0
8/26/2016 12:00	2016	239	1200	239.5	8/26/2016	13.21	0
8/26/2016 13:00	2016	239	1300	239.5417	8/26/2016	13.18	0
8/26/2016 14:00	2016	239	1400	239.5833	8/26/2016	13.15	0
8/26/2016 15:00	2016	239	1500	239.625	8/26/2016	13.09	0.01
8/26/2016 16:00	2016	239	1600	239.6667	8/26/2016	13.29	0
8/26/2016 17:00	2016	239	1700	239.7083	8/26/2016	13.28	0
8/26/2016 18:00	2016	239	1800	239.75	8/26/2016	13.28	0

8/26/2016 19:00	2016	239	1900	239.7917	8/26/2016	12.93	0
8/26/2016 20:00	2016	239	2000	239.8333	8/26/2016	12.81	0
8/26/2016 21:00	2016	239	2100	239.875	8/26/2016	12.78	0
8/26/2016 22:00	2016	239	2200	239.9167	8/26/2016	12.75	0
8/26/2016 23:00	2016	239	2300	239.9583	8/26/2016	12.73	0
8/27/2016 0:00	2016	240	0	240	8/27/2016	12.72	0
8/27/2016 1:00	2016	240	100	240.0417	8/27/2016	12.7	0
8/27/2016 2:00	2016	240	200	240.0833	8/27/2016	12.68	0
8/27/2016 3:00	2016	240	300	240.125	8/27/2016	12.66	0
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8/27/2016 6:00	2016	240	600	240.25	8/27/2016	12.57	0
8/27/2016 7:00	2016	240	700	240.2917	8/27/2016	12.53	0.11
8/27/2016 8:00	2016	240	800	240.3333	8/27/2016	12.9	0.01
8/27/2016 9:00	2016	240	900	240.375	8/27/2016	12.92	0
8/27/2016 10:00	2016	240	1000	240.4167	8/27/2016	13.13	0.01
8/27/2016 11:00	2016	240	1100	240.4583	8/27/2016	13.39	0
8/27/2016 12:00	2016	240	1200	240.5	8/27/2016	13.37	0
8/27/2016 13:00	2016	240	1300	240.5417	8/27/2016	13.34	0
8/27/2016 14:00	2016	240	1400	240.5833	8/27/2016	13.27	0
8/27/2016 15:00	2016	240	1500	240.625	8/27/2016	13.26	0
8/27/2016 16:00	2016	240	1600	240.6667	8/27/2016	13.29	0
8/27/2016 17:00	2016	240	1700	240.7083	8/27/2016	13.32	0
8/27/2016 18:00	2016	240	1800	240.75	8/27/2016	13.23	0
8/27/2016 19:00	2016	240	1900	240.7917	8/27/2016	12.92	0
8/27/2016 20:00	2016	240	2000	240.8333	8/27/2016	12.82	0
8/27/2016 21:00	2016	240	2100	240.875	8/27/2016	12.78	0
8/27/2016 22:00	2016	240	2200	240.9167	8/27/2016	12.76	0
8/27/2016 23:00	2016	240	2300	240.9583	8/27/2016	12.75	0
8/28/2016 0:00	2016	241	0	241	8/28/2016	12.73	0
8/28/2016 1:00	2016	241	100	241.0417	8/28/2016	12.71	0.08
8/28/2016 2:00	2016	241	200	241.0833	8/28/2016	12.7	0
8/28/2016 3:00	2016	241	300	241.125	8/28/2016	12.67	0
8/28/2016 4:00	2016	241	400	241.1667	8/28/2016	12.64	0
8/28/2016 5:00	2016	241	500	241.2083	8/28/2016	12.6	0
8/28/2016 6:00	2016	241	600	241.25	8/28/2016	12.55	0
8/28/2016 7:00	2016	241	700	241.2917	8/28/2016	12.64	0
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8/28/2016 10:00	2016	241	1000	241.4167	8/28/2016	13.32	0
8/28/2016 11:00	2016	241	1100	241.4583	8/28/2016	13.26	0
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8/28/2016 13:00	2016	241	1300	241.5417	8/28/2016	13.18	0
8/28/2016 14:00	2016	241	1400	241.5833	8/28/2016	13.16	0
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8/28/2016 17:00	2016	241	1700	241.7083	8/28/2016	13.19	0

8/28/2016 18:00	2016	241	1800	241.75	8/28/2016	13.17	0
8/28/2016 19:00	2016	241	1900	241.7917	8/28/2016	12.95	0
8/28/2016 20:00	2016	241	2000	241.8333	8/28/2016	12.81	0
8/28/2016 21:00	2016	241	2100	241.875	8/28/2016	12.77	0
8/28/2016 22:00	2016	241	2200	241.9167	8/28/2016	12.74	0
8/28/2016 23:00	2016	241	2300	241.9583	8/28/2016	12.72	0
8/29/2016 0:00	2016	242	0	242	8/29/2016	12.71	0
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8/29/2016 2:00	2016	242	200	242.0833	8/29/2016	12.67	0
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8/29/2016 6:00	2016	242	600	242.25	8/29/2016	12.57	0
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8/29/2016 10:00	2016	242	1000	242.4167	8/29/2016	13.27	0
8/29/2016 11:00	2016	242	1100	242.4583	8/29/2016	13.22	0
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8/29/2016 14:00	2016	242	1400	242.5833	8/29/2016	13.14	0
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8/29/2016 21:00	2016	242	2100	242.875	8/29/2016	12.77	0
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8/29/2016 23:00	2016	242	2300	242.9583	8/29/2016	12.73	0
8/30/2016 0:00	2016	243	0	243	8/30/2016	12.71	0
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8/30/2016 5:00	2016	243	500	243.2083	8/30/2016	12.58	0
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8/30/2016 8:00	2016	243	800	243.3333	8/30/2016	13.38	0
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8/30/2016 10:00	2016	243	1000	243.4167	8/30/2016	13.26	0
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8/30/2016 12:00	2016	243	1200	243.5	8/30/2016	13.15	0
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8/30/2016 14:00	2016	243	1400	243.5833	8/30/2016	13.1	0
8/30/2016 15:00	2016	243	1500	243.625	8/30/2016	13.11	0
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8/30/2016 17:00	2016	243	1700	243.7083	8/30/2016	13.13	0
8/30/2016 18:00	2016	243	1800	243.75	8/30/2016	13.12	0
8/30/2016 19:00	2016	243	1900	243.7917	8/30/2016	12.93	0
8/30/2016 20:00	2016	243	2000	243.8333	8/30/2016	12.81	0
8/30/2016 21:00	2016	243	2100	243.875	8/30/2016	12.77	0
8/30/2016 22:00	2016	243	2200	243.9167	8/30/2016	12.75	0
8/30/2016 23:00	2016	243	2300	243.9583	8/30/2016	12.73	0
8/31/2016 0:00	2016	244	0	244	8/31/2016	12.72	0
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8/31/2016 10:00	2016	244	1000	244.4167	8/31/2016	13.25	0
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8/31/2016 16:00	2016	244	1600	244.6667	8/31/2016	13.11	0
8/31/2016 17:00	2016	244	1700	244.7083	8/31/2016	13.13	0
8/31/2016 18:00	2016	244	1800	244.75	8/31/2016	13.11	0
8/31/2016 19:00	2016	244	1900	244.7917	8/31/2016	12.95	0
8/31/2016 20:00	2016	244	2000	244.8333	8/31/2016	12.81	0
8/31/2016 21:00	2016	244	2100	244.875	8/31/2016	12.77	0
8/31/2016 22:00	2016	244	2200	244.9167	8/31/2016	12.75	0
8/31/2016 23:00	2016	244	2300	244.9583	8/31/2016	12.73	0
9/1/2016 0:00	2016	245	0	245	9/1/2016	12.71	0
9/1/2016 1:00	2016	245	100	245.0417	9/1/2016	12.69	0
9/1/2016 2:00	2016	245	200	245.0833	9/1/2016	12.67	0
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9/1/2016 5:00	2016	245	500	245.2083	9/1/2016	12.59	0
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9/1/2016 10:00	2016	245	1000	245.4167	9/1/2016	13.25	0
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9/1/2016 12:00	2016	245	1200	245.5	9/1/2016	13.15	0
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9/1/2016 18:00	2016	245	1800	245.75	9/1/2016	12.84	0
9/1/2016 19:00	2016	245	1900	245.7917	9/1/2016	12.76	0
9/1/2016 20:00	2016	245	2000	245.8333	9/1/2016	12.74	0
9/1/2016 21:00	2016	245	2100	245.875	9/1/2016	12.73	0
9/1/2016 22:00	2016	245	2200	245.9167	9/1/2016	12.71	0
9/1/2016 23:00	2016	245	2300	245.9583	9/1/2016	12.68	0
9/2/2016 0:00	2016	246	0	246	9/2/2016	12.66	0
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9/2/2016 9:00	2016	246	900	246.375	9/2/2016	13.29	0
9/2/2016 10:00	2016	246	1000	246.4167	9/2/2016	13.24	0
9/2/2016 11:00	2016	246	1100	246.4583	9/2/2016	13.21	0
9/2/2016 12:00	2016	246	1200	246.5	9/2/2016	13.19	0.01
9/2/2016 13:00	2016	246	1300	246.5417	9/2/2016	13.2	0.17
9/2/2016 14:00	2016	246	1400	246.5833	9/2/2016	13.28	0
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9/2/2016 16:00	2016	246	1600	246.6667	9/2/2016	13.3	0
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9/2/2016 21:00	2016	246	2100	246.875	9/2/2016	12.78	0
9/2/2016 22:00	2016	246	2200	246.9167	9/2/2016	12.76	0
9/2/2016 23:00	2016	246	2300	246.9583	9/2/2016	12.75	0
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9/3/2016 3:00	2016	247	300	247.125	9/3/2016	12.68	0
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9/3/2016 6:00	2016	247	600	247.25	9/3/2016	12.61	0
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9/3/2016 21:00	2016	247	2100	247.875	9/3/2016	12.76	0
9/3/2016 22:00	2016	247	2200	247.9167	9/3/2016	12.74	0
9/3/2016 23:00	2016	247	2300	247.9583	9/3/2016	12.72	0
9/4/2016 0:00	2016	248	0	248	9/4/2016	12.7	0
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9/4/2016 2:00	2016	248	200	248.0833	9/4/2016	12.66	0
9/4/2016 3:00	2016	248	300	248.125	9/4/2016	12.63	0
9/4/2016 4:00	2016	248	400	248.1667	9/4/2016	12.6	0
9/4/2016 5:00	2016	248	500	248.2083	9/4/2016	12.58	0
9/4/2016 6:00	2016	248	600	248.25	9/4/2016	12.55	0
9/4/2016 7:00	2016	248	700	248.2917	9/4/2016	12.67	0
9/4/2016 8:00	2016	248	800	248.3333	9/4/2016	13.39	0
9/4/2016 9:00	2016	248	900	248.375	9/4/2016	13.32	0
9/4/2016 10:00	2016	248	1000	248.4167	9/4/2016	13.26	0
9/4/2016 11:00	2016	248	1100	248.4583	9/4/2016	13.21	0
9/4/2016 12:00	2016	248	1200	248.5	9/4/2016	13.17	0
9/4/2016 13:00	2016	248	1300	248.5417	9/4/2016	13.14	0
9/4/2016 14:00	2016	248	1400	248.5833	9/4/2016	13.13	0
9/4/2016 15:00	2016	248	1500	248.625	9/4/2016	13.13	0
9/4/2016 16:00	2016	248	1600	248.6667	9/4/2016	13.14	0
9/4/2016 17:00	2016	248	1700	248.7083	9/4/2016	13.17	0
9/4/2016 18:00	2016	248	1800	248.75	9/4/2016	13.14	0
9/4/2016 19:00	2016	248	1900	248.7917	9/4/2016	12.91	0
9/4/2016 20:00	2016	248	2000	248.8333	9/4/2016	12.8	0
9/4/2016 21:00	2016	248	2100	248.875	9/4/2016	12.76	0
9/4/2016 22:00	2016	248	2200	248.9167	9/4/2016	12.73	0
9/4/2016 23:00	2016	248	2300	248.9583	9/4/2016	12.71	0
9/5/2016 0:00	2016	249	0	249	9/5/2016	12.7	0
9/5/2016 1:00	2016	249	100	249.0417	9/5/2016	12.68	0
9/5/2016 2:00	2016	249	200	249.0833	9/5/2016	12.66	0
9/5/2016 3:00	2016	249	300	249.125	9/5/2016	12.63	0
9/5/2016 4:00	2016	249	400	249.1667	9/5/2016	12.59	0
9/5/2016 5:00	2016	249	500	249.2083	9/5/2016	12.56	0
9/5/2016 6:00	2016	249	600	249.25	9/5/2016	12.52	0
9/5/2016 7:00	2016	249	700	249.2917	9/5/2016	12.64	0
9/5/2016 8:00	2016	249	800	249.3333	9/5/2016	13.46	0
9/5/2016 9:00	2016	249	900	249.375	9/5/2016	13.37	0
9/5/2016 10:00	2016	249	1000	249.4167	9/5/2016	13.3	0
9/5/2016 11:00	2016	249	1100	249.4583	9/5/2016	13.23	0
9/5/2016 12:00	2016	249	1200	249.5	9/5/2016	13.18	0
9/5/2016 13:00	2016	249	1300	249.5417	9/5/2016	13.15	0

9/5/2016 14:00	2016	249	1400	249.5833	9/5/2016	13.12	0
9/5/2016 15:00	2016	249	1500	249.625	9/5/2016	13.11	0
9/5/2016 16:00	2016	249	1600	249.6667	9/5/2016	13.12	0
9/5/2016 17:00	2016	249	1700	249.7083	9/5/2016	13.15	0
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9/5/2016 19:00	2016	249	1900	249.7917	9/5/2016	12.91	0
9/5/2016 20:00	2016	249	2000	249.8333	9/5/2016	12.8	0
9/5/2016 21:00	2016	249	2100	249.875	9/5/2016	12.76	0
9/5/2016 22:00	2016	249	2200	249.9167	9/5/2016	12.74	0
9/5/2016 23:00	2016	249	2300	249.9583	9/5/2016	12.72	0
9/6/2016 0:00	2016	250	0	250	9/6/2016	12.7	0
9/6/2016 1:00	2016	250	100	250.0417	9/6/2016	12.68	0
9/6/2016 2:00	2016	250	200	250.0833	9/6/2016	12.66	0
9/6/2016 3:00	2016	250	300	250.125	9/6/2016	12.63	0
9/6/2016 4:00	2016	250	400	250.1667	9/6/2016	12.6	0
9/6/2016 5:00	2016	250	500	250.2083	9/6/2016	12.56	0
9/6/2016 6:00	2016	250	600	250.25	9/6/2016	12.53	0
9/6/2016 7:00	2016	250	700	250.2917	9/6/2016	12.65	0
9/6/2016 8:00	2016	250	800	250.3333	9/6/2016	13.42	0
9/6/2016 9:00	2016	250	900	250.375	9/6/2016	13.34	0
9/6/2016 10:00	2016	250	1000	250.4167	9/6/2016	13.27	0
9/6/2016 11:00	2016	250	1100	250.4583	9/6/2016	13.21	0
9/6/2016 12:00	2016	250	1200	250.5	9/6/2016	13.16	0
9/6/2016 13:00	2016	250	1300	250.5417	9/6/2016	13.12	0
9/6/2016 14:00	2016	250	1400	250.5833	9/6/2016	13.1	0
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9/6/2016 16:00	2016	250	1600	250.6667	9/6/2016	13.11	0
9/6/2016 17:00	2016	250	1700	250.7083	9/6/2016	13.14	0
9/6/2016 18:00	2016	250	1800	250.75	9/6/2016	13.17	0
9/6/2016 19:00	2016	250	1900	250.7917	9/6/2016	12.98	0
9/6/2016 20:00	2016	250	2000	250.8333	9/6/2016	12.82	0
9/6/2016 21:00	2016	250	2100	250.875	9/6/2016	12.78	0
9/6/2016 22:00	2016	250	2200	250.9167	9/6/2016	12.75	0
9/6/2016 23:00	2016	250	2300	250.9583	9/6/2016	12.73	0
9/7/2016 0:00	2016	251	0	251	9/7/2016	12.72	0
9/7/2016 1:00	2016	251	100	251.0417	9/7/2016	12.7	0
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9/7/2016 4:00	2016	251	400	251.1667	9/7/2016	12.63	0
9/7/2016 5:00	2016	251	500	251.2083	9/7/2016	12.6	0
9/7/2016 6:00	2016	251	600	251.25	9/7/2016	12.57	0
9/7/2016 7:00	2016	251	700	251.2917	9/7/2016	12.6	0
9/7/2016 8:00	2016	251	800	251.3333	9/7/2016	13.16	0
9/7/2016 9:00	2016	251	900	251.375	9/7/2016	13.33	0
9/7/2016 10:00	2016	251	1000	251.4167	9/7/2016	13.28	0
9/7/2016 11:00	2016	251	1100	251.4583	9/7/2016	13.24	0
9/7/2016 12:00	2016	251	1200	251.5	9/7/2016	13.21	0

9/7/2016 13:00	2016	251	1300	251.5417	9/7/2016	13.17	0
9/7/2016 14:00	2016	251	1400	251.5833	9/7/2016	13.16	0
9/7/2016 15:00	2016	251	1500	251.625	9/7/2016	13.16	0
9/7/2016 16:00	2016	251	1600	251.6667	9/7/2016	13.18	0
9/7/2016 17:00	2016	251	1700	251.7083	9/7/2016	13.18	0
9/7/2016 18:00	2016	251	1800	251.75	9/7/2016	13.17	0
9/7/2016 19:00	2016	251	1900	251.7917	9/7/2016	12.94	0
9/7/2016 20:00	2016	251	2000	251.8333	9/7/2016	12.82	0
9/7/2016 21:00	2016	251	2100	251.875	9/7/2016	12.78	0
9/7/2016 22:00	2016	251	2200	251.9167	9/7/2016	12.76	0
9/7/2016 23:00	2016	251	2300	251.9583	9/7/2016	12.75	0
9/8/2016 0:00	2016	252	0	252	9/8/2016	12.73	0
9/8/2016 1:00	2016	252	100	252.0417	9/8/2016	12.71	0
9/8/2016 2:00	2016	252	200	252.0833	9/8/2016	12.69	0
9/8/2016 3:00	2016	252	300	252.125	9/8/2016	12.67	0
9/8/2016 4:00	2016	252	400	252.1667	9/8/2016	12.65	0
9/8/2016 5:00	2016	252	500	252.2083	9/8/2016	12.62	0
9/8/2016 6:00	2016	252	600	252.25	9/8/2016	12.59	0
9/8/2016 7:00	2016	252	700	252.2917	9/8/2016	12.7	0
9/8/2016 8:00	2016	252	800	252.3333	9/8/2016	13.33	0
9/8/2016 9:00	2016	252	900	252.375	9/8/2016	13.28	0
9/8/2016 10:00	2016	252	1000	252.4167	9/8/2016	13.23	0
9/8/2016 11:00	2016	252	1100	252.4583	9/8/2016	13.18	0
9/8/2016 12:00	2016	252	1200	252.5	9/8/2016	13.14	0
9/8/2016 13:00	2016	252	1300	252.5417	9/8/2016	13.11	0
9/8/2016 14:00	2016	252	1400	252.5833	9/8/2016	13.1	0
9/8/2016 15:00	2016	252	1500	252.625	9/8/2016	13.1	0
9/8/2016 16:00	2016	252	1600	252.6667	9/8/2016	13.1	0
9/8/2016 17:00	2016	252	1700	252.7083	9/8/2016	13.13	0
9/8/2016 18:00	2016	252	1800	252.75	9/8/2016	13.1	0
9/8/2016 19:00	2016	252	1900	252.7917	9/8/2016	12.9	0
9/8/2016 20:00	2016	252	2000	252.8333	9/8/2016	12.8	0
9/8/2016 21:00	2016	252	2100	252.875	9/8/2016	12.77	0
9/8/2016 22:00	2016	252	2200	252.9167	9/8/2016	12.75	0
9/8/2016 23:00	2016	252	2300	252.9583	9/8/2016	12.73	0
9/9/2016 0:00	2016	253	0	253	9/9/2016	12.72	0
9/9/2016 1:00	2016	253	100	253.0417	9/9/2016	12.7	0
9/9/2016 2:00	2016	253	200	253.0833	9/9/2016	12.67	0
9/9/2016 3:00	2016	253	300	253.125	9/9/2016	12.65	0
9/9/2016 4:00	2016	253	400	253.1667	9/9/2016	12.62	0
9/9/2016 5:00	2016	253	500	253.2083	9/9/2016	12.59	0
9/9/2016 6:00	2016	253	600	253.25	9/9/2016	12.57	0
9/9/2016 7:00	2016	253	700	253.2917	9/9/2016	12.7	0
9/9/2016 8:00	2016	253	800	253.3333	9/9/2016	13.31	0
9/9/2016 9:00	2016	253	900	253.375	9/9/2016	13.26	0
9/9/2016 10:00	2016	253	1000	253.4167	9/9/2016	13.21	0
9/9/2016 11:00	2016	253	1100	253.4583	9/9/2016	13.15	0

9/9/2016 12:00	2016	253	1200	253.5	9/9/2016	13.1	0
9/9/2016 13:00	2016	253	1300	253.5417	9/9/2016	13.08	0
9/9/2016 14:00	2016	253	1400	253.5833	9/9/2016	13.07	0
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9/9/2016 16:00	2016	253	1600	253.6667	9/9/2016	13.09	0
9/9/2016 17:00	2016	253	1700	253.7083	9/9/2016	13.11	0
9/9/2016 18:00	2016	253	1800	253.75	9/9/2016	13.09	0
9/9/2016 19:00	2016	253	1900	253.7917	9/9/2016	12.89	0
9/9/2016 20:00	2016	253	2000	253.8333	9/9/2016	12.79	0
9/9/2016 21:00	2016	253	2100	253.875	9/9/2016	12.75	0
9/9/2016 22:00	2016	253	2200	253.9167	9/9/2016	12.73	0
9/9/2016 23:00	2016	253	2300	253.9583	9/9/2016	12.71	0
9/10/2016 0:00	2016	254	0	254	9/10/2016	12.69	0
9/10/2016 1:00	2016	254	100	254.0417	9/10/2016	12.67	0
9/10/2016 2:00	2016	254	200	254.0833	9/10/2016	12.63	0
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9/10/2016 4:00	2016	254	400	254.1667	9/10/2016	12.57	0
9/10/2016 5:00	2016	254	500	254.2083	9/10/2016	12.54	0
9/10/2016 6:00	2016	254	600	254.25	9/10/2016	12.52	0
9/10/2016 7:00	2016	254	700	254.2917	9/10/2016	12.68	0
9/10/2016 8:00	2016	254	800	254.3333	9/10/2016	13.4	0
9/10/2016 9:00	2016	254	900	254.375	9/10/2016	13.3	0
9/10/2016 10:00	2016	254	1000	254.4167	9/10/2016	13.23	0
9/10/2016 11:00	2016	254	1100	254.4583	9/10/2016	13.18	0
9/10/2016 12:00	2016	254	1200	254.5	9/10/2016	13.13	0
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9/10/2016 16:00	2016	254	1600	254.6667	9/10/2016	13.13	0
9/10/2016 17:00	2016	254	1700	254.7083	9/10/2016	13.13	0
9/10/2016 18:00	2016	254	1800	254.75	9/10/2016	13.01	0
9/10/2016 19:00	2016	254	1900	254.7917	9/10/2016	12.88	0
9/10/2016 20:00	2016	254	2000	254.8333	9/10/2016	12.8	0
9/10/2016 21:00	2016	254	2100	254.875	9/10/2016	12.77	0
9/10/2016 22:00	2016	254	2200	254.9167	9/10/2016	12.76	0
9/10/2016 23:00	2016	254	2300	254.9583	9/10/2016	12.74	0
9/11/2016 0:00	2016	255	0	255	9/11/2016	12.72	0
9/11/2016 1:00	2016	255	100	255.0417	9/11/2016	12.69	0
9/11/2016 2:00	2016	255	200	255.0833	9/11/2016	12.67	0
9/11/2016 3:00	2016	255	300	255.125	9/11/2016	12.64	0
9/11/2016 4:00	2016	255	400	255.1667	9/11/2016	12.61	0
9/11/2016 5:00	2016	255	500	255.2083	9/11/2016	12.58	0
9/11/2016 6:00	2016	255	600	255.25	9/11/2016	12.56	0
9/11/2016 7:00	2016	255	700	255.2917	9/11/2016	12.6	0
9/11/2016 8:00	2016	255	800	255.3333	9/11/2016	13.22	0
9/11/2016 9:00	2016	255	900	255.375	9/11/2016	13.26	0
9/11/2016 10:00	2016	255	1000	255.4167	9/11/2016	13.2	0

9/11/2016 11:00	2016	255	1100	255.4583	9/11/2016	13.15	0
9/11/2016 12:00	2016	255	1200	255.5	9/11/2016	13.11	0
9/11/2016 13:00	2016	255	1300	255.5417	9/11/2016	13.09	0
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9/11/2016 16:00	2016	255	1600	255.6667	9/11/2016	13.09	0
9/11/2016 17:00	2016	255	1700	255.7083	9/11/2016	13.11	0
9/11/2016 18:00	2016	255	1800	255.75	9/11/2016	13.09	0
9/11/2016 19:00	2016	255	1900	255.7917	9/11/2016	12.88	0
9/11/2016 20:00	2016	255	2000	255.8333	9/11/2016	12.79	0
9/11/2016 21:00	2016	255	2100	255.875	9/11/2016	12.75	0
9/11/2016 22:00	2016	255	2200	255.9167	9/11/2016	12.73	0
9/11/2016 23:00	2016	255	2300	255.9583	9/11/2016	12.71	0
9/12/2016 0:00	2016	256	0	256	9/12/2016	12.68	0
9/12/2016 1:00	2016	256	100	256.0417	9/12/2016	12.66	0
9/12/2016 2:00	2016	256	200	256.0833	9/12/2016	12.63	0
9/12/2016 3:00	2016	256	300	256.125	9/12/2016	12.61	0
9/12/2016 4:00	2016	256	400	256.1667	9/12/2016	12.58	0
9/12/2016 5:00	2016	256	500	256.2083	9/12/2016	12.55	0
9/12/2016 6:00	2016	256	600	256.25	9/12/2016	12.54	0
9/12/2016 7:00	2016	256	700	256.2917	9/12/2016	12.66	0
9/12/2016 8:00	2016	256	800	256.3333	9/12/2016	13.31	0
9/12/2016 9:00	2016	256	900	256.375	9/12/2016	13.29	0
9/12/2016 10:00	2016	256	1000	256.4167	9/12/2016	13.24	0
9/12/2016 11:00	2016	256	1100	256.4583	9/12/2016	13.18	0
9/12/2016 12:00	2016	256	1200	256.5	9/12/2016	13.14	0
9/12/2016 13:00	2016	256	1300	256.5417	9/12/2016	13.12	0
9/12/2016 14:00	2016	256	1400	256.5833	9/12/2016	13.11	0
9/12/2016 15:00	2016	256	1500	256.625	9/12/2016	13.11	0
9/12/2016 16:00	2016	256	1600	256.6667	9/12/2016	13.12	0
9/12/2016 17:00	2016	256	1700	256.7083	9/12/2016	13.15	0
9/12/2016 18:00	2016	256	1800	256.75	9/12/2016	13.11	0
9/12/2016 19:00	2016	256	1900	256.7917	9/12/2016	12.88	0
9/12/2016 20:00	2016	256	2000	256.8333	9/12/2016	12.79	0
9/12/2016 21:00	2016	256	2100	256.875	9/12/2016	12.75	0
9/12/2016 22:00	2016	256	2200	256.9167	9/12/2016	12.72	0
9/12/2016 23:00	2016	256	2300	256.9583	9/12/2016	12.7	0
9/13/2016 0:00	2016	257	0	257	9/13/2016	12.68	0
9/13/2016 1:00	2016	257	100	257.0417	9/13/2016	12.66	0
9/13/2016 2:00	2016	257	200	257.0833	9/13/2016	12.64	0
9/13/2016 3:00	2016	257	300	257.125	9/13/2016	12.62	0
9/13/2016 4:00	2016	257	400	257.1667	9/13/2016	12.6	0
9/13/2016 5:00	2016	257	500	257.2083	9/13/2016	12.57	0
9/13/2016 6:00	2016	257	600	257.25	9/13/2016	12.54	0
9/13/2016 7:00	2016	257	700	257.2917	9/13/2016	12.68	0
9/13/2016 8:00	2016	257	800	257.3333	9/13/2016	13.37	0
9/13/2016 9:00	2016	257	900	257.375	9/13/2016	13.29	0

9/13/2016 10:00	2016	257	1000	257.4167	9/13/2016	13.24	0
9/13/2016 11:00	2016	257	1100	257.4583	9/13/2016	13.2	0
9/13/2016 12:00	2016	257	1200	257.5	9/13/2016	13.21	0
9/13/2016 13:00	2016	257	1300	257.5417	9/13/2016	13.17	0
9/13/2016 14:00	2016	257	1400	257.5833	9/13/2016	13.16	0
9/13/2016 15:00	2016	257	1500	257.625	9/13/2016	13.14	0
9/13/2016 16:00	2016	257	1600	257.6667	9/13/2016	13.14	0
9/13/2016 17:00	2016	257	1700	257.7083	9/13/2016	13.17	0
9/13/2016 18:00	2016	257	1800	257.75	9/13/2016	13.18	0
9/13/2016 19:00	2016	257	1900	257.7917	9/13/2016	12.92	0
9/13/2016 20:00	2016	257	2000	257.8333	9/13/2016	12.8	0
9/13/2016 21:00	2016	257	2100	257.875	9/13/2016	12.77	0
9/13/2016 22:00	2016	257	2200	257.9167	9/13/2016	12.74	0
9/13/2016 23:00	2016	257	2300	257.9583	9/13/2016	12.73	0
9/14/2016 0:00	2016	258	0	258	9/14/2016	12.71	0
9/14/2016 1:00	2016	258	100	258.0417	9/14/2016	12.69	0
9/14/2016 2:00	2016	258	200	258.0833	9/14/2016	12.67	0
9/14/2016 3:00	2016	258	300	258.125	9/14/2016	12.64	0
9/14/2016 4:00	2016	258	400	258.1667	9/14/2016	12.61	0
9/14/2016 5:00	2016	258	500	258.2083	9/14/2016	12.58	0
9/14/2016 6:00	2016	258	600	258.25	9/14/2016	12.55	0
9/14/2016 7:00	2016	258	700	258.2917	9/14/2016	12.7	0
9/14/2016 8:00	2016	258	800	258.3333	9/14/2016	13.46	0
9/14/2016 9:00	2016	258	900	258.375	9/14/2016	13.36	0
9/14/2016 10:00	2016	258	1000	258.4167	9/14/2016	13.28	0
9/14/2016 11:00	2016	258	1100	258.4583	9/14/2016	13.22	0
9/14/2016 12:00	2016	258	1200	258.5	9/14/2016	13.17	0
9/14/2016 13:00	2016	258	1300	258.5417	9/14/2016	13.14	0
9/14/2016 14:00	2016	258	1400	258.5833	9/14/2016	13.12	0
9/14/2016 15:00	2016	258	1500	258.625	9/14/2016	13.12	0
9/14/2016 16:00	2016	258	1600	258.6667	9/14/2016	13.13	0
9/14/2016 17:00	2016	258	1700	258.7083	9/14/2016	13.16	0
9/14/2016 18:00	2016	258	1800	258.75	9/14/2016	13.12	0
9/14/2016 19:00	2016	258	1900	258.7917	9/14/2016	12.88	0
9/14/2016 20:00	2016	258	2000	258.8333	9/14/2016	12.8	0
9/14/2016 21:00	2016	258	2100	258.875	9/14/2016	12.77	0
9/14/2016 22:00	2016	258	2200	258.9167	9/14/2016	12.74	0
9/14/2016 23:00	2016	258	2300	258.9583	9/14/2016	12.72	0
9/15/2016 0:00	2016	259	0	259	9/15/2016	12.69	0
9/15/2016 1:00	2016	259	100	259.0417	9/15/2016	12.66	0
9/15/2016 2:00	2016	259	200	259.0833	9/15/2016	12.64	0
9/15/2016 3:00	2016	259	300	259.125	9/15/2016	12.61	0
9/15/2016 4:00	2016	259	400	259.1667	9/15/2016	12.58	0
9/15/2016 5:00	2016	259	500	259.2083	9/15/2016	12.54	0
9/15/2016 6:00	2016	259	600	259.25	9/15/2016	12.5	0
9/15/2016 7:00	2016	259	700	259.2917	9/15/2016	12.68	0
9/15/2016 8:00	2016	259	800	259.3333	9/15/2016	13.52	0

9/15/2016 9:00	2016	259	900	259.375	9/15/2016	13.39	0
9/15/2016 10:00	2016	259	1000	259.4167	9/15/2016	13.31	0
9/15/2016 11:00	2016	259	1100	259.4583	9/15/2016	13.24	0
9/15/2016 12:00	2016	259	1200	259.5	9/15/2016	13.19	0
9/15/2016 13:00	2016	259	1300	259.5417	9/15/2016	13.16	0
9/15/2016 14:00	2016	259	1400	259.5833	9/15/2016	13.13	0
9/15/2016 15:00	2016	259	1500	259.625	9/15/2016	13.13	0
9/15/2016 16:00	2016	259	1600	259.6667	9/15/2016	13.13	0
9/15/2016 17:00	2016	259	1700	259.7083	9/15/2016	13.16	0
9/15/2016 18:00	2016	259	1800	259.75	9/15/2016	13.13	0
9/15/2016 19:00	2016	259	1900	259.7917	9/15/2016	12.89	0
9/15/2016 20:00	2016	259	2000	259.8333	9/15/2016	12.8	0
9/15/2016 21:00	2016	259	2100	259.875	9/15/2016	12.77	0
9/15/2016 22:00	2016	259	2200	259.9167	9/15/2016	12.74	0
9/15/2016 23:00	2016	259	2300	259.9583	9/15/2016	12.72	0
9/16/2016 0:00	2016	260	0	260	9/16/2016	12.7	0
9/16/2016 1:00	2016	260	100	260.0417	9/16/2016	12.68	0
9/16/2016 2:00	2016	260	200	260.0833	9/16/2016	12.66	0
9/16/2016 3:00	2016	260	300	260.125	9/16/2016	12.64	0
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9/16/2016 5:00	2016	260	500	260.2083	9/16/2016	12.57	0
9/16/2016 6:00	2016	260	600	260.25	9/16/2016	12.53	0
9/16/2016 7:00	2016	260	700	260.2917	9/16/2016	12.72	0
9/16/2016 8:00	2016	260	800	260.3333	9/16/2016	13.47	0
9/16/2016 9:00	2016	260	900	260.375	9/16/2016	13.36	0
9/16/2016 10:00	2016	260	1000	260.4167	9/16/2016	13.29	0
9/16/2016 11:00	2016	260	1100	260.4583	9/16/2016	13.22	0
9/16/2016 12:00	2016	260	1200	260.5	9/16/2016	13.17	0
9/16/2016 13:00	2016	260	1300	260.5417	9/16/2016	13.14	0
9/16/2016 14:00	2016	260	1400	260.5833	9/16/2016	13.11	0
9/16/2016 15:00	2016	260	1500	260.625	9/16/2016	13.11	0
9/16/2016 16:00	2016	260	1600	260.6667	9/16/2016	13.12	0
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9/16/2016 18:00	2016	260	1800	260.75	9/16/2016	13.12	0
9/16/2016 19:00	2016	260	1900	260.7917	9/16/2016	12.88	0.02
9/16/2016 20:00	2016	260	2000	260.8333	9/16/2016	12.79	0.02
9/16/2016 21:00	2016	260	2100	260.875	9/16/2016	12.76	0
9/16/2016 22:00	2016	260	2200	260.9167	9/16/2016	12.73	0
9/16/2016 23:00	2016	260	2300	260.9583	9/16/2016	12.71	0
9/17/2016 0:00	2016	261	0	261	9/17/2016	12.69	0
9/17/2016 1:00	2016	261	100	261.0417	9/17/2016	12.67	0
9/17/2016 2:00	2016	261	200	261.0833	9/17/2016	12.65	0
9/17/2016 3:00	2016	261	300	261.125	9/17/2016	12.62	0
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9/17/2016 5:00	2016	261	500	261.2083	9/17/2016	12.56	0
9/17/2016 6:00	2016	261	600	261.25	9/17/2016	12.52	0
9/17/2016 7:00	2016	261	700	261.2917	9/17/2016	12.71	0

9/17/2016 8:00	2016	261	800	261.3333	9/17/2016	13.47	0
9/17/2016 9:00	2016	261	900	261.375	9/17/2016	13.35	0
9/17/2016 10:00	2016	261	1000	261.4167	9/17/2016	13.28	0
9/17/2016 11:00	2016	261	1100	261.4583	9/17/2016	13.21	0
9/17/2016 12:00	2016	261	1200	261.5	9/17/2016	13.16	0
9/17/2016 13:00	2016	261	1300	261.5417	9/17/2016	13.13	0
9/17/2016 14:00	2016	261	1400	261.5833	9/17/2016	13.11	0
9/17/2016 15:00	2016	261	1500	261.625	9/17/2016	13.1	0
9/17/2016 16:00	2016	261	1600	261.6667	9/17/2016	13.11	0
9/17/2016 17:00	2016	261	1700	261.7083	9/17/2016	13.14	0
9/17/2016 18:00	2016	261	1800	261.75	9/17/2016	13.12	0
9/17/2016 19:00	2016	261	1900	261.7917	9/17/2016	12.88	0
9/17/2016 20:00	2016	261	2000	261.8333	9/17/2016	12.79	0
9/17/2016 21:00	2016	261	2100	261.875	9/17/2016	12.75	0
9/17/2016 22:00	2016	261	2200	261.9167	9/17/2016	12.72	0
9/17/2016 23:00	2016	261	2300	261.9583	9/17/2016	12.7	0
9/18/2016 0:00	2016	262	0	262	9/18/2016	12.68	0
9/18/2016 1:00	2016	262	100	262.0417	9/18/2016	12.66	0
9/18/2016 2:00	2016	262	200	262.0833	9/18/2016	12.63	0
9/18/2016 3:00	2016	262	300	262.125	9/18/2016	12.61	0
9/18/2016 4:00	2016	262	400	262.1667	9/18/2016	12.58	0
9/18/2016 5:00	2016	262	500	262.2083	9/18/2016	12.54	0
9/18/2016 6:00	2016	262	600	262.25	9/18/2016	12.51	0
9/18/2016 7:00	2016	262	700	262.2917	9/18/2016	12.72	0
9/18/2016 8:00	2016	262	800	262.3333	9/18/2016	13.49	0
9/18/2016 9:00	2016	262	900	262.375	9/18/2016	13.36	0
9/18/2016 10:00	2016	262	1000	262.4167	9/18/2016	13.28	0
9/18/2016 11:00	2016	262	1100	262.4583	9/18/2016	13.21	0
9/18/2016 12:00	2016	262	1200	262.5	9/18/2016	13.15	0
9/18/2016 13:00	2016	262	1300	262.5417	9/18/2016	13.11	0
9/18/2016 14:00	2016	262	1400	262.5833	9/18/2016	13.09	0
9/18/2016 15:00	2016	262	1500	262.625	9/18/2016	13.09	0
9/18/2016 16:00	2016	262	1600	262.6667	9/18/2016	13.09	0
9/18/2016 17:00	2016	262	1700	262.7083	9/18/2016	13.12	0
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9/18/2016 19:00	2016	262	1900	262.7917	9/18/2016	12.88	0
9/18/2016 20:00	2016	262	2000	262.8333	9/18/2016	12.8	0
9/18/2016 21:00	2016	262	2100	262.875	9/18/2016	12.76	0
9/18/2016 22:00	2016	262	2200	262.9167	9/18/2016	12.73	0
9/18/2016 23:00	2016	262	2300	262.9583	9/18/2016	12.7	0
9/19/2016 0:00	2016	263	0	263	9/19/2016	12.68	0
9/19/2016 1:00	2016	263	100	263.0417	9/19/2016	12.66	0
9/19/2016 2:00	2016	263	200	263.0833	9/19/2016	12.64	0
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9/19/2016 5:00	2016	263	500	263.2083	9/19/2016	12.55	0
9/19/2016 6:00	2016	263	600	263.25	9/19/2016	12.52	0

9/19/2016 7:00	2016	263	700	263.2917	9/19/2016	12.74	0
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9/19/2016 9:00	2016	263	900	263.375	9/19/2016	13.33	0
9/19/2016 10:00	2016	263	1000	263.4167	9/19/2016	13.26	0
9/19/2016 11:00	2016	263	1100	263.4583	9/19/2016	13.19	0
9/19/2016 12:00	2016	263	1200	263.5	9/19/2016	13.15	0
9/19/2016 13:00	2016	263	1300	263.5417	9/19/2016	13.12	0
9/19/2016 14:00	2016	263	1400	263.5833	9/19/2016	13.1	0
9/19/2016 15:00	2016	263	1500	263.625	9/19/2016	13.1	0
9/19/2016 16:00	2016	263	1600	263.6667	9/19/2016	13.11	0
9/19/2016 17:00	2016	263	1700	263.7083	9/19/2016	13.14	0
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9/19/2016 19:00	2016	263	1900	263.7917	9/19/2016	12.85	0
9/19/2016 20:00	2016	263	2000	263.8333	9/19/2016	12.8	0
9/19/2016 21:00	2016	263	2100	263.875	9/19/2016	12.77	0
9/19/2016 22:00	2016	263	2200	263.9167	9/19/2016	12.76	0
9/19/2016 23:00	2016	263	2300	263.9583	9/19/2016	12.75	0
9/20/2016 0:00	2016	264	0	264	9/20/2016	12.73	0
9/20/2016 1:00	2016	264	100	264.0417	9/20/2016	12.71	0
9/20/2016 2:00	2016	264	200	264.0833	9/20/2016	12.69	0
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9/20/2016 4:00	2016	264	400	264.1667	9/20/2016	12.64	0
9/20/2016 5:00	2016	264	500	264.2083	9/20/2016	12.62	0
9/20/2016 6:00	2016	264	600	264.25	9/20/2016	12.59	0
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9/20/2016 9:00	2016	264	900	264.375	9/20/2016	12.69	0.02
9/20/2016 10:00	2016	264	1000	264.4167	9/20/2016	12.76	0
9/20/2016 11:00	2016	264	1100	264.4583	9/20/2016	13.14	0
9/20/2016 12:00	2016	264	1200	264.5	9/20/2016	13.24	0
9/20/2016 13:00	2016	264	1300	264.5417	9/20/2016	13.23	0
9/20/2016 14:00	2016	264	1400	264.5833	9/20/2016	13.21	0
9/20/2016 15:00	2016	264	1500	264.625	9/20/2016	13.16	0.01
9/20/2016 16:00	2016	264	1600	264.6667	9/20/2016	13.01	0.05
9/20/2016 17:00	2016	264	1700	264.7083	9/20/2016	13.14	0
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9/20/2016 20:00	2016	264	2000	264.8333	9/20/2016	12.75	0
9/20/2016 21:00	2016	264	2100	264.875	9/20/2016	12.71	0.01
9/20/2016 22:00	2016	264	2200	264.9167	9/20/2016	12.66	0.02
9/20/2016 23:00	2016	264	2300	264.9583	9/20/2016	12.59	0.01
9/21/2016 0:00	2016	265	0	265	9/21/2016	12.53	0
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9/21/2016 3:00	2016	265	300	265.125	9/21/2016	12.51	0
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9/21/2016 6:00	2016	265	600	265.25	9/21/2016	12.5	0
9/21/2016 7:00	2016	265	700	265.2917	9/21/2016	12.52	0
9/21/2016 8:00	2016	265	800	265.3333	9/21/2016	12.69	0
9/21/2016 9:00	2016	265	900	265.375	9/21/2016	13.26	0
9/21/2016 10:00	2016	265	1000	265.4167	9/21/2016	13.32	0
9/21/2016 11:00	2016	265	1100	265.4583	9/21/2016	13.28	0
9/21/2016 12:00	2016	265	1200	265.5	9/21/2016	13.24	0
9/21/2016 13:00	2016	265	1300	265.5417	9/21/2016	13.21	0
9/21/2016 14:00	2016	265	1400	265.5833	9/21/2016	13.21	0
9/21/2016 15:00	2016	265	1500	265.625	9/21/2016	13.19	0
9/21/2016 16:00	2016	265	1600	265.6667	9/21/2016	13.21	0
9/21/2016 17:00	2016	265	1700	265.7083	9/21/2016	13.22	0
9/21/2016 18:00	2016	265	1800	265.75	9/21/2016	13.19	0
9/21/2016 19:00	2016	265	1900	265.7917	9/21/2016	12.89	0
9/21/2016 20:00	2016	265	2000	265.8333	9/21/2016	12.8	0
9/21/2016 21:00	2016	265	2100	265.875	9/21/2016	12.77	0
9/21/2016 22:00	2016	265	2200	265.9167	9/21/2016	12.75	0
9/21/2016 23:00	2016	265	2300	265.9583	9/21/2016	12.73	0
9/22/2016 0:00	2016	266	0	266	9/22/2016	12.71	0
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9/22/2016 5:00	2016	266	500	266.2083	9/22/2016	12.62	0
9/22/2016 6:00	2016	266	600	266.25	9/22/2016	12.6	0
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9/22/2016 11:00	2016	266	1100	266.4583	9/22/2016	13.22	0
9/22/2016 12:00	2016	266	1200	266.5	9/22/2016	13.19	0
9/22/2016 13:00	2016	266	1300	266.5417	9/22/2016	13.2	0
9/22/2016 14:00	2016	266	1400	266.5833	9/22/2016	13.15	0
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9/22/2016 16:00	2016	266	1600	266.6667	9/22/2016	13.26	0.01
9/22/2016 17:00	2016	266	1700	266.7083	9/22/2016	13.28	0.01
9/22/2016 18:00	2016	266	1800	266.75	9/22/2016	13.19	0
9/22/2016 19:00	2016	266	1900	266.7917	9/22/2016	12.86	0
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9/22/2016 22:00	2016	266	2200	266.9167	9/22/2016	12.73	0
9/22/2016 23:00	2016	266	2300	266.9583	9/22/2016	12.71	0
9/23/2016 0:00	2016	267	0	267	9/23/2016	12.7	0
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9/23/2016 2:00	2016	267	200	267.0833	9/23/2016	12.66	0
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9/23/2016 4:00	2016	267	400	267.1667	9/23/2016	12.63	0

9/23/2016 5:00	2016	267	500	267.2083	9/23/2016	12.61	0
9/23/2016 6:00	2016	267	600	267.25	9/23/2016	12.58	0
9/23/2016 7:00	2016	267	700	267.2917	9/23/2016	12.68	0
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9/23/2016 10:00	2016	267	1000	267.4167	9/23/2016	13.39	0
9/23/2016 11:00	2016	267	1100	267.4583	9/23/2016	13.34	0
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9/23/2016 14:00	2016	267	1400	267.5833	9/23/2016	13.25	0
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9/23/2016 17:00	2016	267	1700	267.7083	9/23/2016	13.3	0
9/23/2016 18:00	2016	267	1800	267.75	9/23/2016	13.22	0
9/23/2016 19:00	2016	267	1900	267.7917	9/23/2016	12.87	0
9/23/2016 20:00	2016	267	2000	267.8333	9/23/2016	12.79	0
9/23/2016 21:00	2016	267	2100	267.875	9/23/2016	12.76	0
9/23/2016 22:00	2016	267	2200	267.9167	9/23/2016	12.73	0
9/23/2016 23:00	2016	267	2300	267.9583	9/23/2016	12.72	0
9/24/2016 0:00	2016	268	0	268	9/24/2016	12.7	0
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9/24/2016 6:00	2016	268	600	268.25	9/24/2016	12.56	0
9/24/2016 7:00	2016	268	700	268.2917	9/24/2016	12.76	0
9/24/2016 8:00	2016	268	800	268.3333	9/24/2016	13.58	0
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9/24/2016 10:00	2016	268	1000	268.4167	9/24/2016	13.38	0
9/24/2016 11:00	2016	268	1100	268.4583	9/24/2016	13.31	0
9/24/2016 12:00	2016	268	1200	268.5	9/24/2016	13.25	0
9/24/2016 13:00	2016	268	1300	268.5417	9/24/2016	13.22	0
9/24/2016 14:00	2016	268	1400	268.5833	9/24/2016	13.2	0
9/24/2016 15:00	2016	268	1500	268.625	9/24/2016	13.2	0
9/24/2016 16:00	2016	268	1600	268.6667	9/24/2016	13.22	0
9/24/2016 17:00	2016	268	1700	268.7083	9/24/2016	13.26	0
9/24/2016 18:00	2016	268	1800	268.75	9/24/2016	13.19	0
9/24/2016 19:00	2016	268	1900	268.7917	9/24/2016	12.87	0
9/24/2016 20:00	2016	268	2000	268.8333	9/24/2016	12.8	0
9/24/2016 21:00	2016	268	2100	268.875	9/24/2016	12.76	0
9/24/2016 22:00	2016	268	2200	268.9167	9/24/2016	12.73	0
9/24/2016 23:00	2016	268	2300	268.9583	9/24/2016	12.7	0
9/25/2016 0:00	2016	269	0	269	9/25/2016	12.68	0
9/25/2016 1:00	2016	269	100	269.0417	9/25/2016	12.67	0
9/25/2016 2:00	2016	269	200	269.0833	9/25/2016	12.65	0
9/25/2016 3:00	2016	269	300	269.125	9/25/2016	12.63	0

9/25/2016 4:00	2016	269	400	269.1667	9/25/2016	12.6	0
9/25/2016 5:00	2016	269	500	269.2083	9/25/2016	12.57	0
9/25/2016 6:00	2016	269	600	269.25	9/25/2016	12.54	0
9/25/2016 7:00	2016	269	700	269.2917	9/25/2016	12.76	0
9/25/2016 8:00	2016	269	800	269.3333	9/25/2016	13.6	0
9/25/2016 9:00	2016	269	900	269.375	9/25/2016	13.48	0
9/25/2016 10:00	2016	269	1000	269.4167	9/25/2016	13.4	0
9/25/2016 11:00	2016	269	1100	269.4583	9/25/2016	13.34	0
9/25/2016 12:00	2016	269	1200	269.5	9/25/2016	13.29	0
9/25/2016 13:00	2016	269	1300	269.5417	9/25/2016	13.25	0
9/25/2016 14:00	2016	269	1400	269.5833	9/25/2016	13.22	0
9/25/2016 15:00	2016	269	1500	269.625	9/25/2016	13.21	0
9/25/2016 16:00	2016	269	1600	269.6667	9/25/2016	13.22	0
9/25/2016 17:00	2016	269	1700	269.7083	9/25/2016	13.25	0
9/25/2016 18:00	2016	269	1800	269.75	9/25/2016	13.18	0
9/25/2016 19:00	2016	269	1900	269.7917	9/25/2016	12.88	0
9/25/2016 20:00	2016	269	2000	269.8333	9/25/2016	12.81	0
9/25/2016 21:00	2016	269	2100	269.875	9/25/2016	12.78	0
9/25/2016 22:00	2016	269	2200	269.9167	9/25/2016	12.76	0
9/25/2016 23:00	2016	269	2300	269.9583	9/25/2016	12.73	0
9/26/2016 0:00	2016	270	0	270	9/26/2016	12.71	0
9/26/2016 1:00	2016	270	100	270.0417	9/26/2016	12.69	0
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9/26/2016 4:00	2016	270	400	270.1667	9/26/2016	12.61	0
9/26/2016 5:00	2016	270	500	270.2083	9/26/2016	12.58	0
9/26/2016 6:00	2016	270	600	270.25	9/26/2016	12.55	0
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9/26/2016 9:00	2016	270	900	270.375	9/26/2016	13.45	0
9/26/2016 10:00	2016	270	1000	270.4167	9/26/2016	13.36	0
9/26/2016 11:00	2016	270	1100	270.4583	9/26/2016	13.29	0
9/26/2016 12:00	2016	270	1200	270.5	9/26/2016	13.24	0
9/26/2016 13:00	2016	270	1300	270.5417	9/26/2016	13.2	0
9/26/2016 14:00	2016	270	1400	270.5833	9/26/2016	13.18	0
9/26/2016 15:00	2016	270	1500	270.625	9/26/2016	13.18	0
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9/26/2016 17:00	2016	270	1700	270.7083	9/26/2016	13.22	0
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9/26/2016 19:00	2016	270	1900	270.7917	9/26/2016	12.88	0
9/26/2016 20:00	2016	270	2000	270.8333	9/26/2016	12.81	0
9/26/2016 21:00	2016	270	2100	270.875	9/26/2016	12.77	0
9/26/2016 22:00	2016	270	2200	270.9167	9/26/2016	12.75	0
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9/27/2016 0:00	2016	271	0	271	9/27/2016	12.71	0
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9/27/2016 5:00	2016	271	500	271.2083	9/27/2016	12.57	0
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9/27/2016 9:00	2016	271	900	271.375	9/27/2016	13.47	0
9/27/2016 10:00	2016	271	1000	271.4167	9/27/2016	13.41	0
9/27/2016 11:00	2016	271	1100	271.4583	9/27/2016	13.39	0
9/27/2016 12:00	2016	271	1200	271.5	9/27/2016	13.33	0
9/27/2016 13:00	2016	271	1300	271.5417	9/27/2016	13.3	0
9/27/2016 14:00	2016	271	1400	271.5833	9/27/2016	13.28	0
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9/27/2016 17:00	2016	271	1700	271.7083	9/27/2016	13.26	0
9/27/2016 18:00	2016	271	1800	271.75	9/27/2016	13.2	0
9/27/2016 19:00	2016	271	1900	271.7917	9/27/2016	12.88	0
9/27/2016 20:00	2016	271	2000	271.8333	9/27/2016	12.81	0
9/27/2016 21:00	2016	271	2100	271.875	9/27/2016	12.79	0
9/27/2016 22:00	2016	271	2200	271.9167	9/27/2016	12.77	0
9/27/2016 23:00	2016	271	2300	271.9583	9/27/2016	12.75	0
9/28/2016 0:00	2016	272	0	272	9/28/2016	12.73	0
9/28/2016 1:00	2016	272	100	272.0417	9/28/2016	12.72	0
9/28/2016 2:00	2016	272	200	272.0833	9/28/2016	12.7	0
9/28/2016 3:00	2016	272	300	272.125	9/28/2016	12.68	0
9/28/2016 4:00	2016	272	400	272.1667	9/28/2016	12.64	0
9/28/2016 5:00	2016	272	500	272.2083	9/28/2016	12.61	0
9/28/2016 6:00	2016	272	600	272.25	9/28/2016	12.57	0
9/28/2016 7:00	2016	272	700	272.2917	9/28/2016	12.71	0
9/28/2016 8:00	2016	272	800	272.3333	9/28/2016	13.45	0
9/28/2016 9:00	2016	272	900	272.375	9/28/2016	13.46	0
9/28/2016 10:00	2016	272	1000	272.4167	9/28/2016	13.39	0
9/28/2016 11:00	2016	272	1100	272.4583	9/28/2016	13.33	0
9/28/2016 12:00	2016	272	1200	272.5	9/28/2016	13.32	0
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9/28/2016 14:00	2016	272	1400	272.5833	9/28/2016	13.3	0.01
9/28/2016 15:00	2016	272	1500	272.625	9/28/2016	13.34	0.01
9/28/2016 16:00	2016	272	1600	272.6667	9/28/2016	13.34	0.02
9/28/2016 17:00	2016	272	1700	272.7083	9/28/2016	13.36	0
9/28/2016 18:00	2016	272	1800	272.75	9/28/2016	13.23	0
9/28/2016 19:00	2016	272	1900	272.7917	9/28/2016	12.87	0
9/28/2016 20:00	2016	272	2000	272.8333	9/28/2016	12.81	0
9/28/2016 21:00	2016	272	2100	272.875	9/28/2016	12.78	0
9/28/2016 22:00	2016	272	2200	272.9167	9/28/2016	12.77	0
9/28/2016 23:00	2016	272	2300	272.9583	9/28/2016	12.76	0
9/29/2016 0:00	2016	273	0	273	9/29/2016	12.74	0
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9/29/2016 2:00	2016	273	200	273.0833	9/29/2016	12.71	0
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9/29/2016 4:00	2016	273	400	273.1667	9/29/2016	12.68	0.01
9/29/2016 5:00	2016	273	500	273.2083	9/29/2016	12.65	0
9/29/2016 6:00	2016	273	600	273.25	9/29/2016	12.62	0
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9/29/2016 10:00	2016	273	1000	273.4167	9/29/2016	13.37	0
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9/29/2016 13:00	2016	273	1300	273.5417	9/29/2016	13.36	0
9/29/2016 14:00	2016	273	1400	273.5833	9/29/2016	13.35	0
9/29/2016 15:00	2016	273	1500	273.625	9/29/2016	13.34	0
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9/29/2016 17:00	2016	273	1700	273.7083	9/29/2016	13.23	0
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9/29/2016 19:00	2016	273	1900	273.7917	9/29/2016	12.86	0
9/29/2016 20:00	2016	273	2000	273.8333	9/29/2016	12.81	0
9/29/2016 21:00	2016	273	2100	273.875	9/29/2016	12.79	0
9/29/2016 22:00	2016	273	2200	273.9167	9/29/2016	12.77	0
9/29/2016 23:00	2016	273	2300	273.9583	9/29/2016	12.76	0
9/30/2016 0:00	2016	274	0	274	9/30/2016	12.74	0
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9/30/2016 2:00	2016	274	200	274.0833	9/30/2016	12.68	0
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9/30/2016 4:00	2016	274	400	274.1667	9/30/2016	12.63	0
9/30/2016 5:00	2016	274	500	274.2083	9/30/2016	12.6	0
9/30/2016 6:00	2016	274	600	274.25	9/30/2016	12.57	0
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9/30/2016 10:00	2016	274	1000	274.4167	9/30/2016	13.39	0
9/30/2016 11:00	2016	274	1100	274.4583	9/30/2016	13.31	0
9/30/2016 12:00	2016	274	1200	274.5	9/30/2016	13.25	0
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9/30/2016 16:00	2016	274	1600	274.6667	9/30/2016	13.3	0
9/30/2016 17:00	2016	274	1700	274.7083	9/30/2016	13.32	0
9/30/2016 18:00	2016	274	1800	274.75	9/30/2016	13.08	0
9/30/2016 19:00	2016	274	1900	274.7917	9/30/2016	12.83	0
9/30/2016 20:00	2016	274	2000	274.8333	9/30/2016	12.78	0
9/30/2016 21:00	2016	274	2100	274.875	9/30/2016	12.76	0
9/30/2016 22:00	2016	274	2200	274.9167	9/30/2016	12.73	0
9/30/2016 23:00	2016	274	2300	274.9583	9/30/2016	12.71	0
10/1/2016 0:00	2016	275	0	275	10/1/2016	12.69	0

10/1/2016 1:00	2016	275	100	275.0417	10/1/2016	12.67	0
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10/1/2016 12:00	2016	275	1200	275.5	10/1/2016	13.29	0.01
10/1/2016 13:00	2016	275	1300	275.5417	10/1/2016	13.28	0
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10/1/2016 19:00	2016	275	1900	275.7917	10/1/2016	12.85	0
10/1/2016 20:00	2016	275	2000	275.8333	10/1/2016	12.81	0
10/1/2016 21:00	2016	275	2100	275.875	10/1/2016	12.78	0
10/1/2016 22:00	2016	275	2200	275.9167	10/1/2016	12.76	0
10/1/2016 23:00	2016	275	2300	275.9583	10/1/2016	12.74	0
10/2/2016 0:00	2016	276	0	276	10/2/2016	12.73	0
10/2/2016 1:00	2016	276	100	276.0417	10/2/2016	12.72	0
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10/2/2016 3:00	2016	276	300	276.125	10/2/2016	12.67	0
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10/2/2016 5:00	2016	276	500	276.2083	10/2/2016	12.63	0
10/2/2016 6:00	2016	276	600	276.25	10/2/2016	12.6	0
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10/2/2016 20:00	2016	276	2000	276.8333	10/2/2016	12.8	0
10/2/2016 21:00	2016	276	2100	276.875	10/2/2016	12.77	0
10/2/2016 22:00	2016	276	2200	276.9167	10/2/2016	12.75	0
10/2/2016 23:00	2016	276	2300	276.9583	10/2/2016	12.73	0

10/3/2016 0:00	2016	277	0	277	10/3/2016	12.71	0
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10/3/2016 6:00	2016	277	600	277.25	10/3/2016	12.58	0
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10/3/2016 11:00	2016	277	1100	277.4583	10/3/2016	13.35	0
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10/3/2016 16:00	2016	277	1600	277.6667	10/3/2016	13.27	0
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10/3/2016 19:00	2016	277	1900	277.7917	10/3/2016	12.84	0
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10/4/2016 0:00	2016	278	0	278	10/4/2016	12.69	0
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10/4/2016 5:00	2016	278	500	278.2083	10/4/2016	12.57	0
10/4/2016 6:00	2016	278	600	278.25	10/4/2016	12.52	0
10/4/2016 7:00	2016	278	700	278.2917	10/4/2016	12.74	0
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10/4/2016 9:00	2016	278	900	278.375	10/4/2016	13.52	0
10/4/2016 10:00	2016	278	1000	278.4167	10/4/2016	13.43	0
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10/4/2016 14:00	2016	278	1400	278.5833	10/4/2016	13.21	0
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10/4/2016 17:00	2016	278	1700	278.7083	10/4/2016	13.26	0
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10/4/2016 23:00	2016	278	2300	278.9583	10/4/2016	12.73	0
10/5/2016 0:00	2016	279	0	279	10/5/2016	12.71	0
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10/5/2016 19:00	2016	279	1900	279.7917	10/5/2016	12.87	0
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10/5/2016 22:00	2016	279	2200	279.9167	10/5/2016	12.76	0
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10/7/2016 21:00	2016	281	2100	281.875	10/7/2016	12.77	0
10/7/2016 22:00	2016	281	2200	281.9167	10/7/2016	12.74	0
10/7/2016 23:00	2016	281	2300	281.9583	10/7/2016	12.71	0
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10/9/2016 13:00	2016	283	1300	283.5417	10/9/2016	13.21	0
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10/15/2016 10:00	2016	289	1000	289.4167	10/15/2016	13.31	0
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10/15/2016 23:00	2016	289	2300	289.9583	10/15/2016	12.72	0
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10/16/2016 13:00	2016	290	1300	290.5417	10/16/2016	13.18	0
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10/17/2016 13:00	2016	291	1300	291.5417	10/17/2016	13.17	0
10/17/2016 14:00	2016	291	1400	291.5833	10/17/2016	13.16	0
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10/22/2016 16:00	2016	296	1600	296.6667	10/22/2016	13.18	0
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10/22/2016 19:00	2016	296	1900	296.7917	10/22/2016	12.86	0
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10/22/2016 21:00	2016	296	2100	296.875	10/22/2016	12.78	0
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10/23/2016 21:00	2016	297	2100	297.875	10/23/2016	12.76	0
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10/23/2016 23:00	2016	297	2300	297.9583	10/23/2016	12.72	0
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10/24/2016 21:00	2016	298	2100	298.875	10/24/2016	12.78	0
10/24/2016 22:00	2016	298	2200	298.9167	10/24/2016	12.76	0
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10/25/2016 15:00	2016	299	1500	299.625	10/25/2016	13.28	0
10/25/2016 16:00	2016	299	1600	299.6667	10/25/2016	13.29	0
10/25/2016 17:00	2016	299	1700	299.7083	10/25/2016	13.25	0
10/25/2016 18:00	2016	299	1800	299.75	10/25/2016	13.03	0
10/25/2016 19:00	2016	299	1900	299.7917	10/25/2016	12.83	0
10/25/2016 20:00	2016	299	2000	299.8333	10/25/2016	12.79	0
10/25/2016 21:00	2016	299	2100	299.875	10/25/2016	12.76	0
10/25/2016 22:00	2016	299	2200	299.9167	10/25/2016	12.74	0
10/25/2016 23:00	2016	299	2300	299.9583	10/25/2016	12.72	0
10/26/2016 0:00	2016	300	0	300	10/26/2016	12.7	0
10/26/2016 1:00	2016	300	100	300.0417	10/26/2016	12.68	0
10/26/2016 2:00	2016	300	200	300.0833	10/26/2016	12.66	0
10/26/2016 3:00	2016	300	300	300.125	10/26/2016	12.64	0
10/26/2016 4:00	2016	300	400	300.1667	10/26/2016	12.61	0
10/26/2016 5:00	2016	300	500	300.2083	10/26/2016	12.57	0
10/26/2016 6:00	2016	300	600	300.25	10/26/2016	12.54	0
10/26/2016 7:00	2016	300	700	300.2917	10/26/2016	12.54	0
10/26/2016 8:00	2016	300	800	300.3333	10/26/2016	13.52	0
10/26/2016 9:00	2016	300	900	300.375	10/26/2016	13.51	0
10/26/2016 10:00	2016	300	1000	300.4167	10/26/2016	13.44	0
10/26/2016 11:00	2016	300	1100	300.4583	10/26/2016	13.37	0

10/26/2016 12:00	2016	300	1200	300.5	10/26/2016	13.3	0
10/26/2016 13:00	2016	300	1300	300.5417	10/26/2016	13.26	0
10/26/2016 14:00	2016	300	1400	300.5833	10/26/2016	13.24	0
10/26/2016 15:00	2016	300	1500	300.625	10/26/2016	13.23	0
10/26/2016 16:00	2016	300	1600	300.6667	10/26/2016	13.25	0
10/26/2016 17:00	2016	300	1700	300.7083	10/26/2016	13.29	0
10/26/2016 18:00	2016	300	1800	300.75	10/26/2016	13.03	0
10/26/2016 19:00	2016	300	1900	300.7917	10/26/2016	12.84	0
10/26/2016 20:00	2016	300	2000	300.8333	10/26/2016	12.8	0
10/26/2016 21:00	2016	300	2100	300.875	10/26/2016	12.76	0
10/26/2016 22:00	2016	300	2200	300.9167	10/26/2016	12.74	0
10/26/2016 23:00	2016	300	2300	300.9583	10/26/2016	12.72	0
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10/27/2016 14:00	2016	301	1400	301.5833	10/27/2016	13.24	0
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10/27/2016 19:00	2016	301	1900	301.7917	10/27/2016	12.84	0
10/27/2016 20:00	2016	301	2000	301.8333	10/27/2016	12.8	0
10/27/2016 21:00	2016	301	2100	301.875	10/27/2016	12.78	0
10/27/2016 22:00	2016	301	2200	301.9167	10/27/2016	12.76	0
10/27/2016 23:00	2016	301	2300	301.9583	10/27/2016	12.74	0
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10/28/2016 13:00	2016	302	1300	302.5417	10/28/2016	13.27	0
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10/28/2016 15:00	2016	302	1500	302.625	10/28/2016	13.29	0
10/28/2016 16:00	2016	302	1600	302.6667	10/28/2016	13.3	0
10/28/2016 17:00	2016	302	1700	302.7083	10/28/2016	13.29	0
10/28/2016 18:00	2016	302	1800	302.75	10/28/2016	13	0
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10/28/2016 20:00	2016	302	2000	302.8333	10/28/2016	12.81	0
10/28/2016 21:00	2016	302	2100	302.875	10/28/2016	12.78	0
10/28/2016 22:00	2016	302	2200	302.9167	10/28/2016	12.76	0
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10/29/2016 1:00	2016	303	100	303.0417	10/29/2016	12.7	0
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10/29/2016 10:00	2016	303	1000	303.4167	10/29/2016	13.36	0
10/29/2016 11:00	2016	303	1100	303.4583	10/29/2016	13.31	0
10/29/2016 12:00	2016	303	1200	303.5	10/29/2016	13.31	0
10/29/2016 13:00	2016	303	1300	303.5417	10/29/2016	13.29	0
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10/29/2016 15:00	2016	303	1500	303.625	10/29/2016	13.28	0
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10/29/2016 20:00	2016	303	2000	303.8333	10/29/2016	12.8	0
10/29/2016 21:00	2016	303	2100	303.875	10/29/2016	12.77	0
10/29/2016 22:00	2016	303	2200	303.9167	10/29/2016	12.75	0
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10/30/2016 0:00	2016	304	0	304	10/30/2016	12.71	0
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10/30/2016 12:00	2016	304	1200	304.5	10/30/2016	13.39	0
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10/31/2016 21:00	2016	305	2100	305.875	10/31/2016	12.77	0
10/31/2016 22:00	2016	305	2200	305.9167	10/31/2016	12.75	0
10/31/2016 23:00	2016	305	2300	305.9583	10/31/2016	12.73	0
11/1/2016 0:00	2016	306	0	306	11/1/2016	12.7	0
11/1/2016 1:00	2016	306	100	306.0417	11/1/2016	12.68	0
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11/1/2016 11:00	2016	306	1100	306.4583	11/1/2016	13.36	0
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11/1/2016 15:00	2016	306	1500	306.625	11/1/2016	13.32	0
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11/1/2016 19:00	2016	306	1900	306.7917	11/1/2016	12.83	0
11/1/2016 20:00	2016	306	2000	306.8333	11/1/2016	12.78	0
11/1/2016 21:00	2016	306	2100	306.875	11/1/2016	12.75	0
11/1/2016 22:00	2016	306	2200	306.9167	11/1/2016	12.73	0
11/1/2016 23:00	2016	306	2300	306.9583	11/1/2016	12.71	0
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11/2/2016 1:00	2016	307	100	307.0417	11/2/2016	12.69	0
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11/2/2016 15:00	2016	307	1500	307.625	11/2/2016	13.29	0
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11/2/2016 19:00	2016	307	1900	307.7917	11/2/2016	12.84	0
11/2/2016 20:00	2016	307	2000	307.8333	11/2/2016	12.79	0
11/2/2016 21:00	2016	307	2100	307.875	11/2/2016	12.76	0
11/2/2016 22:00	2016	307	2200	307.9167	11/2/2016	12.74	0
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11/3/2016 15:00	2016	308	1500	308.625	11/3/2016	13.34	0
11/3/2016 16:00	2016	308	1600	308.6667	11/3/2016	13.12	0.01
11/3/2016 17:00	2016	308	1700	308.7083	11/3/2016	12.89	0.13
11/3/2016 18:00	2016	308	1800	308.75	11/3/2016	12.82	0.04
11/3/2016 19:00	2016	308	1900	308.7917	11/3/2016	12.79	0.14
11/3/2016 20:00	2016	308	2000	308.8333	11/3/2016	12.76	0.11
11/3/2016 21:00	2016	308	2100	308.875	11/3/2016	12.74	0.12
11/3/2016 22:00	2016	308	2200	308.9167	11/3/2016	12.72	0.02
11/3/2016 23:00	2016	308	2300	308.9583	11/3/2016	12.7	0
11/4/2016 0:00	2016	309	0	309	11/4/2016	12.69	0
11/4/2016 1:00	2016	309	100	309.0417	11/4/2016	12.66	0
11/4/2016 2:00	2016	309	200	309.0833	11/4/2016	12.63	0
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11/4/2016 10:00	2016	309	1000	309.4167	11/4/2016	13.44	0
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11/4/2016 16:00	2016	309	1600	309.6667	11/4/2016	13.38	0
11/4/2016 17:00	2016	309	1700	309.7083	11/4/2016	13.39	0
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11/4/2016 20:00	2016	309	2000	309.8333	11/4/2016	12.8	0
11/4/2016 21:00	2016	309	2100	309.875	11/4/2016	12.78	0
11/4/2016 22:00	2016	309	2200	309.9167	11/4/2016	12.76	0.02
11/4/2016 23:00	2016	309	2300	309.9583	11/4/2016	12.74	0
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11/15/2016 7:00	2016	320	700	320.2917	11/15/2016	12.46	0
11/15/2016 8:00	2016	320	800	320.3333	11/15/2016	13.43	0
11/15/2016 9:00	2016	320	900	320.375	11/15/2016	13.67	0
11/15/2016 10:00	2016	320	1000	320.4167	11/15/2016	13.54	0
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11/15/2016 13:00	2016	320	1300	320.5417	11/15/2016	13.33	0
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11/15/2016 19:00	2016	320	1900	320.7917	11/15/2016	12.83	0
11/15/2016 20:00	2016	320	2000	320.8333	11/15/2016	12.79	0
11/15/2016 21:00	2016	320	2100	320.875	11/15/2016	12.76	0
11/15/2016 22:00	2016	320	2200	320.9167	11/15/2016	12.74	0
11/15/2016 23:00	2016	320	2300	320.9583	11/15/2016	12.72	0
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11/16/2016 5:00	2016	321	500	321.2083	11/16/2016	12.62	0
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11/16/2016 20:00	2016	321	2000	321.8333	11/16/2016	12.79	0
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11/18/2016 0:00	2016	323	0	323	11/18/2016	12.62	0
11/18/2016 1:00	2016	323	100	323.0417	11/18/2016	12.6	0
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11/18/2016 13:00	2016	323	1300	323.5417	11/18/2016	13.53	0
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11/19/2016 19:00	2016	324	1900	324.7917	11/19/2016	12.82	0
11/19/2016 20:00	2016	324	2000	324.8333	11/19/2016	12.78	0
11/19/2016 21:00	2016	324	2100	324.875	11/19/2016	12.75	0
11/19/2016 22:00	2016	324	2200	324.9167	11/19/2016	12.73	0
11/19/2016 23:00	2016	324	2300	324.9583	11/19/2016	12.71	0
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11/20/2016 1:00	2016	325	100	325.0417	11/20/2016	12.67	0
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11/20/2016 11:00	2016	325	1100	325.4583	11/20/2016	13.57	0
11/20/2016 12:00	2016	325	1200	325.5	11/20/2016	13.54	0
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11/21/2016 7:00	2016	326	700	326.2917	11/21/2016	12.47	0.04
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11/21/2016 12:00	2016	326	1200	326.5	11/21/2016	13.57	0.03
11/21/2016 13:00	2016	326	1300	326.5417	11/21/2016	13.54	0
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11/21/2016 22:00	2016	326	2200	326.9167	11/21/2016	12.72	0
11/21/2016 23:00	2016	326	2300	326.9583	11/21/2016	12.7	0.03
11/22/2016 0:00	2016	327	0	327	11/22/2016	12.69	0
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11/22/2016 13:00	2016	327	1300	327.5417	11/22/2016	13.45	0
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11/24/2016 10:00	2016	329	1000	329.4167	11/24/2016	13.77	0
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11/24/2016 12:00	2016	329	1200	329.5	11/24/2016	13.6	0
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11/24/2016 14:00	2016	329	1400	329.5833	11/24/2016	13.52	0
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11/25/2016 13:00	2016	330	1300	330.5417	11/25/2016	13.58	0
11/25/2016 14:00	2016	330	1400	330.5833	11/25/2016	13.54	0
11/25/2016 15:00	2016	330	1500	330.625	11/25/2016	13.54	0
11/25/2016 16:00	2016	330	1600	330.6667	11/25/2016	13.57	0
11/25/2016 17:00	2016	330	1700	330.7083	11/25/2016	13.54	0
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11/25/2016 19:00	2016	330	1900	330.7917	11/25/2016	12.8	0
11/25/2016 20:00	2016	330	2000	330.8333	11/25/2016	12.75	0
11/25/2016 21:00	2016	330	2100	330.875	11/25/2016	12.71	0
11/25/2016 22:00	2016	330	2200	330.9167	11/25/2016	12.68	0
11/25/2016 23:00	2016	330	2300	330.9583	11/25/2016	12.65	0
11/26/2016 0:00	2016	331	0	331	11/26/2016	12.63	0
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11/26/2016 2:00	2016	331	200	331.0833	11/26/2016	12.58	0
11/26/2016 3:00	2016	331	300	331.125	11/26/2016	12.55	0
11/26/2016 4:00	2016	331	400	331.1667	11/26/2016	12.52	0
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11/26/2016 6:00	2016	331	600	331.25	11/26/2016	12.39	0
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11/26/2016 8:00	2016	331	800	331.3333	11/26/2016	12.43	0
11/26/2016 9:00	2016	331	900	331.375	11/26/2016	13.8	0
11/26/2016 10:00	2016	331	1000	331.4167	11/26/2016	13.81	0
11/26/2016 11:00	2016	331	1100	331.4583	11/26/2016	13.72	0
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11/26/2016 13:00	2016	331	1300	331.5417	11/26/2016	13.68	0
11/26/2016 14:00	2016	331	1400	331.5833	11/26/2016	13.69	0
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11/26/2016 17:00	2016	331	1700	331.7083	11/26/2016	13.11	0
11/26/2016 18:00	2016	331	1800	331.75	11/26/2016	12.85	0
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11/27/2016 0:00	2016	332	0	332	11/27/2016	12.68	0
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11/27/2016 9:00	2016	332	900	332.375	11/27/2016	13.73	0
11/27/2016 10:00	2016	332	1000	332.4167	11/27/2016	13.68	0
11/27/2016 11:00	2016	332	1100	332.4583	11/27/2016	13.63	0
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11/27/2016 13:00	2016	332	1300	332.5417	11/27/2016	13.56	0
11/27/2016 14:00	2016	332	1400	332.5833	11/27/2016	13.56	0
11/27/2016 15:00	2016	332	1500	332.625	11/27/2016	13.63	0
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11/28/2016 9:00	2016	333	900	333.375	11/28/2016	12.54	0
11/28/2016 10:00	2016	333	1000	333.4167	11/28/2016	13.17	0
11/28/2016 11:00	2016	333	1100	333.4583	11/28/2016	13.72	0
11/28/2016 12:00	2016	333	1200	333.5	11/28/2016	13.64	0
11/28/2016 13:00	2016	333	1300	333.5417	11/28/2016	13.58	0
11/28/2016 14:00	2016	333	1400	333.5833	11/28/2016	13.56	0
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11/29/2016 0:00	2016	334	0	334	11/29/2016	12.63	0
11/29/2016 1:00	2016	334	100	334.0417	11/29/2016	12.6	0
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11/29/2016 6:00	2016	334	600	334.25	11/29/2016	12.34	0
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11/29/2016 10:00	2016	334	1000	334.4167	11/29/2016	13.81	0
11/29/2016 11:00	2016	334	1100	334.4583	11/29/2016	13.74	0
11/29/2016 12:00	2016	334	1200	334.5	11/29/2016	13.66	0
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11/29/2016 16:00	2016	334	1600	334.6667	11/29/2016	13.62	0
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11/29/2016 19:00	2016	334	1900	334.7917	11/29/2016	12.79	0
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11/30/2016 10:00	2016	335	1000	335.4167	11/30/2016	13.85	0
11/30/2016 11:00	2016	335	1100	335.4583	11/30/2016	13.74	0
11/30/2016 12:00	2016	335	1200	335.5	11/30/2016	13.67	0
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11/30/2016 14:00	2016	335	1400	335.5833	11/30/2016	13.58	0
11/30/2016 15:00	2016	335	1500	335.625	11/30/2016	13.58	0
11/30/2016 16:00	2016	335	1600	335.6667	11/30/2016	13.62	0
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11/30/2016 20:00	2016	335	2000	335.8333	11/30/2016	12.74	0
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11/30/2016 22:00	2016	335	2200	335.9167	11/30/2016	12.67	0
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12/1/2016 0:00	2016	336	0	336	12/1/2016	12.63	0
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12/1/2016 12:00	2016	336	1200	336.5	12/1/2016	13.71	0
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12/1/2016 14:00	2016	336	1400	336.5833	12/1/2016	13.63	0
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12/1/2016 16:00	2016	336	1600	336.6667	12/1/2016	13.63	0
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12/1/2016 20:00	2016	336	2000	336.8333	12/1/2016	12.74	0
12/1/2016 21:00	2016	336	2100	336.875	12/1/2016	12.7	0
12/1/2016 22:00	2016	336	2200	336.9167	12/1/2016	12.67	0
12/1/2016 23:00	2016	336	2300	336.9583	12/1/2016	12.65	0
12/2/2016 0:00	2016	337	0	337	12/2/2016	12.62	0
12/2/2016 1:00	2016	337	100	337.0417	12/2/2016	12.6	0
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12/3/2016 21:00	2016	338	2100	338.875	12/3/2016	12.7	0
12/3/2016 22:00	2016	338	2200	338.9167	12/3/2016	12.66	0
12/3/2016 23:00	2016	338	2300	338.9583	12/3/2016	12.63	0
12/4/2016 0:00	2016	339	0	339	12/4/2016	12.6	0
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12/4/2016 18:00	2016	339	1800	339.75	12/4/2016	12.9	0
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12/4/2016 22:00	2016	339	2200	339.9167	12/4/2016	12.68	0
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12/5/2016 0:00	2016	340	0	340	12/5/2016	12.63	0
12/5/2016 1:00	2016	340	100	340.0417	12/5/2016	12.61	0
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12/5/2016 6:00	2016	340	600	340.25	12/5/2016	12.51	0
12/5/2016 7:00	2016	340	700	340.2917	12/5/2016	12.47	0
12/5/2016 8:00	2016	340	800	340.3333	12/5/2016	13.08	0
12/5/2016 9:00	2016	340	900	340.375	12/5/2016	13.78	0
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12/5/2016 11:00	2016	340	1100	340.4583	12/5/2016	13.57	0
12/5/2016 12:00	2016	340	1200	340.5	12/5/2016	13.49	0
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12/5/2016 15:00	2016	340	1500	340.625	12/5/2016	13.43	0
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12/16/2016 6:00	2016	351	600	351.25	12/16/2016	12.58	0.03
12/16/2016 7:00	2016	351	700	351.2917	12/16/2016	12.55	0.02
12/16/2016 8:00	2016	351	800	351.3333	12/16/2016	12.63	0
12/16/2016 9:00	2016	351	900	351.375	12/16/2016	13.45	0

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12/16/2016 12:00	2016	351	1200	351.5	12/16/2016	13.47	0
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12/16/2016 19:00	2016	351	1900	351.7917	12/16/2016	12.81	0
12/16/2016 20:00	2016	351	2000	351.8333	12/16/2016	12.78	0
12/16/2016 21:00	2016	351	2100	351.875	12/16/2016	12.76	0
12/16/2016 22:00	2016	351	2200	351.9167	12/16/2016	12.74	0
12/16/2016 23:00	2016	351	2300	351.9583	12/16/2016	12.72	0
12/17/2016 0:00	2016	352	0	352	12/17/2016	12.71	0
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12/17/2016 2:00	2016	352	200	352.0833	12/17/2016	12.65	0
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12/17/2016 5:00	2016	352	500	352.2083	12/17/2016	12.54	0
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12/17/2016 7:00	2016	352	700	352.2917	12/17/2016	12.44	0
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12/17/2016 11:00	2016	352	1100	352.4583	12/17/2016	13.74	0
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12/17/2016 13:00	2016	352	1300	352.5417	12/17/2016	13.67	0
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12/17/2016 17:00	2016	352	1700	352.7083	12/17/2016	13.64	0
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12/20/2016 0:00	2016	355	0	355	12/20/2016	12.58	0
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12/21/2016 10:00	2016	356	1000	356.4167	12/21/2016	13.75	0
12/21/2016 11:00	2016	356	1100	356.4583	12/21/2016	13.73	0
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12/21/2016 13:00	2016	356	1300	356.5417	12/21/2016	13.57	0
12/21/2016 14:00	2016	356	1400	356.5833	12/21/2016	13.54	0
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12/21/2016 17:00	2016	356	1700	356.7083	12/21/2016	13.05	0
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12/22/2016 21:00	2016	357	2100	357.875	12/22/2016	12.46	0
12/22/2016 22:00	2016	357	2200	357.9167	12/22/2016	12.43	0
12/22/2016 23:00	2016	357	2300	357.9583	12/22/2016	12.41	0
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12/24/2016 10:00	2016	359	1000	359.4167	12/24/2016	13.67	0
12/24/2016 11:00	2016	359	1100	359.4583	12/24/2016	13.61	0
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12/24/2016 13:00	2016	359	1300	359.5417	12/24/2016	13.59	0
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12/26/2016 11:00	2016	361	1100	361.4583	12/26/2016	13.81	0
12/26/2016 12:00	2016	361	1200	361.5	12/26/2016	13.76	0
12/26/2016 13:00	2016	361	1300	361.5417	12/26/2016	13.72	0
12/26/2016 14:00	2016	361	1400	361.5833	12/26/2016	13.7	0
12/26/2016 15:00	2016	361	1500	361.625	12/26/2016	13.69	0
12/26/2016 16:00	2016	361	1600	361.6667	12/26/2016	13.71	0
12/26/2016 17:00	2016	361	1700	361.7083	12/26/2016	13.72	0
12/26/2016 18:00	2016	361	1800	361.75	12/26/2016	12.93	0
12/26/2016 19:00	2016	361	1900	361.7917	12/26/2016	12.8	0
12/26/2016 20:00	2016	361	2000	361.8333	12/26/2016	12.74	0
12/26/2016 21:00	2016	361	2100	361.875	12/26/2016	12.71	0
12/26/2016 22:00	2016	361	2200	361.9167	12/26/2016	12.68	0
12/26/2016 23:00	2016	361	2300	361.9583	12/26/2016	12.65	0
12/27/2016 0:00	2016	362	0	362	12/27/2016	12.63	0
12/27/2016 1:00	2016	362	100	362.0417	12/27/2016	12.61	0
12/27/2016 2:00	2016	362	200	362.0833	12/27/2016	12.58	0
12/27/2016 3:00	2016	362	300	362.125	12/27/2016	12.56	0
12/27/2016 4:00	2016	362	400	362.1667	12/27/2016	12.53	0
12/27/2016 5:00	2016	362	500	362.2083	12/27/2016	12.5	0
12/27/2016 6:00	2016	362	600	362.25	12/27/2016	12.46	0
12/27/2016 7:00	2016	362	700	362.2917	12/27/2016	12.4	0
12/27/2016 8:00	2016	362	800	362.3333	12/27/2016	12.54	0
12/27/2016 9:00	2016	362	900	362.375	12/27/2016	13.93	0
12/27/2016 10:00	2016	362	1000	362.4167	12/27/2016	13.84	0
12/27/2016 11:00	2016	362	1100	362.4583	12/27/2016	13.79	0
12/27/2016 12:00	2016	362	1200	362.5	12/27/2016	13.73	0
12/27/2016 13:00	2016	362	1300	362.5417	12/27/2016	13.67	0
12/27/2016 14:00	2016	362	1400	362.5833	12/27/2016	13.63	0
12/27/2016 15:00	2016	362	1500	362.625	12/27/2016	13.62	0
12/27/2016 16:00	2016	362	1600	362.6667	12/27/2016	13.65	0
12/27/2016 17:00	2016	362	1700	362.7083	12/27/2016	13.68	0
12/27/2016 18:00	2016	362	1800	362.75	12/27/2016	12.94	0
12/27/2016 19:00	2016	362	1900	362.7917	12/27/2016	12.8	0
12/27/2016 20:00	2016	362	2000	362.8333	12/27/2016	12.75	0
12/27/2016 21:00	2016	362	2100	362.875	12/27/2016	12.71	0
12/27/2016 22:00	2016	362	2200	362.9167	12/27/2016	12.68	0
12/27/2016 23:00	2016	362	2300	362.9583	12/27/2016	12.66	0
12/28/2016 0:00	2016	363	0	363	12/28/2016	12.64	0
12/28/2016 1:00	2016	363	100	363.0417	12/28/2016	12.61	0
12/28/2016 2:00	2016	363	200	363.0833	12/28/2016	12.6	0
12/28/2016 3:00	2016	363	300	363.125	12/28/2016	12.58	0

12/28/2016 4:00	2016	363	400	363.1667	12/28/2016	12.55	0
12/28/2016 5:00	2016	363	500	363.2083	12/28/2016	12.53	0
12/28/2016 6:00	2016	363	600	363.25	12/28/2016	12.5	0
12/28/2016 7:00	2016	363	700	363.2917	12/28/2016	12.46	0
12/28/2016 8:00	2016	363	800	363.3333	12/28/2016	12.42	0
12/28/2016 9:00	2016	363	900	363.375	12/28/2016	13.23	0
12/28/2016 10:00	2016	363	1000	363.4167	12/28/2016	13.85	0
12/28/2016 11:00	2016	363	1100	363.4583	12/28/2016	13.78	0
12/28/2016 12:00	2016	363	1200	363.5	12/28/2016	13.73	0
12/28/2016 13:00	2016	363	1300	363.5417	12/28/2016	13.68	0
12/28/2016 14:00	2016	363	1400	363.5833	12/28/2016	13.66	0
12/28/2016 15:00	2016	363	1500	363.625	12/28/2016	13.63	0
12/28/2016 16:00	2016	363	1600	363.6667	12/28/2016	13.65	0
12/28/2016 17:00	2016	363	1700	363.7083	12/28/2016	13.69	0
12/28/2016 18:00	2016	363	1800	363.75	12/28/2016	12.93	0
12/28/2016 19:00	2016	363	1900	363.7917	12/28/2016	12.8	0
12/28/2016 20:00	2016	363	2000	363.8333	12/28/2016	12.75	0
12/28/2016 21:00	2016	363	2100	363.875	12/28/2016	12.72	0
12/28/2016 22:00	2016	363	2200	363.9167	12/28/2016	12.7	0
12/28/2016 23:00	2016	363	2300	363.9583	12/28/2016	12.67	0
12/29/2016 0:00	2016	364	0	364	12/29/2016	12.65	0
12/29/2016 1:00	2016	364	100	364.0417	12/29/2016	12.63	0
12/29/2016 2:00	2016	364	200	364.0833	12/29/2016	12.6	0
12/29/2016 3:00	2016	364	300	364.125	12/29/2016	12.58	0
12/29/2016 4:00	2016	364	400	364.1667	12/29/2016	12.56	0
12/29/2016 5:00	2016	364	500	364.2083	12/29/2016	12.52	0
12/29/2016 6:00	2016	364	600	364.25	12/29/2016	12.49	0
12/29/2016 7:00	2016	364	700	364.2917	12/29/2016	12.43	0
12/29/2016 8:00	2016	364	800	364.3333	12/29/2016	12.4	0
12/29/2016 9:00	2016	364	900	364.375	12/29/2016	13.33	0
12/29/2016 10:00	2016	364	1000	364.4167	12/29/2016	13.81	0
12/29/2016 11:00	2016	364	1100	364.4583	12/29/2016	13.73	0
12/29/2016 12:00	2016	364	1200	364.5	12/29/2016	13.67	0
12/29/2016 13:00	2016	364	1300	364.5417	12/29/2016	13.62	0
12/29/2016 14:00	2016	364	1400	364.5833	12/29/2016	13.59	0
12/29/2016 15:00	2016	364	1500	364.625	12/29/2016	13.58	0
12/29/2016 16:00	2016	364	1600	364.6667	12/29/2016	13.61	0
12/29/2016 17:00	2016	364	1700	364.7083	12/29/2016	13.64	0
12/29/2016 18:00	2016	364	1800	364.75	12/29/2016	12.93	0
12/29/2016 19:00	2016	364	1900	364.7917	12/29/2016	12.81	0
12/29/2016 20:00	2016	364	2000	364.8333	12/29/2016	12.75	0
12/29/2016 21:00	2016	364	2100	364.875	12/29/2016	12.72	0
12/29/2016 22:00	2016	364	2200	364.9167	12/29/2016	12.69	0
12/29/2016 23:00	2016	364	2300	364.9583	12/29/2016	12.66	0
12/30/2016 0:00	2016	365	0	365	12/30/2016	12.64	0
12/30/2016 1:00	2016	365	100	365.0417	12/30/2016	12.62	0
12/30/2016 2:00	2016	365	200	365.0833	12/30/2016	12.6	0

12/30/2016 3:00	2016	365	300	365.125	12/30/2016	12.58	0
12/30/2016 4:00	2016	365	400	365.1667	12/30/2016	12.56	0
12/30/2016 5:00	2016	365	500	365.2083	12/30/2016	12.53	0
12/30/2016 6:00	2016	365	600	365.25	12/30/2016	12.5	0
12/30/2016 7:00	2016	365	700	365.2917	12/30/2016	12.47	0
12/30/2016 8:00	2016	365	800	365.3333	12/30/2016	12.43	0
12/30/2016 9:00	2016	365	900	365.375	12/30/2016	13.71	0
12/30/2016 10:00	2016	365	1000	365.4167	12/30/2016	13.82	0
12/30/2016 11:00	2016	365	1100	365.4583	12/30/2016	13.74	0
12/30/2016 12:00	2016	365	1200	365.5	12/30/2016	13.67	0
12/30/2016 13:00	2016	365	1300	365.5417	12/30/2016	13.6	0
12/30/2016 14:00	2016	365	1400	365.5833	12/30/2016	13.56	0
12/30/2016 15:00	2016	365	1500	365.625	12/30/2016	13.55	0
12/30/2016 16:00	2016	365	1600	365.6667	12/30/2016	13.57	0
12/30/2016 17:00	2016	365	1700	365.7083	12/30/2016	13.38	0
12/30/2016 18:00	2016	365	1800	365.75	12/30/2016	12.9	0
12/30/2016 19:00	2016	365	1900	365.7917	12/30/2016	12.82	0
12/30/2016 20:00	2016	365	2000	365.8333	12/30/2016	12.78	0
12/30/2016 21:00	2016	365	2100	365.875	12/30/2016	12.75	0.04
12/30/2016 22:00	2016	365	2200	365.9167	12/30/2016	12.72	0.06
12/30/2016 23:00	2016	365	2300	365.9583	12/30/2016	12.71	0.06
12/31/2016 0:00	2016	366	0	366	12/31/2016	12.69	0.05
12/31/2016 1:00	2016	366	100	366.0417	12/31/2016	12.67	0
12/31/2016 2:00	2016	366	200	366.0833	12/31/2016	12.65	0
12/31/2016 3:00	2016	366	300	366.125	12/31/2016	12.63	0
12/31/2016 4:00	2016	366	400	366.1667	12/31/2016	12.6	0
12/31/2016 5:00	2016	366	500	366.2083	12/31/2016	12.57	0
12/31/2016 6:00	2016	366	600	366.25	12/31/2016	12.55	0
12/31/2016 7:00	2016	366	700	366.2917	12/31/2016	12.51	0
12/31/2016 8:00	2016	366	800	366.3333	12/31/2016	12.48	0
12/31/2016 9:00	2016	366	900	366.375	12/31/2016	13.29	0.01
12/31/2016 10:00	2016	366	1000	366.4167	12/31/2016	13.6	0
12/31/2016 11:00	2016	366	1100	366.4583	12/31/2016	13.68	0
12/31/2016 12:00	2016	366	1200	366.5	12/31/2016	13.65	0
12/31/2016 13:00	2016	366	1300	366.5417	12/31/2016	13.59	0
12/31/2016 14:00	2016	366	1400	366.5833	12/31/2016	13.56	0
12/31/2016 15:00	2016	366	1500	366.625	12/31/2016	13.54	0
12/31/2016 16:00	2016	366	1600	366.6667	12/31/2016	13.57	0
12/31/2016 17:00	2016	366	1700	366.7083	12/31/2016	13.44	0
12/31/2016 18:00	2016	366	1800	366.75	12/31/2016	12.93	0
12/31/2016 19:00	2016	366	1900	366.7917	12/31/2016	12.82	0
12/31/2016 20:00	2016	366	2000	366.8333	12/31/2016	12.78	0
12/31/2016 21:00	2016	366	2100	366.875	12/31/2016	12.75	0
12/31/2016 22:00	2016	366	2200	366.9167	12/31/2016	12.72	0
12/31/2016 23:00	2016	366	2300	366.9583	12/31/2016	12.71	0

Hourly Max Air Temp deg F	Hourly Min Air Temp deg F	Hourly Ave Air Temp deg F	Soil Temp 6 in deg C	Soil Water 6 in wfv	Soil Temp 20 in deg C	Soil Water 20 in wfv	Soil Temp 40 in deg C
20.28	17.91	19.54	4.2	0	6.2	0	8.97
19.27	17.99	18.66	4.17	0	6.2	0	8.97
18.23	14.56	16.5	4.11	0	6.2	0	8.97
17.12	13.72	15.49	4.04	0	6.18	0	8.95
16.18	13.14	14.35	3.97	0	6.16	0	8.93
14.6	11.67	13.45	3.91	0	6.14	0	8.93
14.14	10.57	12.31	3.86	0	6.14	0	8.91
16.39	9.3	12.52	3.81	0	6.14	0	8.91
11.52	8.04	9.66	3.75	0	6.13	0	8.91
19.94	10.38	13.31	3.68	0	6.11	0	8.87
23.57	19.94	22.05	3.57	0	6.05	0	8.8
26.18	23.36	24.6	3.61	0	6.11	0	8.87
28.25	25.61	26.79	3.68	0	6.16	0	8.95
30.98	27.67	29.31	3.81	0	6.22	0	9.01
32.17	29.78	30.83	3.93	0	6.28	0	9.07
36.01	30.28	33.34	4.04	0	6.32	0	9.11
34.23	32.51	33.23	4.17	0	6.39	0	9.2
33.09	29.56	31.87	4.15	0	6.28	0	9.07
29.51	18.16	24	4.17	0	6.24	0	9.05
21.01	18.21	19.76	4.13	0	6.16	0	8.97
21.39	17.08	19.92	4.13	0	6.13	0	8.91
22.89	18.19	20.59	4.11	0	6.09	0	8.89
21.89	15.13	17.99	4.11	0	6.09	0	8.87
15.79	14.64	15.17	4.09	0	6.07	0	8.87
16.35	14.48	15.18	4.06	0	6.05	0	8.85
19.6	15.83	17.65	3.99	0	6.05	0	8.85
19.47	14.94	17.06	3.93	0	6.03	0	8.85
17.86	14.83	16.42	3.88	0	6.03	0	8.85
17.6	13.95	15.5	3.81	0	6.03	0	8.82
14.71	12.99	13.91	3.73	0	6.03	0	8.82
15.51	12.91	14.47	3.66	0	6.01	0	8.8
15.58	13.53	14.51	3.61	0	6.01	0	8.8
14.18	12.41	13.25	3.56	0	5.99	0	8.8
22.57	14.03	19.35	3.41	0	5.9	0	8.7
27.37	22.43	26.16	3.41	0	5.94	0	8.74
30.26	26.86	28.35	3.45	0	5.99	0	8.8
33.6	29.59	31.79	3.5	0	6.07	0	8.89
36.57	31.73	34.5	3.68	0	6.2	0	9.03
38	35.06	36.58	3.9	0	6.35	0	9.22
38	36.36	37.2	4.02	0	6.41	0	9.26
38.27	36.9	37.49	4.04	0	6.32	0	9.15
37.46	30.46	34.8	4	0	6.2	0	9.03
30.46	21.67	25.32	4	0	6.13	0	8.95
22.72	19.96	21.61	3.97	0	6.03	0	8.85

22.45	20.32	21.4	3.97	0	5.97	0	8.8
23.71	21.84	22.62	3.99	0	5.96	0	8.78
27.87	23.46	26.46	3.99	0	5.94	0	8.76
25.21	20.69	22.78	3.99	0	5.94	0	8.76
23.02	19.78	21.33	3.95	0	5.94	0	8.76
22.65	19.58	21.79	3.91	0	5.92	0	8.74
21.1	18.21	19.69	3.88	0	5.9	0	8.74
18.17	16.3	16.89	3.84	0	5.9	0	8.72
19.51	16.06	17.42	3.79	0	5.88	0	8.72
22.93	19.55	21.6	3.72	0	5.88	0	8.7
22.82	15.79	18.92	3.68	0	5.88	0	8.72
19.29	15	16.7	3.63	0	5.88	0	8.7
20.24	18.3	19.31	3.57	0	5.86	0	8.7
26.48	20.2	22.62	3.49	0	5.82	0	8.64
29.62	26.5	27.87	3.43	0	5.79	0	8.62
31.67	29.51	30.55	3.47	0	5.86	0	8.7
34.86	30.9	32.29	3.56	0	5.9	0	8.74
35.51	33.65	34.44	3.73	0	6.03	0	8.89
37.39	34.21	35.53	3.86	0	6.07	0	8.95
38.22	35.58	36.45	3.97	0	6.11	0	8.97
39.11	37.12	38.13	4.02	0	6.09	0	8.97
37.48	33.11	34.85	4.08	0	6.07	0	8.93
33.11	29.03	30.75	4.04	0	5.97	0	8.82
31.52	28.51	29.4	4.02	0	5.9	0	8.76
33.01	30.9	31.69	4.04	0	5.88	0	8.74
32.48	30.55	31.36	4.04	0	5.86	0	8.72
32.49	30.46	31.19	4.08	0	5.88	0	8.72
32.05	30.97	31.48	4.09	0	5.86	0	8.72
31.83	29.38	30.92	4.09	0	5.86	0	8.7
30.13	28.22	28.87	4.09	0	5.84	0	8.7
29.29	28.17	28.88	4.09	0	5.82	0	8.68
28.91	28.2	28.58	4.09	0	5.82	0	8.68
29.99	28.48	29.47	4.09	0	5.82	0	8.66
29.26	27.66	28.4	4.09	0	5.8	0	8.66
28.83	26.42	28.01	4.09	0	5.8	0	8.66
28.05	26.44	27.4	4.08	0	5.8	0	8.66
30.73	28.06	29.84	4.06	0	5.79	0	8.64
31.12	30.1	30.37	4.06	0	5.8	0	8.66
31.71	28.67	31.06	4.04	0	5.79	0	8.64
30.31	28.38	29.42	4	0	5.75	0	8.58
34.54	30.21	32.32	4.02	0	5.77	0	8.62
36.59	33.94	34.87	4.13	0	5.84	0	8.7
37.35	35.74	36.51	4.17	0	5.86	0	8.72
36.66	36.11	36.39	4.2	0	5.9	0	8.76
36.27	35.51	35.86	4.22	0	5.9	0	8.74
35.62	32.23	34.29	4.22	0	5.88	0	8.74
32.23	31.21	31.61	4.2	0	5.84	0	8.7

31.22	31.04	31.08	4.18	0	5.8	0	8.66
31.43	31.02	31.24	4.18	0	5.8	0	8.64
31.43	31.12	31.28	4.2	0	5.79	0	8.64
31.14	30.59	30.84	4.2	0	5.79	0	8.62
30.62	30.45	30.53	4.2	0	5.77	0	8.62
30.5	30.43	30.47	4.2	0	5.77	0	8.62
30.54	30.4	30.47	4.22	0	5.79	0	8.62
30.42	30.31	30.34	4.22	0	5.77	0	8.62
30.66	30.33	30.51	4.22	0	5.77	0	8.6
30.64	30.43	30.5	4.22	0	5.77	0	8.6
30.47	30.19	30.34	4.22	0	5.77	0	8.6
30.33	30.09	30.22	4.22	0	5.75	0	8.58
30.16	29.78	30	4.22	0	5.75	0	8.58
30.27	29.68	29.83	4.22	0	5.75	0	8.56
31.01	30.27	30.63	4.13	0	5.64	0	8.46
31.14	30.5	30.83	4.17	0	5.69	0	8.5
31.6	30.67	31.03	4.2	0	5.71	0	8.52
33.23	30.96	32.06	4.26	0	5.77	0	8.58
34.66	33.08	33.76	4.35	0	5.84	0	8.68
36.74	33.78	35.34	4.36	0	5.88	0	8.7
37.84	36.4	37.31	4.4	0	5.9	0	8.72
37.72	36.73	37.24	4.45	0	5.96	0	8.78
37.38	35.65	36.56	4.4	0	5.9	0	8.7
35.62	33.29	34.43	4.35	0	5.82	0	8.64
33.27	32.82	32.94	4.31	0	5.77	0	8.58
33.37	32.79	33.11	4.29	0	5.75	0	8.54
32.79	31.96	32.39	4.27	0	5.73	0	8.54
32.26	31.78	32.02	4.27	0	5.73	0	8.52
32.65	31.96	32.32	4.27	0	5.73	0	8.52
33.01	32.53	32.69	4.29	0	5.73	0	8.52
33.29	33.01	33.14	4.29	0	5.73	0	8.52
33.54	33.17	33.34	4.29	0	5.73	0	8.52
33.51	32.5	33.2	4.29	0	5.73	0	8.52
33.08	32.48	32.78	4.29	0	5.73	0	8.5
32.86	32.41	32.66	4.29	0	5.71	0	8.48
32.65	32.41	32.54	4.29	0	5.73	0	8.5
32.94	32.43	32.68	4.31	0	5.73	0	8.48
33.65	32.48	33.16	4.31	0	5.71	0	8.5
35.5	33.65	34.54	4.29	0	5.69	0	8.46
36.9	34.69	35.6	4.22	0	5.64	0	8.4
38.75	36.77	37.88	4.27	0	5.69	0	8.46
39.16	38.01	38.53	4.36	0	5.79	0	8.54
43.94	38.58	40.28	4.42	0	5.82	0	8.58
45.39	41.88	43.92	4.66	0	6.07	0	8.87
44.7	42.19	43.33	5.1	0	6.55	0	9.36
42.86	40.47	42.01	4.86	0	6.28	0	9.09
40.5	38.35	39.15	4.56	0	5.97	0	8.74

38.35	37.33	37.91	4.47	0	5.86	0	8.62
37.79	33.24	35.61	4.4	0	5.79	0	8.54
35.6	31.5	32.99	4.33	0	5.71	0	8.44
35.53	32.43	34.38	4.31	0	5.67	0	8.4
36.2	33.75	35.12	4.31	0	5.67	0	8.4
34.85	33	33.71	4.31	0	5.67	0	8.4
37.28	33.37	34.81	4.31	0	5.69	0	8.4
37.78	32.67	33.75	4.33	0	5.69	0	8.4
33.89	31.59	32.69	4.31	0	5.67	0	8.4
37.25	32.4	34.4	4.31	0	5.67	0	8.38
36.02	34.03	35.21	4.31	0	5.67	0	8.38
35.55	33.02	34.24	4.31	0	5.67	0	8.4
35.67	29.35	32.03	4.31	0	5.67	0	8.38
33.48	29.17	31.21	4.27	0	5.64	0	8.34
35.71	32.64	34.46	4.29	0	5.64	0	8.34
34.7	33.63	34.2	4.27	0	5.65	0	8.34
36.14	34.62	35.37	4.22	0	5.58	0	8.26
38.52	35.86	37.35	4.33	0	5.71	0	8.38
37.5	36.18	36.6	4.44	0	5.8	0	8.5
36.87	34.12	35.53	4.47	0	5.86	0	8.54
37.71	35.31	36.3	4.44	0	5.8	0	8.48
38	37.31	37.68	4.42	0	5.79	0	8.46
37.69	35.99	36.67	4.49	0	5.86	0	8.54
36.32	30.84	34.2	4.49	0	5.82	0	8.5
30.81	29.32	30	4.47	0	5.79	0	8.46
30.26	28.25	29.32	4.42	0	5.71	0	8.38
30.25	26.45	29.27	4.4	0	5.69	0	8.34
27.22	24.38	25.78	4.38	0	5.67	0	8.32
29.86	26.27	28.49	4.36	0	5.65	0	8.28
29.9	27.09	28.54	4.36	0	5.65	0	8.28
29.45	28.11	28.82	4.36	0	5.65	0	8.28
29.24	27.99	28.57	4.36	0	5.65	0	8.28
29.79	28.06	29.01	4.36	0	5.65	0	8.28
28.55	25.51	26.83	4.36	0	5.65	0	8.28
27.76	23.06	25.12	4.35	0	5.64	0	8.26
28.7	24.99	27.15	4.35	0	5.64	0	8.24
28.52	24.43	26.25	4.33	0	5.64	0	8.24
27.83	23.51	25.77	4.33	0	5.64	0	8.24
28.77	24.04	26.27	4.35	0	5.64	0	8.24
29.89	28.3	28.84	4.24	0	5.52	0	8.12
30.59	28.57	29.56	4.29	0	5.6	0	8.18
31.78	30.57	31.07	4.36	0	5.67	0	8.28
33.52	31.48	32.13	4.42	0	5.73	0	8.32
35.26	32.18	33.81	4.49	0	5.79	0	8.38
38.05	32.72	34.67	4.67	0	5.99	0	8.6
39.1	35.51	37.64	4.71	0	6.03	0	8.64
38.83	35.88	37.03	4.86	0.179	6.16	0	8.78

37.32	31.9	34.17	4.67	0	5.97	0	8.56
31.9	29.62	30.54	4.55	0	5.79	0	8.36
30.45	29.27	29.8	4.47	0	5.69	0	8.26
29.55	28.96	29.29	4.45	0	5.65	0	8.22
30.24	29.17	29.63	4.45	0	5.64	0	8.22
30.35	29.69	30.01	4.45	0	5.65	0	8.2
30.07	29.24	29.63	4.45	0	5.64	0	8.2
30.07	29.16	29.64	4.44	0	5.64	0	8.2
29.7	28.95	29.36	4.44	0	5.64	0	8.18
29.51	28.52	29.02	4.42	0	5.64	0	8.18
28.73	28	28.36	4.4	0	5.64	0	8.18
28.66	27.24	27.96	4.4	0	5.62	0	8.16
27.66	26.53	26.96	4.38	0	5.62	0	8.16
26.79	24.51	25.71	4.36	0	5.62	0	8.14
24.67	21.27	22.37	4.36	0	5.62	0	8.14
22.09	21.16	21.56	4.33	0	5.6	0	8.12
24.83	21.73	23.26	4.18	0	5.45	0	7.96
30.85	24.76	27.42	4.29	0	5.58	0	8.1
33.71	30.21	32.03	4.38	0	5.67	0	8.2
35.91	33.16	34.34	4.56	0	5.88	0	8.4
36.62	34.77	35.87	4.8	0	6.14	0	8.68
38.75	35.93	37.19	5	0.181	6.35	0	8.91
39.41	37.32	38.37	5.02	0.185	6.37	0	8.93
38.86	36.49	37.66	4.93	0.188	6.28	0	8.82
36.63	33.61	35.03	4.6	0	5.96	0	8.46
34.4	31.41	32.79	4.42	0	5.77	0	8.28
31.5	28.96	30.03	4.36	0	5.71	0	8.2
30.07	28.71	29.37	4.35	0	5.67	0	8.16
32.17	28.99	31.07	4.35	0	5.67	0	8.16
31.58	30.65	31.16	4.35	0	5.67	0	8.16
31.95	30.66	31.44	4.35	0	5.65	0	8.14
31.98	28.31	30.94	4.33	0	5.64	0	8.12
31.43	26.83	28.51	4.31	0	5.62	0	8.12
31.36	30.5	30.95	4.31	0	5.62	0	8.1
31.17	27.79	30.08	4.31	0	5.64	0	8.1
30.84	24.57	28.19	4.31	0	5.64	0	8.1
25.94	24.61	25.18	4.29	0	5.62	0	8.1
26.05	25.33	25.7	4.27	0	5.62	0	8.08
26.33	25.07	25.6	4.27	0	5.62	0	8.08
30.57	25.52	28.41	4.26	0	5.62	0	8.08
31.92	30.43	31.11	4.24	0	5.6	0	8.08
33.31	30.4	31.68	4.18	0	5.56	0	8.02
37.12	33.35	35.11	4.27	0	5.65	0	8.12
38.15	35.27	36.49	4.47	0	5.88	0	8.36
37.46	32.7	34.7	4.71	0	6.13	0	8.62
33.49	32.32	32.76	4.49	0	5.9	0	8.38
34.54	32.58	33.48	4.38	0	5.8	0	8.28

34.13	32.56	33.15	4.42	0	5.82	0	8.3
32.55	32.16	32.31	4.4	0	5.8	0	8.26
32.18	30.93	31.56	4.35	0	5.75	0	8.2
30.93	28.44	30.04	4.33	0	5.71	0	8.18
28.48	25.84	27.61	4.29	0	5.67	0	8.12
26.56	20.21	22.78	4.27	0	5.64	0	8.1
23.19	18.91	20.91	4.22	0	5.58	0	8.04
19.8	18.1	19.11	4.2	0	5.56	0	8.02
19.65	17.08	18.35	4.2	0	5.56	0	8
19.58	17.67	18.55	4.2	0	5.54	0	7.98
19.76	17.67	18.71	4.2	0	5.54	0	7.98
18.26	17.34	17.79	4.2	0	5.54	0	7.98
19.18	16.49	17.86	4.18	0	5.54	0	7.98
18.69	15.74	17.21	4.17	0	5.54	0	7.98
16.77	14.32	15.45	4.15	0	5.52	0	7.98
14.84	13.85	14.4	4.11	0	5.52	0	7.96
15.96	14.27	15.07	4.08	0	5.5	0	7.94
25.57	15.96	20.48	3.91	0	5.37	0	7.8
29.04	25.57	27.38	4	0	5.5	0	7.94
31.88	29.02	30.46	4.09	0	5.62	0	8.06
34.53	31.79	33.11	4.26	0	5.8	0	8.26
36.36	33.89	35.02	4.49	0	6.09	0	8.54
38.21	35.33	36.73	4.78	0	6.37	0	8.87
39.43	37.94	38.64	4.82	0	6.41	0	8.91
41.69	38.33	39.46	4.64	0	6.22	0	8.68
39.7	36.71	38.04	4.36	0	5.94	0	8.38
36.8	19.02	27.38	4.17	0	5.73	0	8.16
19.18	17.79	18.32	4.08	0	5.6	0	8.04
18.84	16.73	17.68	4.02	0	5.54	0	7.98
17.93	16.41	17.12	4.02	0	5.52	0	7.96
17.42	16.22	16.88	4.02	0	5.5	0	7.94
18.56	16.15	16.88	4.02	0	5.5	0	7.94
20.06	14.7	17.05	4	0	5.5	0	7.92
17.35	14.28	15.39	3.99	0	5.49	0	7.92
17.98	15.33	16.95	3.95	0	5.49	0	7.92
20.9	17.76	19.52	3.91	0	5.49	0	7.92
20.28	15.83	17.91	3.9	0	5.49	0	7.92
15.82	12.52	14.44	3.86	0	5.49	0	7.92
13.16	10.9	11.7	3.82	0	5.47	0	7.9
12.54	10.3	11.05	3.77	0	5.45	0	7.9
14.9	12.25	13.6	3.72	0	5.45	0	7.88
27.64	14.47	21.52	3.56	0	5.34	0	7.74
29.92	27.36	28.86	3.61	0	5.45	0	7.86
32.02	29.08	30.51	3.68	0	5.56	0	7.98
36.62	31.95	34.11	3.82	0	5.73	0	8.18
39	35.74	37.59	4.09	0	5.99	0	8.46
38.24	36.2	37.25	4.42	0	6.3	0	8.78

42.09	35.86	38.35	4.4	0	6.24	0	8.72
41.85	39.17	39.99	4.35	0	6.14	0	8.62
39.94	35.29	37.82	4.15	0	5.9	0	8.36
35.25	19.1	26.58	3.97	0	5.67	0	8.12
19.84	15.83	17.79	3.88	0	5.54	0	7.98
18.77	15.98	17.54	3.84	0	5.49	0	7.92
18.59	16.5	17.42	3.84	0	5.47	0	7.9
16.54	15.42	15.83	3.84	0	5.45	0	7.9
16.93	15.64	16.15	3.82	0	5.45	0	7.88
16.79	14.87	15.75	3.81	0	5.43	0	7.88
16.72	14.99	15.8	3.77	0	5.43	0	7.86
16.95	14.06	15.24	3.73	0	5.43	0	7.86
15.75	13.18	14.3	3.68	0	5.43	0	7.86
16.78	14.43	15.49	3.63	0	5.41	0	7.86
15.15	14.35	14.79	3.57	0	5.41	0	7.86
14.69	10.3	12.83	3.52	0	5.41	0	7.84
12.45	8.9	10.65	3.45	0	5.39	0	7.84
17.79	8.02	12.05	3.4	0	5.37	0	7.82
23.68	10.48	19.18	3.2	0	5.24	0	7.68
27.04	23.61	25.7	3.27	0	5.37	0	7.82
30.04	26.93	28.45	3.31	0	5.45	0	7.9
32.96	29.43	31.24	3.43	0	5.6	0	8.06
37.72	32.67	34.72	3.65	0	5.8	0	8.3
40.54	36.77	38.61	4.04	0	6.14	0	8.66
42.25	39.48	41.02	4.27	0	6.34	0	8.87
43.6	41.05	42	4.2	0	6.18	0	8.7
41.5	36.78	39.74	3.97	0	5.86	0	8.36
36.73	22.59	28.25	3.81	0	5.64	0	8.1
22.64	20.01	21.46	3.72	0	5.49	0	7.96
23.2	20.49	21.91	3.68	0	5.43	0	7.88
20.62	18.25	19.1	3.7	0	5.41	0	7.86
20.19	19.2	19.75	3.72	0	5.39	0	7.86
21.45	18.88	19.81	3.7	0	5.39	0	7.86
45.07	19.65	35.04	3.7	0	5.39	0	7.86
44.99	42.92	43.81	3.72	0	5.41	0	7.9
43.42	36.14	41.29	3.77	0	5.49	0	7.98
41.62	33.02	36.89	3.77	0	5.5	0	7.98
41.32	36.41	38.63	3.75	0	5.45	0	7.94
40.17	34.68	36.93	3.77	0	5.47	0	7.94
38.81	34.06	36.84	3.77	0	5.45	0	7.94
39	37.25	38.33	3.77	0	5.43	0	7.92
38.92	37.46	38.31	3.77	0	5.43	0	7.92
40.43	37.44	39.09	3.66	0	5.32	0	7.8
43.55	40.03	41.99	3.86	0	5.5	0	8
46.64	43.18	44.8	4.17	0	5.8	0	8.34
47.52	45.81	46.58	4.58	0	6.26	0	8.8
47.58	45.89	46.79	4.99	0	6.64	0	9.24

48.04	46.28	47.15	5.21	0	6.87	0	9.47
49.42	47.35	48.32	5.13	0	6.76	0	9.34
48.28	45.33	46.66	4.91	0	6.51	0	9.09
45.85	42.35	43.79	4.44	0	6.01	0	8.56
42.49	39.73	41.06	4.17	0	5.71	0	8.24
40.38	39.01	39.76	4.04	0	5.56	0	8.08
39.59	38.55	39.21	3.97	0	5.47	0	7.98
39.34	36.53	38.68	3.95	0	5.43	0	7.96
39.81	35.17	37.07	3.95	0	5.41	0	7.94
40.53	34.39	37.2	3.95	0	5.41	0	7.92
42.4	34.18	37.73	3.95	0	5.39	0	7.9
42.66	38.35	41.58	3.95	0	5.39	0	7.9
38.59	32.04	35.6	3.99	0	5.41	0	7.9
36.71	29.68	33.62	3.97	0	5.39	0	7.9
37.15	34.34	35.7	3.95	0	5.36	0	7.86
37.75	34.05	35.62	3.97	0	5.37	0	7.88
40.31	33.94	36.87	3.97	0	5.37	0	7.88
40.58	37.72	39.36	3.99	0	5.37	0	7.88
39.4	37.37	38.45	4	0	5.39	0	7.88
41.54	38.35	39.79	3.99	0	5.36	0	7.86
43.01	41.27	41.85	4	0	5.39	0	7.9
44.28	42.09	43.11	4.09	0	5.47	0	7.98
42.9	36.52	39.37	4.31	0	5.69	0	8.22
38.35	36.76	37.6	4.2	0	5.58	0	8.1
38.47	37	37.81	4.2	0	5.56	0	8.06
37.41	35.75	36.7	4.2	0	5.58	0	8.08
37.63	35.8	36.69	4.18	0	5.54	0	8.06
36.59	34.6	35.49	4.17	0	5.54	0	8.04
34.69	32.39	33.46	4.11	0	5.47	0	7.98
32.67	31.73	32.23	4.06	0	5.39	0	7.9
32.19	31.02	31.55	4.02	0	5.36	0	7.86
31.83	31.02	31.51	4	0	5.34	0	7.84
31.76	30.66	31.26	4	0	5.34	0	7.82
31.86	30.24	31.11	4	0	5.34	0	7.82
31.66	30.09	31.01	4	0	5.32	0	7.8
32	30.99	31.55	4	0	5.32	0	7.8
31.91	30.77	31.43	4	0	5.32	0	7.8
31.29	29.91	30.79	4	0	5.32	0	7.78
31.79	30.02	31.09	4	0	5.3	0	7.78
32.07	30.08	31.32	4	0	5.32	0	7.8
32.24	31.49	31.92	4.02	0	5.34	0	7.8
32.5	29.48	31.37	4.04	0	5.34	0	7.8
31.25	29.86	30.63	4	0	5.3	0	7.78
36.5	30.79	33.04	3.88	0	5.17	0	7.62
40.99	36.55	39.03	4.02	0	5.32	0	7.78
42.36	39.81	40.71	4.22	0	5.54	0	8.02
46.79	41.86	44.2	4.56	0	5.9	0	8.4

48.29	43.66	46.31	5	0	6.35	0	8.89
49.49	47.28	48.31	5.52	0	6.87	0	9.44
48.46	43.79	45.17	5.36	0	6.72	0	9.28
44.62	43.72	44.19	4.64	0	5.96	0	8.46
44.48	43.02	43.75	4.42	0	5.73	0	8.22
43.04	42.05	42.7	4.35	0	5.65	0	8.12
42.43	41.5	42.08	4.27	0	5.56	0	8.02
41.94	41.11	41.57	4.24	0	5.5	0	7.96
41.69	39.85	40.83	4.2	0	5.47	0	7.92
40.59	39.75	40.14	4.18	0	5.43	0	7.88
40.38	38.98	39.64	4.17	0	5.41	0	7.84
41.34	39.37	40.78	4.17	0	5.39	0	7.82
41.16	39.3	40.5	4.18	0	5.39	0	7.84
40.54	39.05	39.78	4.18	0	5.39	0	7.84
40.75	39.17	39.81	4.17	0	5.37	0	7.82
40.94	38.16	39.72	4.17	0	5.36	0	7.8
39.39	37.4	38.45	4.17	0	5.36	0	7.78
40.15	37.78	39.19	4.15	0	5.36	0	7.76
39.6	37.54	38.56	4.17	0	5.36	0	7.76
40.45	38.37	39.41	4.15	0	5.34	0	7.76
43.92	40.24	42.18	4.04	0	5.23	0	7.62
47.76	43.81	45.62	4.24	0	5.45	0	7.86
50.89	47.76	49.15	4.66	0	5.86	0	8.3
53.55	48.65	51.12	5.32	0	6.55	0	9.03
55.38	52.72	54.21	6.13	0.195	7.36	0	9.89
56.33	53.76	55.12	6.99	0.2	8.16	0	10.74
57.37	55.25	56.08	7.22	0.194	8.26	0	10.83
57.15	55.5	56.1	6.87	0.195	7.66	0	10.18
55.58	49.97	53.27	6.2	0.194	6.7	0	9.15
49.93	44.82	47.03	5.64	0.192	5.88	0	8.3
46.68	40.43	44.68	5.45	0	5.56	0	7.96
41.6	34.89	37.85	5.41	0	5.47	0	7.84
34.84	31.88	33.22	5.3	0	5.37	0	7.74
34.62	29.85	31.91	5.21	0	5.34	0	7.7
32.47	28.17	30.03	5.1	0	5.34	0	7.68
30.91	26.17	27.99	4.97	0	5.32	0	7.66
29.25	25.87	27.38	4.88	0	5.32	0	7.66
30.78	27.1	29.04	4.78	0	5.34	0	7.64
29.22	26.54	28.02	4.71	0	5.34	0	7.64
28.98	25.71	27.23	4.64	0	5.34	0	7.62
33.24	27.11	30.93	4.58	0	5.34	0	7.62
31.12	27.86	29.68	4.55	0	5.36	0	7.64
30.91	28.28	29.46	4.49	0	5.37	0	7.64
28.45	24.99	26.88	4.45	0	5.37	0	7.64
33.01	27.76	30.39	4.38	0	5.34	0	7.6
46.1	33.02	39.51	4.31	0	5.32	0	7.56
41.05	39.33	39.88	4.45	0	5.49	0	7.74

42.2	40.08	41.08	4.55	0	5.6	0	7.84
47.19	40.43	44.68	4.66	0	5.75	0	8
56.16	44.24	48.24	5.04	0	6.14	0	8.42
58.24	56.19	57.23	5.36	0.185	6.41	0	8.66
56.61	52.6	55.49	5.9	0.191	6.8	0	9.09
54.02	49.24	51.42	5.75	0.193	6.43	0	8.68
49.19	46.55	47.33	5.41	0.189	5.9	0	8.12
46.92	44.93	46.19	5.37	0	5.71	0	7.94
46.15	44.77	45.42	5.37	0	5.65	0	7.86
46.69	45.09	45.81	5.37	0	5.64	0	7.84
45.76	44.01	44.91	5.36	0	5.62	0	7.8
45.02	42.49	43.94	5.36	0	5.6	0	7.8
42.66	41.21	41.93	5.32	0	5.6	0	7.78
41.87	39.84	40.96	5.3	0	5.56	0	7.74
41	38.62	39.9	5.26	0	5.56	0	7.72
38.94	36.13	37.64	5.23	0	5.54	0	7.7
38.36	36.03	37.14	5.17	0	5.54	0	7.7
37.3	34.9	35.97	5.13	0	5.54	0	7.68
36.48	33.77	35.14	5.08	0	5.52	0	7.68
36.41	32.28	34.19	5	0	5.5	0	7.64
33.38	28.76	30.58	4.91	0	5.5	0	7.62
40.77	30.88	35.68	4.75	0	5.39	0	7.5
43.36	40.84	42.55	4.8	0	5.52	0	7.64
45.52	42.85	43.94	4.95	0	5.73	0	7.86
47.39	44.77	45.71	5.28	0	6.09	0	8.22
47.3	44.68	45.71	5.58	0.185	6.34	0	8.48
46.69	44.95	45.68	5.77	0.188	6.35	0	8.5
48.89	45.23	47	5.94	0.192	6.3	0	8.42
47.7	45.57	46.44	6.35	0.194	6.45	0	8.58
46.99	45.09	46.18	6.28	0.196	6.13	0	8.24
45.07	41.22	43.21	6.34	0.19	6.01	0	8.1
42.22	41.31	41.75	6.28	0.19	5.84	0	7.92
46.05	41.81	43.33	6.26	0.191	5.79	0	7.86
44.96	37.69	40.17	6.26	0.19	5.79	0	7.86
37.69	36.02	36.65	6.18	0.19	5.75	0	7.8
37.33	36.16	36.88	6.11	0.191	5.71	0	7.74
41.15	34.78	37.49	6.03	0.19	5.69	0	7.72
41.54	39.13	41.11	5.96	0.189	5.67	0	7.7
41.38	39.88	40.66	5.92	0.19	5.71	0	7.72
41.38	39.93	40.53	5.86	0.189	5.71	0	7.72
41.08	38.45	39.8	5.8	0	5.73	0	7.72
39.85	36.44	38.15	5.75	0	5.73	0	7.72
36.73	35.07	35.88	5.69	0	5.71	0	7.68
35.17	31.91	33.9	5.6	0	5.69	0	7.66
35.46	31.35	33.75	5.5	0	5.69	0	7.64
39.08	34.28	36.81	5.3	0	5.58	0	7.5
41.23	38.81	40.05	5.39	0	5.77	0	7.68

45.52	41.12	42.93	5.52	0.187	5.96	0	7.88
48.07	44.96	46.53	6.05	0.186	6.49	0	8.44
50.67	47.62	49.35	6.72	0.19	7.13	0	9.09
51.87	49.78	50.97	7.56	0.202	7.84	0	9.82
52.53	50.61	51.26	7.72	0.206	7.82	0	9.8
51.54	49.69	50.75	7.52	0.203	7.42	0	9.36
50.16	46.99	48.55	7.11	0.202	6.8	0	8.7
46.99	43.37	44.95	6.76	0.197	6.3	0	8.18
43.39	40.45	41.57	6.58	0.194	6.05	0	7.9
40.49	37.14	38.27	6.49	0.192	5.94	0	7.78
37.91	35.52	36.87	6.41	0.192	5.88	0	7.72
36.51	33.15	34.71	6.3	0.191	5.86	0	7.68
34.56	32.47	33.56	6.18	0.19	5.84	0	7.66
34.16	31.52	32.78	6.03	0	5.82	0	7.64
33.58	23.3	28.9	5.9	0	5.8	0	7.62
24.08	21.01	22.23	5.75	0	5.8	0	7.6
24.23	21.27	22.23	5.6	0	5.8	0	7.58
22.16	19.98	20.75	5.47	0	5.8	0	7.58
20.4	18.35	19.35	5.34	0	5.8	0	7.56
19.07	16.93	17.91	5.23	0	5.82	0	7.56
19.16	16.88	17.68	5.11	0	5.82	0	7.56
18.56	16.02	16.68	5	0	5.82	0	7.54
33.86	18.58	26.31	4.8	0	5.71	0	7.42
37.17	33.81	35.12	4.84	0	5.86	0	7.56
40.74	36.31	38.36	4.93	0	6.01	0	7.72
43.39	40.1	41.56	5.17	0	6.35	0	8.06
44.4	42.25	43.24	5.49	0.183	6.72	0	8.44
45.92	43.35	44.6	5.71	0.185	6.97	0	8.7
46.09	44.03	45.03	5.82	0.191	7.07	0	8.8
45.91	43.9	45	5.8	0.191	6.91	0	8.62
44.28	41.49	43.16	5.65	0.19	6.51	0	8.22
41.49	34.29	38.03	5.6	0	6.24	0	7.94
34.27	25.41	27.1	5.58	0	6.07	0	7.76
26.7	25.39	26.16	5.54	0	5.99	0	7.68
26.92	23.96	25.16	5.49	0	5.96	0	7.64
27.76	25.8	27.16	5.41	0	5.96	0	7.64
25.8	21.19	23.58	5.32	0	5.96	0	7.64
22.88	20.84	21.85	5.21	0	5.94	0	7.62
23	19.15	21.03	5.11	0	5.92	0	7.6
19.71	18.18	18.74	5.04	0	5.92	0	7.6
20.74	18.56	19.78	4.97	0	5.92	0	7.6
19.91	18.12	19.06	4.89	0	5.92	0	7.6
20.92	17.77	18.72	4.82	0	5.92	0	7.58
23.93	20.67	21.44	4.77	0	5.92	0	7.6
23.88	15.9	19.04	4.71	0	5.94	0	7.6
17.71	15.47	16.01	4.66	0	5.94	0	7.6
30.82	17.79	26.51	4.51	0	5.84	0	7.5

34.48	30.58	32.03	4.55	0	5.92	0	7.58
35.64	33.28	34.25	4.6	0	6.03	0	7.72
39.28	35.26	37.57	4.73	0	6.2	0	7.88
42.86	37.94	40.72	5.06	0	6.55	0	8.26
44.41	41.69	42.65	5.41	0.179	6.93	0	8.66
46.23	43.34	44.45	5.43	0.184	6.93	0	8.66
47.49	44.76	45.98	5.47	0.186	6.85	0	8.56
44.93	42.34	43.48	5.54	0.187	6.7	0	8.42
42.32	34.4	39.9	5.43	0	6.35	0	8.06
34.21	26.64	28.08	5.41	0	6.16	0	7.86
29.6	26.67	28.34	5.37	0	6.03	0	7.74
28.15	26.6	27.59	5.34	0	6.01	0	7.72
30.83	28.13	28.97	5.28	0	5.99	0	7.7
32.26	28.2	30.03	5.21	0	5.99	0	7.7
30.07	26.51	28.2	5.15	0	5.99	0	7.7
27.12	25.2	26.37	5.08	0	5.97	0	7.7
28.44	25.9	26.93	5	0	5.97	0	7.68
27.22	24.84	25.67	4.93	0	5.97	0	7.68
27.11	25.17	26.23	4.88	0	5.97	0	7.7
26.16	25.05	25.58	4.84	0	5.97	0	7.68
26.77	24.72	25.75	4.78	0	5.97	0	7.68
26.2	22.7	25.37	4.75	0	5.97	0	7.68
24.23	20.98	22.22	4.69	0	5.96	0	7.68
30.07	23.27	26.54	4.6	0	5.92	0	7.64
41.17	30.11	35.26	4.55	0	5.88	0	7.6
43.55	40.67	41.7	4.67	0	6.05	0	7.78
46.31	43.65	45.12	5.02	0	6.45	0	8.2
49.26	46.16	47.28	5.49	0.18	6.95	0	8.72
49.7	47.81	48.81	5.82	0.185	7.28	0	9.07
50.94	48.86	49.62	6.09	0.189	7.42	0	9.22
51.65	48.81	49.99	6.09	0.191	7.18	0	8.97
55.58	48.16	49.85	5.99	0.188	6.78	0	8.56
54.92	43.66	51.18	5.97	0.189	6.49	0	8.24
43.63	35.78	39.45	5.97	0.187	6.3	0	8.06
42.33	35.57	39.04	5.9	0	6.13	0	7.88
39.82	35.75	37.39	5.86	0	6.07	0	7.82
46.38	39.85	43.37	5.8	0	6.05	0	7.8
46.48	39.86	43.6	5.77	0	6.07	0	7.84
44.57	40.94	43.45	5.71	0	6.07	0	7.84
44	36.28	41.27	5.65	0	6.09	0	7.84
38.36	31.29	35.68	5.6	0	6.07	0	7.82
37.94	30.34	33.18	5.49	0	6.03	0	7.78
40.14	35.9	38.19	5.39	0	6.01	0	7.76
40.24	37.9	39.05	5.34	0	6.03	0	7.78
40.58	37.4	38.66	5.28	0	6.07	0	7.82
40.1	35.36	38.15	5.23	0	6.09	0	7.84
38.55	37.21	38.1	5.17	0	6.07	0	7.8

39.29	37.56	38.26	5	0	5.96	0	7.68
42.91	39.23	41.03	5.13	0	6.13	0	7.84
44.67	42.39	43.41	5.32	0	6.34	0	8.08
45.69	41.36	43.49	5.67	0.179	6.68	0	8.44
45.69	42.77	44.29	5.97	0.181	6.93	0	8.68
46.41	44.12	45.21	6.34	0.181	7.17	0	8.93
47.2	45.17	46.19	6.6	0.184	7.24	0	9.03
46.41	44.98	45.67	6.64	0.189	7.07	0	8.82
45.7	42.54	44.03	6.41	0.189	6.66	0	8.4
43.01	39.88	41.55	6.3	0.19	6.37	0	8.1
40.26	35.03	37.69	6.26	0.186	6.24	0	7.96
37.12	33.08	35.45	6.18	0.188	6.16	0	7.88
35.6	31.71	34.11	6.11	0	6.13	0	7.84
35.98	33.03	34.72	6.01	0	6.11	0	7.82
35.81	32.33	34.55	5.92	0	6.13	0	7.82
32.86	31.37	32.25	5.8	0	6.13	0	7.82
31.82	30.47	31.06	5.71	0	6.11	0	7.8
33.58	30.42	31.75	5.6	0	6.11	0	7.8
33.63	28.76	31.07	5.49	0	6.11	0	7.78
28.73	25.06	27.37	5.39	0	6.11	0	7.78
29.64	27.71	28.57	5.3	0	6.11	0	7.78
29.88	25.78	27.57	5.23	0	6.11	0	7.78
29.09	24.23	26.79	5.13	0	6.11	0	7.78
24.23	20.11	21.96	5.06	0	6.11	0	7.76
34.11	22.93	29.69	4.88	0	5.99	0	7.64
37.47	33.87	35.46	4.93	0	6.11	0	7.76
39.52	37.09	38.2	5	0	6.24	0	7.9
41.11	38.8	40.06	5.19	0	6.51	0	8.16
42.77	39.37	40.98	5.41	0	6.78	0	8.44
43.53	41.11	42.25	5.77	0.173	7.13	0	8.8
44.12	42.09	42.89	5.97	0.175	7.2	0	8.89
44.39	42.37	43.29	5.99	0.184	6.97	0	8.62
42.78	39.58	41.31	5.92	0.186	6.6	0	8.26
39.59	32.35	36.54	5.96	0	6.39	0	8.04
32.31	29.63	30.69	5.99	0	6.28	0	7.92
30.73	26.95	29.51	5.96	0	6.2	0	7.84
30.18	20.04	26.78	5.86	0	6.16	0	7.8
20.47	17.47	18.35	5.73	0	6.14	0	7.78
21.27	17.49	19.48	5.58	0	6.13	0	7.76
18.48	16.8	17.51	5.47	0	6.13	0	7.76
18.08	16.15	17.08	5.34	0	6.11	0	7.74
16.71	15.55	16.14	5.23	0	6.11	0	7.74
17.01	15.81	16.32	5.11	0	6.11	0	7.74
19.35	13.71	15.58	5.02	0	6.11	0	7.74
16.86	14.62	15.71	4.93	0	6.11	0	7.74
17.35	15.6	16.52	4.86	0	6.13	0	7.74
15.99	14.94	15.53	4.78	0	6.13	0	7.74

18.08	14.41	15.36	4.71	0	6.13	0	7.74
31.04	18.1	24.78	4.53	0	6.01	0	7.62
34.61	30.79	32.58	4.58	0	6.14	0	7.74
36.77	33.7	35.17	4.62	0	6.22	0	7.84
39.4	36.11	37.81	4.71	0	6.35	0	7.98
41.01	38.13	39.56	4.91	0	6.6	0	8.24
42.49	39.2	40.45	5.15	0	6.87	0	8.54
43.37	40.68	41.8	5.19	0	6.91	0	8.58
43.59	41.85	42.68	5.11	0	6.78	0	8.42
43.74	41.92	42.88	5.1	0	6.62	0	8.28
41.86	33.07	37.81	5.08	0	6.43	0	8.06
33.21	22.88	24.55	5.06	0	6.3	0	7.92
25.53	21.69	23.51	5.02	0	6.2	0	7.84
22.98	21.3	22.18	4.99	0	6.18	0	7.82
23.38	20.76	21.96	4.93	0	6.14	0	7.8
23.45	20.98	21.73	4.89	0	6.14	0	7.8
26.72	23.48	25.28	4.82	0	6.14	0	7.8
25.71	22.16	23.88	4.78	0	6.14	0	7.8
22.27	20.26	21.24	4.73	0	6.13	0	7.8
22.03	18.81	19.86	4.67	0	6.13	0	7.8
22.52	19.33	20.86	4.62	0	6.13	0	7.8
25.32	21.57	22.77	4.6	0	6.13	0	7.8
22.82	20.13	21.18	4.56	0	6.13	0	7.8
20.42	18.28	19.33	4.51	0	6.13	0	7.8
22.23	18.26	19	4.47	0	6.11	0	7.8
36.38	22.27	29.3	4.33	0	5.99	0	7.68
39.41	36.31	37.88	4.4	0	6.11	0	7.8
41.4	38.57	39.87	4.51	0	6.26	0	7.96
43.69	40.98	42.33	4.75	0	6.53	0	8.24
46.49	42.96	44.49	5.08	0	6.87	0	8.64
48.38	45.68	46.85	5.45	0.171	7.28	0	9.05
50.1	46.93	48.13	5.56	0.175	7.38	0	9.15
50.32	48.06	49.3	5.45	0.18	7.17	0	8.95
49.99	46.98	48.52	5.24	0	6.78	0	8.54
47	28.84	40.86	5.13	0	6.45	0	8.2
28.79	25.14	26.33	5.13	0	6.26	0	8
27.01	25.26	26.01	5.1	0	6.14	0	7.9
26.71	25.17	25.76	5.06	0	6.13	0	7.86
26.71	25.24	26.14	5.02	0	6.11	0	7.86
27.07	25.48	26.28	4.95	0	6.09	0	7.86
26.48	22.41	25.13	4.89	0	6.09	0	7.86
23.55	21.7	22.64	4.84	0	6.07	0	7.84
21.93	20.76	21.38	4.78	0	6.07	0	7.84
23.45	20.73	22.4	4.73	0	6.05	0	7.84
23.77	22.84	23.31	4.67	0	6.05	0	7.84
24.05	22.93	23.41	4.64	0	6.05	0	7.84
24.62	21.05	23.17	4.6	0	6.05	0	7.84

23.5	22.15	22.89	4.56	0	6.05	0	7.84
23.27	20.04	21.12	4.51	0	6.05	0	7.84
34.13	22.83	28.84	4.36	0	5.94	0	7.7
39.43	34.15	36.97	4.45	0	6.05	0	7.82
43.01	38.91	40.86	4.58	0	6.22	0	8.02
45.55	41.7	43.66	4.86	0	6.53	0	8.34
46.96	44.5	45.63	4.97	0	6.66	0	8.48
49.82	46.21	47.9	5.19	0	6.89	0	8.72
52.34	49.03	50.03	5.34	0.158	7.01	0	8.85
52.38	50.82	51.51	5.37	0.165	6.89	0	8.74
51.57	48.48	50.34	5.37	0	6.64	0	8.48
48.46	31.41	41.96	5.39	0	6.39	0	8.22
31.39	28.67	29.43	5.41	0	6.22	0	8.04
30.14	27.66	29.03	5.41	0	6.11	0	7.94
31.13	26.53	28.52	5.37	0	6.09	0	7.9
27.49	24.32	26.08	5.3	0	6.07	0	7.88
37.02	24.41	31.71	5.23	0	6.05	0	7.88
45.23	33.38	35.74	5.15	0	6.05	0	7.88
51.35	34.37	43.59	5.08	0	6.05	0	7.88
40.21	31.24	34.46	5.02	0	6.07	0	7.9
52.54	36.19	49.33	4.97	0	6.07	0	7.9
52.62	37.93	49.27	4.93	0	6.09	0	7.92
46.03	34.66	39.11	4.91	0	6.11	0	7.94
40.36	34.76	37.13	4.88	0	6.11	0	7.94
43.82	37.71	40.27	4.84	0	6.11	0	7.92
50.06	28.55	35.61	4.82	0	6.11	0	7.92
46.43	29.63	37.81	4.67	0	5.99	0	7.8
48.13	41.76	45.13	4.77	0	6.13	0	7.94
59.01	47.07	50.62	4.88	0	6.26	0	8.08
51.34	44.82	47.02	5.08	0	6.45	0	8.28
61.21	45.36	52.43	5.3	0	6.6	0	8.46
65.91	59.34	61.77	6.01	0.155	7.17	0	9.03
65.81	61.28	62.35	6.76	0.154	7.66	0	9.55
63.57	61.12	62.14	6.82	0.167	7.4	0	9.3
62.34	59.12	60.87	6.91	0.175	7.17	0	9.03
59.37	54.6	57.13	6.82	0.182	6.78	0	8.62
56.06	54.18	55.35	6.76	0.184	6.47	0	8.3
54.88	49.14	52.54	6.76	0.188	6.35	0	8.18
53.53	51.21	52.5	6.78	0.189	6.3	0	8.12
54.2	52.15	53.24	6.78	0.187	6.28	0	8.1
54.27	53.28	53.8	6.82	0.189	6.3	0	8.12
55.13	53.75	54.49	6.85	0.189	6.34	0	8.14
55.08	50.82	52.82	6.89	0.187	6.35	0	8.16
52.12	48.15	50.32	6.87	0.189	6.34	0	8.12
52.38	49.75	51.18	6.85	0.19	6.3	0	8.1
51.86	49.35	50.34	6.87	0.187	6.32	0	8.12
50.33	44.76	47.88	6.85	0.189	6.32	0	8.1

50.2	47.29	48.58	6.8	0.189	6.3	0	8.06
49.26	47.28	48.29	6.76	0.188	6.3	0	8.04
48.2	46.35	47.16	6.7	0.188	6.28	0	8.02
52.6	47.47	50.15	6.56	0.193	6.22	0	7.92
55.44	51.39	53.23	6.7	0.189	6.39	0	8.12
56.48	51.94	54.78	7.03	0.18	6.74	0	8.46
59.62	54.69	56.83	7.42	0.173	7.13	0	8.85
60.74	56.01	57.86	7.8	0.17	7.42	0	9.15
60.69	56.93	58.69	8.34	0.173	7.8	0	9.53
59.46	56.15	57.53	8.4	0.179	7.68	0	9.38
58.17	54.97	56.44	8.36	0.186	7.44	0	9.13
56.45	52.94	54.17	8.16	0.19	7.07	0	8.72
53.2	51.01	52.04	8	0.192	6.8	0	8.42
51.29	49.79	50.6	7.94	0.19	6.66	0	8.26
51.83	50.75	51.23	7.92	0.191	6.6	0	8.18
51.67	50.56	51.13	7.9	0.192	6.58	0	8.16
51.1	47.83	49.57	7.86	0.192	6.58	0	8.16
47.92	46.95	47.42	7.82	0.193	6.58	0	8.14
47.93	46.49	47.38	7.76	0.193	6.58	0	8.12
47.29	46.36	46.7	7.7	0.192	6.56	0	8.08
46.8	45.47	46.11	7.66	0.192	6.58	0	8.08
46.75	45.17	45.71	7.6	0.19	6.58	0	8.08
47.14	45.45	45.98	7.54	0.192	6.6	0	8.08
47.7	45.56	46.6	7.5	0.192	6.62	0	8.06
46.29	45.24	45.68	7.46	0.191	6.64	0	8.08
45.8	44.89	45.35	7.42	0.191	6.66	0	8.08
45.21	42.81	44.23	7.36	0.189	6.66	0	8.06
48.42	43.71	46.22	7.24	0.195	6.6	0	7.98
50.81	48.41	49.7	7.3	0.192	6.72	0	8.08
52.24	50.24	51.37	7.48	0.188	6.95	0	8.3
54.79	51.82	53.59	7.92	0.176	7.4	0	8.74
55.36	52.7	54.07	8.2	0.177	7.64	0	8.99
56.36	53.55	54.86	8.44	0.182	7.78	0	9.11
56.08	52.75	54.76	8.54	0.186	7.72	0	9.03
56.51	52.5	54.48	8.6	0.19	7.62	0	8.91
54.01	43.89	49.47	8.58	0.192	7.4	0	8.68
44.91	41.81	43.4	8.34	0.195	7.05	0	8.28
45.19	42.56	43.68	8.26	0.195	6.91	0	8.14
44.56	42.45	43.71	8.2	0.195	6.89	0	8.1
44.98	41.36	43.38	8.14	0.193	6.89	0	8.1
41.71	37.99	39.66	8.06	0.195	6.89	0	8.1
38.1	32.89	35.47	7.98	0.193	6.89	0	8.08
38.12	34.14	36.02	7.86	0.195	6.87	0	8.04
37.91	33.6	35.06	7.7	0.193	6.87	0	8.04
34.87	33.08	34.12	7.5	0.192	6.87	0	8
33.49	31.09	32.66	7.3	0.192	6.87	0	8
31.98	29.44	30.71	7.15	0.193	6.87	0	7.98

29.99	27.83	28.84	6.99	0.19	6.89	0	7.98
28.6	27.05	27.54	6.83	0	6.89	0	7.98
28.22	27.23	27.76	6.68	0	6.91	0	7.98
28.11	26.14	26.87	6.53	0	6.91	0	7.96
28.84	26.9	27.98	6.26	0	6.8	0	7.84
30.31	28.43	29.09	6.26	0	6.93	0	7.96
30.5	28.59	29.39	6.18	0	6.97	0	8
32.62	28.76	30.61	6.11	0	7.03	0	8.02
34.48	31.79	33.03	6.09	0	7.09	0	8.1
35	31.84	33.3	6.07	0	7.17	0	8.16
34.04	31.94	32.77	6.03	0	7.17	0	8.16
33.18	31.01	32.11	6.01	0	7.15	0	8.14
31.75	26.46	28.03	6.03	0	7.13	0	8.12
28.12	25.95	27.42	5.99	0	7.07	0	8.06
25.93	23.88	24.86	6.01	0	7.09	0	8.08
23.89	22.64	23.25	5.92	0	7.05	0	8.02
22.62	21.55	22.07	5.86	0	7.01	0	8
21.72	20.65	21.19	5.79	0	7.01	0	8
20.73	18.95	19.68	5.73	0	6.99	0	8
19.07	18.34	18.77	5.65	0	6.99	0	7.98
18.47	17.64	18.11	5.6	0	6.97	0	7.98
18.97	17.47	18.09	5.54	0	6.97	0	8
18.21	16.65	17.51	5.49	0	6.97	0	7.98
17.01	16.09	16.6	5.43	0	6.97	0	7.98
16.52	15.55	15.97	5.37	0	6.95	0	7.98
16.62	15.6	16.1	5.32	0	6.95	0	8
16.26	14.92	15.48	5.26	0	6.95	0	8
16.48	14.49	15.19	5.21	0	6.91	0	7.98
18.85	16.49	17.76	5.08	0	6.85	0	7.9
21.26	18.75	19.96	5.1	0	6.91	0	7.98
24.76	21.12	22.87	5.11	0	6.97	0	8.04
26.86	24.12	25.55	5.13	0	7.03	0	8.12
28.37	26.25	27.28	5.19	0	7.11	0	8.2
29.82	27.57	28.72	5.24	0	7.18	0	8.32
30.23	28.47	29.38	5.24	0	7.2	0	8.34
29.63	28.32	28.98	5.17	0	7.13	0	8.28
29.27	27.35	28.14	5.1	0	7.05	0	8.2
27.45	24.92	26.1	5.04	0	7.01	0	8.18
25.1	23.67	24.56	5	0	6.97	0	8.16
23.72	22.7	23.18	4.97	0	6.93	0	8.12
23.13	22.34	22.72	4.93	0	6.89	0	8.1
23.04	20.73	22.2	4.93	0	6.87	0	8.1
21.23	19.93	20.63	4.91	0	6.85	0	8.1
20.91	17.88	19	4.88	0	6.85	0	8.08
18.43	17.29	17.99	4.84	0	6.83	0	8.08
17.43	15.94	16.96	4.8	0	6.8	0	8.08
16.75	14.5	15.67	4.78	0	6.8	0	8.08

15.39	11.78	13.07	4.75	0	6.78	0	8.06
12.1	9.6	11.14	4.71	0	6.76	0	8.06
10.3	8.76	9.63	4.66	0	6.74	0	8.06
10.92	9.48	10.04	4.62	0	6.74	0	8.06
14.94	9.94	12.23	4.58	0	6.72	0	8.06
21.04	14.96	17.9	4.47	0	6.64	0	8
25.38	21	23.14	4.49	0	6.7	0	8.08
26.19	24.53	25.37	4.51	0	6.76	0	8.14
28.44	25.76	27.07	4.55	0	6.83	0	8.24
32.65	27.81	29.66	4.62	0	6.91	0	8.34
33.05	29.68	31.32	4.71	0	7.03	0	8.48
33.65	31.49	32.54	4.73	0	7.05	0	8.5
34.92	32.76	33.69	4.67	0	6.97	0	8.44
34.95	32.41	33.77	4.58	0	6.87	0	8.34
32.94	24.01	29.43	4.55	0	6.82	0	8.28
24.37	17.35	20.44	4.51	0	6.74	0	8.24
18.89	16.59	17.31	4.45	0	6.66	0	8.18
17.53	15.32	16.36	4.45	0	6.64	0	8.16
16.8	14.92	16.16	4.45	0	6.6	0	8.14
16.04	14.83	15.5	4.45	0	6.58	0	8.14
15.97	13.5	14.88	4.44	0	6.56	0	8.14
16.91	13.1	14.8	4.44	0	6.56	0	8.14
15.32	13.28	14.12	4.44	0	6.56	0	8.14
14.29	11.92	12.73	4.42	0	6.55	0	8.14
13.39	10.34	11.78	4.38	0	6.53	0	8.12
12.54	10.18	11.39	4.36	0	6.51	0	8.14
13.49	10.42	11.47	4.31	0	6.49	0	8.12
15.09	11.31	13.21	4.27	0	6.49	0	8.12
20.46	14.64	17.19	4.24	0	6.49	0	8.14
22.73	20.46	21.49	4.18	0	6.47	0	8.12
25.93	22.08	23.77	4.15	0	6.45	0	8.12
28.81	25.82	27.34	4.18	0	6.51	0	8.2
33.32	28.47	30.61	4.26	0	6.6	0	8.32
37.26	32.93	34.98	4.4	0	6.76	0	8.48
38.95	36.25	38.03	4.6	0	6.95	0	8.68
39.97	38.26	39	4.66	0	6.99	0	8.74
39.96	38.06	39.05	4.58	0	6.87	0	8.64
39.09	36.3	37.8	4.47	0	6.74	0	8.5
36.67	27.53	33.24	4.36	0	6.6	0	8.38
27.46	20.2	21.76	4.33	0	6.53	0	8.3
20.55	19.71	20.21	4.29	0	6.45	0	8.24
21.05	19.66	20.29	4.27	0	6.41	0	8.2
22.7	20.91	21.45	4.29	0	6.39	0	8.2
23.55	21.23	22.39	4.29	0	6.39	0	8.2
21.23	18.36	19.41	4.31	0	6.39	0	8.2
18.84	17.82	18.25	4.31	0	6.37	0	8.2
19.38	18.21	18.85	4.31	0	6.34	0	8.18

21.27	18.71	19.73	4.31	0	6.34	0	8.18
20.65	17.82	18.96	4.31	0	6.32	0	8.18
19.84	17.42	18.49	4.31	0	6.32	0	8.18
17.49	15.6	16.61	4.29	0	6.3	0	8.18
15.81	13.63	14.39	4.26	0	6.3	0	8.16
19.36	14.15	15.45	4.2	0	6.26	0	8.16
30.59	19.41	26.76	4.09	0	6.2	0	8.08
32.4	29.47	30.89	4.13	0	6.26	0	8.18
35.74	32.09	33.72	4.17	0	6.35	0	8.26
36.47	33.98	35.15	4.26	0	6.45	0	8.36
38.07	35.32	36.57	4.36	0	6.56	0	8.5
39.47	37.01	38.3	4.49	0	6.68	0	8.64
40.62	38.4	39.4	4.55	0	6.72	0	8.68
40.77	39.29	40.11	4.53	0	6.68	0	8.64
40.97	39.23	39.81	4.44	0	6.55	0	8.5
39.43	28.91	36.38	4.35	0	6.43	0	8.4
28.75	22.6	23.87	4.33	0	6.35	0	8.32
23.36	21.76	22.56	4.27	0	6.26	0	8.24
23.48	20.51	21.57	4.27	0	6.22	0	8.2
22.2	19.24	20.67	4.27	0	6.2	0	8.18
22.5	19.27	20.87	4.27	0	6.18	0	8.18
20.13	18	19.02	4.29	0	6.18	0	8.18
19.69	17.03	18.62	4.29	0	6.16	0	8.16
19	17.38	18.13	4.29	0	6.16	0	8.16
17.67	16.49	17.15	4.29	0	6.14	0	8.16
17.45	14.53	15.93	4.29	0	6.13	0	8.14
15.47	13.73	14.79	4.27	0	6.13	0	8.14
14.8	13.81	14.25	4.26	0	6.13	0	8.14
14.9	13.41	14.11	4.24	0	6.11	0	8.14
18.7	12.93	14.56	4.18	0	6.09	0	8.12
29.83	18.74	26.03	4.09	0	6.03	0	8.06
31.75	28.97	30.16	4.11	0	6.11	0	8.14
34.74	31.11	32.8	4.17	0	6.18	0	8.22
37.74	34.49	35.81	4.26	0	6.3	0	8.34
40.46	36.48	37.92	4.38	0	6.43	0	8.5
43.42	38.88	41.28	4.55	0	6.6	0	8.68
44.48	42.03	43.38	4.67	0	6.72	0	8.8
44.38	43.01	43.62	4.66	0	6.68	0	8.76
43.66	41.67	42.53	4.51	0	6.49	0	8.58
41.6	32.31	38.12	4.38	0	6.32	0	8.38
32.28	23.52	25.88	4.31	0	6.2	0	8.28
24.06	22.43	23.22	4.27	0	6.13	0	8.2
23.83	21.59	22.96	4.27	0	6.09	0	8.16
24.09	21.88	22.96	4.27	0	6.07	0	8.14
23.02	20.22	21.62	4.29	0	6.05	0	8.14
25.5	22.7	24.12	4.29	0	6.03	0	8.12
25.64	22.02	23.18	4.29	0	6.03	0	8.12

22.7	21.09	22.07	4.31	0	6.03	0	8.12
21.7	19.93	20.96	4.31	0	6.01	0	8.12
20.52	18.26	19.47	4.29	0	6.01	0	8.1
20.49	17.49	18.62	4.29	0	5.99	0	8.08
19.11	17.3	18.17	4.27	0	5.99	0	8.08
17.77	14.77	15.77	4.27	0	5.99	0	8.08
26.44	17.82	20.61	4.22	0	5.96	0	8.06
37.2	26.44	32.54	4.17	0	5.9	0	8
40.04	37.27	38.84	4.22	0	5.99	0	8.1
43.33	39.85	41.1	4.31	0	6.13	0	8.24
44.84	42.05	43.38	4.51	0	6.34	0	8.46
47.37	44.25	45.64	4.77	0	6.64	0	8.78
51.88	46.88	48.96	5.13	0	7.01	0	9.2
52.64	49.6	51.55	5.34	0	7.22	0	9.42
53.68	51.96	52.82	5.23	0	7.07	0	9.26
53.2	51.96	52.4	4.93	0	6.7	0	8.87
52.18	35.17	48.33	4.67	0	6.37	0	8.52
35.1	31.17	33.09	4.56	0	6.16	0	8.3
39.06	30.19	34.09	4.53	0	6.05	0	8.18
33.7	26.86	29.38	4.55	0	5.99	0	8.12
35.37	29.07	32.48	4.53	0	5.97	0	8.1
34.29	26.85	31.89	4.53	0	5.96	0	8.1
31.38	25.6	29.03	4.53	0	5.96	0	8.08
28.9	26.3	27.64	4.51	0	5.94	0	8.08
32.35	24.42	27.2	4.49	0	5.92	0	8.06
29.85	25.95	27.44	4.47	0	5.92	0	8.06
27.59	22.24	24.9	4.45	0	5.92	0	8.04
25.28	21.91	23.11	4.44	0	5.92	0	8.04
26.81	21.45	24.33	4.44	0	5.9	0	8.04
30.54	25.07	27.35	4.42	0	5.9	0	8.04
30.61	24.4	26.44	4.38	0	5.88	0	8.02
43.25	30.64	37.92	4.33	0	5.84	0	7.96
45.1	42.81	43.76	4.42	0	5.96	0	8.08
47.51	44.62	46.24	4.56	0	6.13	0	8.26
50.56	46.91	48.89	4.88	0	6.45	0	8.6
53.79	49.42	51.36	5.23	0	6.83	0	9.01
55.09	52.12	53.65	5.69	0.168	7.32	0	9.51
56.83	54.74	55.87	5.82	0.173	7.4	0	9.61
57.52	55.66	56.53	5.73	0.179	7.18	0	9.38
57.5	55.26	56.58	5.6	0	6.82	0	8.99
55.3	45.51	51.48	5.43	0	6.43	0	8.58
45.45	35.7	43.45	5.36	0	6.16	0	8.3
37.88	34.09	36.12	5.3	0	6.01	0	8.14
35.19	31.95	33.25	5.26	0	5.97	0	8.08
33.32	30.26	32.57	5.21	0	5.94	0	8.06
31.83	29.52	30.45	5.13	0	5.94	0	8.02
35.52	30.64	32.79	5.08	0	5.92	0	8.02

31.97	30.24	31.39	5	0	5.9	0	8
32.31	30.33	31.2	4.95	0	5.92	0	8
32.64	30.76	31.89	4.89	0	5.92	0	8
31.72	29.42	30.74	4.86	0	5.92	0	8
34.76	28.07	30	4.8	0	5.92	0	8
31.7	27.57	29.14	4.77	0	5.92	0	7.98
28.56	25.97	26.92	4.73	0	5.92	0	7.98
32.97	25.28	27.99	4.67	0	5.9	0	7.94
45.51	32.98	40.02	4.6	0	5.84	0	7.9
48.2	45.58	46.99	4.67	0	5.97	0	8.02
50.93	47.92	49.35	4.86	0	6.18	0	8.22
52.58	49.96	51.54	5.21	0	6.56	0	8.64
55.43	51.71	53.59	5.62	0.171	6.99	0	9.09
57.47	53.64	55.35	6.13	0.17	7.48	0	9.59
58.15	55.8	57.21	6.37	0.175	7.54	0	9.68
59.16	57.49	58.26	6.51	0.178	7.36	0	9.47
59.23	57.45	58.29	6.47	0.182	6.95	0	9.01
57.57	40.52	53.48	6.34	0.186	6.51	0	8.54
40.5	36.52	38.03	6.24	0	6.2	0	8.22
37.42	34.49	35.69	6.2	0	6.05	0	8.06
36.15	33.9	34.95	6.13	0	6.01	0	8.02
35.1	32.55	33.78	6.05	0	5.99	0	8
34.17	31.59	33.29	5.94	0	5.99	0	7.98
31.54	29.29	30.29	5.82	0	5.97	0	7.96
31.4	28.39	29.93	5.69	0	5.97	0	7.94
29.83	28.27	28.92	5.58	0	5.97	0	7.94
29.54	27.76	28.67	5.49	0	5.97	0	7.94
28.59	26.96	27.98	5.39	0	5.97	0	7.92
29.11	27.06	28.15	5.3	0	5.99	0	7.92
28.32	25.71	26.72	5.23	0	5.99	0	7.92
26.3	24.72	25.7	5.13	0	5.99	0	7.9
31.75	24.47	26.56	5.06	0	5.97	0	7.86
44.89	31.78	39.27	4.95	0	5.94	0	7.84
47.12	44.25	45.51	5	0	6.07	0	7.94
49.36	46.51	47.93	5.15	0	6.26	0	8.16
52.98	48.88	50.63	5.45	0	6.6	0	8.5
55.82	52.11	54.03	5.88	0.17	7.07	0	8.99
58.01	55.43	56.61	6.47	0.169	7.62	0	9.57
59.73	56.73	58.11	6.72	0.178	7.62	0	9.55
61.16	58.47	59.31	6.85	0.184	7.38	0	9.3
59.1	55.78	57.37	6.91	0.189	7.03	0	8.93
56.1	47.32	53.33	6.83	0.191	6.58	0	8.44
47.13	34.63	37.51	6.85	0.186	6.37	0	8.22
35.29	33.56	34.48	6.8	0.19	6.2	0	8.02
33.96	33.08	33.64	6.74	0	6.14	0	7.96
35.88	32.76	33.94	6.64	0	6.13	0	7.94
35.36	30.4	33.52	6.51	0	6.13	0	7.94

31.13	29.46	30.36	6.37	0	6.13	0	7.92
32.53	29.54	30.59	6.22	0	6.13	0	7.9
34.59	30.28	32.57	6.09	0	6.13	0	7.9
30.87	28.72	29.74	5.97	0	6.14	0	7.9
29.73	28.01	28.97	5.84	0	6.14	0	7.9
29.7	26.36	27.67	5.73	0	6.14	0	7.88
27.03	24.15	25.17	5.62	0	6.14	0	7.88
24.58	23.16	23.84	5.5	0	6.16	0	7.88
32.16	23.91	27.01	5.39	0	6.13	0	7.84
46.5	32.21	39.98	5.28	0	6.11	0	7.8
49	46.14	47.45	5.32	0	6.24	0	7.92
51.6	48.37	49.76	5.45	0	6.47	0	8.14
54.51	50.98	52.41	5.77	0	6.83	0	8.52
57.48	53.55	55.01	6.26	0.171	7.34	0	9.05
59.34	55.98	57.86	6.99	0.173	7.98	0	9.72
61.3	58.38	59.8	7.56	0.181	8.24	0	9.97
61.17	59.52	60.37	7.84	0.19	8.06	0	9.76
61.37	58.65	59.88	7.82	0.194	7.54	0	9.24
58.81	49.42	55.26	7.62	0.193	6.97	0	8.62
49.45	36.51	38.65	7.48	0.19	6.56	0	8.2
37.58	35.54	36.53	7.42	0.194	6.39	0	8.02
38.53	35.3	36.89	7.36	0.192	6.35	0	7.96
35.69	34.5	35.17	7.24	0.192	6.34	0	7.94
36.61	34.08	35.29	7.11	0.192	6.34	0	7.94
35.6	33.75	34.61	6.97	0.191	6.34	0	7.92
35.5	31.93	33.31	6.82	0.19	6.34	0	7.92
32.86	29.67	31.19	6.68	0	6.34	0	7.92
29.95	28.74	29.41	6.53	0	6.34	0	7.9
30.05	29.28	29.63	6.37	0	6.34	0	7.88
29.31	28.2	28.63	6.24	0	6.35	0	7.88
28.62	27.8	28.24	6.11	0	6.35	0	7.88
28.23	26.05	27.06	5.97	0	6.37	0	7.88
33.06	25.84	27.78	5.84	0	6.35	0	7.86
43.16	33.09	39.99	5.69	0	6.34	0	7.8
45.21	43.16	44.07	5.71	0	6.45	0	7.92
49.87	45.14	47.37	5.82	0	6.66	0	8.12
52.74	49.19	50.91	6.09	0.178	7.01	0	8.48
56.34	52.1	54.3	6.6	0.172	7.52	0	9.01
58.78	55.1	57.12	7.4	0.175	8.14	0	9.63
61.97	58.46	59.93	8.02	0.184	8.4	0	9.89
62.28	60.18	60.96	8.4	0.192	8.32	0	9.82
61.86	60.32	61.09	8.4	0.197	7.88	0	9.34
60.28	49.63	56.5	8.18	0.196	7.28	0	8.72
49.5	37.7	40.45	7.98	0.195	6.85	0	8.26
38.28	37.08	37.51	7.88	0.195	6.64	0	8.04
38.39	36.88	37.85	7.82	0.196	6.6	0	8
37.02	36	36.39	7.7	0.197	6.6	0	7.98

36.15	35.03	35.61	7.58	0.194	6.58	0	7.96
37.04	35.4	36.08	7.42	0.194	6.58	0	7.96
39.37	36.58	37.59	7.28	0.193	6.58	0	7.94
37.25	34.21	35.37	7.13	0.192	6.6	0	7.94
34.62	32.4	33.43	6.99	0.19	6.6	0	7.94
32.79	30.66	31.84	6.85	0	6.6	0	7.94
31.86	29.57	30.72	6.7	0	6.62	0	7.92
30.99	29.45	30.41	6.56	0	6.62	0	7.92
31.45	29.97	30.72	6.43	0	6.64	0	7.92
35.67	28.83	30.94	6.28	0	6.62	0	7.88
47.18	35.71	43.42	6.13	0	6.6	0	7.86
51.2	47.18	48.79	6.14	0	6.76	0	8
54.27	50.36	52.35	6.32	0.185	7.01	0	8.26
58.99	53.68	56.18	6.78	0.175	7.52	0	8.78
61.92	58.19	59.97	7.58	0.173	8.24	0	9.53
63.25	60.72	61.86	8.54	0.18	8.99	0	10.29
67.8	62.64	65.42	9.22	0.193	9.28	0	10.57
68.08	64.95	66.64	9.61	0.195	9.2	0	10.48
65.52	61.08	63.5	9.44	0.201	8.6	0	9.84
61.08	45.27	57.44	8.89	0.198	7.7	0	8.91
45.22	42.38	43.48	8.56	0.197	7.15	0	8.34
47.49	44.21	45.47	8.46	0.198	6.95	0	8.14
47.35	42.02	44.31	8.4	0.197	6.91	0	8.1
50.07	42.4	45.89	8.3	0.196	6.89	0	8.06
48.96	41.18	43.31	8.16	0.195	6.89	0	8.06
43.11	38.82	41.62	8.02	0.196	6.89	0	8.06
46.93	35.14	41.71	7.88	0.194	6.89	0	8.04
45.42	39.18	42.98	7.74	0.194	6.91	0	8.04
39.08	35.55	36.4	7.62	0.194	6.91	0	8.04
42.44	35.12	37.41	7.46	0.191	6.91	0	8.02
37.21	33	34.52	7.34	0.191	6.91	0	8.02
36.81	34.27	35.37	7.2	0.193	6.93	0	8.02
36.36	33	34.64	7.07	0.19	6.95	0	8.02
37.51	31.9	33.46	6.89	0.192	6.93	0	7.98
47.62	37.58	44.21	6.74	0.194	6.91	0	7.96
51.33	47.13	49.78	6.76	0.191	7.07	0	8.08
54.54	51.28	52.64	6.85	0.189	7.24	0	8.26
59.55	54.45	57.5	7.2	0.183	7.56	0	8.58
63.32	58.55	61.03	8.24	0.173	8.5	0	9.55
66.31	62.09	64.58	9.49	0.175	9.53	0	10.59
65.59	63.77	64.62	10.14	0.186	9.82	0	10.87
64.66	62.99	63.98	9.95	0.19	9.26	0	10.29
64.17	61.32	63.1	9.49	0.198	8.48	0	9.47
61.3	54.3	58.71	9.2	0.198	7.94	0	8.91
54.52	51.36	53.11	8.95	0.195	7.52	0	8.48
51.59	49.14	50.38	8.8	0.198	7.34	0	8.3
49.4	48.08	48.78	8.74	0.198	7.3	0	8.24

49.56	47.59	48.61	8.64	0.196	7.26	0	8.2
48.16	46.5	47.07	8.54	0.197	7.26	0	8.2
46.98	42.16	45.29	8.42	0.195	7.26	0	8.18
42.23	34.86	37.11	8.3	0.196	7.24	0	8.14
39.85	33.23	35.87	8.14	0.194	7.22	0	8.12
36.73	34.4	35.44	8	0.195	7.22	0	8.1
39.03	35.48	37.39	7.86	0.194	7.24	0	8.12
38.02	36.01	36.98	7.72	0.193	7.26	0	8.12
38.88	32.86	35.57	7.58	0.193	7.28	0	8.12
34.27	31.35	32.99	7.44	0.192	7.28	0	8.12
39.05	32.78	34.35	7.26	0.193	7.26	0	8.08
51.08	39.12	45.32	7.11	0.197	7.24	0	8.06
52.68	49.59	51.04	7.15	0.192	7.4	0	8.2
54.65	51.55	53.14	7.34	0.184	7.7	0	8.48
57.62	53.94	56.01	7.88	0.175	8.24	0	9.03
59.3	56.64	57.91	8.54	0.17	8.82	0	9.61
62.47	58.04	59.68	9.38	0.179	9.4	0	10.23
62.31	60.01	61.11	9.8	0.188	9.49	0	10.29
62.67	60.95	61.69	10.08	0.197	9.34	0	10.14
62.88	60.94	61.62	9.99	0.197	8.85	0	9.61
62.2	54.86	59.73	9.76	0.2	8.3	0	9.05
54.84	44.83	50.35	9.61	0.198	7.94	0	8.68
45.9	39.39	41.13	9.44	0.199	7.66	0	8.4
43.43	40.11	41.9	9.32	0.2	7.58	0	8.3
42.36	38.94	41.06	9.22	0.201	7.56	0	8.28
39.42	37.57	38.39	9.07	0.197	7.56	0	8.28
38.73	36.34	37.67	8.91	0.199	7.54	0	8.26
36.85	35.84	36.21	8.74	0.199	7.56	0	8.24
36.57	33.95	35.32	8.58	0.198	7.56	0	8.26
37.4	34.11	35.96	8.42	0.196	7.56	0	8.24
35.76	33.13	34.46	8.26	0.195	7.58	0	8.24
33.22	31.5	32.1	8.12	0.195	7.6	0	8.24
32.69	30.71	31.83	7.98	0.196	7.6	0	8.24
31.69	29.64	30.48	7.82	0.195	7.62	0	8.24
36.28	29.63	31.45	7.64	0.196	7.6	0	8.2
49.69	36.32	43.7	7.46	0.196	7.58	0	8.16
54.31	48.9	51.26	7.46	0.194	7.72	0	8.32
56.5	53.5	55.11	7.62	0.189	8	0	8.56
59.71	55.59	57.48	8.14	0.179	8.52	0	9.09
61.95	58.23	59.94	8.91	0.175	9.22	0	9.8
63.5	60.45	61.97	9.8	0.186	9.86	0	10.46
64.26	62.19	63.31	10.42	0.197	10.1	0	10.68
64.78	63.04	63.99	10.74	0.202	9.99	0	10.57
64.13	62.6	63.25	10.57	0.203	9.4	0	9.97
62.98	53.76	59.67	10.18	0.203	8.7	0	9.24
53.7	41.54	45.82	9.91	0.199	8.24	0	8.76
41.47	40.15	40.78	9.72	0.202	7.96	0	8.5

40.38	38.63	39.44	9.61	0.202	7.9	0	8.42
39.86	38.07	39.04	9.47	0.201	7.88	0	8.42
39.42	34.11	36.34	9.3	0.2	7.88	0	8.4
41.91	36.02	38.72	9.13	0.198	7.88	0	8.38
36.82	32.78	34.78	8.99	0.198	7.9	0	8.4
36.03	32.61	34.44	8.8	0.197	7.9	0	8.38
34.66	32.6	33.47	8.64	0.197	7.9	0	8.38
34.26	31.41	32.3	8.48	0.197	7.92	0	8.38
31.4	27.72	29.42	8.32	0.197	7.92	0	8.38
30.11	28.86	29.48	8.16	0.196	7.94	0	8.38
31.23	28.77	29.93	8	0.197	7.94	0	8.38
34.44	27.92	29.73	7.82	0.195	7.92	0	8.36
44.45	34.54	42.15	7.58	0.198	7.88	0	8.28
48.76	44.38	46.1	7.62	0.192	8.06	0	8.46
51.57	48.04	50	7.76	0.189	8.28	0	8.68
56.92	50.65	53.85	8.16	0.179	8.68	0	9.09
61.5	55.99	58.53	8.93	0.175	9.38	0	9.78
67.49	60.78	63.93	10.03	0.179	10.27	0	10.68
74.86	66.08	70.03	10.87	0.193	10.74	0	11.16
74.02	71.79	72.98	11.49	0.202	10.92	0	11.33
72.25	67.27	69.4	11.27	0.205	10.25	0	10.66
67.54	60.72	64.68	10.68	0.206	9.36	0	9.76
61.38	57.9	59.34	10.25	0.202	8.74	0	9.13
59.26	52.8	56.66	10.08	0.201	8.48	0	8.87
56.66	50.37	53.3	9.97	0.202	8.38	0	8.76
57.94	52.32	55.58	9.84	0.202	8.32	0	8.7
58.04	55.05	56.75	9.78	0.2	8.34	0	8.7
58.15	55.02	57.21	9.72	0.198	8.38	0	8.76
56.69	54.71	56.05	9.65	0.199	8.42	0	8.78
56.84	55.35	56.05	9.61	0.198	8.42	0	8.78
55.66	54.22	55.04	9.57	0.196	8.46	0	8.8
55.6	52.69	54.26	9.55	0.196	8.48	0	8.82
52.92	43.28	47.96	9.49	0.198	8.48	0	8.8
48.46	40.31	45.07	9.36	0.197	8.4	0	8.72
53.07	42.02	46.79	9.26	0.196	8.36	0	8.68
55.03	52.16	53.38	9.11	0.199	8.34	0	8.64
57.34	53.66	55.5	9.07	0.2	8.4	0	8.68
57.53	55.66	56.57	9.22	0.196	8.6	0	8.89
63.69	56.13	59.79	9.38	0.192	8.78	0	9.07
65.18	59.66	62.38	9.8	0.187	9.17	0	9.44
65.1	61.7	62.95	10.44	0.183	9.7	0	9.97
65.89	63.27	64.32	10.94	0.188	10.06	0	10.31
65.55	63.22	64.46	11.4	0.196	10.29	0	10.55
65.07	62.97	63.93	11.42	0.2	10.08	0	10.33
63.59	61.15	62.23	11.2	0.201	9.68	0	9.91
61.37	58.09	59.68	10.92	0.205	9.24	0	9.47
58.17	55.83	57.03	10.72	0.199	8.95	0	9.17

56.14	53.21	54.75	10.57	0.202	8.8	0	9.01
54.03	52.41	53.2	10.46	0.202	8.74	0	8.95
53.66	49.96	51.7	10.38	0.2	8.74	0	8.91
51.55	46.42	49.59	10.25	0.2	8.7	0	8.89
50.83	43.83	47.02	10.08	0.202	8.66	0	8.82
46.78	42.15	43.98	9.93	0.2	8.66	0	8.82
45.87	39.78	43.57	9.78	0.2	8.68	0	8.82
41.19	35.37	37.89	9.61	0.201	8.68	0	8.8
38.1	36.13	36.89	9.44	0.198	8.66	0	8.78
38.47	35.92	37.12	9.28	0.196	8.68	0	8.78
36.19	33.55	34.68	9.11	0.197	8.7	0	8.78
36.17	34.77	35.57	8.97	0.196	8.7	0	8.78
39.42	35.62	37.26	8.82	0.195	8.72	0	8.8
46.23	39.43	42.81	8.64	0.197	8.68	0	8.74
49.51	45.55	46.92	8.6	0.196	8.74	0	8.8
51.65	49.2	50.4	8.68	0.192	8.91	0	8.95
56.85	51.09	54.07	8.95	0.187	9.13	0	9.2
62.44	55.72	57.34	9.53	0.179	9.59	0	9.65
68.53	62.5	66.66	10.23	0.178	10.08	0	10.14
68.78	64.14	67.04	11.47	0.178	11.05	0	11.09
67.86	66.13	66.83	11.76	0.192	11	0	11.05
66.7	64.63	65.64	11.58	0.2	10.55	0	10.59
64.92	59.37	62.46	11.11	0.202	9.86	0	9.91
59.41	52.21	54.74	10.79	0.2	9.4	0	9.44
52.54	49.71	51.47	10.57	0.199	9.13	0	9.17
53.14	42.74	49.74	10.46	0.199	9.05	0	9.07
48.21	40.5	46.29	10.35	0.199	9.01	0	9.05
47.03	38.03	42.28	10.18	0.202	8.97	0	9.01
46.27	40.41	44.25	10.01	0.199	8.95	0	8.99
50.53	39.89	46.74	9.89	0.2	8.97	0	8.99
48.89	46.12	47.16	9.76	0.198	8.99	0	9.01
46.22	43.23	44.21	9.63	0.197	9.01	0	9.03
44.49	41.14	42.81	9.51	0.197	9.01	0	9.01
46.7	40.49	43.58	9.38	0.197	9.01	0	9.01
46.11	41.11	43.82	9.26	0.194	9.01	0	9.01
42.23	36.81	40.24	9.13	0.195	9.03	0	9.03
41.89	35.9	38.92	8.97	0.197	8.99	0	8.97
50.84	42	47.54	8.82	0.199	8.99	0	8.97
55.39	50.16	52.32	8.87	0.194	9.13	0	9.11
60.55	54.91	56.88	9.07	0.19	9.44	0	9.42
63.76	59.7	61.44	9.68	0.179	10.06	0	10.03
63.23	60.15	61.67	10.59	0.176	10.87	0	10.87
67.07	61.93	63.81	11.36	0.187	11.4	0	11.38
68.24	64.92	66.56	12.16	0.199	11.82	0	11.8
68.85	65.81	67.46	12.48	0.207	11.71	0	11.69
67.49	63.93	65.52	12.12	0.208	10.94	0	10.92
63.95	56.28	61.31	11.58	0.206	10.1	0	10.08

56.28	42.04	47.24	11.27	0.203	9.61	0	9.59
44.86	42.01	43.32	11.07	0.204	9.32	0	9.32
44.16	42.5	43.25	10.94	0.203	9.26	0	9.24
42.64	39.68	41.87	10.79	0.204	9.24	0	9.22
40.88	36.88	38.74	10.61	0.202	9.24	0	9.2
40.49	36.83	38.49	10.44	0.201	9.22	0	9.2
40.87	37.86	39.11	10.27	0.2	9.22	0	9.2
39.8	35.65	37.55	10.08	0.2	9.24	0	9.2
36.41	34.89	35.77	9.93	0.199	9.24	0	9.2
35.46	34.45	34.84	9.74	0.196	9.24	0	9.2
34.92	32.7	33.69	9.57	0.198	9.26	0	9.2
36.3	30.59	33.04	9.4	0.196	9.26	0	9.2
31.85	29.16	30.35	9.26	0.194	9.26	0	9.2
39.91	30.87	33.68	9.05	0.197	9.24	0	9.15
52.5	39.98	47.5	8.89	0.198	9.24	0	9.15
53.55	51.92	52.76	8.91	0.195	9.42	0	9.32
56.1	53.18	54.37	9.07	0.189	9.68	0	9.59
59.41	55.2	57.32	9.49	0.18	10.12	0	10.01
60.89	58.15	59.87	10.14	0.174	10.68	0	10.59
62.6	59.64	60.99	10.92	0.178	11.2	0	11.11
64.42	61.48	63.23	11.44	0.188	11.38	0	11.29
65.72	63.65	64.63	11.78	0.196	11.29	0	11.2
65.19	63.27	63.95	11.69	0.199	10.79	0	10.7
63.37	58.69	61.48	11.4	0.202	10.18	0	10.1
58.73	43.26	47.09	11.24	0.201	9.82	0	9.74
52.19	43.22	46.32	11.07	0.201	9.59	0	9.51
50.65	47.52	49.01	10.96	0.2	9.53	0	9.44
50.11	45.73	48.18	10.85	0.199	9.53	0	9.44
45.91	44.3	44.9	10.72	0.2	9.53	0	9.44
46.01	43.4	44.88	10.57	0.2	9.53	0	9.44
48.87	41.62	46.86	10.44	0.198	9.55	0	9.47
43.64	39.91	41.53	10.29	0.2	9.53	0	9.44
45.81	43.65	44.7	10.14	0.197	9.53	0	9.44
45.02	38.75	42.26	10.01	0.197	9.53	0	9.42
44.15	35.95	40.64	9.89	0.195	9.55	0	9.44
41.02	36.7	38.95	9.74	0.195	9.55	0	9.44
42.08	35.77	39.37	9.61	0.196	9.55	0	9.44
43.52	35.48	38.84	9.42	0.197	9.51	0	9.4
49.05	43.59	46.88	9.32	0.198	9.55	0	9.42
53.9	48.82	50.96	9.34	0.195	9.7	0	9.57
57.59	53.55	55.55	9.51	0.188	9.93	0	9.8
59.16	54.96	56.93	9.99	0.175	10.42	0	10.27
61.14	56.05	59.16	10.16	0.18	10.5	0	10.38
61.14	56.78	59.51	10.96	0.169	11.13	0	11
60.3	57.65	58.88	11.31	0.178	11.24	0	11.11
58.98	56.98	58.04	11.27	0.186	10.89	0	10.79
58.38	54.62	56.41	11.09	0.192	10.5	0	10.38

54.75	50.53	52.75	10.92	0.195	10.14	0	10.01
50.52	47.45	49.24	10.87	0.197	9.97	0	9.84
47.84	42.57	46.25	10.76	0.196	9.84	0	9.72
43.69	42.43	43.07	10.68	0.199	9.8	0	9.68
44.37	40.28	42.31	10.55	0.198	9.76	0	9.65
41.66	34.36	38.22	10.4	0.197	9.74	0	9.63
36.85	30.15	34.35	10.25	0.198	9.72	0	9.61
33.22	25.32	29.19	10.06	0.198	9.7	0	9.59
28.62	26.21	27.38	9.86	0.197	9.7	0	9.57
33.65	23.82	28.52	9.68	0.195	9.68	0	9.57
34.27	27.99	30.69	9.49	0.195	9.7	0	9.57
34.68	32.07	33.59	9.32	0.194	9.7	0	9.59
32.1	28.13	30.08	9.15	0.191	9.72	0	9.61
29.38	25.34	26.66	8.99	0.191	9.72	0	9.59
32.43	26.63	29.1	8.74	0.195	9.63	0	9.53
37.35	32.48	35.18	8.62	0.195	9.7	0	9.55
40.09	36.94	38.72	8.56	0.192	9.8	0	9.65
41.77	39.02	40.33	8.52	0.188	9.89	0	9.76
44.07	40.38	42.08	8.6	0.186	10.01	0	9.86
45.64	42.4	43.92	8.8	0.182	10.14	0	10.01
48.23	43.83	45.89	9.11	0.177	10.27	0	10.16
48.4	45.8	47.08	9.49	0.179	10.33	0	10.23
48.75	46.56	47.64	9.8	0.182	10.27	0	10.18
47.94	45.58	46.84	10.03	0.188	10.14	0	10.06
46.19	41.31	44.08	10.18	0.193	10.01	0	9.93
41.27	35.39	38.65	10.33	0.191	9.97	0	9.91
35.37	27.53	29.93	10.27	0.193	9.86	0	9.82
33.22	27.97	30.74	10.14	0.196	9.8	0	9.76
33.51	25.02	29.57	9.97	0.194	9.78	0	9.74
28.72	21.9	25.19	9.78	0.195	9.76	0	9.74
24.58	21.73	23.17	9.59	0.194	9.76	0	9.74
23.9	21.73	22.9	9.4	0.193	9.76	0	9.74
23.57	21.66	22.7	9.2	0.195	9.76	0	9.74
23.39	21.55	22.56	9.01	0.192	9.74	0	9.74
22.63	19.97	21	8.8	0.191	9.74	0	9.74
22.52	19.57	21.32	8.64	0.189	9.76	0	9.76
20.89	18.91	19.94	8.48	0.188	9.76	0	9.76
19.78	17.79	18.71	8.3	0	9.76	0	9.76
30	18.03	22.47	8.06	0	9.68	0	9.7
36.7	30.09	34.91	7.92	0	9.72	0	9.74
40.38	35.79	37.7	7.88	0	9.82	0	9.82
43.98	39.53	41.89	7.9	0.182	9.93	0	9.95
47.72	42.64	45.01	8.02	0.18	10.06	0	10.1
49.26	45.38	47.11	8.28	0.173	10.23	0	10.27
51.19	47.79	49.31	8.72	0.169	10.4	0	10.46
52.87	49.4	51.07	9.22	0.168	10.53	0	10.59
53.14	51.1	51.99	9.63	0.171	10.48	0	10.57

52.71	50.92	51.83	9.91	0.18	10.31	0	10.42
51.28	45.93	49.76	10.08	0.188	10.12	0	10.23
45.92	31.85	38.84	10.23	0.191	10.03	0	10.16
32.51	31.53	32.03	10.2	0.191	9.89	0	10.01
32.14	30.91	31.41	10.12	0.194	9.82	0	9.97
32.55	30.9	31.67	9.97	0.193	9.8	0	9.95
33	32.05	32.52	9.82	0.194	9.78	0	9.95
32.94	31.18	31.92	9.65	0.193	9.76	0	9.95
32.07	30.45	31.36	9.49	0.194	9.76	0	9.97
30.47	28.67	29.36	9.32	0.191	9.76	0	9.97
29.66	28.17	28.79	9.15	0.191	9.76	0	9.95
28.96	26.79	28.08	8.99	0.189	9.76	0	9.95
26.76	24.32	25.75	8.85	0.19	9.76	0	9.97
24.8	22.67	23.69	8.68	0.189	9.76	0	9.97
22.98	21.01	22.22	8.52	0.186	9.74	0	9.97
33.45	21.63	25.99	8.3	0	9.68	0	9.89
43.26	33.5	39.98	8.16	0	9.72	0	9.93
48.34	43.17	45.78	8.14	0.187	9.82	0	10.06
50.75	47.77	49.44	8.2	0.184	9.97	0	10.18
53.99	49.56	51.36	8.42	0.178	10.18	0	10.42
56.14	51.87	54.05	8.8	0.168	10.44	0	10.7
58.34	54.92	56.39	9.38	0.155	10.76	0	11.03
59.85	56.95	58.57	9.95	0.16	10.94	0	11.2
59.6	57.89	58.79	10.35	0.17	10.85	0	11.13
59.26	57.64	58.54	10.55	0.181	10.57	0	10.87
57.81	52.33	56.21	10.61	0.188	10.27	0	10.55
52.3	38.08	44.3	10.7	0.193	10.08	0	10.38
38.23	37.17	37.78	10.63	0.194	9.93	0	10.23
37.86	36.4	36.96	10.55	0.195	9.84	0	10.16
37.16	35.62	36.27	10.42	0.195	9.82	0	10.14
35.96	34.84	35.52	10.27	0.194	9.8	0	10.14
36.65	35.04	35.67	10.1	0.193	9.8	0	10.14
37.56	35.81	36.74	9.93	0.194	9.8	0	10.14
36.1	32.6	34.43	9.78	0.193	9.8	0	10.14
33.34	32.36	32.81	9.61	0.191	9.8	0	10.14
32.88	30.44	31.45	9.44	0.192	9.78	0	10.12
30.39	28.31	29.43	9.3	0.191	9.8	0	10.14
28.54	27.07	27.84	9.13	0.19	9.8	0	10.12
28.46	27.05	27.66	8.99	0.191	9.78	0	10.12
41.17	27.04	32.76	8.78	0.192	9.74	0	10.06
50.17	41.24	47.45	8.64	0.192	9.76	0	10.08
50.53	49.24	49.95	8.66	0.188	9.91	0	10.23
53.51	49.45	51.33	8.74	0.185	10.06	0	10.4
56.25	52.34	53.97	9.01	0.176	10.31	0	10.63
59.51	55.04	57.28	9.47	0.163	10.66	0	11
62.86	58.72	60.5	10.18	0.155	11.09	0	11.44
64.42	61.7	62.94	10.85	0.16	11.38	0	11.73

66.33	63.34	64.78	11.2	0.175	11.24	0	11.62
66.17	63.93	64.81	11.36	0.184	10.94	0	11.29
64.48	57.63	62.09	11.36	0.19	10.55	0	10.89
57.55	43.28	49.23	11.33	0.194	10.27	0	10.61
43.6	41.97	42.67	11.22	0.198	10.03	0	10.4
42.74	38.23	40.84	11.13	0.197	9.97	0	10.31
41.48	37.93	40.25	11	0.197	9.93	0	10.29
44.01	40.11	42.51	10.85	0.195	9.93	0	10.27
46.42	41.49	43.96	10.7	0.195	9.93	0	10.27
43.32	39.7	41.5	10.53	0.195	9.93	0	10.29
42.8	39.9	41.27	10.38	0.195	9.93	0	10.29
40.78	36.62	38.81	10.23	0.192	9.93	0	10.27
37.41	34.88	35.77	10.08	0.192	9.93	0	10.27
36.97	33.61	34.84	9.93	0.194	9.93	0	10.25
35.31	32.93	33.93	9.76	0.193	9.93	0	10.25
33.68	31.07	31.98	9.63	0.19	9.93	0	10.25
38.34	32.21	34.81	9.44	0.194	9.91	0	10.2
53.18	38.12	47.96	9.28	0.194	9.89	0	10.18
55.97	53.02	54.05	9.32	0.189	10.06	0	10.35
57.66	54.23	55.66	9.44	0.184	10.23	0	10.53
63.05	56.64	60.09	9.74	0.178	10.48	0	10.79
65.98	61.63	63.15	10.46	0.164	11.09	0	11.38
68.28	64.22	65.97	11.33	0.158	11.67	0	11.98
71.61	65.67	69.42	12.09	0.166	12.03	0	12.34
71.41	69.47	70.33	12.78	0.177	12.25	0	12.57
70.37	68.2	69.4	12.66	0.187	11.73	0	12.05
68.24	64.32	66.35	12.23	0.198	10.98	0	11.27
64.47	58.36	61.49	12	0.196	10.55	0	10.85
62.12	55.75	58.23	11.87	0.199	10.33	0	10.63
58.73	53.47	54.9	11.78	0.198	10.27	0	10.55
56.18	52.73	54.3	11.67	0.198	10.23	0	10.5
56.24	54.92	55.55	11.58	0.196	10.2	0	10.48
55.49	54.77	55.12	11.47	0.198	10.2	0	10.48
55.28	53.67	54.63	11.38	0.196	10.23	0	10.48
54.74	53.24	54.12	11.29	0.196	10.23	0	10.48
54.43	53.15	53.72	11.2	0.195	10.23	0	10.48
54.15	42.94	49.03	11.09	0.194	10.25	0	10.48
49.29	45.03	47.19	10.98	0.195	10.23	0	10.44
51.08	47.52	49.22	10.87	0.197	10.2	0	10.44
51.28	46.78	49.19	10.76	0.195	10.23	0	10.44
50.78	43.38	47.17	10.61	0.196	10.2	0	10.4
56.69	49.65	54.06	10.53	0.198	10.23	0	10.4
59.48	55.92	57.83	10.61	0.193	10.42	0	10.59
62.71	59.1	61.01	10.85	0.182	10.72	0	10.89
63.89	61.25	62.42	11.31	0.169	11.18	0	11.36
66.5	62.89	64.58	11.96	0.16	11.71	0	11.87
68.82	64.44	66.68	12.76	0.164	12.25	0	12.41

70.79	66.15	68.31	13.32	0.177	12.43	0	12.57
69.89	67.62	68.79	13.98	0.185	12.64	0	12.78
67.6	64.06	65.94	13.67	0.193	11.96	0	12.09
64.18	60.18	63.09	12.96	0.199	11.07	0	11.18
60.13	53.23	56.81	12.73	0.2	10.74	0	10.83
55.23	49.01	51.62	12.59	0.2	10.57	0	10.68
54.82	52.39	53.52	12.43	0.201	10.5	0	10.59
55.66	54.4	55.09	12.32	0.201	10.5	0	10.57
55.55	53.77	54.69	12.21	0.201	10.53	0	10.59
54.12	52.83	53.37	12.09	0.199	10.53	0	10.59
53.67	52.65	53.12	11.98	0.198	10.55	0	10.59
53.08	50.81	52.14	11.89	0.198	10.57	0	10.59
50.98	47.98	49.46	11.78	0.197	10.57	0	10.61
49.6	47.13	48.27	11.67	0.197	10.57	0	10.57
48.41	44.3	46.99	11.53	0.198	10.55	0	10.55
45.07	41.12	43.08	11.42	0.197	10.57	0	10.55
49.05	40.92	45.18	11.29	0.197	10.57	0	10.53
51.19	48.61	50.02	11.09	0.2	10.5	0	10.46
57.05	50.38	54.42	11.03	0.199	10.61	0	10.53
60.84	56.14	58.37	11.09	0.192	10.76	0	10.68
64.75	60.75	62.45	11.38	0.183	11.09	0	11
66.93	63.34	65.15	12.05	0.164	11.76	0	11.67
68.86	65.47	67.02	13.08	0.154	12.66	0	12.57
69.5	67.02	68.01	13.91	0.166	13.24	0	13.15
70.45	67.06	68.52	14.37	0.18	13.39	0	13.27
69.8	67.79	68.68	14.42	0.188	13.1	0	12.99
69.16	67.07	68	14.03	0.195	12.43	0	12.3
67.2	63.47	65.51	13.48	0.198	11.69	0	11.55
63.45	59.34	61.23	13.15	0.201	11.27	0	11.11
59.68	52.89	56.37	12.99	0.203	11.05	0	10.89
54.21	51.74	52.73	12.83	0.202	10.94	0	10.76
54.61	51.02	53.05	12.69	0.2	10.89	0	10.72
51.72	49.62	50.41	12.57	0.199	10.89	0	10.7
54.08	50.03	52.68	12.43	0.199	10.89	0	10.7
53.33	51.28	52.74	12.3	0.199	10.89	0	10.7
53.37	52.08	52.82	12.16	0.198	10.92	0	10.7
52.91	51.39	52.12	12.05	0.199	10.94	0	10.7
52.84	50.93	52.04	11.93	0.198	10.94	0	10.7
51.18	46.99	49.05	11.82	0.198	10.96	0	10.7
50.72	47.38	48.4	11.71	0.196	10.96	0	10.7
51.19	48.23	49.72	11.6	0.196	10.96	0	10.68
56.32	48.64	52.44	11.42	0.198	10.92	0	10.61
59.99	56.32	58.38	11.4	0.197	10.98	0	10.68
62.06	59.83	60.66	11.49	0.193	11.18	0	10.87
64.93	60.98	63.01	11.69	0.188	11.4	0	11.09
66.98	63.56	65.35	12.32	0.168	12.03	0	11.69
68.93	65.57	67.02	13.58	0.151	13.13	0	12.8

71.52	67.16	69.17	14.74	0.167	14.05	0	13.69
71.48	68.25	69.69	15.26	0.18	14.22	0	13.86
71.44	69.1	70.15	15.03	0.192	13.65	0	13.29
70.73	66.72	68.29	14.74	0.197	13.06	0	12.69
67.8	65.51	66.13	13.96	0.199	12.09	0	11.73
65.51	54.56	60.11	13.62	0.202	11.64	0	11.29
55.6	46.33	50.52	13.41	0.202	11.4	0	11.03
51.13	47.35	49.16	13.2	0.204	11.27	0	10.89
51.56	49.24	50.34	13.06	0.202	11.22	0	10.85
57.24	48.65	50.66	12.92	0.204	11.24	0	10.85
57.61	51.32	53.83	12.76	0.201	11.24	0	10.87
55.95	51.18	52.7	12.64	0.201	11.27	0	10.87
55.8	54.12	55.09	12.5	0.198	11.29	0	10.89
56.78	52.8	54.96	12.39	0.198	11.31	0	10.89
54.84	52.46	53.99	12.3	0.198	11.33	0	10.92
57.06	49.92	53.83	12.21	0.197	11.36	0	10.92
53.75	46.98	50.18	12.09	0.198	11.36	0	10.89
55.96	45.28	52.54	11.98	0.198	11.33	0	10.87
54.79	45.78	49.42	11.8	0.2	11.27	0	10.81
61.54	53.79	57.95	11.76	0.198	11.36	0	10.87
65.19	60.99	62.83	11.85	0.193	11.53	0	11.05
67.45	64.38	65.75	12.14	0.185	11.87	0	11.36
69.2	65.72	67.49	12.66	0.169	12.37	0	11.89
70.01	67.65	68.9	13.6	0.157	13.2	0	12.69
72.47	68.36	70.41	14.66	0.162	14.03	0	13.5
72.51	70.47	71.39	15.41	0.179	14.47	0	13.93
72.79	70.49	71.55	15.28	0.187	14.03	0	13.48
72.24	70.66	71.29	14.81	0.196	13.29	0	12.76
70.85	66.16	68.82	14.25	0.201	12.55	0	12.03
66.12	56.86	60.97	13.86	0.203	12.03	0	11.51
59.91	55.14	56.3	13.62	0.202	11.73	0	11.2
60.18	53.09	56.31	13.46	0.203	11.62	0	11.09
58.93	50.48	53.42	13.34	0.202	11.6	0	11.07
52.09	49.53	51.06	13.2	0.201	11.6	0	11.07
52.15	48.98	50.56	13.03	0.202	11.6	0	11.05
50.26	46.45	48.9	12.87	0.201	11.6	0	11.05
49.58	44.84	47.93	12.71	0.198	11.58	0	11.03
49.36	47.82	48.57	12.57	0.199	11.6	0	11.05
49.29	45.14	47.54	12.43	0.197	11.62	0	11.05
49.99	44.37	45.93	12.32	0.198	11.64	0	11.05
46.64	43.99	45.41	12.18	0.198	11.64	0	11.05
45.98	37.21	41.72	12.05	0.198	11.64	0	11.05
46.33	34.32	38.26	11.87	0.199	11.6	0	11
56.7	46.4	53.44	11.71	0.2	11.6	0	10.98
60.41	55.56	57.69	11.76	0.194	11.78	0	11.16
63.74	59.71	61.52	11.96	0.185	12.09	0	11.44
66.07	61.95	64.23	12.48	0.17	12.59	0	11.96

68.17	64.39	66.22	13.24	0.164	13.2	0	12.55
69.72	66.62	68.39	13.79	0.174	13.43	0	12.8
71.27	68.31	69.53	14.22	0.182	13.48	0	12.83
71.9	68.8	70.16	14.66	0.189	13.48	0	12.83
71.94	68.87	69.79	14.64	0.196	13.06	0	12.41
70.07	63.83	66.74	14.49	0.199	12.66	0	12.03
63.85	57.9	60.58	14.29	0.2	12.3	0	11.67
58.24	49.81	55.17	14.1	0.202	12.07	0	11.44
56	48.78	52.97	13.93	0.203	11.96	0	11.33
55.39	53.41	54.33	13.77	0.204	11.91	0	11.29
56.38	51.52	54.72	13.62	0.203	11.91	0	11.29
56.74	53.74	55.02	13.5	0.2	11.93	0	11.29
55.99	49.73	53.47	13.36	0.2	11.93	0	11.31
51.88	48.67	50.15	13.24	0.2	11.96	0	11.29
49.28	43.73	46.37	13.08	0.202	11.93	0	11.27
45.56	39.92	43.58	12.92	0.199	11.91	0	11.24
41.12	31.77	36.56	12.73	0.2	11.91	0	11.24
38.16	31.81	35.15	12.55	0.201	11.89	0	11.22
37.59	33.2	34.99	12.37	0.199	11.89	0	11.2
45.42	34.11	38.63	12.16	0.199	11.89	0	11.2
58.21	45.47	51.13	11.96	0.201	11.87	0	11.18
61.09	57.4	58.58	11.96	0.197	12.05	0	11.33
63.21	59.48	61.06	12.05	0.19	12.23	0	11.51
65.37	61.43	63.83	12.41	0.181	12.62	0	11.89
67.99	63.72	65.31	12.99	0.169	13.1	0	12.37
68.57	65.34	67.04	13.79	0.161	13.65	0	12.89
70.07	67.35	68.68	14.34	0.172	13.79	0	13.03
71.45	68.6	69.77	14.74	0.184	13.77	0	13.01
70.44	68.41	69.3	14.78	0.192	13.41	0	12.66
70.01	63	67.11	14.56	0.198	12.89	0	12.16
64.2	49.49	56.92	14.39	0.201	12.53	0	11.8
52.15	47.82	50.08	14.22	0.203	12.3	0	11.6
54.33	48.72	51.3	14.1	0.203	12.23	0	11.51
54.08	52.56	53.45	13.96	0.203	12.21	0	11.51
54.24	52.49	53.66	13.81	0.202	12.23	0	11.51
53.16	50.92	52.3	13.67	0.202	12.23	0	11.51
54.95	50.67	52.82	13.53	0.199	12.23	0	11.53
55.52	51.28	53.98	13.36	0.2	12.23	0	11.51
55.21	50.92	52.89	13.22	0.2	12.25	0	11.51
51.72	48.15	50.69	13.13	0.199	12.27	0	11.53
51.39	39.77	47.34	13.01	0.197	12.3	0	11.53
44.11	37.48	40.24	12.87	0.196	12.27	0	11.53
43.08	36.71	38.74	12.71	0.196	12.25	0	11.49
50.59	37.43	43.73	12.43	0.2	12.14	0	11.38
55.25	48.49	52.04	12.37	0.201	12.23	0	11.47
58.85	54.64	57.1	12.37	0.195	12.39	0	11.6
61.03	57.47	59	12.5	0.19	12.59	0	11.8

67.58	60.09	63.87	12.76	0.183	12.8	0	12
66.23	63.11	64.03	13.24	0.172	13.17	0	12.39
69.32	63.69	66.37	13.36	0.178	13.08	0	12.3
70.42	66.04	68.03	14.13	0.169	13.62	0	12.83
69.68	66.14	67.25	14.59	0.171	13.84	0	13.03
67.63	63.44	65.2	14.51	0.184	13.5	0	12.71
64.91	59.82	62.09	14.27	0.193	13.06	0	12.27
59.83	56.14	57.84	14.13	0.197	12.8	0	12
57.39	55.53	56.54	14.03	0.198	12.64	0	11.87
55.94	53.86	54.96	13.96	0.199	12.62	0	11.85
54.2	50.94	52.64	13.84	0.2	12.57	0	11.8
50.94	48.63	49.38	13.72	0.199	12.55	0	11.78
54.36	49.11	51.43	13.58	0.198	12.53	0	11.76
52.77	50.27	50.91	13.48	0.197	12.55	0	11.76
51.9	49.59	50.55	13.39	0.197	12.57	0	11.78
52.84	50.86	51.75	13.29	0.199	12.57	0	11.8
52.99	51.4	52.28	13.2	0.198	12.57	0	11.8
52.26	51.09	51.69	13.1	0.195	12.59	0	11.8
51.97	47.43	49.34	13.03	0.196	12.59	0	11.82
50.79	48.08	49.96	12.94	0.196	12.59	0	11.82
50.83	49.12	49.88	12.85	0.197	12.57	0	11.8
57.56	50.33	54.54	12.69	0.2	12.53	0	11.73
59.34	54.28	56.15	12.78	0.197	12.69	0	11.89
61.77	58.3	59.81	12.89	0.19	12.85	0	12.07
62.05	58.86	60.72	13.22	0.181	13.17	0	12.39
63.8	60.53	62.41	13.55	0.17	13.46	0	12.66
64.86	62.23	63.44	14.03	0.17	13.77	0	12.96
64.55	61.87	63.15	14.27	0.172	13.79	0	12.99
63.73	58.67	60.62	14.29	0.183	13.58	0	12.8
61.65	57.76	59.27	14.17	0.193	13.24	0	12.48
58.03	53.38	55.75	14.05	0.197	12.99	0	12.21
53.38	51.24	52.36	14.03	0.196	12.89	0	12.12
51.91	33.3	40.82	13.91	0.198	12.76	0	12
40.12	34.23	36.95	13.77	0.201	12.69	0	11.93
40.1	38.99	39.47	13.58	0.202	12.66	0	11.89
39.43	38.13	38.71	13.34	0.2	12.64	0	11.89
39.22	37.11	38.24	13.08	0.199	12.64	0	11.89
39.73	38.39	38.94	12.83	0.199	12.64	0	11.89
39.28	38	38.71	12.59	0.197	12.64	0	11.89
38.73	37.88	38.33	12.34	0.195	12.64	0	11.89
38.58	37.5	38.04	12.14	0.195	12.66	0	11.91
38.33	37.17	37.81	11.93	0.194	12.66	0	11.91
37.68	32.5	34.99	11.71	0.193	12.66	0	11.91
32.46	25.48	28.13	11.51	0.191	12.66	0	11.89
37.55	27.29	32.64	11.22	0.196	12.55	0	11.78
43.15	37.54	40.98	11.11	0.196	12.62	0	11.87
47.31	42.7	45.04	11.05	0.191	12.73	0	11.98

48.38	46.01	47.09	11.05	0.185	12.85	0	12.09
49.57	47.26	48.45	11.2	0.184	12.99	0	12.25
51.66	48.55	49.96	11.44	0.181	13.08	0	12.34
50.9	48.7	49.68	11.89	0.178	13.24	0	12.53
51.92	48.98	50.36	12.09	0.185	13.06	0	12.37
54.12	51.05	52.54	12.34	0.187	13.01	0	12.32
53.88	48.45	50.45	12.64	0.187	13.08	0	12.41
49.04	45.27	47.26	12.69	0.191	12.94	0	12.3
45.23	42.47	43.52	12.73	0.192	12.87	0	12.23
43.32	40.22	42.04	12.64	0.193	12.78	0	12.16
40.22	36.93	38.14	12.53	0.194	12.73	0	12.14
37.1	35.94	36.6	12.37	0.195	12.71	0	12.12
36.68	34.48	35.49	12.21	0.195	12.66	0	12.09
35.03	33.19	34.36	12.03	0.193	12.64	0	12.09
36.09	33.88	34.96	11.87	0.193	12.64	0	12.09
35.54	32.25	33.94	11.69	0.192	12.64	0	12.09
34.16	31.86	32.88	11.51	0.192	12.62	0	12.09
35.19	33.29	34	11.36	0.19	12.62	0	12.09
34.76	31.09	33.44	11.18	0.191	12.59	0	12.09
34.77	31.3	33.29	11.03	0.189	12.59	0	12.09
34.46	33.49	33.91	10.87	0.19	12.59	0	12.09
40.08	33.83	36.12	10.7	0.188	12.57	0	12.09
44.39	40.12	41.5	10.5	0.192	12.5	0	12.05
49.74	43.69	46.44	10.55	0.187	12.66	0	12.21
49.92	46.77	48.02	10.66	0.183	12.78	0	12.34
52.77	48.46	50.69	10.83	0.182	12.85	0	12.43
55.11	51.76	53.49	11.22	0.174	13.06	0	12.64
56.33	53.25	54.75	11.73	0.168	13.27	0	12.87
57.4	54	55.4	12.25	0.165	13.39	0	12.99
56.27	54.42	55.38	12.62	0.172	13.29	0	12.92
55.94	54.31	54.96	12.89	0.182	13.13	0	12.78
54.85	50.14	53.45	13.01	0.189	12.89	0	12.57
50.09	36.02	44.34	13.1	0.19	12.78	0	12.46
38.09	34.84	36.39	13.03	0.195	12.62	0	12.34
43.11	36.23	40.18	12.92	0.196	12.55	0	12.27
41	36.13	38.43	12.73	0.194	12.53	0	12.27
40.07	38.12	39.43	12.55	0.195	12.53	0	12.27
38.32	35.53	37.02	12.37	0.193	12.53	0	12.27
37.57	35.75	36.82	12.18	0.192	12.53	0	12.27
41	36.65	38.56	12	0.193	12.5	0	12.27
41.72	39.6	40.95	11.85	0.19	12.5	0	12.3
41.36	37.4	39.38	11.69	0.188	12.53	0	12.3
40.58	33.04	38.06	11.55	0.189	12.53	0	12.3
37.43	32.5	35.07	11.4	0.19	12.5	0	12.3
39.84	31.76	36.91	11.24	0.19	12.48	0	12.3
44.97	36.1	40.12	11	0.192	12.39	0	12.18
50.53	45.01	48.15	10.96	0.191	12.48	0	12.27

52.55	50.13	51.09	10.98	0.186	12.62	0	12.41
55.92	51.48	53.31	11.11	0.181	12.8	0	12.62
57.3	53.59	54.89	11.44	0.167	13.1	0	12.94
59.53	55.36	57.13	12	0.15	13.5	0	13.34
62.15	57.32	59.47	12.76	0.144	13.91	0	13.77
62.04	60.02	61.02	13.34	0.153	14.08	0	13.93
63.21	60.35	61.49	13.65	0.167	13.88	0	13.77
63.06	60.6	61.51	13.65	0.181	13.48	0	13.36
60.99	56.58	58.78	13.6	0.191	13.08	0	12.96
56.54	45.07	51.34	13.55	0.194	12.83	0	12.71
46.87	43.3	45.17	13.48	0.197	12.64	0	12.55
47.02	43.11	45.21	13.36	0.196	12.57	0	12.48
46.45	43.75	45.39	13.22	0.196	12.55	0	12.48
46.08	39.95	43.54	13.08	0.195	12.53	0	12.46
40.09	37.21	38.52	12.89	0.193	12.5	0	12.43
40.28	37.98	38.97	12.71	0.194	12.5	0	12.43
40.69	38.43	39.75	12.53	0.194	12.5	0	12.43
40.01	37.04	38.88	12.37	0.194	12.5	0	12.43
37.02	33.46	35.2	12.21	0.193	12.5	0	12.43
33.49	30.82	32.36	12.05	0.191	12.5	0	12.43
31.72	30.74	31.31	11.87	0.192	12.48	0	12.41
32.59	30.67	31.32	11.71	0.19	12.48	0	12.41
46.9	32.59	38.24	11.44	0.192	12.39	0	12.3
51.09	46.94	49.51	11.38	0.191	12.48	0	12.41
53.68	50.33	51.71	11.38	0.188	12.64	0	12.55
57.04	53.26	55.07	11.49	0.183	12.8	0	12.71
61.52	56.75	58.86	11.78	0.174	13.06	0	12.96
64.34	59.97	62.02	12.3	0.165	13.39	0	13.32
66.54	61.95	64.12	12.89	0.165	13.62	0	13.55
67.57	64.58	65.87	13.48	0.166	13.77	0	13.69
67.78	65.63	66.72	13.98	0.173	13.74	0	13.67
67.07	65.31	66.03	14.2	0.184	13.48	0	13.43
65.75	62.32	64.22	14.22	0.189	13.17	0	13.1
62.28	44.63	55.06	14.25	0.196	12.94	0	12.89
45.09	43.26	44.13	14.15	0.198	12.76	0	12.69
49.02	43.56	45.27	14	0.199	12.64	0	12.59
50.56	43.89	48.27	13.86	0.197	12.62	0	12.55
51.15	46.71	48.94	13.69	0.197	12.62	0	12.55
54.02	45.7	50.54	13.5	0.199	12.59	0	12.55
50.22	47.07	48.45	13.34	0.197	12.59	0	12.55
50.44	44.77	47.92	13.17	0.195	12.59	0	12.55
50.1	41.71	45.07	13.01	0.195	12.62	0	12.55
43.82	35.64	40.49	12.87	0.194	12.62	0	12.55
37.81	31.96	34.69	12.71	0.193	12.62	0	12.53
35.89	31.97	33.4	12.53	0.193	12.59	0	12.5
42.82	33.24	36.91	12.34	0.195	12.59	0	12.48
50.43	40.96	45.55	12.07	0.195	12.5	0	12.39

51.3	49.32	50.41	12.05	0.191	12.62	0	12.5
51.4	48.42	49.59	12.05	0.19	12.76	0	12.64
55.14	51.15	53.26	12.12	0.186	12.85	0	12.73
59.48	54.21	55.88	12.34	0.184	13.01	0	12.87
65.12	58.99	61.74	12.73	0.176	13.24	0	13.13
68.67	63.23	66.16	13.46	0.163	13.72	0	13.6
66.7	65.11	65.95	13.74	0.173	13.65	0	13.53
66.35	64.23	65.26	13.79	0.183	13.39	0	13.24
64.64	62.15	63.2	13.84	0.188	13.2	0	13.06
62.13	60.5	61.13	13.86	0.193	13.08	0	12.94
60.66	57.8	59.21	13.86	0.19	13.01	0	12.89
59.21	55.89	57.92	13.79	0.192	12.94	0	12.83
58.04	52.64	56	13.69	0.192	12.92	0	12.78
55.52	49.48	52.88	13.58	0.195	12.85	0	12.73
53.81	47.54	50	13.43	0.196	12.83	0	12.69
53.04	42.06	48.27	13.32	0.195	12.8	0	12.69
47.7	40.32	44.17	13.15	0.196	12.78	0	12.64
50.11	41.43	47.77	12.99	0.194	12.76	0	12.62
49.79	46.74	48.99	12.85	0.192	12.78	0	12.64
47.62	32.93	44.04	12.76	0.193	12.83	0	12.66
34.26	32.83	33.41	12.62	0.192	12.8	0	12.64
34.17	32.19	33.38	12.46	0.194	12.76	0	12.59
32.62	31.12	32.02	12.3	0.194	12.73	0	12.57
32.65	32.1	32.36	12.09	0.192	12.71	0	12.53
35.62	32.44	33.91	11.93	0.193	12.71	0	12.53
38.56	35.38	36.98	11.85	0.193	12.76	0	12.57
41.65	38.16	39.8	11.78	0.191	12.83	0	12.66
44.45	40.26	42.71	11.76	0.188	12.94	0	12.78
47.54	43.36	45.11	11.87	0.181	13.1	0	12.92
50.59	46.39	48.34	12.05	0.178	13.22	0	13.06
52.36	48.79	50.4	12.25	0.177	13.29	0	13.13
52.79	50.31	51.64	12.41	0.179	13.27	0	13.1
53	51.36	52.06	12.53	0.183	13.17	0	13.01
52.07	48.96	50.67	12.57	0.19	13.06	0	12.89
48.94	45.69	46.97	12.62	0.187	13.01	0	12.87
47.19	45.61	46.48	12.53	0.19	12.89	0	12.76
47.07	43.61	45.39	12.43	0.19	12.87	0	12.73
44.08	42.81	43.71	12.32	0.19	12.85	0	12.71
44.09	40.81	42.65	12.18	0.19	12.83	0	12.71
43.97	43.12	43.53	12.07	0.188	12.83	0	12.71
43.43	42.57	42.94	11.93	0.189	12.83	0	12.71
43.54	42.35	43.05	11.82	0.189	12.83	0	12.71
42.5	37.02	39.44	11.69	0.189	12.8	0	12.71
37.14	35.79	36.42	11.58	0.189	12.78	0	12.69
39.28	35.54	37.13	11.44	0.187	12.76	0	12.66
37.98	33.15	35.16	11.29	0.188	12.73	0	12.66
34.38	27.42	29.53	11.16	0.188	12.73	0	12.64

45.19	29.23	36.85	10.89	0.193	12.59	0	12.53
48.59	45.28	46.77	10.83	0.189	12.69	0	12.62
53.44	47.78	50.49	10.83	0.185	12.8	0	12.76
54.9	51.36	53.35	10.96	0.179	12.96	0	12.92
61.27	53.85	57.9	11.31	0.166	13.24	0	13.2
63.37	59.63	61.28	12.12	0.143	13.81	0	13.81
63.83	61.07	62.49	12.96	0.133	14.32	0	14.32
64.27	60.72	62.19	13.32	0.157	14.22	0	14.25
64.43	60.47	62.14	13.32	0.175	13.81	0	13.81
61.25	58.04	59.01	13.36	0.187	13.48	0	13.53
58.34	54.54	56.4	13.27	0.189	13.13	0	13.17
54.55	49.01	52.3	13.27	0.192	12.96	0	13.03
48.94	44.23	46.57	13.17	0.192	12.85	0	12.92
49.63	48.04	48.86	13.03	0.193	12.76	0	12.83
48.22	42.02	44.85	12.92	0.193	12.73	0	12.83
47.91	41.7	45.96	12.76	0.192	12.71	0	12.78
47.95	45.38	46.67	12.62	0.194	12.69	0	12.8
46.64	45.17	45.72	12.48	0.191	12.71	0	12.8
45.66	44.56	45.14	12.34	0.192	12.71	0	12.8
45.33	43.71	44.5	12.23	0.191	12.69	0	12.8
45	43.04	43.93	12.09	0.191	12.71	0	12.8
44.45	36.8	41.49	11.98	0.19	12.69	0	12.8
43.34	38.87	40.99	11.85	0.191	12.66	0	12.78
40.18	32.73	34.94	11.73	0.187	12.66	0	12.76
50.28	33.84	41.48	11.51	0.193	12.57	0	12.66
51.88	49.72	50.81	11.42	0.189	12.62	0	12.73
56.87	51.23	53.79	11.49	0.185	12.8	0	12.89
60.14	56.29	58.25	11.69	0.178	13.01	0	13.13
63.09	59.22	61.49	12.12	0.168	13.36	0	13.48
65.45	61.72	63.37	12.8	0.154	13.86	0	14
66.71	62.96	64.85	13.46	0.151	14.22	0	14.37
66.73	64.1	65.49	14	0.162	14.39	0	14.54
65.63	62.82	64.09	13.98	0.181	14	0	14.15
64.26	61.93	63.2	13.86	0.188	13.53	0	13.67
62.44	58.19	60.42	13.84	0.191	13.27	0	13.41
58.15	55.35	56.9	13.72	0.193	13.03	0	13.17
55.41	53.05	54.1	13.62	0.195	12.89	0	13.03
53.57	52.26	52.84	13.53	0.194	12.83	0	12.96
52.68	49.73	51.43	13.43	0.193	12.8	0	12.96
49.74	45.71	47.33	13.32	0.194	12.78	0	12.94
49.78	47.01	48.99	13.17	0.193	12.73	0	12.89
49.68	42.85	47.92	13.03	0.195	12.73	0	12.87
43.09	39.67	41.7	12.89	0.195	12.73	0	12.87
41.12	38.36	39.47	12.73	0.192	12.71	0	12.85
40.93	37.43	38.55	12.57	0.192	12.69	0	12.83
39.61	35.8	37.61	12.41	0.193	12.69	0	12.8
43.1	39.36	41.3	12.25	0.191	12.69	0	12.83

43.08	41.71	42.24	12.12	0.192	12.71	0	12.83
46.93	42.94	44.86	11.91	0.193	12.66	0	12.78
50.9	46.93	48.85	11.8	0.193	12.69	0	12.78
51.84	48.85	50.03	11.85	0.188	12.8	0	12.89
53.34	51.07	51.95	11.93	0.184	12.92	0	13.01
56.08	51.38	53.63	12.16	0.182	13.08	0	13.17
61.46	55.57	58.97	12.59	0.175	13.32	0	13.41
61.85	58.84	60.05	13.27	0.165	13.72	0	13.81
62.54	59.8	61.14	13.74	0.164	13.86	0	13.98
62.96	60.7	61.54	14.03	0.172	13.81	0	13.91
62.58	60.22	61.2	14.05	0.18	13.53	0	13.65
60.93	57.93	59.33	13.98	0.188	13.27	0	13.36
57.89	49.84	54.12	13.93	0.192	13.08	0	13.17
50.58	45.16	47.32	13.84	0.195	12.92	0	13.03
50.82	45	47.51	13.67	0.195	12.83	0	12.92
51.93	49.13	51.09	13.55	0.196	12.8	0	12.92
51.75	47.5	49.73	13.41	0.195	12.83	0	12.92
49.9	47.09	48.99	13.27	0.194	12.83	0	12.92
49.42	46.99	48.38	13.13	0.193	12.83	0	12.92
49.79	47.81	49.04	12.99	0.193	12.85	0	12.92
49.83	45.77	47.04	12.85	0.192	12.83	0	12.92
48.09	43.68	45.89	12.73	0.192	12.83	0	12.89
49.49	40.37	42.94	12.59	0.194	12.83	0	12.89
41.5	39.94	40.66	12.46	0.192	12.83	0	12.87
41.38	39.71	40.35	12.32	0.192	12.83	0	12.87
49.64	41.38	46.3	12.09	0.195	12.73	0	12.76
52.13	48.72	50.69	12.05	0.194	12.85	0	12.87
53.05	51.22	52	12.09	0.188	12.96	0	13.01
55.47	51.71	53.49	12.21	0.183	13.13	0	13.15
57.69	53.92	55.82	12.5	0.172	13.34	0	13.39
60.66	56.78	58.53	13.06	0.162	13.72	0	13.77
61.34	59.06	60.18	13.72	0.157	14.03	0	14.08
62.22	59.92	61.15	14.15	0.165	14	0	14.05
63.59	60.9	62.03	14.51	0.172	13.91	0	13.93
62.54	60.91	61.67	14.69	0.184	13.62	0	13.67
61.81	59.07	60.61	14.74	0.193	13.34	0	13.39
59.05	43.42	52.68	14.76	0.195	13.2	0	13.22
43.98	40.79	42.31	14.69	0.199	13.03	0	13.06
41.63	39.83	40.76	14.51	0.199	12.94	0	12.96
40.79	38.85	39.82	14.34	0.199	12.89	0	12.94
41.9	38.55	40.08	14.13	0.197	12.89	0	12.92
41.8	39.39	40.55	13.91	0.197	12.89	0	12.92
42.85	37.64	40.28	13.69	0.198	12.89	0	12.89
38.46	35.07	36.89	13.46	0.197	12.89	0	12.89
36.4	33.44	34.44	13.27	0.195	12.89	0	12.89
33.96	32.19	33.13	13.06	0.194	12.89	0	12.87
35.05	33.27	33.96	12.85	0.193	12.89	0	12.87

36.68	33.92	35.42	12.66	0.194	12.92	0	12.87
36.1	33.12	34.77	12.48	0.194	12.92	0	12.87
51.18	34.71	42.09	12.21	0.197	12.85	0	12.78
53.95	51.01	52.42	12.14	0.193	12.94	0	12.89
55.81	52.37	53.58	12.16	0.188	13.13	0	13.03
59.88	55.2	57.48	12.3	0.182	13.32	0	13.22
62.93	58.72	60.66	12.66	0.172	13.62	0	13.53
64.88	61.19	63	13.32	0.156	14.05	0	13.98
66.43	63.79	65.12	14.03	0.15	14.39	0	14.34
70.8	65.43	68.57	14.74	0.156	14.64	0	14.56
69.76	67.52	68.53	15.28	0.168	14.66	0	14.59
69.13	67.05	68.18	15.28	0.18	14.27	0	14.2
67.37	64.62	66.05	15.08	0.192	13.79	0	13.72
64.62	59.42	61.78	14.96	0.193	13.5	0	13.43
59.69	53.32	55.89	14.83	0.196	13.32	0	13.24
56.71	54.54	55.51	14.71	0.198	13.22	0	13.13
55.43	52.74	54.06	14.56	0.196	13.17	0	13.1
53.3	50.99	52.02	14.42	0.199	13.17	0	13.08
53.75	51.82	52.66	14.27	0.2	13.15	0	13.06
53.22	51.86	52.76	14.1	0.196	13.15	0	13.06
53.02	49.03	51.72	13.96	0.196	13.15	0	13.06
49.03	44.5	46.09	13.81	0.195	13.15	0	13.06
48.73	45.21	46.96	13.67	0.196	13.15	0	13.03
49.12	43.56	45.36	13.53	0.193	13.15	0	13.01
49.72	45.98	48.16	13.39	0.195	13.15	0	13.01
49.79	46.78	47.9	13.24	0.193	13.17	0	13.01
56.35	49.15	52.54	13.03	0.198	13.08	0	12.94
59.64	56.2	57.99	13.03	0.195	13.22	0	13.06
63.29	58.72	61.02	13.13	0.186	13.41	0	13.24
65.63	62.45	63.9	13.41	0.176	13.72	0	13.53
65.57	62.45	64.07	13.91	0.161	14.17	0	13.98
68.7	64.72	66.38	14.49	0.151	14.54	0	14.37
70.94	65.99	68.61	15.38	0.15	15.08	0	14.91
71.43	68.51	69.71	16.3	0.158	15.56	0	15.38
71.65	68.48	69.76	16.59	0.174	15.38	0	15.18
69.74	67.19	68.45	16.36	0.184	14.81	0	14.61
68.49	65.14	66.64	15.89	0.194	14.1	0	13.91
65.12	59.34	62.31	15.69	0.197	13.77	0	13.55
59.96	54.21	56.85	15.51	0.199	13.55	0	13.34
56.1	53.84	54.73	15.36	0.201	13.46	0	13.22
55.99	52.72	54.09	15.21	0.2	13.41	0	13.2
56.29	52.68	55.42	15.03	0.198	13.41	0	13.17
55.69	48.71	52.48	14.88	0.199	13.41	0	13.17
49.6	48.15	48.77	14.69	0.199	13.39	0	13.15
48.23	44.27	46.64	14.51	0.199	13.39	0	13.13
44.82	37.63	41.34	14.32	0.199	13.39	0	13.1
38.39	35.32	36.79	14.13	0.198	13.36	0	13.08

37.57	35.53	36.31	13.93	0.197	13.36	0	13.06
36.11	34.48	35.37	13.72	0.195	13.36	0	13.06
36.22	33.44	34.45	13.53	0.194	13.36	0	13.06
52.52	36.27	44.88	13.24	0.199	13.29	0	12.96
54.96	52.4	53.84	13.17	0.195	13.43	0	13.08
57.9	54.2	56.15	13.2	0.19	13.6	0	13.24
60.3	56.67	58.67	13.34	0.185	13.81	0	13.43
63.16	59.3	61.29	13.74	0.172	14.17	0	13.79
66.54	62.01	64.01	14.47	0.157	14.69	0	14.32
67.12	63.51	65.44	15.16	0.155	15.03	0	14.64
67.6	64.2	65.77	15.71	0.162	15.13	0	14.74
67.1	64.89	65.72	15.97	0.176	14.91	0	14.51
66.24	64.17	65.03	15.87	0.185	14.42	0	14
64.13	61.65	63.08	15.79	0.195	14.05	0	13.65
61.63	51.43	56.52	15.81	0.197	13.91	0	13.5
51.43	50.03	50.58	15.69	0.199	13.77	0	13.39
50.03	47.27	48.83	15.53	0.201	13.69	0	13.29
49.77	47.34	48.58	15.36	0.2	13.67	0	13.27
49.6	46.28	47.6	15.18	0.198	13.67	0	13.24
46.68	42.77	45.03	15.01	0.199	13.65	0	13.24
47.77	41.15	45.17	14.81	0.196	13.65	0	13.22
47.21	35.36	40.67	14.61	0.198	13.65	0	13.2
35.36	33.49	34.55	14.39	0.198	13.62	0	13.17
36.27	34.72	35.5	14.17	0.197	13.62	0	13.17
35.34	32.4	33.5	13.98	0.195	13.62	0	13.17
33.26	31.85	32.58	13.79	0.197	13.65	0	13.17
36.52	32.17	33.28	13.58	0.195	13.65	0	13.17
47.73	36.57	42.51	13.32	0.197	13.58	0	13.08
53.41	47.74	51.04	13.24	0.195	13.67	0	13.17
57.77	52.9	55.42	13.27	0.19	13.84	0	13.32
61.72	56.55	59.18	13.41	0.185	14.03	0	13.5
64.77	60.48	62.42	13.77	0.176	14.32	0	13.79
68.24	63.64	65.65	14.34	0.164	14.71	0	14.17
69.77	66.53	68.03	15.03	0.157	15.03	0	14.49
72.22	69.03	70.3	15.76	0.16	15.31	0	14.78
72.75	69.74	71.22	16.23	0.17	15.26	0	14.74
71.18	68.77	70.12	16.33	0.182	14.93	0	14.42
72.06	68.73	70.28	16.3	0.189	14.54	0	14
69.62	65.13	66.97	16.33	0.194	14.37	0	13.84
65.48	57.31	61.72	16.25	0.198	14.17	0	13.65
57.61	55.89	56.58	16.1	0.199	14.03	0	13.53
58.04	56.86	57.47	15.94	0.199	13.98	0	13.48
59.11	56.28	57.63	15.81	0.2	13.98	0	13.46
57.7	56.28	56.96	15.66	0.2	14	0	13.46
59.19	56.52	57.93	15.53	0.198	14	0	13.48
57.14	54.46	55.76	15.36	0.199	14	0	13.46
57.48	54.94	56.5	15.21	0.198	13.98	0	13.43

57.43	52.34	55.21	15.06	0.197	13.98	0	13.43
54.14	47.67	50.04	14.91	0.195	13.98	0	13.41
49.19	43.29	46.64	14.76	0.197	13.96	0	13.39
53.82	45.24	48.14	14.59	0.198	13.96	0	13.36
59.75	49.53	55.36	14.34	0.2	13.88	0	13.29
61.84	56.34	59.79	14.29	0.195	14.03	0	13.41
69.29	61.72	63.79	14.37	0.191	14.22	0	13.6
72.75	68.1	69.91	14.64	0.18	14.54	0	13.91
73.87	70.61	72.22	15.28	0.16	15.13	0	14.49
74.58	71.72	73.27	16.12	0.144	15.79	0	15.13
76.35	70.76	72.96	16.7	0.158	16.1	0	15.43
75.77	72.35	74.16	16.75	0.171	15.87	0	15.18
75.38	72.53	73.62	17.01	0.18	15.84	0	15.16
74.46	69.59	72.34	16.96	0.185	15.53	0	14.86
69.93	65.46	67.35	16.62	0.191	15.01	0	14.34
65.46	62.99	64.02	16.33	0.195	14.61	0	13.96
63.27	62.3	62.69	16.17	0.199	14.44	0	13.79
62.59	59.9	61.08	16.1	0.198	14.39	0	13.74
60.67	58.95	59.76	15.97	0.198	14.34	0	13.69
59.52	57.27	58.28	15.81	0.197	14.32	0	13.65
58.06	55.85	57.09	15.66	0.2	14.29	0	13.62
58.11	56.22	57.37	15.53	0.198	14.29	0	13.62
57.9	55.54	56.92	15.41	0.197	14.32	0	13.62
55.98	54.27	55.3	15.31	0.197	14.32	0	13.65
54.81	52.32	53.42	15.18	0.197	14.34	0	13.62
53.01	51.34	52.24	15.08	0.195	14.34	0	13.65
52.84	51.11	52.04	14.96	0.194	14.32	0	13.6
53.57	51.13	52.56	14.83	0.194	14.32	0	13.6
57.79	53.32	54.64	14.69	0.197	14.29	0	13.58
57.67	55.14	55.98	14.64	0.196	14.34	0	13.6
60.59	56.37	57.79	14.64	0.194	14.44	0	13.69
63.07	58.86	60.72	14.81	0.187	14.64	0	13.86
65.14	60.47	62.86	15.11	0.178	14.93	0	14.17
66.14	62.6	64.34	15.56	0.167	15.26	0	14.49
65.88	63.23	64.42	15.97	0.162	15.53	0	14.76
65.12	61.25	63.14	16.15	0.165	15.46	0	14.71
62.9	57.4	59.91	16.2	0.179	15.28	0	14.51
59.28	53.93	56.86	16.04	0.185	14.96	0	14.17
55.61	51.34	52.96	15.92	0.191	14.71	0	13.93
51.57	47.21	49.5	15.84	0.195	14.59	0	13.81
47.17	45.81	46.41	15.71	0.196	14.51	0	13.77
45.79	43.71	44.82	15.56	0.197	14.49	0	13.72
43.85	39.33	42.04	15.38	0.199	14.44	0	13.67
40.5	38.25	39.64	15.16	0.198	14.42	0	13.65
39.3	37.34	38.17	14.98	0.197	14.39	0	13.62
38	34.04	35.27	14.76	0.196	14.39	0	13.62
34.54	33.03	33.77	14.56	0.197	14.39	0	13.6

34.12	32.04	33.29	14.37	0.196	14.39	0	13.6
32.74	31.14	32.06	14.15	0.196	14.39	0	13.6
31.62	30.26	30.9	13.96	0.195	14.39	0	13.6
32.03	29.83	30.62	13.77	0.195	14.39	0	13.6
30.52	28.62	29.6	13.58	0.192	14.39	0	13.6
36.66	30.16	32.94	13.29	0.196	14.32	0	13.53
41.42	36.22	38.74	13.2	0.191	14.39	0	13.62
44.87	41.1	43.06	13.15	0.188	14.51	0	13.72
46.67	43.85	45.08	13.15	0.186	14.61	0	13.81
51.16	45.08	47.58	13.32	0.18	14.74	0	13.96
53	49.15	50.84	13.69	0.17	14.96	0	14.17
54.47	51.42	52.95	14.17	0.166	15.16	0	14.37
56.67	53.21	54.75	14.66	0.167	15.23	0	14.47
57.81	54.05	55.66	14.98	0.174	15.13	0	14.37
56.42	53.91	55.36	15.23	0.182	14.96	0	14.22
54.33	51.56	53.04	15.36	0.191	14.76	0	14.03
52.67	44.39	48.79	15.48	0.193	14.69	0	13.98
45.58	39.88	43.5	15.46	0.196	14.59	0	13.88
43.61	36.62	40.31	15.33	0.197	14.49	0	13.81
43.25	38.51	40.88	15.13	0.194	14.47	0	13.79
41.62	38.79	40.91	14.96	0.195	14.47	0	13.77
40.8	39.08	39.91	14.74	0.196	14.44	0	13.79
40.25	38.45	39.33	14.54	0.196	14.44	0	13.79
39.29	36.19	37.86	14.34	0.195	14.44	0	13.79
36.58	30.46	33.16	14.15	0.193	14.42	0	13.77
33.18	23.97	27.53	13.96	0.192	14.42	0	13.77
25.32	23.22	24.27	13.74	0.193	14.39	0	13.74
26.12	24.52	25.25	13.53	0.192	14.39	0	13.74
29.63	24.77	26.04	13.32	0.19	14.39	0	13.74
43.94	29.68	37.45	13.06	0.193	14.32	0	13.69
44.64	42.09	43.36	12.96	0.188	14.44	0	13.79
47.34	43.73	45.56	12.92	0.184	14.54	0	13.91
50.64	46.25	48.27	12.99	0.183	14.69	0	14.05
52.92	48.71	50.63	13.24	0.175	14.86	0	14.22
56.66	52	54.14	13.67	0.166	15.06	0	14.44
58.86	54.54	56.39	14.25	0.16	15.31	0	14.69
62.42	56.18	60.04	14.83	0.156	15.41	0	14.81
64.86	60.92	62.87	15.23	0.167	15.33	0	14.76
63.12	60.16	61.36	15.64	0.171	15.28	0	14.71
62.4	56.64	59.62	15.74	0.181	15.03	0	14.47
56.81	52.9	55.13	15.74	0.187	14.83	0	14.29
52.84	45.99	49.1	15.64	0.193	14.66	0	14.15
46.94	44.55	45.57	15.51	0.196	14.56	0	14.03
48.34	45.16	46.44	15.33	0.197	14.51	0	14
47.45	45.77	46.68	15.16	0.195	14.49	0	13.98
47.66	46.28	46.99	15.01	0.193	14.49	0	14
48	46.1	47.31	14.83	0.194	14.49	0	14

47.77	46.68	47.18	14.69	0.192	14.51	0	14
47.52	43.8	46.16	14.54	0.191	14.51	0	14
47.88	43.85	46	14.39	0.191	14.51	0	14.03
47.88	42.43	46.2	14.27	0.193	14.51	0	14
43.43	39.23	41.54	14.13	0.191	14.51	0	14.03
46.91	39.66	43.74	13.98	0.192	14.49	0	14
49.88	42.76	44.94	13.79	0.195	14.44	0	13.93
53.79	49.86	51.65	13.77	0.189	14.54	0	14.05
56.3	52.87	54.48	13.81	0.187	14.69	0	14.17
58.66	54.89	56.79	13.96	0.177	14.86	0	14.37
61.89	56.24	59.42	14.32	0.165	15.18	0	14.71
65.77	59.44	62.39	14.98	0.141	15.71	0	15.23
67.31	63.28	64.99	15.64	0.132	16.1	0	15.61
66.21	63.8	64.8	15.87	0.152	15.97	0	15.48
65.68	63.27	64.36	16.02	0.164	15.74	0	15.28
65.14	62.27	63.54	15.99	0.174	15.41	0	14.93
63.21	60.23	61.68	15.92	0.185	15.11	0	14.64
60.25	55.7	58.03	15.84	0.189	14.91	0	14.47
56.15	53.64	54.93	15.76	0.192	14.76	0	14.32
53.91	50.12	51.8	15.64	0.197	14.69	0	14.25
50.67	48.59	49.86	15.48	0.195	14.64	0	14.2
51.09	45.13	48.36	15.33	0.193	14.61	0	14.17
51.15	45.62	48.64	15.16	0.194	14.59	0	14.15
50.22	45.71	47.64	15.01	0.194	14.59	0	14.15
52.4	47.56	50.8	14.86	0.193	14.59	0	14.15
52.73	51.51	52.1	14.71	0.191	14.59	0	14.17
52.57	50.58	51.74	14.59	0.189	14.64	0	14.17
50.92	48.36	49.55	14.49	0.189	14.64	0	14.2
48.5	43.89	46.07	14.37	0.188	14.64	0	14.2
43.82	41.46	42.14	14.25	0.191	14.61	0	14.17
46.96	42.07	44.09	14.05	0.193	14.54	0	14.08
50.18	46.71	48.73	14	0.189	14.61	0	14.15
52.99	48.92	50.56	14.03	0.186	14.76	0	14.29
53.95	51.18	52.56	14.13	0.18	14.91	0	14.44
55.39	51.98	53.24	14.34	0.175	15.08	0	14.61
56.5	52.74	54.43	14.64	0.168	15.28	0	14.81
57.74	54.52	56.04	14.93	0.162	15.41	0	14.93
57.93	54.68	56.32	15.31	0.16	15.51	0	15.06
56.86	54.19	55.45	15.51	0.167	15.43	0	14.98
55.62	53.35	54.46	15.48	0.182	15.08	0	14.64
53.77	49.8	51.92	15.58	0.188	14.91	0	14.47
49.78	43.91	47.07	15.71	0.189	14.83	0	14.39
43.91	32.25	39.19	15.66	0.195	14.74	0	14.29
33.21	30.98	32.05	15.53	0.195	14.66	0	14.22
32.36	30.75	31.39	15.33	0.195	14.61	0	14.17
34.44	29.05	31.12	15.11	0.195	14.59	0	14.15
37.35	34.32	35.4	14.86	0.192	14.56	0	14.15

36.73	31.55	34.51	14.64	0.192	14.59	0	14.15
33.12	25.79	28.51	14.42	0.193	14.59	0	14.17
34.35	29.93	31.56	14.17	0.192	14.56	0	14.15
35.49	33.07	34.6	13.96	0.191	14.59	0	14.15
33.05	29.73	30.93	13.77	0.189	14.61	0	14.17
31.09	19.24	26.37	13.55	0.19	14.59	0	14.17
26.43	19.48	21.8	13.32	0.189	14.59	0	14.15
37.47	26.49	33.64	13.03	0.19	14.51	0	14.05
41.1	36.88	38.61	12.94	0.185	14.59	0	14.15
47.06	41.15	44.21	12.89	0.184	14.71	0	14.27
51.71	45.75	48.54	12.96	0.179	14.83	0	14.39
55.04	49.77	52.5	13.2	0.177	14.96	0	14.51
58.69	53.13	56.11	13.62	0.167	15.16	0	14.74
61.95	57.32	59.3	14.27	0.157	15.41	0	15.01
64.53	60.63	62.21	14.93	0.155	15.58	0	15.18
63.5	61.54	62.69	15.33	0.167	15.46	0	15.08
65.18	62.61	63.71	15.58	0.176	15.23	0	14.83
65.21	62.32	64.09	15.84	0.183	15.13	0	14.74
62.34	54.7	58.56	15.97	0.185	15.03	0	14.66
54.66	50.53	52.69	15.89	0.191	14.86	0	14.51
50.77	47.15	49.11	15.76	0.193	14.76	0	14.44
49.08	45.94	47.42	15.61	0.191	14.71	0	14.39
48.41	45.08	46.63	15.43	0.196	14.69	0	14.37
50.83	44.93	48.17	15.26	0.193	14.66	0	14.34
53.71	50.85	52.62	15.11	0.192	14.66	0	14.37
53.59	51.27	52	14.98	0.19	14.71	0	14.39
51.95	47.84	50.69	14.86	0.19	14.74	0	14.42
47.86	40.29	44.54	14.74	0.19	14.71	0	14.39
46.99	39.95	43.06	14.59	0.191	14.66	0	14.34
48.45	41.04	44.86	14.44	0.189	14.66	0	14.34
49.33	44.67	46.46	14.29	0.192	14.66	0	14.32
54.97	49.4	52.57	14.1	0.193	14.61	0	14.27
58.3	54.79	56.28	14.1	0.19	14.74	0	14.42
62.17	56.83	58.85	14.17	0.183	14.91	0	14.56
62.82	59.36	60.81	14.34	0.177	15.08	0	14.76
61.76	58.86	60.09	14.54	0.174	15.21	0	14.86
60.21	57.86	58.7	14.66	0.176	15.13	0	14.81
59.67	58.18	58.96	14.71	0.182	15.03	0	14.69
63.42	58.09	60.92	14.83	0.183	15.01	0	14.69
63.77	59.7	61.38	15.13	0.179	15.21	0	14.88
61.36	56.73	58.37	15.28	0.18	15.18	0	14.86
58.44	55.27	56.29	15.28	0.184	15.01	0	14.69
55.28	53.76	54.54	15.31	0.187	14.96	0	14.64
54.13	52.6	53.43	15.31	0.188	14.91	0	14.59
53.07	51.33	52.03	15.21	0.189	14.86	0	14.54
51.82	48.78	50.6	15.11	0.188	14.81	0	14.51
51.41	49.66	50.36	15.03	0.19	14.81	0	14.51

50.15	48.29	49.21	14.93	0.188	14.81	0	14.49
50.48	47.77	48.92	14.81	0.19	14.78	0	14.49
49.64	46.81	48.02	14.74	0.189	14.81	0	14.51
48.78	45.18	47.03	14.61	0.189	14.78	0	14.49
47.3	44.78	45.96	14.54	0.189	14.81	0	14.49
45.23	43.57	44.6	14.42	0.188	14.76	0	14.47
43.92	37.44	40.62	14.29	0.189	14.76	0	14.47
37.41	36.28	36.67	14.2	0.187	14.76	0	14.47
37.1	36.04	36.5	14.05	0.189	14.71	0	14.42
38.94	36.23	37.5	13.88	0.192	14.66	0	14.37
41.78	35.51	37.9	13.81	0.188	14.74	0	14.44
46.02	41.63	43.63	13.81	0.187	14.83	0	14.51
45.54	39.43	42.16	13.88	0.181	14.93	0	14.64
45.61	39	42.47	13.93	0.182	14.93	0	14.64
48.09	42.99	45.56	14.03	0.181	14.93	0	14.66
48.71	44.9	46.7	14.17	0.179	15.01	0	14.71
48.62	43.5	45.69	14.34	0.182	15.01	0	14.74
47.52	44.72	45.73	14.44	0.183	14.93	0	14.66
45.88	42.85	44.2	14.54	0.186	14.88	0	14.61
42.85	39.56	40.87	14.59	0.186	14.86	0	14.59
39.91	37.51	38.71	14.51	0.188	14.78	0	14.51
38.32	35.17	36.74	14.39	0.188	14.74	0	14.47
35.82	32.43	34.17	14.22	0.188	14.69	0	14.47
37.28	32.13	34.77	14.05	0.189	14.69	0	14.44
35.86	30.5	32.99	13.86	0.189	14.66	0	14.44
31.9	23.14	26.35	13.67	0.187	14.64	0	14.42
30.14	23.31	26.82	13.46	0.187	14.61	0	14.39
28.13	25.16	27.11	13.27	0.188	14.61	0	14.39
30.68	27.92	29.17	13.08	0.187	14.61	0	14.42
30.93	25.55	28.38	12.92	0.187	14.61	0	14.42
25.53	22.98	24.28	12.73	0.183	14.61	0	14.42
30.01	24.5	26.45	12.57	0.184	14.59	0	14.39
37.87	30.03	34.92	12.34	0	14.51	0	14.34
41.67	37.7	39.51	12.27	0.182	14.59	0	14.42
43.66	39.02	41.56	12.25	0.179	14.71	0	14.54
45.74	42.01	43.35	12.34	0.177	14.81	0	14.66
47.56	43.48	44.65	12.5	0.173	14.88	0	14.74
51.41	44.54	47.14	12.71	0.174	14.88	0	14.76
49.01	42.23	45.59	12.99	0.172	14.93	0	14.81
51.93	45.27	48.59	13.24	0.176	14.88	0	14.78
50	44.28	47.94	13.58	0.175	14.91	0	14.83
44.3	42.3	43.39	13.86	0.178	14.86	0	14.78
44.5	42.68	43.65	14	0.184	14.69	0	14.64
43.39	40.61	41.88	14.17	0.183	14.69	0	14.66
41.16	37.17	39.37	14.17	0.184	14.61	0	14.61
37.42	35.96	36.91	14.1	0.187	14.56	0	14.56
36.78	35.96	36.4	13.98	0.185	14.54	0	14.54

36.81	35.31	36.23	13.81	0.186	14.49	0	14.51
35.32	32.72	33.7	13.65	0.185	14.49	0	14.51
34.57	33.2	34.16	13.48	0.185	14.44	0	14.49
34.13	33	33.55	13.32	0.185	14.44	0	14.51
33.62	32.72	33.05	13.15	0.187	14.42	0	14.49
33.38	31.85	32.68	12.99	0.186	14.42	0	14.49
32.51	29.78	31.57	12.83	0.184	14.39	0	14.49
30.82	27.23	29.33	12.69	0.185	14.39	0	14.47
33.89	27.09	30.21	12.5	0	14.37	0	14.47
41.82	33.52	38.6	12.3	0	14.29	0	14.39
44.13	41.61	42.94	12.23	0	14.37	0	14.49
47.13	43.68	45.29	12.25	0.179	14.49	0	14.61
50.56	46.68	47.97	12.37	0.172	14.61	0	14.76
52.06	47.86	50.04	12.64	0.167	14.78	0	14.91
55.87	50.87	52.68	13.22	0.149	15.11	0	15.26
57.93	51.9	54.07	13.74	0.147	15.23	0	15.41
56.12	50.69	53.06	14	0.16	15.03	0	15.21
53.76	51.31	52.63	14.2	0.175	14.78	0	14.98
53.41	50.97	52.12	14.44	0.178	14.71	0	14.91
51.18	50.52	50.82	14.56	0.182	14.61	0	14.81
50.54	46.3	48.96	14.64	0.184	14.56	0	14.78
46.53	42.46	44.52	14.59	0.186	14.47	0	14.71
46.51	42.19	44.8	14.49	0.188	14.39	0	14.64
43.96	40.36	42.47	14.37	0.188	14.37	0	14.61
42.33	41.2	41.69	14.22	0.187	14.34	0	14.59
41.55	39.63	40.65	14.05	0.187	14.32	0	14.59
41.04	37.89	39.43	13.91	0.185	14.32	0	14.59
41.66	37.77	40.12	13.74	0.187	14.29	0	14.56
41.97	38.6	40.94	13.6	0.185	14.29	0	14.56
38.53	29.83	32.34	13.48	0.186	14.32	0	14.56
32.03	28.69	30.76	13.32	0.187	14.27	0	14.54
29.38	27.07	28.11	13.17	0.187	14.25	0	14.51
34.97	28.09	30.59	13.01	0.187	14.25	0	14.49
43.93	35.02	41.19	12.76	0.188	14.17	0	14.42
45.73	43.4	44.33	12.71	0.186	14.27	0	14.54
49.29	45.14	46.93	12.69	0.181	14.37	0	14.64
51.88	48.2	49.59	12.78	0.177	14.47	0	14.74
54.94	49.46	51.21	13.01	0.173	14.61	0	14.88
55.7	51.94	53.39	13.48	0.164	14.81	0	15.08
57.67	53.25	55.37	14.03	0.158	15.01	0	15.28
58.21	55.03	56.59	14.54	0.156	15.03	0	15.33
59.02	56.27	57.6	14.98	0.165	14.93	0	15.23
58.65	56.63	57.5	15.31	0.175	14.78	0	15.08
57.45	54.85	56.1	15.53	0.183	14.64	0	14.93
54.85	48	52.01	15.69	0.188	14.51	0	14.81
48.3	35.65	41.79	15.71	0.192	14.42	0	14.71
37.34	35.26	36.36	15.58	0.192	14.29	0	14.61

36.46	33.56	34.94	15.38	0.194	14.27	0	14.56
34.42	32.54	33.47	15.18	0.194	14.25	0	14.54
33.5	31.41	32.5	14.91	0.193	14.22	0	14.51
32.65	30.97	31.82	14.66	0.192	14.22	0	14.51
33.31	31.69	32.64	14.42	0.192	14.22	0	14.49
32.21	29.54	30.94	14.17	0.189	14.22	0	14.49
31.18	28.83	30.06	13.96	0.189	14.22	0	14.49
31.88	28.75	30.11	13.74	0.188	14.22	0	14.49
32.48	27.51	30.46	13.53	0.186	14.25	0	14.49
36.24	27.02	29.59	13.34	0.188	14.25	0	14.47
48.91	36.29	44.09	13.08	0.189	14.2	0	14.42
50.83	47.94	49.42	13.01	0.184	14.29	0	14.51
53.04	49.98	51.41	13.01	0.18	14.44	0	14.66
56.36	52.05	53.92	13.15	0.176	14.59	0	14.81
58.29	54.72	56.45	13.48	0.167	14.81	0	15.01
60.47	56.54	58.06	14.03	0.153	15.08	0	15.31
61.89	57.55	59.89	14.64	0.148	15.26	0	15.48
63.89	60.68	62.25	15.23	0.147	15.36	0	15.58
64.43	62.02	63.17	15.71	0.155	15.31	0	15.51
63.63	61.95	62.71	15.97	0.17	15.06	0	15.28
63.19	60.21	61.7	16.15	0.18	14.83	0	15.06
60.25	51.25	56.39	16.28	0.188	14.69	0	14.88
51.54	41.65	44.43	16.25	0.191	14.54	0	14.74
42.29	38.98	40.86	16.12	0.192	14.42	0	14.61
42.33	40.26	41.24	15.94	0.193	14.37	0	14.56
41.75	40.86	41.27	15.74	0.193	14.34	0	14.56
43.37	41	42.47	15.51	0.194	14.34	0	14.54
45.58	42.35	43.33	15.28	0.192	14.34	0	14.54
45.27	38.46	42.86	15.08	0.193	14.37	0	14.54
46.14	42.7	44.3	14.86	0.19	14.37	0	14.54
45.13	42.73	43.73	14.69	0.19	14.39	0	14.54
44.27	41.14	42.83	14.51	0.188	14.39	0	14.54
41.84	37.26	39.91	14.34	0.188	14.39	0	14.54
46.1	41.56	43.06	14.15	0.187	14.39	0	14.51
51.59	45.19	48.66	13.93	0.189	14.34	0	14.44
57.55	51.48	54.28	13.88	0.186	14.47	0	14.56
61.97	57.15	59.59	13.93	0.179	14.64	0	14.74
65.31	61.01	63.01	14.15	0.175	14.88	0	14.96
68.05	64.05	65.69	14.61	0.156	15.23	0	15.31
69.98	65.3	67.45	15.36	0.136	15.71	0	15.79
70.14	65.11	67.89	16.04	0.135	15.94	0	16.04
71.8	68.23	69.52	16.7	0.141	16.1	0	16.17
70.36	68.5	69.51	16.99	0.161	15.87	0	15.94
71.14	68.95	69.87	17.17	0.172	15.58	0	15.66
70.04	67.42	68.57	17.23	0.183	15.26	0	15.31
67.5	54.09	63.27	17.25	0.188	15.01	0	15.06
54.04	48.79	50.4	17.17	0.192	14.78	0	14.83

50.38	46.97	48.77	17.01	0.196	14.66	0	14.69
49.12	47.23	48.3	16.83	0.196	14.59	0	14.64
48.48	45.76	46.85	16.62	0.194	14.59	0	14.61
51.78	46.02	48.88	16.41	0.194	14.56	0	14.59
50.1	47.95	49	16.17	0.192	14.59	0	14.59
51.66	48.67	50.08	15.97	0.193	14.59	0	14.59
51.66	47.08	49.11	15.76	0.193	14.61	0	14.59
49.65	47.14	48.5	15.58	0.191	14.61	0	14.59
49.99	40.9	47	15.43	0.191	14.64	0	14.59
41.12	34	36.2	15.26	0.191	14.64	0	14.56
49.11	34.58	39.76	15.03	0.192	14.61	0	14.51
57.06	49.14	54.1	14.81	0.192	14.59	0	14.47
60.9	54.27	57.38	14.78	0.187	14.74	0	14.61
63.53	59.13	60.82	14.83	0.184	14.91	0	14.76
65.35	61.9	63.67	15.03	0.177	15.11	0	14.96
69.41	64.57	66.87	15.48	0.166	15.43	0	15.26
72.27	67.55	70.06	16.15	0.151	15.87	0	15.69
75.7	70.19	72.7	17.12	0.136	16.46	0	16.28
76.03	73.15	74.58	17.99	0.14	16.85	0	16.64
76.28	73.77	74.82	18.43	0.155	16.8	0	16.62
74.87	72.66	73.59	18.38	0.171	16.33	0	16.15
73.25	69.96	71.81	18.13	0.181	15.81	0	15.58
69.99	65.23	67.58	17.93	0.186	15.43	0	15.21
65.97	56.79	63.52	17.71	0.192	15.18	0	14.96
56.73	54.41	55.27	17.55	0.195	15.06	0	14.83
55.87	53.04	54.75	17.33	0.197	14.98	0	14.74
54.95	52.07	53.44	17.15	0.195	14.96	0	14.69
54.78	52.43	53.5	16.93	0.195	14.96	0	14.66
57.62	52.99	55.74	16.72	0.192	14.96	0	14.66
56.39	54.48	55.64	16.54	0.193	14.96	0	14.66
55.48	53.29	54.29	16.36	0.193	14.98	0	14.66
54.37	45.53	50.65	16.17	0.192	14.98	0	14.66
50.56	45.21	47.94	15.99	0.19	14.98	0	14.64
51.95	48.12	49.38	15.84	0.191	14.98	0	14.61
57.05	51.91	54.32	15.66	0.192	14.98	0	14.61
61.32	57.1	59.23	15.46	0.194	14.98	0	14.59
65.42	61.07	63.04	15.48	0.189	15.13	0	14.71
68.77	65.23	66.86	15.61	0.18	15.38	0	14.96
69.88	67.4	68.53	15.99	0.165	15.76	0	15.31
71.45	68.45	70.28	16.67	0.142	16.36	0	15.89
74.31	69.8	72.06	17.41	0.135	16.88	0	16.41
74.37	71.5	72.95	17.85	0.139	17.01	0	16.54
75.35	71.57	72.9	18.04	0.157	16.88	0	16.41
74.64	71.55	72.84	18.01	0.167	16.54	0	16.04
73.37	71.11	72.17	17.96	0.174	16.25	0	15.74
71.2	69.35	70.23	17.85	0.181	15.94	0	15.43
69.67	63.62	66.08	17.69	0.185	15.69	0	15.18

64.47	59.97	61.93	17.55	0.189	15.51	0	14.98
60.12	54.38	56.71	17.39	0.192	15.38	0	14.88
57.38	52.67	55.43	17.2	0.194	15.31	0	14.78
54.19	47.06	50.64	17.01	0.193	15.28	0	14.74
51.52	45.24	49.3	16.8	0.193	15.23	0	14.71
50.01	38.39	44.45	16.59	0.194	15.26	0	14.69
40.81	35.09	38.44	16.36	0.195	15.23	0	14.66
42.07	33.39	36.45	16.12	0.194	15.23	0	14.64
40.92	33.42	36.65	15.89	0.194	15.23	0	14.64
36.14	33.67	34.49	15.66	0.191	15.23	0	14.64
35.44	32.89	34.18	15.46	0.191	15.23	0	14.64
40.54	34.64	36.99	15.23	0.191	15.23	0	14.61
56.03	40.54	47.69	14.96	0.193	15.18	0	14.54
56.59	54.67	55.45	14.91	0.188	15.33	0	14.69
59.47	55.55	57.36	14.96	0.183	15.51	0	14.83
62.48	58.32	59.91	15.11	0.177	15.69	0	15.01
64.28	60.34	62.14	15.48	0.168	15.97	0	15.28
66.99	62.88	64.72	16.12	0.156	16.36	0	15.66
69.03	65.79	67.24	16.77	0.146	16.64	0	15.97
71.01	67.02	68.79	17.44	0.144	16.83	0	16.15
70.9	68.63	69.76	17.82	0.159	16.75	0	16.04
71.05	68.83	70.12	17.99	0.17	16.46	0	15.76
70.05	66.69	68.27	18.04	0.181	16.15	0	15.46
66.88	58.31	62.51	18.01	0.186	15.89	0	15.23
58.27	47.3	48.54	17.93	0.193	15.66	0	15.01
48.51	47.2	47.93	17.77	0.194	15.53	0	14.86
48.2	47.21	47.61	17.58	0.196	15.48	0	14.83
48.02	46.26	47.24	17.39	0.196	15.48	0	14.81
48.68	43.31	45.09	17.17	0.197	15.48	0	14.81
44.37	41.57	43.28	16.93	0.194	15.46	0	14.78
42.88	41.4	42.09	16.72	0.193	15.48	0	14.78
42.22	39.86	41.1	16.49	0.19	15.48	0	14.78
42.17	39.49	40.79	16.28	0.193	15.48	0	14.78
41	38.39	39.55	16.1	0.193	15.48	0	14.78
40.83	38.94	40.04	15.89	0.192	15.51	0	14.78
45.74	39.78	41.64	15.71	0.192	15.51	0	14.78
55.89	45.77	51.38	15.48	0.192	15.46	0	14.74
58.7	55.37	57.25	15.46	0.189	15.58	0	14.86
61.48	57.47	59.62	15.51	0.183	15.76	0	15.01
65.55	60.91	63.38	15.74	0.177	15.97	0	15.21
68.6	64.56	66.4	16.17	0.162	16.3	0	15.53
72.19	66.88	69.24	16.8	0.151	16.7	0	15.92
72.44	69.18	70.65	17.52	0.141	17.09	0	16.3
71.31	69.52	70.26	17.77	0.154	16.91	0	16.12
71.63	69.34	70.43	17.88	0.168	16.59	0	15.81
71.98	69.6	70.94	18.13	0.172	16.51	0	15.74
71.42	68.36	69.35	18.24	0.177	16.38	0	15.61

68.36	63.28	66.35	18.21	0.182	16.2	0	15.43
63.3	58.12	60.34	18.13	0.187	16.04	0	15.28
63.98	58.33	60.22	17.99	0.191	15.92	0	15.16
63.38	60.13	62.47	17.88	0.192	15.89	0	15.13
62	60.77	61.36	17.77	0.191	15.92	0	15.13
61.14	59.63	60.32	17.63	0.19	15.92	0	15.13
60.48	58.41	59.63	17.52	0.188	15.92	0	15.13
58.76	50.72	55.55	17.39	0.191	15.92	0	15.13
51.96	47.11	49.15	17.25	0.19	15.87	0	15.08
56.38	51.82	55.1	17.07	0.189	15.84	0	15.03
59.05	54.15	56.65	16.99	0.19	15.89	0	15.08
56.81	53.91	54.89	16.88	0.188	15.92	0	15.11
53.9	51.77	53	16.77	0.19	15.94	0	15.11
51.78	47.45	48.91	16.64	0.19	15.92	0	15.08
50.47	49.21	49.86	16.49	0.191	15.87	0	15.01
54.17	50.47	51.9	16.43	0.192	15.92	0	15.06
55.58	52.97	54.12	16.46	0.187	16.02	0	15.16
57.5	55.28	56.49	16.54	0.183	16.12	0	15.26
56.3	50.14	53.85	16.62	0.184	16.17	0	15.31
58.59	53.31	56.15	16.64	0.186	16.15	0	15.26
63.45	57.52	61.09	16.85	0.18	16.3	0	15.41
61.44	53.89	58.11	16.99	0.179	16.38	0	15.48
61.66	57	58.9	16.96	0.184	16.28	0	15.38
59.18	54.81	56.35	17.04	0.186	16.25	0	15.36
54.81	51.15	53.16	17.04	0.188	16.2	0	15.31
51.11	43.92	48	16.99	0.19	16.12	0	15.23
45.08	42.12	43.57	16.85	0.192	16.04	0	15.16
49.25	43.16	46.81	16.7	0.191	16.02	0	15.13
49.17	47.05	47.93	16.56	0.189	16.04	0	15.13
49.23	47.35	48.12	16.43	0.19	16.04	0	15.16
47.47	44.53	45.42	16.3	0.188	16.07	0	15.16
46.7	45.04	45.89	16.15	0.187	16.04	0	15.16
47.12	43.01	45.35	16.02	0.186	16.07	0	15.16
46.64	41.83	44.18	15.89	0.187	16.04	0	15.16
44.22	40.64	42.29	15.74	0.188	16.04	0	15.16
41.6	39.52	40.5	15.61	0.186	16.04	0	15.16
47.63	41.26	45.34	15.46	0.187	16.02	0	15.13
51.74	46.31	48.93	15.31	0.187	15.99	0	15.11
54.91	51.16	52.8	15.31	0.186	16.1	0	15.21
59.04	54.1	55.9	15.38	0.178	16.25	0	15.36
59.67	57.25	58.43	15.56	0.175	16.43	0	15.53
61.15	58.44	59.77	15.84	0.168	16.59	0	15.71
63.04	60.38	61.79	16.2	0.168	16.7	0	15.84
68.14	62.84	65.02	16.64	0.16	16.88	0	16.02
66.74	63.89	65.06	17.01	0.164	16.91	0	16.04
66.04	63.41	64.83	17.36	0.165	16.96	0	16.12
66.95	62.4	64.57	17.5	0.171	16.83	0	15.99

64.94	60.45	62.77	17.47	0.183	16.59	0	15.79
60.57	56.21	57.95	17.47	0.188	16.43	0	15.64
56.25	53.69	55.14	17.41	0.188	16.3	0	15.48
53.98	52.53	53.32	17.31	0.191	16.23	0	15.41
53.59	52.14	52.69	17.2	0.193	16.17	0	15.38
52.79	51.36	52.05	17.04	0.192	16.15	0	15.36
51.59	45.8	47.94	16.88	0.192	16.12	0	15.36
52.71	48.59	50.37	16.72	0.19	16.12	0	15.33
49.83	47.19	48.84	16.56	0.19	16.12	0	15.36
52.22	46.88	49.21	16.41	0.188	16.12	0	15.36
49.64	45.61	47.16	16.28	0.187	16.12	0	15.36
45.72	43.61	44.79	16.1	0.188	16.1	0	15.36
43.71	37.82	39.79	15.97	0.187	16.1	0	15.33
46.53	37.51	40.78	15.79	0.189	16.07	0	15.31
56.2	46.54	51.26	15.58	0.192	15.99	0	15.23
59.6	54.77	57.01	15.61	0.186	16.17	0	15.41
58.2	54.59	56.39	15.71	0.181	16.36	0	15.58
59.25	53.99	56.43	15.81	0.18	16.41	0	15.64
59.65	55.02	57.15	15.87	0.18	16.38	0	15.61
61.28	57.68	59.2	16.12	0.18	16.51	0	15.74
63	57.48	59.65	16.36	0.176	16.56	0	15.81
59.07	49.47	53.37	16.67	0.178	16.64	0	15.89
54.54	49.55	51.92	16.59	0.187	16.33	0	15.58
52.73	49.71	51.5	16.77	0.186	16.36	0	15.61
51.64	48.36	50.53	16.85	0.186	16.33	0	15.58
48.96	47.81	48.48	16.85	0.185	16.3	0	15.58
47.81	44.18	46.31	16.77	0.186	16.25	0	15.53
44.14	42.11	43.09	16.62	0.19	16.2	0	15.48
44.44	40.98	42.69	16.46	0.189	16.15	0	15.43
44.98	40.57	42.37	16.28	0.187	16.15	0	15.43
44.2	39.64	42.14	16.1	0.189	16.12	0	15.43
40.64	38.19	39.41	15.92	0.187	16.12	0	15.43
41.25	37.47	39.39	15.74	0.186	16.12	0	15.43
42.51	39.1	40.73	15.58	0.186	16.12	0	15.43
41.61	39.56	40.23	15.43	0.187	16.15	0	15.43
43.09	41.23	41.89	15.31	0.185	16.15	0	15.46
43.02	38.51	41.42	15.18	0.185	16.15	0	15.48
44.17	38.37	41.09	15.06	0.183	16.12	0	15.46
47.89	44.29	46.15	14.86	0.186	16.04	0	15.38
52.32	47.89	50.06	14.86	0.184	16.17	0	15.51
52.82	50.37	51.51	14.93	0.18	16.33	0	15.66
57.03	51.43	53.24	15.08	0.174	16.46	0	15.81
57.1	54.26	55.63	15.33	0.169	16.62	0	15.94
58.95	55.46	57.2	15.66	0.165	16.77	0	16.12
62.8	56.95	58.82	15.87	0.171	16.67	0	16.02
62.16	57.81	59.54	16.33	0.168	16.8	0	16.17
63.71	59.25	61.73	16.56	0.173	16.7	0	16.1

64.19	59.1	61.21	16.91	0.176	16.7	0	16.1
63.22	59.54	61.29	17.04	0.181	16.54	0	15.97
59.6	55.11	57.96	17.2	0.186	16.46	0	15.87
55.09	51.87	53.13	17.23	0.188	16.33	0	15.79
52.2	50.6	51.3	17.2	0.19	16.25	0	15.71
51.83	50.02	50.72	17.09	0.187	16.23	0	15.69
52.66	48.11	51.22	16.96	0.189	16.2	0	15.66
48.71	47.29	47.94	16.83	0.189	16.2	0	15.66
48.69	47.6	48.26	16.64	0.188	16.15	0	15.64
48.83	48.3	48.56	16.51	0.187	16.17	0	15.64
48.43	46.77	47.73	16.38	0.186	16.17	0	15.64
47.3	45.15	46.37	16.23	0.187	16.15	0	15.64
46.33	43.87	45.34	16.07	0.187	16.12	0	15.61
45.49	42.78	44.11	15.94	0.185	16.12	0	15.61
48.64	40.74	42.98	15.79	0.188	16.12	0	15.61
54.45	48.71	52.4	15.56	0.189	16.04	0	15.51
56.8	53.52	54.94	15.58	0.186	16.2	0	15.69
59.57	56.19	58	15.69	0.177	16.41	0	15.87
62.93	58.46	60.8	15.94	0.169	16.64	0	16.12
65	61.27	63.14	16.46	0.153	17.01	0	16.51
67	62.19	64.64	17.28	0.133	17.58	0	17.07
68.21	63.38	65.76	17.74	0.143	17.66	0	17.12
69.33	62.81	66.89	18.13	0.161	17.55	0	17.04
63.02	59.29	60.49	18.26	0.174	17.23	0	16.72
60.1	59.08	59.47	18.07	0.189	16.67	0	16.15
60	58.86	59.28	18.1	0.19	16.51	0	16.02
60.15	56.66	57.88	18.07	0.188	16.43	0	15.94
57.01	53.47	54.99	17.96	0.19	16.38	0	15.89
55.68	54.17	55.16	17.77	0.193	16.33	0	15.81
56.44	54.68	55.47	17.6	0.192	16.28	0	15.79
56.44	55.2	55.82	17.44	0.19	16.28	0	15.79
55.24	54.23	54.81	17.31	0.189	16.28	0	15.76
54.4	53.63	54.06	17.15	0.19	16.3	0	15.79
54.03	53.17	53.58	17.01	0.189	16.3	0	15.79
53.59	52.34	53.01	16.88	0.187	16.3	0	15.79
52.54	51.53	52.09	16.75	0.187	16.3	0	15.76
51.97	51.34	51.67	16.62	0.189	16.3	0	15.76
52.11	51.19	51.65	16.51	0.186	16.3	0	15.76
54.38	51.71	53.05	16.38	0.186	16.3	0	15.74
57.54	54.37	55.83	16.23	0.189	16.28	0	15.69
60.76	57.09	58.76	16.25	0.186	16.41	0	15.84
64.32	60.31	61.94	16.38	0.178	16.64	0	16.04
66.54	61.89	63.49	16.72	0.166	16.99	0	16.41
67.68	62.5	65.37	17.15	0.155	17.31	0	16.72
71.36	66.74	68.38	17.74	0.147	17.71	0	17.12
69.12	65.99	67.47	17.9	0.162	17.6	0	17.01
68.9	66.53	67.39	17.82	0.177	17.17	0	16.59

73.73	67.95	70.12	17.96	0.179	17.04	0	16.46
73.95	69.38	71.76	18.38	0.176	17.25	0	16.64
70.15	66.21	68.66	18.6	0.178	17.28	0	16.7
67.07	63.6	65.35	18.4	0.186	16.93	0	16.33
63.58	58.92	61.45	18.29	0.187	16.75	0	16.15
59.36	57.56	58.54	18.18	0.188	16.62	0	16.02
58.26	55.2	56.75	18.04	0.192	16.54	0	15.94
57.52	56.2	56.97	17.9	0.191	16.51	0	15.92
56.92	55.83	56.5	17.74	0.192	16.51	0	15.89
56.57	51.8	54.34	17.6	0.189	16.49	0	15.89
55.63	54.07	54.92	17.44	0.19	16.49	0	15.87
54.9	49.04	52.09	17.31	0.19	16.49	0	15.87
49.75	42.64	45.97	17.15	0.191	16.49	0	15.84
44.4	41.79	42.98	16.99	0.189	16.46	0	15.81
42.64	38.71	40.72	16.8	0.189	16.43	0	15.79
54.52	38.73	45.03	16.62	0.188	16.41	0	15.76
58.57	54.06	56.12	16.41	0.19	16.38	0	15.71
61.14	57.27	59.54	16.41	0.188	16.56	0	15.89
67.26	59.74	62.6	16.51	0.181	16.75	0	16.07
69.35	66.67	67.94	16.75	0.174	16.99	0	16.33
70.09	66.64	68.18	17.28	0.159	17.41	0	16.72
72.44	68.02	69.67	17.69	0.153	17.63	0	16.93
72.73	69.1	70.87	18.21	0.154	17.9	0	17.2
72.68	69.84	71.38	18.54	0.159	17.93	0	17.25
70.99	68.25	69.39	18.54	0.171	17.66	0	16.99
71.33	67.82	69.43	18.46	0.178	17.33	0	16.64
69.39	65.66	67.3	18.57	0.182	17.23	0	16.54
65.83	60.37	63.05	18.46	0.185	17.04	0	16.33
60.31	56.86	58.46	18.32	0.189	16.83	0	16.15
59.03	55.52	58.19	18.15	0.192	16.7	0	16.02
58.75	56.02	57.56	18.07	0.191	16.7	0	15.99
56.2	50.76	53.33	17.93	0.192	16.7	0	15.99
51.74	46.57	48.07	17.74	0.192	16.64	0	15.94
49.96	46.02	47.68	17.55	0.191	16.59	0	15.89
50.37	47.85	49.01	17.36	0.187	16.59	0	15.89
49	44.97	47.44	17.2	0.188	16.62	0	15.89
47.37	40.83	45.04	17.04	0.187	16.62	0	15.89
47.03	39.33	44.19	16.83	0.188	16.59	0	15.89
47.54	44.56	46.36	16.67	0.187	16.62	0	15.89
50.4	46.87	48.58	16.51	0.188	16.62	0	15.87
56.2	50.38	53.47	16.3	0.187	16.56	0	15.84
57.39	55.49	56.4	16.3	0.186	16.72	0	15.97
58.57	56.23	57.26	16.38	0.181	16.88	0	16.12
61.18	57.3	59.17	16.59	0.171	17.12	0	16.36
61.41	50.19	54.78	16.93	0.164	17.39	0	16.64
55.67	49.58	52.55	16.8	0.175	17.12	0	16.36
57.46	52.23	55.26	16.93	0.176	17.09	0	16.33

59.69	53.7	56.21	17.33	0.17	17.36	0	16.59
54.33	48.61	51.25	17.33	0.174	17.2	0	16.43
52.91	49.21	51.23	17.31	0.181	16.99	0	16.23
49.54	41.43	44.25	17.33	0.184	16.93	0	16.17
41.4	36.37	38.34	17.25	0.186	16.8	0	16.04
38.52	36.98	37.74	17.15	0.186	16.72	0	15.97
38.85	35.61	37.76	17.01	0.187	16.7	0	15.97
35.58	32.82	34.21	16.8	0.187	16.7	0	15.94
33.16	32.32	32.64	16.56	0.185	16.67	0	15.94
34.81	33.15	33.86	16.33	0.184	16.67	0	15.94
37.5	34.42	35.94	16.07	0.185	16.64	0	15.94
37.88	36.35	37.06	15.84	0.183	16.64	0	15.94
36.99	35.91	36.32	15.58	0.184	16.64	0	15.94
35.96	34.32	35.01	15.31	0	16.64	0	15.94
34.76	33.59	34.25	15.06	0	16.64	0	15.94
35.7	33.96	34.61	14.83	0	16.64	0	15.94
35.16	33.6	34.28	14.59	0	16.64	0	15.94
39.16	35.16	37.04	14.27	0	16.54	0	15.84
44.62	38.67	42.11	14.15	0	16.62	0	15.92
48.37	42.95	45.94	14.08	0	16.7	0	16.02
49.18	46.43	47.76	14.13	0	16.8	0	16.12
51.78	48.08	49.3	14.17	0	16.8	0	16.12
53.75	49.49	51.64	14.32	0	16.8	0	16.15
53.55	50.33	51.78	14.54	0	16.85	0	16.23
54.07	50.95	51.82	14.76	0.173	16.85	0	16.23
52.89	51.5	52.16	14.96	0	16.8	0	16.2
55.68	52.36	53.3	15.11	0.177	16.77	0	16.17
53.66	51.59	52.63	15.23	0.177	16.77	0	16.2
52.31	50.1	51.44	15.31	0.179	16.75	0	16.2
50.1	47.76	48.99	15.33	0.177	16.72	0	16.17
47.89	45.86	46.9	15.28	0.18	16.67	0	16.15
47.02	44.48	45.4	15.18	0	16.62	0	16.12
45.21	43.5	44.38	15.08	0	16.56	0	16.1
46.1	44.18	45.05	14.96	0	16.54	0	16.1
45.33	41.65	43.89	14.83	0	16.54	0	16.1
41.64	37.27	39.22	14.71	0	16.51	0	16.1
38.08	30.67	33.26	14.54	0	16.46	0	16.07
34.44	29.1	30.93	14.34	0	16.41	0	16.02
37.95	33.03	36.36	14.15	0	16.38	0	16.02
37.94	35.09	36.48	13.96	0	16.38	0	16.02
41.58	36.05	38.76	13.77	0	16.36	0	16.02
43.39	41.54	42.52	13.58	0	16.33	0	16.02
46.22	43.36	44.56	13.46	0	16.36	0	16.04
45.6	43.65	44.52	13.48	0	16.43	0	16.15
47.67	44.45	46.04	13.53	0	16.43	0	16.17
50.18	46.99	48.65	13.69	0	16.46	0	16.2
54.68	49.85	51.9	13.91	0	16.51	0	16.28

57.29	51.39	54.23	14.29	0	16.62	0	16.41
57.7	52.69	54.87	14.78	0.165	16.72	0	16.54
58.55	52.85	55.1	15.23	0.169	16.67	0	16.49
57.5	52.95	54.67	15.66	0.173	16.59	0	16.46
55.58	52.66	54.2	15.94	0.178	16.49	0	16.36
53.03	48.08	50.81	16.17	0.18	16.43	0	16.33
48.14	42.26	45.27	16.23	0.181	16.33	0	16.25
42.77	37.19	40.13	16.12	0.182	16.25	0	16.17
45.49	37.07	40.81	15.94	0.183	16.17	0	16.15
45.99	41.29	45.01	15.76	0.182	16.17	0	16.15
41.24	35.3	37.62	15.56	0.18	16.17	0	16.15
35.26	31.71	32.91	15.36	0	16.12	0	16.12
33.47	31.72	32.44	15.13	0	16.1	0	16.1
32.51	30.19	31.63	14.91	0	16.07	0	16.07
30.73	28.97	29.99	14.69	0	16.04	0	16.07
29.29	27.78	28.6	14.44	0	16.04	0	16.07
29.05	27.59	27.99	14.2	0	16.02	0	16.07
42.02	28.01	34.5	13.98	0	15.99	0	16.04
46.99	42.06	44.87	13.74	0	15.99	0	16.04
49.52	46.68	47.91	13.65	0	16.07	0	16.12
51.88	47.66	49.46	13.69	0	16.17	0	16.25
54.47	49.97	51.81	13.88	0	16.33	0	16.38
56.67	51.9	54.1	14.29	0.162	16.46	0	16.56
58.97	54.61	56.13	14.96	0.151	16.72	0	16.83
60.72	54.7	57.49	15.64	0.146	16.85	0	16.99
60.78	57.29	59.09	16.17	0.155	16.8	0	16.93
61.91	58.67	60.49	16.67	0.164	16.75	0	16.88
61.49	59.51	60.49	17.04	0.169	16.62	0	16.77
60.68	58.44	59.63	17.28	0.178	16.43	0	16.59
58.44	52.97	56.41	17.44	0.183	16.3	0	16.46
52.95	46.85	49.45	17.47	0.185	16.17	0	16.36
47.12	42.54	44.97	17.36	0.187	16.07	0	16.25
45.27	42.76	43.74	17.15	0.188	16.02	0	16.2
46.17	44.38	45.26	16.93	0.188	15.99	0	16.17
45.4	41.46	43.43	16.7	0.188	15.97	0	16.17
42.59	40.17	41.43	16.43	0.189	15.97	0	16.15
44.01	36.51	39.47	16.17	0.185	15.94	0	16.15
37.06	34.19	35.32	15.94	0.184	15.94	0	16.12
35.84	34.43	35	15.69	0	15.94	0	16.12
39.51	34.64	36.99	15.43	0	15.94	0	16.1
38.7	36.3	37.81	15.23	0	15.94	0	16.1
46.99	34.64	40.51	14.98	0	15.92	0	16.07
50.89	47.02	49.38	14.78	0	15.92	0	16.07
55.49	50.23	53.12	14.64	0	15.99	0	16.12
58.19	54.25	56.06	14.74	0	16.17	0	16.3
60.89	56.87	58.72	14.98	0.166	16.36	0	16.49
63.57	59.33	61.3	15.41	0.16	16.56	0	16.7

67.44	62.45	64.63	16.17	0.146	16.93	0	17.09
70.06	65.84	68	17.12	0.13	17.39	0	17.52
71.75	68.23	69.91	17.96	0.129	17.63	0	17.8
71.75	68.9	70.32	18.32	0.152	17.41	0	17.58
72.06	69.5	70.53	18.49	0.166	17.12	0	17.28
70.98	67.56	69.46	18.46	0.178	16.8	0	16.93
67.5	61.97	64.83	18.4	0.184	16.51	0	16.64
61.97	54.9	58.26	18.26	0.187	16.3	0	16.43
59.68	53.29	55.53	18.07	0.189	16.17	0	16.28
60.47	57.35	58.79	17.9	0.19	16.12	0	16.25
58.02	56.04	57.08	17.71	0.187	16.12	0	16.23
57.88	56.7	57.37	17.52	0.188	16.12	0	16.23
57.66	56.59	57.11	17.31	0.187	16.12	0	16.23
57.1	55.95	56.59	17.12	0.189	16.12	0	16.2
56.54	54.05	55.19	16.96	0.186	16.12	0	16.2
55.5	47.76	53.23	16.77	0.184	16.12	0	16.17
55.75	54.38	55.05	16.59	0.185	16.12	0	16.15
55.45	53.83	54.62	16.41	0.185	16.12	0	16.17
59.21	53.52	55.59	16.25	0.185	16.12	0	16.15
63.57	59.23	61.42	16.12	0.186	16.15	0	16.15
66.86	63.17	65.09	16.1	0.182	16.25	0	16.25
70.07	66.17	68.03	16.3	0.171	16.54	0	16.51
71.38	68.04	69.59	16.72	0.156	16.91	0	16.88
73.57	69.29	71.24	17.41	0.136	17.44	0	17.41
75.4	70.82	73.32	18.51	0.112	18.24	0	18.21
76.4	72.54	74.62	19.54	0.126	18.82	0	18.8
77.8	74.53	76.2	19.83	0.151	18.63	0	18.6
77.96	75.12	76.24	19.86	0.163	18.21	0	18.15
77.33	75.3	76.13	19.78	0.174	17.74	0	17.69
75.82	73.4	74.72	19.63	0.179	17.31	0	17.23
73.4	68.49	71.14	19.43	0.187	16.93	0	16.85
68.74	60.77	64.83	19.2	0.187	16.67	0	16.56
64.45	59.4	61.81	19	0.191	16.49	0	16.38
60.63	57.63	58.8	18.8	0.192	16.43	0	16.28
61.19	57.85	60.24	18.6	0.192	16.41	0	16.25
64.24	60.15	63.21	18.4	0.189	16.41	0	16.25
63.6	62.19	62.8	18.21	0.189	16.43	0	16.25
62.55	54.35	58.12	18.04	0.187	16.43	0	16.28
59.58	54.85	58.02	17.85	0.189	16.43	0	16.23
59.62	55.94	58.51	17.69	0.188	16.43	0	16.2
56.18	52.94	54.56	17.5	0.189	16.43	0	16.2
53.29	51.32	52.33	17.33	0.186	16.43	0	16.15
62.58	51.19	55.03	17.12	0.187	16.41	0	16.12
65.93	62.6	64.82	16.96	0.188	16.41	0	16.12
69.66	65.79	67.4	16.99	0.183	16.59	0	16.28
70.69	67.55	68.64	17.17	0.177	16.85	0	16.51
73.12	69.97	71.56	17.55	0.161	17.17	0	16.85

75.89	71.26	73.28	18.07	0.154	17.5	0	17.12
77.6	72.35	74.83	18.82	0.144	17.9	0	17.52
78.22	74.7	76.35	19.75	0.137	18.38	0	18.01
79.93	75.49	77.86	20.37	0.151	18.46	0	18.07
79.11	76.35	77.79	20.55	0.168	18.15	0	17.77
78.34	76.21	77.06	20.64	0.174	17.82	0	17.41
76.4	73.97	75.09	20.61	0.183	17.5	0	17.07
74.63	68.57	72.86	20.49	0.189	17.23	0	16.77
68.53	63.77	65.23	20.37	0.19	17.07	0	16.62
64.77	61.71	63.49	20.13	0.193	16.88	0	16.43
65.4	62	63.43	19.89	0.194	16.83	0	16.36
64.07	59.83	62.44	19.66	0.192	16.8	0	16.33
63.32	58.06	60.24	19.43	0.193	16.77	0	16.28
63.98	58.54	62.29	19.2	0.192	16.77	0	16.28
59.11	51.41	55.66	18.97	0.189	16.8	0	16.28
58.4	52.12	55.16	18.74	0.191	16.77	0	16.23
55.88	48.42	51.41	18.51	0.19	16.77	0	16.2
55.16	47.86	51.45	18.26	0.189	16.77	0	16.17
51.28	48.38	50.16	18.04	0.192	16.8	0	16.17
59.33	48.98	53.21	17.82	0.189	16.8	0	16.15
68.66	59.37	64.61	17.6	0.189	16.8	0	16.15
70.56	68.03	69.34	17.6	0.185	16.99	0	16.3
74.08	70.4	72.23	17.82	0.176	17.31	0	16.59
76.28	72.81	74.29	18.24	0.161	17.71	0	16.99
77.37	74.32	75.9	18.88	0.145	18.21	0	17.44
78.6	75.42	77.11	19.54	0.137	18.57	0	17.8
79.73	76.59	78.09	20.25	0.14	18.94	0	18.15
80.2	76.19	78.22	20.55	0.151	18.85	0	18.04
78.75	76.44	77.75	20.55	0.167	18.51	0	17.69
77.34	74.69	76.07	20.58	0.172	18.26	0	17.44
75.1	71.53	73.38	20.46	0.181	17.9	0	17.09
72.32	67.59	69.77	20.25	0.187	17.6	0	16.8
67.86	63.03	65.05	20.1	0.188	17.44	0	16.62
64.22	61.43	63.33	19.89	0.192	17.28	0	16.46
62.61	51.54	56.19	19.69	0.192	17.25	0	16.41
52.2	49.79	50.94	19.43	0.193	17.17	0	16.33
57.68	48.04	51.89	19.2	0.195	17.12	0	16.25
56.94	51.41	53.87	18.97	0.191	17.15	0	16.25
59.73	53.5	56.4	18.77	0.192	17.15	0	16.28
58.8	54.77	57.71	18.57	0.189	17.17	0	16.28
60.23	57.76	58.83	18.4	0.19	17.23	0	16.3
59.11	54.5	57.17	18.26	0.189	17.25	0	16.33
55.24	53.59	54.2	18.07	0.187	17.25	0	16.3
59	53.63	56.31	17.9	0.19	17.23	0	16.28
60.18	58.29	59.07	17.77	0.189	17.25	0	16.28
63.69	59.6	61.4	17.74	0.186	17.36	0	16.38
66.34	62.18	64.17	17.85	0.181	17.55	0	16.56

68.65	64.3	66.38	18.07	0.175	17.8	0	16.8
68.98	65.86	67.08	18.4	0.167	18.07	0	17.04
69.71	66.1	67.8	18.8	0.154	18.32	0	17.28
69.71	65.86	67.56	19.2	0.149	18.54	0	17.5
69.71	66.6	68.16	19.34	0.151	18.46	0	17.41
69.35	66.13	67.45	19.4	0.159	18.32	0	17.28
67.5	64.21	65.7	19.46	0.169	18.15	0	17.12
64.84	61.56	63.34	19.34	0.178	17.88	0	16.85
61.83	57.07	59.85	19.28	0.182	17.74	0	16.7
57.54	54.51	55.89	19.14	0.187	17.58	0	16.54
55.33	51.03	52.12	18.94	0.189	17.47	0	16.43
51.55	48.4	49.8	18.74	0.19	17.41	0	16.38
49.85	47.86	49.08	18.54	0.188	17.41	0	16.36
49.49	47.07	48.23	18.32	0.188	17.39	0	16.36
49.32	48.23	48.7	18.1	0.188	17.39	0	16.33
49	46.31	47.73	17.9	0.185	17.39	0	16.33
47.38	45.35	46.14	17.71	0.185	17.39	0	16.36
45.66	42.22	43.54	17.5	0.185	17.39	0	16.33
44.64	41.07	43.32	17.31	0.185	17.39	0	16.33
47.18	40.52	43.12	17.15	0.185	17.39	0	16.33
52.63	45.48	48.6	16.93	0.183	17.39	0	16.3
55.57	52.59	53.89	16.77	0.184	17.41	0	16.33
59.39	54.68	56.65	16.72	0.183	17.5	0	16.41
62.61	58.37	60.16	16.85	0.173	17.71	0	16.64
64.78	61.5	62.97	17.12	0.166	17.96	0	16.88
67.81	62.82	65.35	17.63	0.151	18.32	0	17.25
70.61	65.87	68.16	18.38	0.131	18.8	0	17.71
72.95	68.32	70.32	19.11	0.121	19.22	0	18.13
73.87	70.49	72.28	19.48	0.136	19.2	0	18.1
74.19	70.16	72.05	19.57	0.151	18.88	0	17.82
72.37	70.34	71.38	19.66	0.16	18.66	0	17.58
71.71	66.35	69.15	19.6	0.173	18.29	0	17.25
66.37	61.69	64.13	19.48	0.18	17.99	0	16.96
62.24	57.79	60.58	19.34	0.186	17.8	0	16.77
58.21	53.87	55.88	19.2	0.187	17.69	0	16.67
56.39	53.55	55.03	19.02	0.188	17.63	0	16.62
54.32	52.36	53.4	18.82	0.187	17.6	0	16.59
53.8	51.47	52.38	18.63	0.187	17.58	0	16.56
52.43	50.47	51.2	18.43	0.187	17.55	0	16.56
53.26	49.67	51.12	18.24	0.187	17.55	0	16.56
52.68	50.26	51.41	18.07	0.184	17.58	0	16.56
52.04	50.03	51.28	17.9	0.185	17.58	0	16.56
51.17	49.92	50.61	17.74	0.183	17.58	0	16.59
50.49	49.08	49.82	17.6	0.183	17.58	0	16.59
51.48	49.49	50.71	17.41	0.185	17.58	0	16.56
54.69	50.96	52.81	17.25	0.186	17.55	0	16.54
56.39	53.32	54.95	17.28	0.183	17.69	0	16.67

58.24	53.71	55.82	17.31	0.18	17.8	0	16.77
59.44	54.51	57.22	17.41	0.176	17.88	0	16.85
58.09	52.67	55.25	17.58	0.174	17.96	0	16.96
53.36	37.9	43.13	17.63	0.178	17.88	0	16.85
42.19	33.81	37.73	17.55	0.184	17.69	0	16.67
49.95	35.58	43.09	17.55	0.182	17.63	0	16.64
51.97	40.12	48.26	17.52	0.184	17.66	0	16.67
52.53	48.87	50.96	17.55	0.183	17.74	0	16.75
52.31	46.37	49.81	17.52	0.18	17.77	0	16.77
47.68	44.32	45.96	17.5	0.182	17.74	0	16.77
44.67	41.41	42.99	17.39	0.182	17.69	0	16.72
42.71	40.19	41.42	17.23	0.183	17.63	0	16.67
40.71	38.55	39.61	17.04	0.183	17.6	0	16.64
40.35	35.75	37.67	16.83	0.183	17.58	0	16.62
38.36	34.55	36.27	16.62	0.181	17.55	0	16.62
37.14	34.5	35.65	16.38	0	17.55	0	16.62
40.81	34.15	38.48	16.2	0	17.55	0	16.62
40.67	37.78	39.56	16.02	0	17.55	0	16.64
40.66	38.19	39.84	15.84	0	17.55	0	16.64
40.32	37.74	39.32	15.69	0	17.58	0	16.67
37.74	35.5	36.14	15.56	0	17.58	0	16.7
40.02	36.47	37.93	15.41	0	17.55	0	16.67
44.45	39.16	41.15	15.28	0	17.52	0	16.67
46.21	42.55	44.17	15.18	0	17.5	0	16.64
48.77	44.62	45.86	15.21	0	17.6	0	16.77
52.77	46.14	50.17	15.26	0	17.69	0	16.83
56.43	50.79	53.26	15.46	0	17.82	0	16.99
58.74	54.85	56.48	15.76	0.161	17.96	0	17.17
61.74	56.67	59	16.17	0.154	18.15	0	17.36
62.92	58.16	60.58	16.56	0.152	18.24	0	17.47
62.92	57.08	60.39	16.83	0.158	18.15	0	17.41
60.99	57.02	59.22	17.04	0.166	18.01	0	17.28
60.69	57	58.74	17.17	0.172	17.85	0	17.15
58.04	54.39	56.24	17.25	0.176	17.77	0	17.09
54.34	50.96	52.8	17.25	0.179	17.66	0	16.99
51.1	47.73	49.91	17.17	0.179	17.55	0	16.93
50.34	48.16	49.38	17.07	0.181	17.5	0	16.88
49.94	46.81	48.32	16.93	0.179	17.5	0	16.88
48.52	45.61	47.31	16.8	0.18	17.44	0	16.85
49.06	47.73	48.43	16.64	0.179	17.41	0	16.85
49.24	48.39	48.78	16.49	0	17.41	0	16.85
49.35	46.88	48.67	16.38	0	17.41	0	16.85
48.42	45.7	47.37	16.25	0	17.39	0	16.88
45.94	43.8	45.02	16.12	0	17.39	0	16.85
49.01	45.71	48.05	16.02	0	17.39	0	16.88
50.06	45.26	46.85	15.92	0	17.36	0	16.85
53.89	50.15	51.76	15.76	0	17.31	0	16.83

56.91	53.08	55.17	15.81	0	17.44	0	16.96
58.42	55.69	56.57	15.94	0.172	17.58	0	17.09
59.36	57.07	58.01	16.15	0.167	17.69	0	17.23
63.57	57.53	60.22	16.38	0.166	17.74	0	17.31
65.23	59.35	61.71	16.77	0.16	17.88	0	17.44
63.03	60.63	62.03	17.15	0.163	17.9	0	17.47
65.84	62.28	64.21	17.5	0.163	17.88	0	17.47
64.9	60.96	62.28	17.9	0.162	17.99	0	17.6
63.95	59.81	61.77	17.96	0.173	17.77	0	17.36
60.39	57.18	58.65	18.07	0.177	17.69	0	17.28
57.55	53.49	55.14	18.07	0.179	17.58	0	17.2
53.65	52.27	53.26	18.01	0.181	17.47	0	17.09
52.31	50.01	50.9	17.9	0.182	17.41	0	17.04
51.79	50.21	51.25	17.77	0.182	17.36	0	17.01
52.7	50.53	51.5	17.6	0.182	17.36	0	17.01
51.22	48.84	49.73	17.47	0.181	17.33	0	17.01
49.78	47.65	48.52	17.33	0.181	17.33	0	17.01
48.5	46.58	47.3	17.17	0.18	17.33	0	16.99
48.41	44.4	46.29	17.04	0.18	17.33	0	16.99
47.3	43.94	45.41	16.91	0.18	17.31	0	16.99
45.46	40.6	42.57	16.77	0.18	17.31	0	16.96
46.42	41.09	43.72	16.62	0	17.28	0	16.93
47.51	43.23	45.59	16.46	0	17.25	0	16.91
51.12	47.49	49.43	16.3	0	17.25	0	16.91
53.59	49.92	51.83	16.23	0	17.31	0	16.96
55.95	51.75	53.76	16.25	0.175	17.44	0	17.09
56.51	50.47	52.98	16.36	0.172	17.52	0	17.2
57.12	52.73	54.33	16.62	0.169	17.66	0	17.33
57.23	49.03	53.5	16.88	0.167	17.74	0	17.41
54.33	48.34	51.47	17.17	0.167	17.8	0	17.5
54.98	51.08	52.95	17.36	0.167	17.77	0	17.44
55.84	48.55	51.94	17.47	0.172	17.66	0	17.36
53.17	49.6	51.55	17.6	0.175	17.6	0	17.28
52.21	47.86	50.09	17.66	0.178	17.52	0	17.23
48.29	44.66	46.38	17.66	0.181	17.47	0	17.15
44.8	43.81	44.26	17.63	0.18	17.39	0	17.09
44.31	42.29	43.52	17.5	0.181	17.33	0	17.01
42.64	39.71	41.35	17.31	0.181	17.28	0	16.99
41.74	40.19	41.2	17.12	0.181	17.25	0	16.99
42.07	41.12	41.67	16.93	0.18	17.25	0	16.96
42.07	41.12	41.68	16.75	0	17.25	0	16.96
41.43	39.58	40.82	16.56	0	17.25	0	16.96
41.68	39.07	40.06	16.38	0	17.23	0	16.96
42.45	41.62	42.1	16.23	0	17.23	0	16.96
42.43	41.12	42.04	16.12	0	17.25	0	16.99
42.19	40.97	41.58	15.99	0	17.28	0	16.99
44.76	42.07	43.03	15.84	0	17.25	0	16.96

45.19	43.14	44.19	15.71	0	17.2	0	16.91
49.17	44.48	46.65	15.69	0	17.28	0	16.99
53.54	48.24	51.45	15.71	0	17.36	0	17.09
55.84	50.66	53.28	15.92	0.166	17.55	0	17.28
57.54	51.47	55.26	16.15	0.165	17.66	0	17.41
60.46	53.69	56.96	16.46	0.161	17.77	0	17.52
63.48	58.85	61.06	16.85	0.153	17.9	0	17.66
63.41	58.23	61.02	17.28	0.149	18.07	0	17.82
63.87	59.2	61.76	17.47	0.158	17.93	0	17.71
62.68	58.03	60.35	17.69	0.163	17.82	0	17.6
59.37	52.59	56.53	17.8	0.171	17.66	0	17.44
53.71	52.44	52.97	17.82	0.175	17.5	0	17.28
52.45	49.6	51.27	17.77	0.18	17.39	0	17.17
50.93	48.35	49.79	17.66	0.182	17.31	0	17.12
50.79	47.34	48.82	17.52	0.181	17.28	0	17.09
48.11	46.8	47.4	17.39	0.178	17.25	0	17.07
46.84	40.29	43.87	17.23	0.181	17.23	0	17.04
45.35	40.36	42.12	17.04	0.182	17.2	0	17.01
43.96	40.62	42.82	16.85	0.181	17.17	0	17.01
43.21	41.96	42.47	16.7	0	17.17	0	17.01
42.76	40.84	41.74	16.56	0	17.2	0	17.01
42.95	41.77	42.52	16.41	0	17.2	0	17.01
42.33	39.74	41.2	16.3	0	17.2	0	17.01
45.33	41.29	43.57	16.12	0	17.17	0	16.99
48.13	44.29	46.27	15.99	0	17.15	0	16.96
49.96	46.72	48.78	15.99	0	17.23	0	17.04
49.42	47.39	48.51	16.04	0	17.31	0	17.12
49.92	44.86	48.58	16.12	0.174	17.31	0	17.15
52.5	44.72	49.12	16.25	0	17.31	0	17.15
55.52	51.9	53.66	16.49	0.172	17.44	0	17.28
53.44	51.22	52.52	16.75	0.17	17.55	0	17.36
51.29	45.49	49.93	16.85	0.175	17.39	0	17.23
45.32	39.76	41.09	16.93	0.177	17.31	0	17.15
40.91	39.73	40.35	16.88	0.18	17.23	0	17.07
40.07	39.73	39.92	16.75	0	17.2	0	17.04
40.38	39.98	40.21	16.54	0	17.2	0	17.04
40.79	40.21	40.53	16.28	0	17.17	0	17.04
40.86	40.36	40.63	16.02	0	17.17	0	17.01
41.84	40.84	41.38	15.81	0	17.17	0	17.04
42.45	41.81	42.16	15.64	0	17.17	0	17.04
42.15	41.43	41.78	15.48	0	17.17	0	17.04
41.6	41.29	41.44	15.33	0	17.17	0	17.04
41.53	41.19	41.34	15.23	0	17.15	0	17.04
41.36	40.36	41.02	15.11	0	17.15	0	17.04
40.6	39.98	40.23	14.98	0	17.15	0	17.01
41.05	40.19	40.64	14.76	0	17.12	0	17.01
41.09	40.64	40.86	14.49	0	17.12	0	17.01

41.45	40.88	41.28	14.29	0	17.12	0	17.01
41.26	39.66	40.21	14.15	0	17.09	0	16.99
40.43	39.16	39.66	14	0.206	17.04	0	16.96
40.79	39.71	40.18	13.91	0.229	16.99	0	16.93
40.65	40.04	40.35	13.88	0.233	17.01	0	16.93
42.1	40.55	41.1	13.93	0.235	17.01	0	16.96
45.83	41.93	43.72	13.98	0.234	17.01	0	16.99
46.88	45.31	45.95	14.1	0.233	17.04	0	17.04
52.17	46.64	48.98	14.29	0.233	17.07	0	17.07
51.98	48.18	49.33	14.61	0.232	17.15	0	17.17
51	48.73	49.23	14.86	0.237	17.07	0	17.12
52.17	50.38	51.39	15.08	0.238	17.04	0	17.12
51.84	48.49	50.44	15.26	0.238	17.04	0	17.15
48.45	44.12	46.34	15.43	0.236	17.04	0	17.15
44.12	42.09	43.19	15.43	0.236	16.93	0	17.07
43.16	39.43	41.36	15.36	0.237	16.88	0	17.04
40.58	38.36	39.46	15.21	0.236	16.85	0	17.01
41.21	38.08	39.21	15.03	0.235	16.8	0	16.99
42.07	39.22	41.27	14.86	0.234	16.8	0	16.99
39.2	37.7	38.14	14.69	0.233	16.8	0	17.01
37.84	36.03	36.7	14.51	0.231	16.75	0	16.99
36.24	35.52	35.87	14.32	0.232	16.72	0	16.96
35.52	34.46	35.01	14.15	0.231	16.72	0	16.96
38.14	33.68	35.02	13.96	0.229	16.7	0	16.96
42.64	38.14	40.84	13.77	0.226	16.67	0	16.96
43.92	42.64	43.41	13.6	0.228	16.64	0	16.93
46.87	43.78	44.94	13.55	0.228	16.64	0	16.96
49.54	45.88	47.54	13.65	0.227	16.72	0	17.04
52.33	49.33	50.52	13.84	0.224	16.77	0	17.12
54.92	50.98	52.62	14.15	0.222	16.85	0	17.2
56.45	52.98	54.47	14.64	0.215	16.99	0	17.36
56.98	53.79	55.35	15.08	0.219	17.01	0	17.41
57.47	54.78	55.93	15.46	0.225	16.93	0	17.36
56.3	54.97	55.58	15.76	0.229	16.85	0	17.28
57.52	54.83	55.64	15.94	0.233	16.77	0	17.2
58.05	55.07	56.69	16.07	0.234	16.72	0	17.2
55.41	53.18	54.53	16.2	0.233	16.72	0	17.2
53.18	48.69	50.73	16.23	0.235	16.67	0	17.15
49.32	45.11	47.45	16.12	0.235	16.59	0	17.07
45.07	42.5	43.94	15.97	0.235	16.51	0	17.01
44.49	42.34	42.83	15.76	0.233	16.46	0	17.01
45.98	41.86	44.21	15.56	0.233	16.46	0	16.99
46.31	39.81	41.56	15.36	0.231	16.43	0	16.96
41.04	38.84	39.95	15.13	0.229	16.41	0	16.96
39.83	37.36	38.47	14.93	0.225	16.41	0	16.96
38.48	36.44	37.52	14.74	0.227	16.41	0	16.93
37.05	35.18	36.12	14.54	0.225	16.38	0	16.93

38.47	34.87	36.64	14.34	0.225	16.38	0	16.93
48.66	38.51	43.5	14.13	0.224	16.36	0	16.91
50.72	47.93	49.35	13.96	0.224	16.36	0	16.91
53.58	49.93	52.02	13.86	0.223	16.38	0	16.93
56.83	52.93	55.2	14.05	0.215	16.56	0	17.15
60.79	56.27	58.2	14.49	0.208	16.8	0	17.36
62.88	59.32	60.92	15.11	0.204	17.01	0	17.63
64.1	60.99	62.79	15.94	0.202	17.33	0	17.96
67.24	63.14	64.67	16.77	0.21	17.55	0	18.21
68.2	64.46	66.38	17.28	0.23	17.41	0	18.07
68.92	66	67.15	17.63	0.238	17.15	0	17.8
68.6	66.81	67.65	17.99	0.242	17.01	0	17.66
68.01	66.69	67.26	18.18	0.245	16.85	0	17.5
66.96	62.73	65.38	18.24	0.242	16.67	0	17.31
62.69	52.05	56.02	18.15	0.242	16.54	0	17.17
52.15	51.21	51.75	17.93	0.242	16.41	0	17.04
51.2	49.78	50.56	17.69	0.239	16.36	0	16.99
50.8	48.45	49.81	17.41	0.239	16.33	0	16.96
50.55	48.41	49.28	17.15	0.235	16.33	0	16.93
50.16	48.65	49.51	16.88	0.234	16.3	0	16.93
49.15	45.44	47.01	16.62	0.23	16.33	0	16.91
48.07	44.91	46.48	16.38	0.23	16.33	0	16.91
45.63	43.35	44.45	16.15	0.226	16.33	0	16.91
43.4	40.57	41.75	15.92	0.227	16.33	0	16.88
41.89	39.9	40.6	15.71	0.226	16.33	0	16.88
56.56	41.53	48.96	15.46	0.226	16.3	0	16.83
59.09	56.09	57.35	15.26	0.226	16.33	0	16.85
62.21	58.96	60.43	15.23	0.224	16.46	0	16.96
65.45	61.57	63.21	15.48	0.219	16.72	0	17.2
68.9	64.5	66.56	15.94	0.211	17.01	0	17.5
73.89	68.33	71.11	16.7	0.21	17.39	0	17.9
77.88	72.19	75.55	17.8	0.214	17.99	0	18.51
82.3	77.06	80.2	18.88	0.235	18.49	0	19.02
82.2	78.05	80.6	19.66	0.253	18.63	0	19.17
82.1	78.25	80.7	19.75	0.256	18.13	0	18.63
81.6	78.86	80.8	19.98	0.255	17.88	0	18.38
80.2	76.67	78.61	19.98	0.253	17.55	0	18.01
77.33	68.97	74.04	19.78	0.246	17.17	0	17.63
69.06	61.89	65.57	19.48	0.241	16.85	0	17.31
62.17	59.63	61.13	19.11	0.239	16.64	0	17.07
60.8	58.86	59.57	18.8	0.237	16.56	0	16.99
60.07	59.07	59.49	18.49	0.238	16.54	0	16.93
59.46	55.91	57.27	18.21	0.235	16.56	0	16.93
59.26	55.04	56.55	17.93	0.233	16.56	0	16.91
59.24	55.62	57.26	17.66	0.231	16.56	0	16.91
59.32	55.88	57.36	17.41	0.229	16.59	0	16.91
59.4	53.3	57.61	17.2	0.228	16.59	0	16.88

54.23	49.04	51.59	16.99	0.225	16.59	0	16.88
49.61	47.95	48.9	16.75	0.227	16.59	0	16.83
54.5	47.95	51.07	16.54	0.225	16.59	0	16.8
62.34	54.5	57.04	16.33	0.227	16.56	0	16.77
66.76	61.38	64.02	16.28	0.225	16.64	0	16.83
71.36	66.62	68.86	16.54	0.217	16.99	0	17.15
77.46	70.25	73.81	17.12	0.209	17.41	0	17.6
79.36	75.74	77.57	18.01	0.207	17.99	0	18.18
80.7	76.97	78.69	18.85	0.215	18.35	0	18.54
79.88	77.2	78.66	19.63	0.229	18.57	0	18.77
80.5	77.15	79.11	19.95	0.237	18.4	0	18.54
79.95	76.82	78.21	20.25	0.239	18.26	0	18.4
77.96	75.29	76.7	20.43	0.243	18.04	0	18.18
75.44	73.69	74.39	20.22	0.24	17.58	0	17.69
73.69	68.89	71.41	20.04	0.238	17.28	0	17.39
68.85	56.26	61.94	19.83	0.236	17.12	0	17.2
58.57	55.54	56.71	19.48	0.235	16.91	0	16.96
60.66	54.87	57.99	19.14	0.235	16.83	0	16.85
61.05	57.53	59.12	18.85	0.233	16.83	0	16.85
59.76	57.44	58.59	18.6	0.231	16.85	0	16.88
60.61	56.84	59.15	18.38	0.229	16.88	0	16.88
60.71	56.69	58.24	18.15	0.226	16.91	0	16.88
57.16	52.57	55.56	17.93	0.224	16.91	0	16.88
54.16	50.52	52.34	17.71	0.223	16.91	0	16.83
52.7	47	50.74	17.47	0.225	16.91	0	16.8
52.49	46.89	49.95	17.23	0.221	16.88	0	16.75
54.32	51.27	52.98	16.99	0.223	16.88	0	16.75
54.62	51.94	52.83	16.8	0.224	16.91	0	16.75
63.33	54.66	60.17	16.62	0.223	16.91	0	16.75
64.63	62.61	63.64	16.75	0.217	17.15	0	16.96
66.19	63.78	64.8	17.01	0.212	17.33	0	17.15
67.3	64.42	66.04	17.47	0.211	17.52	0	17.31
68.4	64.86	66.7	18.01	0.208	17.74	0	17.5
67.91	65.43	66.64	18.6	0.207	17.85	0	17.63
67.45	65.35	66.4	18.97	0.213	17.74	0	17.52
67.17	64.26	65.6	19.2	0.22	17.55	0	17.31
65.47	62.01	63.35	19.46	0.225	17.47	0	17.23
63.53	59.69	61.89	19.6	0.226	17.41	0	17.15
59.71	53.81	56.15	19.66	0.226	17.36	0	17.09
53.81	46.93	50.74	19.48	0.228	17.23	0	16.96
47.31	44.76	46.17	19.17	0.229	17.12	0	16.83
44.76	42.95	43.94	18.85	0.226	17.07	0	16.77
43.86	42.56	43.32	18.51	0.226	17.07	0	16.75
44.21	43.31	43.63	18.18	0.225	17.07	0	16.75
43.59	41.5	42.04	17.88	0.224	17.07	0	16.75
43.52	41.5	42.03	17.6	0.222	17.09	0	16.75
43.54	40.98	42.2	17.33	0.22	17.09	0	16.75

44.18	40.64	42.18	17.09	0.216	17.12	0	16.75
44.69	43.31	43.83	16.88	0.217	17.12	0	16.75
43.59	41.9	43.08	16.7	0.217	17.15	0	16.75
43.71	41.55	42.06	16.49	0.216	17.12	0	16.72
48.67	43.64	45.58	16.28	0.219	17.07	0	16.64
51.74	48.62	49.74	16.25	0.216	17.2	0	16.77
54.87	49.21	51.16	16.28	0.214	17.31	0	16.85
55.82	50.9	53.05	16.38	0.21	17.39	0	16.93
57.74	52.89	55.04	16.56	0.208	17.5	0	17.07
60.51	53.12	57.66	16.96	0.199	17.74	0	17.31
61.71	57.13	59.33	17.52	0.19	18.04	0	17.6
57.93	54.65	55.7	17.9	0.196	18.04	0	17.6
60.19	55.88	57.99	17.77	0.215	17.55	0	17.12
61.99	58.01	60.2	18.07	0.214	17.66	0	17.23
61.14	57.64	59.27	18.24	0.217	17.6	0	17.17
58.45	53.88	56.15	18.4	0.22	17.5	0	17.09
53.88	51.48	52.49	18.46	0.22	17.44	0	17.01
51.48	48.2	50.06	18.32	0.221	17.33	0	16.91
48.22	45.47	46.77	18.13	0.221	17.28	0	16.88
45.58	44.13	44.8	17.9	0.221	17.25	0	16.85
45.27	44.05	44.59	17.63	0.22	17.23	0	16.83
45.53	44.38	44.98	17.36	0.219	17.2	0	16.8
44.74	42.87	43.35	17.12	0.218	17.23	0	16.83
42.85	41.57	42.05	16.91	0.215	17.23	0	16.8
42.98	40.88	41.73	16.67	0.216	17.2	0	16.8
42.29	40.78	41.4	16.46	0.216	17.2	0	16.8
42	40.35	41.14	16.28	0.213	17.23	0	16.8
45.75	41.16	43.16	16.04	0.214	17.17	0	16.77
51.39	45.75	48.79	15.87	0.215	17.17	0	16.75
54.1	50.77	52.23	15.81	0.213	17.25	0	16.85
58.13	53.26	55.09	15.94	0.207	17.44	0	17.01
60.51	56.15	57.95	16.28	0.202	17.69	0	17.25
61.15	53.34	56.08	16.75	0.194	17.9	0	17.5
59.2	52.27	55.37	16.99	0.202	17.82	0	17.41
59.62	47.37	51.63	17.25	0.207	17.74	0	17.36
57.92	53.68	55.7	17.36	0.212	17.6	0	17.2
57.26	46.27	50.58	17.6	0.213	17.63	0	17.23
56.65	52.98	54.51	17.63	0.22	17.44	0	17.04
57.22	47.55	53.95	17.71	0.218	17.41	0	17.04
49.77	47.62	48.55	17.69	0.217	17.41	0	17.07
49.23	46.44	48.01	17.52	0.219	17.33	0	16.99
49.99	46.5	48.61	17.28	0.217	17.28	0	16.93
50.8	49.37	50.13	17.04	0.216	17.25	0	16.91
51.19	50.4	50.82	16.85	0.216	17.25	0	16.91
51.48	50.58	51.02	16.64	0.214	17.25	0	16.93
52.49	51.05	51.59	16.49	0.212	17.28	0	16.93
52.65	50.95	51.64	16.36	0.212	17.28	0	16.96

51.65	50.76	51.17	16.23	0.213	17.28	0	16.96
51.48	50.3	50.95	16.12	0.211	17.28	0	16.93
51.61	50.37	50.89	15.99	0.209	17.25	0	16.93
51.63	50.26	50.89	15.89	0.211	17.25	0	16.93
53.98	51.27	52.68	15.76	0.209	17.25	0	16.93
56.71	54	55.18	15.69	0.209	17.25	0	16.93
60.69	56.36	58.27	15.71	0.21	17.33	0	17.04
62.99	59.47	60.95	15.94	0.202	17.55	0	17.25
65.18	61.57	63.5	16.36	0.193	17.82	0	17.55
67.63	63.97	65.99	16.99	0.182	18.21	0	17.93
70.14	65.94	67.84	17.88	0.175	18.77	0	18.51
70.42	67.39	68.87	18.54	0.188	18.97	0	18.71
70.94	68.27	69.72	18.85	0.203	18.77	0	18.54
71.55	69	70.05	18.94	0.213	18.43	0	18.21
71.15	68.58	69.81	19.14	0.22	18.21	0	17.99
69.47	65.82	67.7	19.17	0.224	17.93	0	17.71
66.96	63.29	65.01	19.02	0.223	17.63	0	17.44
63.27	60.71	61.86	18.91	0.223	17.47	0	17.28
60.97	56.75	57.75	18.71	0.222	17.36	0	17.15
56.88	53.91	55.25	18.51	0.222	17.28	0	17.09
55.69	53.27	54.54	18.26	0.221	17.25	0	17.07
56.38	52.99	55.33	18.07	0.221	17.25	0	17.04
56.52	55.52	56.09	17.85	0.217	17.25	0	17.04
56.41	54.85	55.61	17.69	0.217	17.28	0	17.07
55.7	54.73	55.11	17.52	0.217	17.28	0	17.07
56.64	51.61	54.38	17.36	0.217	17.28	0	17.07
55.58	49.39	50.92	17.2	0.215	17.28	0	17.04
53.88	48.29	51.21	17.04	0.213	17.28	0	17.04
59.49	49.49	54.97	16.85	0.214	17.25	0	17.01
63.16	59.47	61.48	16.75	0.212	17.31	0	17.04
65.88	62.72	64.61	16.83	0.212	17.47	0	17.2
68.76	64.52	66.52	17.2	0.2	17.85	0	17.58
70.37	66.66	68.6	17.8	0.186	18.29	0	18.04
72.66	69.05	70.94	18.68	0.183	18.85	0	18.6
75.68	71.24	73.3	19.78	0.187	19.54	0	19.28
76.94	73.48	75.22	20.7	0.205	19.98	0	19.72
76.23	70.77	73.41	20.82	0.218	19.6	0	19.34
75.79	70.76	73.36	20.34	0.224	18.71	0	18.43
76.14	73.22	74.33	20.46	0.225	18.51	0	18.24
74.22	69.94	72.47	20.52	0.225	18.38	0	18.13
70.89	66.76	69.22	20.28	0.224	18.01	0	17.71
66.76	61.26	64.54	20.04	0.222	17.77	0	17.47
61.5	57.4	59.3	19.78	0.222	17.6	0	17.31
58.78	56.79	57.62	19.54	0.222	17.5	0	17.2
58.98	56.93	57.65	19.28	0.223	17.5	0	17.17
59.95	58.19	58.77	19.05	0.221	17.5	0	17.17
60.3	55.5	56.89	18.85	0.219	17.5	0	17.15

60.44	57.48	59.38	18.63	0.218	17.52	0	17.15
60.23	50.26	54.56	18.46	0.218	17.55	0	17.15
51.27	45.03	48.56	18.26	0.216	17.52	0	17.12
47.86	42.83	44.96	18.04	0.215	17.5	0	17.09
49.36	42.9	45.41	17.82	0.215	17.5	0	17.07
54.96	49.01	52.91	17.58	0.216	17.47	0	17.04
58.9	55.03	56.94	17.44	0.214	17.55	0	17.07
60.57	57.98	59.32	17.47	0.212	17.71	0	17.23
63.57	59.87	61.62	17.71	0.202	17.96	0	17.47
66.58	62.52	64.06	18.15	0.197	18.24	0	17.74
68.45	64.14	66.25	18.77	0.198	18.49	0	17.96
70.55	66.41	68.26	19.46	0.195	18.68	0	18.18
72.41	68.45	70.16	20.13	0.199	18.82	0	18.29
72.88	68.99	70.96	20.67	0.208	18.8	0	18.26
73	70.48	71.66	21.13	0.213	18.68	0	18.15
72.29	69.62	71.1	21.56	0.22	18.66	0	18.1
71.77	68.14	70.24	21.62	0.224	18.4	0	17.85
69.46	65.9	67.98	21.56	0.227	18.18	0	17.63
65.88	60.42	63.22	21.4	0.223	18.04	0	17.5
60.4	54.03	58.6	21.13	0.225	17.9	0	17.33
54.05	50.47	51.93	20.79	0.228	17.82	0	17.25
50.88	49.49	50.14	20.49	0.225	17.8	0	17.2
50.24	48.56	49.43	20.19	0.223	17.8	0	17.17
49.61	46.82	48.47	19.89	0.221	17.8	0	17.17
47.39	45.13	46.31	19.63	0.221	17.82	0	17.15
46.68	44.78	45.41	19.34	0.218	17.82	0	17.15
45.17	43.38	44.16	19.08	0.216	17.85	0	17.12
45.73	42.19	43.39	18.82	0.217	17.85	0	17.12
46.47	43.17	44.49	18.57	0.214	17.88	0	17.12
57.96	46.52	54.49	18.32	0.214	17.88	0	17.09
61.56	57.6	59.74	18.15	0.214	17.96	0	17.15
64.81	61.17	62.9	18.18	0.213	18.13	0	17.31
69.58	64.61	66.67	18.38	0.205	18.38	0	17.52
72.86	68.45	70.39	18.82	0.198	18.66	0	17.82
74.83	70.52	72.68	19.54	0.188	19.05	0	18.18
76.35	73.16	74.72	20.4	0.188	19.43	0	18.54
77.89	74.8	76.19	21.19	0.193	19.69	0	18.8
78.61	76.33	77.43	21.72	0.203	19.63	0	18.71
78.51	76.35	77.48	22.13	0.212	19.51	0	18.6
79.17	76.91	77.83	22.51	0.216	19.46	0	18.54
77.79	76.24	77	22.61	0.222	19.22	0	18.32
76.43	71.86	74.71	22.48	0.222	18.88	0	17.99
71.82	58.8	64.43	22.22	0.223	18.63	0	17.71
59.75	57.51	58.62	21.87	0.225	18.4	0	17.5
60.35	57.84	59.01	21.56	0.225	18.32	0	17.39
60.51	55.94	58.01	21.28	0.224	18.29	0	17.36
58.61	54.98	56.75	21	0.224	18.29	0	17.33

57.7	55.01	56.59	20.73	0.22	18.32	0	17.33
60.65	57.59	59.07	20.46	0.22	18.32	0	17.33
59.69	47.99	54.2	20.22	0.219	18.35	0	17.33
49.82	47.54	48.71	19.95	0.217	18.35	0	17.31
48.92	46.82	47.83	19.69	0.216	18.35	0	17.28
50.76	45.11	47.03	19.46	0.215	18.35	0	17.25
66.83	50.8	57.76	19.22	0.216	18.38	0	17.25
67.91	64.72	66.35	19.08	0.213	18.46	0	17.33
71.74	67.46	69.66	19.14	0.211	18.68	0	17.52
75.12	70.77	72.87	19.54	0.198	19.11	0	17.93
78.13	74.16	76	20.16	0.183	19.6	0	18.4
79.79	76.54	78.18	21.03	0.176	20.16	0	18.94
82.3	77.89	80.3	22.07	0.184	20.7	0	19.46
84.3	80.4	82	23	0.196	21.07	0	19.81
86.9	81.9	84.4	23.44	0.208	20.91	0	19.66
87	84.1	85.5	23.74	0.216	20.67	0	19.43
85.5	83.3	84.5	24.25	0.222	20.73	0	19.48
84.3	82.7	83.5	24.18	0.226	20.4	0	19.14
83	78.36	80.8	23.7	0.224	19.86	0	18.6
78.51	73.16	75.02	23.24	0.225	19.43	0	18.18
74.99	67.24	70.65	22.77	0.225	19.11	0	17.85
69.15	66.57	67.4	22.42	0.224	18.97	0	17.71
71.85	66.01	68.13	22.13	0.221	18.91	0	17.66
71.61	67.94	70.21	21.87	0.219	18.94	0	17.63
71.59	70.41	71.02	21.65	0.22	18.97	0	17.66
70.67	61.59	64.59	21.47	0.218	19	0	17.66
68.34	60.21	64.3	21.22	0.218	18.97	0	17.6
68.68	63.09	67.41	21.03	0.215	18.97	0	17.6
63.07	58.14	59.87	20.85	0.215	19	0	17.6
63.9	57.19	60.13	20.61	0.215	19	0	17.58
68.22	63.9	66.45	20.46	0.214	19.02	0	17.58
71.34	67.48	69.76	20.34	0.214	19.08	0	17.6
74.09	71.3	72.63	20.37	0.212	19.22	0	17.74
76.19	72.59	74.68	20.58	0.203	19.48	0	17.99
76.94	75.18	75.8	21	0.191	19.86	0	18.32
78.61	73.83	76.19	21.19	0.192	19.92	0	18.38
77.11	72	74.74	21.44	0.194	20.01	0	18.46
80.4	74.45	77.47	21.34	0.203	19.81	0	18.24
83.7	77.41	80.9	21.75	0.197	20.04	0	18.46
77.44	68.89	73.01	22.16	0.197	20.31	0	18.71
73.65	69.6	71.29	21.78	0.206	19.81	0	18.21
72.76	70.92	72.05	21.62	0.211	19.63	0	18.04
72.57	71	71.87	21.56	0.21	19.6	0	18.01
71.57	61.47	66.32	21.47	0.21	19.57	0	17.99
61.84	54.95	58.71	21.25	0.211	19.46	0	17.85
56.86	53.1	55.1	20.97	0.214	19.31	0	17.74
54.17	51.62	52.84	20.76	0.215	19.28	0	17.69

53.56	51.03	51.98	20.55	0.212	19.25	0	17.66
57.38	52.69	54.94	20.34	0.212	19.25	0	17.66
54.48	48.92	52.04	20.16	0.213	19.28	0	17.66
53.06	48.82	51.37	19.95	0.211	19.28	0	17.66
52.64	45.47	49.6	19.75	0.211	19.25	0	17.66
47.74	44.83	45.91	19.54	0.21	19.25	0	17.63
54.42	43.62	50.27	19.34	0.21	19.25	0	17.63
55.41	52.43	54.53	19.17	0.207	19.28	0	17.63
58.8	53.54	55.4	19	0.207	19.28	0	17.66
62.94	58.83	60.94	18.94	0.207	19.31	0	17.69
68.18	62.06	64.14	19.02	0.205	19.46	0	17.85
73.31	67.19	69.63	19.17	0.201	19.6	0	17.96
75.93	71.57	73.97	19.6	0.19	19.92	0	18.29
77.08	73.22	75.31	20.46	0.17	20.61	0	18.94
78.32	74.5	76.54	21.19	0.166	21	0	19.37
78.95	74.3	77.03	21.56	0.177	20.94	0	19.31
78.25	73.55	76.6	21.72	0.193	20.64	0	19.02
77.06	73.06	75.02	21.87	0.202	20.46	0	18.85
75.27	71.88	73.11	21.94	0.206	20.22	0	18.63
72.07	67.11	69.54	21.81	0.209	19.98	0	18.4
67.26	61.97	64.54	21.65	0.21	19.78	0	18.21
62.12	59.2	60.68	21.37	0.213	19.57	0	18.04
59.18	57.24	58.13	21.16	0.213	19.48	0	17.96
61.13	57.62	59.99	20.91	0.213	19.46	0	17.93
59.68	56.05	58.3	20.67	0.21	19.46	0	17.93
58.14	54.44	55.68	20.49	0.209	19.46	0	17.93
56.81	54.57	55.71	20.28	0.208	19.43	0	17.93
55.55	53.85	54.94	20.1	0.209	19.46	0	17.93
55.44	53.74	54.52	19.89	0.205	19.43	0	17.93
57.91	55.03	56.27	19.72	0.206	19.46	0	17.93
58.29	56.33	57.53	19.57	0.207	19.46	0	17.93
60.86	56.17	58.59	19.4	0.202	19.48	0	17.96
63.76	60.86	62.31	19.28	0.203	19.51	0	17.99
66.32	63.41	64.84	19.34	0.2	19.66	0	18.15
69.26	65.59	67.27	19.63	0.189	20.01	0	18.46
71.78	67.1	69.61	20.25	0.169	20.52	0	18.97
72.26	68.54	70.28	20.94	0.157	21	0	19.48
74.57	69.49	71.17	21.16	0.173	20.94	0	19.37
74.98	66.28	70.29	21.22	0.187	20.67	0	19.14
71.83	65.22	67.81	21.16	0.194	20.34	0	18.82
69.09	63.18	65.92	21.03	0.202	20.04	0	18.54
67.83	64.85	65.82	21	0.203	19.92	0	18.46
66.29	64.25	65.16	21	0.206	19.86	0	18.38
65.26	62.62	64.07	21	0.205	19.81	0	18.35
62.6	53.03	57.37	20.91	0.203	19.78	0	18.32
53.24	50.77	52.13	20.64	0.206	19.63	0	18.18
52.2	48.77	50.11	20.43	0.206	19.54	0	18.1

52.51	50.57	51.72	20.22	0.205	19.54	0	18.1
51.6	49.52	50.37	20.01	0.204	19.57	0	18.13
51.36	50	50.75	19.81	0.204	19.54	0	18.1
51.11	47.62	49.63	19.6	0.201	19.54	0	18.13
48.26	44.65	45.98	19.4	0.202	19.54	0	18.13
49.83	45.56	48.33	19.2	0.202	19.54	0	18.1
49.48	47.12	48.26	19.02	0.2	19.54	0	18.13
51.63	45.95	47.77	18.85	0.201	19.54	0	18.13
57.29	51.7	55.62	18.63	0.204	19.51	0	18.07
56.57	53.18	54.67	18.63	0.199	19.66	0	18.24
58.84	54.89	55.72	18.51	0.201	19.6	0	18.18
61.33	57.59	59.41	18.68	0.198	19.81	0	18.4
62.58	59.14	60.77	19.05	0.186	20.13	0	18.71
59.22	53.24	56.77	19.14	0.191	19.95	0	18.57
53.32	48.67	50.43	19.11	0.197	19.75	0	18.35
59.77	49.71	55.22	19	0.202	19.57	0	18.21
65.41	58.75	62.65	19.05	0.198	19.66	0	18.29
64.96	62.75	63.71	19.34	0.196	19.86	0	18.51
63.56	58.43	62.25	19.6	0.197	19.92	0	18.57
58.47	56.02	56.89	19.69	0.199	19.83	0	18.51
56.47	55.98	56.21	19.63	0.199	19.75	0	18.43
56.32	55.41	55.75	19.57	0.2	19.72	0	18.43
55.48	53.75	54.72	19.4	0.201	19.66	0	18.38
54.7	49.65	52.23	19.25	0.198	19.63	0	18.38
49.67	46.39	48.14	19.05	0.198	19.57	0	18.32
46.57	45.47	46.11	18.88	0.2	19.54	0	18.29
46.26	43.99	45.28	18.71	0.199	19.51	0	18.29
43.99	42.3	42.82	18.51	0.2	19.48	0	18.29
43.94	42.24	43.15	18.35	0.198	19.48	0	18.29
43.07	39.19	41.73	18.18	0.199	19.46	0	18.29
40.95	38.85	39.83	18.01	0.196	19.46	0	18.29
45.44	40.43	42.43	17.82	0.197	19.43	0	18.26
49.87	45.47	48.3	17.58	0.197	19.37	0	18.21
52.75	49.89	51.13	17.55	0.197	19.43	0	18.29
55.06	52.39	53.71	17.55	0.192	19.51	0	18.38
59.48	54.04	55.71	17.69	0.193	19.6	0	18.49
61.41	56.38	57.73	17.9	0.19	19.69	0	18.6
64.92	58.14	60.86	18.18	0.187	19.78	0	18.71
66.67	60.15	63.22	18.8	0.174	20.13	0	19.08
66.56	62.06	63.17	19.6	0.167	20.55	0	19.51
62.13	54.97	56.31	19.6	0.189	20.04	0	19.02
58.58	54.34	56.34	19.48	0.203	19.54	0	18.54
60.95	57.84	59.27	19.57	0.205	19.51	0	18.54
60.21	55.12	57.31	19.69	0.203	19.57	0	18.63
56.63	54.42	55.47	19.72	0.202	19.51	0	18.57
54.42	48.45	51.26	19.72	0.201	19.48	0	18.54
49.45	47.62	48.63	19.57	0.203	19.4	0	18.49

48.35	45.16	46.75	19.4	0.203	19.34	0	18.46
45.2	44.31	44.79	19.2	0.204	19.31	0	18.43
44.54	42.97	43.79	18.97	0.201	19.28	0	18.4
44.22	41.41	43.07	18.77	0.2	19.25	0	18.4
44.51	41.69	43.3	18.57	0.199	19.25	0	18.4
43.85	40.47	41.93	18.38	0.198	19.25	0	18.43
42.62	40.47	41.22	18.18	0.197	19.25	0	18.43
41.52	40.1	40.77	17.99	0.197	19.25	0	18.4
43.44	40.91	42.44	17.82	0.195	19.22	0	18.43
56.32	43.24	50.39	17.63	0.195	19.22	0	18.43
60.05	55.29	58.61	17.47	0.197	19.2	0	18.4
63.02	59.43	61.05	17.55	0.192	19.37	0	18.6
66.76	62.47	64.44	17.82	0.182	19.66	0	18.85
71.05	64.62	67.97	18.51	0.165	20.16	0	19.4
70.54	65.69	67.47	19.31	0.164	20.61	0	19.83
72.62	68.23	70.49	19.4	0.189	20.16	0	19.43
74.91	69.54	72.67	20.4	0.193	20.7	0	19.95
77.2	71.86	73.81	21.16	0.203	20.97	0	20.25
78.03	71.49	75.32	21.19	0.211	20.46	0	19.72
78.02	73.33	75.3	22.03	0.216	20.82	0	20.13
74.78	71.45	72.76	22	0.217	20.4	0	19.72
73.91	69.31	71.79	21.65	0.213	19.83	0	19.17
69.29	63.28	66.28	21.53	0.211	19.66	0	19
65.29	62.63	63.98	21.25	0.21	19.46	0	18.8
64.39	62.41	63.31	21.03	0.209	19.37	0	18.71
63.42	62.35	62.86	20.82	0.208	19.34	0	18.68
62.91	61.41	62.19	20.64	0.205	19.34	0	18.68
62.1	60.88	61.41	20.43	0.206	19.34	0	18.68
62.29	60.88	61.44	20.25	0.203	19.31	0	18.66
61	55.29	59	20.07	0.203	19.31	0	18.66
59.2	56.05	57.47	19.89	0.202	19.31	0	18.63
58.69	53.44	56.02	19.72	0.2	19.31	0	18.63
58.37	55.47	56.96	19.51	0.201	19.28	0	18.6
63.91	57.23	60.56	19.34	0.2	19.28	0	18.6
67.22	62.43	65.45	19.22	0.202	19.31	0	18.6
70.68	66.45	68.4	19.34	0.193	19.54	0	18.82
72.41	69.92	71.04	19.63	0.186	19.86	0	19.14
73.91	70.55	72.08	20.07	0.179	20.22	0	19.48
75.15	72.07	73.38	20.7	0.176	20.67	0	19.92
78.32	73.64	75.38	21.25	0.18	20.97	0	20.25
77.86	74.55	76.08	21.81	0.195	21.19	0	20.46
78.25	73.26	76.05	22.07	0.198	21.07	0	20.34
77.15	73.82	75.36	21.91	0.203	20.55	0	19.81
76.78	73.8	75.25	22	0.204	20.34	0	19.6
75.41	70.72	72.78	22.16	0.205	20.25	0	19.48
72.14	68.39	70.54	22	0.206	19.92	0	19.2
68.41	65.06	66.81	21.94	0.204	19.78	0	19.05

65.37	62.13	63.98	21.69	0.204	19.63	0	18.88
63.77	60.21	62.44	21.47	0.205	19.54	0	18.8
63.17	53.7	59.75	21.22	0.205	19.51	0	18.74
62.01	52.52	59.11	20.97	0.203	19.46	0	18.68
61.43	59.72	60.59	20.76	0.2	19.48	0	18.71
60.9	59.07	59.98	20.58	0.201	19.51	0	18.74
59.99	57.74	58.68	20.4	0.198	19.54	0	18.74
58.19	55.01	56.73	20.22	0.199	19.51	0	18.71
56.35	54.3	55.27	20.04	0.197	19.51	0	18.68
55.99	52.79	54.65	19.86	0.198	19.48	0	18.66
59.48	55.77	57.6	19.66	0.199	19.48	0	18.63
63.97	58.4	60.9	19.51	0.198	19.51	0	18.66
66.36	62.39	64.81	19.57	0.194	19.72	0	18.82
68.75	64.96	66.53	19.75	0.188	19.89	0	19.02
71.35	67.36	69.15	20.13	0.178	20.19	0	19.31
74.53	68.24	71.79	20.79	0.164	20.73	0	19.83
74.32	70.9	72.46	21.69	0.159	21.37	0	20.46
74.23	70.94	72.66	22	0.178	21.28	0	20.4
74.73	70.1	72.58	22.13	0.189	21	0	20.1
73.78	69.42	71.88	22.1	0.195	20.61	0	19.69
73.37	69.39	71	22.19	0.199	20.37	0	19.48
70.46	67.62	69.05	22.26	0.197	20.22	0	19.31
67.92	64.17	66.29	22.16	0.199	20.01	0	19.08
64.15	60.5	62.26	22.1	0.201	19.89	0	18.97
60.98	56.77	58.6	21.87	0.201	19.75	0	18.85
57.24	52.14	54.8	21.65	0.203	19.69	0	18.77
55.87	51.67	53.93	21.37	0.204	19.63	0	18.71
56.97	53.08	55.4	21.1	0.198	19.63	0	18.68
56.37	50.68	54.51	20.91	0.201	19.66	0	18.71
53.66	48.86	51.24	20.67	0.196	19.66	0	18.71
52.66	48.7	49.74	20.43	0.198	19.63	0	18.66
51.3	47.53	49.14	20.19	0.196	19.63	0	18.66
52.33	49.33	51.05	19.98	0.195	19.63	0	18.66
51.66	49.23	50.8	19.81	0.194	19.66	0	18.66
54.95	51.66	53.52	19.57	0.195	19.66	0	18.66
58.99	53.61	56.44	19.4	0.194	19.66	0	18.66
62.89	58.7	60.3	19.43	0.192	19.83	0	18.8
65.02	61.57	63.21	19.57	0.185	20.04	0	19
68.73	64.34	66.22	19.98	0.173	20.4	0	19.34
70.06	67.04	68.23	20.7	0.159	20.91	0	19.86
72.4	68.06	69.92	21.59	0.15	21.5	0	20.43
72.7	69.27	71.2	22.35	0.158	21.84	0	20.76
73.48	69.93	71.88	22.42	0.174	21.5	0	20.46
74.53	70.81	72.61	22.32	0.187	20.97	0	19.92
73.06	70.82	71.9	22.55	0.189	20.82	0	19.78
71.63	68.94	70.12	22.58	0.195	20.58	0	19.54
69.09	64.66	67.28	22.42	0.199	20.28	0	19.22

64.62	58.61	61.52	22.29	0.199	20.1	0	19.05
59	56.48	58.19	22.07	0.202	19.92	0	18.88
58.19	55.16	56.67	21.84	0.199	19.86	0	18.82
55.2	52.64	53.73	21.59	0.201	19.83	0	18.8
54.43	51.21	52.55	21.31	0.199	19.83	0	18.77
51.39	49.29	50.29	21.07	0.198	19.81	0	18.74
53.04	48.62	50.56	20.79	0.199	19.78	0	18.74
52.57	45.39	48.04	20.55	0.198	19.81	0	18.74
45.74	41.24	43.63	20.31	0.196	19.81	0	18.71
43.9	39.43	41.52	20.04	0.193	19.78	0	18.68
46.91	42.03	43.75	19.81	0.196	19.78	0	18.68
58.02	46.94	53.4	19.54	0.194	19.78	0	18.66
61.01	57.81	59.44	19.37	0.195	19.83	0	18.71
61.6	59.31	60.67	19.37	0.19	20.01	0	18.88
64.17	60.47	62.53	19.48	0.185	20.16	0	19.02
66.81	62.74	64.73	19.86	0.176	20.4	0	19.28
70.45	65.08	67.86	20.55	0.162	20.85	0	19.69
73.98	69.53	71.76	21.47	0.149	21.34	0	20.22
75.43	71.32	73.24	22.61	0.145	21.97	0	20.79
74.64	71.75	73.2	23.07	0.164	21.84	0	20.7
74.34	71.73	73.28	23.04	0.178	21.31	0	20.16
75.38	71.88	73.46	23.17	0.189	21.07	0	19.92
73.69	70.46	71.9	23.2	0.192	20.79	0	19.66
70.59	66.49	68.69	23.1	0.196	20.49	0	19.37
66.47	59.48	63.47	22.97	0.199	20.31	0	19.17
60.96	54.99	58.03	22.71	0.202	20.13	0	19.02
59.2	52.93	56.77	22.45	0.2	20.04	0	18.91
56.13	51.08	53.91	22.19	0.201	20.01	0	18.91
57.04	53.05	55.07	21.87	0.2	19.98	0	18.85
55.17	52	53.76	21.62	0.197	20.01	0	18.88
56.12	53.76	55.26	21.37	0.198	20.01	0	18.85
55.93	53.76	54.86	21.13	0.197	20.01	0	18.85
55.27	47.46	51.76	20.88	0.196	20.04	0	18.85
53.56	44.22	48.02	20.64	0.195	20.01	0	18.85
54.38	48.05	49.74	20.4	0.194	20.01	0	18.82
57.12	51.23	54.79	20.16	0.196	20.01	0	18.8
60.8	57.23	59.01	19.98	0.195	20.04	0	18.82
63.02	59.46	61.38	20.01	0.191	20.25	0	19.02
65.76	62.15	63.96	20.16	0.182	20.46	0	19.22
68.6	64.35	66.25	20.46	0.17	20.73	0	19.48
69.89	66.44	68.01	21.19	0.15	21.31	0	20.04
71.5	67.93	69.47	21.81	0.148	21.62	0	20.37
72.16	69.02	70.76	22.22	0.157	21.72	0	20.43
73.53	70.49	71.73	22.45	0.166	21.53	0	20.25
73.13	69.81	71.11	22.45	0.178	21.16	0	19.89
71.72	68.58	70.01	22.58	0.184	20.97	0	19.72
70.24	66.81	68.23	22.58	0.191	20.76	0	19.51

67.71	63.42	65.32	22.55	0.194	20.58	0	19.34
63.4	60.56	61.87	22.45	0.196	20.49	0	19.22
60.62	58.2	59.21	22.26	0.197	20.37	0	19.11
58.52	56.84	57.65	22.03	0.195	20.31	0	19.05
57.18	53.87	55.51	21.78	0.196	20.28	0	19.02
57.11	53.14	54.89	21.5	0.195	20.25	0	18.97
56.66	51.47	54.16	21.25	0.195	20.25	0	18.97
55.75	52.74	54.24	21	0.191	20.22	0	18.97
54.34	47.76	49.91	20.76	0.191	20.22	0	18.97
51.28	43.18	47.88	20.52	0.19	20.22	0	18.97
49.12	39.15	42.37	20.28	0.191	20.22	0	18.94
47.21	42.21	44.75	20.01	0.193	20.19	0	18.91
55.05	43.64	50.35	19.75	0.191	20.16	0	18.88
57.79	54.79	56.31	19.57	0.19	20.19	0	18.91
60.53	57.46	59.07	19.54	0.185	20.37	0	19.05
63.94	59.21	61.25	19.66	0.178	20.52	0	19.22
66.17	62.07	63.67	20.01	0.172	20.76	0	19.46
68.71	64.01	66.36	20.67	0.155	21.19	0	19.86
70.57	66.09	68.24	21.31	0.147	21.47	0	20.16
75.06	67.9	71.05	22.32	0.135	21.97	0	20.67
74.64	70.32	72.78	22.55	0.161	21.69	0	20.37
74.06	70.38	71.97	22.64	0.172	21.34	0	20.04
72.86	69.55	71.12	22.87	0.181	21.16	0	19.89
70.43	68.27	69.28	22.97	0.186	20.97	0	19.69
69.01	63.62	65.77	22.94	0.192	20.76	0	19.48
63.62	59.31	61.22	22.87	0.194	20.61	0	19.34
59.43	55.22	57.61	22.68	0.197	20.49	0	19.22
55.38	53	54.15	22.45	0.195	20.43	0	19.17
54.06	49.59	50.65	22.16	0.197	20.37	0	19.14
52.01	49.25	50.47	21.87	0.193	20.34	0	19.11
51.2	50.28	50.62	21.62	0.193	20.34	0	19.11
51.19	49.89	50.44	21.37	0.192	20.34	0	19.08
52.31	49.63	51.38	21.13	0.191	20.37	0	19.11
52.78	50.52	51.9	20.91	0.189	20.37	0	19.11
50.61	50.07	50.36	20.73	0.19	20.4	0	19.14
50.68	48.89	49.92	20.52	0.19	20.4	0	19.14
50.61	48.97	49.63	20.34	0.19	20.4	0	19.11
51.36	48.53	49.54	20.1	0.19	20.37	0	19.05
52.22	51.15	51.53	20.01	0.189	20.43	0	19.11
56.16	52.11	53.58	19.98	0.185	20.49	0	19.2
63.52	55.4	59.45	20.04	0.182	20.61	0	19.28
68.33	62.56	65.01	20.37	0.171	20.94	0	19.63
67.81	62.31	65.08	21.13	0.14	21.62	0	20.28
63.94	59.48	61.98	21.1	0.164	21.28	0	19.95
65.27	57.25	59.78	20.94	0.18	20.82	0	19.51
67.15	61.33	64.49	21.03	0.185	20.73	0	19.43
66.57	62.66	64.58	21.34	0.176	20.94	0	19.63

63.28	60.92	62.5	21.44	0.179	20.91	0	19.6
61.71	59.09	60.41	21.37	0.183	20.76	0	19.46
59.34	55.18	57.66	21.37	0.185	20.7	0	19.43
55.9	54.64	55.42	21.22	0.186	20.61	0	19.31
55.68	53.34	54.6	21.03	0.188	20.55	0	19.25
54.56	52.61	53.76	20.85	0.189	20.52	0	19.25
54.01	52.41	53.18	20.67	0.186	20.49	0	19.22
53.23	51.49	52.59	20.46	0.189	20.49	0	19.22
53.02	51.66	52.41	20.28	0.187	20.46	0	19.22
54.73	52.93	53.59	20.1	0.187	20.46	0	19.22
54.8	53.39	53.9	19.98	0.186	20.49	0	19.22
54.17	51.88	53.47	19.81	0.185	20.49	0	19.25
53.51	51.63	53.02	19.66	0.185	20.49	0	19.25
57.08	51.98	53.88	19.51	0.183	20.46	0	19.22
62.46	57.06	59.6	19.4	0.182	20.46	0	19.25
65.25	61.46	63.22	19.46	0.179	20.64	0	19.4
68.35	64.06	66.08	19.66	0.172	20.85	0	19.63
69.97	66.29	67.95	20.1	0.154	21.22	0	20.01
73.35	68.17	70.4	21	0.117	21.91	0	20.7
73.93	70.4	71.89	22.1	0.096	22.71	0	21.5
74.05	69.33	71.77	22.71	0.121	22.84	0	21.65
75.03	70.18	72.59	22.61	0.151	22.29	0	21.1
75.36	70.13	72.53	22.61	0.163	21.87	0	20.7
74.48	71.01	72.9	22.64	0.173	21.56	0	20.4
73.92	70.25	72.1	22.74	0.176	21.34	0	20.22
72.49	68.62	70.09	22.68	0.182	21.1	0	19.98
68.67	64.99	66.68	22.58	0.186	20.88	0	19.78
64.93	57.94	59.86	22.39	0.19	20.7	0	19.6
59.41	54.45	57.13	22.16	0.192	20.58	0	19.48
58.31	54.87	56.19	21.94	0.19	20.52	0	19.43
57.68	56.28	57.01	21.72	0.19	20.49	0	19.43
59.11	54.94	56.76	21.5	0.189	20.52	0	19.43
56.61	53.82	54.95	21.31	0.188	20.52	0	19.43
55.87	52.96	54.72	21.1	0.188	20.52	0	19.43
54.58	49.38	51.7	20.91	0.188	20.49	0	19.4
51.9	49.21	50.39	20.7	0.188	20.49	0	19.37
53.04	48.91	50.79	20.52	0.187	20.46	0	19.37
63.8	53.11	59.91	20.31	0.188	20.46	0	19.34
67.98	63.68	65.65	20.16	0.187	20.52	0	19.4
69.86	66.33	67.8	20.25	0.18	20.73	0	19.6
71.62	68.29	69.78	20.43	0.17	20.94	0	19.81
73.78	70.35	72.03	20.88	0.16	21.25	0	20.13
75.91	71.97	73.54	21.59	0.147	21.65	0	20.55
77.79	72.68	75.24	22.35	0.14	22.03	0	20.91
78.68	74.94	76.85	23.04	0.147	22.19	0	21.03
79.88	73.31	77.17	23.5	0.155	22.16	0	21
79.97	75.56	78.17	23.64	0.171	21.75	0	20.61

79.61	74.6	76.26	24.01	0.174	21.69	0	20.55
75.06	71.85	74.03	23.98	0.184	21.31	0	20.19
72.39	71.11	71.67	23.98	0.186	21.1	0	19.98
71.69	67.63	69.54	23.87	0.189	21.03	0	19.89
68.58	59.56	62.84	23.64	0.191	20.88	0	19.78
61.11	59.28	60.01	23.34	0.193	20.76	0	19.63
61.34	57.88	59.8	23.07	0.192	20.7	0	19.57
61.75	58.42	59.69	22.81	0.193	20.7	0	19.57
65.42	59.18	63.82	22.58	0.191	20.7	0	19.54
64.24	56.05	57.86	22.35	0.19	20.7	0	19.57
58.31	55.02	56.81	22.1	0.19	20.7	0	19.54
57.97	54.68	56.13	21.84	0.188	20.7	0	19.51
56.9	52.95	54.94	21.62	0.191	20.67	0	19.48
58.36	52.34	54.53	21.4	0.188	20.7	0	19.48
67.21	57.71	61.51	21.19	0.189	20.7	0	19.48
70.4	64.63	68.05	21	0.187	20.76	0	19.51
72.13	70.06	70.94	21.07	0.18	20.97	0	19.72
75.76	71.46	73.51	21.28	0.172	21.25	0	19.98
78.14	73.7	75.7	21.75	0.154	21.62	0	20.34
81.8	74.39	77.89	22.58	0.135	22.19	0	20.88
82.8	78.33	80.4	23.47	0.129	22.68	0	21.34
84.1	77.22	80.4	24.53	0.129	23.27	0	21.94
80.8	77.09	78.56	24.46	0.16	22.68	0	21.34
82.5	76.49	78.98	24.08	0.177	21.87	0	20.58
83.1	79.9	81.4	24.25	0.178	21.78	0	20.49
80.7	78.08	79.08	24.53	0.177	21.91	0	20.58
78.2	73.07	75.88	24.46	0.184	21.65	0	20.34
73.09	67.78	70.92	24.25	0.187	21.37	0	20.07
68.44	66.41	67.48	24.01	0.19	21.19	0	19.89
67.74	64.17	65.79	23.77	0.192	21.1	0	19.78
65.34	62.61	63.78	23.54	0.19	21.07	0	19.75
63.78	59.44	62.31	23.24	0.191	21.03	0	19.69
60.98	58.66	59.78	23	0.19	21	0	19.66
62.17	57.33	59.3	22.74	0.189	21	0	19.63
62.25	60.88	61.69	22.51	0.19	21	0	19.63
61.7	60.03	60.93	22.29	0.189	21	0	19.66
60.63	52.33	54.76	22.07	0.189	21.03	0	19.63
57.51	51.82	53.43	21.81	0.188	21	0	19.6
67.15	57.56	62.48	21.59	0.188	21	0	19.57
71.53	66.8	69.53	21.44	0.186	21.07	0	19.63
73.78	70.36	72.43	21.56	0.178	21.31	0	19.86
75.6	72.13	73.37	21.78	0.168	21.62	0	20.16
76.91	73.65	75.2	22.35	0.149	22.13	0	20.64
79.62	75.01	77.1	23.2	0.126	22.71	0	21.19
81	76.1	78.41	24.22	0.117	23.34	0	21.81
82.1	77.51	79.9	24.95	0.134	23.57	0	22.03
81.9	75.29	78.89	25.2	0.153	23.27	0	21.75

81.9	75.36	77.5	24.84	0.173	22.45	0	20.94
76.73	74.19	74.96	24.81	0.181	22.07	0	20.55
77.61	72.43	75.42	24.84	0.183	21.87	0	20.37
72.38	68.41	70.13	24.88	0.183	21.84	0	20.34
68.41	63.47	66.49	24.63	0.186	21.62	0	20.13
66.31	60.65	62.48	24.32	0.191	21.44	0	19.95
60.75	56.54	58.86	24.01	0.192	21.34	0	19.83
63.4	57.57	61.07	23.74	0.192	21.28	0	19.78
61.08	54.68	56.13	23.47	0.193	21.28	0	19.75
59.38	53.77	56.66	23.2	0.19	21.25	0	19.75
59.3	55.95	58.05	22.97	0.191	21.25	0	19.72
60.46	53.33	56.17	22.71	0.19	21.28	0	19.72
57.84	52.03	54.54	22.48	0.187	21.28	0	19.72
56.75	50.55	52.3	22.26	0.187	21.25	0	19.72
54.81	49.64	51.73	22.03	0.189	21.25	0	19.69
66.12	54.83	61.21	21.78	0.186	21.25	0	19.66
69.6	65.69	67.72	21.65	0.187	21.34	0	19.75
73.08	68.87	70.87	21.72	0.178	21.59	0	19.95
74.95	71.73	73.16	21.94	0.169	21.87	0	20.25
77.09	72.8	74.91	22.48	0.15	22.32	0	20.67
81.9	75.09	77.97	23.44	0.125	23	0	21.34
81.1	77.06	79.3	24.63	0.11	23.84	0	22.13
82.6	77.01	79.98	26.26	0.112	24.95	0	23.2
82.9	80	81.3	25.92	0.145	24.18	0	22.45
83.6	80.3	81.8	25.63	0.163	23.44	0	21.72
83	80.7	81.7	25.63	0.169	23.04	0	21.37
81.7	79.8	80.8	25.74	0.174	22.84	0	21.16
80.4	75.36	78.58	25.52	0.181	22.39	0	20.7
75.5	65.04	70.23	25.31	0.185	22.07	0	20.4
65.87	63.05	64.61	25.02	0.192	21.78	0	20.13
64.01	62.06	62.89	24.77	0.194	21.65	0	20.01
65	62.85	63.63	24.49	0.192	21.62	0	19.95
66.01	60.98	63.16	24.25	0.192	21.62	0	19.95
69.02	65.67	67.33	23.98	0.19	21.62	0	19.95
67	63.62	65.16	23.77	0.19	21.62	0	19.95
65.2	58.8	63.02	23.5	0.187	21.62	0	19.95
59.2	56.95	58.37	23.27	0.189	21.62	0	19.92
60.88	56.97	58.76	23.04	0.189	21.62	0	19.92
63.54	56.35	58.96	22.84	0.187	21.62	0	19.92
69.2	63.56	66.61	22.61	0.187	21.62	0	19.92
72.63	68.83	70.75	22.48	0.184	21.75	0	19.98
74.78	71.93	72.98	22.58	0.177	22	0	20.22
76.64	72.66	75.06	22.81	0.168	22.29	0	20.49
79.94	75.67	77.67	23.4	0.147	22.81	0	20.97
83.6	77.96	80.6	24.46	0.115	23.64	0	21.75
86.3	81.2	83.1	25.78	0.104	24.56	0	22.68
87.7	82	85.1	26.97	0.124	25.27	0	23.3

86.7	82.5	84.7	27.36	0.141	25.16	0	23.2
89.2	85.5	87	26.7	0.162	24.11	0	22.22
88.6	85.7	86.8	27.39	0.162	24.35	0	22.45
87.1	84.3	85.5	27.43	0.167	24.11	0	22.19
84.7	81	83.1	26.82	0.175	23.3	0	21.44
81	76.99	78.88	26.33	0.18	22.74	0	20.88
77.12	72.16	73.35	25.89	0.187	22.35	0	20.52
72.21	66.03	69.04	25.52	0.192	22.13	0	20.31
67.88	62.14	63.52	25.2	0.192	22.03	0	20.22
63.96	61.09	62.68	24.88	0.193	21.97	0	20.13
69.23	59.67	64.49	24.56	0.19	21.97	0	20.1
69.05	60.21	66.46	24.29	0.19	21.94	0	20.1
63.63	59.52	61.87	24.04	0.187	21.97	0	20.13
61.07	57.51	59.5	23.77	0.189	21.97	0	20.1
64.28	57.82	60.65	23.5	0.189	21.97	0	20.07
62.06	56.95	59.75	23.27	0.186	21.97	0	20.07
70.51	61.67	66.45	23.04	0.187	22	0	20.07
74.98	70.42	72.87	22.91	0.184	22.1	0	20.16
77.96	74.35	76.09	23	0.176	22.39	0	20.43
80.4	77.22	78.71	23.3	0.162	22.77	0	20.76
84	79.76	81.8	24.08	0.133	23.44	0	21.4
85.8	82	83.9	25.27	0.1	24.42	0	22.32
88.4	84.3	86	26.67	0.099	25.41	0	23.27
90.5	85.2	87.5	27.71	0.121	25.92	0	23.74
89.7	87	88.1	27.86	0.14	25.59	0	23.44
90.7	87.1	88.9	27.47	0.155	24.74	0	22.61
90	87.4	88.4	27.51	0.16	24.39	0	22.29
89.9	87	88.2	27.51	0.165	24.04	0	21.97
87.7	84	86.2	27.16	0.174	23.5	0	21.44
84.1	68.15	76.51	26.86	0.179	23.1	0	21.03
71.2	67.25	68.88	26.4	0.189	22.64	0	20.64
70.51	65.28	68.17	26.07	0.19	22.48	0	20.46
66.28	64.51	65.42	25.78	0.191	22.42	0	20.4
68.16	65.61	67.07	25.49	0.19	22.39	0	20.37
69.3	66.04	67.62	25.23	0.19	22.39	0	20.34
70.47	66.63	68.88	24.95	0.189	22.39	0	20.34
71	66.73	68.86	24.7	0.188	22.42	0	20.34
69.36	62.59	65.22	24.42	0.186	22.42	0	20.34
63.52	61.62	62.51	24.18	0.186	22.39	0	20.31
69.79	59.61	63.57	23.91	0.186	22.39	0	20.31
74.23	69.81	71.91	23.7	0.188	22.42	0	20.31
79.9	74.26	77.9	23.6	0.183	22.55	0	20.43
83.2	79.38	81	23.77	0.171	22.91	0	20.73
85.7	82.4	83.9	24.22	0.15	23.4	0	21.19
88.9	85.3	86.9	25.09	0.115	24.22	0	21.97
91.4	87	88.7	26.33	0.093	25.2	0	22.87
90.6	87.3	89.2	27.55	0.098	26.03	0	23.67

92.6	88.5	90.8	28.95	0.11	26.97	0	24.49
93.3	90	91.4	29.58	0.118	27.05	0	24.6
93.9	90.7	92.4	28.91	0.146	26	0	23.6
93.6	91	92.1	28.67	0.155	25.41	0	23.04
92.7	90.5	91.5	28.5	0.158	24.91	0	22.61
91.5	86.9	89.4	28.02	0.17	24.22	0	21.94
87	78.82	84.1	27.55	0.177	23.7	0	21.47
79.14	74.3	75.61	27.09	0.184	23.27	0	21.07
76.91	74.11	75.27	26.63	0.186	22.97	0	20.76
75.98	71	74.68	26.37	0.191	22.91	0	20.7
70.85	64.36	66.3	26.11	0.191	22.87	0	20.67
64.61	61.16	62.86	25.78	0.19	22.81	0	20.61
66.3	62.04	63.89	25.45	0.19	22.81	0	20.55
68.47	61.06	65.24	25.2	0.188	22.81	0	20.55
69	60.76	66.83	24.91	0.186	22.77	0	20.55
60.72	57.55	58.6	24.67	0.186	22.81	0	20.55
63.28	57.4	59.69	24.42	0.184	22.81	0	20.52
76.39	63.3	70.64	24.18	0.185	22.81	0	20.52
80.4	76.13	78.63	24.11	0.181	22.97	0	20.64
82.4	79.79	80.9	24.29	0.169	23.3	0	20.97
83.8	81.5	82.7	24.63	0.155	23.74	0	21.37
86.3	82.9	84.6	25.38	0.126	24.42	0	22
89.4	85.4	87.3	26.82	0.081	25.59	0	23.1
92.9	87.6	89.9	28.3	0.088	26.7	0	24.11
93.3	89.2	91.1	29.33	0.108	27.24	0	24.6
94.4	90.7	92.4	29.7	0.12	27.12	0	24.49
93.5	91.3	92.5	29.2	0.139	26.26	0	23.7
92.8	91.1	91.8	29.12	0.149	25.81	0	23.3
92.4	90.8	91.5	28.71	0.156	25.2	0	22.71
91.5	87.9	89.8	28.34	0.163	24.67	0	22.19
87.9	73.47	82.2	27.94	0.173	24.22	0	21.78
73.38	69.71	70.88	27.36	0.18	23.67	0	21.28
69.87	65.72	67.81	26.93	0.187	23.37	0	21
66.97	65.53	66.08	26.63	0.188	23.27	0	20.88
69.34	66.21	67.97	26.33	0.188	23.2	0	20.85
68.98	67.44	68.16	26.07	0.186	23.24	0	20.85
72.07	65.34	68.99	25.81	0.185	23.24	0	20.85
66	61.79	63.88	25.59	0.184	23.24	0	20.85
64.91	60.05	62.4	25.31	0.183	23.2	0	20.79
62.55	58.55	60.49	25.06	0.185	23.2	0	20.76
65.48	59.03	61	24.81	0.184	23.17	0	20.76
78.22	65.52	72.4	24.6	0.185	23.24	0	20.79
78.97	76.56	77.56	24.49	0.178	23.37	0	20.91
81.6	78.09	79.47	24.63	0.166	23.7	0	21.19
86	80.9	83.3	24.98	0.155	24.08	0	21.56
88.4	84.8	86.6	25.78	0.12	24.81	0	22.26
92.6	87.8	90	27.01	0.086	25.81	0	23.2

93.9	90.2	92	28.22	0.09	26.67	0	23.94
95.5	91.8	93.5	29.37	0.1	27.32	0	24.56
97	92.5	95.3	30.26	0.113	27.75	0	24.95
97.8	93.5	95.7	30.05	0.13	27.09	0	24.32
97.7	94.8	95.9	30	0.139	26.67	0	23.98
96	92.5	94.2	30.05	0.144	26.4	0	23.74
92.9	89.2	91.1	29.2	0.16	25.45	0	22.84
89.2	85.2	86.7	28.46	0.167	24.74	0	22.16
85.2	83.1	84	27.94	0.176	24.25	0	21.75
83.7	82.1	82.9	27.63	0.177	24.08	0	21.56
82.6	76.02	78.91	27.36	0.18	24.01	0	21.5
79.95	77.43	78.88	27.05	0.179	23.91	0	21.37
80.3	76.4	78.67	26.82	0.178	23.87	0	21.34
77.67	75.13	76.64	26.59	0.18	23.87	0	21.34
77.69	70.57	74.86	26.33	0.181	23.84	0	21.31
73.15	67.3	70.63	26.07	0.182	23.77	0	21.25
68.51	61.51	64.84	25.78	0.18	23.7	0	21.16
71.15	60.56	64.3	25.52	0.182	23.64	0	21.1
76.54	71.17	74.06	25.27	0.183	23.64	0	21.07
79.26	73.6	75.54	25.23	0.179	23.81	0	21.22
86.2	79.41	84	25.34	0.17	24.08	0	21.47
88.7	85	86.5	25.78	0.149	24.6	0	21.94
91.2	87.2	89.1	26.48	0.119	25.27	0	22.58
93.5	89	91.4	28.26	0.055	26.86	0	24.01
95.6	90.7	92.7	29.96	0.063	28.18	0	25.23
95.8	91.8	93.5	31.01	0.092	28.79	0	25.81
95.6	92.2	93.6	31.19	0.104	28.63	0	25.63
95.7	92.2	93.6	30.17	0.127	27.32	0	24.46
94	91.7	92.6	29.75	0.138	26.7	0	23.87
92.6	88.5	90.7	29.45	0.147	26.18	0	23.4
89.2	84.7	87.3	28.75	0.155	25.45	0	22.71
84.9	74.91	79.69	28.18	0.169	24.84	0	22.19
78.01	72.46	74.6	27.63	0.18	24.39	0	21.72
77.72	74.01	75.75	27.28	0.18	24.18	0	21.53
77.81	76.14	76.9	27.05	0.181	24.18	0	21.53
77.5	71.99	75.49	26.82	0.179	24.18	0	21.53
76.23	68.12	73.59	26.59	0.179	24.15	0	21.5
74.87	66.34	69.28	26.33	0.177	24.11	0	21.47
74.8	66.23	71.31	26.03	0.18	24.04	0	21.4
66.39	59.2	62.41	25.78	0.179	24.04	0	21.37
60.05	57.31	58.91	25.49	0.178	23.98	0	21.31
63.82	59.56	61.49	25.23	0.18	23.94	0	21.28
76.73	63.68	70.01	25.02	0.181	23.94	0	21.28
81.2	75.93	78.42	24.95	0.177	24.11	0	21.4
82.4	79.79	81.3	25.09	0.166	24.46	0	21.72
84.9	81.2	82.8	25.49	0.146	24.91	0	22.16
85.8	82.7	84.6	26.29	0.109	25.7	0	22.91

88.3	84.8	86.1	28.1	0.045	27.28	0	24.35
90.9	85.8	87.7	29.79	0.047	28.63	0	25.59
91.1	87.2	89	31.01	0.069	29.37	0	26.26
92.1	88.6	90.4	31.14	0.087	29.08	0	26
91.8	88.9	90.4	30.17	0.118	27.75	0	24.81
92	88.9	89.9	29.83	0.129	27.09	0	24.22
90.1	88	88.9	29.49	0.138	26.55	0	23.7
88.4	85.3	87.1	28.83	0.154	25.74	0	22.97
85.3	81	83.1	28.34	0.165	25.2	0	22.48
82.1	74.44	77.95	27.86	0.172	24.81	0	22.1
77.08	74.82	75.81	27.51	0.178	24.56	0	21.91
76.56	74.84	75.89	27.28	0.179	24.49	0	21.84
77.6	75.72	76.65	27.05	0.177	24.49	0	21.81
77.27	72.99	75.35	26.82	0.177	24.49	0	21.81
76.42	72.14	74.58	26.59	0.178	24.46	0	21.78
76.61	75.3	75.97	26.37	0.174	24.42	0	21.75
75.93	74.23	75.13	26.18	0.176	24.46	0	21.78
74.91	73.44	74.38	26	0.17	24.46	0	21.78
74.68	73.23	73.84	25.81	0.172	24.46	0	21.78
77.31	74.68	75.93	25.63	0.174	24.46	0	21.78
80.2	77.34	78.98	25.59	0.17	24.56	0	21.87
85.8	78.48	81.9	25.7	0.163	24.81	0	22.1
89.1	84.8	86.5	26.07	0.142	25.27	0	22.51
90	86.8	88.1	27.24	0.086	26.4	0	23.6
91.7	87.7	89.5	28.63	0.043	27.63	0	24.7
93.6	88.2	90.1	29.75	0.064	28.42	0	25.41
94.7	89.5	92.1	29.87	0.089	28.18	0	25.23
93	89.5	91.4	30.65	0.087	28.58	0	25.59
94.3	89.5	91.1	29.83	0.113	27.59	0	24.67
92.2	89.4	90.6	29.28	0.134	26.86	0	24.01
91.4	89.1	90.1	28.95	0.139	26.4	0	23.57
90.8	87.9	89.1	28.63	0.15	26	0	23.24
87.9	76.65	83.8	28.26	0.155	25.7	0	22.94
84.1	80.8	81.8	27.67	0.166	25.16	0	22.45
80.9	75.64	78.65	27.43	0.168	25.06	0	22.35
79.61	75.64	78.39	27.16	0.173	24.91	0	22.22
78.97	77.05	78.31	26.93	0.17	24.88	0	22.19
78.58	77.34	77.93	26.78	0.171	24.84	0	22.16
78.06	74.01	76.15	26.55	0.17	24.84	0	22.16
77.89	74.52	76.31	26.37	0.172	24.77	0	22.1
78.17	75.63	77.16	26.18	0.172	24.77	0	22.1
77.55	75.67	77.02	26.03	0.169	24.77	0	22.1
77.74	74.98	76.58	25.89	0.172	24.77	0	22.1
78.1	74.98	76.33	25.74	0.169	24.81	0	22.1
81.1	77.94	79.82	25.74	0.167	24.91	0	22.22
83.8	80.2	82.3	25.92	0.153	25.23	0	22.51
87.2	83	85.2	26.29	0.136	25.67	0	22.91

89.8	86.1	87.5	27.12	0.101	26.44	0	23.64
91.3	87.9	89.6	28.34	0.056	27.51	0	24.67
93.7	90	91.4	29.79	0.041	28.75	0	25.78
94.4	91	92.8	30.79	0.062	29.45	0	26.4
94.4	91.7	92.9	31.01	0.074	29.33	0	26.29
93.1	89.3	91.2	30.35	0.104	28.34	0	25.41
92.6	89.4	90.8	29.58	0.126	27.32	0	24.46
91	88.3	89.5	29.45	0.131	26.97	0	24.18
89	84.8	87	29.08	0.144	26.48	0	23.74
84.8	79.7	82.3	28.54	0.156	25.96	0	23.24
79.95	75.48	78.08	27.98	0.163	25.41	0	22.74
77.72	71.77	75.2	27.59	0.17	25.13	0	22.48
75.77	71.6	73.81	27.28	0.172	24.98	0	22.35
76.32	74.25	75.16	27.05	0.172	24.95	0	22.32
76.7	72.41	74.93	26.86	0.17	24.95	0	22.32
76.28	71.13	73.06	26.67	0.172	24.95	0	22.32
73.83	70.98	72.45	26.44	0.173	24.91	0	22.26
74.93	73.07	74.08	26.22	0.172	24.91	0	22.26
73.95	68.47	71.76	26.07	0.168	24.91	0	22.29
70.98	65.47	68.33	25.85	0.171	24.88	0	22.26
72.59	67.95	69.97	25.59	0.174	24.84	0	22.19
76.01	72.54	74.55	25.49	0.169	24.91	0	22.26
84.7	75.52	79.72	25.63	0.159	25.16	0	22.51
86	79.82	82.9	25.96	0.145	25.56	0	22.91
88.1	85	86.4	26.74	0.112	26.29	0	23.57
88.6	85.6	87.1	27.98	0.067	27.36	0	24.56
90.2	87	88.6	28.54	0.076	27.67	0	24.84
90.6	86.9	88.7	29.54	0.066	28.34	0	25.49
91	88.2	89.7	29.79	0.082	28.34	0	25.49
91.7	86.2	88.5	29.62	0.104	27.9	0	25.09
87.4	85.1	86.3	29.16	0.123	27.2	0	24.42
86.8	84.2	85.1	28.67	0.138	26.55	0	23.84
84.6	80.9	82.7	28.3	0.152	26.11	0	23.44
80.9	78.26	79.73	27.9	0.158	25.7	0	23.07
78.66	77.76	78.36	27.63	0.164	25.49	0	22.87
78.14	61.2	67.47	27.39	0.169	25.34	0	22.74
61.68	59.25	60.37	26.82	0.175	24.98	0	22.39
61.76	59.55	60.81	26.55	0.176	24.84	0	22.29
63.52	59.67	60.64	26.33	0.176	24.84	0	22.29
65.22	60.28	63	26.11	0.174	24.88	0	22.32
61.25	59.67	60.4	25.89	0.176	24.91	0	22.35
61.14	59.98	60.61	25.63	0.174	24.91	0	22.35
60.94	58.18	59.48	25.41	0.171	24.91	0	22.35
62.49	57.64	59.65	25.16	0	24.88	0	22.32
68.04	62.17	65.39	24.91	0	24.84	0	22.29
71.47	67.81	69.95	24.77	0	24.91	0	22.35
75.42	70.9	73.07	24.81	0.166	25.13	0	22.58

79.13	74.43	76.68	24.95	0.16	25.41	0	22.84
81.6	76.91	79.2	25.27	0.147	25.7	0	23.14
83.8	79.15	81.7	26	0.121	26.33	0	23.7
84.6	80.8	83	27.01	0.093	27.09	0	24.46
85.7	81.7	83.8	27.71	0.1	27.47	0	24.77
86	82.6	84.4	28.1	0.111	27.43	0	24.77
86	81.8	83.8	27.94	0.133	26.89	0	24.29
84.8	82.8	83.8	27.98	0.146	26.59	0	24.01
84.4	80.3	82.5	27.9	0.153	26.22	0	23.7
80.2	77.3	78.53	27.67	0.163	25.81	0	23.3
77.3	73.56	75.55	27.51	0.17	25.52	0	23.04
73.54	71.29	72.12	27.24	0.172	25.31	0	22.87
71.63	70.5	71.09	27.01	0.174	25.2	0	22.74
70.74	66.29	68.64	26.78	0.174	25.16	0	22.71
69.68	66.2	67.63	26.52	0.176	25.09	0	22.68
66.9	61.45	63.57	26.29	0.173	25.06	0	22.64
64.21	58.1	61.51	26	0.174	24.98	0	22.58
60.79	57.8	59.05	25.74	0	24.95	0	22.55
61.12	56.87	59.25	25.49	0	24.91	0	22.51
58.98	53.69	57.58	25.27	0	24.88	0	22.48
60.58	51.8	54.9	25.02	0	24.88	0	22.48
67.51	60.64	65.14	24.77	0	24.84	0	22.45
70.7	67.51	69.19	24.63	0	24.91	0	22.55
74.06	70.48	72.72	24.67	0	25.16	0	22.74
78.57	73.8	76.05	24.84	0.157	25.41	0	23
84.1	77.28	80.9	25.31	0.145	25.78	0	23.37
85.4	80.6	83.2	26.11	0.122	26.37	0	23.94
86	82	83.9	26.67	0.113	26.63	0	24.22
87	82.8	84.6	27.32	0.112	26.93	0	24.49
86.1	83	84.4	27.59	0.12	26.82	0	24.39
84.4	79.19	82	27.55	0.14	26.4	0	24.01
81	78.31	79.34	27.36	0.156	25.89	0	23.54
82.7	79.08	80.8	27.24	0.164	25.59	0	23.27
80	74.81	77.39	27.32	0.163	25.59	0	23.27
75.69	71.16	73.71	27.16	0.166	25.45	0	23.14
71.98	62.03	67.26	26.93	0.169	25.23	0	22.97
64.42	59.71	60.83	26.63	0.172	25.09	0	22.81
60.48	55.92	57.37	26.37	0.172	24.98	0	22.74
58.44	53.84	56.22	26.07	0	24.91	0	22.68
58.9	54.02	56.78	25.85	0	24.91	0	22.68
56.63	50.69	52.63	25.59	0	24.91	0	22.68
59.32	53.02	55.75	25.34	0	24.88	0	22.64
63.28	58.55	60.32	25.09	0	24.84	0	22.64
64.42	58.98	61.21	24.91	0	24.88	0	22.68
66.79	62.73	64.25	24.7	0	24.91	0	22.71
71.2	64.29	67.4	24.53	0	24.95	0	22.71
69.63	63.28	65.78	24.46	0	25.02	0	22.81

75.42	69.12	72.49	24.35	0	25.06	0	22.81
76.49	73.9	75.15	24.56	0	25.31	0	23.1
79.42	74.08	76.48	25.02	0.142	25.7	0	23.5
80	76.38	78.32	25.67	0.121	26.22	0	23.98
82	77.41	79.47	26.33	0.106	26.59	0	24.35
82.5	76.75	79.11	26.89	0.102	26.86	0	24.6
82.7	76.49	80.5	27.16	0.112	26.7	0	24.49
82.7	78.86	81.2	27.2	0.132	26.4	0	24.22
81.7	79.44	80.4	27.39	0.138	26.29	0	24.11
80.4	76.48	78.83	27.39	0.144	26.07	0	23.87
78.53	75.22	76.87	27.28	0.155	25.7	0	23.57
75.2	69.95	73.02	27.12	0.161	25.45	0	23.34
69.88	65.08	66.89	26.89	0.166	25.23	0	23.14
65.58	63.72	64.61	26.59	0.169	25.06	0	22.97
64.51	62.53	63.48	26.37	0	24.98	0	22.91
63.57	61.67	62.62	26.14	0	24.98	0	22.91
61.91	59.92	60.83	25.89	0	24.95	0	22.91
63.54	60.56	62.11	25.67	0	24.91	0	22.87
63.34	59.02	60.36	25.41	0	24.91	0	22.87
61.13	59.2	60.36	25.2	0	24.91	0	22.84
60.15	57.33	58.58	24.98	0	24.88	0	22.84
62.31	56.99	59.15	24.77	0	24.88	0	22.81
70.63	62.31	66.97	24.56	0	24.84	0	22.81
73.79	65.48	70.04	24.46	0	24.95	0	22.91
75.54	71.93	73.55	24.53	0	25.13	0	23.1
78.3	73.87	75.63	24.7	0	25.38	0	23.34
80.8	75.78	77.64	25.13	0.137	25.7	0	23.64
83.3	78.49	80.6	25.85	0.119	26.18	0	24.11
84.5	79.48	81.4	26.78	0.092	26.74	0	24.67
87	81.5	84.5	27.94	0.065	27.47	0	25.38
86.1	83.5	85	28.71	0.076	27.71	0	25.59
86.8	83.5	85.1	28.46	0.116	27.01	0	24.95
86	83.1	84.5	28.5	0.131	26.63	0	24.6
85	81.7	83.2	28.54	0.139	26.37	0	24.32
81.9	78.49	80.5	28.34	0.152	25.89	0	23.91
78.44	72.38	75.79	28.1	0.161	25.56	0	23.6
72.34	69.41	70.53	27.82	0.165	25.31	0	23.34
69.32	66.73	67.95	27.51	0.169	25.13	0	23.17
68.07	65.35	66.41	27.24	0.169	25.02	0	23.1
68.51	64.81	67.08	26.97	0.171	24.98	0	23.07
68.36	66.92	67.65	26.7	0	24.98	0	23.04
67.13	62.44	64.59	26.48	0	24.98	0	23.04
63.51	59.49	61.5	26.22	0	24.95	0	23
59.86	49.94	54.88	25.92	0	24.91	0	22.97
55.16	48.37	51.1	25.63	0	24.84	0	22.91
56.91	48.88	51.92	25.34	0	24.81	0	22.87
71.35	56.94	65.41	25.06	0	24.81	0	22.87

71.89	68.9	70.43	24.91	0	24.91	0	22.94
73.69	70.96	72.4	24.91	0	25.13	0	23.17
77.89	73.13	75.5	25.09	0	25.38	0	23.4
83.4	77.47	80.3	25.49	0.142	25.74	0	23.74
85.2	81.2	83.2	26.33	0.111	26.37	0	24.35
87.2	82.7	84.7	27.36	0.076	27.09	0	25.06
86.7	83.6	85	27.9	0.084	27.24	0	25.2
87.5	84	85.5	28.06	0.105	27.01	0	24.95
86.5	83.5	84.9	27.94	0.126	26.55	0	24.56
86	82.1	84	28.02	0.133	26.37	0	24.35
83.6	80	81.7	28.1	0.14	26.18	0	24.18
80.8	76.86	78.86	27.94	0.15	25.85	0	23.84
76.83	70.44	73.84	27.78	0.159	25.56	0	23.6
71.14	66.06	69	27.51	0.165	25.34	0	23.37
66.18	62.42	64.78	27.24	0.168	25.2	0	23.24
62.36	58.57	60.01	26.93	0.169	25.09	0	23.14
65.01	58.7	62.57	26.63	0	25.02	0	23.07
62.85	58.03	60.46	26.4	0	25.02	0	23.07
63.18	57.78	60.49	26.11	0	24.98	0	23.04
61.94	57.91	60.25	25.85	0	24.98	0	23.04
59.68	52.46	56.35	25.59	0	24.95	0	23
54.67	49.5	52.07	25.31	0	24.91	0	22.97
59.94	54.78	58.37	25.06	0	24.91	0	22.94
64.1	59.92	62.21	24.84	0	24.95	0	23
67.96	64.14	66.23	24.63	0	24.98	0	23.04
73.57	67.85	70	24.67	0	25.2	0	23.24
81	71.79	75.17	24.84	0	25.45	0	23.47
82.4	78.28	80.4	25.27	0	25.81	0	23.81
84.6	80.4	82.5	26.26	0.099	26.59	0	24.56
85.4	81.6	83.4	27.28	0.07	27.28	0	25.23
86.9	83	84.9	28.18	0.055	27.78	0	25.74
87.7	83.2	85.6	28.71	0.072	27.86	0	25.78
87	84.1	85.2	28.34	0.113	27.09	0	25.06
85.9	83.4	84.5	28.34	0.127	26.74	0	24.74
84.3	81.2	82.9	28.34	0.138	26.44	0	24.46
81.9	77.44	79.76	28.14	0.148	26.03	0	24.08
77.41	74.31	75.62	27.9	0.159	25.74	0	23.77
74.41	71.87	73.19	27.63	0.162	25.49	0	23.54
72.18	68.16	70.1	27.39	0.167	25.34	0	23.44
69.91	63.53	67.97	27.09	0.168	25.23	0	23.34
70.23	63.71	66.98	26.78	0	25.16	0	23.27
64.11	60.17	62.41	26.55	0	25.16	0	23.24
65.46	59.32	60.2	26.26	0	25.09	0	23.2
66.57	58.85	63.2	26	0	25.06	0	23.17
60.63	55.68	58.23	25.74	0	25.06	0	23.17
58.46	52.87	55.34	25.49	0	25.06	0	23.14
60.58	53.24	56.1	25.2	0	24.98	0	23.07

71.98	59.84	66.19	24.98	0	24.98	0	23.07
73.36	71.55	72.36	24.81	0	25.09	0	23.17
74.93	72.19	73.34	24.88	0	25.34	0	23.4
76.47	73.37	74.84	25.06	0	25.56	0	23.64
80.6	75.86	77.97	25.45	0	25.89	0	23.94
85.2	79.3	82.2	26.26	0.114	26.44	0	24.49
88.9	82.4	85.6	27.47	0.072	27.32	0	25.31
90.1	84.7	87.7	28.95	0.027	28.3	0	26.29
91.3	86.7	89.1	29.7	0.05	28.54	0	26.48
91.8	87.1	89.9	29.24	0.103	27.59	0	25.59
91.1	88.1	89.7	29.2	0.12	27.12	0	25.16
90.2	86.8	88.5	29.33	0.129	26.86	0	24.91
87.4	83.6	85.8	29.08	0.142	26.4	0	24.46
83.6	75.63	78.59	28.83	0.152	26.03	0	24.11
75.87	71.42	73.61	28.46	0.162	25.63	0	23.74
76.76	74.28	75.91	28.14	0.164	25.41	0	23.54
75.63	68.31	74.02	27.9	0.167	25.41	0	23.5
74.52	73.12	73.98	27.67	0.165	25.38	0	23.5
74.02	71.93	72.88	27.39	0.164	25.38	0	23.47
72.56	66.53	71.74	27.12	0	25.34	0	23.44
72.19	64.17	68.62	26.89	0	25.31	0	23.4
65.26	62.91	64.05	26.63	0	25.27	0	23.37
63.87	61.66	62.64	26.33	0	25.23	0	23.34
64.21	57.67	61.1	26.07	0	25.2	0	23.27
76.26	64.3	69.6	25.81	0	25.2	0	23.27
77.2	73.89	75.25	25.7	0	25.27	0	23.37
79.95	75.71	77.96	25.78	0	25.56	0	23.64
82.5	78.7	80.2	26.03	0	25.89	0	23.91
84.2	80	82.3	26.52	0.131	26.29	0	24.32
86.2	82.1	84.1	27.24	0.104	26.82	0	24.81
88.3	84.6	86.6	28.26	0.069	27.51	0	25.49
90.4	86.3	88.1	29.12	0.065	27.9	0	25.85
93.3	88.9	91.5	29.66	0.075	27.94	0	25.89
94.3	90.7	92.2	30	0.092	27.86	0	25.78
95.6	90.7	93.4	30.09	0.108	27.51	0	25.45
95	92	92.9	30.26	0.117	27.28	0	25.23
92.3	88.1	90.1	30.13	0.132	26.89	0	24.88
88	83.1	85.7	29.75	0.145	26.44	0	24.42
83.1	79.79	81	29.37	0.154	26.07	0	24.08
80.3	78.91	79.62	28.99	0.163	25.81	0	23.84
79.26	77.48	78.57	28.71	0.162	25.74	0	23.77
78.22	76.91	77.5	28.42	0.162	25.7	0	23.74
77.53	76.64	77.05	28.18	0.164	25.67	0	23.67
77.38	75.51	76.43	27.94	0.162	25.67	0	23.67
76.37	71.81	74.46	27.67	0.161	25.63	0	23.6
71.79	66.28	69.66	27.39	0	25.56	0	23.57
67.37	64.74	66.07	27.12	0	25.52	0	23.5

71.77	65.69	67.96	26.89	0	25.45	0	23.44
80.8	71.74	76.51	26.7	0	25.49	0	23.47
84.2	77.87	80.6	26.63	0	25.63	0	23.6
86.2	82.9	84.6	26.82	0.148	26	0	23.94
89.7	85.4	87.5	27.24	0.128	26.48	0	24.39
92	88.3	90.1	28.3	0.098	27.47	0	25.31
94.5	89.6	91.8	29.12	0.048	28.06	0	25.89
97.1	91.6	93.8	30.35	0.032	28.91	0	26.67
97.9	93.4	95.4	31.64	0.019	29.75	0	27.43
99.3	94.6	97	32.01	0.052	29.58	0	27.32
99.1	95	96.9	31.73	0.08	28.91	0	26.67
99.2	95	97.2	31.82	0.091	28.58	0	26.37
96.4	93.5	94.5	31.64	0.109	28.1	0	25.89
95.1	89.8	92.6	30.92	0.132	27.24	0	25.09
89.8	80.2	86.7	30.48	0.146	26.74	0	24.6
81.9	74.76	76.65	29.96	0.158	26.33	0	24.18
81.5	74.08	77.55	29.54	0.165	26.03	0	23.91
80.8	75.61	77.13	29.24	0.166	25.96	0	23.84
81.9	72.41	77.42	28.99	0.165	25.92	0	23.77
79.97	77.2	78.44	28.71	0.166	25.89	0	23.74
77.55	73.12	75.41	28.46	0.165	25.89	0	23.74
78.44	71.09	74.8	28.18	0.164	25.85	0	23.7
71.97	66.78	69.27	27.94	0	25.85	0	23.67
69.04	66.45	67.28	27.67	0	25.81	0	23.6
72.22	65.64	68.1	27.43	0	25.78	0	23.57
86.2	72.27	78.53	27.24	0	25.81	0	23.6
88.3	85.5	87.1	27.2	0	26.03	0	23.77
90.5	86.6	88.5	27.47	0.143	26.44	0	24.18
92.5	89.3	90.8	27.9	0.122	26.97	0	24.67
94.1	91	92.5	28.75	0.087	27.71	0	25.38
98	92.8	95.6	29.96	0.039	28.75	0	26.33
99.6	95.7	97.6	31.46	0.005	29.79	0	27.32
102.2	97.6	99.4	32.66	0.015	30.52	0	28.02
101.5	98.3	99.9	33.05	0.036	30.48	0	27.9
102.4	99.8	100.8	32.76	0.07	29.75	0	27.24
102.3	99.4	100.7	32.57	0.088	29.2	0	26.74
101.2	98.7	99.6	32.47	0.095	28.83	0	26.37
99.2	96.7	98.1	32.01	0.117	28.14	0	25.74
96.7	88.9	93.6	31.5	0.134	27.55	0	25.2
92.9	89	90.7	31.05	0.146	27.12	0	24.77
91.1	85.8	88.4	30.7	0.15	26.89	0	24.56
90.9	85.9	87.6	30.43	0.152	26.78	0	24.42
86.7	84.8	85.7	30.17	0.155	26.74	0	24.39
85.3	82.7	84.3	29.92	0.153	26.67	0	24.32
84.8	83.5	84	29.66	0.155	26.63	0	24.25
83.6	81.6	82.4	29.45	0.156	26.59	0	24.22
82.2	80.8	81.4	29.2	0.155	26.55	0	24.15

81.7	79.8	80.6	28.95	0.157	26.48	0	24.08
84.4	79.65	82.3	28.71	0.159	26.44	0	24.04
86.8	83.3	85	28.54	0.157	26.48	0	24.04
89.9	85.5	87.4	28.54	0.151	26.67	0	24.22
92	88.7	90.3	28.75	0.137	27.05	0	24.56
95.2	89	92.7	29.2	0.115	27.51	0	25.02
96.7	93.7	95	30.26	0.052	28.58	0	26.03
97.6	93.3	94.5	32.15	0	30.35	0	27.63
93.7	90.8	92	31.68	0.059	29.7	0	27.01
93.9	91.9	93	30.22	0.12	28.06	0	25.49
98.6	92.3	95.5	30.26	0.118	28.02	0	25.41
99.7	96	97.8	31.05	0.091	28.67	0	26.07
99	94.5	96.6	31.82	0.073	29.28	0	26.59
95.8	94.5	94.9	31.5	0.097	28.79	0	26.14
94.5	89.3	92.3	30.96	0.12	28.14	0	25.56
89.3	85	86.9	30.57	0.134	27.71	0	25.13
85	83.2	84.2	30.09	0.145	27.32	0	24.74
83.5	82.2	83	29.75	0.151	27.09	0	24.49
83.4	82.2	82.8	29.45	0.152	26.93	0	24.35
82.6	79.8	80.8	29.2	0.153	26.86	0	24.29
81.4	79.23	80.4	28.95	0.156	26.78	0	24.25
81.8	78.96	80.8	28.79	0.154	26.78	0	24.22
81.6	78.36	80.2	28.58	0	26.74	0	24.18
80.8	78.56	79.67	28.42	0	26.74	0	24.18
82.2	78.87	80.1	28.26	0	26.74	0	24.18
81.1	78.48	79.75	28.14	0	26.78	0	24.22
85.4	79.74	82.1	27.98	0	26.78	0	24.22
87.3	79.5	82.7	27.86	0	26.82	0	24.22
91.2	87.2	88.9	28.1	0	27.16	0	24.53
93	89.7	90.7	28.67	0.113	27.78	0	25.13
90.7	88.5	89.4	29.24	0.092	28.3	0	25.63
95.1	88.2	90.8	29.03	0.115	27.98	0	25.31
95.5	90.5	93	30.52	0.044	29.28	0	26.55
91.6	87.3	89.2	30.79	0.069	29.28	0	26.55
91.1	86.9	88.9	29.92	0.12	28.18	0	25.52
94.5	88.2	92.1	29.96	0.119	28.06	0	25.41
94.8	91.1	92.7	30.79	0.093	28.75	0	26.07
93.4	90.4	92.1	31.14	0.091	28.95	0	26.26
91.8	89	90.4	30.57	0.121	28.26	0	25.59
89	82.7	85.6	30.13	0.138	27.71	0	25.09
82.8	79.99	82	29.75	0.148	27.32	0	24.7
80.6	78.58	79.74	29.41	0.155	27.05	0	24.49
82.1	79.4	81.1	29.16	0.156	26.97	0	24.39
81.2	77.76	78.69	28.99	0	26.97	0	24.39
78.51	77.13	77.74	28.75	0	26.89	0	24.32
77.81	75.47	76.64	28.54	0	26.89	0	24.29
76.92	74.84	76.09	28.34	0	26.86	0	24.29

77.62	73.3	76.48	28.14	0	26.82	0	24.25
75.39	73.93	74.62	27.9	0	26.78	0	24.22
75.4	71.66	73.19	27.71	0	26.78	0	24.18
79.6	72.68	76.88	27.51	0	26.7	0	24.18
82.4	79.28	80.5	27.43	0	26.86	0	24.29
85.9	81.7	83.5	27.63	0	27.16	0	24.56
87.7	84.7	86.2	27.94	0	27.51	0	24.91
90.6	86.7	88.6	28.58	0.111	28.1	0	25.45
92.7	89.1	90.5	29.41	0.079	28.71	0	26.03
95	90.6	92.4	30.05	0.068	29.03	0	26.37
96	91.6	92.8	30.96	0.049	29.58	0	26.89
97.6	91.9	94.5	30.92	0.082	29.16	0	26.52
98	93.2	95.8	31.41	0.073	29.41	0	26.74
96.3	89.2	92.2	31.96	0.063	29.7	0	27.01
92.1	88.1	89.2	31.1	0.116	28.67	0	26.03
89	88	88.4	30.43	0.135	27.9	0	25.31
88	84.3	86.2	30.22	0.143	27.67	0	25.09
84.5	81.2	83.3	29.96	0.149	27.43	0	24.91
82.7	80.5	81.8	29.66	0.155	27.28	0	24.74
81	79.4	80.5	29.41	0.153	27.16	0	24.67
80.5	79.23	80	29.2	0	27.12	0	24.63
79.75	77.43	78.83	28.99	0	27.12	0	24.63
78.74	77.57	78.2	28.79	0	27.09	0	24.6
78.35	75.78	77.04	28.63	0	27.09	0	24.56
77.86	75.6	77.03	28.46	0	27.09	0	24.56
76.87	74.62	75.78	28.3	0	27.05	0	24.53
75.14	70.25	72.04	28.1	0	27.01	0	24.49
76.75	70.59	72.68	27.82	0	26.89	0	24.39
78.68	76.72	77.97	27.67	0	26.86	0	24.39
83.5	78.26	81.1	27.78	0	27.12	0	24.63
87.8	82.5	84.8	27.98	0	27.43	0	24.91
92.5	85.5	88.4	28.67	0.106	28.14	0	25.56
92.8	89.3	90.9	30.17	0.026	29.49	0	26.86
93.9	90.5	92.1	31.87	0	30.87	0	28.14
95	90.3	92.8	32.66	0	31.28	0	28.5
95.3	91.5	93.6	32.76	0.028	30.92	0	28.22
95.8	91.9	94	32.66	0.058	30.52	0	27.82
94.3	90.2	92.3	32.29	0.077	29.83	0	27.2
93.1	90.6	91.7	31.91	0.102	29.2	0	26.63
91.1	87.4	89.3	31.41	0.122	28.58	0	26.03
87.4	84.4	85.8	30.87	0.138	28.02	0	25.52
84.4	82.2	83.1	30.39	0.147	27.63	0	25.13
82.5	79.24	81.2	30.05	0.152	27.39	0	24.91
81.2	79.5	80.4	29.75	0.155	27.28	0	24.81
80.2	78.72	79.5	29.54	0	27.24	0	24.77
79.06	77.58	78.25	29.28	0	27.2	0	24.7
78.22	77.2	77.8	29.03	0	27.12	0	24.67

78.01	75.19	77.09	28.83	0	27.12	0	24.63
77.72	71.65	75.57	28.63	0	27.09	0	24.63
76.3	72.41	74.49	28.38	0	27.09	0	24.6
77.91	73.48	76.41	28.18	0	27.05	0	24.56
78.05	75	76.92	27.98	0	27.05	0	24.56
82.4	77.35	80.7	27.9	0	27.16	0	24.67
85.1	82.1	83.8	28.1	0	27.47	0	24.98
87.8	84	85.8	28.42	0	27.9	0	25.38
90.6	86.7	88.1	29.24	0.085	28.71	0	26.11
91.5	88.6	89.9	30.7	0.005	30	0	27.36
93.2	88.6	90.6	32.29	0	31.32	0	28.58
95.5	88.4	91.5	31.96	0.044	30.61	0	27.9
97	91.9	93.9	31.82	0.059	30.13	0	27.47
95	87.9	91.6	32.52	0.05	30.48	0	27.82
91.6	87.4	88.8	31.64	0.102	29.33	0	26.7
90.8	87.4	89.4	30.83	0.128	28.34	0	25.81
89.3	86.4	87.1	30.74	0.135	28.14	0	25.63
86.8	83.6	85.5	30.48	0.147	27.86	0	25.34
85.3	82.2	83.4	30.22	0.152	27.67	0	25.2
82.7	79.05	80	29.96	0.151	27.55	0	25.06
79.7	78.35	79.13	29.7	0	27.43	0	24.95
80.5	78.19	79.27	29.41	0	27.36	0	24.88
79.56	77.67	78.65	29.2	0	27.32	0	24.84
77.96	75.11	76.7	28.95	0	27.28	0	24.81
75.48	73.21	74.12	28.71	0	27.24	0	24.77
74.32	73.03	73.85	28.46	0	27.16	0	24.7
74.2	71.05	72.36	28.26	0	27.16	0	24.67
73.89	70.66	72.37	28.02	0	27.12	0	24.63
80.2	73.86	77.45	27.78	0	27.09	0	24.63
84.5	80.2	82.2	27.71	0	27.24	0	24.74
86	83.4	84.6	27.9	0	27.59	0	25.06
87.7	84.8	86.1	28.18	0	27.9	0	25.38
90.3	85.6	87.8	28.71	0	28.38	0	25.85
92.4	88.1	90.3	29.75	0.069	29.24	0	26.67
95.4	91	92.8	31.19	0.006	30.39	0	27.71
96.5	93.2	94.9	32.15	0.008	30.92	0	28.22
97.3	93.6	95.4	32.43	0.03	30.7	0	28.02
96.9	94	95.8	32.47	0.063	30.26	0	27.63
97	94.7	95.8	32.43	0.079	29.83	0	27.24
96.4	92.7	95	32.52	0.095	29.58	0	27.01
92.7	91.6	92.1	32.05	0.121	28.91	0	26.37
91.6	81.4	86.8	31.5	0.137	28.3	0	25.81
85.7	80.6	83.3	31.1	0.148	27.86	0	25.38
82.6	80.4	81.7	30.83	0.151	27.75	0	25.27
81.4	79.69	80.6	30.52	0.15	27.63	0	25.16
80	78.45	79.29	30.26	0	27.59	0	25.13
79.16	74.5	76.78	29.96	0	27.51	0	25.06

75.1	70.34	72.89	29.66	0	27.43	0	24.98
76.04	70.42	72.6	29.33	0	27.36	0	24.88
70.68	63.95	68.04	29.08	0	27.32	0	24.84
67.78	63.44	65.57	28.75	0	27.24	0	24.77
69.88	67.15	68.7	28.5	0	27.2	0	24.74
75.52	69.43	73.76	28.26	0	27.24	0	24.77
77.37	74.91	76.35	28.18	0	27.36	0	24.88
80.5	74.43	76.54	28.18	0	27.59	0	25.06
85.3	80.2	83	28.34	0	27.82	0	25.31
88	84.4	86	28.95	0	28.42	0	25.89
91.7	87.1	89.3	29.92	0.077	29.28	0	26.67
93.9	89.1	91.3	31.1	0.036	30.13	0	27.47
95.7	90.7	93.3	32.05	0.024	30.7	0	27.98
96.2	92.8	94.3	32.38	0.042	30.57	0	27.9
96	91.7	93.7	32.33	0.075	30.09	0	27.43
95.4	84	90.7	32.05	0.1	29.45	0	26.86
84.3	77.91	81.7	31.5	0.124	28.67	0	26.11
81.7	79.49	80.6	31.14	0.146	28.14	0	25.63
80.9	79.16	80	30.92	0.15	27.94	0	25.41
82	79.44	80.5	30.7	0	27.86	0	25.34
82	78.62	80	30.52	0	27.82	0	25.31
82.7	79.21	80.7	30.3	0	27.82	0	25.31
79.55	76.95	77.61	30.09	0	27.78	0	25.27
79.26	76.82	77.84	29.87	0	27.75	0	25.23
76.79	73.37	75.22	29.66	0	27.71	0	25.2
74.43	72.9	73.53	29.41	0	27.67	0	25.13
73.53	70.66	71.85	29.2	0	27.63	0	25.13
71.79	70.66	71.27	28.95	0	27.59	0	25.06
73.73	70.81	72.24	28.75	0	27.55	0	25.06
74.18	72.59	73.14	28.58	0	27.59	0	25.06
74.68	71.03	73.07	28.46	0	27.63	0	25.09
77.04	72	73.92	28.26	0	27.59	0	25.06
82.4	76.28	78.79	28.3	0	27.75	0	25.2
88	82.5	85.3	28.63	0	28.18	0	25.59
84.5	81.1	82.7	29.2	0	28.75	0	26.14
81	78.41	79.36	29.08	0	28.38	0	25.81
80.8	77.46	78.81	28.95	0	28.14	0	25.56
88.5	80.4	84.3	29.03	0	28.18	0	25.59
89.5	86.2	87.8	29.62	0	28.75	0	26.14
91.1	84.2	88.2	30.09	0.107	29.12	0	26.48
85.3	82.5	83.8	30	0.118	28.91	0	26.29
84.6	80.8	82.7	29.66	0	28.38	0	25.81
80.8	76.79	79.47	29.58	0	28.22	0	25.67
76.76	71.23	73.39	29.37	0	27.94	0	25.45
74.96	69.19	72.39	29.08	0	27.75	0	25.23
70.01	66.1	68.54	28.87	0	27.67	0	25.16
69.28	65.49	66.99	28.67	0	27.59	0	25.13

66.09	63.77	64.46	28.42	0	27.55	0	25.09
64.01	61.84	62.85	28.22	0	27.51	0	25.02
63.31	61.02	61.7	28.02	0	27.47	0	25.02
62.59	61.34	61.89	27.82	0	27.43	0	24.98
61.81	59.98	61.05	27.59	0	27.43	0	24.98
64.04	58.88	60.31	27.39	0	27.43	0	24.95
74.63	64.11	71	27.16	0	27.39	0	24.95
78.95	74.53	76.15	27.09	0	27.51	0	25.06
81.2	77.84	79.53	27.28	0	27.82	0	25.38
83	79.37	81.1	27.55	0	28.18	0	25.7
85.9	80.1	83.1	28.06	0	28.54	0	26.11
89.2	84.6	86.7	28.87	0	29.2	0	26.7
90.2	85	86.9	30	0.053	30	0	27.47
85.8	84.6	85.2	29.83	0.094	29.37	0	26.89
85.5	83.6	84.5	29.41	0	28.58	0	26.14
87.4	84.1	85.9	29.37	0	28.34	0	25.96
87.5	85.9	86.7	29.62	0	28.46	0	26.07
87.4	81.6	84.5	29.7	0	28.5	0	26.11
81.6	78.51	79.98	29.62	0	28.34	0	26
78.51	76.56	77.5	29.37	0	28.06	0	25.74
77.71	74.43	75.69	29.12	0	27.9	0	25.56
75.6	74.48	75.06	28.87	0	27.75	0	25.45
76.19	74.48	75.32	28.67	0	27.71	0	25.41
76.02	72.86	74.11	28.5	0	27.67	0	25.38
72.83	69.3	71.06	28.34	0	27.67	0	25.38
71.18	68.44	70.09	28.1	0	27.55	0	25.27
68.53	65.91	67.43	27.86	0	27.47	0	25.23
71.88	67.82	69.88	27.71	0	27.47	0	25.23
72.43	69.03	70.52	27.59	0	27.51	0	25.27
72.48	69.84	71.5	27.47	0	27.51	0	25.27
74.36	71	72.49	27.32	0	27.51	0	25.27
79.37	74.36	76.56	27.2	0	27.51	0	25.31
78.01	74.51	75.83	27.32	0	27.78	0	25.56
76.28	74.47	75.6	27.51	0	27.94	0	25.74
79.83	76	78.17	27.51	0	27.94	0	25.74
79.39	76.87	78.62	27.59	0	27.98	0	25.74
77.69	74.22	76.02	27.59	0	27.9	0	25.7
78.25	76.79	77.45	27.59	0	27.82	0	25.63
78.95	77.53	78.33	27.71	0	27.86	0	25.67
80.4	78.34	79.43	27.82	0	27.9	0	25.74
83.9	79.73	81.3	27.94	0	27.94	0	25.81
81.4	78.75	79.7	28.14	0	28.06	0	25.92
82.1	76.14	79.24	28.14	0	27.94	0	25.81
76.14	73.36	74.61	28.14	0	27.82	0	25.7
75.42	73.21	74.32	28.06	0	27.67	0	25.59
74.71	70.46	72.75	27.98	0	27.63	0	25.52
70.44	67.51	68.43	27.86	0	27.59	0	25.52

67.51	65.86	66.79	27.67	0	27.51	0	25.45
65.86	64.56	65.02	27.51	0	27.47	0	25.41
64.77	62.5	63.85	27.32	0	27.39	0	25.34
63.41	61.17	62.23	27.16	0	27.32	0	25.31
62.83	61.2	62.07	27.01	0	27.28	0	25.27
63.33	61.57	62.22	26.86	0	27.28	0	25.27
64.87	62.59	63.57	26.7	0	27.28	0	25.27
67.85	64.89	66.68	26.55	0	27.24	0	25.23
69.57	67.41	68.49	26.44	0	27.28	0	25.31
75.58	67.57	71.68	26.48	0	27.39	0	25.45
78.32	74.64	76.47	26.67	0	27.67	0	25.7
79.28	75.98	77.79	27.24	0	28.22	0	26.26
83.5	77.91	80.1	27.86	0	28.71	0	26.74
83.7	77.82	79.87	28.26	0	28.87	0	26.89
81.8	79.03	80.3	28.18	0	28.38	0	26.48
85.2	79.71	81.6	28.46	0	28.38	0	26.44
81.2	72.57	76.51	28.87	0	28.5	0	26.59
77.15	75.39	76.3	28.63	0	27.94	0	26.07
82.2	76.12	78.36	28.63	0	27.82	0	25.96
81.5	77.65	78.73	28.71	0	27.86	0	26
77.6	69.81	73.48	28.67	0	27.82	0	25.96
69.82	67.7	68.52	28.38	0	27.55	0	25.74
67.72	64.98	66.19	28.14	0	27.36	0	25.56
65.76	64.46	65	27.94	0	27.28	0	25.45
66.49	63.41	65.47	27.75	0	27.2	0	25.41
63.37	60.06	61.23	27.55	0	27.2	0	25.41
62.07	58.56	60.44	27.32	0	27.12	0	25.34
62.89	59.23	61.73	27.12	0	27.05	0	25.31
62.97	61.73	62.56	26.93	0	27.05	0	25.31
61.89	60.35	60.99	26.78	0	27.09	0	25.31
62.32	59.63	61.51	26.55	0	27.09	0	25.31
63.07	58.91	60.33	26.44	0	27.09	0	25.34
74.16	61.59	67.66	26.29	0	27.05	0	25.31
74.78	71.92	72.76	26.11	0	27.05	0	25.31
77.29	72.61	74.22	26.18	0	27.28	0	25.52
82.3	76.63	78.81	26.33	0	27.43	0	25.74
83.5	78.65	81.1	26.86	0	28.02	0	26.29
84.5	78.8	82	27.39	0	28.38	0	26.7
85.6	66.88	77.15	27.82	0	28.58	0	26.89
70.48	61.5	66.47	27.39	0	27.86	0	26.14
68.47	65.47	67.11	27.05	0	27.24	0	25.56
77.34	68.43	74.94	26.86	0	27.09	0	25.41
77.27	75.77	76.25	26.86	0	27.2	0	25.52
77.7	75.91	77.06	26.74	0	27.24	0	25.59
75.91	72.24	73.42	26.67	0	27.28	0	25.63
73.21	72.3	72.74	26.48	0	27.16	0	25.52
72.85	70.83	71.87	26.22	0	27.09	0	25.49

71.41	69.13	70.41	26.03	0	27.05	0	25.45
70.16	65.88	68	25.85	0	27.01	0	25.41
70.72	68	69.35	25.63	0	26.97	0	25.38
69.45	64.71	66.79	25.45	0	26.93	0	25.38
64.67	61.5	63.14	25.27	0	26.89	0	25.34
61.73	60.5	61.19	25.09	0	26.89	0	25.34
63.48	60.77	61.58	24.91	0	26.86	0	25.31
64.99	60.92	62.11	24.74	0	26.82	0	25.31
73.73	65.09	70.03	24.56	0	26.82	0	25.27
76.57	73.68	75.31	24.42	0	26.86	0	25.34
79.67	76.02	77.86	24.56	0	27.09	0	25.59
82.5	78.92	80.4	24.84	0	27.39	0	25.92
85.2	80.7	82.7	25.49	0	27.94	0	26.48
86.4	82.3	84.4	26.37	0	28.63	0	27.16
88.5	84.6	86.4	27.32	0.073	29.2	0	27.75
90.1	86.3	88	28.1	0.078	29.49	0	28.1
90.4	87.5	88.9	28.58	0.096	29.45	0	28.06
90.5	85.5	88	28.54	0.115	28.87	0	27.51
89.9	85.7	88.1	28.54	0.132	28.34	0	27.01
88.9	85.4	87.3	28.67	0.134	28.14	0	26.82
86.8	83.2	85	28.54	0	27.75	0	26.4
83.2	80.2	81.5	28.34	0	27.43	0	26.11
80.3	75.44	78.43	28.1	0	27.16	0	25.85
77.78	75.51	76.71	27.9	0	26.97	0	25.7
76.3	73.31	75.2	27.63	0	26.89	0	25.59
75.81	72.68	75.1	27.39	0	26.82	0	25.59
75.46	72.06	74.08	27.2	0	26.82	0	25.56
74.68	71.4	72.15	27.01	0	26.78	0	25.52
74.82	73.17	74.17	26.78	0	26.74	0	25.52
74.3	72.86	73.44	26.59	0	26.74	0	25.52
73.53	68.05	71.92	26.4	0	26.7	0	25.49
73.5	71.2	72.27	26.22	0	26.7	0	25.45
76.8	73.5	75.08	26.03	0	26.67	0	25.45
78.75	76.65	77.64	25.92	0	26.74	0	25.52
82.8	78.14	80.6	26.03	0	26.97	0	25.78
84.5	80.8	82.3	26.37	0	27.36	0	26.14
89.9	82.6	86	26.82	0	27.75	0	26.52
90.1	84.8	87.5	27.51	0	28.26	0	27.05
91.7	87.5	89.4	29.08	0.039	29.49	0	28.3
91.7	87.8	89.7	30.35	0.037	30.3	0	29.12
92.9	87.2	90.4	30.43	0.077	29.87	0	28.67
92.7	87.8	90.4	29.96	0.11	28.95	0	27.78
93	88.2	90.5	29.92	0.12	28.54	0	27.39
90.9	87.3	89.2	29.92	0.129	28.26	0	27.09
88.8	85.4	87	29.66	0.138	27.78	0	26.63
85.4	82.3	83.7	29.37	0	27.43	0	26.26
82.5	76.07	80.3	29.08	0	27.12	0	25.96

76.76	71.44	73.96	28.79	0	26.93	0	25.78
73.19	70.3	71.21	28.46	0	26.78	0	25.59
71.03	68.31	69.91	28.14	0	26.7	0	25.52
72.22	69.71	70.75	27.9	0	26.67	0	25.49
76.15	72.4	75.28	27.67	0	26.67	0	25.49
75.35	73.93	74.55	27.47	0	26.7	0	25.52
74.64	71.51	73.27	27.28	0	26.74	0	25.52
71.84	64.25	66.71	27.05	0	26.7	0	25.49
69.36	64.13	66.16	26.82	0	26.63	0	25.41
75.67	68.32	73.27	26.59	0	26.59	0	25.38
79.61	73.87	76.42	26.48	0	26.67	0	25.45
85.3	79.12	82.3	26.59	0	26.93	0	25.7
87.6	84	85.7	26.89	0	27.32	0	26.07
89.8	86.2	87.6	27.63	0	27.98	0	26.78
91.7	87.2	89.1	28.87	0.045	29.08	0	27.86
93	88.6	90.3	30.13	0.014	30.05	0	28.79
93.2	89.4	91.1	30.74	0.042	30.26	0	29.03
93.2	89.1	91.3	30.7	0.077	29.75	0	28.5
93.2	90.1	91.5	30.3	0.104	28.95	0	27.71
90.9	86.5	88.4	30.17	0.121	28.5	0	27.28
88.6	85.4	86.2	29.92	0.137	27.98	0	26.7
87.3	84.7	86.2	29.66	0.147	27.59	0	26.33
84.7	78.46	81.8	29.49	0	27.39	0	26.14
78.44	74.88	76.82	29.2	0	27.16	0	25.89
75.56	73.78	74.77	28.87	0	26.93	0	25.67
75.2	72.44	73.97	28.58	0	26.86	0	25.59
76.63	72.23	75.07	28.34	0	26.78	0	25.52
76.37	74.27	75.33	28.1	0	26.78	0	25.52
76.28	73.21	74.34	27.9	0	26.82	0	25.52
75.53	72.1	73.92	27.67	0	26.82	0	25.52
75.21	69.26	73.06	27.47	0	26.82	0	25.49
70.61	65.3	67.96	27.28	0	26.78	0	25.45
69.11	62.04	65.79	27.01	0	26.7	0	25.38
77.27	69.11	73.27	26.78	0	26.67	0	25.34
80.4	76.83	78.22	26.67	0	26.74	0	25.41
82.6	79.4	81.1	26.82	0	27.05	0	25.7
84.6	81	82.9	27.01	0	27.32	0	26
87.9	83.5	85.6	27.47	0	27.75	0	26.4
90.6	86	88.1	28.42	0.08	28.58	0	27.2
91.9	88.5	90.2	29.54	0.034	29.49	0	28.14
91.9	87.6	89.6	30.26	0.037	29.83	0	28.46
94.3	87.2	89.6	29.87	0.084	29.08	0	27.71
94.1	90.7	92.2	29.7	0.107	28.63	0	27.24
92.4	89.5	90.8	30.39	0.092	29.03	0	27.67
92	87.2	89.1	30.43	0.104	28.83	0	27.43
87.4	83.2	85.3	30.09	0.129	28.22	0	26.86
83.2	79.5	81	29.7	0.142	27.71	0	26.33

79.63	76.9	78.36	29.37	0	27.32	0	25.96
77.04	72.99	74.63	29.08	0	27.12	0	25.74
74.4	72.79	73.35	28.79	0	27.01	0	25.59
74.52	73.39	74.05	28.54	0	26.93	0	25.56
73.57	72.54	73.18	28.3	0	26.89	0	25.52
72.85	69.17	70.79	28.1	0	26.89	0	25.52
71.84	68.41	70.46	27.86	0	26.86	0	25.45
71.14	67.94	69.19	27.63	0	26.82	0	25.41
70.29	62.35	67.03	27.39	0	26.78	0	25.38
67.01	60.36	63.21	27.12	0	26.74	0	25.34
74.2	66.22	71.01	26.89	0	26.7	0	25.31
76.12	73.01	74.41	26.78	0	26.78	0	25.38
80.2	74.94	76.84	26.86	0	27.05	0	25.59
85.3	79.02	83	27.09	0	27.36	0	25.92
88.7	83.2	85.3	27.78	0	27.98	0	26.55
89.9	85.2	87.4	28.87	0.061	28.95	0	27.47
90.4	87.2	88.7	30.05	0.027	29.83	0	28.34
92.6	88.3	90	30.96	0.024	30.39	0	28.91
92.9	89.1	90.9	31.19	0.042	30.22	0	28.75
93.1	89.8	91.5	30.83	0.085	29.49	0	28.02
91.7	89.3	90.5	30.7	0.106	29.03	0	27.55
90.5	87.3	88.7	30.61	0.117	28.67	0	27.16
88.1	84.2	86.1	30.26	0.137	28.1	0	26.67
84.1	79.6	82	29.96	0.145	27.71	0	26.26
79.87	73.36	76.4	29.62	0.154	27.39	0	25.92
73.57	72.29	72.86	29.24	0	27.16	0	25.7
74.78	72.12	72.98	28.95	0	27.01	0	25.56
73.84	71.31	72.04	28.71	0	27.01	0	25.52
74.68	73.57	74.16	28.46	0	26.97	0	25.52
73.8	72.32	73.03	28.26	0	27.01	0	25.52
73.12	70.05	71.84	28.06	0	26.97	0	25.49
72.23	67.97	70.42	27.86	0	26.93	0	25.45
70.76	65.95	68.77	27.59	0	26.89	0	25.41
72.28	67.7	69.61	27.39	0	26.89	0	25.41
75.1	69.53	72.74	27.2	0	26.89	0	25.38
78.08	74.14	75.86	27.09	0	26.97	0	25.45
81.1	77.22	79.35	27.16	0	27.2	0	25.67
84.3	80.8	82.5	27.39	0	27.51	0	25.96
89.9	82.6	87.5	27.98	0	28.06	0	26.52
93.1	88.2	90.2	29.16	0.064	29.03	0	27.47
93.8	89.6	91.8	30.83	0	30.39	0	28.79
95.3	91.2	93.2	31.73	0.017	30.83	0	29.2
94.9	91.1	93	32.1	0.038	30.74	0	29.12
94.4	91.5	93	31.73	0.082	29.96	0	28.34
93.7	91.3	92.3	31.46	0.103	29.37	0	27.78
92.6	89.3	90.8	31.32	0.115	28.95	0	27.39
90.1	86.3	88.2	30.87	0.135	28.34	0	26.78

86.3	81.4	84.1	30.48	0.147	27.9	0	26.33
81.3	75.76	78.17	30.13	0.153	27.55	0	26
76.19	72.39	74.13	29.75	0.158	27.32	0	25.74
78.25	72.7	74.91	29.41	0	27.16	0	25.63
73.56	68.01	71.01	29.12	0	27.12	0	25.56
71.14	67.63	68.84	28.83	0	27.09	0	25.49
71.88	69.65	71.2	28.54	0	27.05	0	25.45
73.57	71.51	72.68	28.34	0	27.05	0	25.45
72.64	70.01	71.83	28.1	0	27.05	0	25.49
72.99	69.71	71.81	27.9	0	27.05	0	25.45
71.24	67.41	68.74	27.71	0	27.05	0	25.45
76.84	71.2	74.77	27.47	0	27.01	0	25.41
79.91	76.26	77.75	27.36	0	27.12	0	25.49
84	79.43	81.6	27.47	0	27.39	0	25.74
90.3	83.8	87.2	27.75	0	27.75	0	26.07
92.2	87.3	89.5	28.42	0.109	28.38	0	26.7
93.3	89.2	90.9	29.83	0.044	29.58	0	27.9
94.6	90.8	92.6	31.1	0	30.57	0	28.83
95.4	91.9	93.7	32.29	0	31.37	0	29.62
96.1	91.4	93.5	32.43	0.032	31.05	0	29.28
95.3	90.5	93	31.82	0.085	30.09	0	28.34
93.8	91.4	92.7	31.46	0.103	29.37	0	27.67
92.6	88	90.9	31.41	0.115	29.12	0	27.43
89	86.1	87.8	31.01	0.135	28.54	0	26.86
86.1	81	83.7	30.61	0.146	28.1	0	26.4
81.3	76.14	78.67	30.22	0.155	27.71	0	26.07
76.54	71.76	74.45	29.87	0.158	27.51	0	25.81
77.86	71.64	74.94	29.54	0	27.36	0	25.7
75.9	70.31	72.21	29.33	0	27.32	0	25.67
71.57	67.76	69.37	29.03	0	27.28	0	25.59
73.84	70.66	72.11	28.79	0	27.2	0	25.56
73.62	69.41	72.07	28.58	0	27.24	0	25.56
73.8	71.03	72.65	28.38	0	27.24	0	25.52
71.97	67.59	70.64	28.18	0	27.28	0	25.56
72.05	69.03	70.35	27.94	0	27.2	0	25.49
76.87	71.68	74.12	27.75	0	27.2	0	25.49
80.2	76.68	78.31	27.63	0	27.28	0	25.56
84.8	79.63	81.7	27.75	0	27.55	0	25.81
88	83.7	85.9	27.98	0	27.86	0	26.11
90.2	86.8	88.3	28.46	0.121	28.34	0	26.59
92.8	88.2	89.8	29.24	0.091	28.99	0	27.24
94.2	90.1	91.5	29.87	0.07	29.45	0	27.67
94.3	90.4	92	30.48	0.057	29.79	0	27.98
93.6	89.7	91.9	30.92	0.064	29.96	0	28.14
93.3	90.6	91.8	30.79	0.093	29.54	0	27.71
92.4	89.9	90.9	30.7	0.11	29.16	0	27.36
91.1	88.2	89.4	30.65	0.119	28.87	0	27.09

88.3	84.2	86.4	30.39	0.131	28.46	0	26.67
84.2	79.43	82.2	30.09	0.145	28.06	0	26.33
80.7	76.7	78.45	29.79	0.15	27.78	0	26.03
77.91	74.63	76.78	29.45	0	27.55	0	25.81
77.24	72.76	75.76	29.2	0	27.47	0	25.7
75.03	69.52	71.82	28.91	0	27.39	0	25.63
75.21	69.71	72.02	28.67	0	27.32	0	25.56
71	61.98	66.14	28.42	0	27.32	0	25.56
68.55	64.53	67.43	28.14	0	27.24	0	25.49
68.55	67.21	67.99	27.9	0	27.24	0	25.49
68.22	66.88	67.39	27.71	0	27.24	0	25.49
68.94	65.08	66.69	27.47	0	27.2	0	25.45
75.95	68.81	72.52	27.28	0	27.2	0	25.45
79.44	75.44	77.53	27.12	0	27.28	0	25.52
82.8	78.71	80.9	27.28	0	27.59	0	25.81
86	82.1	83.7	27.51	0	27.9	0	26.14
88.4	84.6	86.4	28.06	0	28.46	0	26.67
89.7	86.6	88.4	28.99	0.078	29.24	0	27.43
92.2	87.9	89.5	30.05	0.029	30.09	0	28.26
93.6	89.1	91.5	31.05	0.004	30.7	0	28.83
93.2	90.6	92	31.23	0.041	30.48	0	28.63
94.1	90.2	91.8	31.1	0.079	29.92	0	28.06
92.3	89.3	90.9	30.96	0.1	29.45	0	27.63
90.4	87.4	89	30.92	0.111	29.08	0	27.32
88	84.5	86.3	30.57	0.133	28.58	0	26.82
84.5	78.72	81.3	30.26	0.144	28.14	0	26.4
79.36	73.82	75.49	29.87	0	27.78	0	26.03
76.19	72.84	74.31	29.49	0	27.55	0	25.81
75.02	73.35	74.14	29.24	0	27.47	0	25.7
74.75	71.97	73.95	28.99	0	27.43	0	25.7
75.03	73.26	74.04	28.75	0	27.39	0	25.67
73.8	72.48	73.2	28.5	0	27.39	0	25.67
73.53	72.45	72.92	28.3	0	27.39	0	25.67
73.24	71.45	72.42	28.1	0	27.36	0	25.63
72.15	61.13	63.59	27.86	0	27.36	0	25.63
64.72	60.99	62.16	27.55	0	27.24	0	25.52
74.88	64.74	70.34	27.36	0	27.24	0	25.49
79.15	74.81	77.16	27.2	0	27.32	0	25.56
82	78.53	80.1	27.32	0	27.63	0	25.85
86.3	81.2	83	27.59	0	27.98	0	26.22
88	83.5	85.5	28.18	0	28.58	0	26.78
90.9	85.5	88.1	29.28	0.059	29.54	0	27.75
91.8	87.7	89.8	30.65	0	30.61	0	28.79
93	89.2	91	31.5	0	31.1	0	29.2
93.6	90.4	92	31.64	0.03	30.74	0	28.91
94.3	91.3	92.6	31.46	0.069	30.17	0	28.34
94.3	90.8	92.3	31.32	0.087	29.66	0	27.9

92.2	89	90.6	31.19	0.11	29.28	0	27.51
89.2	85.6	87.7	30.87	0.128	28.75	0	26.97
85.6	79.8	83	30.52	0.138	28.3	0	26.55
80.4	74.81	76.89	30.17	0.148	27.94	0	26.18
75.6	72.79	73.82	29.79	0	27.67	0	25.96
74.33	72.45	73.44	29.49	0	27.55	0	25.81
74.16	72.94	73.54	29.2	0	27.51	0	25.78
74.82	72.08	73.5	28.95	0	27.47	0	25.74
72.19	69.79	70.79	28.75	0	27.47	0	25.74
69.88	67.58	68.51	28.5	0	27.43	0	25.7
68.79	66.57	67.66	28.22	0	27.39	0	25.67
68.16	66.22	67.19	27.98	0	27.36	0	25.63
67.88	66.51	67.27	27.75	0	27.36	0	25.63
77.31	67.42	72.73	27.55	0	27.36	0	25.59
80.2	77.16	78.35	27.39	0	27.43	0	25.7
83.4	79.43	81.2	27.55	0	27.75	0	26
86.3	82.8	84.9	27.82	0	28.14	0	26.37
89.1	85	87.3	28.5	0	28.79	0	27.01
92.2	86.8	89.5	29.66	0.05	29.79	0	27.98
94	88.5	91.5	31.01	0	30.87	0	29.03
94.3	90.9	92.9	31.82	0	31.28	0	29.41
95.2	92	93.5	32.05	0.017	31.1	0	29.24
95.2	92	93.6	31.73	0.064	30.39	0	28.54
95.3	92.6	93.8	31.59	0.089	29.92	0	28.1
93.8	91.1	92.3	31.5	0.099	29.58	0	27.78
91.5	88.1	89.9	31.14	0.123	28.99	0	27.24
88.1	82	85.8	30.74	0.133	28.5	0	26.74
82.7	80.6	81.7	30.35	0.144	28.14	0	26.4
82.6	76.52	78.27	30	0	27.9	0	26.14
79.75	76.72	77.81	29.7	0	27.75	0	26
80.1	78.58	79.47	29.45	0	27.71	0	25.96
79.26	77.89	78.45	29.28	0	27.71	0	26
78.15	74.73	77.09	29.08	0	27.71	0	25.96
77.79	76.18	76.87	28.83	0	27.67	0	25.92
76.6	75.16	76.08	28.63	0	27.63	0	25.89
75.79	74.59	75.28	28.46	0	27.63	0	25.85
75.3	72.68	74.51	28.26	0	27.59	0	25.85
78.87	73.3	75.76	28.06	0	27.55	0	25.81
81.6	78.72	80	27.98	0	27.67	0	25.92
84	81.1	82.5	28.14	0	27.98	0	26.18
87.4	83.8	85.8	28.46	0	28.38	0	26.59
91.1	86.3	88.7	29.16	0.096	29.08	0	27.28
94.4	89	91.5	30.35	0.044	30.09	0	28.26
96.3	91.2	93.4	31.87	0	31.32	0	29.45
96.1	92.6	94.3	32.9	0	32.01	0	30.09
96.6	93.2	94.8	33.14	0	31.82	0	29.92
96.5	94.1	95.3	32.66	0.05	30.96	0	29.08

96.7	94	95.2	32.33	0.075	30.26	0	28.42
95.3	92.7	93.8	32.29	0.088	29.96	0	28.14
93.4	89.6	91.5	31.82	0.114	29.33	0	27.47
89.6	85.6	87.5	31.37	0.132	28.79	0	26.97
85.7	79.9	83.1	30.92	0.145	28.34	0	26.55
83	81.6	82.3	30.52	0	28.06	0	26.29
82.8	78.77	81.2	30.26	0	27.94	0	26.18
81.7	78.04	80.5	30	0	27.94	0	26.14
80.9	79.24	79.91	29.79	0	27.9	0	26.11
79.48	77.53	78.9	29.58	0	27.86	0	26.07
78.63	77.72	78.21	29.37	0	27.82	0	26.03
78.34	77.36	77.97	29.16	0	27.82	0	26.03
78.01	77.25	77.61	28.95	0	27.82	0	26
78.21	77.26	77.67	28.79	0	27.78	0	26
80.3	70.41	77.33	28.63	0	27.82	0	26
84.8	80.1	82.2	28.54	0	27.86	0	26.07
87.8	84.2	85.8	28.67	0	28.18	0	26.37
90.3	86.9	88.6	29.03	0	28.63	0	26.78
94.1	89.5	91	29.83	0.095	29.41	0	27.51
94.9	91.1	93.1	31.05	0.023	30.52	0	28.58
96.8	92.1	94.7	32.57	0	31.78	0	29.75
98.1	93	95.7	33.63	0	32.43	0	30.43
98.3	95.3	96.7	33.78	0	32.19	0	30.22
97.7	94.4	96.4	33.24	0.038	31.32	0	29.33
98.6	94.4	95.9	32.9	0.065	30.7	0	28.75
95.5	93.1	94.3	32.66	0.09	30.22	0	28.26
93.2	89.6	91.4	32.19	0.114	29.54	0	27.63
89.6	85.5	87.6	31.68	0.133	28.99	0	27.09
86	82.3	84.3	31.23	0.138	28.54	0	26.67
82.7	77.37	79.8	30.83	0	28.3	0	26.4
81.4	76.72	79.03	30.52	0	28.14	0	26.26
80.7	78.07	79.94	30.26	0	28.06	0	26.18
79.72	78.68	79.2	30.05	0	28.06	0	26.18
79.36	77.48	78.49	29.79	0	28.02	0	26.14
78.97	77.86	78.42	29.58	0	27.98	0	26.11
78.29	70.62	74.1	29.37	0	27.98	0	26.11
71.4	69.49	70.29	29.12	0	27.9	0	26
77.84	70.74	74.6	28.87	0	27.86	0	25.96
80.3	77.65	78.52	28.75	0	27.9	0	26
83.2	80.3	81.9	28.71	0	28.06	0	26.11
85.9	82.4	83.8	28.83	0	28.3	0	26.37
89.2	85.1	87	29.03	0	28.63	0	26.67
91.2	87.3	89.1	29.54	0	29.16	0	27.16
92.9	89	90.9	30.35	0.078	29.92	0	27.9
94	90.4	92.1	31.37	0.034	30.74	0	28.71
94	90.9	92.5	32.1	0.012	31.19	0	29.16
94	91.3	92.5	32.43	0.029	31.23	0	29.16

94	90.9	92.5	32.19	0.062	30.7	0	28.67
93.8	89.4	91.6	31.91	0.087	30.17	0	28.14
91.7	89.4	90.3	31.78	0.103	29.83	0	27.82
90.2	85.8	87.7	31.5	0.119	29.37	0	27.39
85.8	83.3	84.7	31.14	0.133	28.95	0	26.97
83.2	81.7	82.5	30.79	0	28.63	0	26.67
81.9	77.65	79.76	30.48	0	28.42	0	26.48
78.26	75.74	77.14	30.22	0	28.26	0	26.33
76.62	71.95	73.28	29.92	0	28.18	0	26.22
75.09	72.17	73.51	29.62	0	28.06	0	26.11
75.23	73.8	74.6	29.41	0	28.06	0	26.11
73.85	71.79	72.86	29.24	0	28.1	0	26.14
73.86	71.66	72.45	29.03	0	28.06	0	26.11
75.7	73.01	74.09	28.87	0	28.06	0	26.11
75.93	71.53	73.27	28.67	0	28.06	0	26.11
79.06	72.88	76.33	28.5	0	28.02	0	26.07
83.5	78.96	81.4	28.42	0	28.14	0	26.18
86.5	82.7	83.8	28.54	0	28.42	0	26.44
86.9	84.2	85.7	28.83	0	28.79	0	26.78
89.1	85	87	29.2	0	29.16	0	27.16
90.4	86.9	88.4	29.75	0.1	29.58	0	27.55
93.2	87.8	89.7	30.17	0.092	29.83	0	27.78
94.5	89.3	92	30.87	0.068	30.35	0	28.3
92.4	88.6	90.3	31.73	0.043	30.92	0	28.87
90.3	87.8	88.8	31.23	0.089	30.17	0	28.14
89.3	87.3	88.2	30.92	0.109	29.62	0	27.59
89	86.8	87.6	30.79	0.119	29.37	0	27.36
87.3	84.4	85.4	30.65	0.126	29.16	0	27.2
84.4	77.69	82	30.43	0	28.91	0	26.93
77.69	75.06	75.99	30.09	0	28.63	0	26.67
76.22	74.91	75.4	29.75	0	28.34	0	26.4
76.84	74.68	75.81	29.54	0	28.26	0	26.33
76.51	72.48	74.5	29.33	0	28.22	0	26.29
76.72	72.95	74.87	29.16	0	28.18	0	26.26
75.34	73.03	74.2	28.95	0	28.18	0	26.26
76.05	74.92	75.5	28.83	0	28.18	0	26.22
76.14	74.87	75.63	28.71	0	28.22	0	26.29
75.05	73.19	73.92	28.58	0	28.22	0	26.29
74.47	73.36	73.86	28.38	0	28.18	0	26.26
77.46	74.01	75.7	28.22	0	28.14	0	26.22
80.6	76.14	77.83	28.18	0	28.22	0	26.33
83.2	79.36	80.7	28.34	0	28.5	0	26.55
83.6	80.2	81.8	28.67	0	28.87	0	26.89
83	81	81.9	28.95	0	29.12	0	27.16
84.2	81.3	82.9	29.16	0	29.16	0	27.24
83.6	77.39	81.4	29.49	0	29.33	0	27.39
77.38	69.12	75.32	29.45	0	29.16	0	27.2

71.88	64.31	67.62	29.08	0	28.63	0	26.7
81.2	71.92	77.07	28.75	0	28.22	0	26.33
79.35	77.46	78.25	29.08	0	28.54	0	26.63
79.68	72.73	75.34	29.16	0	28.58	0	26.7
72.68	70.6	71.38	29.08	0	28.46	0	26.59
72.09	71.51	71.84	28.87	0	28.26	0	26.4
72.66	71.64	72.06	28.75	0	28.22	0	26.37
72.75	68.96	71.18	28.58	0	28.18	0	26.33
70.2	68.64	69.38	28.42	0	28.1	0	26.29
69.47	65.94	67.63	28.26	0	28.1	0	26.26
66.6	64.48	65.42	28.06	0	28.02	0	26.22
65.18	61.44	63.62	27.9	0	27.98	0	26.14
63.83	61.61	62.77	27.71	0	27.9	0	26.11
63.31	59.81	61.24	27.51	0	27.9	0	26.07
62.04	59.42	60.51	27.32	0	27.86	0	26.07
63.43	60.97	61.85	27.16	0	27.86	0	26.07
70.61	62.99	66.38	26.97	0	27.82	0	26.07
73.24	70.61	71.69	26.82	0	27.82	0	26.07
75.07	72.3	73.62	26.93	0	28.06	0	26.29
79.78	74.77	77.16	27.05	0	28.26	0	26.48
80.1	77.84	78.77	27.36	0	28.5	0	26.74
82.4	77.94	80.5	27.67	0	28.75	0	26.97
80.5	73.54	77.56	28.1	0	28.95	0	27.2
75.34	70.37	72.83	27.78	0	28.38	0	26.63
70.91	67.99	69.36	27.75	0	28.18	0	26.44
71.46	67.83	69.46	27.63	0	27.98	0	26.29
77.89	69.71	73.74	27.63	0	27.98	0	26.29
82.2	75.82	80.2	27.67	0	28.06	0	26.37
81.4	77.86	79.79	27.75	0	28.22	0	26.55
77.84	73.5	75.2	27.75	0	28.22	0	26.59
73.45	68.79	71.2	27.59	0	28.1	0	26.44
69.49	64.72	67.53	27.47	0	27.98	0	26.33
68.98	64.64	66.13	27.32	0	27.86	0	26.29
66.45	60.35	63.59	27.16	0	27.82	0	26.22
67.25	64.35	65.6	26.97	0	27.75	0	26.14
65.73	63.15	64.53	26.86	0	27.75	0	26.14
63.23	59.98	61.14	26.7	0	27.71	0	26.14
65.61	61.18	63.68	26.55	0	27.71	0	26.14
64.87	59.19	63.12	26.44	0	27.71	0	26.18
61.62	57.58	59.36	26.29	0	27.67	0	26.14
67.86	61.66	65.8	26.11	0	27.63	0	26.11
72.12	67.86	70.03	26	0	27.63	0	26.14
77	71.66	74.22	26.11	0	27.86	0	26.37
81.1	76.31	78.58	26.37	0	28.14	0	26.67
84.6	79.64	82.3	26.89	0	28.63	0	27.16
87.8	82.8	84.8	27.86	0	29.37	0	27.94
89.1	84.8	86.6	28.5	0	29.58	0	28.18

86.6	78.51	82.9	28.91	0.101	29.54	0	28.1
78.49	71.01	74.36	28.5	0	28.5	0	27.12
73.24	70.75	71.5	28.38	0	28.06	0	26.67
74.61	70.3	73.1	28.38	0	27.9	0	26.55
77.78	72.78	75.27	28.38	0	27.86	0	26.52
77.49	72.18	74.06	28.38	0	27.9	0	26.55
74.91	71.99	73.69	28.26	0	27.9	0	26.55
71.99	69.75	70.47	28.1	0	27.78	0	26.48
71.05	69.97	70.64	27.9	0	27.71	0	26.4
70.76	69.58	69.98	27.78	0	27.71	0	26.4
71.13	68.1	69.76	27.63	0	27.67	0	26.4
68.1	63.95	65.56	27.51	0	27.63	0	26.37
66.27	63.85	65.65	27.32	0	27.59	0	26.29
64.98	63.15	64.23	27.2	0	27.55	0	26.29
64.17	60.58	61.83	27.09	0	27.55	0	26.26
62.2	59.44	60.42	26.89	0	27.47	0	26.22
63.63	59.29	61.92	26.74	0	27.47	0	26.22
69.94	59.21	62.83	26.55	0	27.43	0	26.18
74.19	69.92	70.77	26.37	0	27.36	0	26.14
76.53	73.4	75.06	26.44	0	27.59	0	26.33
80.1	75.64	77.31	26.7	0	27.9	0	26.67
82.9	78.68	80.6	27.12	0	28.26	0	27.05
86.4	81.9	83.8	27.94	0	28.87	0	27.67
89.2	84.3	86.8	28.91	0.082	29.49	0	28.3
89.5	83.6	85.8	29.83	0.076	29.96	0	28.75
85.5	84.1	84.8	29.2	0	28.75	0	27.55
84.8	77.44	81.3	29.28	0	28.38	0	27.2
80.1	77	78.72	29.2	0	28.06	0	26.89
85.1	79.68	83.7	29.12	0	27.9	0	26.74
83.7	79.34	81.3	29.2	0	28.02	0	26.86
79.34	76.92	78.13	29.08	0	27.9	0	26.74
76.92	74.11	75.55	28.91	0	27.78	0	26.63
74.78	73.12	74.12	28.71	0	27.67	0	26.52
74.36	72.57	73.29	28.5	0	27.59	0	26.44
75.37	73.37	74.67	28.34	0	27.59	0	26.44
74.01	70.2	72.68	28.22	0	27.63	0	26.44
70.52	68.22	69.5	28.02	0	27.55	0	26.37
68.73	62.88	65.43	27.82	0	27.51	0	26.33
64.96	63.13	63.79	27.63	0	27.43	0	26.29
64.98	63.22	63.82	27.43	0	27.39	0	26.26
66	62.87	63.92	27.24	0	27.39	0	26.22
72.74	65.97	69.35	27.09	0	27.36	0	26.22
80.1	72.77	77.29	26.89	0	27.36	0	26.22
82.7	79.03	81	27.05	0	27.67	0	26.48
88.3	81	84.2	27.32	0	28.02	0	26.86
92	87.6	89.6	27.98	0	28.67	0	27.55
93.7	89.2	91.5	29.66	0.027	30.22	0	29.08

91.9	88.3	89.3	30.09	0.065	30.26	0	29.12
90.9	88.7	89.7	29.33	0.123	29.03	0	27.9
89.6	87.6	88.5	29.33	0	28.75	0	27.59
89.3	87.2	88.1	29.28	0	28.5	0	27.36
87.7	85	86.6	29.33	0	28.38	0	27.2
87.2	83.3	84.8	29.24	0	28.22	0	27.05
85.3	83.3	84.4	29.16	0	28.1	0	26.93
84.7	80.8	82.7	29.08	0	28.02	0	26.86
81.1	73.13	76.39	28.91	0	27.9	0	26.74
75.95	73.79	75.04	28.67	0	27.75	0	26.59
75.95	72.7	74.5	28.5	0	27.67	0	26.52
74.27	71.05	72.58	28.34	0	27.63	0	26.48
75.7	73.8	74.65	28.18	0	27.59	0	26.4
76.28	74.37	75.06	28.06	0	27.59	0	26.4
76.74	73.98	75.69	27.98	0	27.59	0	26.4
77.02	70.61	72.66	27.82	0	27.59	0	26.4
70.63	63.35	66.49	27.71	0	27.55	0	26.37
66.62	62.41	63.49	27.47	0	27.43	0	26.26
80	66.62	72.67	27.28	0	27.39	0	26.18
83.5	79.92	81.9	27.16	0	27.43	0	26.26
87.1	82.9	84.9	27.39	0	27.82	0	26.63
89	86	87.3	27.78	0	28.3	0	27.12
91.4	87.1	89.1	28.38	0	28.87	0	27.71
93.9	89.8	91.8	29.49	0.058	29.83	0	28.67
95	89.8	92.4	30.61	0.032	30.65	0	29.49
97.2	93.4	95.2	31.46	0.035	31.05	0	29.92
98.1	94.3	96.1	32.1	0.051	31.23	0	30.09
97.3	93.5	95.7	32.43	0.064	31.01	0	29.83
98.3	92.9	95.8	32.33	0.088	30.43	0	29.28
93.6	87.9	91.7	32.33	0.104	30	0	28.83
88	85.6	86.9	31.41	0.138	28.83	0	27.67
87.4	70.56	79.06	30.87	0	28.22	0	27.05
77.39	72.73	75.46	30.35	0	27.71	0	26.52
80.5	77.39	78.77	30.09	0	27.63	0	26.44
81.3	79.78	80.5	29.92	0	27.67	0	26.48
84	81	82.1	29.66	0	27.71	0	26.52
82.1	78.22	80.3	29.37	0	27.71	0	26.52
80	75.98	77.72	29.03	0	27.67	0	26.48
78.55	77.27	77.98	28.75	0	27.63	0	26.4
78.75	77.55	78.19	28.46	0	27.59	0	26.37
78.65	76.84	77.81	28.26	0	27.59	0	26.37
78.17	76.98	77.52	28.02	0	27.59	0	26.33
79.85	77.72	78.47	27.82	0	27.59	0	26.33
85.9	78.99	83	27.63	0	27.55	0	26.29
88.9	84.1	85.4	27.75	0	27.82	0	26.59
91.2	88.4	89.7	27.98	0	28.18	0	26.93
93.5	90	91.6	28.87	0	29.16	0	27.9

92.2	83.6	87.2	29.87	0.054	30.09	0	28.79
92	85.1	87.1	28.91	0	28.83	0	27.51
92.4	85	87.8	28.71	0	28.34	0	27.05
90.7	86	87.9	28.87	0	28.38	0	27.09
87.8	67.98	77.42	29.03	0	28.38	0	27.09
79	68.81	72.5	28.46	0	27.71	0	26.4
79.34	72.46	74.72	28.22	0	27.51	0	26.22
73.04	70.09	72.01	28.06	0	27.59	0	26.26
76.42	69.11	71.82	27.78	0	27.55	0	26.22
73.66	67.45	70.16	27.47	0	27.47	0	26.18
71.68	67.62	69.53	27.24	0	27.47	0	26.18
72.39	68.79	70.62	27.05	0	27.51	0	26.18
72.14	66.88	69.6	26.78	0	27.51	0	26.18
67.91	64.19	65.92	26.52	0	27.43	0	26.14
68.26	66.26	67.29	26.26	0	27.39	0	26.11
69.75	65.2	67.77	26.07	0	27.39	0	26.11
68.65	66.06	67.32	25.85	0	27.39	0	26.07
68.94	63.91	66.33	25.63	0	27.39	0	26.11
67.96	63.79	65.47	25.45	0	27.39	0	26.11
69.04	63.32	66.07	25.23	0	27.32	0	26.07
74.84	69.09	72.13	25.02	0	27.28	0	26.03
81.6	74.88	78.26	25.09	0	27.47	0	26.22
86.4	80.6	84.1	25.38	0	27.82	0	26.59
89.8	85.5	87.5	26.18	0	28.58	0	27.39
91.8	87.5	89.6	27.43	0.086	29.66	0	28.46
91.6	87.7	88.9	28.42	0.097	30.26	0	29.03
88.5	86.6	87.2	27.71	0	28.87	0	27.71
86.8	81.7	84.4	27.47	0	28.1	0	26.93
82.4	80.1	81.2	27.51	0	27.86	0	26.7
83.8	77.51	79.18	27.51	0	27.75	0	26.63
81.2	76.09	77.55	27.47	0	27.67	0	26.55
77.12	75.25	76.19	27.36	0	27.59	0	26.48
83.3	75.62	79.24	27.24	0	27.55	0	26.44
83.4	78.36	80.8	27.12	0	27.55	0	26.44
81	75.14	77.6	27.05	0	27.55	0	26.48
75.32	71.95	74.01	26.86	0	27.51	0	26.44
73.62	71.36	72.38	26.67	0	27.39	0	26.37
74.36	71.88	72.92	26.52	0	27.39	0	26.33
73.21	70.12	71.55	26.4	0	27.36	0	26.33
70.66	69.88	70.2	26.26	0	27.32	0	26.29
70.63	68.6	69.62	26.14	0	27.32	0	26.29
70.44	68.94	69.5	26.03	0	27.28	0	26.26
73.1	70.22	71.89	25.92	0	27.28	0	26.26
74.73	72.99	73.59	25.78	0	27.24	0	26.26
81	74.73	77.84	25.63	0	27.2	0	26.22
81.4	77.49	78.72	25.81	0	27.43	0	26.48
82.4	78.73	80.6	25.96	0	27.59	0	26.63

83.4	81.2	82.2	26.37	0	27.86	0	26.97
86.5	81.7	83.5	26.67	0	27.98	0	27.05
90.7	85.3	87.8	27.43	0	28.5	0	27.63
91.7	88.2	89.6	28.95	0.082	29.79	0	28.91
93.1	89.2	91.4	29.54	0.1	29.83	0	28.99
93.2	88.3	90.7	29.49	0.126	29.16	0	28.34
93.4	89.2	91.5	29.37	0.144	28.5	0	27.67
92.3	88.8	90.9	29.66	0.147	28.34	0	27.51
91.1	84.4	87.5	29.58	0.15	27.98	0	27.16
84.4	80.4	82.9	29.54	0	27.78	0	26.93
80.3	74.34	76.53	29.33	0	27.51	0	26.67
75.27	73.46	74.3	28.99	0	27.28	0	26.44
74.57	72.73	73.61	28.71	0	27.2	0	26.37
74.14	72.37	73.18	28.46	0	27.16	0	26.33
73.75	71.05	72.42	28.22	0	27.12	0	26.29
72.9	70.83	72.32	27.98	0	27.12	0	26.26
74.61	69.32	71.35	27.75	0	27.12	0	26.26
71.18	69.93	70.47	27.51	0	27.09	0	26.22
73.23	70.26	71.81	27.28	0	27.09	0	26.22
76.98	72.94	74.91	27.09	0	27.05	0	26.18
81.4	76.77	78.89	26.89	0	27.09	0	26.18
85	81.4	83	26.74	0	27.09	0	26.26
87.9	84.4	86	26.93	0	27.47	0	26.59
90.1	87.2	88.7	27.39	0	28.02	0	27.16
92	88.7	90.4	28.18	0	28.71	0	27.9
95.1	90.7	92.4	29.2	0.076	29.54	0	28.71
95.7	92.5	94	30.35	0.072	30.26	0	29.41
98	93.8	95.6	31.1	0.087	30.48	0	29.66
98.1	95	96.5	31.5	0.098	30.3	0	29.45
98.1	95.6	96.9	31.41	0.113	29.66	0	28.83
98.5	95.3	96.9	31.55	0.126	29.33	0	28.46
96.9	95.3	96.1	31.59	0.132	28.99	0	28.14
96.5	91.1	94.5	31.37	0.143	28.46	0	27.63
91.1	78.43	85.2	31.01	0.152	27.98	0	27.12
85.5	77.79	83.2	30.61	0	27.59	0	26.67
84.1	82.1	83.1	30.39	0	27.47	0	26.59
83.2	81.7	82.5	30.13	0	27.43	0	26.55
82.4	78.09	80.4	29.87	0	27.39	0	26.52
78.73	77.22	77.84	29.62	0	27.36	0	26.44
79.41	75.88	77.27	29.33	0	27.32	0	26.37
80.2	79.36	79.75	29.08	0	27.28	0	26.33
80.2	76.87	79.12	28.83	0	27.32	0	26.33
77.79	75.28	76.61	28.67	0	27.32	0	26.33
78	74.52	76.29	28.42	0	27.32	0	26.29
80.3	76.23	78.78	28.18	0	27.24	0	26.22
86.6	79.28	82.8	27.98	0	27.24	0	26.22
89.3	85.6	87.3	28.14	0	27.59	0	26.59

91.5	88.3	90	28.63	0	28.22	0	27.2
95.3	90.9	92.9	29.58	0.078	29.16	0	28.14
98.2	92.7	95.7	31.14	0.023	30.57	0	29.49
100.4	95.4	97.6	32.29	0.03	31.32	0	30.26
100.5	97.1	98.9	32.95	0.051	31.5	0	30.39
99.4	95.9	97.9	33	0.082	31.05	0	29.96
97.9	95.4	96.5	32.57	0.105	30.17	0	29.08
97	92.4	94.1	32.47	0.116	29.66	0	28.58
94	91.3	92.7	32.05	0.135	29.08	0	27.94
92.2	87.3	90.4	31.55	0.147	28.54	0	27.39
87.3	84	85.8	31.23	0.152	28.22	0	27.09
84.3	81.3	83.1	30.83	0.156	27.94	0	26.78
81.8	80.8	81.4	30.52	0.158	27.78	0	26.63
81.5	80.6	81	30.26	0	27.71	0	26.55
82.4	81.2	81.7	30	0	27.71	0	26.52
82.3	80.1	81.3	29.79	0	27.67	0	26.48
80.9	79.92	80.5	29.54	0	27.63	0	26.44
81.6	80.5	81	29.33	0	27.63	0	26.4
81.6	80.5	81.1	29.2	0	27.67	0	26.4
81.4	76.67	79.7	29.03	0	27.67	0	26.4
80.8	76.34	78.49	28.87	0	27.67	0	26.4
82.1	79.37	80.9	28.71	0	27.67	0	26.37
86.3	81.1	83.6	28.5	0	27.63	0	26.33
88.7	86.2	87.2	28.71	0	27.94	0	26.63
92.2	88.5	90.2	29.08	0	28.46	0	27.12
93.8	90.7	91.7	29.92	0.079	29.28	0	27.98
98.3	92	94.7	30.57	0.062	29.83	0	28.46
100.5	94.1	96.6	32.29	0.001	31.32	0	29.92
96.4	93.7	94.7	32.43	0.044	31.1	0	29.7
95.2	92.6	93.7	31.46	0.102	29.83	0	28.46
93.3	89.8	91.4	31.14	0.122	29.24	0	27.86
90.9	81.6	87.5	30.79	0.137	28.79	0	27.39
84.9	81.3	83.5	30.57	0.144	28.5	0	27.09
85	82.6	83.5	30.26	0.153	28.22	0	26.82
85.1	82.2	83.5	30.13	0.153	28.14	0	26.74
84.3	82.8	83.4	29.96	0.153	28.06	0	26.67
84.8	83.3	84.1	29.79	0	28.06	0	26.63
83.8	77.36	79.66	29.58	0	27.98	0	26.55
79.38	77.52	78.43	29.33	0	27.9	0	26.48
81.8	78.77	80.4	29.12	0	27.82	0	26.4
81.3	76.23	78.19	28.99	0	27.9	0	26.44
76.35	73.52	74.69	28.83	0	27.86	0	26.4
76.05	72.26	74.33	28.63	0	27.78	0	26.33
72.71	71.2	71.63	28.46	0	27.75	0	26.29
73.48	72.56	72.98	28.3	0	27.75	0	26.26
76.66	73.46	75.33	28.1	0	27.71	0	26.22
81.5	76.66	78.8	27.94	0	27.71	0	26.22

84.7	80.9	82.6	28.06	0	27.94	0	26.44
89.3	84.2	86.7	28.38	0	28.34	0	26.82
90.6	87.8	89.1	29.03	0.107	28.99	0	27.51
92.3	88.3	90	30	0.067	29.92	0	28.38
94.6	90.3	92.2	30.7	0.048	30.39	0	28.87
95.6	89.9	92.7	32.24	0.007	31.64	0	30.09
90.6	81.1	84.8	31.14	0.101	30.13	0	28.58
82	72	75.53	29.83	0.15	28.46	0	26.97
77.74	73.39	75.92	29.54	0	27.98	0	26.48
80.2	72.89	75.37	29.54	0	27.94	0	26.48
75.27	72.38	73.49	29.41	0	27.94	0	26.44
75.1	71.46	72.77	29.28	0	27.86	0	26.37
75.3	71.3	73.85	28.95	0	27.75	0	26.26
76.2	73.53	74.6	28.83	0	27.78	0	26.29
74.91	73.12	73.99	28.71	0	27.82	0	26.33
76.77	74.07	75.73	28.54	0	27.82	0	26.33
76.14	67.74	73.37	28.42	0	27.82	0	26.33
67.66	63.95	64.51	28.22	0	27.78	0	26.29
64.25	63.29	63.82	27.94	0	27.67	0	26.18
63.77	61.84	62.76	27.75	0	27.63	0	26.11
65.24	61.92	63.33	27.55	0	27.59	0	26.07
64.93	61.77	63.09	27.36	0	27.55	0	26.07
69.23	64.39	66.61	27.09	0	27.55	0	26.03
71.71	68.75	71.02	26.86	0	27.51	0	26
75.86	70.87	72.85	26.86	0	27.71	0	26.18
81.8	75.7	78.38	26.97	0	27.94	0	26.44
84.2	80.9	82.5	27.39	0	28.42	0	26.93
87.2	82.7	84.9	28.5	0.095	29.45	0	27.94
90.4	85.6	87.6	29.87	0.053	30.61	0	29.08
90.6	86.1	88.4	30.79	0.061	31.14	0	29.62
91.7	86.5	89.1	30.74	0.093	30.65	0	29.16
88	81.4	85.5	30.3	0.128	29.79	0	28.3
81.4	68.62	71.74	29.37	0.157	28.46	0	27.01
75.12	70.19	72.99	28.95	0	27.78	0	26.33
75.42	73.57	74.52	28.91	0	27.78	0	26.33
76.14	72.17	73.9	28.79	0	27.75	0	26.33
73.68	72.32	72.81	28.54	0	27.75	0	26.29
77.31	70.33	72.6	28.26	0	27.71	0	26.26
70.37	69.2	69.9	27.98	0	27.67	0	26.26
70.07	66.51	67.55	27.71	0	27.63	0	26.22
68.82	66.39	67.51	27.43	0	27.63	0	26.22
68.91	65.18	66.79	27.24	0	27.59	0	26.18
66.24	64.19	65.32	27.05	0	27.59	0	26.18
66.29	64.9	65.44	26.82	0	27.55	0	26.14
67.11	64.53	66.4	26.63	0	27.55	0	26.14
64.74	63.81	64.18	26.48	0	27.55	0	26.18
70.8	63.78	66.25	26.26	0	27.51	0	26.11

73.48	69.44	71.39	26.07	0	27.43	0	26.07
78.05	72.59	74.9	26.14	0	27.67	0	26.29
81.9	77.29	79.19	26.33	0	27.9	0	26.55
84.7	79.85	82.1	26.82	0	28.38	0	27.01
85.9	82.5	84.2	27.86	0.109	29.28	0	27.9
83.7	76.28	81.5	28.95	0.109	30.05	0	28.71
78.48	74.48	76.72	27.75	0	28.26	0	26.93
81.9	74.03	78.58	27.55	0	27.75	0	26.4
84.2	80.7	82.1	27.82	0	27.94	0	26.63
82.6	80.6	81.4	28.06	0	28.14	0	26.86
81.3	78.75	79.84	28.1	0	28.1	0	26.82
80.6	78.61	79.62	28.02	0	27.98	0	26.7
80.5	77.99	78.89	28.02	0	27.94	0	26.67
78.31	75.94	76.97	27.9	0	27.86	0	26.59
76.04	74.34	75.2	27.78	0	27.75	0	26.52
75.35	73.64	74.37	27.63	0	27.71	0	26.44
73.93	62.83	66.74	27.47	0	27.63	0	26.4
65.02	62.66	63.8	27.28	0	27.51	0	26.33
64.49	62.94	63.92	27.05	0	27.43	0	26.22
63.95	63.01	63.29	26.89	0	27.43	0	26.22
63.95	62.42	63.47	26.74	0	27.39	0	26.22
62.78	60.87	62	26.55	0	27.39	0	26.18
61.77	59.67	60.81	26.4	0	27.36	0	26.14
66.98	61.34	64.38	26.22	0	27.32	0	26.11
72.16	66.94	69.35	26	0	27.24	0	26.07
75.85	70.36	73.46	26.07	0	27.47	0	26.29
78.88	75.21	76.66	26.44	0	27.94	0	26.78
81.1	75.6	77.9	26.86	0	28.3	0	27.2
83.2	78.27	80.7	27.67	0.121	28.95	0	27.82
79.39	73.36	75.33	28.26	0.126	29.2	0	28.1
76.23	72.84	75.06	27.55	0	27.98	0	26.86
76.4	75.14	75.71	27.59	0	27.78	0	26.7
78.73	75.56	76.82	27.67	0	27.75	0	26.63
78.71	77.74	78.26	27.75	0	27.78	0	26.74
80.6	78.27	79.23	27.78	0	27.82	0	26.78
79.95	75.02	77.66	27.82	0	27.82	0	26.78
74.99	72.49	73.35	27.75	0	27.75	0	26.7
74	72.81	73.36	27.59	0	27.59	0	26.52
74.25	73.84	74.08	27.43	0	27.51	0	26.44
74.55	70.55	73.46	27.32	0	27.47	0	26.44
72.89	69.13	70.58	27.2	0	27.43	0	26.4
73.03	69.24	71.45	27.05	0	27.39	0	26.37
73.19	72.59	72.99	26.93	0	27.39	0	26.37
73.12	71.62	72.43	26.86	0	27.39	0	26.37
71.57	68.05	69.72	26.74	0	27.39	0	26.37
70.92	63.09	67.73	26.67	0	27.39	0	26.37
63.13	61.44	62.01	26.52	0	27.28	0	26.29

63.85	62.38	63.35	26.33	0	27.2	0	26.22
62.57	62.03	62.35	26.18	0	27.2	0	26.22
63.03	62.04	62.44	26	0	27.16	0	26.18
66.82	62.63	64.65	25.7	0	27.05	0	26.07
71.51	66.86	69.09	25.59	0	27.12	0	26.14
75.74	71.51	73.61	25.7	0	27.39	0	26.48
77.53	75	76.1	26.33	0	28.14	0	27.24
81.3	77.01	78.71	26.7	0.142	28.5	0	27.55
82.3	79.36	80.9	27.32	0.152	28.91	0	28.02
83.6	79.76	81.7	27.36	0.173	28.63	0	27.75
83.5	79.31	81.3	27.43	0.183	28.26	0	27.39
82.8	73.16	77.73	27.43	0.184	27.94	0	27.09
74.75	66.63	70.07	27.32	0.18	27.59	0	26.7
67.97	66.67	67.41	27.12	0	27.32	0	26.44
68.12	67.03	67.54	26.93	0	27.2	0	26.29
68.03	67.66	67.92	26.74	0	27.16	0	26.29
67.95	64.74	66.62	26.55	0	27.16	0	26.29
66.76	64.72	65.45	26.33	0	27.09	0	26.22
66.74	64.25	65.89	26.14	0	27.09	0	26.22
65.14	63.69	64.43	25.96	0	27.05	0	26.22
65.71	64.55	65.18	25.74	0	27.05	0	26.22
66.37	65.27	65.88	25.59	0	27.05	0	26.22
65.96	63.37	64.17	25.45	0	27.09	0	26.26
64.05	63.37	63.67	25.27	0	27.05	0	26.26
65.04	63.77	64.33	25.13	0	27.05	0	26.22
66.76	64.92	65.77	24.98	0	26.97	0	26.22
72.19	66.59	68.64	24.91	0	27.05	0	26.26
76.96	71.75	74.13	25.31	0	27.55	0	26.78
80.1	75.23	77.09	26.22	0.154	28.5	0	27.78
82.8	77.71	79.93	27.55	0.181	29.7	0	28.99
82.8	78.09	80.5	28.3	0.197	30	0	29.33
81.8	74.58	78.85	28.18	0.2	29.28	0	28.63
83.5	78.62	80.9	27.75	0.2	28.26	0	27.59
82.4	78.6	80	28.1	0.2	28.06	0	27.43
80.6	76.5	78.73	28.26	0.197	27.71	0	27.05
76.79	75.86	76.25	28.34	0.189	27.47	0	26.82
76.91	75.27	76.35	28.3	0.186	27.28	0	26.63
75.27	71.78	73.35	28.22	0.179	27.24	0	26.55
75.12	71.49	73.46	28.02	0	27.12	0	26.48
71.79	68.09	69.56	27.78	0	27.05	0	26.4
68.07	67.59	67.75	27.55	0	26.97	0	26.33
68.01	66.12	67.31	27.32	0	26.93	0	26.26
66.76	64.78	65.36	27.09	0	26.89	0	26.22
66.26	64.33	65.69	26.82	0	26.86	0	26.18
65.75	63.41	64.13	26.63	0	26.82	0	26.18
64.18	63.34	63.75	26.4	0	26.82	0	26.14
67.03	62.1	64.7	26.18	0	26.78	0	26.14

65.85	60.91	62.48	26	0	26.78	0	26.11
71.98	61.88	67.36	25.78	0	26.74	0	26.11
75.9	72.03	74.09	25.63	0	26.82	0	26.18
78.68	75.04	76.89	26	0	27.39	0	26.74
80.7	76.4	77.92	26.48	0.154	27.98	0	27.36
81.8	75.99	79.24	27.01	0.168	28.46	0	27.82
80.4	75.33	77.82	27.16	0.183	28.38	0	27.78
77.92	72.96	75.23	26.82	0.186	27.71	0	27.09
80.1	71.71	75.52	26.59	0	27.24	0	26.63
74.66	72.26	73.67	26.74	0	27.28	0	26.63
75.64	73.37	74.89	26.78	0	27.2	0	26.59
75.89	74.88	75.41	26.82	0	27.24	0	26.63
76.98	74.46	75.59	26.97	0.174	27.36	0	26.7
75.33	70.44	72.51	27.01	0.175	27.32	0	26.67
70.44	67.17	68.77	26.89	0	27.09	0	26.44
67.17	65.22	66.28	26.7	0	26.89	0	26.26
67.09	64.3	65.66	26.55	0	26.82	0	26.18
64.9	63.21	64.06	26.4	0	26.78	0	26.14
63.45	61.91	62.25	26.22	0	26.74	0	26.11
62.78	62.17	62.57	26.03	0	26.74	0	26.11
63.53	62.24	62.67	25.89	0	26.74	0	26.14
63.69	63.09	63.41	25.78	0	26.74	0	26.14
63.65	62.93	63.26	25.67	0	26.78	0	26.14
63.45	60.51	62.32	25.52	0	26.78	0	26.14
61.77	60.24	61.15	25.38	0	26.74	0	26.11
61.48	61.04	61.25	25.27	0	26.74	0	26.14
62.95	61.16	61.71	25.16	0	26.74	0	26.14
66.02	62.52	64.11	25.02	0	26.74	0	26.14
68.56	65.59	66.87	25.27	0	27.05	0	26.44
74.09	68.08	70.33	25.63	0	27.43	0	26.86
78.3	72.74	74.25	25.96	0.168	27.63	0	27.05
81.1	76.45	78.36	26.52	0.185	27.98	0	27.47
79.71	76.35	77.48	27.24	0.205	28.38	0	27.9
83.9	77.71	80.2	26.93	0.204	27.59	0	27.09
85.3	81.7	83.3	27.9	0.216	28.18	0	27.71
85.7	81.1	83.8	28.38	0.221	28.3	0	27.82
85.7	80.7	82.4	28.46	0.22	27.94	0	27.47
81.2	79.78	80.3	28.26	0.207	27.36	0	26.89
79.78	63.96	73.02	28.22	0.198	27.16	0	26.67
66.76	63.69	65.41	27.71	0.189	26.67	0	26.14
67.3	65.82	66.43	27.12	0	26.55	0	26.03
68.35	65.91	66.93	26.63	0	26.55	0	26.03
69.13	65.84	67.45	26.26	0	26.55	0	26.03
67.16	64.65	65.4	25.89	0	26.52	0	26
66.78	64.55	65.34	25.59	0	26.52	0	26.03
64.69	63.79	64.18	25.34	0	26.55	0	26
64.17	61.85	63.22	25.09	0	26.55	0	26

61.81	59.4	60.52	24.84	0	26.52	0	26
62.1	59.22	60.56	24.6	0	26.48	0	25.96
70.55	60.92	65.04	24.35	0	26.48	0	25.96
77.63	70.59	74.55	24.18	0	26.52	0	26.03
79.36	76.85	78.19	24.53	0	27.12	0	26.63
80.6	77.76	79.35	24.88	0.194	27.55	0	27.09
83.3	79.91	81.3	25.52	0.219	28.1	0	27.67
84.2	80.4	82.2	26.67	0.234	28.99	0	28.58
86.9	81.5	84.3	27.05	0.234	28.91	0	28.54
87.4	83.2	84.8	27.67	0.237	29.12	0	28.75
90	84.5	85.9	27.2	0.238	28.14	0	27.78
90.6	88.4	89.5	27.63	0.241	28.26	0	27.9
90.3	86.6	88.8	28.42	0.244	28.87	0	28.5
89	83.1	87.1	28.14	0.241	28.3	0	27.94
83.1	80.5	81.7	27.43	0.233	27.43	0	27.05
80.6	76.55	77.99	26.93	0.216	26.86	0	26.44
76.79	73.21	74.92	26.63	0.204	26.63	0	26.26
73.71	72.58	73.04	26.33	0.199	26.55	0	26.14
73.48	71.88	72.51	26.07	0.194	26.52	0	26.11
73.75	72.01	72.76	25.81	0.189	26.52	0	26.11
73.59	70.94	72.01	25.59	0.187	26.52	0	26.11
73.12	70.14	71.12	25.38	0.184	26.52	0	26.11
73.53	70.55	72.18	25.2	0	26.48	0	26.11
70.85	67.66	69.75	24.98	0	26.48	0	26.11
67.6	63.85	65.12	24.77	0	26.44	0	26.03
64.69	62.91	63.81	24.49	0	26.37	0	25.92
73.49	63.91	68.9	24.29	0	26.33	0	25.89
81.4	73.54	78.59	24.18	0	26.44	0	26.03
82.2	79.57	81.1	24.6	0.185	27.09	0	26.7
84.6	81.4	83	24.98	0.202	27.55	0	27.2
85.9	82	83.3	25.34	0.215	27.71	0	27.39
87.9	82.8	84.8	25.59	0.218	27.67	0	27.36
91.2	84.4	87.3	26.11	0.226	27.98	0	27.67
91.3	87.6	89.9	27.71	0.222	29.45	0	29.2
91.6	89.4	90.3	29.28	0.203	30.7	0	30.48
91.4	87.6	89.9	29.08	0.211	29.87	0	29.66
90.7	88.4	89.4	28.79	0.227	28.99	0	28.79
89	86.5	87.8	28.46	0.232	28.26	0	28.02
86.7	82.7	84.8	27.82	0.226	27.43	0	27.16
82.7	79.24	80.8	27.39	0.214	26.89	0	26.59
79.86	75.34	79.07	27.05	0.205	26.59	0	26.29
79.38	72.79	76.32	26.78	0.2	26.48	0	26.18
77.29	72.16	73.51	26.52	0.196	26.4	0	26.11
73.84	70.66	72.15	26.22	0.192	26.33	0	26.03
75.4	69.94	72.01	26	0.191	26.29	0	26
75.44	68.14	70.21	25.74	0.186	26.29	0	26
68.28	67.15	67.73	25.49	0.186	26.26	0	25.92

67.67	65.83	66.93	25.23	0.183	26.22	0	25.89
67.2	62.47	64.58	25.02	0.182	26.22	0	25.89
68.05	64.57	66.34	24.77	0.182	26.18	0	25.85
75.51	65.52	71.22	24.6	0.18	26.18	0	25.85
79.91	75.53	77.91	24.49	0.183	26.29	0	25.96
84.6	79.56	82.1	24.84	0.176	26.86	0	26.52
84.7	81.8	83.2	25.45	0.179	27.51	0	27.24
87.5	83.1	85.1	26.33	0.195	28.26	0	28.02
87.7	84.8	86.3	27.39	0.206	29.03	0	28.79
90	86.1	87.6	28.75	0.201	29.96	0	29.75
89.7	86.7	88	29.7	0.192	30.35	0	30.17
90	85.9	88	29.96	0.202	30.05	0	29.87
89.5	86.1	87.8	29.7	0.211	29.24	0	29.03
87.5	83.5	86.3	29.45	0.225	28.58	0	28.38
84.4	76.91	79.71	28.95	0.224	27.75	0	27.55
81.6	77.39	78.9	28.06	0.213	26.74	0	26.48
77.85	74.04	76.1	27.9	0.208	26.59	0	26.33
75	72.97	73.87	27.59	0.204	26.44	0	26.14
73.26	71.03	72.01	27.32	0.199	26.37	0	26.07
72.16	70.84	71.48	27.05	0.199	26.29	0	26
71.86	69.94	71.27	26.78	0.196	26.26	0	25.92
70.5	69.17	69.81	26.59	0.194	26.26	0	25.92
69.71	67.99	68.88	26.37	0.193	26.26	0	25.89
68.93	66.6	67.91	26.14	0.192	26.18	0	25.85
68.66	65.57	66.83	25.92	0.191	26.18	0	25.81
66.38	63.44	64.29	25.67	0.191	26.14	0	25.78
67.76	65	66.1	25.45	0.191	26.11	0	25.74
72.28	65.32	68.82	25.27	0.19	26.11	0	25.74
74.88	72.26	73.57	25.13	0.192	26.18	0	25.81
78.29	74.6	76.27	25.38	0.183	26.63	0	26.26
80.1	75.32	77.26	25.89	0.18	27.2	0	26.82
82.7	76.09	79.23	26.37	0.192	27.55	0	27.2
85.3	79.33	82.5	27.36	0.208	28.3	0	27.94
82.4	80.3	81.2	28.42	0.221	28.95	0	28.63
85.6	79.7	82	27.55	0.222	27.59	0	27.24
87.9	84	86.3	28.14	0.23	27.94	0	27.59
88.3	85.6	86.8	28.87	0.232	28.38	0	28.06
88	83.5	85.9	29.24	0.232	28.38	0	28.06
86.4	80.9	82.4	28.95	0.231	27.78	0	27.43
81	73.01	77.58	28.38	0.222	27.05	0	26.67
72.99	69.66	71.3	27.94	0.213	26.63	0	26.18
72.54	69.45	71.14	27.59	0.209	26.33	0	25.89
69.56	67.49	68.54	27.36	0.208	26.33	0	25.92
69.69	65.67	67.45	27.12	0.204	26.29	0	25.85
67.53	65.86	66.56	26.89	0.2	26.29	0	25.81
68.71	66.18	67.62	26.63	0.199	26.22	0	25.78
67.61	66.1	67.05	26.44	0.2	26.26	0	25.78

68.86	66.8	67.98	26.26	0.199	26.29	0	25.81
67.09	64.8	65.94	26.11	0.197	26.29	0	25.81
66.52	63.29	64.91	25.89	0.197	26.26	0	25.74
65.79	63.41	64.31	25.67	0.195	26.22	0	25.7
67.93	63.58	66.02	25.45	0.194	26.18	0	25.63
73.45	67.95	70.61	25.27	0.198	26.22	0	25.67
75.69	73.29	74.34	25.56	0.187	26.67	0	26.14
78.65	74.79	76.78	26.11	0.18	27.32	0	26.82
80.3	76.93	78.55	26.97	0.19	28.14	0	27.67
81.3	74.37	78.04	27.55	0.207	28.5	0	28.02
80.1	72.84	77.34	26.82	0.214	27.39	0	26.89
80.9	69.21	76.02	26.86	0.215	27.24	0	26.7
86	78.48	83.4	26.89	0.216	27.09	0	26.55
87.4	84.1	85.7	28.26	0.228	28.34	0	27.86
87	83.9	84.9	28.63	0.234	28.38	0	27.9
86.1	83	84.1	28.3	0.237	27.75	0	27.24
83	78.95	81.2	27.98	0.226	27.16	0	26.67
78.97	76.69	77.55	27.67	0.219	26.78	0	26.26
76.93	72.45	75.61	27.36	0.214	26.52	0	26
73.74	71.73	72.68	27.12	0.21	26.4	0	25.85
73.73	71.09	72.35	26.89	0.207	26.37	0	25.78
72.74	71.84	72.27	26.67	0.205	26.33	0	25.74
72.06	71.18	71.74	26.48	0.205	26.29	0	25.74
72.14	70.89	71.56	26.29	0.2	26.29	0	25.74
71.57	70.29	70.95	26.11	0.201	26.29	0	25.74
70.79	69.42	70.13	25.96	0.2	26.29	0	25.74
69.46	67.61	68.56	25.74	0.198	26.29	0	25.7
69.13	67.95	68.58	25.59	0.198	26.26	0	25.67
73.86	68.47	70.52	25.41	0.194	26.26	0	25.63
77.2	73.86	75.37	25.27	0.2	26.29	0	25.7
80	77.06	78.36	25.67	0.188	26.86	0	26.26
83	78.84	81.2	26.29	0.186	27.59	0	27.01
85.1	82.3	83.7	27.2	0.196	28.38	0	27.82
87.4	83.3	85	27.98	0.207	28.87	0	28.34
87.8	82.5	85.3	29.24	0.201	29.7	0	29.16
87.7	83.9	85.5	29.03	0.21	28.91	0	28.38
89	84.4	87.2	29.03	0.22	28.42	0	27.86
89.3	85.1	86.8	29.62	0.221	28.67	0	28.1
86.7	81.8	83.4	29.24	0.225	27.94	0	27.39
83.2	80.9	81.9	28.63	0.222	27.12	0	26.55
81.7	79.33	80.7	28.5	0.219	26.93	0	26.37
80.8	73.27	76.45	28.34	0.212	26.82	0	26.22
73.78	71.99	72.61	27.94	0.21	26.52	0	25.92
73.89	68.92	71.43	27.67	0.21	26.4	0	25.78
73.53	66.78	70.83	27.39	0.208	26.33	0	25.7
69.54	66.68	68.36	27.12	0.204	26.26	0	25.63
69.3	65.83	67.31	26.89	0.205	26.26	0	25.63

69.36	64.45	66.68	26.67	0.203	26.26	0	25.59
66.87	64.61	65.54	26.4	0.202	26.22	0	25.59
66.59	62.83	64.46	26.18	0.201	26.22	0	25.56
64.59	61.18	62.8	25.96	0.2	26.22	0	25.52
65.37	61.34	63.46	25.74	0.198	26.22	0	25.52
70.24	64.35	66.47	25.52	0.198	26.18	0	25.49
79.15	70.33	75.37	25.31	0.2	26.18	0	25.49
81	74.55	78.08	25.45	0.192	26.52	0	25.81
82.5	80.2	81.4	25.92	0.176	27.09	0	26.4
85.6	80.4	83.1	26.82	0.166	27.94	0	27.28
88.4	84.5	86.6	28.06	0.174	28.95	0	28.3
90	86.8	88.7	28.87	0.192	29.33	0	28.67
92.5	87.5	89.7	29.83	0.198	29.7	0	29.03
92.3	89.1	90.2	30.26	0.201	29.54	0	28.87
91	88.9	90	30.61	0.205	29.24	0	28.58
91	89	89.9	30.57	0.216	28.75	0	28.1
90.9	87	88.9	30.26	0.218	28.1	0	27.47
87.8	83.7	85.5	29.7	0.217	27.39	0	26.7
83.6	69.9	74.5	29.2	0.217	26.86	0	26.14
69.87	68.2	69.02	28.79	0.214	26.52	0	25.81
73.89	67.93	70.21	28.46	0.214	26.37	0	25.67
70.27	67.57	68.82	28.18	0.213	26.37	0	25.63
71.54	66.98	69.88	27.9	0.208	26.33	0	25.59
68.44	65.02	66.75	27.63	0.207	26.33	0	25.59
65.84	63.7	64.69	27.32	0.203	26.33	0	25.56
65.08	59.56	63.23	27.05	0.203	26.29	0	25.52
62.65	56.52	58.3	26.78	0.203	26.26	0	25.49
65.38	57.99	61.62	26.52	0.202	26.26	0	25.45
61.04	55.23	58.64	26.26	0.203	26.26	0	25.45
66.84	55.22	60.75	25.96	0.201	26.22	0	25.41
72.95	66.88	70.29	25.7	0.204	26.22	0	25.38
76.75	72.11	74.16	25.78	0.195	26.52	0	25.67
79.54	75.33	77.65	26.11	0.182	27.01	0	26.14
84.3	78.52	81.5	27.09	0.16	27.98	0	27.12
87.1	83.6	85.2	27.86	0.145	28.54	0	27.71
90.4	85.9	88.3	28.99	0.155	29.28	0	28.46
91.6	88.3	90	29.96	0.166	29.75	0	28.91
92.5	89.5	91	30.79	0.179	29.96	0	29.12
92	89	90.8	29.96	0.196	28.58	0	27.75
91.7	89.9	90.7	30.13	0.203	28.3	0	27.47
91.1	89.3	90	30.09	0.207	27.9	0	27.05
89.5	83.3	87.5	29.79	0.208	27.39	0	26.55
83.3	71.73	75.88	29.49	0.211	27.05	0	26.18
73.81	71.37	72.52	29.08	0.212	26.7	0	25.81
72.74	71.79	72.3	28.79	0.21	26.59	0	25.67
75.26	72.52	73.51	28.5	0.209	26.55	0	25.67
76.02	71	73.73	28.26	0.208	26.55	0	25.67

75.67	70.46	74.27	28.02	0.206	26.59	0	25.67
76.07	73.96	75.02	27.82	0.204	26.59	0	25.67
77.03	74.64	75.5	27.63	0.202	26.63	0	25.67
78.25	74.34	76.75	27.43	0.202	26.63	0	25.67
78.15	76.44	77.52	27.28	0.199	26.63	0	25.67
78.12	77.2	77.66	27.12	0.197	26.67	0	25.7
80.2	75.37	78.25	26.93	0.198	26.67	0	25.67
81.8	80.2	80.8	26.82	0.201	26.7	0	25.7
86.3	81.7	83.7	27.01	0.186	27.05	0	26.07
87.4	84.7	86.3	27.55	0.166	27.67	0	26.67
90.4	86.7	88.1	28.42	0.14	28.54	0	27.55
91.5	88.4	89.8	29.75	0.116	29.7	0	28.71
93.5	87.8	90.6	31.05	0.121	30.74	0	29.75
93.7	88.8	91.2	31.5	0.145	30.83	0	29.79
91.6	85.8	89.1	31.23	0.174	30.13	0	29.12
85.8	70.46	78.93	29.96	0.197	28.46	0	27.47
80.6	77.27	78.92	28.71	0.212	27.09	0	26.03
79.55	75.52	77.35	28.58	0.212	27.01	0	25.96
78.17	74.89	76.25	28.42	0.208	26.97	0	25.92
75.44	70.01	72.64	28.18	0.208	26.86	0	25.81
77.15	71.46	74.97	27.94	0.207	26.78	0	25.7
77.34	74.93	76.34	27.71	0.205	26.78	0	25.74
76.25	71.98	75.11	27.55	0.204	26.86	0	25.78
73.9	68.22	70.21	27.36	0.202	26.82	0	25.74
70.99	67.32	68.94	27.09	0.202	26.7	0	25.63
72.91	69.3	70.27	26.89	0.202	26.7	0	25.59
73.72	69.37	71.75	26.74	0.198	26.74	0	25.67
69.39	62.85	66.88	26.55	0.198	26.74	0	25.63
62.93	59.9	61.16	26.37	0.202	26.67	0	25.56
62.28	59.59	60.9	26.18	0.199	26.63	0	25.52
70.33	60.87	64.22	25.96	0.199	26.59	0	25.49
77.75	70.42	75.85	25.74	0.199	26.59	0	25.45
82.8	76.75	79.23	25.92	0.191	26.89	0	25.78
84	79.98	81.5	26.26	0.179	27.36	0	26.26
88.6	84.1	86.4	26.55	0.175	27.59	0	26.48
91.7	85	88.1	27.67	0.155	28.58	0	27.47
87.5	82.1	84	28.06	0.169	28.63	0	27.51
84.3	73.88	77.87	27.55	0.192	27.67	0	26.55
79.83	76.19	78.14	27.51	0.196	27.36	0	26.29
78.66	77.06	77.84	27.71	0.195	27.39	0	26.29
77.2	75.98	76.75	27.71	0.199	27.2	0	26.14
75.98	73.43	74.66	27.59	0.202	27.05	0	25.96
76.79	75.53	76.18	27.55	0.202	27.01	0	25.92
75.81	74.36	74.84	27.51	0.197	27.01	0	25.96
74.43	70.4	72.85	27.39	0.199	26.93	0	25.89
72.79	67.84	70.6	27.16	0.198	26.86	0	25.78
72.77	68.6	69.84	26.97	0.199	26.78	0	25.7

68.98	65.91	66.91	26.78	0.201	26.7	0	25.67
67.32	63.25	65.12	26.59	0.199	26.67	0	25.63
64.67	61.45	62.44	26.4	0.199	26.67	0	25.59
64.63	60.09	62.6	26.22	0.198	26.59	0	25.56
62.2	58.87	60.5	26.03	0.196	26.59	0	25.56
62.99	59.58	60.85	25.89	0.197	26.59	0	25.56
62.29	58.21	59.92	25.7	0.196	26.59	0	25.52
71.55	62.35	66.42	25.52	0.195	26.55	0	25.52
75.08	71.55	73.26	25.38	0.199	26.55	0	25.52
75.21	72.98	74.08	25.49	0.188	26.82	0	25.81
79.27	74.49	76.51	25.81	0.178	27.2	0	26.18
83.6	78.73	80.8	26.52	0.157	27.9	0	26.89
86.7	82.3	84.6	27.75	0.13	28.99	0	27.98
88	74.73	83.7	29.08	0.133	29.96	0	28.95
76.35	59.36	66.07	27.63	0.19	27.86	0	26.89
70.31	67.1	68.49	26.55	0.208	26.55	0	25.56
72.38	68.1	70.46	26.18	0.206	26.48	0	25.52
69.75	64.01	66.27	25.96	0.201	26.59	0	25.63
68.15	63.3	65.3	25.63	0.199	26.52	0	25.56
70.35	67.73	69.19	25.34	0.201	26.52	0	25.56
70.32	65.8	66.91	25.16	0.196	26.59	0	25.63
68.53	64.75	66.42	24.88	0.197	26.55	0	25.59
66.41	63.85	65.03	24.67	0.195	26.52	0	25.59
65.85	64.19	65.04	24.42	0.193	26.52	0	25.59
66.51	65.12	65.9	24.25	0.194	26.48	0	25.59
66.59	64.89	65.82	24.11	0.193	26.52	0	25.63
65.4	63.71	64.7	23.94	0.193	26.52	0	25.63
65.48	62.75	63.65	23.77	0.189	26.48	0	25.59
63.99	61.63	63.05	23.64	0.191	26.44	0	25.59
62.97	61.25	62.09	23.47	0.19	26.44	0	25.56
62.93	60.42	61.65	23.3	0.191	26.4	0	25.56
65.8	61.63	63.78	23.14	0.19	26.37	0	25.56
69.88	65.72	67.17	22.91	0.191	26.29	0	25.49
71.52	66.32	68.24	22.91	0.189	26.37	0	25.56
70.98	68.3	69.67	22.97	0.188	26.48	0	25.7
74.85	71.03	72.67	23.17	0.182	26.63	0	25.89
76.09	74.12	75.21	23.64	0.175	27.01	0	26.29
81	75.81	78.47	24.04	0.178	27.16	0	26.48
79.49	76.13	77.61	25.06	0.182	27.94	0	27.28
77.81	75.95	76.78	24.67	0.201	27.01	0	26.37
76.72	72.72	75.42	24.7	0.203	26.7	0	26.07
73.43	64.57	66.36	24.74	0.202	26.55	0	25.96
67.26	64.8	65.68	24.6	0.202	26.33	0	25.74
71.43	64.33	67.03	24.46	0.2	26.29	0	25.7
64.9	63.53	64.07	24.25	0.196	26.26	0	25.7
65.93	63.73	65.05	24.04	0.196	26.18	0	25.63
66.34	65.5	65.99	23.84	0.195	26.14	0	25.63

66.18	63.39	64.41	23.67	0.193	26.11	0	25.63
64.35	62.36	63.86	23.47	0.192	26.07	0	25.59
64.19	62.24	63.3	23.3	0.193	26.03	0	25.59
64.75	63.47	64.08	23.17	0.191	26.03	0	25.59
63.95	62.88	63.29	23	0.191	26.03	0	25.59
62.92	58.39	59.88	22.84	0.191	26	0	25.56
61.71	58.92	60.33	22.68	0.191	25.92	0	25.52
60.71	57.31	58.72	22.51	0.19	25.89	0	25.52
63.24	59.2	61.54	22.35	0.191	25.85	0	25.49
65.4	62.67	64.03	22.16	0.194	25.78	0	25.45
71.37	64.98	68.51	22.16	0.191	25.89	0	25.56
76.37	71.41	73.95	22.51	0.178	26.29	0	26.03
79.88	75.6	77.79	23.27	0.163	27.09	0	26.86
81.9	78.89	80.3	24.46	0.175	28.18	0	28.02
83.4	80.1	81.7	25.49	0.203	28.87	0	28.79
83.1	77.98	79.91	25.34	0.218	28.06	0	27.94
84.6	80.4	82.6	24.74	0.215	26.78	0	26.67
85.9	81	83.7	25.45	0.22	27.16	0	27.09
85.5	82.3	83.8	25.89	0.222	27.24	0	27.16
82	77.86	79.01	25.92	0.221	26.86	0	26.82
77.93	66.08	72.69	25.56	0.212	26.22	0	26.14
67.28	60.99	64.96	25.31	0.209	25.89	0	25.81
67.18	60.57	63.82	25.02	0.209	25.67	0	25.59
66.47	63.47	65.01	24.74	0.206	25.56	0	25.49
67.01	63.19	64.92	24.49	0.202	25.56	0	25.52
68.6	64.47	66.03	24.29	0.203	25.59	0	25.56
66.3	63.03	64.74	24.04	0.202	25.56	0	25.56
64.21	63.27	63.77	23.84	0.202	25.56	0	25.52
67.84	64.07	66.18	23.67	0.199	25.56	0	25.52
68.94	67.71	68.34	23.47	0.198	25.52	0	25.52
69.83	68.15	68.8	23.3	0.195	25.56	0	25.56
69.53	68.24	69	23.14	0.194	25.52	0	25.56
70.35	68.77	69.53	23	0.195	25.52	0	25.52
71.89	69.94	70.79	22.81	0.198	25.41	0	25.45
76	71.55	73.44	22.87	0.193	25.63	0	25.67
79.55	75.9	77.8	23.24	0.184	26.07	0	26.14
83.2	77.94	80.1	24.04	0.181	26.86	0	26.97
84.1	78.81	80.7	24.63	0.199	27.2	0	27.36
85.6	81.9	83.2	24.91	0.213	27.12	0	27.28
86.6	83.4	85.2	25.78	0.224	27.63	0	27.82
86.6	81.8	82.9	26.37	0.226	27.75	0	27.94
83.2	82	82.7	25.59	0.223	26.4	0	26.55
85.2	79.48	83.5	25.7	0.22	26.29	0	26.44
79.48	75.92	77.77	25.81	0.22	26.22	0	26.37
75.92	73.18	74.66	25.56	0.213	25.85	0	26
73.32	70.55	71.58	25.38	0.212	25.67	0	25.78
72.5	70.83	71.69	25.16	0.205	25.56	0	25.67

71.05	69.52	70.31	24.98	0.206	25.52	0	25.63
70.61	67.68	69.13	24.77	0.205	25.49	0	25.59
69.45	67.59	68.37	24.6	0.204	25.45	0	25.56
69.55	67.94	68.91	24.42	0.203	25.41	0	25.56
70.37	68.24	69.25	24.29	0.202	25.41	0	25.56
74.01	68.65	71.49	24.15	0.2	25.41	0	25.56
70.71	68.22	69.5	24.01	0.201	25.41	0	25.56
70.16	62.89	67.63	23.87	0.196	25.38	0	25.52
65.82	62.5	63.65	23.7	0.198	25.38	0	25.49
66.98	63.79	64.8	23.54	0.2	25.27	0	25.38
70.79	67.01	68.99	23.3	0.202	25.2	0	25.31
75.01	70.32	72.42	23.5	0.193	25.56	0	25.67
77.67	74.41	76.11	23.81	0.185	25.89	0	26.03
77.89	76.22	76.91	24.22	0.179	26.22	0	26.4
78.08	76.59	77.17	24.42	0.186	26.22	0	26.4
79.68	76.68	77.67	24.67	0.191	26.26	0	26.44
82.3	74.57	77.76	24.88	0.196	26.14	0	26.33
81.2	71.6	74.76	25.59	0.2	26.67	0	26.86
74.73	69.82	71.73	25.31	0.205	26.07	0	26.26
74.15	65.07	69.02	25.09	0.205	25.67	0	25.81
68.77	64.87	66.95	24.81	0.208	25.31	0	25.45
66.93	63.31	65.32	24.74	0.205	25.31	0	25.45
66.04	63.21	64.94	24.56	0.204	25.27	0	25.41
66.93	65.18	65.73	24.39	0.205	25.27	0	25.41
66.16	60.75	61.96	24.22	0.204	25.23	0	25.38
61.34	60.21	60.81	23.98	0.205	25.16	0	25.31
62.08	60.21	60.98	23.81	0.203	25.13	0	25.27
61.98	59.15	60.99	23.64	0.201	25.13	0	25.27
62.63	59.05	60.45	23.44	0.201	25.09	0	25.23
60.96	58.37	59.87	23.27	0.203	25.13	0	25.23
61.22	59.34	60.37	23.07	0.199	25.09	0	25.23
65.55	57.97	60.38	22.94	0.2	25.09	0	25.23
65.59	60.19	63.8	22.77	0.197	25.09	0	25.2
68.46	64.89	66.58	22.61	0.195	25.09	0	25.2
70.68	68.44	69.52	22.45	0.2	25.06	0	25.2
74.1	70.5	72.42	22.64	0.192	25.38	0	25.52
76.52	73.65	74.87	23.17	0.173	25.96	0	26.14
78.49	74.19	76.42	23.6	0.176	26.26	0	26.44
77.96	71.33	74.86	24.11	0.181	26.48	0	26.7
78.44	75.12	76.24	24.01	0.198	25.92	0	26.14
76.37	70.66	73.46	24.15	0.204	25.7	0	25.92
78.03	72.05	76.05	24.11	0.207	25.38	0	25.56
80.6	75.63	78.22	24.46	0.205	25.63	0	25.85
77	74.28	75.43	24.98	0.207	26	0	26.26
75.14	71.78	73.54	24.88	0.21	25.63	0	25.89
71.85	69.84	71.14	24.81	0.208	25.45	0	25.67
69.86	66.27	68.12	24.67	0.207	25.27	0	25.52

66.45	64.77	65.63	24.46	0.207	25.09	0	25.34
64.77	62.54	63.92	24.25	0.208	25.02	0	25.27
62.96	61.99	62.55	24.08	0.204	24.98	0	25.2
62.24	60.87	61.72	23.91	0.204	24.95	0	25.16
61.79	59.4	60.66	23.74	0.204	24.91	0	25.16
63.43	60.95	61.96	23.57	0.203	24.91	0	25.13
62.83	59.67	61.16	23.4	0.201	24.91	0	25.13
59.71	59.08	59.32	23.27	0.2	24.91	0	25.13
60.61	59.09	59.87	23.14	0.201	24.88	0	25.13
61.8	59.66	60.93	23	0.197	24.88	0	25.13
60.76	59.14	60.07	22.87	0.201	24.88	0	25.09
65.3	60.76	62.95	22.68	0.201	24.77	0	25.02
68.42	64.77	67.05	22.74	0.198	24.95	0	25.2
69.05	67.2	67.95	23	0.192	25.27	0	25.52
70.05	67.6	69.01	23.2	0.195	25.41	0	25.67
72.6	69.04	70.35	23.54	0.196	25.59	0	25.89
73.7	70.23	71.64	23.87	0.201	25.74	0	26.07
75.93	69.56	71.95	24.04	0.207	25.67	0	25.96
75.44	72.95	74.28	24.6	0.215	26.03	0	26.37
76.01	73.27	74.63	25.2	0.227	26.33	0	26.67
76.79	73.49	75.35	25.31	0.23	26.03	0	26.37
76.51	66.49	73.73	25.31	0.228	25.67	0	26
66.24	58.05	59.12	25.13	0.217	25.23	0	25.52
60.58	58.85	60	24.74	0.217	24.81	0	25.09
60.44	59.59	59.92	24.46	0.214	24.74	0	25.02
60.44	59.4	59.85	24.22	0.212	24.7	0	24.98
59.79	57.9	58.93	23.94	0.21	24.7	0	24.98
60.57	57.9	59.49	23.67	0.208	24.67	0	24.95
62.93	59.84	61.48	23.44	0.205	24.67	0	24.95
63.29	60.21	61.36	23.27	0.205	24.7	0	24.98
61.66	59.42	60.18	23.07	0.204	24.74	0	25.02
70.45	61.08	63.44	22.91	0.203	24.74	0	25.02
66.15	60.72	62.82	22.77	0.2	24.77	0	25.06
62.05	59.64	60.5	22.61	0.202	24.77	0	25.02
64.97	60.19	62.71	22.45	0.201	24.7	0	24.98
70.05	64.99	67.11	22.22	0.204	24.63	0	24.91
73.01	69.66	71.12	22.45	0.202	25.02	0	25.34
76.82	72.14	74.46	22.81	0.208	25.52	0	25.89
78.85	75.76	77.37	23.47	0.234	26.14	0	26.52
80.4	77.45	78.78	24.56	0.256	27.09	0	27.55
78.31	70.74	74.44	25.16	0.257	27.28	0	27.75
71.09	62.16	67.55	23.57	0.234	25.02	0	25.38
77.53	64.44	71.96	23.2	0.226	24.49	0	24.81
80.7	75.54	78.19	23.67	0.235	25.06	0	25.41
81.1	77.64	78.98	24.15	0.255	25.45	0	25.85
78.17	72.18	75.79	24.04	0.251	25.16	0	25.56
73.91	69.99	71.77	23.98	0.24	24.98	0	25.34

71.39	65.33	67.2	23.84	0.232	24.77	0	25.13
66.77	61.28	63.87	23.64	0.226	24.67	0	25.02
63.23	61.41	62.28	23.44	0.221	24.6	0	24.95
63.87	61.88	62.87	23.27	0.218	24.56	0	24.91
63.11	60.58	61.68	23.1	0.214	24.53	0	24.88
61.54	59.76	60.67	22.91	0.211	24.53	0	24.88
60.61	58.88	59.72	22.71	0.21	24.49	0	24.84
61.06	57.41	59.3	22.51	0.207	24.46	0	24.81
67.66	60.9	63.48	22.35	0.209	24.46	0	24.81
69	62.93	65.82	22.26	0.206	24.53	0	24.88
68.7	61.94	64.91	22.13	0.203	24.56	0	24.91
70.6	62.33	67.13	22	0.207	24.53	0	24.88
73.79	70.65	72.56	21.87	0.21	24.53	0	24.88
77.14	73.55	75.37	22.22	0.219	25.02	0	25.45
79.65	76.61	78.01	22.84	0.246	25.67	0	26.14
80.4	76.79	78.32	23.74	0.265	26.55	0	27.09
76.83	68.49	72.64	23.44	0.258	25.85	0	26.33
70.77	62.39	66.86	22.71	0.239	24.7	0	25.13
72.52	70.31	71.59	22.77	0.23	24.56	0	24.98
74.41	64.32	68.59	23	0.234	24.67	0	25.09
78.16	63.32	70.88	22.94	0.227	24.46	0	24.88
75.69	55.4	64.2	23.3	0.234	24.81	0	25.27
62.08	59.41	60.96	22.91	0.222	24.32	0	24.77
59.86	56.88	57.77	22.74	0.218	24.35	0	24.77
57.59	56.58	57.06	22.51	0.215	24.32	0	24.77
56.92	55.88	56.18	22.32	0.211	24.32	0	24.77
56.05	55.64	55.85	22.16	0.213	24.32	0	24.77
55.73	53.74	55.06	22.03	0.21	24.32	0	24.81
54.39	52.89	53.32	21.81	0.211	24.25	0	24.74
55.89	54.41	55.43	21.72	0.208	24.29	0	24.77
56.2	55.38	55.72	21.62	0.208	24.35	0	24.84
56.25	55.61	56	21.53	0.209	24.32	0	24.84
56.09	54.85	55.33	21.44	0.208	24.35	0	24.88
55.42	54.92	55.16	21.31	0.209	24.32	0	24.84
55.46	54.77	55.02	21.25	0.211	24.35	0	24.84
55.89	55.05	55.34	21.16	0.211	24.29	0	24.81
57.1	55.61	56.35	21.07	0.211	24.29	0	24.81
61.8	56.82	58.83	20.91	0.219	24.22	0	24.77
66.9	61.7	63.72	21.28	0.238	24.67	0	25.27
69.71	66.81	68.1	22.07	0.269	25.52	0	26.18
72.01	69.2	70.62	23.47	0.282	26.86	0	27.63
74.09	70.93	72.57	24.6	0.277	27.71	0	28.54
74.05	68.89	71.58	25.27	0.28	27.9	0	28.79
69.84	61.55	67.01	23.3	0.28	25.13	0	25.89
72.6	63.43	68.87	22.77	0.273	24.29	0	24.98
71.11	68.16	69.5	23.4	0.282	24.84	0	25.59
68.94	67.32	68.53	23.34	0.281	24.63	0	25.38

67.3	63.96	65.53	23.24	0.27	24.46	0	25.16
65.55	61.88	63.04	23.07	0.263	24.25	0	24.98
63.15	61.65	62.4	22.87	0.257	24.15	0	24.88
63.63	60.75	62.3	22.64	0.251	24.08	0	24.77
62.44	60.02	61.18	22.48	0.25	24.08	0	24.81
64.07	61.77	62.63	22.32	0.249	24.08	0	24.81
64.4	60.33	62.78	22.19	0.249	24.11	0	24.84
61.78	58.77	59.96	22	0.245	24.08	0	24.81
59.57	55.65	56.63	21.81	0.243	23.98	0	24.7
57.32	54.52	55.24	21.65	0.237	23.94	0	24.63
57.42	54.96	56.09	21.53	0.237	23.94	0	24.67
59.05	53.97	55.32	21.44	0.236	23.98	0	24.7
56.03	53.16	54.29	21.31	0.234	23.98	0	24.7
56.11	53.16	54.97	21.07	0.236	23.84	0	24.56
56.48	55.74	56.18	21.03	0.238	23.94	0	24.67
57.76	55.92	56.48	20.94	0.242	23.94	0	24.67
60.3	57.7	58.78	20.91	0.251	24.01	0	24.74
60.27	57.75	58.82	21.25	0.263	24.35	0	25.16
65.34	58.73	61.41	21.47	0.271	24.49	0	25.31
67.88	63.14	65.37	22.68	0.287	25.67	0	26.59
69.15	65.8	67.03	23.81	0.285	26.67	0	27.63
67.22	64.79	65.81	23.34	0.288	25.7	0	26.67
66.58	64.31	64.92	22.84	0.29	24.81	0	25.7
67.49	63.49	65.78	22.94	0.292	24.7	0	25.59
64.87	60.28	63.31	22.84	0.286	24.49	0	25.38
60.24	58.03	58.88	22.55	0.277	24.08	0	24.95
59.03	57.1	57.89	22.35	0.268	23.84	0	24.7
57.14	55.88	56.47	22.22	0.265	23.84	0	24.67
60.16	56.06	57.16	22.07	0.262	23.77	0	24.63
58.21	56.76	57.5	21.97	0.265	23.84	0	24.7
56.85	55.25	56.14	21.87	0.265	23.84	0	24.74
57.15	55.45	56.25	21.72	0.263	23.84	0	24.7
56.58	53.49	55.05	21.53	0.258	23.77	0	24.63
55.51	51.5	53.58	21.34	0.255	23.67	0	24.56
51.66	49.87	50.82	21.16	0.25	23.64	0	24.53
50.85	49.59	50.02	20.97	0.248	23.64	0	24.49
56.75	50.54	53.07	20.79	0.249	23.6	0	24.49
63.56	56.77	60.96	20.73	0.263	23.7	0	24.6
64.39	62.41	63.41	21.22	0.281	24.46	0	25.41
66.04	64.28	65.05	22.13	0.292	25.56	0	26.63
69.17	65.77	67.49	23.67	0.289	27.2	0	28.38
71.36	68.49	70.08	25.49	0.277	28.95	0.143	30.26
72.9	70.39	71.72	26.89	0.27	30.05	0.132	31.41
75.27	72.72	73.73	27.98	0.276	30.61	0.125	32.01
76.5	74.17	75.39	28.58	0.287	30.52	0.136	31.96
76.8	74.66	75.86	28.58	0.306	29.92	0.155	31.32
77.34	75.72	76.55	28.38	0.323	29.12	0.172	30.48

77.09	70.42	73.54	27.39	0.332	27.75	0.189	28.99
71.05	65.18	69.23	25.59	0.332	25.67	0	26.82
65.16	61.58	63.17	24.29	0.323	24.25	0	25.31
63.54	60.56	62.08	23.6	0.309	23.6	0	24.63
62.69	57.08	60.29	23.34	0.303	23.47	0	24.49
60.19	55.89	57.24	23.07	0.293	23.4	0	24.39
56.26	55.64	55.96	22.81	0.288	23.37	0	24.32
56.07	55.22	55.57	22.58	0.282	23.37	0	24.32
58.16	55.35	56.65	22.35	0.278	23.34	0	24.29
60.28	57.61	58.74	22.13	0.277	23.37	0	24.32
58.82	56.44	57.47	21.94	0.274	23.4	0	24.32
58.82	55.96	57.59	21.72	0.272	23.4	0	24.29
58.08	55	56.77	21.53	0.27	23.4	0	24.29
61	55.14	57.36	21.34	0.268	23.37	0	24.25
68.19	61.08	65.12	21.22	0.282	23.44	0	24.35
70.6	67.14	68.66	21.94	0.305	24.46	0	25.41
72.28	69.6	70.81	23.44	0.308	26.18	0	27.28
73.8	71.88	73.08	25.13	0.297	27.98	0.16	29.2
76.6	73.32	74.83	26.93	0.275	29.7	0.129	31.01
79.09	75.87	76.93	28.34	0.264	30.79	0.108	32.15
81.1	77.41	78.98	29.33	0.27	31.19	0.108	32.57
81.1	78.13	79.83	29.62	0.284	30.83	0.126	32.19
81.7	79.56	80.6	29.37	0.308	29.96	0.148	31.28
81.6	80.1	81	29.03	0.32	29.16	0.165	30.43
81.5	79.72	80.6	28.1	0.329	27.86	0.182	29.12
80	72.83	77.11	26.7	0.333	26.29	0	27.39
73.07	63.03	66.7	25.09	0.325	24.6	0	25.59
63.47	61.78	62.72	24.01	0.309	23.6	0	24.49
62.2	60.4	61.2	23.64	0.298	23.37	0	24.25
60.56	58.99	59.55	23.37	0.292	23.3	0	24.18
60.4	58.5	59.68	23.14	0.286	23.27	0	24.15
58.94	57.39	58.06	22.91	0.281	23.27	0	24.11
57.77	55.92	57.1	22.64	0.275	23.24	0	24.08
57.76	55.89	56.8	22.42	0.271	23.24	0	24.04
56.39	54.46	55.33	22.22	0.268	23.27	0	24.04
55.89	53.36	54.36	22	0.264	23.24	0	24.01
54.65	52.38	53.5	21.81	0.259	23.27	0	24.01
60.96	52.02	55.33	21.59	0.258	23.24	0	23.98
71.36	61	66.72	21.44	0.27	23.27	0	24.04
72.64	70.6	71.51	22.07	0.301	24.18	0	24.98
74.68	72.1	73.22	23.37	0.312	25.7	0	26.63
78.85	74.13	76.02	25.27	0.3	27.71	0	28.75
81.2	77.82	79.62	27.67	0.265	30.05	0.117	31.19
83.6	80.4	81.9	29.33	0.241	31.32	0.086	32.52
84.9	81.9	83.4	30.57	0.233	31.96	0.071	33.19
85	82.9	83.9	31.05	0.256	31.64	0.094	32.85
85.9	83.1	84.4	31.05	0.286	30.96	0.12	32.15

85	83.6	84.3	30.74	0.307	30.09	0.145	31.23
84.4	82.8	83.5	29.45	0.327	28.38	0.173	29.41
83.5	69.4	79.38	27.47	0.333	26.26	0	27.16
69.36	66.01	66.9	25.59	0.324	24.39	0	25.2
69.76	66.6	67.91	24.74	0.31	23.6	0	24.35
70.49	68.82	69.73	24.53	0.308	23.6	0	24.32
71.18	66.97	69.15	24.35	0.307	23.64	0	24.35
69.3	63.77	66.24	24.08	0.301	23.57	0	24.25
65.47	63.03	63.85	23.7	0.29	23.4	0	24.08
63.19	59.94	61.4	23.44	0.282	23.34	0	24.01
62.06	57.21	58.82	23.2	0.274	23.3	0	23.94
60.53	56.69	58.52	22.97	0.268	23.3	0	23.91
56.88	54.7	55.85	22.74	0.263	23.3	0	23.87
55.55	54.06	54.77	22.55	0.26	23.3	0	23.84
64.24	54.24	58.11	22.29	0.259	23.27	0	23.81
69.03	64.24	67.03	22.16	0.27	23.37	0	23.91
71.42	68.6	69.97	22.71	0.299	24.15	0	24.74
74.13	70.91	72.45	23.7	0.312	25.34	0	26
77.18	72.8	75.12	25.41	0.307	27.12	0	27.86
81.7	76.7	79.03	27.75	0.278	29.37	0.134	30.17
84	80.4	82.3	29.79	0.245	30.96	0.095	31.87
87.1	82.2	85	31.28	0.243	31.87	0.083	32.76
85.7	82.2	84.2	32.01	0.251	31.82	0.089	32.71
86.4	82.9	84.8	31.59	0.288	30.7	0.126	31.55
86.1	82.9	84.6	31.05	0.309	29.66	0.153	30.48
87	82.3	83.8	29.54	0.326	27.9	0	28.63
83.3	76.61	80.9	27.78	0.333	26.11	0	26.7
76.59	67.65	69.84	26.4	0.325	24.74	0	25.27
71.05	67.51	69.57	25.41	0.309	23.84	0	24.32
71.18	69.11	70.16	25.09	0.303	23.7	0	24.18
69.07	66.48	68.01	24.84	0.298	23.67	0	24.15
67.74	64.69	66.29	24.56	0.291	23.6	0	24.04
74.1	67.28	68.95	24.32	0.285	23.57	0	23.98
68.88	65.55	67.63	24.15	0.283	23.64	0	24.01
67.78	65.1	66.49	23.94	0.281	23.64	0	24.01
68.26	64.75	66.88	23.74	0.276	23.64	0	23.98
69.19	66.48	67.65	23.6	0.276	23.67	0	24.01
66.63	62.31	63.74	23.5	0.277	23.74	0	24.04
67.57	61.72	64	23.24	0.271	23.64	0	23.94
70.18	67.59	68.43	23.1	0.28	23.67	0	23.94
74.61	70.18	72.91	23.34	0.293	24.04	0	24.32
78.24	74.4	75.49	24.18	0.31	24.95	0	25.27
81	77.81	79.15	25.31	0.314	26.11	0	26.44
83.3	79.76	81.2	27.39	0.303	28.14	0	28.5
82.8	74.89	80.4	29.79	0.263	30.3	0.115	30.74
80	73.46	76.47	27.82	0.299	27.86	0	28.26
79.95	78.39	78.9	27.71	0.315	27.47	0	27.82

78.44	67.29	74.91	27.47	0.313	27.05	0	27.39
67.23	62.02	63.99	25.49	0.306	24.95	0	25.2
63.87	62.4	63.07	24.46	0.29	23.91	0	24.11
64.12	62.45	63.1	24.18	0.286	23.81	0	24.01
63.07	62.14	62.73	23.98	0.284	23.77	0	23.98
64.03	61.61	62.67	23.81	0.283	23.81	0	23.98
65.07	62.35	63.69	23.6	0.28	23.81	0	23.98
63.62	61.9	62.49	23.44	0.281	23.84	0	23.98
62.93	62	62.4	23.3	0.279	23.84	0	23.98
62.85	61.65	62.16	23.2	0.278	23.84	0	24.01
62.18	60.62	61.15	23.07	0.277	23.84	0	23.98
60.75	57.45	59.02	22.91	0.273	23.77	0	23.87
62.53	57.39	60.13	22.71	0.267	23.7	0	23.77
62.51	58.83	60.63	22.55	0.262	23.67	0	23.77
59.73	57.5	58.43	22.42	0.262	23.67	0	23.77
64.17	59.13	60.89	22.22	0.262	23.67	0	23.74
69.14	64.19	66.71	22.19	0.278	23.77	0	23.87
71.55	67.52	69.95	23.04	0.302	24.81	0	24.95
74.47	70.92	72.32	24.39	0.31	26.29	0	26.48
77.11	72.92	73.98	25.96	0.304	27.9	0	28.14
77.4	68.06	73.6	26.82	0.3	28.54	0.17	28.79
68.06	59.88	64.17	24.88	0.305	26.07	0	26.29
75.05	66.88	71.87	23.67	0.304	24.63	0	24.77
74.67	69.92	72.5	25.13	0.316	26.11	0	26.33
70.31	64.73	67.79	24.84	0.31	25.67	0	25.89
69.69	67.7	68.4	24.42	0.312	25.23	0	25.41
71.29	68.41	69.33	24.49	0.312	25.27	0	25.49
69.64	66.74	68.24	24.35	0.308	25.16	0	25.38
66.76	64.56	65.64	23.98	0.304	24.77	0	24.98
66.03	63.39	64.37	23.57	0.301	24.46	0	24.67
64.83	62.62	63.68	23.27	0.296	24.22	0	24.42
66.34	61.18	63	23.07	0.293	24.11	0	24.32
66.26	61.22	63.77	22.87	0.29	24.08	0	24.29
62.67	61.24	62	22.74	0.291	24.08	0	24.29
63.03	60.21	61.99	22.55	0.286	23.98	0	24.15
60.84	58.31	59.53	22.35	0.283	23.87	0	24.08
59.26	56.37	57.88	22.1	0.276	23.77	0	23.94
59.73	56.62	58.01	21.94	0.271	23.7	0	23.87
57.81	54.09	55.66	21.75	0.272	23.67	0	23.84
58.42	54.11	55.84	21.59	0.269	23.64	0	23.81
64.59	58.44	62.38	21.53	0.277	23.74	0	23.91
67.94	63.85	65.37	21.81	0.289	24.15	0	24.39
76.37	67.9	72.29	22.91	0.295	25.41	0	25.7
79.09	75.14	77.22	26.37	0.259	29.24	0.129	29.62
80.2	75.92	77.95	27.9	0.236	30.65	0.097	31.1
82.5	79.85	81	28.22	0.247	30.61	0.108	31.1
82.8	80.3	81.3	29.83	0.207	32.05	0.063	32.57

83.4	79.8	81.8	30.26	0.22	32.1	0.071	32.62
82.8	79.66	81.3	30.26	0.249	31.55	0.101	32.1
82	79.04	80.7	29.83	0.277	30.65	0.132	31.14
80.4	77.34	78.9	28.75	0.305	29.2	0.167	29.66
77.32	69.43	73.76	27.16	0.315	27.39	0	27.82
69.28	63.31	65.26	25.16	0.315	25.31	0	25.7
66.78	63.05	64.12	23.94	0.306	24.15	0	24.46
65.93	62.4	63.99	23.54	0.302	23.87	0	24.22
62.4	59.33	60.7	23.24	0.298	23.74	0	24.08
64.24	58.75	61	22.84	0.289	23.54	0	23.84
64.38	58.12	60.28	22.61	0.283	23.5	0	23.81
62.14	57.74	59.91	22.35	0.277	23.44	0	23.74
61.99	58.4	59.64	22.16	0.273	23.44	0	23.7
60.14	56.02	58.07	21.94	0.27	23.4	0	23.7
56.44	53.14	55	21.72	0.266	23.37	0	23.64
55.98	53.4	54.81	21.5	0.256	23.3	0	23.57
63.2	54.89	58.44	21.31	0.256	23.3	0	23.57
70.23	63.24	67.53	21.22	0.273	23.44	0	23.7
73.84	69.49	71.84	22.13	0.297	24.63	0	24.98
76.23	72.01	74.15	23.64	0.296	26.4	0	26.82
78.47	74.82	76.91	25.41	0.276	28.34	0	28.83
80.7	77.56	79.03	27.24	0.236	30.13	0.105	30.7
82.1	78.95	80.4	28.22	0.221	30.87	0.085	31.5
82.4	79.63	81.1	29.16	0.21	31.46	0.074	32.1
82.4	80.6	81.4	29.58	0.222	31.37	0.082	32.01
82.3	80.7	81.4	29.16	0.252	30.3	0.112	30.92
81.4	78.7	79.84	28.46	0.284	28.99	0.145	29.62
79.19	75.22	77.23	27.12	0.303	27.24	0	27.78
75.2	69.18	72.27	25.59	0.308	25.49	0	25.96
69.14	60.3	64.76	24.22	0.295	24.01	0	24.42
67.15	64.55	65.78	23.47	0.276	23.34	0	23.7
67.01	62.73	64.97	23.24	0.272	23.3	0	23.67
65.88	61.53	63.22	23	0.269	23.3	0	23.64
64.49	60.65	62.26	22.77	0.265	23.27	0	23.64
63.36	59.36	61.68	22.55	0.259	23.24	0	23.6
61.9	52.11	57.8	22.32	0.254	23.24	0	23.57
62.33	50.83	55.43	22.07	0.247	23.14	0	23.47
51.98	47.9	49.56	21.81	0.239	23.07	0	23.4
48.72	45.74	47.35	21.56	0.235	23.04	0	23.37
48.54	45.38	47.64	21.34	0.232	23.04	0	23.37
55.67	44.92	49.72	21.1	0.23	23	0	23.34
66.11	55.73	62.34	20.85	0.239	23	0	23.3
68.14	64.1	65.71	21.22	0.258	23.6	0	23.94
73.07	67.26	70.61	21.94	0.286	24.56	0	24.95
75.64	71.84	73.42	23.2	0.293	25.92	0	26.37
77.58	74.02	75.57	25.31	0.262	28.02	0	28.54
80.3	76.05	78.54	26.97	0.232	29.41	0.106	30.05

84.4	78.97	82.7	28.46	0.207	30.52	0.076	31.19
85.1	82.4	83.7	29.49	0.203	30.92	0.069	31.59
83.9	82	82.9	29.28	0.239	30	0.102	30.65
82.6	80.5	81.5	28.5	0.277	28.58	0.142	29.2
80.9	77.81	79.56	27.09	0.296	26.7	0	27.28
77.78	69.28	73.53	25.63	0.3	25.02	0	25.52
69.52	57.89	62.95	24.39	0.283	23.7	0	24.11
67.49	57.96	62.65	23.77	0.266	23.17	0	23.57
68.13	60.66	64.77	23.54	0.259	23.14	0	23.5
67.03	60.72	63.37	23.34	0.255	23.14	0	23.5
70.33	61.11	67.58	23.1	0.252	23.17	0	23.54
70.05	61.34	66.05	23	0.253	23.27	0	23.64
67.38	54.64	63.01	22.77	0.25	23.24	0	23.6
56.25	53.53	54.76	22.51	0.242	23.14	0	23.5
57.48	51.64	54.62	22.22	0.236	23	0	23.34
56.44	52	54.07	22	0.232	23	0	23.34
55.17	51.64	53.43	21.81	0.229	23	0	23.3
59.49	52.61	55.43	21.59	0.23	23	0	23.3
67.78	59.55	65	21.34	0.234	22.94	0	23.24
71.25	66.91	68.98	21.72	0.246	23.54	0	23.87
76.85	70.64	73.49	22.35	0.27	24.35	0	24.74
79.15	75.76	77.17	23.47	0.284	25.56	0	25.96
80.9	77.93	79.18	25.49	0.261	27.55	0	28.06
83.4	79.9	81.5	27.28	0.222	29.16	0.099	29.7
84.1	81.7	82.8	28.42	0.205	29.92	0.078	30.52
84.4	81.8	82.9	28.87	0.211	29.83	0.084	30.39
84.1	82.1	83	28.71	0.234	29.03	0.105	29.62
83	80.4	81.7	27.98	0.265	27.75	0	28.26
81.3	78.39	79.93	26.89	0.288	26.22	0	26.67
78.46	73.13	75.99	26.03	0.291	25.09	0	25.52
73.09	67.22	69.9	25.13	0.281	24.11	0	24.46
68.94	65.75	67.72	24.53	0.269	23.54	0	23.87
68.37	65.53	66.96	24.25	0.263	23.4	0	23.7
66.75	64.81	65.62	24.04	0.257	23.34	0	23.64
65.51	61.4	63.23	23.81	0.251	23.27	0	23.57
65.39	63.54	64.59	23.54	0.246	23.2	0	23.5
64.23	61.85	62.56	23.37	0.242	23.2	0	23.5
63.67	60.64	61.62	23.2	0.241	23.2	0	23.47
63.23	60.48	61.92	23.04	0.238	23.2	0	23.44
62.61	60.44	61.68	22.87	0.236	23.2	0	23.44
62.3	59.4	61.07	22.74	0.232	23.24	0	23.47
60.48	58.72	59.45	22.61	0.233	23.24	0	23.44
65.63	59.34	62.44	22.35	0.235	23.14	0	23.34
71.49	65.65	69.15	22.48	0.244	23.4	0	23.6
74.1	70.64	72.26	23.04	0.259	24.01	0	24.25
76.37	73.11	74.71	23.47	0.274	24.46	0	24.7
78.06	74.63	76.22	24.25	0.287	25.16	0	25.45

80.7	76.34	78.05	25.41	0.287	26.14	0	26.44
80.9	77.21	78.92	26.7	0.279	27.2	0	27.51
78.94	77.82	78.34	26.86	0.277	27.01	0	27.32
79.33	77.67	78.44	26.44	0.284	26.26	0	26.55
80.8	77.13	78.8	26.14	0.29	25.74	0	26
77.32	75.31	76.25	25.85	0.29	25.23	0	25.49
75.33	70.98	73.31	25.31	0.285	24.6	0	24.81
72.06	65.69	69.45	24.77	0.274	24.01	0	24.18
70.05	68.22	69.1	24.32	0.265	23.64	0	23.81
68.96	67.2	68.31	24.11	0.26	23.57	0	23.7
69.16	66.78	68.49	23.98	0.259	23.54	0	23.67
68.78	67.77	68.14	23.84	0.255	23.54	0	23.67
68.11	66.86	67.45	23.67	0.254	23.54	0	23.67
67.07	66.04	66.55	23.54	0.253	23.5	0	23.64
66.49	65.08	65.93	23.37	0.25	23.47	0	23.57
65.34	64.45	64.97	23.24	0.247	23.47	0	23.57
64.63	63.99	64.31	23.07	0.243	23.44	0	23.5
64.63	63.79	64.27	22.94	0.243	23.44	0	23.5
66.16	63.65	64.68	22.84	0.243	23.44	0	23.5
69.65	66.2	67.84	22.74	0.253	23.44	0	23.5
73.11	69.52	71.44	23.2	0.27	24.08	0	24.18
76.25	72.68	74.31	24.11	0.287	25.09	0	25.2
78.47	75.41	76.92	25.59	0.284	26.63	0	26.78
81.7	77.44	79.56	27.71	0.249	28.67	0	28.87
83.6	80.1	81.7	29.41	0.2	30.22	0.08	30.48
84.3	81.8	83	30.35	0.191	30.83	0.065	31.1
85	82.2	83.9	30.61	0.2	30.65	0.075	30.87
85	83	84	30.17	0.232	29.7	0.105	29.92
84.8	82.7	83.6	29.28	0.265	28.38	0	28.58
83.1	80.1	81.7	27.94	0.286	26.74	0	26.89
80.1	74.9	77.51	26.55	0.289	25.2	0	25.31
75.55	70.46	73.11	25.59	0.277	24.18	0	24.25
71.68	69.95	70.86	25.06	0.268	23.74	0	23.77
72.94	71.35	72.41	24.84	0.26	23.64	0	23.67
72.37	70.61	71.47	24.74	0.259	23.67	0	23.7
71.33	70.27	70.77	24.53	0.254	23.67	0	23.67
70.29	69.45	69.82	24.35	0.252	23.64	0	23.64
69.95	68.65	69.29	24.18	0.248	23.6	0	23.6
69.55	68.28	68.88	24.01	0.244	23.6	0	23.57
69.13	67.8	68.4	23.87	0.243	23.6	0	23.54
69.04	67.86	68.35	23.7	0.239	23.57	0	23.5
68.92	67.7	68.3	23.57	0.237	23.57	0	23.5
69.6	67.61	68.43	23.44	0.237	23.57	0	23.47
73.26	69.62	71.15	23.34	0.245	23.6	0	23.5
76.07	72.99	74.69	23.77	0.257	24.18	0	24.08
79.73	75.39	77.59	24.63	0.273	25.13	0	25.06
82.2	79.05	80.6	26.29	0.273	26.86	0	26.82

83.9	80.1	82	28.71	0.23	29.24	0	29.24
86.1	82.6	84	30.43	0.184	30.74	0.065	30.74
86	83.7	84.9	31.1	0.18	31.05	0.061	31.05
88	84	85.6	31.05	0.209	30.52	0.084	30.52
87.3	84.9	86	30.65	0.236	29.62	0.111	29.62
86.9	84.9	85.8	29.75	0.267	28.22	0	28.18
85.7	83.1	84.4	28.46	0.281	26.63	0	26.55
83.1	69.73	77.34	27.12	0.281	25.16	0	25.06
69.67	65.23	66.35	26.07	0.264	24.11	0	23.94
69.54	65.16	67.6	25.59	0.252	23.7	0	23.5
69.89	67.41	68.73	25.38	0.247	23.64	0	23.44
69.19	66.99	67.92	25.16	0.241	23.64	0	23.44
67.49	60.78	64.1	24.91	0.238	23.6	0	23.37
65.48	58.75	62.23	24.67	0.233	23.54	0	23.3
60.6	58.38	59.77	24.39	0.23	23.5	0	23.24
58.46	55.87	57.04	24.18	0.228	23.47	0	23.2
61.53	55.15	57.26	23.94	0.222	23.47	0	23.17
57.62	53.53	55.67	23.74	0.221	23.47	0	23.17
55.81	53.69	54.81	23.54	0.219	23.47	0	23.14
61.23	53.87	56.76	23.3	0.218	23.44	0	23.1
74.72	61.27	69.22	23.04	0.222	23.4	0	23.07
76.28	72.59	74.68	23.44	0.221	24.01	0	23.64
78.02	75.07	76.29	24.18	0.235	24.91	0	24.56
81.6	77.35	79.47	25.06	0.259	25.85	0	25.52
85.6	80.5	83	26.37	0.261	27.12	0	26.78
87.6	83.9	85.8	27.82	0.242	28.34	0	28.02
88.5	84.1	86.3	28.46	0.234	28.67	0	28.34
88.4	84.8	86.8	28.3	0.243	28.02	0	27.71
86.7	84.5	85.2	27.9	0.253	27.24	0	26.89
85.2	83.7	84.5	26.93	0.26	25.92	0	25.56
83.7	80.2	81.8	26.52	0.262	25.27	0	24.91
81	75.63	77.61	26.11	0.254	24.81	0	24.42
76.37	74.43	75.62	25.7	0.246	24.42	0	24.04
76.87	73.06	75.95	25.45	0.241	24.22	0	23.81
76.84	72.48	73.92	25.23	0.236	24.11	0	23.7
74	70.82	72.08	25.06	0.232	24.04	0	23.64
75.53	72.32	73.74	24.88	0.23	23.98	0	23.57
74.87	71.66	72.8	24.74	0.227	24.01	0	23.57
74.89	69.75	72.81	24.63	0.226	24.01	0	23.57
70.31	68.22	69.16	24.49	0.225	23.98	0	23.57
68.94	67.14	68.28	24.32	0.221	23.94	0	23.5
68.06	64.9	66.58	24.18	0.219	23.91	0	23.44
67.11	64.61	65.94	23.98	0.219	23.87	0	23.4
66.39	63.62	64.78	23.84	0.217	23.84	0	23.34
76.49	65.52	71.47	23.57	0.221	23.7	0	23.2
79.43	76.32	77.97	23.91	0.218	24.22	0	23.7
82	78.89	80.3	24.77	0.228	25.2	0	24.7

83.1	80.7	81.9	25.74	0.24	26.22	0	25.78
84.8	82.1	83.2	27.09	0.224	27.51	0	27.05
85.8	82.6	83.9	28.42	0.201	28.71	0	28.22
85.8	83.4	84.6	29.2	0.189	29.2	0	28.75
86.7	84.1	85.2	29.16	0.203	28.83	0	28.38
86.8	81.4	84.9	28.71	0.224	28.02	0	27.55
84.7	80.7	82.9	27.82	0.244	26.78	0	26.33
83.1	79.36	81.3	27.01	0.253	25.7	0	25.23
79.33	75.77	77.45	26.37	0.245	24.91	0	24.42
76.03	69.22	72.26	25.89	0.234	24.39	0	23.87
69.4	67.3	68.34	25.52	0.228	24.08	0	23.57
71.31	67.18	68.58	25.23	0.224	23.94	0	23.4
67.68	63.61	65.97	25.06	0.222	23.91	0	23.37
66.06	61.95	64.32	24.81	0.219	23.87	0	23.3
67.48	63.11	65.6	24.6	0.218	23.84	0	23.27
67.46	63.89	65.57	24.46	0.213	23.87	0	23.3
65.77	61.96	63.92	24.29	0.214	23.87	0	23.3
66.06	59.13	63.43	24.11	0.212	23.87	0	23.27
67.38	62.01	66.25	23.94	0.212	23.84	0	23.27
66.59	63.55	65.24	23.81	0.208	23.91	0	23.3
67.82	62.87	64.42	23.67	0.209	23.91	0	23.3
70.95	67.84	69.28	23.44	0.212	23.81	0	23.2
73.53	68.35	71.08	23.57	0.208	24.08	0	23.47
76.62	72.9	74.41	23.87	0.205	24.49	0	23.91
77.79	74.95	76.16	24.6	0.204	25.31	0	24.7
79.34	76.68	78.08	25.49	0.217	26.14	0	25.56
81	77.72	79.22	26.11	0.228	26.7	0	26.11
81.4	79.48	80.4	26.48	0.228	26.86	0	26.26
81.8	78.97	80.4	26.44	0.233	26.55	0	25.96
81.1	78.39	79.62	26.26	0.233	26.07	0	25.49
80	76.98	78.36	26	0.235	25.52	0	24.91
77.39	74.17	75.74	25.63	0.228	24.88	0	24.29
74.17	68.71	71.65	25.34	0.222	24.49	0	23.87
68.92	64.19	66.34	25.09	0.216	24.18	0	23.57
65.34	60.16	63.79	24.84	0.215	24.01	0	23.4
61.54	57.82	59.07	24.63	0.211	23.94	0	23.34
60.71	57.16	58.94	24.42	0.209	23.87	0	23.27
60.59	55.61	57.68	24.22	0.208	23.87	0	23.27
58.83	52.73	55.86	24.01	0.208	23.87	0	23.24
66.4	57.05	61.29	23.84	0.208	23.84	0	23.2
66.17	62.94	64.51	23.67	0.204	23.87	0	23.24
66.07	62.62	64.43	23.57	0.203	23.94	0	23.3
64.35	57.24	62	23.44	0.201	23.98	0	23.34
64.25	56.4	61.23	23.27	0.203	23.94	0	23.3
64.55	59.04	61.89	23.1	0.202	23.87	0	23.27
69.32	64.49	67.29	22.87	0.203	23.81	0	23.17
71.07	68.09	69.65	23.07	0.199	24.15	0	23.5

76.25	70.78	73.71	23.47	0.189	24.67	0	24.01
76.63	71.93	74.15	24.04	0.191	25.27	0	24.63
77.75	72.24	74.01	24.04	0.202	25.13	0	24.53
79.2	76.3	77.74	24.15	0.209	25.09	0	24.49
80.1	75.31	77.17	24.95	0.22	25.74	0	25.16
81.4	77.27	79.37	24.98	0.225	25.56	0	24.98
80.5	77.01	78.54	25.34	0.227	25.67	0	25.06
78.02	74.89	76.41	25.27	0.226	25.31	0	24.7
75.79	72.29	74.02	24.98	0.22	24.74	0	24.15
72.27	68.58	70.2	24.84	0.21	24.42	0	23.84
69.19	66.76	68.3	24.67	0.208	24.18	0	23.6
68.1	65.41	66.92	24.53	0.211	24.08	0	23.5
67.78	64.69	66.12	24.35	0.209	24.04	0	23.47
65.38	59.86	62.28	24.18	0.208	24.01	0	23.44
61.04	56.77	59.19	23.98	0.204	23.94	0	23.37
59.77	55.07	57.96	23.77	0.202	23.87	0	23.34
58.14	55	56.29	23.6	0.203	23.84	0	23.3
57.83	52.16	54.72	23.4	0.202	23.81	0	23.27
55.05	47.38	51.15	23.2	0.203	23.81	0	23.24
53.63	47.03	48.67	23	0.203	23.77	0	23.2
53.81	46.14	49.33	22.84	0.2	23.77	0	23.2
55.75	46.49	49.54	22.61	0.199	23.74	0	23.2
64.35	55.82	60.71	22.32	0.202	23.64	0	23.07
67.62	63.06	65.11	22.39	0.198	23.87	0	23.34
73.24	67.55	70.96	22.68	0.188	24.32	0	23.81
75.23	72.15	73.72	23.24	0.181	24.98	0	24.46
77.96	74.51	76	23.84	0.194	25.52	0	25.02
79	75.63	77.01	24.6	0.21	26.14	0	25.67
80	76.66	78.26	25.02	0.22	26.4	0	25.92
80.7	77.07	79.12	25.2	0.221	26.26	0	25.78
80.6	78.1	79.1	25.2	0.225	25.89	0	25.41
79.17	76.35	77.46	25.02	0.223	25.34	0	24.88
77.03	72.69	74.78	24.74	0.218	24.74	0	24.25
72.69	68.67	70.7	24.6	0.21	24.39	0	23.91
69.25	66.84	67.96	24.39	0.206	24.11	0	23.64
67.32	64.98	66.2	24.22	0.207	23.94	0	23.5
65.92	56.79	62.97	24.04	0.205	23.87	0	23.44
56.86	52.94	54.7	23.84	0.203	23.81	0	23.37
54.24	53.39	53.8	23.6	0.2	23.74	0	23.3
60.28	53.64	56.51	23.4	0.2	23.7	0	23.27
57.33	50.94	53.58	23.2	0.197	23.7	0	23.27
53.37	48.87	51.28	22.97	0.199	23.7	0	23.27
55.82	45.45	51.99	22.77	0.195	23.67	0	23.24
48.54	44.13	46.27	22.58	0.195	23.67	0	23.24
44.09	41.54	42.66	22.35	0.194	23.64	0	23.2
51.48	43.2	45.57	22.13	0.192	23.6	0	23.17
63.67	51.52	58.33	21.81	0.197	23.5	0	23.07

67.16	63.73	65.31	21.84	0.192	23.74	0	23.3
68.83	66.31	67.45	22.03	0.185	24.08	0	23.67
70.3	68.15	69.32	22.45	0.172	24.56	0	24.18
72.84	69.42	71.28	23.04	0.168	25.16	0	24.77
74.71	71.32	72.92	23.7	0.174	25.67	0	25.31
76.93	73.24	74.95	24.25	0.182	25.89	0	25.56
77.83	75.07	76.37	24.63	0.193	25.85	0	25.52
79.43	76.3	77.76	24.84	0.2	25.56	0	25.23
79.92	77.6	78.9	24.81	0.206	25.06	0	24.74
79.17	75.75	77.45	24.74	0.206	24.6	0	24.25
75.89	69.24	71.93	24.7	0.202	24.22	0	23.87
70.93	61.49	66.56	24.53	0.202	23.91	0	23.57
62.04	60.9	61.44	24.35	0.202	23.77	0	23.47
67.54	61.26	62.66	24.18	0.203	23.7	0	23.37
67.39	62.6	64.63	24.01	0.201	23.7	0	23.37
66.69	64.6	65.73	23.81	0.199	23.7	0	23.4
65.93	64.53	65.25	23.64	0.195	23.7	0	23.4
65.01	58.35	64.01	23.47	0.197	23.7	0	23.4
58.91	54.56	57.12	23.27	0.194	23.67	0	23.37
59.88	57.29	58.6	23.07	0.195	23.64	0	23.3
58.46	50.1	55.68	22.91	0.194	23.64	0	23.3
55.09	47.19	50.44	22.71	0.193	23.6	0	23.3
54.77	47.41	50.27	22.51	0.192	23.57	0	23.24
66.34	54.6	61.4	22.19	0.196	23.47	0	23.14
67.31	65.1	66.18	22.26	0.19	23.7	0	23.37
69.89	66.63	68.51	22.42	0.179	24.01	0	23.74
73	69.33	71.05	22.87	0.162	24.53	0	24.25
75.09	71.54	73.28	23.54	0.147	25.2	0	24.91
77.6	74.26	75.75	24.32	0.144	25.74	0	25.49
78.92	76.07	77.46	25.02	0.151	26.11	0	25.89
80.3	77.13	78.86	25.31	0.172	25.96	0	25.7
80.6	78.2	79.52	25.49	0.181	25.67	0	25.41
82	78.33	79.78	25.31	0.195	25.02	0	24.77
78.99	76.26	77.75	25.13	0.198	24.46	0	24.22
76.17	65.93	70.43	25.06	0.198	24.11	0	23.84
67.63	61.16	64.57	24.84	0.197	23.81	0	23.54
61.9	58.7	59.97	24.7	0.197	23.7	0	23.4
59.33	57.67	58.58	24.49	0.198	23.64	0	23.37
64.89	57.56	60.96	24.29	0.193	23.64	0	23.34
60.98	58.96	60.01	24.04	0.194	23.6	0	23.34
66.66	59.5	63.29	23.84	0.196	23.6	0	23.34
66.41	56.82	59.47	23.64	0.193	23.64	0	23.34
59.22	56.76	58.09	23.44	0.194	23.6	0	23.34
56.65	50.06	53.38	23.24	0.191	23.6	0	23.3
56.17	50.55	52.9	23	0.189	23.57	0	23.27
54.71	51	52.02	22.81	0.192	23.57	0	23.27
54.6	49.62	51.46	22.61	0.191	23.54	0	23.24

69.59	54.66	62.74	22.32	0.193	23.44	0	23.14
71.21	68.29	69.82	22.35	0.189	23.67	0	23.37
72.65	69.44	70.95	22.55	0.177	24.01	0	23.7
74.81	71.83	73.29	22.94	0.16	24.49	0	24.18
78.15	74.67	76.16	23.64	0.137	25.16	0	24.88
79.34	76.07	77.78	24.39	0.131	25.74	0	25.49
80.7	77.82	79.14	24.88	0.147	25.96	0	25.74
81.3	78.44	79.71	25.23	0.156	26	0	25.74
82.4	79.79	81.1	25.13	0.174	25.45	0	25.2
81.4	79.37	80.2	25.09	0.184	24.98	0	24.7
79.7	76	78.06	24.95	0.19	24.42	0	24.18
75.95	60.21	68.26	24.91	0.191	24.15	0	23.87
61.06	57.68	58.83	24.74	0.194	23.84	0	23.54
59.78	57.68	58.52	24.53	0.196	23.67	0	23.4
59.76	58.29	59	24.35	0.195	23.64	0	23.34
60.42	59.04	59.64	24.18	0.194	23.64	0	23.34
59.77	57.16	58.42	23.98	0.192	23.6	0	23.3
59.15	55.85	57.33	23.74	0.191	23.6	0	23.3
58.29	51.62	55.56	23.54	0.19	23.57	0	23.27
53.4	51.23	52.27	23.3	0.191	23.57	0	23.27
54.29	50.99	52.65	23.1	0.188	23.57	0	23.27
53.46	50.67	51.86	22.91	0.186	23.57	0	23.24
52.44	48.75	50.47	22.71	0.187	23.57	0	23.24
54.12	48.79	50.31	22.48	0.186	23.54	0	23.2
66.47	54.12	62.25	22.16	0.192	23.4	0	23.1
70.13	66.11	67.96	22.19	0.186	23.64	0	23.3
74.93	69.85	72.05	22.32	0.176	23.94	0	23.6
76.99	73.75	75.47	22.71	0.16	24.39	0	24.08
80.9	76	78.38	23.44	0.134	25.09	0	24.81
81.7	78.95	80.5	24.29	0.124	25.74	0	25.49
85.7	81.1	83.2	24.95	0.134	26.18	0	25.89
87.2	82.7	84.9	25.27	0.154	26.14	0	25.89
87.4	84.1	85.8	25.34	0.17	25.74	0	25.49
86.2	83.8	84.8	25.27	0.179	25.2	0	24.95
84.8	78.51	81.5	25.09	0.188	24.6	0	24.32
78.54	61.44	69.18	25.02	0.187	24.22	0	23.94
66.66	58.98	61.76	24.77	0.192	23.84	0	23.57
64.05	58.93	62.32	24.6	0.195	23.7	0	23.4
64.76	58.07	61.7	24.42	0.192	23.64	0	23.34
62.45	60.61	61.62	24.25	0.191	23.64	0	23.34
64.95	61.29	63.16	24.04	0.191	23.64	0	23.34
64.49	61.35	62.5	23.84	0.19	23.64	0	23.34
62.87	57.24	60.62	23.64	0.188	23.6	0	23.3
62.11	57.34	59.53	23.47	0.186	23.6	0	23.3
58.77	56.59	57.75	23.27	0.185	23.6	0	23.3
59.15	57.4	58.1	23.07	0.184	23.6	0	23.27
60.34	56.41	58.21	22.91	0.186	23.57	0	23.27

57.97	53.58	55.7	22.71	0.185	23.57	0	23.27
71.57	58.01	66.16	22.42	0.189	23.44	0	23.14
70.77	69.3	69.99	22.48	0.183	23.67	0	23.34
74.04	70.44	72.4	22.64	0.171	23.98	0	23.67
76.77	73.34	75.17	23	0.158	24.42	0	24.11
80.1	76.48	78.33	23.6	0.136	24.95	0	24.67
82.5	78.97	80.9	24.11	0.138	25.31	0	25.02
85.3	81.6	83.2	24.7	0.14	25.59	0	25.34
86.2	83.3	84.9	25.06	0.151	25.59	0	25.34
85.4	83.4	84.4	25.31	0.165	25.38	0	25.13
84.1	82.4	83.1	25.2	0.174	24.88	0	24.6
82.6	77.51	80.8	25.2	0.18	24.53	0	24.25
77.48	69.62	72.84	25.06	0.183	24.18	0	23.87
73.47	69.3	70.49	24.95	0.185	24.01	0	23.7
77.03	72.76	75.42	24.84	0.186	23.91	0	23.6
76.7	74.56	75.61	24.77	0.185	23.91	0	23.6
76.47	74.42	75.46	24.7	0.184	23.94	0	23.64
76.5	73.9	75.52	24.6	0.184	23.94	0	23.64
76.55	72.86	74.88	24.53	0.184	23.94	0	23.64
74.34	72.41	73.15	24.42	0.18	23.91	0	23.6
73.03	70.74	71.79	24.32	0.183	23.87	0	23.57
74.75	70.96	72.5	24.22	0.182	23.87	0	23.54
72.92	70.05	71.29	24.11	0.182	23.87	0	23.57
70.22	62.82	68.6	24.04	0.181	23.87	0	23.54
64.61	59.95	62.39	23.91	0.182	23.81	0	23.5
59.93	57.5	58.13	23.7	0.185	23.7	0	23.37
60.56	57.52	59.33	23.6	0.184	23.7	0	23.34
59.99	58.76	59.34	23.44	0.187	23.67	0	23.3
62.02	58.72	59.84	23.27	0.187	23.64	0	23.27
62.67	61.65	62.09	23.2	0.187	23.67	0	23.3
63.62	61.39	62.51	23.17	0.186	23.74	0	23.34
63.32	61.32	62.19	23.1	0.185	23.74	0	23.37
62.43	60.85	61.9	23.04	0.183	23.74	0	23.37
60.89	59.44	59.81	23	0.183	23.74	0	23.37
60.71	59.63	60.41	22.87	0.184	23.74	0	23.34
60.44	58.87	59.76	22.84	0.185	23.74	0	23.37
58.89	57.05	57.98	22.81	0.185	23.77	0	23.37
57.13	56.73	56.93	22.71	0.185	23.74	0	23.34
56.78	56.28	56.49	22.61	0.184	23.7	0	23.34
56.88	56.43	56.7	22.51	0.184	23.7	0	23.3
56.84	56.02	56.29	22.42	0.182	23.7	0	23.34
56.04	55.67	55.89	22.32	0.181	23.67	0	23.34
56.04	55.74	55.86	22.22	0.182	23.67	0	23.3
55.83	55.44	55.63	22.13	0.181	23.67	0	23.3
55.52	54.67	54.91	22.03	0.183	23.64	0	23.27
55.52	54.89	55.3	21.91	0.185	23.64	0	23.27
55.67	55.34	55.46	21.84	0.181	23.64	0	23.3

55.67	55.52	55.59	21.75	0.18	23.64	0	23.3
56.02	55.63	55.74	21.69	0.18	23.64	0	23.34
57.1	55.91	56.37	21.59	0.179	23.64	0	23.3
60.13	56.88	58.64	21.44	0.185	23.5	0	23.2
64.67	60.16	62.29	21.62	0.176	23.77	0	23.47
68.69	63.74	65.4	22	0.165	24.11	0	23.84
73.23	66.08	69.72	22.45	0.168	24.49	0	24.25
73.23	70.17	71.9	23.17	0.193	25.06	0	24.84
75.98	72.46	73.75	23.24	0.216	24.77	0	24.6
77.57	74.04	76.39	23.5	0.228	24.77	0	24.56
76.68	75.04	75.81	23.7	0.238	24.7	0	24.49
79.62	76.04	77.66	23.6	0.229	24.35	0	24.18
77.4	73.46	75.71	23.67	0.229	24.25	0	24.08
73.46	66.9	70.15	23.6	0.217	24.04	0	23.87
70.27	66.88	68.88	23.37	0.209	23.74	0	23.57
68.4	64.68	66.54	23.2	0.204	23.6	0	23.44
64.79	59.27	63.04	23	0.203	23.54	0	23.37
61.77	59.4	60.38	22.84	0.197	23.47	0	23.3
63.16	60.14	61.71	22.68	0.196	23.47	0	23.34
61.15	55.52	57.81	22.55	0.195	23.47	0	23.34
63.01	54.61	58.67	22.32	0.195	23.4	0	23.27
65.48	58.5	62.06	22.19	0.19	23.4	0	23.27
62.89	56.49	59.3	22.07	0.19	23.44	0	23.3
61.81	56.74	59.45	21.91	0.192	23.4	0	23.27
63.28	55.64	59.48	21.75	0.188	23.37	0	23.27
62.47	53.76	56.4	21.59	0.188	23.37	0	23.24
66.41	62.49	64.5	21.34	0.191	23.24	0	23.14
70.53	65.33	67.95	21.56	0.188	23.6	0	23.5
73.25	70.38	71.87	21.97	0.188	24.15	0	24.08
78.68	71.39	75.11	22.39	0.208	24.56	0	24.53
77.15	71.9	73.91	22.91	0.226	24.98	0	24.95
74.5	70.26	72.16	23.04	0.231	24.81	0	24.77
78.07	71.77	76.02	23.81	0.241	25.31	0	25.31
76.82	62.68	68.6	24.77	0.249	25.96	0	26.03
66.88	62.7	64.86	23.2	0.224	23.84	0	23.84
68.12	66.35	67.5	23.17	0.217	23.6	0	23.57
68.24	65.8	66.96	23.2	0.215	23.57	0	23.54
66.03	63.22	64.65	23.14	0.206	23.54	0	23.54
63.95	61.83	63.28	22.91	0.204	23.4	0	23.37
63.29	59.09	61.95	22.68	0.199	23.34	0	23.34
62.27	60.78	61.63	22.45	0.198	23.3	0	23.3
62.89	60.92	61.98	22.26	0.196	23.3	0	23.3
61.59	48.22	51.86	22.03	0.194	23.27	0	23.3
52.94	50.61	52.14	21.75	0.191	23.17	0	23.17
54.36	52.13	53.04	21.5	0.189	23.14	0	23.17
54.63	52.97	53.99	21.31	0.187	23.14	0	23.17
53.63	52.5	53.15	21.1	0.185	23.17	0	23.2

52.61	50.1	51.18	20.85	0.183	23.14	0	23.17
50.75	43.27	47.8	20.61	0.184	23.1	0	23.14
50.47	43.09	47.84	20.4	0.184	23.04	0	23.07
53.85	49.59	51.99	20.04	0.188	22.91	0	22.94
57.59	53.57	55.42	19.98	0.184	23.1	0	23.14
58.6	56.81	57.58	20.07	0.179	23.37	0	23.44
60.11	57.72	58.78	20.25	0.18	23.67	0	23.77
61.65	58.1	59.74	20.64	0.188	24.08	0	24.18
63.59	59.62	61.32	21.03	0.197	24.32	0	24.46
64.24	61.07	62.42	21.28	0.204	24.29	0	24.42
64.77	61.74	63.32	21.56	0.206	24.18	0	24.35
64.33	61.97	62.96	21.69	0.203	23.91	0	24.08
63.07	61.24	62.21	21.69	0.199	23.57	0	23.74
61.89	58.53	60.32	21.69	0.196	23.24	0	23.44
58.55	54.55	56.52	21.75	0.19	23.17	0	23.34
55.17	50.54	52.52	21.62	0.188	23	0	23.2
53.46	51.51	52.42	21.47	0.186	22.94	0	23.14
53.34	51.96	52.63	21.31	0.186	22.91	0	23.1
52.21	50.65	51.58	21.13	0.184	22.87	0	23.1
51.94	48.82	50.26	20.91	0.182	22.84	0	23.1
51.98	49.8	51.34	20.7	0.183	22.84	0	23.07
51.62	43.34	46.15	20.52	0.181	22.81	0	23.07
47.07	44.97	46.13	20.28	0.179	22.77	0	23.04
46.48	44.53	45.36	20.1	0	22.77	0	23.04
46.89	42.93	44.7	19.92	0	22.74	0	23.04
44.49	41.9	43.03	19.72	0	22.74	0	23.04
48.81	41.72	45.46	19.51	0	22.71	0	23
54.63	46.91	50.78	19.22	0	22.58	0	22.87
59.52	54.33	57.08	19.22	0	22.74	0	23.07
61.77	59.16	60.27	19.37	0.17	23	0	23.37
63.28	60.21	61.88	19.72	0.162	23.4	0	23.81
65.62	62.36	63.79	20.37	0.159	24.04	0	24.49
67.09	64.3	65.61	20.91	0.174	24.32	0	24.77
67.91	64.54	66.56	21.44	0.185	24.42	0	24.91
68.8	65.39	67.31	21.65	0.194	24.08	0	24.53
69.38	66.74	68.19	21.87	0.194	23.7	0	24.22
68.57	66.41	67.25	22.03	0.194	23.34	0	23.81
66.62	63.05	65.21	22.1	0.193	23	0	23.47
63.03	56.54	59.62	22.19	0.186	22.84	0	23.3
56.62	52.89	55.18	22.13	0.186	22.68	0	23.17
54.42	46.61	49.62	22	0.187	22.55	0	23.04
48.59	46.56	47.37	21.81	0.185	22.51	0	23
51.04	48.56	50.2	21.59	0.183	22.48	0	22.97
51.91	48.13	49.64	21.34	0.184	22.48	0	22.97
52.75	48.58	51.36	21.13	0.181	22.48	0	22.97
51.58	48.26	50.11	20.94	0.184	22.48	0	23
48.42	40.9	44.61	20.73	0.18	22.45	0	22.97

46.05	40.02	43.83	20.52	0.18	22.42	0	22.94
46.52	39.54	43.31	20.31	0	22.39	0	22.94
47.1	37.99	42.9	20.07	0	22.39	0	22.91
47.24	39.69	43.62	19.86	0	22.35	0	22.91
54.08	47.33	51.95	19.54	0	22.22	0	22.74
57.91	54.1	56.23	19.51	0	22.42	0	22.94
61.53	57.65	59.52	19.54	0.174	22.58	0	23.14
64.5	60.17	62.12	19.72	0.168	22.81	0	23.37
67.02	63.24	65.17	20.07	0.163	23.1	0	23.67
69.44	64.98	67.15	20.64	0.16	23.44	0	24.08
70.9	67.96	69.8	21.22	0.165	23.67	0	24.32
72.73	69.59	71.07	21.62	0.172	23.64	0	24.29
73.14	70.16	71.44	21.91	0.184	23.44	0	24.08
72.41	70.74	71.39	22.07	0.185	23.14	0	23.77
71.13	66.27	68.99	22.16	0.188	22.84	0	23.44
66.27	61.73	63.87	22.26	0.183	22.68	0	23.27
61.97	60.35	61.12	22.19	0.186	22.48	0	23.1
60.66	58.64	59.44	22.1	0.187	22.42	0	23
58.61	54.65	56.54	21.94	0.183	22.35	0	22.97
55.46	52.39	54.06	21.75	0.185	22.32	0	22.94
54.84	48.36	50.21	21.53	0.184	22.29	0	22.91
49.46	45.97	47.63	21.31	0.18	22.26	0	22.87
47.35	44.93	45.9	21.13	0.181	22.22	0	22.87
45.46	43.86	44.73	20.91	0.18	22.22	0	22.84
46.02	42.69	44.39	20.67	0.179	22.19	0	22.81
46.19	42.76	43.97	20.49	0.179	22.19	0	22.81
45.05	40.36	42.05	20.28	0	22.19	0	22.81
46.43	40.5	42.15	20.04	0	22.16	0	22.77
59.44	46.49	54.76	19.75	0	22.03	0	22.64
61.67	58.9	59.97	19.75	0	22.22	0	22.84
65.6	61.5	63.48	19.83	0.169	22.48	0	23.1
70.12	64.36	67.51	20.1	0.161	22.81	0	23.44
72.08	68.54	70.04	20.61	0.151	23.2	0	23.87
72.73	69.54	71.14	21.25	0.154	23.6	0	24.32
73.8	70.58	72.39	21.78	0.161	23.74	0	24.46
75.4	71.69	73.62	22.22	0.176	23.7	0	24.42
75.35	72.59	74.13	22.51	0.182	23.5	0	24.22
74.22	72.69	73.54	22.61	0.185	23.14	0	23.84
73.09	69.69	71.9	22.58	0.186	22.74	0	23.4
69.67	60.09	65.36	22.64	0.186	22.55	0	23.2
59.94	54.84	55.98	22.51	0.187	22.32	0	22.97
62.37	55.85	60.31	22.39	0.187	22.22	0	22.84
62.87	61.29	62.05	22.26	0.187	22.19	0	22.84
62.61	56.17	60.3	22.13	0.183	22.22	0	22.87
58.29	47.21	51.7	21.94	0.185	22.19	0	22.84
47.16	45.07	45.87	21.72	0.184	22.13	0	22.77
46.85	44.85	45.77	21.5	0.181	22.1	0	22.71

46.26	43.44	44.71	21.28	0.181	22.07	0	22.71
48.12	43.78	45.52	21.07	0.181	22.1	0	22.68
47.07	43.2	45.06	20.85	0.179	22.07	0	22.68
44.15	42.57	43.33	20.64	0.178	22.07	0	22.64
50.96	44.18	48.01	20.46	0.178	22.07	0	22.64
56.96	50.96	53.07	20.28	0	22.07	0	22.64
60.92	57	59.05	20.04	0.181	22	0	22.58
61.05	57.66	59.72	20.13	0.178	22.19	0	22.77
61.94	58.64	60.14	20.22	0.174	22.26	0	22.84
66.29	61.78	63.65	20.43	0.171	22.42	0	23
66.29	64.05	65.41	20.76	0.164	22.61	0	23.24
68.74	65.61	67.03	21.03	0.166	22.64	0	23.27
72.03	67.51	69.39	21.44	0.165	22.84	0	23.44
72.27	69.62	70.76	21.81	0.166	22.94	0	23.57
72.62	70.63	71.4	21.97	0.174	22.84	0	23.44
71.38	66.82	69.17	22	0.179	22.61	0	23.2
66.8	57.75	62.55	22.07	0.181	22.45	0	23.04
62.36	57.15	58.8	21.97	0.182	22.26	0	22.84
63.75	59.69	61.03	21.91	0.182	22.22	0	22.77
60.89	52.42	56.19	21.81	0.18	22.19	0	22.77
56.67	51.87	54.47	21.62	0.181	22.13	0	22.71
61.37	56.63	58.01	21.5	0.182	22.1	0	22.68
62.23	59.13	61.22	21.37	0.181	22.13	0	22.71
59.13	54.23	56.24	21.28	0.179	22.16	0	22.74
56.27	50.58	53.66	21.13	0.18	22.1	0	22.68
50.9	47.44	48.83	20.97	0.178	22.03	0	22.64
51.18	47.3	48.87	20.79	0.18	22	0	22.58
48.2	44.02	46.01	20.64	0.179	22	0	22.55
51.73	45.68	47.87	20.43	0.178	21.97	0	22.55
60.53	51.81	57.18	20.16	0	21.87	0	22.42
61.04	58.42	59.97	20.13	0.177	22	0	22.55
65.96	60.49	62.6	20.16	0.176	22.13	0	22.71
67.34	64.38	65.59	20.37	0.167	22.35	0	22.94
66.89	60.72	64.52	20.46	0.172	22.35	0	22.94
66.66	60.16	63.59	20.79	0.166	22.55	0	23.14
68.16	60.47	65.25	20.82	0.174	22.35	0	22.94
64.6	59.54	61.89	21.07	0.174	22.42	0	23
65.29	62.52	63.54	21.13	0.179	22.29	0	22.91
65.38	62.38	64.11	21.25	0.179	22.26	0	22.84
65.06	61.13	62.93	21.34	0.179	22.22	0	22.81
61.1	57.84	59.37	21.4	0.179	22.19	0	22.77
58.27	56.85	57.49	21.34	0.179	22.1	0	22.71
57.71	56.64	57.17	21.25	0.181	22.07	0	22.64
57.37	56.32	56.75	21.16	0.18	22.03	0	22.64
56.32	54.78	55.57	21.03	0.179	22.03	0	22.61
55.43	52.87	54.03	20.91	0.18	22	0	22.58
55.61	53.91	54.99	20.79	0.181	21.97	0	22.58

55.55	54.92	55.21	20.67	0.178	21.97	0	22.58
55.01	54.31	54.83	20.58	0.18	21.97	0	22.58
54.77	54.2	54.49	20.49	0.177	21.97	0	22.58
55.09	54.59	54.89	20.4	0.177	21.94	0	22.55
54.98	54.17	54.69	20.31	0.177	21.97	0	22.58
55.16	53.76	54.26	20.22	0.178	21.94	0	22.55
56.78	55.16	56.04	20.1	0.177	21.87	0	22.48
57.9	56.59	57.28	20.04	0.181	21.87	0	22.51
59.21	57.78	58.34	20.07	0.178	21.97	0	22.58
59.4	58.87	59.06	20.16	0.175	22.03	0	22.68
60.6	58.94	59.59	20.19	0.177	22	0	22.64
62.73	60.4	61.6	20.37	0.175	22.1	0	22.74
63.53	61.71	62.57	20.58	0.176	22.22	0	22.87
65.99	62.89	64.28	20.76	0.179	22.26	0	22.91
65.02	63.27	63.96	21	0.181	22.32	0	22.97
65.27	62.72	64.03	21.13	0.185	22.29	0	22.94
62.81	59.74	61.64	21.1	0.189	22.13	0	22.77
59.74	55.27	57.33	21.1	0.185	22.03	0	22.71
56.75	53.33	55.41	20.97	0.184	21.87	0	22.55
56.92	56.5	56.76	20.91	0.183	21.91	0	22.55
56.69	54.01	55.69	20.82	0.185	21.91	0	22.58
54.5	52.89	53.47	20.67	0.184	21.84	0	22.51
53.6	51.37	52.48	20.55	0.183	21.81	0	22.48
51.37	47.95	49.59	20.4	0.181	21.78	0	22.42
50.75	46.82	49.17	20.22	0.183	21.72	0	22.35
50.79	49.39	50	20.07	0.181	21.69	0	22.35
52.88	50.75	52.12	19.95	0.179	21.72	0	22.39
53.24	50.8	52.07	19.89	0.177	21.78	0	22.45
53.31	52.02	52.79	19.78	0.178	21.81	0	22.48
53.2	51.8	52.35	19.72	0.178	21.81	0	22.48
53.66	52.53	53.19	19.66	0.178	21.78	0	22.48
56.67	52.74	54.51	19.57	0.18	21.72	0	22.42
59.64	56.1	57.72	19.6	0.181	21.81	0	22.51
63.79	59.08	61.75	20.1	0.18	22.35	0	23.07
67.67	63.03	65.35	21.1	0.206	23.3	0	24.11
71.07	66.52	67.98	22.07	0.234	24.11	0	24.98
71.4	66.36	68.31	22.32	0.242	24.04	0	24.91
68.91	56.31	60.9	21.59	0.232	22.81	0	23.6
65.19	56.29	61.63	20.94	0.214	21.78	0	22.48
70.06	65.23	68.67	21.31	0.216	21.97	0	22.71
68.67	60.47	64.19	21.47	0.215	22.03	0	22.81
62.2	60.57	61.25	21.34	0.206	21.84	0	22.58
61.08	57.61	59.43	21.25	0.201	21.75	0	22.48
57.8	55.22	56.04	21.1	0.198	21.69	0	22.42
55.9	53.51	54.73	20.88	0.195	21.62	0	22.35
55.72	53.58	54.63	20.7	0.192	21.59	0	22.32
56.54	53.84	54.96	20.52	0.191	21.59	0	22.32

55.11	52.97	53.89	20.37	0.189	21.56	0	22.32
54.81	53.08	53.98	20.16	0.189	21.56	0	22.29
55.44	52.76	53.76	20.01	0.187	21.56	0	22.29
54.26	51.2	52.29	19.83	0.186	21.56	0	22.29
54.27	50.59	52.35	19.66	0.184	21.5	0	22.26
51	47.23	49.14	19.48	0	21.5	0	22.22
53.23	48.68	49.99	19.34	0	21.5	0	22.22
63.65	53.25	58.99	19.08	0	21.4	0	22.13
65.53	61.53	63.61	19.31	0.187	21.78	0	22.55
67.77	63.37	66.09	19.78	0.204	22.39	0	23.17
70.02	66.47	67.87	20.46	0.232	23.1	0	23.94
69.15	64.7	66.8	20.4	0.236	22.87	0	23.7
72.85	64.96	68.98	20.31	0.232	22.48	0	23.3
72.71	67.41	70.14	20.55	0.233	22.42	0	23.27
72.73	69.41	70.3	21.4	0.247	23.07	0	23.94
70.77	68.77	69.35	21.16	0.24	22.45	0	23.3
70.01	68.85	69.11	21.16	0.237	22.22	0	23.04
70.03	65.65	68.1	21.22	0.231	22.13	0	22.97
65.61	59.98	63.49	21.19	0.221	22	0	22.81
60.97	57.95	59.31	20.94	0.209	21.69	0	22.48
61.19	58.74	59.88	20.79	0.202	21.56	0	22.35
61.89	58.79	60.55	20.67	0.199	21.53	0	22.32
63.21	59.25	61.16	20.61	0.198	21.56	0	22.39
62.71	58.53	60.38	20.43	0.197	21.53	0	22.32
61.1	56.5	59.11	20.28	0.195	21.5	0	22.29
56.71	52.82	54.94	20.1	0.191	21.47	0	22.26
61.62	53.09	56.22	19.92	0.189	21.4	0	22.19
60.26	51.11	54.13	19.78	0.189	21.37	0	22.16
54.34	50.14	51.94	19.57	0.185	21.34	0	22.1
54.34	49.78	51.93	19.43	0.183	21.31	0	22.1
57.51	51.29	54	19.25	0	21.31	0	22.13
65.65	57.54	62.49	19.02	0	21.22	0	22.03
69.02	64.1	66.5	19.37	0.192	21.72	0	22.55
70.33	67.95	68.88	19.83	0.213	22.35	0	23.2
72.56	69.35	70.69	20.52	0.233	23.07	0	24.01
76.51	71.42	74.12	21.13	0.238	23.6	0	24.56
78.01	75.27	76.54	23.2	0.223	25.67	0	26.78
78.37	75.61	76.93	24.08	0.213	26.18	0	27.32
78.54	74.03	76.45	24.46	0.219	26.07	0	27.24
77.29	72.34	74.59	23.84	0.234	24.91	0	26
74.76	71.2	72.81	22.58	0.246	23.17	0	24.11
71.2	65.76	68.48	22.1	0.241	22.32	0	23.24
65.76	62.69	64.23	21.75	0.225	21.81	0	22.68
63.09	61.42	62.33	21.53	0.213	21.5	0	22.35
62.14	60.02	61.19	21.37	0.207	21.44	0	22.26
61.05	59.04	60.27	21.22	0.201	21.37	0	22.19
61.2	57.99	59.63	21.07	0.202	21.34	0	22.19

61.53	60.11	60.95	20.91	0.194	21.31	0	22.16
61	59.53	60.44	20.76	0.195	21.34	0	22.16
60.34	58.43	59.53	20.61	0.192	21.31	0	22.13
59.37	57.53	58.42	20.46	0.19	21.28	0	22.13
57.87	56.67	57.34	20.28	0.188	21.28	0	22.1
57.5	55.64	56.53	20.16	0.189	21.28	0	22.1
56.95	55.16	56.25	20.01	0.186	21.25	0	22.03
56.74	55.9	56.3	19.86	0.186	21.22	0	22.03
57.14	56.09	56.7	19.6	0.192	21.1	0	21.87
59.04	57.03	57.89	19.72	0.187	21.34	0	22.13
61.74	58.49	59.76	19.83	0.19	21.56	0	22.39
61.85	60.05	60.78	19.92	0.194	21.72	0	22.55
66.81	60.84	64.42	19.89	0.195	21.69	0	22.48
67.73	63.13	65.37	20.55	0.205	22.35	0	23.2
67.3	64.27	65.92	20.79	0.207	22.45	0	23.3
68.41	65.69	66.98	20.85	0.205	22.32	0	23.17
68.16	64.43	66.27	21	0.204	22.26	0	23.1
65.1	61.89	63.69	20.91	0.197	21.91	0	22.74
62.12	57.85	59.6	20.76	0.192	21.56	0	22.35
57.8	53.82	55.74	20.64	0.188	21.34	0	22.13
53.93	51.98	52.81	20.49	0.186	21.19	0	21.97
52.24	49.43	50.74	20.34	0.185	21.16	0	21.91
49.63	48.54	49.03	20.16	0.182	21.1	0	21.87
48.7	45.91	47.52	19.95	0	21.1	0	21.84
46.01	44.36	45.14	19.72	0	21.07	0	21.81
46.45	43.81	44.43	19.51	0	21.03	0	21.78
48.19	45.91	47.15	19.31	0	21.03	0	21.78
47.61	44.06	45.64	19.11	0	21.03	0	21.78
44.11	43.04	43.49	18.91	0	21	0	21.75
46.83	40.05	42.84	18.71	0	21	0	21.75
40.04	37.12	38.76	18.51	0	20.97	0	21.72
42.45	38.43	40.05	18.29	0	20.97	0	21.72
55.31	42.49	49.56	17.96	0	20.79	0	21.56
55.86	51.66	53.77	17.96	0	21	0	21.75
59.14	55.15	57.71	18.07	0	21.25	0	22.03
63.37	58.92	60.82	18.43	0.154	21.72	0	22.55
65.8	62.02	63.58	19.08	0.15	22.35	0	23.24
69.03	64.07	65.88	19.75	0.157	22.84	0	23.77
69.26	66.11	67.79	20.31	0.166	23.07	0	24.01
70.16	66.95	68.74	20.52	0.169	22.81	0	23.7
70.75	68.46	69.72	20.58	0.174	22.39	0	23.3
69.88	66.97	68.44	20.55	0.182	21.91	0	22.81
67.03	62.52	65.04	20.46	0.183	21.44	0	22.29
62.8	53.48	57.19	20.43	0.184	21.22	0	22.03
55.46	52.55	53.93	20.34	0.182	21	0	21.84
55.59	52.6	54.27	20.22	0.181	20.94	0	21.78
56.73	54.87	56	20.13	0.179	20.91	0	21.75

56.13	53.77	54.81	19.95	0	20.91	0	21.75
55.71	54.67	55.28	19.81	0	20.88	0	21.75
55.97	54.86	55.48	19.66	0	20.88	0	21.75
55.43	50.59	53.13	19.51	0	20.88	0	21.75
53.56	51.07	52.42	19.34	0	20.85	0	21.72
52.26	45.45	48.16	19.2	0	20.82	0	21.69
47.29	44.73	46.36	19.02	0	20.79	0	21.65
46.37	37.62	41.85	18.85	0	20.79	0	21.65
46.33	37.67	39.93	18.66	0	20.73	0	21.59
52.94	46.36	49.48	18.35	0	20.58	0	21.44
57.52	52.57	55.08	18.35	0	20.76	0	21.62
61.77	57.31	58.94	18.4	0	20.97	0	21.84
67.3	60.24	63.54	18.66	0.159	21.28	0	22.19
69.05	63.78	66.93	19.22	0.146	21.87	0	22.84
71.21	67.1	69.22	20.16	0.141	22.64	0	23.64
72.2	69.06	70.66	20.64	0.162	22.81	0	23.81
71.64	69.08	70.46	20.85	0.167	22.58	0	23.6
71.84	69.8	70.71	20.82	0.178	22.07	0	23.07
71.05	67.82	69.38	20.82	0.184	21.69	0	22.61
67.99	62.68	65.19	20.7	0.185	21.25	0	22.16
63.05	60.24	61.27	20.7	0.179	21.03	0	21.94
60.48	58.06	59.23	20.64	0.181	20.88	0	21.78
58.76	56.71	57.91	20.52	0.18	20.79	0	21.69
58.16	56.69	57.48	20.4	0.182	20.76	0	21.65
57.29	55.4	56.3	20.25	0.181	20.76	0	21.65
55.83	52.45	54.52	20.07	0.18	20.73	0	21.65
54.8	51.59	53.5	19.92	0.177	20.7	0	21.59
54.04	47.02	50.49	19.75	0	20.7	0	21.59
49.82	47.24	48.28	19.57	0	20.67	0	21.56
48.52	42.97	45.67	19.4	0	20.64	0	21.53
45.79	42.94	44.45	19.22	0	20.64	0	21.53
44.77	40.9	42.69	19.02	0	20.61	0	21.5
42.78	38.97	40.79	18.82	0	20.61	0	21.47
53.92	42.81	50.75	18.51	0	20.46	0	21.31
55.98	53.76	54.72	18.49	0	20.61	0	21.5
58.7	55.57	57.12	18.54	0	20.82	0	21.72
61.62	57.82	59.54	18.74	0.159	21.13	0	22
63.83	60	61.62	19.11	0.147	21.5	0	22.42
65.52	62.93	64.24	19.75	0.14	21.97	0	22.94
66.69	64.18	65.27	20.1	0.152	22.03	0	23
68.48	64.85	66.73	20.37	0.165	21.87	0	22.84
70.01	66.24	67.66	20.46	0.173	21.56	0	22.48
66.91	64.67	65.87	20.58	0.178	21.22	0	22.13
64.63	58.07	62.48	20.64	0.18	20.94	0	21.84
58.04	45.52	51.19	20.73	0.179	20.82	0	21.69
45.52	44.73	45.12	20.61	0.181	20.64	0	21.53
44.92	43.91	44.38	20.49	0	20.58	0	21.47

46.07	39.94	43.14	20.31	0	20.55	0	21.44
43.66	39.96	41.28	20.07	0	20.52	0	21.4
42.67	37.32	39.67	19.83	0	20.52	0	21.37
38.9	37.39	38.1	19.6	0	20.49	0	21.37
38.07	36.22	37	19.34	0	20.49	0	21.37
36.8	34.69	36.01	19.11	0	20.49	0	21.34
34.81	32.65	33.45	18.88	0	20.49	0	21.34
34.72	32.7	33.72	18.63	0	20.46	0	21.31
34.75	32.64	33.77	18.4	0	20.46	0	21.31
37.31	32.54	33.93	18.15	0	20.46	0	21.31
51.67	37.36	46.09	17.8	0	20.31	0	21.13
54.36	51.19	52.6	17.77	0	20.49	0	21.31
57.67	54.17	55.75	17.77	0	20.64	0	21.47
61.1	57.13	59	17.88	0	20.82	0	21.69
64.25	60.41	62.37	18.21	0	21.13	0	21.97
67.55	63.44	65.64	18.71	0.141	21.44	0	22.32
70.77	66.7	68.4	19.2	0.144	21.62	0	22.55
70.51	67.58	68.82	19.54	0.155	21.53	0	22.42
70.18	68.53	69.18	19.81	0.162	21.34	0	22.22
69.15	67.71	68.28	20.04	0.168	21.1	0	22
67.88	59	64.49	20.16	0.173	20.88	0	21.75
58.98	48.4	52.02	20.25	0.176	20.73	0	21.59
50.19	47.45	48.59	20.16	0	20.55	0	21.4
52.18	45.99	47.92	20.04	0	20.49	0	21.34
48.27	45.37	46.67	19.92	0	20.46	0	21.31
46.68	43.86	45.5	19.75	0	20.43	0	21.31
44.69	43.16	44.02	19.54	0	20.43	0	21.28
45.37	43.24	44.15	19.34	0	20.4	0	21.25
45.75	43.28	45.08	19.14	0	20.4	0	21.25
44.35	41.9	43.37	18.97	0	20.4	0	21.25
44.2	42.48	43.23	18.77	0	20.37	0	21.25
43.8	42.1	42.62	18.6	0	20.37	0	21.25
43.76	41.88	42.71	18.46	0	20.37	0	21.25
45.26	41.72	42.66	18.29	0	20.37	0	21.22
53.58	45.3	49.53	18.04	0	20.28	0	21.13
56.63	53.61	55.73	17.96	0	20.31	0	21.19
57.97	56.47	57.11	18.01	0	20.46	0	21.31
59.94	57.13	58.43	18.13	0	20.55	0	21.4
61.86	59.42	60.78	18.29	0	20.64	0	21.5
61.87	60.89	61.27	18.54	0	20.7	0	21.59
63.55	61.63	62.78	18.71	0	20.67	0	21.53
64.39	62.8	63.42	18.94	0	20.7	0	21.59
63.61	57.21	60.94	19.14	0.164	20.73	0	21.62
59.51	56.66	57.58	19.17	0	20.58	0	21.47
59.11	55.09	56.35	19.17	0	20.46	0	21.34
56.5	55.22	55.78	19.11	0	20.43	0	21.31
55.81	49.69	53.55	19.05	0	20.4	0	21.28

53.18	49.49	51.39	18.94	0	20.37	0	21.25
53.99	50.88	52.97	18.82	0	20.34	0	21.22
51.33	49.67	50.47	18.71	0	20.34	0	21.25
55.9	50.46	52.91	18.57	0	20.31	0	21.22
56.36	51.94	54.99	18.46	0	20.31	0	21.25
59.01	51.84	54.74	18.38	0	20.34	0	21.25
59.05	50.58	52.41	18.26	0	20.31	0	21.25
50.8	45.3	48.28	18.18	0	20.31	0	21.22
45.45	43.26	44.25	18.07	0	20.25	0	21.19
45.47	43.05	43.92	17.96	0	20.22	0	21.13
45.89	40.91	43.99	17.85	0	20.19	0	21.1
55.61	45.4	51.24	17.6	0	20.04	0	20.97
59.26	55.11	57.54	17.6	0	20.19	0	21.13
63.67	58.97	60.97	17.71	0	20.4	0	21.34
66.28	62.11	64.09	18.04	0	20.76	0	21.78
68.96	65.33	66.92	18.63	0.141	21.31	0	22.35
71.89	68.49	69.91	19.48	0.148	22.03	0	23.14
74.1	70.17	71.99	20.22	0.177	22.45	0	23.6
76.69	72.69	74.47	20.55	0.192	22.35	0	23.5
77.36	73.74	75.1	20.64	0.2	22	0	23.1
75.58	70.53	72.9	20.73	0.206	21.62	0	22.71
70.8	64.5	68.51	20.4	0.198	20.85	0	21.91
64.48	55.47	59.39	20.34	0.188	20.49	0	21.5
57.23	55.08	55.82	20.22	0.185	20.25	0	21.28
57.76	54.23	56	20.16	0.184	20.16	0	21.19
58.35	54.28	56.09	20.07	0.182	20.13	0	21.16
58.71	56.48	57.38	19.92	0	20.13	0	21.16
58.02	55.31	56.85	19.78	0	20.13	0	21.16
57.1	54.17	56	19.63	0	20.1	0	21.13
56.69	54.39	55.73	19.48	0	20.1	0	21.13
55.54	48.53	51.38	19.34	0	20.1	0	21.1
53.5	48.32	50.21	19.2	0	20.07	0	21.07
48.33	45.94	47.11	19.05	0	20.07	0	21.07
46.25	43.06	44.61	18.91	0	20.04	0	21.03
48.54	43.49	45.09	18.71	0	20.01	0	21
61.39	48.46	55.7	18.4	0	19.83	0	20.82
64.72	61.05	63.02	18.49	0	20.1	0	21.07
68.39	64.68	66.46	18.74	0	20.49	0	21.5
72.21	67.97	69.89	19.25	0.159	21.07	0	22.1
73.98	70.15	71.85	19.83	0.17	21.62	0	22.71
76.06	73.49	74.54	20.52	0.183	22.1	0	23.2
79.43	75.01	77.53	21.4	0.193	22.68	0	23.84
80.8	77.63	79	22.32	0.195	23.2	0	24.39
79.52	74.48	77.17	22.32	0.201	22.74	0	23.87
76.66	72.99	74.67	21.59	0.202	21.53	0	22.58
73.81	68.88	71.97	21.22	0.2	20.82	0	21.81
70.05	59.34	64.52	21.13	0.19	20.52	0	21.5

63.74	59.43	62.24	20.91	0.19	20.25	0	21.22
64.31	61.14	62.42	20.82	0.185	20.19	0	21.16
64.98	60.64	62.89	20.73	0.185	20.19	0	21.13
65.45	63.02	64.6	20.61	0.183	20.19	0	21.13
64.63	62.28	63.58	20.49	0.181	20.22	0	21.16
67.28	56.87	60.13	20.34	0.182	20.19	0	21.13
67.21	58.33	62.39	20.19	0.181	20.16	0	21.07
65.71	60.01	62.62	20.1	0.18	20.19	0	21.1
64.51	58.54	60.95	19.98	0	20.19	0	21.1
66.28	63.86	64.74	19.86	0.179	20.19	0	21.1
65.58	61.74	63.7	19.78	0.175	20.22	0	21.1
65.34	58.45	63.57	19.66	0	20.22	0	21.1
63.07	58.52	61.31	19.43	0	20.1	0	20.94
67.07	61.7	64.52	19.46	0.178	20.25	0	21.1
70.39	66.62	68.28	19.66	0.171	20.55	0	21.4
76.9	68.62	72.46	20.04	0.164	20.97	0	21.84
77.97	75.35	76.55	20.85	0.159	21.78	0	22.71
78.75	76.1	77.44	21.75	0.172	22.58	0	23.54
79.8	76.52	78.18	22.45	0.179	23	0	23.98
79.61	76.73	78.01	22.61	0.185	22.84	0	23.81
78.46	73.34	75.64	22.29	0.19	22.16	0	23.07
76.04	73.58	74.83	21.78	0.191	21.31	0	22.16
73.62	66.29	70.64	21.53	0.192	20.82	0	21.65
66.46	59.65	63.35	21.37	0.187	20.55	0	21.31
60.23	58.75	59.51	21.19	0.186	20.31	0	21.1
59.87	57.07	58.79	21.07	0.186	20.25	0	21
57.92	55.74	56.57	20.91	0.184	20.22	0	20.97
57.08	55.2	56.08	20.73	0.182	20.19	0	20.94
56.43	54.57	55.46	20.55	0.181	20.19	0	20.91
55.22	53.31	54.67	20.37	0.179	20.19	0	20.91
56.02	53.18	54.62	20.22	0	20.19	0	20.88
58.7	51.91	53.91	20.04	0	20.19	0	20.88
54.74	52.05	53.63	19.89	0	20.19	0	20.85
54.95	51.45	53.78	19.72	0	20.19	0	20.85
55.84	49	52.6	19.57	0	20.19	0	20.82
50.11	45.26	47.57	19.37	0	20.16	0	20.79
62.22	49.31	55.98	19.08	0	20.01	0	20.64
64.94	61.18	63.01	19.08	0	20.22	0	20.82
69.95	64.9	67.53	19.25	0.167	20.52	0	21.16
71.37	68.52	69.93	19.63	0.158	21	0	21.65
73.14	70.78	71.73	20.13	0.152	21.5	0	22.16
74.27	71.16	72.42	20.73	0.156	21.94	0	22.61
75.54	72.61	74	21.28	0.169	22.19	0	22.87
76.33	73.65	74.81	21.44	0.178	22	0	22.68
75.58	73.39	74.74	21.53	0.183	21.69	0	22.32
75.47	73.43	74.34	21.47	0.184	21.25	0	21.87
75.47	66.21	71.8	21.34	0.185	20.85	0	21.44

66.17	60.68	62.36	21.31	0.181	20.61	0	21.19
67.09	60.88	63.15	21.19	0.184	20.43	0	20.97
66.8	62.69	64.88	21.13	0.182	20.4	0	20.97
65.81	62.38	64.49	21.07	0.181	20.4	0	20.94
64.45	62.59	63.33	20.94	0.182	20.37	0	20.94
64.01	62.53	63.24	20.79	0.179	20.37	0	20.91
63.54	61.14	62.04	20.64	0.179	20.34	0	20.88
62.03	58.18	60.22	20.49	0.178	20.31	0	20.85
61.9	60.38	61.06	20.34	0.178	20.31	0	20.85
60.84	59.15	60.18	20.22	0	20.34	0	20.85
60.46	58.16	59.25	20.1	0	20.31	0	20.82
58.92	51.98	53.43	19.95	0	20.31	0	20.82
54.91	51.85	52.94	19.78	0	20.28	0	20.76
64.43	54.92	60.69	19.51	0	20.16	0	20.64
67.77	64.35	65.62	19.54	0	20.34	0	20.82
70.35	66.81	68.63	19.72	0.166	20.67	0	21.16
74.69	69.68	71.88	20.19	0.148	21.22	0	21.72
74.73	71.8	73.05	20.67	0.139	21.69	0	22.22
76.05	72.43	74.13	21.16	0.143	22.1	0	22.61
78.15	74.41	76.27	21.44	0.158	22.07	0	22.58
77.77	75.35	76.43	21.65	0.169	21.94	0	22.48
78.93	76.36	77.41	21.87	0.173	21.81	0	22.32
77.14	73.53	75.49	21.97	0.175	21.53	0	22
73.51	69.52	71.9	21.75	0.178	21.03	0	21.5
69.65	62.09	66.29	21.62	0.178	20.76	0	21.19
63.4	60.71	62.3	21.5	0.183	20.55	0	20.97
60.71	59.04	59.77	21.37	0.182	20.46	0	20.88
61.2	59.1	60.27	21.22	0.181	20.43	0	20.85
61.31	57.46	59.97	21.1	0.18	20.43	0	20.85
59.46	57.03	58.22	20.91	0.179	20.43	0	20.82
59.2	56.58	57.99	20.73	0.179	20.4	0	20.79
60.42	56.5	58.31	20.58	0.177	20.4	0	20.79
59.72	51.37	54.94	20.4	0.176	20.4	0	20.76
52.11	48.35	49.95	20.22	0	20.37	0	20.73
52.04	46.39	48.91	20.04	0	20.34	0	20.7
46.36	44.44	45.31	19.86	0	20.34	0	20.7
48.85	43.99	46.28	19.69	0	20.34	0	20.67
63.46	48.89	56.42	19.37	0	20.22	0	20.55
66.27	62.4	63.91	19.37	0	20.4	0	20.73
69.45	64.51	66.76	19.48	0	20.67	0	20.97
76.25	69.03	72.71	19.78	0.152	21	0	21.34
75.42	71.19	73.28	20.28	0.14	21.5	0	21.87
82.2	74.3	77.17	21	0.133	22.1	0	22.48
84.1	79.95	81.8	21.84	0.137	22.68	0	23.07
83.2	80.4	81.6	22.55	0.144	23.04	0	23.44
82	78.58	79.95	22.39	0.157	22.45	0	22.84
79.07	75.31	77.25	21.94	0.172	21.69	0	22.03

75.29	69.94	72.61	21.62	0.178	21.1	0	21.4
69.9	62.98	66.78	21.5	0.177	20.82	0	21.13
68.19	65.61	67.13	21.37	0.179	20.67	0	20.94
67.23	65.52	66.51	21.28	0.179	20.58	0	20.88
66.72	64.98	65.93	21.16	0.179	20.58	0	20.85
66.06	64.55	65.33	21.03	0.178	20.58	0	20.85
65.32	63.39	64.03	20.91	0.177	20.58	0	20.85
64.75	62.32	63.61	20.79	0.176	20.55	0	20.85
64	61.39	62.55	20.67	0.176	20.55	0	20.82
63.92	61.16	62.09	20.55	0.175	20.55	0	20.82
62.53	60.65	61.73	20.4	0.173	20.52	0	20.79
63.68	60.9	61.78	20.28	0	20.52	0	20.79
62.08	50.51	55.04	20.16	0	20.52	0	20.76
51.41	45.71	48.29	19.95	0	20.46	0	20.7
61.6	47.29	56.45	19.66	0	20.31	0	20.55
70.44	60.51	64.06	19.66	0	20.49	0	20.7
75.53	70.31	73.05	19.75	0	20.73	0	20.97
78.13	73.88	76.14	20.1	0.148	21.19	0	21.44
80.4	76.6	78.38	20.7	0.128	21.81	0	22.1
82	79.24	80.5	21.44	0.118	22.45	0	22.74
81.4	78.79	80.1	21.81	0.135	22.58	0	22.87
81.2	79.07	80	21.87	0.152	22.32	0	22.61
80.3	76.76	78.38	21.94	0.159	22.07	0	22.32
77.16	74.52	75.98	21.65	0.169	21.47	0	21.72
74.52	67.91	72	21.53	0.174	21.1	0	21.34
69.15	58.88	65.45	21.44	0.175	20.88	0	21.1
65.73	57.8	60.53	21.31	0.18	20.67	0	20.91
66.22	63.95	65.12	21.16	0.177	20.61	0	20.82
64.91	62.42	63.78	21.1	0.176	20.64	0	20.85
63.87	60.11	62.78	20.94	0.177	20.61	0	20.82
63.22	60.3	62.47	20.79	0.176	20.58	0	20.79
62.29	53.45	58.18	20.64	0.174	20.61	0	20.79
62	54.12	59.42	20.46	0	20.55	0	20.73
61.68	60.12	61.01	20.34	0	20.55	0	20.76
60.45	59.27	59.96	20.22	0	20.58	0	20.76
61.6	58.36	59.8	20.07	0	20.58	0	20.76
61.8	59.4	60.78	19.95	0	20.58	0	20.76
61.64	58.19	59.71	19.83	0	20.58	0	20.76
66.4	60.07	63.98	19.6	0	20.46	0	20.64
68.46	66.36	67.38	19.66	0	20.64	0	20.79
72.72	66.83	69.22	19.72	0	20.79	0	20.94
75.46	71.74	73.22	19.92	0.16	21	0	21.19
77.2	73.95	75.59	20.31	0.148	21.37	0	21.56
78.05	73.97	75.82	20.85	0.135	21.81	0	22.03
77.36	74.3	75.91	20.91	0.144	21.69	0	21.87
78.97	75.44	76.85	21.1	0.15	21.62	0	21.81
77.94	74.57	76.17	21.28	0.158	21.56	0	21.75

76.7	72.29	74.55	21.28	0.165	21.34	0	21.5
72.25	67.12	69.94	21.25	0.169	21.1	0	21.25
67.42	64.4	65.84	21.19	0.172	20.88	0	21.07
65.58	63.5	64.59	21.1	0.174	20.76	0	20.91
63.9	61.73	62.8	20.97	0.176	20.7	0	20.85
61.88	60.43	61.16	20.88	0.176	20.67	0	20.82
61.39	60.31	60.8	20.73	0.176	20.64	0	20.79
62.73	60.85	61.78	20.61	0.176	20.64	0	20.79
62.93	61.62	62.27	20.52	0.174	20.64	0	20.82
62.92	61.74	62.28	20.4	0.172	20.64	0	20.82
62.51	60.92	61.83	20.31	0	20.67	0	20.82
62.72	60.77	61.81	20.22	0	20.67	0	20.82
62.06	59.5	60.84	20.13	0	20.67	0	20.82
60.77	58.81	59.86	20.01	0	20.64	0	20.79
62.06	59.96	60.74	19.92	0	20.64	0	20.79
61.24	60.17	60.76	19.72	0	20.55	0	20.67
65.42	60.79	62.83	19.72	0	20.61	0	20.76
71.84	65.46	68.82	19.78	0	20.76	0	20.91
76.25	71.04	73.55	20.01	0.157	21.07	0	21.22
77.92	73.69	75.96	20.46	0.14	21.5	0	21.69
77.98	75.24	76.56	21.07	0.125	22	0	22.19
80.1	76.89	77.8	21.37	0.132	22.1	0	22.32
78.06	76.12	77.12	21.53	0.144	22	0	22.22
76.4	74.21	75.12	21.44	0.157	21.65	0	21.84
74.44	71.63	73.02	21.31	0.167	21.28	0	21.44
71.61	67.03	69.57	21.25	0.173	21.03	0	21.19
68.03	63.76	66.06	21.19	0.172	20.88	0	21.03
65.44	62.57	64.06	21.1	0.177	20.76	0	20.91
63.11	59.65	61.53	20.97	0.177	20.7	0	20.85
61.44	60.15	60.85	20.85	0.176	20.67	0	20.82
60.34	58.9	59.49	20.73	0.176	20.67	0	20.82
59.09	52.53	56.6	20.58	0	20.61	0	20.79
57.89	48.62	53.49	20.4	0	20.58	0	20.73
48.94	44.63	45.81	20.25	0	20.55	0	20.73
49.14	46.22	47.27	20.04	0	20.52	0	20.67
47.7	44.83	46.03	19.86	0	20.52	0	20.67
47.86	42.59	45.85	19.66	0	20.52	0	20.64
47.63	42.18	44.86	19.48	0	20.49	0	20.64
45.43	41.96	43.7	19.31	0	20.49	0	20.61
55.19	44.3	50.54	19.02	0	20.4	0	20.52
60.8	54.7	57.31	18.97	0	20.52	0	20.64
64.55	60	62.29	19	0	20.7	0	20.82
67.88	64.25	66.13	19.14	0	20.91	0	21.07
73.53	66.7	70.42	19.48	0.149	21.25	0	21.4
76.33	69.59	71.59	20.04	0.131	21.69	0	21.91
76.77	74.64	75.72	20.64	0.122	22.1	0	22.29
76.75	74.16	75.55	21.03	0.128	22.19	0	22.35

75.98	73.13	74.24	21.07	0.146	21.84	0	22.03
73.55	71.14	72.49	20.97	0.161	21.4	0	21.59
71.14	67.07	69.29	20.88	0.168	21.07	0	21.25
67.48	62.73	65.14	20.82	0.17	20.85	0	21.03
64.11	62.2	63.1	20.73	0.174	20.7	0	20.88
63.05	56.02	60.03	20.64	0	20.64	0	20.82
60.95	55.37	59.18	20.52	0	20.61	0	20.79
60.8	53.55	56.13	20.4	0	20.58	0	20.76
57.78	54.68	56.13	20.22	0	20.55	0	20.73
56.58	53.62	55.36	20.07	0	20.55	0	20.73
56.06	49.24	52.93	19.92	0	20.52	0	20.7
52.77	48.15	51.52	19.75	0	20.49	0	20.7
51.29	44.77	48.54	19.57	0	20.49	0	20.67
47.75	39.09	42.42	19.4	0	20.46	0	20.64
43.66	38.16	39.97	19.2	0	20.43	0	20.61
43.35	35.01	38.03	19	0	20.43	0	20.61
50.71	39.59	47.5	18.68	0	20.28	0	20.46
53.68	50.67	52.25	18.6	0	20.43	0	20.61
57.4	53.46	55.18	18.57	0	20.55	0	20.73
59.16	56.3	57.42	18.6	0	20.7	0	20.88
61.06	58.04	59.56	18.71	0	20.85	0	21.03
63	59.66	61.4	19.02	0	21.07	0	21.28
64.9	61.77	63.51	19.37	0.144	21.22	0	21.44
65.63	63.45	64.39	19.63	0.147	21.19	0	21.4
65.47	63.83	64.53	19.81	0.155	21.03	0	21.28
64.72	62.24	63.74	19.95	0.163	20.85	0	21.1
62.4	54.78	59.02	20.07	0	20.73	0	20.94
54.76	47.69	51.64	20.1	0	20.61	0	20.82
52.64	41.67	50.65	20.01	0	20.46	0	20.7
47.18	39.3	41.95	19.86	0	20.43	0	20.64
48.17	39.61	44.17	19.66	0	20.34	0	20.58
43.04	37.22	39.76	19.48	0	20.34	0	20.61
42.83	36.56	39.05	19.25	0	20.34	0	20.58
41.38	33.47	36.51	19.02	0	20.31	0	20.58
34.66	31.19	33.13	18.77	0	20.31	0	20.55
34.91	33.04	33.97	18.54	0	20.31	0	20.55
33.24	30.07	31.65	18.32	0	20.28	0	20.55
30.79	28.13	29.59	18.1	0	20.28	0	20.55
31.52	29.45	30.78	17.88	0	20.25	0	20.55
31.81	29	29.96	17.66	0	20.25	0	20.52
48.71	31.83	39.63	17.31	0	20.1	0	20.4
51.36	48.57	49.62	17.23	0	20.25	0	20.52
54.85	50.6	52.57	17.2	0	20.37	0	20.67
58.24	54.18	56.22	17.23	0	20.49	0	20.79
60.92	56.84	58.74	17.39	0	20.64	0	20.94
63.24	58.82	61.24	17.66	0	20.79	0	21.13
64.76	61.78	63.24	18.04	0	20.91	0	21.25

66.18	63.87	64.92	18.38	0	20.91	0	21.28
66.02	64.26	65.05	18.66	0	20.82	0	21.19
65.09	62.76	63.9	18.88	0	20.67	0	21.03
62.8	47.47	57.16	19.11	0	20.55	0	20.94
47.91	44.66	46.49	19.17	0	20.4	0	20.79
44.98	43.59	44.3	19.11	0	20.28	0	20.67
44.9	43.93	44.45	19.02	0	20.22	0	20.64
44.21	43.04	43.66	18.88	0	20.19	0	20.61
43.42	42.05	42.83	18.74	0	20.16	0	20.61
44.91	37.02	40.92	18.54	0	20.13	0	20.58
38.66	36.91	37.87	18.38	0	20.13	0	20.58
39.51	37.78	38.85	18.18	0	20.1	0	20.55
38.12	35.86	36.83	18.01	0	20.07	0	20.55
36.01	34.76	35.54	17.82	0	20.07	0	20.55
35.79	34.01	34.77	17.66	0	20.07	0	20.52
36.65	33.57	35.18	17.47	0	20.04	0	20.55
34.55	32.37	33.52	17.31	0	20.04	0	20.55
52.47	34.6	43.29	17.04	0	19.92	0	20.43
54.72	52.11	53.32	16.96	0	20.01	0	20.52
57.65	54.48	55.78	16.96	0	20.16	0	20.67
60.56	56.96	58.69	17.04	0	20.31	0	20.82
63.97	60.3	62.2	17.25	0	20.49	0	21.03
66.86	63.1	65.33	17.63	0	20.7	0	21.28
70.3	66.61	68.1	18.1	0	20.91	0	21.5
71.98	69.17	70.65	18.46	0	20.94	0	21.56
72.88	71.35	72.07	18.74	0	20.82	0	21.44
72.14	69.82	71.27	18.97	0	20.61	0	21.22
69.8	53.33	63.66	19.11	0	20.4	0	21.03
53.28	49.34	50.85	19.14	0	20.19	0	20.82
49.61	48.74	49.17	19.11	0	20.07	0	20.67
56.28	49.49	51.64	19.08	0	20.01	0	20.64
58.23	49.96	55.47	19	0	19.98	0	20.64
58.04	48.26	53.16	18.85	0	19.95	0	20.61
51.14	43.16	46.73	18.74	0	19.95	0	20.61
49.76	43.16	47.58	18.57	0	19.89	0	20.58
52.64	43.44	46.69	18.43	0	19.89	0	20.55
53.34	43.72	51.23	18.29	0	19.86	0	20.55
53.58	43.67	50.4	18.13	0	19.86	0	20.55
48.95	40.98	44.71	17.99	0	19.86	0	20.55
44.02	40.22	41.49	17.82	0	19.83	0	20.52
42.81	40.02	41.25	17.69	0	19.81	0	20.52
56.82	42.83	50.82	17.44	0	19.72	0	20.4
59.15	56.68	57.7	17.41	0	19.83	0	20.55
63.66	58.97	61.15	17.47	0	19.98	0	20.67
68.84	63.76	65.84	17.6	0	20.16	0	20.88
72.36	68.4	70.81	17.9	0	20.43	0	21.19
80.8	72.38	77.82	18.26	0	20.64	0	21.4

81.5	78.39	80.3	18.85	0.118	21	0	21.81
81.9	77.53	79.52	19.48	0.113	21.28	0	22.13
80.5	76.27	78.94	19.63	0.134	21.03	0	21.84
79.14	75.18	76.86	19.69	0.152	20.67	0	21.47
76.05	67.07	72.36	19.75	0.157	20.4	0	21.19
67.07	60.44	62.88	19.75	0	20.16	0	20.94
63.45	59.86	61.45	19.69	0	19.98	0	20.76
61.57	58.29	59.91	19.66	0	19.92	0	20.7
62.1	60.69	61.29	19.57	0	19.86	0	20.67
61.14	59.02	60.25	19.48	0	19.86	0	20.64
62.04	59.96	60.91	19.37	0	19.83	0	20.64
61.3	56.95	58.58	19.22	0	19.83	0	20.61
63.58	57.53	60.8	19.14	0	19.83	0	20.61
63.6	58.9	62.11	19.02	0	19.81	0	20.61
59.55	54.55	57.03	18.94	0	19.83	0	20.61
57.85	53.71	55.6	18.82	0	19.81	0	20.58
54.78	52.86	53.89	18.71	0	19.78	0	20.55
55.25	51.1	53.11	18.6	0	19.75	0	20.52
58.1	53.69	55.6	18.38	0	19.63	0	20.4
63.58	57.63	59.9	18.35	0	19.75	0	20.52
70.75	63.68	67.98	18.4	0	19.89	0	20.67
73.71	70.31	72.18	18.6	0	20.16	0	20.94
74.52	72.81	73.57	18.88	0	20.43	0	21.22
77.93	72.3	75.56	19.28	0.137	20.67	0	21.47
79	74.32	76.57	19.92	0.12	21.1	0	21.94
76.36	73.87	74.56	20.1	0.138	20.88	0	21.72
74.85	73.81	74.22	19.98	0.157	20.37	0	21.16
73.88	72.08	73.06	20.13	0.162	20.22	0	21
72.92	61.11	67.85	20.22	0	20.1	0	20.85
63.05	57.59	59.3	20.25	0	20.01	0	20.76
64.33	56.3	59.39	20.13	0	19.86	0	20.61
62.93	56.37	59.29	20.01	0	19.81	0	20.55
61.68	60.07	60.91	19.89	0	19.78	0	20.52
62.47	59.95	61.49	19.78	0	19.78	0	20.52
62.11	60.45	61.14	19.66	0	19.81	0	20.52
61.83	57.83	59.72	19.54	0	19.81	0	20.55
60.47	55.59	57.65	19.43	0	19.81	0	20.52
61.84	56.13	58.61	19.28	0	19.78	0	20.49
57.14	51.51	54.69	19.17	0	19.78	0	20.49
53.45	48.81	51.45	19.05	0	19.75	0	20.46
53.78	50.66	52.1	18.91	0	19.72	0	20.43
54.16	51.25	52.33	18.77	0	19.75	0	20.43
58.9	53.75	56.29	18.57	0	19.63	0	20.31
60.17	56.26	57.77	18.51	0	19.72	0	20.4
63.26	59.57	61.5	18.51	0	19.78	0	20.46
66.19	62.72	63.98	18.6	0	19.89	0	20.55
69.39	65.8	67.93	18.77	0	20.01	0	20.67

73.28	67.28	71.07	19	0	20.1	0	20.76
72.75	69.67	70.6	19.22	0	20.16	0	20.82
71.18	69.2	70.3	19.43	0	20.13	0	20.82
70.37	69.14	69.85	19.6	0	20.13	0	20.79
70.41	68.41	69.45	19.72	0	20.1	0	20.76
68.41	65.21	66.98	19.83	0	20.1	0	20.76
65.46	59.35	62.75	19.83	0	20.01	0	20.67
60.77	57.32	59.22	19.75	0	19.89	0	20.52
63.13	58.06	61.25	19.66	0	19.83	0	20.46
62.73	57.44	60.23	19.57	0	19.83	0	20.49
62.95	54.15	59.27	19.48	0	19.83	0	20.46
54.12	52.18	53.42	19.37	0	19.83	0	20.46
52.67	51.51	52.07	19.25	0	19.78	0	20.4
53.66	50.4	51.73	19.14	0	19.75	0	20.37
51.95	51.15	51.52	19	0	19.75	0	20.37
52.31	49.37	50.3	18.88	0	19.75	0	20.37
50.88	49.41	50.06	18.74	0	19.75	0	20.34
50.02	49.45	49.76	18.63	0	19.75	0	20.34
51.53	49.91	50.62	18.49	0	19.72	0	20.34
58.47	51.53	54.08	18.26	0	19.6	0	20.19
60.03	56.39	58.27	18.24	0	19.66	0	20.28
63.61	59.75	60.83	18.32	0	19.81	0	20.4
62.76	59.81	61.11	18.4	0	19.92	0	20.55
66.33	62.12	64.63	18.51	0	19.98	0	20.58
67.63	64.92	65.81	18.94	0	20.31	0	20.94
68.62	65.51	66.43	19.17	0	20.4	0	21.03
69.73	66.04	67.49	19.22	0	20.22	0	20.85
68.6	65.72	66.68	19.46	0	20.22	0	20.85
68.09	65.43	66.34	19.48	0	20.07	0	20.7
66.6	61.44	64.18	19.57	0	20.01	0	20.64
61.44	54.07	57.33	19.57	0	19.89	0	20.52
54.53	51.06	52.49	19.46	0	19.78	0	20.37
51.33	50.22	50.86	19.34	0	19.72	0	20.34
50.75	49.55	50.11	19.22	0	19.69	0	20.31
50.36	49.1	49.66	19.05	0	19.66	0	20.28
49.94	48.19	49.04	18.88	0	19.66	0	20.28
48.61	46.76	47.38	18.71	0	19.66	0	20.25
47.2	46.32	46.71	18.54	0	19.63	0	20.25
46.86	45.39	45.91	18.38	0	19.63	0	20.25
46.02	44.27	44.99	18.21	0	19.63	0	20.22
44.66	43.8	44.18	18.04	0	19.63	0	20.22
43.79	42.68	43.1	17.9	0	19.6	0	20.22
43.24	42.31	42.87	17.71	0	19.6	0	20.19
54.84	43.17	47.61	17.47	0	19.48	0	20.07
55.74	54.13	54.89	17.41	0	19.57	0	20.16
59.45	55.41	57.26	17.41	0	19.72	0	20.31
64	59.39	61.59	17.55	0	19.89	0	20.52

66.6	62.96	64.92	17.8	0	20.13	0	20.79
69.47	65.21	67.15	18.26	0	20.49	0	21.16
70.56	67.55	69.14	18.68	0.147	20.7	0	21.37
71.82	69.06	70.62	18.91	0.16	20.61	0	21.31
71.66	69.66	70.71	19.02	0.168	20.4	0	21.07
70.87	68.59	69.39	19.11	0	20.16	0	20.82
68.63	57.8	64.41	19.2	0	19.95	0	20.61
57.7	52.29	54.81	19.2	0	19.78	0	20.43
54.42	49.86	52.32	19.08	0	19.63	0	20.28
57.42	48.24	51.93	19	0	19.6	0	20.25
48.52	47.75	48.15	18.88	0	19.57	0	20.22
48.82	47.36	48.15	18.74	0	19.54	0	20.19
48.97	47.08	47.96	18.57	0	19.51	0	20.19
49.9	47.45	48.36	18.4	0	19.51	0	20.19
48.73	46.8	47.73	18.24	0	19.48	0	20.16
48.14	45.6	46.9	18.1	0	19.48	0	20.16
47.25	45.34	46.26	17.96	0	19.48	0	20.16
46.09	44.59	45.27	17.82	0	19.48	0	20.16
44.81	43.01	43.61	17.69	0	19.48	0	20.16
44.39	41.93	43.11	17.52	0	19.46	0	20.13
55.92	44.32	49.77	17.28	0	19.34	0	20.01
58.91	55.95	57.89	17.23	0	19.43	0	20.1
61.26	58.64	59.86	17.28	0	19.57	0	20.28
64.95	60.95	62.7	17.44	0	19.78	0	20.49
66.95	64.13	65.39	17.82	0	20.1	0	20.82
69.34	65.88	67.67	18.21	0	20.37	0	21.1
71.22	68.68	69.94	18.54	0.159	20.43	0	21.19
73.08	70	71.13	18.85	0.166	20.43	0	21.16
72.47	71.15	71.81	19.02	0.173	20.25	0	21
71.52	68.71	70.24	19.2	0.176	20.07	0	20.82
68.67	62.11	65.4	19.25	0	19.86	0	20.61
63.89	61.29	63.04	19.25	0	19.69	0	20.4
62.32	56.56	59.61	19.22	0	19.6	0	20.31
62.25	57.88	60.02	19.17	0	19.54	0	20.28
61.43	55.13	59.52	19.08	0	19.51	0	20.22
61	54.42	56.61	18.97	0	19.46	0	20.22
59.36	51.21	54.65	18.85	0	19.46	0	20.19
54.35	51.95	53.02	18.71	0	19.43	0	20.16
54.78	52.6	53.59	18.6	0	19.43	0	20.16
53.02	50.13	51.61	18.46	0	19.43	0	20.16
51.94	49.35	50.49	18.32	0	19.4	0	20.13
51.74	47.97	49.59	18.18	0	19.4	0	20.13
50.61	47.13	49.01	18.07	0	19.37	0	20.1
52.28	46.98	49.27	17.93	0	19.37	0	20.1
53.86	48.89	51.52	17.74	0	19.31	0	20.04
62.16	53.86	57.84	17.58	0	19.25	0	19.98
66.39	59.85	62.77	17.63	0	19.46	0	20.19

74.34	66.26	70.3	17.85	0	19.75	0	20.49
75.38	73.46	74.41	18.15	0	20.04	0	20.79
74.34	72.9	73.56	18.49	0	20.22	0	21
74.02	71.95	72.75	18.6	0	20.1	0	20.88
72.95	71.33	71.96	18.71	0	19.95	0	20.73
73.41	71.31	71.65	18.82	0	19.86	0	20.61
74.14	70.74	72.37	18.97	0	19.83	0	20.61
71	65.45	68.15	19.14	0	19.86	0	20.61
66.89	63.33	65.25	19.05	0	19.66	0	20.43
63.29	60.09	61.92	19	0	19.57	0	20.31
63.4	60.21	61.64	18.91	0	19.48	0	20.25
63.16	59.8	61.73	18.85	0	19.46	0	20.22
62.72	59.81	61.59	18.8	0	19.46	0	20.22
59.87	57.27	58.45	18.68	0	19.43	0	20.19
59.3	55.24	57.4	18.57	0	19.37	0	20.13
58.84	54.72	57.18	18.46	0	19.37	0	20.13
59.09	49.12	55.22	18.35	0	19.34	0	20.1
54.6	49.2	50.93	18.24	0	19.31	0	20.07
52.92	47.37	51.22	18.1	0	19.28	0	20.04
53.03	45.84	48.93	17.96	0	19.28	0	20.01
50.37	46.44	48.5	17.82	0	19.25	0	20.01
61.76	49.01	54.31	17.58	0	19.17	0	19.89
66.65	61.78	64.5	17.55	0	19.25	0	20.01
66.12	63.84	64.73	17.71	0	19.54	0	20.31
66.87	64.9	65.89	18.01	0	19.89	0	20.67
69.13	64.62	66.56	18.07	0	19.89	0	20.7
71.98	68.05	69.59	18.1	0	19.81	0	20.58
72.01	70.1	70.79	18.35	0	19.92	0	20.7
71.82	70.9	71.34	18.6	0	19.95	0	20.73
74.58	70.53	72.08	18.74	0	19.83	0	20.61
72.11	66.76	69.46	18.88	0	19.75	0	20.55
66.84	64.22	65.34	19	0	19.69	0	20.46
64.99	62.42	64.23	18.97	0	19.54	0	20.31
64.69	58.05	61.53	18.94	0	19.43	0	20.19
59.11	54.64	56.71	18.85	0	19.34	0	20.1
59.53	54.5	57.01	18.74	0	19.28	0	20.04
57.76	52.67	55.73	18.66	0	19.25	0	20.04
54.26	50.69	52.46	18.54	0	19.25	0	20.04
52.82	50.28	51.19	18.4	0	19.25	0	20.01
52.05	49.49	50.59	18.26	0	19.22	0	19.98
49.6	47.5	48.53	18.15	0	19.2	0	19.98
49.75	46.46	47.87	18.01	0	19.2	0	19.95
57.54	45.74	49.3	17.88	0	19.17	0	19.95
51.34	45.7	48.21	17.77	0	19.17	0	19.92
48.95	44.77	46.28	17.6	0	19.14	0	19.89
56.04	44.77	50.87	17.39	0	19.05	0	19.83
60.24	56.06	59.05	17.31	0	19.08	0	19.86

60.38	59.56	59.94	17.36	0	19.22	0	20.01
61.18	59.59	60.01	17.44	0	19.34	0	20.1
65.46	60.85	62.54	17.55	0	19.4	0	20.16
73.15	64.93	69.66	17.74	0	19.48	0	20.28
74.32	72.57	73.54	18.1	0	19.72	0	20.52
75.81	72.21	73.78	18.57	0	20.04	0	20.85
73.95	70.87	72.16	18.82	0.156	20.07	0	20.88
71.95	68.63	70.15	18.82	0	19.81	0	20.61
68.81	65.57	67.24	18.85	0	19.63	0	20.43
66.43	61.17	63.69	18.82	0	19.46	0	20.25
62.92	58.65	60.59	18.74	0	19.31	0	20.1
62.93	59.99	61.41	18.66	0	19.25	0	20.04
63.17	59.46	61.87	18.6	0	19.25	0	20.01
60.91	53.43	57.25	18.51	0	19.22	0	20.01
62.77	53.8	59.61	18.38	0	19.17	0	19.95
63.12	57.87	60.6	18.29	0	19.2	0	19.98
62.47	61.25	61.9	18.21	0	19.2	0	19.98
62.34	58.77	61.36	18.15	0	19.22	0	20.01
59.91	52.81	56	18.07	0	19.2	0	19.98
59.01	50.01	52.16	17.96	0	19.14	0	19.92
55.82	50.7	53.13	17.82	0	19.08	0	19.89
54.42	51.13	52.83	17.71	0	19.08	0	19.86
57.99	51.31	55.25	17.52	0	19	0	19.78
60.72	57.07	58.73	17.5	0	19.08	0	19.86
66.28	60.6	62.63	17.55	0	19.25	0	20.04
69.35	64.95	66.88	17.77	0	19.51	0	20.31
68.9	66.37	67.6	18.01	0	19.75	0	20.58
72.19	67.47	70.01	18.24	0	19.86	0	20.67
71.26	69.11	70.16	18.71	0.155	20.16	0	21.03
70.73	68.67	69.82	18.97	0.16	20.22	0	21.07
69.92	67.68	68.43	18.88	0.171	19.86	0	20.73
68.9	64.67	67.34	18.85	0	19.6	0	20.43
64.98	60.58	62.74	18.88	0	19.43	0	20.25
61.1	59.63	60.32	18.8	0	19.25	0	20.04
60.61	58.69	59.88	18.74	0	19.17	0	19.98
59.8	57.8	58.88	18.71	0	19.14	0	19.95
58.1	56.03	57.23	18.6	0	19.11	0	19.92
57.36	49.9	53.96	18.51	0	19.08	0	19.89
51.77	45.61	49.07	18.38	0	19.05	0	19.86
47.09	42.67	44.7	18.21	0	19	0	19.81
50.69	41.38	45.63	18.07	0	18.97	0	19.78
49.94	45.08	47.29	17.9	0	18.97	0	19.75
49.51	45.63	47.81	17.77	0	18.97	0	19.78
51.3	43.13	46.74	17.6	0	18.97	0	19.75
51.67	46.72	49.78	17.44	0	18.94	0	19.75
46.69	44.38	45.17	17.31	0	18.97	0	19.75
53.49	42.03	48.01	17.09	0	18.91	0	19.69

56.75	51.83	54.17	16.93	0	18.88	0	19.66
58.8	55.89	57.25	16.96	0	19.05	0	19.86
61.98	58.11	60.01	17.09	0	19.28	0	20.07
62.81	60.3	61.77	17.39	0	19.6	0	20.43
66.21	62.25	64.56	17.55	0	19.66	0	20.49
64.92	62.84	63.91	17.71	0	19.63	0	20.49
64.29	62.56	63.44	17.8	0	19.46	0	20.28
63.91	62.44	62.86	17.88	0	19.28	0	20.1
63.57	60.99	62.26	17.99	0	19.22	0	20.04
60.99	54.18	57.55	18.13	0	19.2	0	20.01
54.15	48.09	50.47	18.1	0	19.05	0	19.86
50.37	47.79	49.18	18.04	0	18.97	0	19.78
53.02	46.92	48.96	17.93	0	18.94	0	19.75
52.99	47.57	51.02	17.82	0	18.91	0	19.72
51.77	48.48	50.96	17.69	0	18.91	0	19.72
51.36	49.89	50.89	17.58	0	18.91	0	19.72
49.87	48.15	49.17	17.47	0	18.91	0	19.75
49.29	44.85	47.59	17.33	0	18.88	0	19.72
47.84	44.02	45.56	17.23	0	18.88	0	19.72
45.32	39.3	43.8	17.12	0	18.82	0	19.69
39.58	36.11	38.18	16.99	0	18.8	0	19.66
39.09	33.99	35.24	16.85	0	18.77	0	19.63
40.56	34.21	36.59	16.7	0	18.77	0	19.6
48.65	39.63	44.85	16.41	0	18.63	0	19.46
51.28	48.38	49.62	16.3	0	18.71	0	19.54
54.2	50.95	52.5	16.3	0	18.85	0	19.69
57.19	53.94	55.38	16.36	0	19	0	19.86
60.34	57.39	58.72	16.51	0	19.17	0	20.04
62.42	58.1	60.46	16.8	0	19.4	0	20.31
63.56	60.76	62.25	17.09	0	19.54	0	20.46
65.84	62.29	64.13	17.31	0	19.48	0	20.4
65.9	64	64.85	17.5	0	19.4	0	20.31
64.84	60.87	62.88	17.6	0	19.17	0	20.07
60.89	55.94	58.25	17.71	0	19.02	0	19.92
56.07	53.47	54.91	17.74	0	18.88	0	19.78
53.86	51.3	52.73	17.74	0	18.8	0	19.72
51.74	48.54	50.44	17.69	0	18.77	0	19.69
49.61	43.11	45.28	17.58	0	18.71	0	19.63
44.67	42.2	43.37	17.41	0	18.68	0	19.6
47.13	40.83	43.5	17.28	0	18.66	0	19.57
47.15	41.02	44.97	17.12	0	18.63	0	19.57
46.28	43.63	45.08	16.96	0	18.63	0	19.54
46.47	45.11	45.69	16.8	0	18.6	0	19.54
46.91	45.86	46.44	16.64	0	18.6	0	19.54
46.52	44.16	45.28	16.51	0	18.63	0	19.57
45.28	43.87	44.51	16.36	0	18.6	0	19.54
44.39	40.22	42.37	16.23	0	18.63	0	19.57

49.45	38.39	42.65	15.97	0	18.46	0	19.4
54.14	49.42	51.93	15.94	0	18.54	0	19.48
56.75	53.62	55.11	15.99	0	18.68	0	19.63
58.6	55.33	56.76	16.1	0	18.82	0	19.81
62.41	56.83	59.12	16.15	0	18.85	0	19.81
62.47	59.3	60.93	16.38	0	18.97	0	19.95
62.39	59.74	60.97	16.62	0	19.02	0	20.01
59.84	55.98	58.03	16.77	0	18.91	0	19.89
55.92	51.21	52.65	16.96	0	18.82	0	19.83
51.21	48.57	49.75	17.07	0	18.68	0	19.69
49.9	48.55	49.47	17.12	0	18.63	0	19.63
48.52	47.71	48.12	17.15	0	18.6	0	19.6
48.35	47.4	47.78	17.09	0	18.57	0	19.57
48.22	47.85	48.03	16.99	0	18.57	0	19.57
48.22	47.74	47.96	16.8	0	18.54	0	19.57
48.5	47.3	48.13	16.62	0	18.54	0	19.57
48.33	47.8	48.04	16.43	0	18.51	0	19.54
48.4	48.08	48.23	16.33	0	18.51	0	19.54
48.82	48.01	48.42	16.23	0	18.51	0	19.54
48.89	47.66	48.44	16.17	0	18.51	0	19.54
48.24	47.43	47.92	16.1	0	18.49	0	19.54
48.12	47.8	47.98	16.04	0	18.49	0	19.54
48.06	47.37	47.79	15.99	0	18.49	0	19.54
47.37	44.84	46.33	15.94	0	18.46	0	19.54
46.43	44.99	45.96	15.89	0	18.43	0	19.51
48.49	46.43	47.27	15.81	0	18.4	0	19.48
49.33	47.99	48.61	15.69	0	18.32	0	19.4
52.4	48.95	50.24	15.81	0	18.4	0	19.48
54.05	51.06	52.51	15.99	0	18.51	0	19.6
54.6	53.36	53.92	16.33	0	18.71	0	19.83
57.15	54.53	55.61	16.51	0	18.66	0	19.81
59.73	55.67	57.32	16.75	0	18.71	0	19.86
60.06	55.8	58.43	17.09	0	18.85	0	20.01
57.92	56.92	57.43	17.2	0	18.74	0	19.89
57.09	51.1	53.92	17.17	0	18.54	0	19.69
51.08	49.55	50.38	17.15	0	18.43	0	19.57
50.43	49.43	50.01	17.04	0	18.38	0	19.51
49.43	48.9	49.24	16.96	0	18.38	0	19.51
48.93	48.32	48.74	16.85	0	18.35	0	19.51
48.4	47.76	47.97	16.75	0	18.32	0	19.48
48.43	47.76	48.01	16.64	0	18.32	0	19.48
48.81	48.45	48.63	16.54	0	18.32	0	19.48
48.88	48.27	48.56	16.46	0	18.29	0	19.48
49	48.19	48.69	16.38	0	18.32	0	19.48
48.45	47.96	48.15	16.3	0	18.29	0	19.46
48.58	47.37	48.21	16.23	0	18.29	0	19.48
48.19	47.62	47.88	16.17	0	18.29	0	19.48

48.75	47.94	48.12	16.1	0	18.29	0	19.48
49.52	48.75	49.13	16.04	0	18.29	0	19.48
49.77	49.24	49.46	15.99	0	18.29	0	19.48
50.97	49.58	50.23	15.92	0	18.21	0	19.43
52.51	50.89	51.59	15.92	0	18.21	0	19.43
54.43	52.49	53.44	16.1	0	18.38	0	19.57
57.34	54.05	55.62	16.51	0	18.68	0	19.92
58.91	54.61	56.84	17.01	0	19	0	20.28
59.71	55.64	57.71	16.96	0	18.71	0	19.95
61.03	57.04	58.72	17.09	0	18.66	0	19.89
57.73	56.83	57.19	17.07	0	18.43	0	19.69
56.85	47.17	51.37	17.07	0	18.32	0	19.54
47.17	45.62	46.23	16.96	0	18.18	0	19.4
46.92	45.49	46.22	16.85	0	18.1	0	19.34
46.61	44.34	45.26	16.7	0	18.1	0	19.31
45.61	44.13	44.86	16.51	0	18.07	0	19.31
44.48	42.93	43.56	16.36	0	18.04	0	19.28
44.39	43.04	43.55	16.15	0	18.04	0	19.28
44.95	43.35	44.01	15.97	0	18.01	0	19.25
45.16	42.83	44.33	15.81	0	18.01	0	19.25
43.42	40.72	42.02	15.64	0	18.01	0	19.25
41.62	40.05	40.73	15.46	0	17.99	0	19.22
43.4	40.19	41.57	15.31	0	17.99	0	19.25
44.49	41.85	42.93	15.13	0	17.99	0	19.22
43.35	40.88	42.34	14.98	0	17.99	0	19.22
48.78	42.05	44.66	14.71	0	17.82	0	19.08
52.5	48.81	51.35	14.66	0	17.93	0	19.2
56.17	52.36	53.95	14.76	0	18.15	0	19.43
60.47	55.25	57.94	14.96	0	18.4	0	19.72
61.54	58.62	60.14	15.33	0	18.77	0	20.13
64.21	60.74	62.1	15.89	0.186	19.2	0	20.58
65.17	62.53	63.85	16.36	0.201	19.4	0	20.79
67.3	64.24	65.38	16.54	0.21	19.2	0	20.61
65.46	63.65	64.42	16.62	0.208	18.85	0	20.25
63.93	60.7	62.79	16.59	0.201	18.46	0	19.83
60.66	50.1	55.17	16.62	0	18.21	0	19.54
50.51	47.74	49.06	16.51	0	17.96	0	19.31
51.9	48.39	49.73	16.46	0	17.88	0	19.22
53.68	50.75	52.19	16.38	0	17.88	0	19.22
53.79	52.37	53.21	16.3	0	17.88	0	19.22
53.14	50.79	52.13	16.17	0	17.85	0	19.22
50.95	48.9	50.04	16.04	0	17.82	0	19.2
49.58	48.2	48.68	15.92	0	17.8	0	19.2
49.89	44.57	48.36	15.76	0	17.77	0	19.14
48.25	43.97	45.9	15.58	0	17.77	0	19.14
47.86	44.74	46.01	15.43	0	17.74	0	19.11
47.15	42.71	44.69	15.28	0	17.71	0	19.11

44.53	43.42	43.98	15.11	0	17.69	0	19.08
43.66	38.42	41.37	14.96	0	17.69	0	19.08
48.37	39.71	43.33	14.69	0	17.55	0	18.91
55.3	48.43	53.56	14.64	0	17.66	0	19.05
57.64	55.25	56.38	14.78	0	17.96	0	19.37
59.81	57.41	58.5	15.11	0	18.35	0	19.78
62.94	59.5	61.32	15.46	0.183	18.68	0	20.16
64.26	62.24	63.26	15.89	0.197	18.97	0	20.49
66.11	63.16	64.43	16.25	0.206	19.05	0	20.58
65.17	63.58	64.33	16.41	0.211	18.88	0	20.43
64.99	63.63	64.17	16.49	0.209	18.57	0	20.07
63.81	61.17	62.83	16.41	0.2	18.15	0	19.63
61.09	48.26	53.87	16.38	0	17.88	0	19.34
48.27	47.53	47.86	16.3	0	17.69	0	19.14
48.26	47.06	47.52	16.23	0	17.6	0	19.05
48.01	44.69	46.69	16.12	0	17.58	0	19.02
52.86	44.69	49.2	15.97	0	17.55	0	19.02
52.64	46.06	49.42	15.81	0	17.52	0	19
45.99	40.62	41.74	15.66	0	17.52	0	18.97
41.38	40.45	40.93	15.51	0	17.5	0	18.97
41.93	40.62	41.2	15.33	0	17.47	0	18.94
40.62	39.14	39.5	15.16	0	17.47	0	18.94
41.48	38.87	40.11	15.01	0	17.47	0	18.94
41.38	39.4	40.42	14.83	0	17.47	0	18.94
39.83	37.67	38.92	14.69	0	17.47	0	18.91
37.67	36.37	37.05	14.54	0	17.44	0	18.91
50	36.47	42.17	14.27	0	17.31	0	18.77
51.97	50.03	50.8	14.22	0	17.41	0	18.88
55.94	51.86	53.95	14.32	0	17.6	0	19.08
59.39	55.25	57.6	14.56	0	17.93	0	19.43
61.54	58.66	59.93	14.96	0	18.32	0	19.86
62.26	59.72	61.12	15.36	0.185	18.54	0	20.13
62.93	61.02	61.96	15.71	0.2	18.66	0	20.25
63.89	61.55	62.57	15.87	0.202	18.49	0	20.07
63.85	62.21	62.92	15.97	0.202	18.21	0	19.78
62.8	59.4	61.36	15.97	0.195	17.88	0	19.43
59.34	46.89	53.54	16.02	0	17.66	0	19.2
47.8	44.62	45.89	15.94	0	17.44	0	18.97
45	43.3	43.99	15.84	0	17.36	0	18.88
44.22	43.34	43.84	15.74	0	17.33	0	18.85
45.26	43.81	44.81	15.58	0	17.31	0	18.85
44.96	42.67	43.98	15.43	0	17.28	0	18.82
42.64	40.29	40.96	15.28	0	17.28	0	18.82
41.33	38.42	40.27	15.13	0	17.28	0	18.8
39.16	38.13	38.56	14.96	0	17.25	0	18.77
38.25	36.81	37.56	14.78	0	17.23	0	18.77
37.89	36.23	37.15	14.64	0	17.23	0	18.77

36.23	34.3	35.41	14.47	0	17.2	0	18.74
34.93	33.94	34.21	14.29	0	17.2	0	18.74
34.61	33.8	34.18	14.13	0	17.17	0	18.71
43.06	33.92	37.5	13.84	0	17.04	0	18.57
50.29	43.1	47.88	13.74	0	17.12	0	18.66
54.42	50.16	52.04	13.79	0	17.31	0	18.85
57.88	53.88	55.81	13.98	0	17.55	0	19.14
60.6	57.25	58.74	14.34	0	17.88	0	19.51
62.09	59.25	60.9	14.78	0.178	18.21	0	19.86
65	61.3	62.64	15.18	0.191	18.38	0	20.04
64.8	62.91	63.58	15.43	0.199	18.26	0	19.92
64.21	62.24	63.17	15.53	0.2	18.01	0	19.66
62.88	58.22	61.06	15.56	0.194	17.63	0	19.25
58.18	45.45	50.98	15.58	0	17.41	0	19.02
46.82	42.73	44.21	15.51	0	17.2	0	18.8
47.38	44.55	45.82	15.43	0	17.12	0	18.71
45.04	40.86	42.3	15.31	0	17.07	0	18.68
43.24	41.64	42.21	15.18	0	17.07	0	18.66
42.5	41.27	41.81	15.01	0	17.04	0	18.66
42.67	40.98	41.93	14.86	0	17.01	0	18.63
41	38.87	40.05	14.69	0	17.01	0	18.63
38.97	36.25	37.5	14.51	0	16.99	0	18.6
36.4	35.55	36.06	14.34	0	16.99	0	18.57
36.37	35.27	35.72	14.17	0	16.96	0	18.57
35.79	34.18	34.99	14.03	0	16.96	0	18.57
34.21	31.8	33.26	13.84	0	16.93	0	18.57
32.18	30.86	31.55	13.67	0	16.93	0	18.54
41.24	31.35	35.16	13.39	0	16.77	0	18.4
49.17	41.29	46.4	13.29	0	16.85	0	18.46
53.53	49.22	51.26	13.29	0	17.01	0	18.66
57.09	53	55.03	13.43	0	17.23	0	18.88
59.73	56.68	58.12	13.72	0	17.5	0	19.2
61	58.27	59.64	14.13	0.17	17.77	0	19.51
62.88	60.37	61.29	14.49	0.179	17.9	0	19.66
62.82	61.05	61.92	14.78	0.187	17.85	0	19.6
62.6	60.75	61.75	14.98	0.189	17.69	0	19.43
60.75	58.04	59.74	15.01	0.187	17.33	0	19.05
58	43.13	47.87	15.06	0	17.09	0	18.8
44.43	42.78	43.67	15.01	0	16.91	0	18.6
43.28	41.1	42.22	14.93	0	16.83	0	18.51
42.26	40.74	41.52	14.83	0	16.8	0	18.51
42.24	40.74	41.58	14.69	0	16.77	0	18.49
41.72	38.83	40.11	14.54	0	16.77	0	18.46
39.37	36.99	38.14	14.37	0	16.75	0	18.46
39.82	38	38.99	14.17	0	16.72	0	18.46
39.15	36.97	37.94	14.03	0	16.72	0	18.43
37.84	37.07	37.44	13.84	0	16.7	0	18.43

37.93	35.58	37.21	13.69	0	16.67	0	18.4
35.74	34.08	35.05	13.53	0	16.67	0	18.4
34.6	32.06	33.14	13.39	0	16.67	0	18.4
32.72	30.41	31.43	13.2	0	16.64	0	18.38
43.39	31.48	35.63	12.92	0	16.49	0	18.21
49.03	43.44	47.46	12.85	0	16.56	0	18.29
51.02	48.23	49.56	12.87	0	16.72	0	18.46
54.97	50.58	52.71	13.03	0	16.96	0	18.71
57.24	54.04	55.72	13.29	0	17.2	0	19
60.63	56.52	58.12	13.67	0.168	17.44	0	19.28
62.58	59.47	60.83	14.05	0.176	17.58	0	19.43
62.19	60.57	61.34	14.27	0.18	17.47	0	19.31
62.26	60.72	61.52	14.47	0.183	17.25	0	19.08
61.38	56.92	59.78	14.59	0.185	16.99	0	18.82
56.88	48.76	51.7	14.71	0	16.83	0	18.66
49.62	39.93	43.91	14.66	0	16.64	0	18.46
40.4	38.42	39.59	14.61	0	16.54	0	18.38
40.64	38.25	39.26	14.49	0	16.51	0	18.32
42.14	39.12	40	14.34	0	16.49	0	18.29
40.56	38.66	39.36	14.17	0	16.46	0	18.29
43.53	38.63	40.92	14	0	16.43	0	18.29
42.64	35.7	39.64	13.84	0	16.43	0	18.26
43.68	40.57	42.06	13.67	0	16.41	0	18.26
44.24	38.39	42.04	13.53	0	16.41	0	18.26
40.68	33.73	38.43	13.39	0	16.41	0	18.26
35.66	32.05	33.59	13.22	0	16.38	0	18.24
35.08	32.79	34.18	13.08	0	16.36	0	18.21
33.27	32.07	32.64	12.92	0	16.36	0	18.18
41.47	32.19	35.24	12.64	0	16.2	0	18.04
47.83	41.49	46.25	12.57	0	16.25	0	18.1
50.33	47	49.11	12.57	0	16.41	0	18.26
53.53	49.94	51.36	12.73	0	16.62	0	18.51
57.01	52.7	54.93	12.96	0	16.85	0	18.77
60.26	56.63	58.14	13.43	0.161	17.23	0	19.17
62.15	59.43	60.8	13.91	0.17	17.47	0	19.43
63.81	61.5	62.59	14.08	0.179	17.28	0	19.25
64.5	61.29	63.14	14.22	0.183	17.01	0	19
62.25	56.28	59.81	14.32	0.184	16.72	0	18.68
56.25	44.38	49.95	14.44	0	16.56	0	18.49
44.34	41.84	42.86	14.39	0	16.36	0	18.26
43.8	41.73	42.62	14.37	0	16.28	0	18.18
45.03	41.51	43.07	14.27	0	16.23	0	18.15
44.88	41.48	42.73	14.17	0	16.23	0	18.13
48.16	41.03	44.81	14.03	0	16.2	0	18.13
47.65	45.24	46.41	13.93	0	16.17	0	18.13
47.51	44.25	45.58	13.81	0	16.17	0	18.13
46.54	42.6	44.64	13.69	0	16.17	0	18.13

45.4	42.9	43.9	13.58	0	16.17	0	18.13
48.28	44.08	46.71	13.46	0	16.15	0	18.1
44.84	41.05	42.98	13.36	0	16.12	0	18.1
42.97	36.75	40.33	13.24	0	16.12	0	18.07
44.52	38.67	42.48	13.1	0	16.1	0	18.04
53.73	44.02	48.26	12.85	0	15.94	0	17.88
57.4	53.81	55.99	12.83	0	16.04	0	17.99
60.55	57.19	58.88	12.96	0	16.28	0	18.24
60.97	56.72	57.9	13.27	0	16.62	0	18.6
60.53	57.02	58.53	13.53	0.162	16.8	0	18.82
62.76	60.49	61.65	13.96	0.166	17.09	0	19.14
64.98	62.04	63.59	14.34	0.175	17.23	0	19.28
65.07	63.68	64.5	14.59	0.182	17.12	0	19.17
65.38	63.33	64.27	14.71	0.187	16.85	0	18.88
63.73	59.03	62.25	14.74	0.187	16.51	0	18.54
58.98	45.75	49.82	14.78	0.18	16.3	0	18.29
46.27	45.52	45.93	14.74	0	16.1	0	18.07
45.98	44.65	45.43	14.69	0	16.04	0	18.01
45.88	44.91	45.33	14.56	0	15.99	0	17.99
46.1	44.77	45.19	14.44	0	15.99	0	17.96
45.23	43.4	44.49	14.29	0	15.97	0	17.96
43.45	42.28	42.89	14.17	0	15.97	0	17.93
43.85	40.98	42.75	14	0	15.94	0	17.93
47.01	43.18	44.97	13.88	0	15.94	0	17.9
45.93	41.41	43.32	13.74	0	15.94	0	17.9
41.38	38.3	39.4	13.6	0	15.92	0	17.88
38.9	35.86	37.3	13.46	0	15.92	0	17.88
37.53	34.52	35.86	13.32	0	15.89	0	17.85
36.68	34.53	35.66	13.17	0	15.89	0	17.82
44.28	34.65	38.02	12.89	0	15.74	0	17.69
54.33	44.35	50.95	12.83	0	15.81	0	17.77
58.22	53.8	56.36	12.87	0	15.99	0	17.96
60	57.22	58.2	13.08	0	16.28	0	18.26
61.84	59.07	60.04	13.36	0.161	16.56	0	18.57
64.77	60.28	62.3	13.77	0.164	16.83	0	18.85
67.03	63.46	65.3	14.27	0.171	17.09	0	19.14
67.6	65.53	66.5	14.59	0.182	17.07	0	19.11
67.57	66.24	66.76	14.71	0.185	16.8	0	18.82
66.39	60.08	64.4	14.71	0.184	16.43	0	18.43
60	45	50.88	14.76	0.181	16.17	0	18.15
46.29	44.11	45	14.71	0.181	15.97	0	17.9
46.29	43.68	45	14.64	0.182	15.87	0	17.82
45.48	43.86	44.5	14.54	0.18	15.84	0	17.8
44.56	42.69	43.49	14.42	0	15.81	0	17.77
45.31	42.41	43.77	14.27	0	15.81	0	17.77
43.66	41.33	42.86	14.13	0	15.79	0	17.74
42.29	40.1	41.46	13.98	0	15.79	0	17.74

41.34	38.47	39.55	13.84	0	15.76	0	17.71
39.66	37.86	38.62	13.69	0	15.76	0	17.69
38.1	36.52	37.5	13.53	0	15.74	0	17.69
36.68	34.96	35.8	13.39	0	15.74	0	17.66
35.27	32.81	34.13	13.22	0	15.74	0	17.66
35.08	32.61	34	13.08	0	15.74	0	17.63
43.32	32.65	36.43	12.78	0	15.58	0	17.47
52.26	43.39	49.34	12.71	0	15.66	0	17.55
54.39	52.13	53.18	12.76	0	15.81	0	17.71
57.47	54.04	55.61	12.89	0	16.04	0	17.96
62.1	57.17	59.39	13.15	0	16.28	0	18.24
65.34	61.57	63.39	13.55	0.16	16.59	0	18.57
67.85	63.57	65.89	14.03	0.166	16.83	0	18.82
68.67	66.02	67.79	14.32	0.175	16.77	0	18.77
69.46	68.24	68.89	14.51	0.18	16.59	0	18.57
68.56	60.84	65.92	14.64	0.182	16.36	0	18.29
60.77	49.39	52.77	14.69	0.179	16.07	0	18.01
51.45	48.44	49.82	14.61	0.179	15.84	0	17.77
55.97	49.47	51.85	14.56	0.18	15.76	0	17.69
55.27	48.79	52.77	14.51	0.181	15.74	0	17.66
59.38	52.82	55.17	14.42	0	15.74	0	17.63
59.48	52.96	55.59	14.34	0.179	15.74	0	17.63
62.3	53.9	58.53	14.25	0.179	15.71	0	17.63
62.51	58.35	60.74	14.2	0.178	15.76	0	17.66
58.52	53.37	55.38	14.13	0.178	15.79	0	17.69
60.39	52.33	54.71	14.03	0	15.74	0	17.63
61.15	58.68	59.47	13.96	0	15.71	0	17.63
59.88	58.84	59.37	13.93	0	15.76	0	17.66
59.46	48.39	54.21	13.91	0	15.79	0	17.66
56.64	48.65	52.04	13.81	0	15.71	0	17.6
59.55	55.63	57.7	13.72	0	15.69	0	17.55
63.46	54.84	58.99	13.62	0	15.66	0	17.52
65.5	54.67	61.47	13.65	0.176	15.74	0	17.6
68.43	65.54	66.8	13.81	0.172	15.94	0	17.82
67.03	66.1	66.56	14.05	0.166	16.15	0	18.04
71	66.59	68.59	14.17	0.169	16.15	0	18.04
71.38	66.81	68.36	14.78	0.163	16.56	0	18.49
70.01	64.6	66.42	15.11	0.166	16.64	0	18.57
65.35	62.68	64.29	15.08	0.177	16.28	0	18.18
62.8	60.67	61.71	15.11	0.179	16.07	0	17.93
61.02	57.61	59.37	15.16	0.18	15.94	0	17.8
58.33	57.07	57.67	15.13	0.178	15.84	0	17.69
57.76	56.44	57.11	15.06	0.184	15.79	0	17.63
57.23	56.15	56.66	15.01	0.182	15.76	0	17.6
56.46	55.66	56.13	14.96	0.18	15.76	0	17.6
56.26	55.16	55.86	14.88	0.18	15.76	0	17.58
55.74	53.64	54.89	14.81	0.177	15.74	0	17.58

54.13	52.44	53.29	14.74	0.179	15.71	0	17.52
53.25	50.2	51.72	14.64	0.18	15.69	0	17.5
51.28	45.97	49.93	14.54	0.179	15.66	0	17.44
45.97	42.26	44.24	14.44	0.18	15.66	0	17.44
42.26	37.68	40.2	14.32	0.181	15.64	0	17.39
37.79	35.4	36.47	14.17	0	15.58	0	17.36
35.43	34.07	34.68	14	0	15.56	0	17.33
35	33.61	34.02	13.67	0	15.41	0	17.17
38.05	34.98	36.16	13.53	0	15.48	0	17.23
39.96	36.88	38.12	13.41	0	15.56	0	17.31
42.69	39.37	40.72	13.34	0	15.64	0	17.39
44.67	41.14	42.96	13.32	0	15.71	0	17.44
46.87	43.3	45.13	13.36	0	15.79	0	17.52
48.1	45.01	46.52	13.48	0.166	15.87	0	17.63
48.17	46.13	47.16	13.58	0.167	15.87	0	17.6
47.75	46.11	46.83	13.67	0.171	15.81	0	17.55
46.76	41.02	44.73	13.69	0.176	15.71	0	17.44
41.66	35.62	38.58	13.79	0	15.69	0	17.41
37.48	25.5	30.19	13.67	0	15.56	0	17.28
33.34	26.04	29.47	13.53	0	15.51	0	17.2
33.82	30.97	32.27	13.32	0	15.48	0	17.2
32.69	24.92	28.51	13.13	0	15.48	0	17.2
28.34	24.62	26.84	12.92	0	15.46	0	17.17
28.29	22.52	25.61	12.69	0	15.43	0	17.15
22.47	20.23	21.3	12.46	0	15.43	0	17.15
22.17	18.54	20.09	12.23	0	15.41	0	17.12
20.11	18.47	19.16	11.98	0	15.38	0	17.09
20.4	19.15	19.73	11.78	0	15.38	0	17.09
20.55	18.45	19.3	11.58	0	15.36	0	17.09
18.93	17.66	18.35	11.4	0	15.33	0	17.07
19.06	16.47	18.04	11.22	0	15.33	0	17.07
28.95	16.1	20.61	10.92	0	15.16	0	16.88
33.16	29.04	31.38	10.83	0	15.26	0	16.99
36.64	32.95	34.7	10.76	0	15.33	0	17.07
39.74	35.66	37.47	10.72	0	15.38	0	17.15
42.86	38.5	40.46	10.7	0	15.46	0	17.23
44.69	40.98	43.06	10.74	0	15.51	0	17.31
46.49	43.39	44.92	10.89	0	15.53	0	17.33
46.95	45.06	45.86	11.16	0	15.51	0	17.33
46.49	44.88	45.58	11.42	0	15.48	0	17.31
45.27	40.81	43.64	11.67	0	15.38	0	17.23
40.78	29.87	34.89	11.89	0	15.38	0	17.23
29.84	26.24	28.1	11.91	0	15.26	0	17.15
26.59	25.55	26.07	11.87	0	15.18	0	17.07
26.15	24.69	25.45	11.76	0	15.13	0	17.04
26.2	24.19	25.16	11.62	0	15.11	0	17.01
26.79	24.62	25.89	11.44	0	15.06	0	16.99

27.36	23.75	25.1	11.29	0	15.06	0	16.99
24.84	22.66	23.48	11.13	0	15.03	0	16.99
24.11	20.98	22.19	10.98	0	15.01	0	16.96
21.91	20.96	21.41	10.83	0	14.98	0	16.96
21.63	20.44	21.08	10.7	0	14.96	0	16.96
21.91	20.58	21.22	10.57	0	14.93	0	16.93
21.5	20	20.5	10.46	0	14.91	0	16.93
21.29	20.15	20.8	10.33	0	14.91	0	16.93
30.49	21.03	23.87	10.1	0	14.74	0	16.77
36.52	30.56	34.61	10.06	0	14.81	0	16.85
39.33	36.27	38.15	10.06	0	14.88	0	16.96
42.45	39.22	40.62	10.06	0	14.96	0	17.04
44.89	41.7	43.41	10.08	0	15.03	0	17.15
48.08	44.55	46.28	10.18	0	15.11	0	17.23
51.6	47.9	49.96	10.44	0	15.18	0	17.33
53.92	50.77	52.28	10.72	0	15.18	0	17.36
54.77	51.01	53.18	11.03	0	15.11	0	17.28
50.98	44.8	48.39	11.31	0	15.01	0	17.2
44.8	41.31	43.03	11.51	0	14.91	0	17.12
42.68	39.45	41.42	11.62	0	14.83	0	17.04
42	37.79	39.5	11.67	0	14.78	0	17.01
42.1	38.51	40.22	11.67	0	14.74	0	16.99
42.22	40.79	41.51	11.62	0	14.71	0	16.96
42.86	40.5	41.68	11.6	0	14.71	0	16.96
40.48	37.5	38.84	11.55	0	14.66	0	16.93
40.71	36.27	37.77	11.49	0	14.64	0	16.93
42.25	39.34	40.96	11.44	0	14.61	0	16.93
41.78	39.69	40.92	11.4	0	14.61	0	16.93
42.02	40.34	41.16	11.36	0	14.61	0	16.91
41.55	39.18	40.49	11.33	0	14.59	0	16.93
42.25	36.87	39.95	11.31	0	14.59	0	16.91
38.18	34.79	36.56	11.27	0	14.54	0	16.88
35.31	32.12	33.79	11.16	0	14.47	0	16.8
47.11	31.66	37.6	11.07	0	14.42	0	16.77
49.87	46.66	48.28	11.05	0	14.47	0	16.83
49.76	47.96	48.88	11.09	0	14.56	0	16.93
50.63	48.84	49.72	11.16	0	14.59	0	16.96
51.93	50.39	50.84	11.29	0	14.61	0	16.99
53	51.51	52.35	11.49	0	14.61	0	17.01
52.73	52.15	52.55	11.76	0	14.64	0	17.04
52.18	50.89	51.52	12	0	14.64	0	17.04
50.89	45.55	48.72	12.18	0	14.59	0	17.01
47.63	45.2	46.57	12.23	0	14.51	0	16.91
46.86	43.72	45.17	12.27	0	14.49	0	16.88
47.84	43.72	45.16	12.3	0	14.47	0	16.88
47.49	45.7	46.52	12.3	0	14.44	0	16.85
46.05	43.79	44.53	12.27	0	14.42	0	16.83

46.44	43.79	44.74	12.25	0	14.39	0	16.83
47.08	44.7	45.77	12.25	0	14.39	0	16.8
47.11	42.48	44.2	12.23	0	14.39	0	16.8
43.28	41.89	42.69	12.21	0	14.37	0	16.8
43.96	42.79	43.33	12.18	0	14.37	0	16.77
43.59	43.05	43.29	12.16	0	14.37	0	16.77
43.45	42.34	43.06	12.14	0	14.34	0	16.77
43.38	42.64	43.03	12.12	0	14.34	0	16.75
43.8	43.07	43.32	12.09	0	14.34	0	16.75
44.81	42.03	43.05	12.07	0	14.32	0	16.72
45.87	43.83	44.75	11.93	0	14.2	0	16.59
51.77	45.64	49.37	11.98	0	14.27	0	16.67
51.63	39.84	47.01	12.07	0	14.34	0	16.72
43.07	40.32	41.67	12.14	0	14.34	0	16.72
48.67	41.82	45.41	12.23	0	14.34	0	16.72
49.99	46.65	48.64	12.39	0	14.44	0	16.83
51.28	45.79	50.27	12.48	0	14.47	0	16.88
45.65	40.42	42.44	12.55	0	14.44	0	16.83
44.78	42.75	43.91	12.53	0	14.32	0	16.7
43.93	42.36	43.23	12.57	0	14.34	0	16.72
42.74	41.45	41.98	12.48	0	14.29	0	16.67
42.28	40.74	41.54	12.37	0	14.27	0	16.62
41.9	40.6	41.28	12.25	0	14.22	0	16.62
42.77	40.52	41.71	12.12	0	14.22	0	16.59
42.84	37.31	39.91	12	0	14.22	0	16.59
41.6	39.44	40.66	11.89	0	14.22	0	16.56
41.93	38.25	40.59	11.8	0	14.2	0	16.56
39.18	37	38.01	11.69	0	14.17	0	16.54
40.02	37.77	38.96	11.6	0	14.17	0	16.51
40.18	38.91	39.69	11.49	0	14.17	0	16.51
39.9	38.98	39.59	11.4	0	14.17	0	16.51
39.8	38.8	39.34	11.31	0	14.15	0	16.49
39.28	37.88	38.65	11.2	0	14.15	0	16.49
39.59	38.12	38.84	11.03	0	14.03	0	16.36
42.11	39.56	40.79	10.96	0	14.05	0	16.38
44.91	41.83	43.27	10.96	0	14.13	0	16.49
47.69	44.35	46.17	11.05	0	14.27	0	16.62
50.2	46.73	48.43	11.22	0	14.42	0	16.77
51.96	49.65	50.84	11.51	0	14.64	0	17.04
53.46	50.17	51.73	11.96	0.147	14.96	0	17.39
51.94	50.02	50.5	11.93	0.168	14.66	0	17.07
52.64	49.74	51.27	11.91	0	14.34	0	16.7
52.07	46.83	50.6	12.05	0	14.22	0	16.59
46.78	37.34	42.26	12.18	0	14.2	0	16.56
37.3	34.6	35.81	12.12	0	14.08	0	16.43
35.97	34.48	35.24	12.03	0	14.03	0	16.36
35.65	32.26	34.12	11.89	0	13.98	0	16.33

32.26	30.45	31.45	11.73	0	13.96	0	16.3
31.86	30.21	31.02	11.55	0	13.93	0	16.3
32.02	29.48	30.51	11.4	0	13.93	0	16.28
29.8	29.24	29.53	11.22	0	13.91	0	16.25
29.55	28.2	28.95	11.07	0	13.88	0	16.25
28.17	27.39	27.81	10.92	0	13.88	0	16.23
27.83	27.02	27.49	10.76	0	13.88	0	16.23
28.64	26.13	27.12	10.61	0	13.86	0	16.2
28.53	25.78	27.15	10.48	0	13.84	0	16.2
28.53	25.5	26.82	10.35	0	13.84	0	16.17
31.33	26.37	27.98	10.1	0	13.69	0	16.02
39.66	31.36	36.34	10.06	0	13.74	0	16.1
42.09	39.66	40.89	10.06	0	13.84	0	16.2
44.93	41.73	43.44	10.06	0	13.96	0	16.33
47.77	44.42	46.34	10.14	0	14.13	0	16.51
52.39	47.63	49.78	10.29	0	14.29	0	16.72
53.85	51.46	52.49	10.53	0	14.44	0	16.88
55.41	53.48	54.46	10.72	0	14.39	0	16.83
58.49	54.88	57.44	10.94	0	14.27	0	16.7
56.88	46.68	53.66	11.11	0	14.1	0	16.51
46.61	39.8	42.97	11.27	0	13.98	0	16.38
49.88	40.7	47.23	11.27	0	13.81	0	16.2
49.47	48.07	48.81	11.27	0	13.79	0	16.2
49.29	48.02	48.69	11.24	0	13.79	0	16.2
49.06	45.96	48.02	11.2	0	13.77	0	16.2
47.01	41.57	44	11.13	0	13.74	0	16.17
41.64	39.28	40.44	11.05	0	13.72	0	16.15
39.9	37.64	38.61	10.94	0	13.67	0	16.12
38.12	37.1	37.57	10.83	0	13.65	0	16.1
38.22	33.58	36.56	10.7	0	13.62	0	16.07
36.36	31.55	34.09	10.57	0	13.6	0	16.04
32.86	27.47	30.85	10.44	0	13.58	0	16.02
29.04	26.79	27.88	10.31	0	13.58	0	16.02
28.34	23.59	25.48	10.2	0	13.53	0	15.99
26.22	22.74	24.5	10.06	0	13.5	0	15.97
38.67	26.19	33.21	9.84	0	13.39	0	15.84
41.4	38.6	39.75	9.82	0	13.48	0	15.92
42.42	40.87	41.53	9.82	0	13.55	0	16.04
43.8	41.58	42.5	9.84	0	13.67	0	16.15
46.44	42.55	44.47	9.91	0	13.77	0	16.25
46.93	44.22	45.51	10.08	0	13.84	0	16.36
47.09	45.33	46.25	10.2	0	13.79	0	16.33
46.84	45.55	46.19	10.38	0	13.72	0	16.25
45.69	39.72	43.85	10.48	0	13.6	0	16.1
39.75	27.66	32.33	10.66	0	13.58	0	16.1
28.05	27.29	27.65	10.61	0	13.43	0	15.94
28.33	27.35	27.94	10.53	0	13.39	0	15.89

33.15	24.3	27.97	10.4	0	13.36	0	15.87
26.55	23.71	25.36	10.27	0	13.34	0	15.84
27.13	23.9	25.3	10.14	0	13.32	0	15.84
23.86	22.21	23.09	9.99	0	13.29	0	15.81
23.18	21.23	22.08	9.86	0	13.27	0	15.81
23	20.73	21.5	9.72	0	13.24	0	15.79
22.52	18.36	20.19	9.59	0	13.22	0	15.76
20.91	17.7	18.55	9.49	0	13.22	0	15.76
19.39	17.4	18.41	9.36	0	13.2	0	15.74
18.63	16.45	17.78	9.26	0	13.2	0	15.74
18.36	15.85	16.96	9.15	0	13.17	0	15.71
23.64	17.43	19.18	8.95	0	13.06	0	15.58
32.59	23.68	29.74	8.89	0	13.08	0	15.61
35.79	32.39	34.01	8.87	0	13.15	0	15.71
38.75	35.68	37.16	8.87	0	13.22	0	15.79
41.38	37.84	39.58	8.89	0	13.29	0	15.89
43.57	40.35	42.01	8.93	0	13.36	0	15.97
44.63	42.75	43.65	8.99	0	13.46	0	16.07
45.48	43.77	44.71	8.99	0	13.43	0	16.07
45.9	44.73	45.24	8.97	0	13.36	0	15.99
45.04	38.55	43.18	9.01	0	13.24	0	15.89
38.5	28.04	32.32	9.15	0	13.24	0	15.89
28.5	27.19	27.76	9.15	0	13.1	0	15.74
27.61	26.64	27.1	9.17	0	13.03	0	15.69
29.81	26.16	28.03	9.17	0	13.01	0	15.66
29.02	25.39	26.91	9.13	0	12.99	0	15.64
27.96	26.23	26.97	9.09	0	12.96	0	15.64
26.67	24.15	25.29	9.03	0	12.94	0	15.64
26	23.56	24.4	8.99	0	12.92	0	15.61
24.1	21.91	22.98	8.93	0	12.89	0	15.61
27.73	21.12	23.23	8.85	0	12.87	0	15.58
22.99	20.47	21.31	8.78	0	12.85	0	15.56
22.41	20.04	21.01	8.72	0	12.83	0	15.56
22.45	18.91	20.26	8.66	0	12.8	0	15.56
22.99	18.98	20.81	8.6	0	12.78	0	15.53
25.69	20.29	22.91	8.54	0	12.76	0	15.51
36.56	24.24	29.66	8.4	0	12.64	0	15.41
38.76	36.49	37.3	8.4	0	12.71	0	15.46
38.69	37.58	38.14	8.44	0	12.78	0	15.56
38.95	37.93	38.43	8.46	0	12.83	0	15.64
39.95	38.42	39.26	8.46	0	12.83	0	15.64
40.33	39.37	39.86	8.44	0	12.8	0	15.64
40.28	39.3	39.81	8.44	0	12.8	0	15.61
39.64	38.7	39.13	8.48	0	12.8	0	15.64
38.7	36.75	37.95	8.54	0	12.8	0	15.64
36.73	32.62	34.61	8.6	0	12.76	0	15.61
34.86	32.16	33.46	8.62	0	12.69	0	15.56

38.38	31.45	33.19	8.62	0	12.66	0	15.51
47.41	34.26	42.22	8.62	0	12.64	0	15.51
46.72	44.24	45.74	8.66	0	12.66	0	15.53
45.97	42.78	44.9	8.68	0	12.66	0	15.56
43.66	38.71	42.25	8.72	0	12.66	0	15.56
41.86	38.23	40.79	8.76	0	12.62	0	15.53
40.64	33.73	38.67	8.8	0	12.59	0	15.48
36.06	33.15	34.17	8.82	0	12.55	0	15.48
36.18	33.12	34.96	8.8	0	12.5	0	15.43
36.44	34.5	35.72	8.78	0	12.48	0	15.41
36.46	35.36	35.93	8.74	0	12.46	0	15.41
36.05	34.52	35.37	8.7	0	12.43	0	15.38
35.93	34.95	35.54	8.66	0	12.39	0	15.36
38.16	35.86	37.07	8.56	0	12.32	0	15.26
40.64	37.66	39.12	8.6	0	12.41	0	15.36
43.05	39.88	41.5	8.64	0	12.46	0	15.43
42.92	40.64	41.61	8.72	0	12.55	0	15.53
43.67	41.27	42.19	8.85	0	12.59	0	15.61
42.57	38.65	40.91	8.99	0	12.59	0	15.64
39.66	37.48	38.59	9.07	0	12.48	0	15.48
39.5	37.5	38.33	9.17	0	12.39	0	15.38
37.7	34.04	36.27	9.32	0	12.39	0	15.43
35.77	33.83	34.64	9.4	0	12.37	0	15.38
36.64	35.41	36.21	9.4	0	12.3	0	15.33
36.22	32.57	33.8	9.36	0	12.27	0	15.31
33.95	32.51	33.18	9.3	0	12.23	0	15.26
32.65	31.24	31.86	9.22	0	12.21	0	15.23
32.24	29.74	30.67	9.15	0	12.18	0	15.23
30.59	29.48	29.98	9.07	0	12.16	0	15.21
30.53	29.23	29.88	8.97	0	12.16	0	15.18
30.29	28.77	29.57	8.91	0	12.14	0	15.18
29.31	28.31	28.89	8.8	0	12.12	0	15.16
29.1	28.31	28.78	8.74	0	12.09	0	15.13
29.4	28.83	29.09	8.66	0	12.09	0	15.13
32.4	28.89	30.59	8.62	0	12.09	0	15.16
33.9	32.31	33.23	8.56	0	12.09	0	15.13
34.32	33.2	33.69	8.5	0	12.07	0	15.13
33.96	32.27	33.21	8.44	0	12.05	0	15.11
36.03	32.65	33.76	8.38	0	12.03	0	15.06
40.83	35.94	38.78	8.3	0	11.98	0	15.01
44.93	39.76	41.65	8.4	0	12.09	0	15.13
45.42	42.59	43.81	8.52	0	12.21	0	15.26
46.81	41.29	44.23	8.7	0	12.27	0	15.36
41.37	37.99	39.32	8.89	0	12.23	0	15.28
40.52	33.22	35.37	9.05	0	12.16	0	15.23
35.49	33.79	34.65	9.11	0	12.03	0	15.08
35.28	34.43	34.79	9.22	0	12.05	0	15.13

34.6	32.96	33.78	9.15	0	12	0	15.06
33.68	32.14	33.04	9.09	0	11.96	0	15.03
32.57	30.83	31.84	8.99	0	11.93	0	14.98
30.86	29.43	30.08	8.91	0	11.91	0	14.98
30.77	29.56	30.29	8.82	0	11.89	0	14.96
30.29	27.44	28.83	8.74	0	11.87	0	14.93
29.3	27.21	28.13	8.66	0	11.85	0	14.93
27.44	26.39	26.97	8.58	0	11.82	0	14.88
26.84	25.42	26.16	8.5	0	11.8	0	14.88
26.1	24.5	25.14	8.42	0	11.8	0	14.86
25.42	23.73	24.54	8.36	0	11.78	0	14.86
25.6	23.8	24.7	8.28	0	11.76	0	14.83
25.07	23.84	24.49	8.2	0	11.73	0	14.81
26.09	22.84	24.57	8.06	0	11.64	0	14.71
30.13	26.04	28.01	7.98	0	11.62	0	14.71
33.32	29.93	31.61	7.98	0	11.69	0	14.78
36.27	33.01	34.4	8	0	11.76	0	14.86
38.36	35.08	36.61	8.06	0	11.87	0	14.98
40.07	37.62	38.71	8.14	0	11.96	0	15.11
40.55	37.99	39.15	8.16	0	12	0	15.16
40.48	38.65	39.55	8.14	0	11.98	0	15.13
40.62	38.58	39.42	8.1	0	11.89	0	15.01
38.73	33.11	36.58	8.06	0	11.76	0	14.88
33.13	29.58	31.72	8.16	0	11.76	0	14.88
29.97	28.62	29.34	8.14	0	11.64	0	14.76
29.02	27.3	27.99	8.12	0	11.6	0	14.71
28.97	26.5	28	8.1	0	11.55	0	14.69
29.77	27.08	27.96	8.08	0	11.53	0	14.66
29.96	23.83	25.98	8.04	0	11.51	0	14.64
24.75	22.27	23.55	8	0	11.49	0	14.61
23.55	20.2	21.64	7.94	0	11.47	0	14.59
24.05	21.38	22.33	7.9	0	11.44	0	14.59
22.31	19.04	20.91	7.84	0	11.42	0	14.56
21.79	19.46	20.8	7.78	0	11.4	0	14.56
21.13	19.46	20.3	7.74	0	11.4	0	14.54
21.05	17.77	19.37	7.68	0	11.38	0	14.54
18.19	15.47	16.86	7.62	0	11.36	0	14.51
22.32	14.45	17.53	7.48	0	11.27	0	14.39
30.36	22.36	27.57	7.44	0	11.24	0	14.39
34.51	30.33	32.14	7.46	0	11.33	0	14.49
35.13	33.49	34.31	7.5	0	11.4	0	14.56
36.9	34.34	35.7	7.54	0	11.47	0	14.66
39.07	35.8	37.28	7.58	0	11.53	0	14.74
41.42	38.11	39.27	7.66	0	11.62	0	14.83
42.72	39.37	40.69	7.66	0	11.6	0	14.81
41.76	39.54	40.2	7.6	0	11.51	0	14.71
39.99	33.85	37.87	7.54	0	11.4	0	14.61

33.83	24.16	27.58	7.6	0	11.42	0	14.61
26.15	23.59	25.25	7.54	0	11.29	0	14.47
24.12	20.5	22.87	7.54	0	11.24	0	14.42
22.82	20.46	21.41	7.54	0	11.2	0	14.39
26.11	22.88	24.78	7.56	0	11.18	0	14.37
27.04	24.72	26.03	7.56	0	11.16	0	14.37
26.96	23.08	25.58	7.56	0	11.16	0	14.37
23.49	20.83	21.68	7.52	0	11.13	0	14.34
21.39	20.13	20.59	7.48	0	11.09	0	14.32
20.94	20	20.52	7.44	0	11.09	0	14.29
20.18	18.87	19.71	7.42	0	11.05	0	14.27
20.27	18.39	19.27	7.38	0	11.05	0	14.27
18.59	16.52	17.33	7.34	0	11.03	0	14.25
19	16.49	18.1	7.28	0	11	0	14.25
23.81	18.45	20.51	7.22	0	10.98	0	14.22
28.81	23.84	26.86	7.13	0	10.89	0	14.13
32.47	28.81	30.9	7.15	0	10.96	0	14.2
36.08	32.56	34.32	7.17	0	11.03	0	14.27
37.45	34.86	35.89	7.22	0	11.07	0	14.34
39.06	36.01	37.12	7.26	0	11.13	0	14.39
41.06	38.92	39.95	7.3	0	11.16	0	14.44
42.9	40.25	41.26	7.36	0	11.18	0	14.49
42.41	40.74	41.34	7.34	0	11.16	0	14.44
41.33	34.74	38.35	7.32	0	11.11	0	14.39
34.7	24.7	29.17	7.3	0	11.03	0	14.32
25.26	23.5	24.61	7.26	0	10.92	0	14.2
26.3	24.97	25.68	7.26	0	10.87	0	14.15
26.09	23.06	24.76	7.26	0	10.85	0	14.15
25.93	23.02	23.88	7.28	0	10.83	0	14.13
26.9	24.8	26.15	7.28	0	10.83	0	14.1
25.15	21.91	24.1	7.28	0	10.81	0	14.1
26.26	21.98	24.59	7.26	0	10.79	0	14.08
29.16	25.42	26.46	7.26	0	10.79	0	14.08
29.72	27.04	28.28	7.24	0	10.76	0	14.05
30.23	27.35	28.56	7.22	0	10.76	0	14.05
30.12	28.9	29.52	7.22	0	10.74	0	14.05
30.3	28.24	29.58	7.2	0	10.74	0	14.05
28.65	26.49	27.6	7.18	0	10.72	0	14.03
26.46	20.22	22.65	7.13	0	10.7	0	14
34.27	22.45	29.58	7.03	0	10.59	0	13.88
34.19	32.84	33.62	7.05	0	10.61	0	13.93
35.35	33.87	34.51	7.09	0	10.68	0	14
36.16	35.05	35.49	7.09	0	10.7	0	14.03
36.35	35.08	35.78	7.11	0	10.72	0	14.05
37.29	35.19	36.49	7.13	0	10.7	0	14.05
39.23	37.21	38.2	7.15	0	10.7	0	14.05
39.92	37.98	38.69	7.17	0	10.72	0	14.05

38.08	36.39	37.39	7.2	0	10.72	0	14.08
36.44	35.2	35.73	7.22	0	10.7	0	14.05
35.36	33.88	34.7	7.22	0	10.63	0	13.98
34.23	33.78	33.96	7.22	0	10.59	0	13.96
33.84	31.21	33.01	7.22	0	10.57	0	13.93
31.17	24.81	28.49	7.22	0	10.55	0	13.91
30.6	26.5	29.02	7.18	0	10.48	0	13.86
30.79	28.27	29.73	7.17	0	10.46	0	13.84
28.27	24.99	26.73	7.17	0	10.46	0	13.84
26.77	23.02	24.69	7.15	0	10.42	0	13.79
25.51	23.06	24.56	7.13	0	10.4	0	13.77
26.98	20.82	24.81	7.11	0	10.4	0	13.74
25.32	20.76	23.45	7.09	0	10.38	0	13.74
26.02	17.67	21.69	7.07	0	10.35	0	13.72
19.51	16.9	18.03	7.03	0	10.33	0	13.72
23.43	16.9	18.45	6.95	0	10.29	0	13.65
31.14	23.46	28.83	6.87	0	10.23	0	13.58
34.03	31.17	32.62	6.91	0	10.31	0	13.67
36.58	33.51	35.03	6.95	0	10.38	0	13.77
38.63	36.18	37.3	7.01	0	10.46	0	13.86
41.15	38.27	39.52	7.07	0	10.55	0	13.96
43.4	40.22	41.94	7.17	0	10.66	0	14.08
44.56	42.26	43.29	7.17	0	10.63	0	14.05
44.65	43.27	43.92	7.13	0	10.57	0	13.98
43.55	35.68	41.05	7.05	0	10.44	0	13.84
35.56	25.17	30.35	7.09	0	10.42	0	13.81
32.45	24.47	26.52	7.01	0	10.27	0	13.67
33.39	24.14	29.11	7.01	0	10.23	0	13.62
25.84	23.58	24.58	7.03	0	10.2	0	13.6
23.59	22.16	22.68	7.01	0	10.18	0	13.55
24.23	20.37	22.33	6.99	0	10.16	0	13.53
20.4	19.42	19.86	6.97	0	10.14	0	13.53
20.33	19.06	19.74	6.95	0	10.12	0	13.5
21.03	18.63	19.75	6.91	0	10.12	0	13.5
20.67	17.45	19.13	6.87	0	10.1	0	13.48
20.98	19.42	20.14	6.83	0	10.08	0	13.46
20.35	18.3	19.3	6.8	0	10.08	0	13.46
19.14	17.64	18.43	6.76	0	10.06	0	13.43
19.4	16.75	18.14	6.7	0	10.06	0	13.43
22.82	16.3	18.24	6.62	0	10.01	0	13.39
35.18	22.86	30.8	6.55	0	9.95	0	13.32
38.28	34.95	36.76	6.58	0	10.03	0	13.41
41.93	37.78	39.95	6.64	0	10.14	0	13.53
43.78	41.88	42.67	6.74	0	10.25	0	13.67
47.79	42.98	45.14	6.83	0	10.38	0	13.79
49.69	46.74	47.93	6.93	0	10.46	0	13.91
50.04	48.67	49.19	6.95	0	10.46	0	13.91

49.44	47.04	48.16	6.89	0	10.38	0	13.79
47.09	40.54	45.28	6.8	0	10.23	0	13.62
40.5	28.55	31.98	6.78	0	10.18	0	13.58
29.2	26.98	27.99	6.7	0	10.03	0	13.41
27.46	24.89	26.22	6.68	0	9.97	0	13.36
25.78	24.19	25.02	6.7	0	9.95	0	13.32
28.02	24.62	26.11	6.72	0	9.93	0	13.32
33.59	24.07	26.93	6.74	0	9.91	0	13.29
34.5	28.7	31.62	6.74	0	9.89	0	13.29
31.29	27.7	29.2	6.74	0	9.91	0	13.27
51.02	27.79	33.51	6.74	0	9.89	0	13.27
52.26	30.95	47.15	6.76	0	9.89	0	13.27
31.81	27.02	29.53	6.76	0	9.91	0	13.29
36.58	25.6	30.56	6.72	0	9.86	0	13.24
39.5	36.82	38.06	6.7	0	9.84	0	13.22
37.87	34.81	36.35	6.7	0	9.86	0	13.24
37.11	32.97	35.64	6.68	0	9.84	0	13.22
41.45	36.82	38.86	6.6	0	9.78	0	13.13
52.44	41.47	46.95	6.68	0	9.86	0	13.24
54.56	51.6	52.77	6.82	0	10.01	0	13.41
56.24	53.96	55.04	7.03	0	10.23	0	13.67
56.22	54.26	55.38	7.26	0	10.46	0	13.93
56.21	54.65	55.36	7.38	0	10.59	0	14.08
56.43	54.91	55.6	7.34	0	10.48	0	13.93
55.47	53.07	54.2	7.28	0	10.29	0	13.72
53.59	48.81	50.99	7.28	0	10.08	0	13.5
49.03	44.86	46.91	7.38	0	9.99	0	13.39
46.4	44.98	45.6	7.44	0	9.89	0	13.27
46.91	43.04	45.26	7.52	0	9.86	0	13.22
46.35	42.24	44.58	7.58	0	9.84	0	13.22
47.15	45.59	46.52	7.62	0	9.8	0	13.2
48	46.38	47.27	7.66	0	9.82	0	13.17
47.75	42.81	45.12	7.72	0	9.8	0	13.17
43.75	40.45	41.91	7.76	0	9.8	0	13.15
43.04	40.35	41.66	7.8	0	9.78	0	13.13
45.42	41.5	43.89	7.82	0	9.76	0	13.1
44.32	39.44	41.85	7.82	0	9.76	0	13.1
43.15	39.87	42.01	7.82	0	9.74	0	13.08
41.57	39.4	40.65	7.82	0	9.74	0	13.08
40.02	37.17	38.61	7.78	0	9.74	0	13.06
40.89	37.43	39.37	7.72	0	9.7	0	13.03
42.52	40.71	41.56	7.62	0	9.63	0	12.94
46.75	41.64	44.19	7.6	0	9.68	0	12.96
50.58	46.07	48.37	7.68	0	9.76	0	13.06
51.59	48.49	50.44	7.88	0	9.93	0	13.22
52.24	50.07	51.28	8.12	0	10.06	0	13.39
52.4	50.41	51.28	8.38	0	10.14	0	13.48

52.64	50.48	51.32	8.56	0	10.12	0	13.43
51.66	47.05	49.67	8.68	0	10.03	0	13.32
47.07	45.72	46.31	8.78	0	9.91	0	13.17
46.22	43.38	44.72	8.87	0	9.82	0	13.08
43.87	39.98	42.11	8.87	0	9.78	0	12.99
40.59	38.82	40	8.85	0	9.74	0	12.96
40.92	37.89	39.34	8.76	0	9.72	0	12.92
41.66	38.43	39.66	8.66	0	9.7	0	12.89
41.71	38	39.43	8.56	0	9.7	0	12.87
39.73	38.01	38.66	8.46	0	9.72	0	12.87
39.87	38.05	38.82	8.36	0	9.7	0	12.87
39.5	33.27	36.96	8.28	0	9.7	0	12.85
36.66	32.45	35.02	8.16	0	9.68	0	12.8
34.44	28.06	31.69	8.04	0	9.68	0	12.8
31.8	21.27	27.15	7.92	0	9.65	0	12.76
26.83	20.69	22.63	7.8	0	9.65	0	12.73
34.46	25.31	31.96	7.7	0	9.65	0	12.73
34.56	32.16	32.54	7.6	0	9.68	0	12.73
33.56	32.52	32.96	7.54	0	9.68	0	12.73
35.27	33.41	34.12	7.4	0	9.61	0	12.66
36.94	34.97	35.74	7.38	0	9.65	0	12.69
40.93	36.18	38.16	7.42	0	9.74	0	12.76
40.98	39.1	40.05	7.62	0	9.84	0	12.89
42.33	40.27	41.37	7.92	0	9.97	0	13.01
43.37	41.11	42.35	8.12	0	9.97	0	13.01
43.67	42.12	42.65	8.26	0	9.91	0	12.92
42.75	36.98	40.67	8.38	0	9.82	0	12.83
36.98	25.07	31.47	8.54	0	9.84	0	12.83
26.2	23.74	25.03	8.48	0	9.72	0	12.69
25.28	22.15	24.11	8.38	0	9.68	0	12.64
24.79	21.08	22.26	8.24	0	9.65	0	12.59
24.97	20.58	22.52	8.08	0	9.63	0	12.57
23.54	20.18	21.54	7.94	0	9.61	0	12.55
24.97	17.22	22.17	7.78	0	9.59	0	12.53
18.48	16.52	17.5	7.66	0	9.59	0	12.5
17.9	16.56	16.98	7.52	0	9.59	0	12.5
17.67	16.34	16.78	7.4	0	9.59	0	12.5
17.49	16.45	16.87	7.3	0	9.59	0	12.5
16.86	14.94	15.98	7.2	0	9.59	0	12.48
17.93	15.98	16.83	7.11	0	9.59	0	12.48
16.15	13.92	14.69	7.01	0	9.59	0	12.46
21.05	13.72	15.83	6.91	0	9.57	0	12.43
29.49	21.09	26.02	6.78	0	9.51	0	12.37
31.44	28.55	29.62	6.78	0	9.59	0	12.43
33.63	31.09	32.38	6.78	0	9.65	0	12.53
37.17	33.02	35.04	6.8	0	9.72	0	12.57
39.21	36.48	37.94	6.83	0	9.8	0	12.66

43.09	38.45	40.88	6.87	0	9.86	0	12.73
44.96	41.92	43.29	6.85	0	9.86	0	12.73
44.66	42.25	43.29	6.83	0	9.82	0	12.69
42.79	37.15	41.07	6.82	0	9.76	0	12.62
37.12	25.01	30.25	6.89	0	9.76	0	12.64
28.72	24.95	26.36	6.85	0	9.63	0	12.48
29.5	26.09	27.88	6.87	0	9.59	0	12.43
28.32	25.55	26.71	6.85	0	9.57	0	12.43
28.95	26.65	27.7	6.85	0	9.57	0	12.41
29.43	28.08	28.8	6.83	0	9.55	0	12.41
28.29	27.14	27.69	6.82	0	9.55	0	12.41
27.81	25.46	26.58	6.8	0	9.53	0	12.39
30.01	24.87	27.08	6.76	0	9.51	0	12.39
28.09	24.62	25.95	6.72	0	9.51	0	12.37
30.1	26.8	28.6	6.68	0	9.49	0	12.37
34.05	27.93	29.75	6.66	0	9.49	0	12.37
34.07	30.64	32.72	6.64	0	9.49	0	12.37
30.69	24.66	26.85	6.6	0	9.49	0	12.37
28.89	24.97	26.55	6.56	0	9.47	0	12.34
40.37	28.89	34.73	6.47	0	9.38	0	12.25
42.46	40.42	41.91	6.51	0	9.44	0	12.32
43.42	41.94	42.71	6.56	0	9.53	0	12.41
46.09	43.35	44.86	6.6	0	9.55	0	12.46
49.68	45.65	47.42	6.7	0	9.65	0	12.57
50.54	48.34	49.27	6.87	0	9.84	0	12.76
49.53	48.5	48.92	6.97	0	9.84	0	12.76
50.33	48.6	49.17	7.05	0	9.72	0	12.64
49.56	41.72	47.09	7.2	0	9.63	0	12.55
41.7	30.1	35.77	7.4	0	9.61	0	12.53
31.68	29.46	30.19	7.44	0	9.47	0	12.39
34.57	29.59	31.93	7.44	0	9.4	0	12.32
29.81	27.82	29.12	7.38	0	9.38	0	12.3
34.2	29.59	31.9	7.32	0	9.38	0	12.27
33.27	30.14	31.51	7.24	0	9.36	0	12.27
34.54	30.18	32.5	7.17	0	9.36	0	12.27
34.92	28.59	32.46	7.09	0	9.36	0	12.25
32.88	29.47	30.92	7.01	0	9.34	0	12.25
34.11	28.15	30.67	6.97	0	9.32	0	12.23
30.3	26.79	28.19	6.93	0	9.32	0	12.23
27.63	24.55	26.23	6.87	0	9.3	0	12.21
25.5	22.57	23.85	6.83	0	9.3	0	12.21
25.39	22.55	24	6.78	0	9.3	0	12.21
29.74	24.05	26.21	6.74	0	9.28	0	12.18
37.46	29.77	32.38	6.62	0	9.22	0	12.09
46.98	37.53	43.2	6.62	0	9.26	0	12.14
50.54	47.01	48.6	6.7	0	9.36	0	12.27
54.15	49.87	51.74	6.83	0	9.53	0	12.43

56	52.71	54.37	7.01	0	9.74	0	12.69
56.98	53.75	55.55	7.26	0	9.97	0	12.94
62.65	56.64	60.21	7.48	0	10.06	0	13.03
59.8	56.56	58.43	7.74	0	10.01	0	12.96
56.6	52.07	54.72	7.84	0	9.74	0	12.66
53.23	51.38	52.41	8.02	0	9.59	0	12.53
51.85	50.75	51.31	8.14	0	9.47	0	12.39
50.79	46.33	48.38	8.28	0	9.44	0	12.34
47.18	43.69	45.21	8.32	0	9.4	0	12.27
48.8	44.48	45.98	8.32	0	9.36	0	12.25
48.6	46.84	47.3	8.32	0	9.34	0	12.23
49.49	44.27	48.25	8.34	0	9.36	0	12.27
48.88	44.27	47.38	8.36	0	9.38	0	12.27
48.53	45.4	47.11	8.38	0	9.36	0	12.25
47.73	45.02	46.07	8.4	0	9.36	0	12.23
49.13	44.55	47.13	8.4	0	9.34	0	12.21
49.24	45.31	47.66	8.42	0	9.36	0	12.21
47.43	44.72	45.9	8.42	0	9.36	0	12.21
47.73	43.33	44.97	8.42	0	9.36	0	12.21
47.01	42.83	44.3	8.42	0	9.36	0	12.21
47.88	46.61	47.39	8.38	0	9.32	0	12.16
51.38	47.7	49.14	8.34	0	9.3	0	12.12
53.57	50.6	52.27	8.56	0	9.49	0	12.3
56.01	52.93	54.6	8.89	0	9.78	0	12.62
57.33	55.25	56.46	9.28	0	10.06	0	12.92
58.12	56.44	57.17	9.55	0.161	10.16	0	13.03
58.22	54.82	56.41	9.61	0.171	10.03	0	12.87
56.92	53.29	55.23	9.63	0	9.84	0	12.64
54.93	49.54	53.24	9.63	0	9.65	0	12.43
51.27	42.31	48.68	9.68	0	9.57	0	12.32
50.52	42.09	46.86	9.61	0	9.47	0	12.18
50.6	43.9	46.45	9.55	0	9.42	0	12.14
51.05	48.64	49.74	9.47	0	9.42	0	12.14
51.39	47.56	50.59	9.4	0	9.44	0	12.12
47.51	40.74	42.72	9.34	0	9.44	0	12.12
41.6	37.8	40.11	9.24	0	9.44	0	12.09
39.63	36.78	37.79	9.13	0	9.42	0	12.05
40.92	36.92	39.27	9.03	0	9.4	0	12.03
42.71	37.02	40.2	8.93	0	9.42	0	12.03
42.16	37.29	39.93	8.85	0	9.44	0	12.03
40.9	37.98	39.84	8.74	0	9.44	0	12.03
40.38	36.71	38.93	8.68	0	9.47	0	12
38.39	34.9	36.59	8.6	0	9.47	0	12
36.73	31.69	33.59	8.5	0	9.47	0	11.98
44.71	36.8	42.54	8.32	0	9.4	0	11.89
49.28	44.46	47.47	8.32	0	9.49	0	11.98
54.15	49.14	52.21	8.48	0	9.74	0	12.23

55.7	52.8	54.65	8.85	0	10.08	0	12.59
57.28	55.39	56.08	9.11	0	10.23	0	12.76
57.62	55.01	56.03	9.36	0.166	10.31	0	12.83
56.74	54.16	55.03	9.49	0	10.2	0	12.69
55.08	53.53	54.17	9.53	0	10.01	0	12.48
53.55	50.87	52.35	9.61	0	9.89	0	12.34
51.23	49.01	49.93	9.68	0	9.8	0	12.23
49.39	42.78	45.61	9.65	0	9.7	0	12.09
46.28	43.24	44.51	9.61	0	9.63	0	12.05
46.82	42.76	43.96	9.57	0	9.63	0	12
47.31	44.48	46.51	9.49	0	9.61	0	11.98
47.61	46.64	47.14	9.44	0	9.63	0	12
47.66	46.47	47.01	9.38	0	9.65	0	12
46.77	44.2	45.93	9.34	0	9.65	0	12
44.35	42.4	43.34	9.3	0	9.65	0	11.98
45.35	42.07	43.53	9.26	0	9.65	0	11.98
45.47	39.18	42.42	9.2	0	9.65	0	11.96
41.02	37.77	39.4	9.11	0	9.65	0	11.93
40.97	37.33	38.84	9.03	0	9.65	0	11.93
42.18	37.43	40.32	8.93	0	9.65	0	11.91
40.25	36.44	37.52	8.87	0	9.65	0	11.91
43.84	39.22	41.09	8.74	0	9.63	0	11.87
48.55	43.87	46.49	8.64	0	9.61	0	11.85
50.53	47.96	49.45	8.76	0	9.76	0	12
50.78	49.01	49.87	9.03	0	10.01	0	12.27
58.55	49.03	51.99	9.22	0	10.12	0	12.34
59.78	55.88	58.04	9.53	0	10.23	0	12.46
58.77	56.73	57.71	10.08	0.169	10.55	0	12.8
58.01	55.71	56.55	10.14	0.178	10.4	0	12.62
56.27	54.69	55.73	10.12	0.181	10.14	0	12.34
54.71	51.84	53.21	10.23	0	10.08	0	12.27
53.17	51.53	52.31	10.18	0	9.93	0	12.09
53.04	51.07	52.27	10.18	0	9.93	0	12.07
51.07	49.54	50.38	10.16	0	9.89	0	12.05
50.18	39.8	45.51	10.1	0	9.86	0	11.98
43.09	37.96	40.41	9.99	0	9.8	0	11.93
45.7	38.83	42.72	9.86	0	9.78	0	11.89
44.55	41.81	43.24	9.78	0	9.78	0	11.89
42.4	41	41.66	9.65	0	9.8	0	11.87
42.38	40.52	41.75	9.55	0	9.78	0	11.87
43.25	41.18	42.13	9.47	0	9.8	0	11.87
48.11	41.66	43.85	9.38	0	9.82	0	11.87
45.23	38.12	40.51	9.28	0	9.82	0	11.87
43.28	37.53	40.58	9.2	0	9.82	0	11.85
38.79	35.24	37.03	9.09	0	9.82	0	11.82
47.63	37.9	43.28	8.89	0	9.72	0	11.71
57.86	47.63	51.56	8.91	0	9.86	0	11.87

60.86	57.63	59.18	9.13	0	10.16	0	12.16
64	60.31	61.91	9.61	0	10.68	0	12.71
65.23	63.25	64.27	10.18	0.163	11.18	0	13.24
67.07	65.1	66.18	10.7	0.177	11.51	0	13.6
67.06	64.17	65.75	10.92	0.185	11.51	0	13.58
64.33	60.03	61.87	10.74	0.19	11.05	0	13.08
60.62	58.48	59.74	10.46	0.191	10.5	0	12.48
58.42	47.05	52.02	10.46	0.186	10.29	0	12.25
50.47	45.71	48.46	10.35	0	10.1	0	12.03
54.8	48.13	51.61	10.31	0	10.03	0	11.96
55.06	52.06	53.67	10.27	0	10.03	0	11.96
53.99	52.85	53.47	10.23	0	10.06	0	11.98
56.08	51.72	54.48	10.18	0	10.08	0	11.98
57.02	51.07	55.79	10.14	0	10.1	0	12
57.92	56.27	56.92	10.12	0	10.12	0	12
56.62	51.07	52.94	10.1	0	10.12	0	12
51.51	48.96	50.37	10.06	0	10.1	0	11.98
52.77	47.1	50.11	9.99	0	10.08	0	11.93
48.6	41.43	45.42	9.91	0	10.06	0	11.91
50.42	41.93	46.48	9.8	0	10.01	0	11.87
50.1	46.05	48.35	9.72	0	10.03	0	11.87
50.81	46.54	48.39	9.65	0	10.06	0	11.89
55.45	50.56	53.15	9.55	0	10.06	0	11.87
59.65	55.41	57.55	9.49	0	10.06	0	11.87
65.4	59.67	62.66	9.7	0	10.27	0	12.07
67.19	62.92	64.98	10.16	0.173	10.7	0	12.53
67.93	63.96	65.04	10.7	0.17	11.11	0	12.94
64.34	62.77	63.45	10.76	0.178	10.98	0	12.8
64.17	61.99	62.81	10.87	0.183	10.83	0	12.64
62.99	60.37	62.15	10.98	0.187	10.72	0	12.5
60.37	57.21	58.91	11.07	0.184	10.63	0	12.41
57.27	53.69	55.78	11.05	0.184	10.5	0	12.25
54.3	52.6	53.43	10.96	0.185	10.38	0	12.09
54.95	53.22	54.17	10.92	0.183	10.31	0	12.05
54.84	52.13	53.45	10.87	0.183	10.33	0	12.03
53.34	51.82	52.62	10.83	0.183	10.31	0	12.03
52.91	51.53	52.26	10.76	0	10.31	0	12
52.48	49.25	50.63	10.72	0.183	10.31	0	12
49.96	47.8	48.96	10.66	0	10.31	0	11.98
49.11	47.2	47.73	10.59	0	10.29	0	11.96
49.15	47.49	48.26	10.55	0	10.29	0	11.96
49.26	46.78	48.32	10.5	0	10.31	0	11.96
48.16	46.71	47.4	10.46	0	10.31	0	11.96
47.25	42.83	45.01	10.42	0	10.31	0	11.96
45.82	42.6	43.91	10.33	0	10.31	0	11.91
46.43	43.8	44.94	10.27	0	10.29	0	11.89
48.56	45.82	47.37	10.14	0	10.25	0	11.82

51.39	48.61	50.01	10.1	0	10.29	0	11.87
53.55	50.99	52.08	10.16	0	10.4	0	11.98
54.73	51.92	53.56	10.33	0	10.59	0	12.18
55.65	53.77	54.55	10.61	0.176	10.85	0	12.43
56.23	54.14	54.96	10.81	0.177	11	0	12.57
56.56	52.26	54.16	10.96	0.179	11.05	0	12.62
52.92	50.52	51.61	10.83	0.184	10.79	0	12.34
50.83	47.17	48.66	10.81	0.186	10.63	0	12.16
50.2	45.76	47.24	10.81	0	10.55	0	12.07
48.94	46.36	47.61	10.76	0	10.5	0	12
50.05	46.54	48.55	10.7	0	10.48	0	11.98
49.81	47.65	48.78	10.63	0	10.5	0	12
49.72	47.88	48.82	10.57	0	10.5	0	11.98
48.45	46.46	47.52	10.5	0	10.5	0	11.98
48.24	38.76	46.1	10.42	0	10.5	0	11.98
38.71	33.37	34.64	10.31	0	10.48	0	11.96
35.48	34.3	34.86	10.16	0	10.44	0	11.89
34.83	31.2	32.84	9.99	0	10.42	0	11.85
32.09	30.76	31.36	9.8	0	10.4	0	11.85
31.17	28.67	29.87	9.61	0	10.4	0	11.82
29.86	28.65	29.26	9.42	0	10.42	0	11.85
29.41	28.52	28.92	9.24	0	10.42	0	11.85
28.97	28.29	28.63	9.03	0	10.42	0	11.82
30.73	28.74	29.7	8.7	0	10.27	0	11.64
33.48	30.67	31.97	8.68	0	10.42	0	11.8
35.22	30.97	33.02	8.58	0	10.46	0	11.85
35.58	32.79	33.88	8.54	0	10.55	0	11.93
36.13	33.32	34.45	8.54	0	10.59	0	12
36.65	34.49	35.51	8.56	0	10.63	0	12.05
37.43	35.62	36.29	8.58	0	10.66	0	12.05
36.61	34.84	35.7	8.6	0	10.61	0	12
35.4	31.31	33.61	8.6	0	10.55	0	11.93
31.33	28.99	30.14	8.64	0	10.57	0	11.98
29.53	27.06	28	8.54	0	10.48	0	11.89
27.58	24.63	26.02	8.4	0	10.44	0	11.85
26.47	24	24.79	8.28	0	10.42	0	11.82
27.15	22.44	25.57	8.14	0	10.42	0	11.82
24.97	23.23	24.35	8	0	10.4	0	11.82
23.73	22.06	23.02	7.86	0	10.38	0	11.8
25.14	23.23	24.39	7.72	0	10.35	0	11.8
25.18	23.59	24.23	7.6	0	10.35	0	11.8
23.86	20.18	21.7	7.48	0	10.35	0	11.8
22.43	19	20.51	7.36	0	10.33	0	11.8
19.55	14.22	17.29	7.26	0	10.33	0	11.8
17.53	14.28	15.19	7.15	0	10.31	0	11.8
14.66	12.67	13.59	7.05	0	10.29	0	11.78
14.5	9.4	12.03	6.93	0	10.27	0	11.78

23.87	12.17	19.73	6.74	0	10.16	0	11.67
26.5	23.69	24.99	6.74	0	10.25	0	11.78
28.85	26.27	27.32	6.72	0	10.29	0	11.85
31.15	28.51	29.7	6.7	0	10.35	0	11.91
32.34	30.1	31.08	6.7	0	10.4	0	11.98
34.16	31.58	32.56	6.72	0	10.42	0	12.03
34.79	33.06	33.91	6.72	0	10.42	0	12.03
34.98	33.61	34.26	6.7	0	10.38	0	12
34.28	29.43	33.1	6.68	0	10.31	0	11.96
29.4	17.3	22.05	6.74	0	10.33	0	11.98
24.31	17.64	18.65	6.66	0	10.2	0	11.87
25.11	21.34	23.21	6.66	0	10.14	0	11.85
22.71	18.56	21.29	6.64	0	10.12	0	11.82
21.73	17.23	19.31	6.6	0	10.1	0	11.82
20.76	11.55	15.97	6.56	0	10.06	0	11.82
13.27	10.48	11.4	6.51	0	10.03	0	11.8
12.1	10.74	11.13	6.45	0	10.01	0	11.8
12.15	8.96	10.27	6.37	0	9.99	0	11.8
13.18	7.92	9.63	6.32	0	9.97	0	11.8
14.5	7.947	10.71	6.24	0	9.95	0	11.8
11.56	8.59	9.85	6.18	0	9.93	0	11.8
10.18	7.975	8.76	6.11	0	9.93	0	11.8
10.08	8.08	8.78	6.03	0	9.89	0	11.8
10.79	8.04	8.73	5.94	0	9.86	0	11.78
23.95	10.81	18.64	5.79	0	9.76	0	11.69
26.62	23.7	25.17	5.79	0	9.82	0	11.78
29.36	26.3	27.43	5.77	0	9.86	0	11.85
32.26	27.88	29.94	5.77	0	9.93	0	11.91
34.42	31.02	32.51	5.8	0	9.97	0	11.98
36.42	33.03	34.73	5.84	0	10.01	0	12.05
37.31	35.18	36.21	5.9	0	10.01	0	12.07
37.44	35.92	36.75	5.9	0	9.97	0	12.03
36.23	29.91	34.54	5.9	0	9.91	0	11.98
29.88	17.04	22.2	5.96	0	9.91	0	12.03
18.56	15.6	16.53	5.86	0	9.78	0	11.89
17.36	15.04	16.03	5.86	0	9.72	0	11.85
16.65	15.57	16.16	5.86	0	9.68	0	11.82
19.07	15.96	16.79	5.84	0	9.65	0	11.82
17.9	12.8	14.75	5.82	0	9.63	0	11.82
15.14	13.46	14.38	5.79	0	9.59	0	11.8
14.43	13.47	14.06	5.73	0	9.59	0	11.8
20.09	11.37	15.9	5.67	0	9.57	0	11.8
12.27	9.76	10.91	5.6	0	9.55	0	11.8
11.11	9.52	10.34	5.54	0	9.53	0	11.78
12.17	10.28	11.28	5.5	0	9.51	0	11.78
11.94	10.36	11.19	5.43	0	9.49	0	11.78
12.19	9.18	10.59	5.36	0	9.47	0	11.78

12.35	8.59	10.01	5.28	0	9.44	0	11.78
20.05	11.39	16.6	5.17	0	9.36	0	11.69
27.03	19.72	23.07	5.11	0	9.38	0	11.73
31.78	26.66	29.16	5.11	0	9.4	0	11.8
34.59	31.67	33.2	5.17	0	9.49	0	11.89
35.5	33.51	34.53	5.24	0	9.57	0	11.98
35.8	34.29	35.03	5.32	0	9.59	0	12.03
37.51	34.98	36.26	5.39	0	9.59	0	12.05
37.67	35.8	37	5.41	0	9.53	0	12
36.64	31.32	35.27	5.45	0	9.47	0	11.96
31.27	20.48	24.04	5.5	0	9.47	0	11.96
23.28	20.63	21.88	5.47	0	9.36	0	11.85
30.3	22.93	25.81	5.49	0	9.32	0	11.82
25.9	22.86	24.4	5.49	0	9.28	0	11.8
26.02	23.18	24.35	5.5	0	9.26	0	11.8
29.61	25.79	28.05	5.5	0	9.26	0	11.8
30.51	29.29	29.8	5.5	0	9.24	0	11.8
31.88	30.43	31.29	5.5	0	9.24	0	11.82
31.54	30.07	30.63	5.52	0	9.24	0	11.82
30.33	28.32	29.37	5.52	0	9.22	0	11.82
29.65	23.11	26.63	5.52	0	9.2	0	11.82
25.49	22.26	24.08	5.52	0	9.15	0	11.8
27.4	23.02	26.03	5.5	0	9.13	0	11.78
26.24	19.4	22.42	5.5	0	9.11	0	11.78
26.72	20.33	23.94	5.47	0	9.09	0	11.76
34.49	26.72	30.16	5.43	0	9.05	0	11.73
38.77	34.43	37.17	5.36	0	8.99	0	11.67
39.8	36.54	37.52	5.49	0	9.11	0	11.82
43.36	39.8	41.4	5.56	0	9.15	0	11.89
48.23	43.19	45.55	5.71	0	9.28	0	12.05
48.38	46.18	47.17	5.9	0	9.44	0	12.23
47.62	44.07	45.66	5.84	0	9.34	0	12.12
45.95	43.55	45.06	5.8	0	9.26	0	12.05
43.5	40.42	41.35	5.82	0	9.22	0	12
40.44	38.94	39.72	5.79	0	9.13	0	11.93
39.43	38.7	39.04	5.77	0	9.07	0	11.87
39.42	37.25	38.09	5.79	0	9.03	0	11.82
38.31	36.99	37.74	5.8	0	9.01	0	11.8
37.24	36.54	36.77	5.82	0	8.97	0	11.8
37.14	36.08	36.81	5.84	0	8.95	0	11.78
36.23	35.51	35.88	5.88	0	8.95	0	11.78
35.92	35.5	35.73	5.92	0	8.93	0	11.76
36.11	35.62	35.87	5.97	0	8.93	0	11.76
35.92	35.34	35.64	6.03	0	8.91	0	11.76
35.34	35.03	35.17	6.07	0	8.89	0	11.73
35.03	34.79	34.9	6.11	0	8.89	0	11.73
34.79	34.21	34.41	6.14	0	8.87	0	11.73

34.45	34.21	34.31	6.16	0	8.85	0	11.71
34.32	33.67	34.06	6.2	0	8.85	0	11.71
33.85	33.63	33.71	6.22	0	8.82	0	11.69
34.35	33.73	34.04	6.24	0	8.82	0	11.69
36.15	34.25	35.11	6.16	0	8.7	0	11.55
35.24	34.84	35.06	6.34	0	8.82	0	11.71
36.66	34.93	35.3	6.41	0	8.82	0	11.69
36.92	35.74	36.37	6.37	0	8.7	0	11.55
36.92	36.03	36.4	6.6	0.218	8.82	0	11.71
37.13	36.29	36.67	6.76	0.221	8.82	0	11.71
37.14	36.36	36.61	6.87	0.222	8.8	0	11.69
36.75	35.67	36.36	6.99	0.219	8.82	0	11.71
36.08	35.63	35.82	7.05	0.218	8.78	0	11.67
36.11	35.55	35.82	7.07	0.219	8.78	0	11.67
35.56	34.21	34.94	7.09	0.219	8.78	0	11.64
35.79	34.66	34.94	7.07	0.218	8.74	0	11.62
35.03	33.04	34.34	7.05	0.218	8.74	0	11.62
40.11	33.97	36.95	7.03	0.218	8.74	0	11.6
41	39.73	40.2	7.01	0.217	8.74	0	11.62
41.35	39.18	40.38	7.03	0.218	8.74	0	11.62
40.04	38.49	39.44	7.03	0.215	8.76	0	11.62
39.11	36.06	37.93	7.05	0.214	8.74	0	11.6
37.96	35.55	36.82	7.03	0.215	8.72	0	11.58
38.2	35.09	36.84	6.99	0.217	8.7	0	11.55
37.08	34.85	35.86	6.95	0.217	8.68	0	11.53
37.42	34.26	36.37	6.89	0.216	8.66	0	11.51
39.43	36.68	38.01	6.7	0.225	8.52	0	11.33
41.52	39.26	40.07	6.82	0.215	8.7	0	11.53
43.37	41.01	42.15	6.93	0.21	8.87	0	11.69
46.91	42.52	44.63	7.07	0.207	9.03	0	11.89
48.04	43.7	45.55	7.26	0.207	9.15	0	12.03
50.88	46.27	48.54	7.66	0.206	9.42	0	12.3
50.76	48	49.6	7.96	0.217	9.53	0	12.41
49.67	46.61	47.72	7.88	0.226	9.22	0	12.05
46.79	44.97	45.67	7.88	0.225	8.99	0	11.8
45.16	41.51	43.71	7.96	0.224	8.89	0	11.69
41.51	38.23	39.97	7.98	0.223	8.8	0	11.6
38.83	36.92	37.98	7.96	0.221	8.74	0	11.51
41.56	34.95	37.34	7.92	0.222	8.72	0	11.49
41.61	38.03	40.02	7.88	0.22	8.7	0	11.44
40.21	35.48	37.43	7.82	0.219	8.7	0	11.44
36.37	33.71	35.08	7.74	0.22	8.68	0	11.42
35.5	32.02	34.21	7.62	0.22	8.66	0	11.4
35.19	29.83	32.58	7.52	0.219	8.66	0	11.38
33.86	30.64	32.92	7.42	0.218	8.64	0	11.36
36.46	32.53	34.79	7.34	0.217	8.64	0	11.36
32.88	31.48	32.33	7.28	0.217	8.68	0	11.36

31.86	28.13	30.34	7.2	0.215	8.66	0	11.33
39.48	31.14	34.23	7.15	0.215	8.66	0	11.31
42.94	39.52	41.17	7.11	0.214	8.68	0	11.33
42.52	41.13	41.67	7.05	0.216	8.68	0	11.33
45.46	41.92	44.19	7.07	0.214	8.78	0	11.42
48.08	44.41	46.69	7.2	0.212	8.97	0	11.6
47.01	41.9	45.27	7.3	0.214	9.09	0	11.73
45	42.08	43.37	7.3	0.217	9.05	0	11.69
44.38	42.44	43.2	7.36	0.217	9.01	0	11.62
43.25	36.42	39.25	7.46	0.217	8.99	0	11.6
36.38	32.68	33.87	7.5	0.215	8.89	0	11.47
32.71	31.45	32.01	7.52	0.215	8.78	0	11.36
31.76	31.29	31.49	7.5	0.215	8.78	0	11.36
31.61	30.51	31.02	7.42	0.218	8.76	0	11.31
31.46	29.31	30.33	7.34	0.218	8.74	0	11.29
30.43	27.6	28.72	7.24	0.218	8.7	0	11.24
29.01	26.25	27.75	7.17	0.218	8.68	0	11.22
28.34	25	27.15	7.09	0.218	8.68	0	11.22
28.81	27.97	28.49	7.03	0.216	8.68	0	11.2
28.63	26.78	27.42	6.99	0.215	8.68	0	11.22
27.06	26.36	26.71	6.93	0.214	8.68	0	11.2
26.85	26.29	26.54	6.87	0.215	8.68	0	11.2
26.89	23.25	25.65	6.82	0.215	8.66	0	11.18
26.84	23.18	25.89	6.76	0.214	8.64	0	11.16
26.46	21.9	24.61	6.72	0.213	8.64	0	11.16
26.33	24.22	25.74	6.68	0.215	8.64	0	11.13
26.5	25.41	26.03	6.64	0.213	8.62	0	11.13
26.93	26.18	26.56	6.51	0.22	8.52	0	11
27.84	26.65	27.3	6.56	0.218	8.62	0	11.11
29.34	27.78	28.64	6.58	0.213	8.66	0	11.16
30.36	28.94	29.48	6.6	0.214	8.7	0	11.2
30.88	29.98	30.4	6.62	0.212	8.74	0	11.24
31.48	30.45	30.99	6.68	0.211	8.82	0	11.33
32.18	31	31.45	6.68	0.211	8.82	0	11.36
31.34	29.24	29.95	6.58	0.212	8.76	0	11.27
29.4	28.93	29.12	6.53	0.21	8.7	0	11.22
29.38	28.46	28.84	6.49	0.21	8.68	0	11.18
28.6	26.86	27.66	6.43	0.209	8.64	0	11.13
27.16	24.74	25.96	6.41	0.209	8.62	0	11.11
26.37	23.98	25.14	6.37	0.21	8.58	0	11.07
25.83	22.4	23.91	6.34	0.208	8.56	0	11.05
24.01	19.12	21.15	6.32	0.21	8.54	0	11.03
24.15	18.8	20.65	6.28	0.21	8.5	0	11
23.09	18.98	20.62	6.26	0.208	8.48	0	11
22.38	19.09	20.4	6.24	0.209	8.48	0	10.98
20.94	19.02	19.93	6.22	0.207	8.48	0	10.98
20.65	18.32	19.15	6.2	0.209	8.46	0	10.98

19.62	18.18	18.71	6.2	0.21	8.46	0	10.98
19.82	16.25	18.77	6.18	0.207	8.46	0	10.96
18.32	16.25	17.52	6.16	0.207	8.44	0	10.96
18.32	16.51	17.55	6.14	0.208	8.42	0	10.94
27.31	17.7	21.49	5.97	0.216	8.26	0	10.76
28.37	26.54	27.46	6.11	0.208	8.4	0	10.94
31.24	28.11	29.52	6.16	0.209	8.46	0	11
32.96	30.34	31.69	6.24	0.203	8.54	0	11.09
33.87	32.2	32.98	6.3	0.205	8.62	0	11.18
34.98	32.74	33.72	6.35	0.203	8.68	0	11.27
35.27	33.66	34.36	6.34	0.203	8.66	0	11.24
35.54	34.28	34.82	6.3	0.204	8.64	0	11.22
34.76	31.84	33.58	6.2	0.206	8.54	0	11.11
31.81	27.14	29.05	6.2	0.203	8.52	0	11.09
27.14	24.7	25.54	6.11	0.205	8.42	0	11
24.88	23.58	24.21	6.07	0.207	8.38	0	10.94
23.67	22.78	23.2	6.03	0.205	8.34	0	10.92
23.42	22.76	23.16	6.03	0.204	8.34	0	10.92
23.42	22.55	22.85	6.01	0.204	8.32	0	10.89
23.16	22.55	22.85	6.01	0.204	8.3	0	10.89
23.64	21.86	22.58	6.01	0.202	8.3	0	10.89
22.15	20.91	21.61	5.99	0.205	8.28	0	10.87
21.45	20.84	21.1	5.97	0.205	8.28	0	10.87
21.27	20.27	20.79	5.97	0.203	8.26	0	10.87
21.3	20.44	20.81	5.96	0.203	8.24	0	10.85
20.76	19.64	20.15	5.96	0.202	8.24	0	10.85
20.11	19.35	19.67	5.94	0.202	8.24	0	10.85
21.05	18.96	19.54	5.92	0.203	8.22	0	10.83
29	21.07	26.23	5.82	0.209	8.12	0	10.72
30.14	28.51	29.19	5.9	0.206	8.2	0	10.83
32.81	29.85	31	5.99	0.202	8.32	0	10.96
35.73	32.19	33.62	6.11	0.199	8.44	0	11.09
38.82	35.6	36.68	6.22	0.198	8.58	0	11.24
41.83	37.96	40.01	6.34	0.201	8.68	0	11.36
42.28	40.57	41.54	6.34	0.203	8.68	0	11.36
42	40.04	40.85	6.28	0.204	8.62	0	11.29
41.06	35.13	39.06	6.11	0.204	8.44	0	11.09
35.08	26.82	29.69	6.01	0.202	8.34	0	11
27.63	26.66	27.16	5.92	0.203	8.24	0	10.87
27.76	25.48	26.7	5.88	0.203	8.18	0	10.85
26.02	25.3	25.73	5.86	0.203	8.16	0	10.83
26.76	25.35	25.87	5.86	0.202	8.14	0	10.81
27.58	24.76	25.68	5.86	0.201	8.14	0	10.81
28.21	23.56	25.17	5.84	0.201	8.12	0	10.79
26.17	23.7	24.69	5.82	0.202	8.1	0	10.79
26.28	24.04	24.82	5.82	0.2	8.1	0	10.79
31	25.93	28.44	5.82	0.201	8.1	0	10.76

30.75	24.36	26.76	5.8	0.202	8.08	0	10.76
26.31	21.39	24.01	5.8	0.2	8.08	0	10.74
25.51	21.07	23.31	5.79	0.2	8.06	0	10.74
25.25	21.84	23.48	5.77	0.199	8.06	0	10.74
26.2	22.16	23.42	5.77	0.199	8.04	0	10.72
31.08	24.33	27.49	5.71	0.2	8	0	10.68
36.72	31.12	34.79	5.69	0.203	7.98	0	10.68
37.58	32.55	34.03	5.79	0.199	8.1	0	10.79
40.16	37.57	38.56	5.9	0.197	8.22	0	10.92
46.68	39.95	43.95	6.01	0.197	8.34	0	11.07
45.4	40.21	42.68	6.07	0.198	8.4	0	11.13
47.48	43.3	45.55	6.13	0.197	8.46	0	11.2
43.25	39.67	41.24	6.16	0.201	8.48	0	11.24
39.96	33.85	37.05	5.97	0.202	8.28	0	11.03
33.82	27.33	29.66	5.86	0.198	8.14	0	10.89
30.87	28.02	30.03	5.77	0.198	8.04	0	10.76
33.18	29.07	30.89	5.73	0.198	8.02	0	10.74
32.25	30.06	30.97	5.73	0.199	8	0	10.72
31.33	29.96	30.53	5.71	0.197	8	0	10.72
31.95	28.03	30.28	5.71	0.198	7.98	0	10.7
28.06	26.55	27.35	5.71	0.199	7.96	0	10.68
31.73	25.28	27.62	5.69	0.198	7.94	0	10.68
25.6	24.55	24.85	5.69	0.196	7.92	0	10.66
26.41	25.08	25.65	5.67	0.198	7.9	0	10.66
25.26	24.94	25.09	5.67	0.199	7.9	0	10.63
25.17	23.81	24.26	5.67	0.196	7.9	0	10.63
25.68	24.13	24.76	5.65	0.198	7.88	0	10.63
26.77	24.13	25.2	5.65	0.199	7.88	0	10.61
25.12	23.92	24.49	5.64	0.197	7.88	0	10.61
35.39	24.36	27.87	5.54	0.2	7.8	0	10.53
37.81	35.46	37.26	5.58	0.2	7.82	0	10.57
38.69	37.39	38	5.77	0.197	8.04	0	10.81
40.57	38.27	39.45	5.96	0.193	8.24	0	11.03
42.05	39.96	40.93	6.11	0.196	8.38	0	11.2
43.9	41.52	42.63	6.22	0.2	8.5	0	11.33
44.44	43.31	43.79	6.18	0.203	8.46	0	11.29
44.98	43.97	44.38	6.07	0.205	8.34	0	11.16
44.08	40.52	43.04	5.9	0.203	8.16	0	10.94
40.48	28.88	32.83	5.77	0.197	8.02	0	10.79
29.71	28.72	29.16	5.65	0.198	7.86	0	10.63
29.36	27.65	28.49	5.62	0.197	7.84	0	10.59
28.14	27.45	27.75	5.6	0.198	7.8	0	10.57
28.11	26.41	27.43	5.6	0.196	7.78	0	10.57
27.35	25.92	26.86	5.6	0.195	7.78	0	10.55
28.01	25.41	26.31	5.58	0.197	7.78	0	10.55
26.51	24.55	25.34	5.58	0.197	7.76	0	10.53
26.83	25.17	25.76	5.56	0.195	7.74	0	10.5

25.73	23.85	24.47	5.56	0.194	7.74	0	10.5
24.77	23.44	24.23	5.54	0.196	7.72	0	10.48
25.33	22.68	23.7	5.54	0.196	7.72	0	10.48
23.28	21.95	22.48	5.52	0.194	7.7	0	10.48
22.86	21.34	22.2	5.52	0.195	7.7	0	10.48
23.16	21.56	22.16	5.5	0.196	7.7	0	10.46
33.23	22.86	27.16	5.41	0.199	7.6	0	10.38
36.22	33.09	34.4	5.49	0.198	7.7	0	10.46
37.45	35.69	36.37	5.64	0.194	7.86	0	10.66
40.41	37.04	38.72	5.84	0.194	8.08	0	10.89
44.44	39.55	41.75	6.05	0.195	8.3	0	11.13
46.87	42.88	44.91	6.26	0.202	8.54	0	11.38
49.6	45.67	47.59	6.24	0.205	8.5	0	11.36
49.53	45.05	46.97	6.16	0.208	8.42	0	11.27
45.07	40.8	43.17	5.88	0.203	8.12	0	10.92
40.76	34.72	37.78	5.75	0.198	7.96	0	10.76
35.84	33.64	34.43	5.64	0.196	7.82	0	10.61
37.21	35.27	36.06	5.58	0.198	7.78	0	10.55
37.76	36.92	37.38	5.62	0.196	7.78	0	10.57
38.13	36.44	37.24	5.62	0.195	7.8	0	10.59
36.51	36.13	36.29	5.64	0.195	7.8	0	10.59
36.63	35.55	36.25	5.64	0.195	7.8	0	10.59
35.65	35.22	35.45	5.64	0.195	7.78	0	10.57
35.58	32.43	34.03	5.62	0.195	7.78	0	10.55
33.13	30.24	31.91	5.56	0.197	7.7	0	10.48
31.96	30.07	30.8	5.52	0.197	7.66	0	10.44
33.6	30.94	32.42	5.54	0.197	7.66	0	10.44
33.06	32.07	32.68	5.58	0.197	7.7	0	10.48
33.42	31.48	32.55	5.58	0.195	7.7	0	10.46
34.37	32.69	33.41	5.56	0.196	7.68	0	10.46
38.38	33.3	34.87	5.5	0.198	7.6	0	10.4
40.32	38.14	38.83	5.62	0.199	7.74	0	10.53
41.9	40.28	41.23	5.73	0.196	7.86	0	10.66
45.47	41.91	42.94	5.88	0.199	8	0	10.83
46.44	43.52	44.8	6.07	0.202	8.18	0	11.03
48.11	43.74	45.22	6.34	0.21	8.48	0	11.33
47.61	44.54	45.41	6.47	0.217	8.58	0	11.47
44.81	42.97	43.92	6.32	0.217	8.42	0	11.27
44.55	40.85	42.68	6.01	0.211	8.06	0	10.89
40.81	39.07	39.62	5.88	0.203	7.92	0	10.72
39.45	35.96	38.59	5.77	0.201	7.76	0	10.55
39.46	35.65	37.4	5.73	0.2	7.68	0	10.48
38.6	36.59	38.08	5.75	0.199	7.68	0	10.48
38.51	37.07	37.82	5.79	0.198	7.72	0	10.53
37.26	36.03	36.47	5.8	0.202	7.72	0	10.53

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Time stamp	YEAR	DAY OF YEAR	HOUR	TIME	DATE	Battery Voltage V	Precip inches
1/1/2017 0:00	2017	1	0	1	1/1/2017	12.69	0
1/1/2017 1:00	2017	1	100	1.041667	1/1/2017	12.67	0
1/1/2017 2:00	2017	1	200	1.083333	1/1/2017	12.65	0
1/1/2017 3:00	2017	1	300	1.125	1/1/2017	12.63	0
1/1/2017 4:00	2017	1	400	1.166667	1/1/2017	12.61	0.04
1/1/2017 5:00	2017	1	500	1.208333	1/1/2017	12.59	0
1/1/2017 6:00	2017	1	600	1.25	1/1/2017	12.56	0
1/1/2017 7:00	2017	1	700	1.291667	1/1/2017	12.52	0
1/1/2017 8:00	2017	1	800	1.333333	1/1/2017	12.47	0
1/1/2017 9:00	2017	1	900	1.375	1/1/2017	12.48	0
1/1/2017 10:00	2017	1	1000	1.416667	1/1/2017	12.71	0
1/1/2017 11:00	2017	1	1100	1.458333	1/1/2017	13.43	0
1/1/2017 12:00	2017	1	1200	1.5	1/1/2017	13.54	0
1/1/2017 13:00	2017	1	1300	1.541667	1/1/2017	13.63	0
1/1/2017 14:00	2017	1	1400	1.583333	1/1/2017	13.63	0
1/1/2017 15:00	2017	1	1500	1.625	1/1/2017	13.6	0
1/1/2017 16:00	2017	1	1600	1.666667	1/1/2017	13.53	0.01
1/1/2017 17:00	2017	1	1700	1.708333	1/1/2017	13.6	0
1/1/2017 18:00	2017	1	1800	1.75	1/1/2017	12.94	0
1/1/2017 19:00	2017	1	1900	1.791667	1/1/2017	12.82	0
1/1/2017 20:00	2017	1	2000	1.833333	1/1/2017	12.77	0
1/1/2017 21:00	2017	1	2100	1.875	1/1/2017	12.73	0
1/1/2017 22:00	2017	1	2200	1.916667	1/1/2017	12.7	0
1/1/2017 23:00	2017	1	2300	1.958333	1/1/2017	12.68	0
1/2/2017 0:00	2017	2	0	2	1/2/2017	12.65	0
1/2/2017 1:00	2017	2	100	2.041667	1/2/2017	12.63	0
1/2/2017 2:00	2017	2	200	2.083333	1/2/2017	12.61	0
1/2/2017 3:00	2017	2	300	2.125	1/2/2017	12.58	0
1/2/2017 4:00	2017	2	400	2.166667	1/2/2017	12.55	0
1/2/2017 5:00	2017	2	500	2.208333	1/2/2017	12.5	0
1/2/2017 6:00	2017	2	600	2.25	1/2/2017	12.45	0
1/2/2017 7:00	2017	2	700	2.291667	1/2/2017	12.43	0
1/2/2017 8:00	2017	2	800	2.333333	1/2/2017	12.43	0
1/2/2017 9:00	2017	2	900	2.375	1/2/2017	12.75	0
1/2/2017 10:00	2017	2	1000	2.416667	1/2/2017	13.64	0
1/2/2017 11:00	2017	2	1100	2.458333	1/2/2017	13.68	0
1/2/2017 12:00	2017	2	1200	2.5	1/2/2017	13.62	0
1/2/2017 13:00	2017	2	1300	2.541667	1/2/2017	13.59	0
1/2/2017 14:00	2017	2	1400	2.583333	1/2/2017	13.6	0
1/2/2017 15:00	2017	2	1500	2.625	1/2/2017	13.62	0
1/2/2017 16:00	2017	2	1600	2.666667	1/2/2017	13.66	0
1/2/2017 17:00	2017	2	1700	2.708333	1/2/2017	13.4	0
1/2/2017 18:00	2017	2	1800	2.75	1/2/2017	12.9	0
1/2/2017 19:00	2017	2	1900	2.791667	1/2/2017	12.81	0

1/2/2017 20:00	2017	2	2000	2.833333	1/2/2017	12.77	0
1/2/2017 21:00	2017	2	2100	2.875	1/2/2017	12.74	0
1/2/2017 22:00	2017	2	2200	2.916667	1/2/2017	12.72	0
1/2/2017 23:00	2017	2	2300	2.958333	1/2/2017	12.7	0
1/3/2017 0:00	2017	3	0	3	1/3/2017	12.68	0
1/3/2017 1:00	2017	3	100	3.041667	1/3/2017	12.66	0
1/3/2017 2:00	2017	3	200	3.083333	1/3/2017	12.64	0
1/3/2017 3:00	2017	3	300	3.125	1/3/2017	12.62	0
1/3/2017 4:00	2017	3	400	3.166667	1/3/2017	12.59	0
1/3/2017 5:00	2017	3	500	3.208333	1/3/2017	12.56	0
1/3/2017 6:00	2017	3	600	3.25	1/3/2017	12.52	0
1/3/2017 7:00	2017	3	700	3.291667	1/3/2017	12.47	0
1/3/2017 8:00	2017	3	800	3.333333	1/3/2017	12.43	0
1/3/2017 9:00	2017	3	900	3.375	1/3/2017	12.99	0
1/3/2017 10:00	2017	3	1000	3.416667	1/3/2017	13.79	0
1/3/2017 11:00	2017	3	1100	3.458333	1/3/2017	13.72	0
1/3/2017 12:00	2017	3	1200	3.5	1/3/2017	13.65	0
1/3/2017 13:00	2017	3	1300	3.541667	1/3/2017	13.6	0
1/3/2017 14:00	2017	3	1400	3.583333	1/3/2017	13.6	0
1/3/2017 15:00	2017	3	1500	3.625	1/3/2017	13.6	0
1/3/2017 16:00	2017	3	1600	3.666667	1/3/2017	13.48	0
1/3/2017 17:00	2017	3	1700	3.708333	1/3/2017	13.15	0
1/3/2017 18:00	2017	3	1800	3.75	1/3/2017	12.88	0
1/3/2017 19:00	2017	3	1900	3.791667	1/3/2017	12.81	0
1/3/2017 20:00	2017	3	2000	3.833333	1/3/2017	12.76	0
1/3/2017 21:00	2017	3	2100	3.875	1/3/2017	12.73	0
1/3/2017 22:00	2017	3	2200	3.916667	1/3/2017	12.71	0
1/3/2017 23:00	2017	3	2300	3.958333	1/3/2017	12.68	0
1/4/2017 0:00	2017	4	0	4	1/4/2017	12.66	0
1/4/2017 1:00	2017	4	100	4.041667	1/4/2017	12.63	0
1/4/2017 2:00	2017	4	200	4.083333	1/4/2017	12.61	0
1/4/2017 3:00	2017	4	300	4.125	1/4/2017	12.59	0
1/4/2017 4:00	2017	4	400	4.166667	1/4/2017	12.56	0
1/4/2017 5:00	2017	4	500	4.208333	1/4/2017	12.52	0
1/4/2017 6:00	2017	4	600	4.25	1/4/2017	12.47	0
1/4/2017 7:00	2017	4	700	4.291667	1/4/2017	12.43	0
1/4/2017 8:00	2017	4	800	4.333333	1/4/2017	12.67	0
1/4/2017 9:00	2017	4	900	4.375	1/4/2017	13.7	0

Hourly Max Air Temp deg F	Hourly Min Air Temp deg F	Hourly Ave Air Temp deg F	Soil Temp 6 in deg C	Soil Water 6 in wfv	Soil Temp 20 in deg C	Soil Water 20 in wfv	Soil Temp 40 in deg C
36.06	35.03	35.59	5.79	0.201	7.7	0	10.48
35.72	34.85	35.12	5.79	0.201	7.68	0	10.48
36.18	35.62	35.97	5.79	0.202	7.7	0	10.48
36.13	35.58	35.96	5.8	0.203	7.72	0	10.5
36.64	35.68	36.16	5.82	0.203	7.7	0	10.5
36.54	32.17	34.19	5.82	0.204	7.7	0	10.48
33.43	31.44	32.6	5.75	0.201	7.64	0	10.4
33.54	32	32.68	5.73	0.203	7.62	0	10.38
33.2	32.12	32.72	5.75	0.204	7.64	0	10.4
34.79	32.76	33.77	5.75	0.204	7.62	0	10.38
37.42	34.78	35.97	5.77	0.205	7.66	0	10.42
38.31	37.28	37.92	5.79	0.209	7.7	0	10.46
40	38.1	38.62	5.92	0.209	7.82	0	10.59
41.74	39.64	40.56	6.13	0.213	8.02	0	10.81
42.91	40.48	41.78	6.26	0.217	8.12	0	10.92
42.9	41.3	42.08	6.43	0.223	8.22	0	11
46.2	41.23	42.7	6.45	0.22	8.12	0	10.89
45.14	42.37	43.67	6.55	0.225	8.08	0	10.85
42.34	39.4	41.29	6.56	0.219	7.98	0	10.74
39.51	36.23	38.51	6.51	0.217	7.8	0	10.55
38.44	32.55	35.25	6.43	0.215	7.66	0	10.4
38.16	31.83	33.6	6.35	0.215	7.58	0	10.31
35.6	33.24	34.67	6.3	0.215	7.56	0	10.27
37.18	33.7	35.09	6.28	0.213	7.58	0	10.29
37.45	34.04	35.86	6.26	0.216	7.58	0	10.29
38.34	33.58	36.26	6.2	0.214	7.58	0	10.29
38.52	32.09	35.01	6.2	0.213	7.6	0	10.31
39.44	33.54	37.19	6.18	0.211	7.6	0	10.31
40.68	38.4	39.09	6.18	0.211	7.66	0	10.35
39.63	37.48	38.42	6.2	0.212	7.7	0	10.38
38.44	37.61	38.04	6.18	0.213	7.7	0	10.38
38.69	37.65	38.11	6.16	0.213	7.72	0	10.4
39.63	37.92	38.47	6.16	0.214	7.72	0	10.4
41.88	37.97	38.7	6.13	0.215	7.72	0	10.38
42.09	39.06	40.28	6.07	0.223	7.68	0	10.33
45.47	40.57	42.56	6.22	0.219	7.84	0	10.5
47.35	44.22	46.17	6.47	0.223	8.14	0	10.83
47	43.16	45.02	6.76	0.231	8.44	0	11.13
45.2	41.99	43.8	6.78	0.234	8.42	0	11.11
43.87	41.35	42.72	6.74	0.232	8.26	0	10.94
41.49	36.88	39.55	6.72	0.23	8.12	0	10.76
37.67	36.85	37.46	6.66	0.224	7.94	0	10.57
39.01	37.08	37.66	6.6	0.215	7.82	0	10.46
40.5	38.36	39.23	6.55	0.217	7.76	0	10.38

41.38	38.89	40.01	6.55	0.217	7.76	0	10.38
41.56	39.83	40.8	6.51	0.217	7.76	0	10.38
40.85	36.99	39.47	6.45	0.216	7.74	0	10.35
40.04	36.37	38.29	6.37	0.217	7.7	0	10.31
40.43	37.37	38.75	6.3	0.215	7.68	0	10.27
38.45	34.68	35.88	6.26	0.216	7.68	0	10.27
35.81	34.26	34.94	6.2	0.213	7.64	0	10.23
35.98	33.44	34.71	6.13	0.212	7.6	0	10.16
33.46	30.55	31.66	6.09	0.211	7.58	0	10.16
32	29.59	30.86	6.05	0.213	7.58	0	10.14
31.44	29.59	30.4	6.01	0.211	7.56	0	10.12
30.28	28.57	29.57	5.99	0.212	7.56	0	10.12
29.9	27.86	28.86	5.96	0.212	7.56	0	10.1
33.62	29.77	31.44	5.88	0.214	7.52	0	10.06
37.5	33.63	35.22	5.84	0.216	7.5	0	10.03
39.76	36.74	37.66	6.09	0.214	7.76	0	10.31
43.11	39.8	41.14	6.35	0.216	8.06	0	10.63
44.48	42.88	43.65	6.68	0.225	8.44	0	11.03
46.67	42.8	44.86	6.8	0.23	8.5	0	11.09
46.53	45.68	46.13	6.85	0.232	8.46	0	11.05
46.02	45.28	45.47	6.95	0.23	8.36	0	10.94
45.39	41.03	44.39	6.99	0.224	8.22	0	10.79
41.6	37.27	38.61	6.89	0.221	8	0	10.55
37.26	34.89	35.83	6.76	0.217	7.78	0	10.31
35.89	32.87	34.62	6.66	0.214	7.66	0	10.18
37.79	34.49	36.84	6.6	0.214	7.62	0	10.14
38.57	34.24	36.47	6.55	0.213	7.62	0	10.14
37.42	33.99	35.6	6.45	0.214	7.58	0	10.1
36.87	32.48	34.35	6.35	0.211	7.54	0	10.03
37.63	35.04	36.22	6.28	0.211	7.52	0	10.03
38.55	36.01	36.79	6.26	0.21	7.56	0	10.06
39.03	32.82	37.44	6.24	0.21	7.6	0	10.1
37.23	31.38	34.53	6.18	0.21	7.56	0	10.03
38.76	36.16	37.51	6.13	0.212	7.56	0	10.03
40.54	36.8	38.64	6.13	0.209	7.58	0	10.06
45.36	37.83	41.91	6.11	0.208	7.6	0	10.08
46.54	41.41	44.77	6.13	0.209	7.64	0	10.12
48.31	45.19	46.69	6.07	0.218	7.64	0	10.1

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Little Colorado River Valley Conservation Area Restoration Project

Southwest Experimental Garden Array Soil Data

Information attained from <https://sega.nau.edu/node/193> follows:



[About](#) [Gardens](#) [Research](#) [News & Pubs](#) [Projects](#) [Contact](#)

- [SEGA Site Locations Map](#)
- [Arboretum Meadow](#)
- [Arboretum Forest](#)
- [Bear Springs](#)
- [Black Point](#)
- [Blue Chute](#)
- [Bradshaw Ranch](#)
- [Little Colorado River](#)
- [Little Mountain](#)
- [Soap Creek](#)
- [Walnut Creek](#)
- [White Pockets](#)
- [Garden Maps](#)
- [Driving Directions to Gardens \(PDF\)](#)
- [Current Garden Weather](#)
- [Vegetation Data](#)
- [Water chemistry](#)
- [Ancillary Sites](#)

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Little Colorado River



This SEGA site is located within and adjacent to the riparian area and flood plain of the Little Colorado River. Located a few miles east of Hwy 89 north of the Cameron Trading Post, it is on Babbitt Ranch managed land. The SEGA Little Colorado River (LCR) site has experimental

fenced enclosures encompassing two different habitat types: riparian (disturbed, with invasive tamarisk removed) and undisturbed upland desert grassland. At an elevation of 4200 ft asl this is one of the two lowest sites on the SEGA site array elevation gradient.

Background

As well as having all the other features of a core SEGA site (i.e. pressurized water supply with irrigation system; full met station and soil temperature/moisture probes, all streaming environmental variables back live to NAU & available on SEGA's data website), this site is also located adjacent to a restoration experiment. The planting of naturally occurring genetic variants of native cottonwoods and willows, as part of a riparian restoration project being run by Professor Thomas Whitham with a grant from the Pulliam Trust, hence offers synergistic possibilities for researchers. .

Site Characteristics Table

Garden name: Little Colorado River (LCR)

County: Coconino County, Arizona

Latitude and Longitude: 35.72444444, -111.32055556

Nearest city: Flagstaff, Arizona

Elevation: 4,205 ft (1,282 m)

Annual Mean Air Temperature: Minimum °F (°C) - Maximum °F (°C)

Annual Mean Precipitation: 6.0 in (152 mm)

On-site manager: No

Overnight housing: No

Parent material: Sandstones & river gravel

Water source: Water tanker delivery/possibility for some on site solar pumping from ponds

Dominant veg. type: Desert Grassland

Weed species: Tamarisk

Mammalian herbivores: Cows, horses, pronghorn antelope, deer.

Cell phone reception at site: Yes

Other: May be bees, rattlesnakes, scorpions.

Potential Hazards: Lightening & access road flooding/becoming impassable during monsoon season (June-Sept) & spring snow melt.



Soil Description:

River floodplain soil profile (shown in photo)

Horizon	Horizon Depth (cm)	Texture	Clay Percent	Effere- yescence	Color Dry	Color Moist	Structure	pH	EC (mS)
A	0-12	Clay loam	32	Strong	Reddish Gray	Dark Reddish Gray	Medium Thick Play	8.2	6.2
Bty	12-43	Clay	45	Strong	Reddish Brown	Dark Reddish Brown	Medium Fine Angular blocky	8.2	2.8
Bt1	43-63	Fine Sand	3	Slight	Reddish Brown	Reddish Brown	Weak Medium Subangular blocky	8.4	1.6
C	63-124	Fine Sand	3	Very Slight	Reddish Brown	Reddish Brown	Massive	9.0	1.5

Upland area soil profile (photo not shown - is much shallower and very sandy)

Horizon	Horizon Depth (cm)	Texture	Clay Percent	Effere- yescence	Color Dry	Color Moist	Structure	pH	EC (mS)
A	0-6	Sand	4	Very Slight	Reddish Brown	Dark Reddish Gray	Single grain	8.4	0.8
C1	6-23	Sand	4	Very Slight	Reddish Brown	Reddish Brown	Massive	8.4	0.2
C2	23-47	Sand	6	Slight	Reddish Brown	Dark Reddish Brown	Massive	8.6	2.2
C3	47-63	Sand	6	Very Slight	Reddish Brown	Dark Reddish Brown	Massive	8.4	2.8
R	63+	Rock outcrop	NA	NA	NA	NA	Sandstone	NA	NA

Vegetation Description:

Vegetation at the Little Colorado River site consists of native bunch grasses and herbs with widely willows (and formerly tamarisk, much of which has been removed) in the riparian area.

Total number of plant species: 34

Dominant Plants: *Populus fremontii* (Fremont's cottonwood), *Allenrolfia occidentalis* (iodine bush)

Main Associates: *Kochia scoparia*, *Isocoma drummondii* (Drummond's goldenbush), *Xanthium gracile* (slender cocklebur)

Plant Survey Data - KNB: [Little Colorado River Lowland \(Riparian\) Plant survey](#)[Ⓔ]

Site Documents: [Little Colorado River Safety Info.pdf](#)

Plant Survey Data 2 - KNB: [Little Colorado River Upland Plant survey](#)[Ⓔ]



Little Colorado River Valley Conservation Area
Restoration Project

KEY PERSONNEL

Qualifications for the following individuals are described in the pages that follow:

Landsward Foundation (pages 2-3)

William C. Cordasco, President

Babbitt Ranches (pages 2-3)

William C. Cordasco, President and General Manager

American Conservation Experience (page 4)

Ian Torrence, National Restoration Director/Project Manager

Natural Channel Design, Inc. (pages 5-6)

Allen Haden, Aquatic Ecologist

Mark Wirtanen, Riparian Specialist

Cathy Scudieri, Restoration Ecologist

Jake Fleishman, GIS Specialist

Applied Ecological Consulting (pages 7-11)

Sean M. Mahoney, Senior Scientist

Arizona Department of Forestry and Fire Management (pages 12-16)

Aaron Green, Northern District Manager

William Cordasco

2712 N Marion Drive
Flagstaff, Arizona, 86001
9288537253
cobar@babbitranches.com

CURRENT EMPLOYMENT

- ✓ CO Bar, Inc. President - Babbitt Ranches, L.L.C., General Manager - Cataract Natural Reserve Lands, L.L.C., General Manager

CURRENT ASSOCIATIONS

- Landsward Foundation, President
- Museum of Northern Arizona, Research Associate

PAST ASSOCIATIONS

- Arizona State Parks, Chairperson
- Hopi Tribe Wildlife and Ecosystems Management Board, Chairperson
- Arizona Department of Agriculture – Open Space Protection Commission, Member
- Kaibab and Coconino National Forests Land Use Plan, Committee Member
- Coconino County Comprehensive Committee, 2015 Board Member
- Coconino County Comprehensive Committee, 2005 Board Member
- Raymond Educational Foundation, Board Member
- The Orme College Prep School, Trustee Board Member- Executive Committee
- Junior Achievement of Northern Arizona, Board Member
- San Francisco De Asis - Finance Committee - Past Chair
- Babbitt Brothers Trading Company, President
- College of Business, Advisory Board Member - Northern Arizona University
- Spur Land and Cattle Company - Board member, Vice President
- Arizona Cattle Growers Association, Board Member
- Arizona Farm Bureau Federation, Board Member
- Other Past Associations upon request

AWARDS AND RECOGNITION

- 2016 Wildlife Habitat Steward of the Year - Arizona Game and Fish
- Arizona Outdoor Hall of Fame, 2010 Recipient - Wildlife for Tomorrow
- Morris K. Udall Award, - Arizona Land Stewardship and Conservation – The Nature Conservancy
- National Private lands Stewardship Award - International Association of Fish and Wildlife Management Agencies
- Arizona Environmental Stewardship Award - Arizona Game and Fish
- National Environmental Stewardship Regional Award - National Cattleman's Association
- Grand Canyon Regional Environmental Stewardship and Partnership Award
- National Best Remuda Award - American Quarter Horse Association
- Cattleman of the Year - American Hereford Association

PARTNERSHIPS

- The Nature Conservancy, National Park Service, National Forest Service, Arizona State Land Department, Arizona Game and Fish Department, Arizona Department of Transportation, Wildlife Habitat Partnership Committee, U.S.G.S, Natural Resources Conservation Service, National Weather Service, Navajo Nation, Hopi and Havasupai Tribes, Trust for Public Land, Arizona Trail Association, NOAA and NASA. Other Associated Partnerships upon request.

William C. Cordasco

Billy Cordasco is the president and general manager of Babbitt Ranches, a family business and pioneering land company that raises livestock, manages natural resources, promotes science and participates in the broader community in order to join, share and be at its best. He is also a Research Associate for the Museum of Northern Arizona.

As president of the Landsward Foundation, Cordasco directs science, research and land stewardship across Babbitt Ranches' 750,000 acres on the Coconino Plateau, with an emphasis on learning, understanding, monitoring and promoting the success of sensitive species such as the Golden Eagle, Gunnison's Prairie Dog, endangered Black-Footed Ferret, Pronghorn Antelope, the rare Fickeisen Plains Pedio Cactus and Riparian restoration along the Little Colorado River Valley.

Research efforts are wide and varied, involving many organizations, institutions and agencies. They include Climate change studies; Geological research; Cultural and Archaeological restoration endeavors; Astronaut and Mars Rover mission operations training; and Range rehabilitation projects.

Cordasco has been instrumental in creating the 16-mile Little Colorado River Conservation Area, the 80,000-acre Antelope Prairie Ecological Research Area, the 12,000 acre Windy Wilson Prairie Dog Research easement Area, as well as several Conservation easements preserving more than 40,000 acres as open space.

He has served on several boards: Chairman of the Hopi Tribe Wildlife and Ecosystems Management Program, Chairman of the Arizona State Parks Board, the NAU College of Business, Raymond Education Foundation, and others.

He has been honored by national conservation groups with prestigious Environmental Stewardship awards and inducted into the Arizona Outdoor Hall of Fame.

He holds a business degree from Northern Arizona University and promotes Cowboy Essence - that peace of mind that comes from knowing our heritage and that we are at our best.

Ian Torrence

American Conservation Experience National Restoration Director

2900 North Fort Valley Road

Flagstaff, AZ 86001

www.usaconservation.org

Email: itorrence@usaconservation.org

Phone: (928) 699-0198

While he is serving as Project Manager for the Little Colorado River Valley Conservation Area Restoration Project, Ian is primarily the National Restoration Director for the American Conservation Experience. While acquiring his B.S. in Biology from Allegheny College (PA), he spent his summers serving as a Student Conservation Association Backcountry Resource Assistant at Shenandoah National Park. Following graduation, Ian spent 10 more years fulfilling various restoration roles for the National Park Service including lead supervisor for the Lake Mead Exotic Plant Management Team, Vegetation Manager for the Southeast Utah Group (which includes Canyonlands and Arches National Parks and Natural Bridges and Hovenweep National Monuments) and as a wildland firefighting sawyer at Grand Teton National Park.

Ian's duties as ACE's National Restoration Director include leading, training and organizing program managers, crew leaders and crew members based at ACE's seven national restoration offices in Flagstaff, AZ, Santa Cruz, CA, Dulzura, CA, South Lake Tahoe, CA, Corpus Cristi, TX, Asheville, NC and St. George, UT. Ian orchestrates the national restoration programs (which includes invasive plant control, native plant revegetation, seed collection, watercourse management, and off highway road closures and rehabilitation) for the American Conservation Experience, a non-profit organization dedicated to providing rewarding environmental service opportunities that harness the idealism and energy of a volunteer labor force to help restore America's public lands.

Allen Haden is an Aquatic Ecologist and a principal at Natural Channel Design, Inc. Allen has broad experience in stream systems and aquatic habitats of the arid southwest. He has been involved in research and management of human impacts on river ecosystems in the southwest for over 15 years. He has a broad understanding of the field of aquatic ecology and its

applications to management of ecosystems which house threatened and endangered species. He has expertise in sampling and statistical techniques for monitoring biological and physical aspects of riparian/aquatic/wetland habitats, as well as an understanding of life history requirements and threats to southwestern native species. Allen has extensive experience with habitat enhancement projects and has designed and provided construction observation services for numerous restoration projects. He has authored and coauthored several refereed manuscripts on effects of nonnative species and links between habitat quality and ecology of aquatic communities. Allen received a B.S. in Forestry and Wildlife from Virginia Polytechnic Institute and State University in Blacksburg, VA, and a M.S. in Biology from Northern Arizona University in Flagstaff. He has completed Levels I - IV river short courses in the inventory, classification, assessment and design of natural channels at Wildland Hydrology.

Mark Wirtanen is a Riparian/Wetland Biologist and engineering technician for Natural Channel Design, Inc. with over 15 years of professional experience. Mark has served as a field biologist and manager for riparian and geomorphic studies of the rivers of the arid southwest. He has a B.S. in Wildlife Biology from Northern Arizona University and broad knowledge of field methods as well as CAD software and GIS systems. Mark has completed Levels I – III river short courses in natural channel inventory, classification, and assessment from David Rosgen at Wildland Hydrology. He has conducted training workshops utilizing the geomorphic approach to stream restoration design. Mark provides assessment, design and construction observation services.

Cathy Scudieri is a Restoration Ecologist and civil engineer-in-training with Natural Channel Design. She has a deep interest in both environmental engineering and ecological restoration. Cathy has a B.S. in Civil Engineering from Virginia Polytechnic Institute and State University and a M.S. in Environmental Engineering from University of Illinois at Urbana-Champaign. She also has a M.S. in Forestry (emphasizing ecological restoration) from Northern Arizona University. She has completed Level I and II river short course in the inventory of natural channels from David Rosgen at Wildland Hydrology as well as Wetland Delineation Training from Richard Chinn Environmental Training, Inc. She has authored several refereed manuscripts on understory vegetation response in prescribed burning sites. She has extensive research in the study of herbaceous vegetation in southwestern ponderosa pine forests. Cathy also held a high-level position at the U.S. Environmental Protection Agency as an environmental engineer working in municipal wastewater permitting under the Clean Water Act reviewing permits, training wastewater treatment plant operators, and assessing operational problems. She has broad understanding and skills required for collaboration and interfacing with tribal and municipal governments as well as with local, state, and federal agencies. Cathy provides drafting, engineering, surveying, ecological, native revegetation planning, and permitting expertise to NCD project planning.

Jake Fleishman is a civil engineer-in-training and GIS Specialist with Natural Channel Design. He has a deep interest in both environmental engineering and ecological restoration. Jake has a B.S. in Civil Engineering from Northern Arizona University. Jake provides drafting, engineering, mapping and surveying expertise to NCD project planning as well as construction observation services.

Sean M. Mahoney

Independent ecology consultant ✕ Flagstaff, AZ 86001
Phone: 610-639-4012 ✕ E-Mail: maho.sean@gmail.com

Education

Ph.D. **Northern Arizona University**

Student, Biology, in progress

M.S. **Northern Arizona University**

Biology, with Distinction, 2016

B.S. **The College of William and Mary**

Biology, 2010

Research/Work Experience

Applied Ecological Consulting Sole proprietorship

Senior Scientist

2018 to present

Ph.D. Dissertation research: Northern Arizona University

Dissertation research is on-going

*Developing song playback experiment to test for
subspecific song recognition in Willow flycatchers*

Conducted pilot playback song study in UT and CO

*Recorded Willow flycatcher song across western US to
investigate for subspecific song differences*

Analyze Willow flycatcher songs using Program Raven

Manuscript preparation

In progress

M.S. thesis research: Northern Arizona University

Developed research questions and chose study sites

Conducted over 200 avian point counts

Mist netted and banded over 300 birds

Identified insect parts in over 100 bird feces

Extracted DNA from over 100 bird feces using DNesay

Data analysis in Program R, Program Distance

**Summer 2013-Spring
2016**

Data management in Microsoft Excel
Manuscript preparation for technical report
Manuscript preparation for publication in peer-reviewed journal
Established long-term photo points for monitoring purposes

Monitoring bird communities along Middle Rio Grande, NM: Eco Plateau Consulting

May-June 2018

Completed >100 bird and vegetation plots to monitor tamarisk and Russian olive control efforts

Southwestern willow flycatcher and Yellow-billed cuckoo monitoring (crew lead): Northern Arizona University and US Fish & Wildlife Service

May-August 2015-2017

Completed southwestern willow flycatcher and yellow-billed cuckoo USFWS survey protocol training
Conducted playback surveys on San Juan River, UT for two endangered bird species
Boated over 100 miles of river in inflatable 14-ft oar raft
Established long-term photo points for monitoring purposes
Data management in Microsoft Excel
Created maps in ArcGIS for field crew
Manuscript preparation for technical report

GIS/Cartographer assistant: Contract work for National Park Service

June-August 2015-2016

Created maps in ArcGIS for field crews
Managed GPS units (Garmin and Trimble)

Monitoring of Southwestern plant ecology field technician: National Park Service & Northern Arizona University

July-October 2011-2012

Conducted approximately 120 0.5 HA vegetation sampling plots
Data management in Microsoft Access

- Monitoring of Southwestern avian ecology field technician: National Park Service & Northern Arizona University**

May-July 2011-2012

Conducted over 200 point count surveys on Colorado Plateau

Conducted extensive vegetation sampling

Data management in Microsoft Access

Selected Publications

- S. M. Mahoney**, Anna Nellis B. Smith, Peter J. Motyka, Erick Lundgren, Matthew J. Johnson, Raemy R. Winton, Bo Stevens. *Russian olive-dominated habitat supports similar bird community assemblages to native-dominated habitat.* **In revision (Journal of Arid Environments)**
- S. M. Mahoney**, J. B. Mike, J. Parker, L. S. Lassiter, T. G. Whitham. *Selection for genetics based-based architecture traits in a native cottonwood negatively affects invasive tamarisk in a restoration field trail. Restoration Ecology.* <https://doi.org/10.1111/rec.12840> **June 2018**
- S. M. Mahoney**, T. C. Theimer, M. J. Johnson. *Similar dietary but different numerical responses to nonnative tamarisk by two native warblers.* Biological Invasions. 19(6):1935-1950. **April 2017**

Selected Presentations

- 2018 American Ornithology Union, Tucson, AZ** **April 2018**
Native bird responses to non-native tamarisk biocontrol
- 2018 Riparian Restoration & Tamarisk Beetle Workshop, Benson, AZ Invited** **April 2018**
Challenges in riparian restoration
- 2018 Tamarisk Coalition Annual Conference, Grand Junction, CO** **February 2018**
Nesting behavior predicts bird densities post-biocontrol of Tamarix spp.: a niche-based approach to management

Guest lecture, Northern Arizona University <i>Invited</i>	April 2017
<i>Vertebrate zoology: Using niche-theory to predict native bird responses to invasive species</i>	
Arizona Bureau of Land Management (BLM) Tamarisk Meeting, Phoenix, AZ <i>Invited</i>	November 2016
<i>Presented the primary issues surrounding tamarisk management to AZ BLM staff. "Terrestrial wildlife responses to Tamarix control."</i>	
2016 Northwest Region Invasive Plant Council, Boise, ID <i>Invited</i>	October 2016
<i>Russian olive symposium: Wildlife community interactions in Russian olive: A literature review and initial observations on the San Juan River, UT</i>	
2016 The Wildlife Society Arizona and New Mexico Joint Annual Meeting (TWS JAM): Student Presentation Competition Session (Wildlife), Flagstaff, AZ	February 2016
<i>Complex and dynamic interactions between tamarisk and native species</i>	
13th Biennial Conference: Novel Ecosystems Special Session, Flagstaff, AZ <i>Invited</i>	October 2015
<i>Native riparian warbler's response to a novel ecosystem</i>	
3-Minute Research Presentation, Flagstaff, AZ	April 2015
<i>Beetles and Weevils: A new food source for birds?</i>	
2015 Tamarisk Coalition Annual Conference, Albuquerque, NM	February 2015
<i>Investigating the effects of biocontrol of an invasive species on riparian bird communities</i>	
Tamarisk Coalition Annual Conference poster session, Albuquerque, NM	February 2015
<i>Native tree architecture negatively affects growth of an invasive species</i>	
Tamarisk Coalition Annual Conference, Grand Junction, CO	February 2014
<i>Investigating the effects of tamarisk and tamarisk leaf beetle on riparian nesting birds</i>	

12th Biennial Conference poster session, Flagstaff, AZ

September 2013

Investigating the effects of biocontrol of tamarisk on riparian bird communities

Awards

Landscape Conservation Initiative Science-Policy Fellowship

May 2018

- Northern Arizona University

Fellowship for students working at the interface between science and policy. \$2000 awarded for conservation biology research

John Prather Award for Conservation Biology - Northern Arizona University

April 2018

\$1000 scholarship to support research in conservation biology

TWS JAM Student Presentation Competition - Wildlife 2nd Place

February 2016

6 finalists in Wildlife research. Awarded \$150

3-Minute Research Presentation 2015 1st Place

April 2015

30 participants and 12 finalists open to every department in the NAU Graduate College. Awarded \$1,000

Relevant Training

Van safety certification

January 2018

Completed at Northern Arizona University

USFWS Yellow-billed cuckoo training

June 2015

Completed at Northern Arizona University

USFWS Southwestern willow flycatcher training

May 2015

Completed in Catalina, AZ and Dudleyville, AZ

Curricula Vitae

Aaron M. Green
3650 Lake Mary Rd
Flagstaff AZ 86005
agreen@dffm.az.gov

Education

2004 Colorado State University, Fort Collins Colorado

Studied towards Masters of Science in Forestry, with an emphasis in Fire Ecology
GPA: 3.7 (Out of 4.00). Major GPA: 3.7 (Out of 4.00). 32 Credit hours

2002 Northern Arizona University, Flagstaff Arizona

Bachelor of Science in Forestry with an Emphasis in Ecological Restoration Magna Cum Laude.
GPA: 3.86 (Out of 4.0). Major GPA: 4.0 (Out of 4.0). 136 Credit hours

Qualifications

Geographic Information Systems Specialist, Agency Representative, Incident Commander 5, Prescribed Fire Burn Boss 3, Cost Apportionment Specialist, CPR/AED First Aid, Crew Boss, Fixed Wing Manager, Fixed Wing Manager Special Use, Faller A, Faller B trainee, Engine Boss Trainee, Firing Boss Trainee, Field Observer/ Fire Effects Monitor Trainee, Skid Steer Operator, Skid Steer Operator instructor, ATV Operator, Qualified USFS Timber Cruiser.

Employment History

2016 January -Current

District Manager and District Fire Management Officer, Arizona Department of Forestry and Fire Management

Responsible for delivery of agencies forestry commitments and responsibilities state wide. Good Neighbor Authority agreement representative for the State of Arizona. Responsible for coordinating and improving the wood products industry state wide. Provide leadership and supervision for 8 professionals in fire and forestry. Manage the State of Arizona's fire suppression and prevention for 23,937 square miles in Northern Arizona. Directly responsible for forestry cooperative forestry programs on 1,704,906 acres of Private and 1,284,812 acres of State Trust lands in Northern Arizona. Represent the State of Arizona and the citizens of Arizona in large multiagency wildland fires and develop cost share agreements on all types of Wildland fires.

2014 November -January 2016

District Forester and District Fire Management Officer, Arizona State Forestry

Provide leadership supervision and guidance for 10 employees with 6 professionals directly reporting from the Flagstaff District Office and the White Mountain Field Office. Manage fire suppression and prevention activities for 4 counties in Northern Arizona representing 54,374 square miles and 34.7 million acres. Provide assistance and direction for cooperative forestry and fire programs and insures and maintains cooperative intergovernmental agreements with local, state and federal agencies. Provide wildland fire training and assistance to 73 fire Departments and Districts. Represent the Arizona State Forester and the citizens of Arizona.

2014 August-November

Acting District Forester and District Fire Management Officer, Arizona State Forestry

Provide leadership supervision and guidance for 10 employees with 6 professionals directly reporting from the Flagstaff District Office and the White Mountain Field Office. Manage fire suppression and prevention activities for 4 counties in Northern Arizona representing 54,374 square miles and 34.7 million acres. Provide assistance and direction for cooperative forestry and fire programs and insures and maintains cooperative intergovernmental agreements with local, state and federal agencies. Provide wildland fire training and assistance to 73 fire Departments and Districts. Represent the Arizona State Forester and the citizens of Arizona.

2011 -Current

Assistant Fire Management Officer, Arizona State Forestry

Provide wildland fire training and support for the 17 Fire Departments in Mohave County covering over 13,469 square miles. Support the Arizona State Forestry Division and the Arizona Dispatch Center with GIS maps, GIS training and GIS analysis. Teach NWCG wildland fire and GPS classes for local fire department, the Arizona State Forestry Division and at the Arizona Wildfire and Incident Management Academy. Manage, support, train and supervise employees. Coordinate, train and supervise two type 2 wildland fire crews. Act as an on call Duty Officer for Flagstaff district which was responsible for all state and private fires in an area of 53,308 square miles. Represent the Arizona State Forestry Division as an Agency Representative for type I, type II and type III wildland fires. Participates in the Planning section of Type 1 and Type 2 incident management teams. Negotiated multimillion dollar cost share agreements between Federal land managers on behave of the State of Arizona. Acted as a lead instructor for the national cadre for GPS for Fire and Incident Management. Participate as aerial survivor and trainer for the State of Arizona in the National Forest Health Protection Program to map current year forest injury from insect and disease by flying and mapping over 1.7 million acres of forest in Northern Arizona annually, managing the resulting data and metadata and producing maps. Produce Forest Stewardship land management plans at all levels from coordinating with local land owners, to sampling design, to sampling and compiling data to producing quality technical reports describing existing conditions and making recommendations for future forest management. Write and implement prescribed burn plans for both broadcast and pile burns. Work collaboratively with natural resource agencies and represent the Arizona State Forester. Work within the Arizona State procurement procedures. Briefed members of the US Congress and the Arizona state legislator on an active type 1 fire. Participated in one accident investigation and one federal Facilitated Learning Analysis on tree falling accidents in Northern Arizona.

2006 -2011

GIS Analyst and Support Specialist, Arizona State Forestry.

Coordinate, update and manage data, software, metadata and hardware for 4 independent GIS workstations in district offices in Flagstaff, Payson, Phoenix and Tucson. Support State Forestry projects and personnel with maps and equipment related to geographic information technologies and global positioning systems. Participate as an aerial surveyor to map current year forest injury from insect and disease and manage the resulting data and metadata and produce maps. Develop, revise and instruct GPS classes to State Forestry employees and fire departments and federal cooperators. Represent the State of Arizona on the National Cadre as a Lead Instructor for the GPS for Fire Management and ICS class, including a starring role in the BLM GPS Training Videos. Participated on the Northern Arizona Incident Management Type II team and the State of Arizona All Risk Incident Management Type II team as the Lead Geographic Information Systems Specialist (Qualified as a Type I GISS) for wildland fire and all risk incidents. Develop and teach basic GIS and GPS classes to State Forestry employees. Work with a variety of different GPS and GIS platforms and software including ArcMap, ArcInfo, ArcIMS, ArcPad, Geolink, Redzone, Trimble GPS units, Google Earth, Garmin GPS units, Megellan GPS units, networks and data storage devices. Administer, and support ArcIMS/ ArcServer web interface Arizona FIREMAP which includes a number of potential tools to help track, plan, and prioritize fuel treatments and other forest activities throughout Arizona. The first phase of this project involves creation of an interactive Internet map viewer (Fuels Treatment Module) that will be a spatially dynamic web application focused on providing access to the geographic location of statewide fuel treatments. Work with the collaborative effort; the Greater Flagstaff Forest Partnership to manage and collect data of fuel treatments done by more than 10 different agencies and groups and to produce high quality fuel treatments maps of the Flagstaff area.

2005 – 2006

Natural Resource Manager II Arizona State Land Department Forestry Division.

Assisted with the administration and managed operations side of the Rural Communities Fuel Management Partnership, a collaborative grant funded effort to decrease fire risk through fuel treatments on private land in Northern Arizona. Authored State of Arizona Forest Stewardship Planning Documents (Management Plans) describing alternative treatments considering multiple resource factors including wildlife, threatened and endangered species, recreation, fire and potential impacts archeological resources. Organized and conducted inventories and pre-sale marking of timber on state and private land. Conducted contractor tours of potential timber sales. Administrate timber sale contracts on state and private land. Worked with community groups on understanding fire risk mitigation on private land and assisted groups in applying for and managing grants associated with the Federal Land Enhancement Program. Assist with general forestry, natural resource and ecosystem management.

2005 – 2005

Natural Resource Manager I Arizona State Land Department Forestry Division.

Identify and recommend areas needing treatment within the Arizona State Trust Timber Sections. Write Forest Stewardship Management prescriptions for areas needing treatment. Coordinate with other resource management agencies to guarantee sound land management techniques. Direct and assist with the designation of trees to meet prescription standards. Develop and write stewardship management plans for the State Timber Trust Sections. Develop and administer sale and treatment contracts. Act as an advisor to Northern Arizona University during timber sale and treatment contract administration. Assist with the coordination of the State Trust Land projects to complement adjacent Greater Flagstaff Forest Partnership projects. Provide assistance in inventory, tree designation, stand prescriptions, plan writing, contract administration and landowner follow-up for natural resource management projects on private land.

2004 – 2004

Botanist/GIS Colorado Natural Heritage Program.

Ground truthing of vegetation mapping in Rocky Mountain National Park. Accurately identify vegetation throughout Rocky Mountain National Park. Plan and execute 5-8 day backcountry backpacking trips to remote study locations within the park. Data entry and application of Geographic Information Systems technology from the data gathered.

2002 – 2004

Graduate Teaching Assistant F-311 (Forest Ecology- Jr. and Sr. Level) College of Natural Resources, Colorado State University, Fort Collins Colorado.

Developed and conducted lectures. Prepared and evaluated assignments and exams. Coordinated and facilitated exam review sessions. Taught and developed chainsaw safety program for the Fire Ecology Laboratory.

2000 – 2003

Graduate and Undergraduate Research Assistant Ecological Restoration Institute, Northern Arizona University, Flagstaff Arizona.

Extensive work in dendrochronology. Assist in community relations projects. Liaison with a local environmental group. Developed and implemented original ecological research. Performed, conducted and trained new employees in ecological field research. Participated in chainsaw and crosscut saw operations for sampling of fire scars.

Special Assignments/Presentations/Awards

2001 6th Biennial Conference of Research on the Colorado Plateau "Changes in Snag and Log Characteristics after a Wildland Use Fire".
Northern Arizona University, Flagstaff Arizona, Speaker.

2002 One of 36 Students to receive the Golden Axe Award from NAU in spring of 2002. Each semester, Northern Arizona University recognizes seniors who have made

outstanding contributions to the university in the areas of academic performance, service, leadership and participation in activities.

- 2003 Southwest Fire Initiative Conference "Comparison of Alternative Sampling Methodology for Fire History reconstruction in the San Juan National Forest. Northern Arizona University, Flagstaff Arizona, Presenter.
- 2003 The 9th Annual Front Range Student Ecology Symposium "Proposed Research on the Spatial Analysis of Fire and Historic Fire Regimes in the Mixed Conifer Forests of the Southern Rocky Mountains". Colorado State University, Fort Collins Colorado, Presenter.
- 2004 The 19th Annual Symposium International Association of Landscape Ecology "Spatial heterogeneity in historical fire regimes in mixed conifer forests of southwestern Colorado". Las Vegas, Nevada, Speaker.
- 2007-2011 *Member of the Northern Arizona Type II incident Management team*
- 2009-2017 *Instructor at the Arizona Wildfire and Incident Management Academy*
- 2010- Current Member of the National Cadre for GPS for Fire and Incident Management
- 2011 Staring roll in BLM training Video program for GPS operations.
- 2013 Member of the Seep Felling Accident Investigation team for the State of Arizona
- 2014 Member of the Facilitated Learning Analysis Team for the Quaking Fire Felling Accident as a chainsaw safety subject matter expert.
- 2014-Current President of the Northern Arizona (Flagstaff and Grand Canyon Zones) Zone Board for Wildland Fire
- 2015-Current Board member of the Greater Flagstaff Forest Partnership www.gffp.org
- 2015-Current Board member of the Flagstaff Watershed Protection Project <http://www.flagstaffwatershedprotection.org/>
- 2015-Current Board member of The Arboretum at Flagstaff www.thearb.org



Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 6th, 2018

Dear Mr. Teran,

We enthusiastically endorse the Landward Foundation's application to the Arizona Water Protection Fund Commission's Fiscal Year 2019 Funding Cycle. Landward has attracted international attention from an array of high-caliber researchers for their efforts to advance conservation and education practices that have yielded significant results for humans, wildlife, plant and other species.

In operation since 1886, Babbitt Ranches raises cattle and American Quarter Horses on CO Bar Ranch, Cataract Ranch, and Espee Ranch in Northern Arizona; our ranches total more than 750,000 acres and include private, state, and federal lands. Inseparable from our business enterprises is a commitment to working cooperatively with others to respect and promote conservation of regional ecological continuity, wildlife habitat, diverse vegetation, watershed integrity, historical and other cultural resources, and public access to its ranches. Our commitment to this land use ethic is evidenced by numerous conservation and research efforts to expand conservation on a landscape level.

We have completed conservation, land use, and management planning for each of our ranches, to guide us in making informed land use and management decisions within a conservation context, thereby providing a framework for conservation efforts that extend beyond the Ranches. Our overarching conservation objective is to benefit and sustain the long-term ecological integrity of natural communities. Each plan identifies strategies for promoting the conservation of these species.

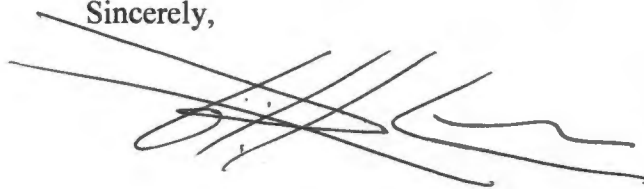
For decades, Babbitt Ranches has worked with the Natural Resources Conservation Service and other organizations to restore native habitats. This work resulted in numerous inventories which provide baseline data on variables including soils and plant species composition and abundance. For example, Natural Resources Conservation Service installed four soil climate stations on CO Bar Ranch to measure soil moisture availability, migration, and retention in soil types, enabling them to build soil-specific models that are used to estimate soil climate at similar sites in other locations. We also underwrote the *Biological Assessment of the Coconino Plateau* to enhance the ability of land managers to perceive, evaluate, and respond to evolving ecological conditions.

Babbitt Ranches established the 16,842-acre Little Colorado River Valley Conservation Area as a path toward environmental improvement. In this spirit, we also created the Landsward Foundation and attained a conservation easement to acquire an adjacent 161-acre parcel for scientific research and conservation purposes; this was then gifted to Landsward and now houses Northern Arizona University Merriam-Powell Center for Environmental Research's Southwest Experimental Garden Array, a highly-instrumented field site that serves as a proxy for climate change. Given that riparian restoration along the Little Colorado River Valley is one of our top priorities, we allocated \$50,000 to hire American Conservation Experience restoration crews to enact our vision of restoring all 16 miles of the Lower Colorado River Valley Conservation Area, on both riverbanks (in tandem with other partners), thereby serving as a model for future restoration efforts.

Their project is site is contained within the 78,438-acre Antelope Prairie Ecological Research Area on CO Bar Ranch, which we created to serve as the geographic focus for a number of additional studies and conservation actions. Babbitt Ranches recognizes how much can be accomplished through partnering with neighbors, educational institutions, businesses, nonprofit organizations, and agencies to reach shared goals.

We will donate **\$400 in matching funds** to the *Little Colorado River Valley Conservation Area Restoration Project*, to cover attorney fees associated with drawing up legal agreements with partners specified in the Scope of Work. Please don't hesitate to reach us at 928-774-6199 or cobar@babbitranches.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'William C. Cordasco', with several overlapping strokes and a long horizontal line extending to the right.

William C. Cordasco – President and General Manager



Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

September 6, 2018

Dear Mr. Teran,

As a first-time applicant to the **Arizona Water Protection Fund Commission**, we are elated to compete for funds via your Fiscal Year 2019 Funding Cycle. Riparian restoration is close to our hearts, as are sharing knowledge via grassroots efforts. The Landsward Foundation evolved with a conservation and land management philosophy of "*Just Participate!*"

This approach to land and resource stewardship emphasizes an attitude of participation through efforts of learning and understanding in order to be better able to join, share and be a part of the land's ecological processes. The Foundation brings together researchers who share a common interest in understanding and sustaining the lands of the Coconino Plateau Region and the Little Colorado River Valley, in addition to promoting environmental stewardship in conjunction with agricultural production and other land uses. Activities include collecting and assessing scientific data relative to the environment, monitoring changes to the land, and disseminating information to private and public landowners and managers.

The Foundation serves as a liaison between landowners, land use managers and the scientific community. Our relationship with land managers is summarized through a Statement of Awareness, which recognizes a responsibility and obligation to the broad regional perspective, appreciating that quality regional planning begins by honoring relationships through our behavior and decisions, appreciating that we are separate, yet connected. As such, we remain aware of others' goals and objectives as we work together and independently to be effective land stewards today while setting the standard for future generations.

Our *vision* is for the Landsward Foundation to be the land use ethic model advancing the understanding of ecological, social and economic factors affecting lands of the Coconino Plateau Region and Little Colorado River Valley. Our *mission* is to develop and promote ecological and social science research, so private landowners and managers will have the

latest science-based information to support decisions and conservation practices. Our purpose is twofold:

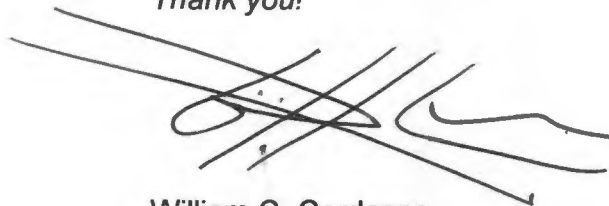
- *Develop and disseminate scientific information that will increase awareness and understanding of ecological processes*
- *Facilitate and advance land use management based on a land use ethic, which places the long-term ecological health of the land as the primary objective, and accounts for intimate relationships that exist between people and the natural world*

Moreover, we assess and monitor ecological processes, social dynamics and land use trends of the Coconino Plateau Region and the Little Colorado River Valley; integrate Landsward Foundation research, education and outreach with other efforts in Northern Arizona; utilize an interdisciplinary information management system as a central source for comprehensive data on the natural resources of the Coconino Plateau Region and the Little Colorado River Valley; and develop and implement education and outreach strategies that position Landsward Foundation as an example of land use ethic-based research, education and stewardship practices.

I volunteer my time for all Landsward Foundation endeavors and anticipate spending an average of two hours each week on this project throughout its five-year duration, resulting in an in-kind **donation of \$52,000 in matching funds**. Additionally, though they are not being leveraged as matching funds, in July we submitted a \$250,000 application to the *Wildlife Conservation Society's Climate Adaptation Fund* and are in the process of submitting a grant application to the *Natural Resources Conservation Service's Environmental Quality Incentives Program* for \$45,000 (both awards are pending). Lastly, we secured \$50,000 from Babbitt Ranches and the Arizona Game and Fish Department committed \$30,000 in support of related riparian restoration efforts (further down Lower Little Colorado River Conservation Area corridor).

We anticipate our ***Little Colorado River Valley Conservation Area Restoration Project*** having profound ripple effects as ranchers and other regional land managers adapt practices promoted through our demonstration project. Please call me anytime at 928-774-6199, or email me at cobar@babbitranches.com, to discuss any aspects of our proposal and plans. We look forward to presenting to the Commission in November.

Thank you!

A handwritten signature in black ink, appearing to read 'William C. Cordasco', written over several horizontal lines.

William C. Cordasco
President – Landsward Foundation



Little Colorado River Valley Conservation Area Restoration Project

LETTERS FROM THOSE PLEDGING MATCHING FUNDS

Letters from two entities pledging matching funds follow:

- ❖ Landward Foundation
- ❖ Babbitt Ranches



AMERICAN CONSERVATION EXPERIENCE
2900 N Fort Valley Rd, Flagstaff
AZ 86001, USA

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

August 20th, 2018

Dear Mr. Teran,

American Conservation Experience (ACE) is a national, nonprofit organization dedicated to partnering with public and private land managers to advance meaningful riparian restoration and environmental stewardship projects. ACE is proud to partner with Landsward Foundation on its latest project, **Little Colorado River Valley Conservation Area Restoration Project**. Our partnership is new – ACE has been working with the Landsward Foundation for a year; this relationship completes what Landsward and ACE desire in terms of integrating youth development in the outdoors and filling the need of resource management and natural habitat restoration in Northern Arizona.

ACE possesses extensive experience in recruiting, training and supporting young adult crews to accomplish landscape-scale restoration projects. These young adults are provided AmeriCorps terms, stipends, free housing, and project meals as well as job skills training in order to pursue careers in restoration and environmental stewardship. ACE is grateful to have the opportunity to contribute to this project. We pledge our support, resources, knowledge, subject-matter experts, and experience to deploy 8-person hand crews to remove 14.7 acres of salt cedar, camelthorn, and Russian knapweed, as well as building fence and revegetating these 14.7 acres with native willow, cottonwood, forbs and grasses in order to fully restore a five-site area alongside the Lower Little Colorado River. ACE will provide experienced Restoration Project Managers to ensure that all work is completed safely, thoroughly and to a high-quality level. Between the on-the-ground restoration activities and proposed community outreach events, we believe this project will serve as a springboard in creating a Little Colorado River Valley demonstration site – an easily-understood and replicable example that other partners will use.

We fully support this project and believe that our activities strongly align with the priorities of the **Arizona Water Protection Fund Commission** Fiscal Year 2019 Funding Cycle. Please feel free to contact us with any questions regarding our role in this project, or anything detailed in our Scope of Work. I can be reached at 240-672-4655 or at itorrence@usaconservation.org.

Thank you,


Ian Torrence
National Restoration Director

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

August 31, 2018

Dear Mr. Teran,

It is my pleasure to write in support for the Landsward Foundation's application for the Arizona Water Protection Fund project titled **Little Colorado Valley Conservation Area Restoration Project**.

Applied Ecological Consulting (AEC) provides monitoring of animal and plant communities following restoration or development efforts. I have been involved in various monitoring projects of animal and plant communities in the Southwest for eight years. As the founder of AEC, I am particularly interested in providing services for riparian-focused projects.

The goal of the Little Colorado Valley Conservation Area Restoration Project is to remove nearly 15 acres of tamarisk and other invasive plants and revegetate with native cottonwoods, willows and other native vegetation. AEC will then monitor the response of native birds, using point count surveys and statistical modelling, because riparian habitat is especially important for migrating and breeding native birds. We will also quantify the response of native plants by on-the-ground surveys and by establishing permanent photo points. The project will serve as a model for riparian restoration that can be applied to other areas of degraded riparian areas that are critical habitat for native animals.

AEC is fully committed to this project and believe our services align with the mission of Arizona Water Protection Fund Commission FY 2019. Please do not hesitate to contact me, should you need any information in support of our proposal.

Sincerely,

A handwritten signature in dark ink, appearing to read 'S. Mahoney', with a long, sweeping horizontal stroke extending to the right.

Sean M. Mahoney
Applied Ecological Consulting



Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

August 29th, 2018

Dear Mr. Teran,

I am writing you in support of the Landsward Foundation's proposed Little Colorado River Valley Conservation Area Restoration Project. The Arizona Game and Fish Department has a long-standing history of partnering on habitat restoration projects with the Landsward Foundation. We have dedicated funds toward furthering their impactful efforts on another stretch of the Little Colorado River Valley Conservation Area.

We hope they are successful in the Arizona Water Protection Fund Commission's Fiscal Year 2019 Funding Cycle and would be glad to answer any questions, or further speak to the remarkable attributes of the Landsward Foundation. Please feel free to reach me at (623) 236-7522 or kduto@azgfd.gov. Thank you very much.

Sincerely,

A handwritten signature in black ink, appearing to read "Kyle Dutro", is written over a horizontal line.

Kyle Dutro
Landowner Relations Program Coordinator
Arizona Game and Fish Department

azgfd.gov | 602.942.3000

5000 W. CAREFREE HIGHWAY, PHOENIX AZ 85086

GOVERNOR: DOUGLAS A. DUCEY COMMISSIONERS: CHAIRMAN, JAMES S. ZIELER, ST. JOHNS | ERIC S. SPARKS, TUCSON | KURT R. DAVIS, PHOENIX
LELAND S. "BILL" BRAKE, ELGIN | JAMES R. AMMONS, YUMA DIRECTOR: TY E. GRAY DEPUTY DIRECTOR: TOM P. FINLEY

Art Babbott

District 1

Elizabeth C. Archuleta

District 2

Matt Ryan

District 3

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

August 27th, 2018

Jim Parks

District 4

Dear Mr. Teran,

Lena Fowler

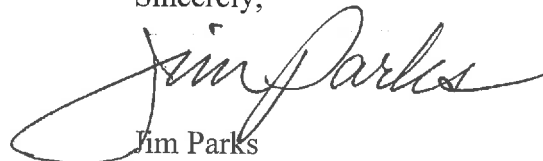
District 5

As Coconino County Supervisor for District 4, my primary interests relate to rural and Native people, farming and ranching, agriculture and the environment, and veterans of our Armed Forces. A retired cowboy from Flagstaff and lifetime Arizonan, I recognize what a gem the Landsward Foundation is. Babbitt Ranches is known far and wide for its stewardship and commitment to excellence in every aspect of their operations; their nonprofit Landsward Foundation is an extension of this generations-deep ethic, bridging ranching and scientific communities for the greater good. Their contributions are paramount – their generous dedication to our local communities, an array of species, and the environment itself has set the standard for Northern Arizona.

Landsward Foundation's ***Little Colorado River Valley Conservation Area Restoration Project*** falls within my district. Given the County's synergy with their riparian restoration efforts along our extremely vital Little Colorado River Valley corridor, I hope they succeed in attaining support via the **Arizona Water Protection Fund Commission** Fiscal Year 2019 Funding Cycle. You will be hard-pressed to find those with higher integrity and leadership-in-action than Babbitt Ranches.

Definitely reach out if you have any questions. I can be reached at 928-679-7154 or jparks@coconino.az.gov.

Sincerely,



Jim Parks

Coconino County Supervisor – District 4



United States Department of the Interior

Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, Suite C3
Phoenix, Arizona 85051

Telephone: (602) 242-0210 Fax: (602) 242-2513



In reply refer to:
AESO/ES

August 30, 2018

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

Dear Mr. Teran,

On behalf of the US Fish and Wildlife Service's (USFWS) Partners for Fish and Wildlife Program I want to extend my support of the project proposal submitted to the Arizona Water Protection Fund by the Babbitt Ranches Landsward Foundation. We have worked with Babbitt Ranches for several years on their grassland enhancement work to enhance habitat for pronghorn antelope and grassland birds in Northern Arizona.

The Landsward Foundation brings local entities together to increase public awareness of the function and value of riparian resources in Arizona. Landsward has been spearheading grassroots efforts to restore the Little Colorado River Valley and has made great strides toward the creation of a restoration model that can be embraced by regional landowners along the Little Colorado River conservation corridor.

The Partners for Fish and Wildlife program helps the United States Fish and Wildlife Service fulfill its mission to conserve, protect, and enhance fish, wildlife, and plants by providing technical and financial support to private landowners in Arizona who want to improve fish and wildlife habitat on their land. Since 1992, the Arizona Partners program has focused on protecting, restoring, and/or enhancing wetland and streamside (riparian) habitats that will benefit federal trust species, as well as federally-listed threatened and endangered species, waterfowl, shorebirds, and migratory birds.

We look forward to working with the Landsward Foundation with their on-the-ground restoration efforts along the Little Colorado River. Enhancement of riparian ecological communities may benefit threatened and endangered species by restoring the biological integrity of the area, thereby reducing habitat fragmentation wrought by invasive species.

The objective of the proposed ***Little Colorado River Valley Conservation Area Restoration Project*** is to enhance and maintain valuable riparian habitat by removing patches of non-native tamarisk and planting native riparian vegetation.

We have had a productive relationship with Babbitt Ranches, working on grassland enhancement projects and look forward to working with their Landsward Foundation and developing new partners. Given their extensive reach, we support their competition in the Arizona Water Protection Fund Commission's Fiscal Year 2019 Funding Cycle.

Best wishes,

A handwritten signature in black ink, appearing to read "Kris Randall". The signature is fluid and cursive, with the first name "Kris" and last name "Randall" clearly distinguishable.

Kris Randall
Acting Field Supervisor



Little Colorado River Valley Conservation Area Restoration Project

LETTERS OF COMMUNITY SUPPORT

Letters of Community Support are enclosed from the following partners:

- ❖ SWCA, Inc.
- ❖ National Park Service
- ❖ Coconino County
- ❖ Arizona Game and Fish Department
- ❖ Fish and Wildlife Service Partners Program
- ❖ American Conservation Experience
- ❖ Applied Ecological Consulting
- ❖ Natural Channel Design, Inc.



United States Department of the Interior

NATIONAL PARK SERVICE
FLAGSTAFF AREA NATIONAL MONUMENTS
6400 N Highway 89
Flagstaff, AZ 86004



IN REPLY REFER TO:

L3221

August 20, 2018

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

Dear Executive Director Teran:

I am writing on behalf of the National Park Service (NPS) at Flagstaff Area National Monuments (Walnut Canyon, Sunset Crater Volcano, and Wupatki) regarding the Landsward Foundation's application for an Arizona Water Protection Fund Commission Fiscal Year 2019 Funding Cycle grant – **Little Colorado River Valley Conservation Area Restoration Project**. The Flagstaff Area National Monuments fully supports the proposal for: its merits of riparian habitat restoration where there is a critical need; strategic location of the site; outreach to communities and land managers across the Little Colorado River Valley; involvement of public school students in environmental education activities; and involvement of university scientists and students in research. The Landsward Foundation is among the rare private land management stewardship organizations in northern Arizona guided by conservation principles that greatly overlap with the NPS mission -- to preserve natural and cultural resources for the enjoyment of future generations.

The NPS shares nineteen miles of mutual boundary with the Landsward Foundation at Wupatki National Monument. Mutual interest and collaboration to conserve the area grassland ecosystem originated many decades ago, focusing on the local American pronghorn and golden eagle populations. Since 2004, the Landsward Foundation and NPS have routinely communicated and coordinated resource stewardship and research activities under a memorandum of understanding. The Landsward stewardship area adjacent to Wupatki is in the next priority tier for reintroducing and recovering the endangered black-footed ferret. In addition to successes and opportunities with grassland wildlife conservation, the NPS has also long recognized opportunities for riparian restoration and enhanced wildlife conservation along the Little Colorado River (LCR) corridor.

The Foundation's project site is only ten miles down the LCR corridor from Wupatki, and complements recent NPS efforts to control invasive riparian vegetation and improve wildlife habitat at a twenty acre site within Wupatki. The Foundation's work will result in restoration of a larger site of greater riparian habitat potential than Wupatki. Furthermore, the Foundation is approaching restoration using an impressive scientific research partnership, along with outreach to stakeholders throughout the LCR Valley. This can result in broader scientific knowledge on successful riparian restoration principles and practices for the LCR Valley, including the NPS at Wupatki National Monument. Lastly, the restoration and environmental education effort will stimulate interest in restoring other sites along the LCR, both

upstream and downstream from the project site and Wupatki, to the benefit other neighbors, including the Navajo Nation, the Hopi Tribe, Arizona Land Trust, Coconino County, and the communities of Winslow, Leupp, and Cameron, Arizona.

Please let me know if you have any questions. I can be reached at (928) 526-1157, ext. 227 or Kayci_cook@nps.gov.



Kayci Cook Collins
Superintendent

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 85007

August 28, 2018

Dear Mr. Teran,

As president of Natural Channel Design, Inc. it is my pleasure to write this letter of support for the Landsward Foundation's application for the Arizona Water Protection Fund FY2019 project titled Little Colorado River Valley Conservation Area Restoration Project.

Natural Channel Design, Inc. (NCD) is a river engineering and natural resource planning consulting firm dedicated to river and riparian restoration in the Southwest. NCD has been active in riparian restoration for almost 20 years. We are looking forward to participating in this restoration project as a technical provider.

The purpose of this project is to remove tamarisk and other invasive plant species on 15 acres and to revegetate the sites with cottonwoods, willows and other native vegetation to help protect and enhance remnant cottonwood gallery forest. While this project provides many challenges ranging from invasive species to impaired soils – it also offers the opportunity to employ recently gained knowledge of cottonwood genotypes matched to environmental conditions. This project can provide an excellent example for riparian restoration considering current and future site conditions. In addition to gaining important information about new practices, restoration of the site will improve a segment of riparian habitat in a long neglected reach of a major stream in Arizona, thus providing momentum to restoration in the Little Colorado River Valley.

We support the foundations goal of promoting environmental stewardship and bringing together the scientific community and land use managers to help sustain the lands of the region.

Sincerely,



Allen Haden
Natural Channel Design, Inc.



Sound Science. Creative Solutions.

Flagstaff Office
114 North San Francisco Street, Suite 100
Flagstaff, AZ 86001
Tel 928.774.5500 Fax 928.779.2709
www.swca.com

August 20, 2018

Reuben Teran
Executive Director
Arizona Water Protection Fund
Arizona Department of Water Resources
1110 West Washington Street, Suite 310
Phoenix, Arizona 86007

Dear Mr. Teran:

I am writing to offer my unequivocal support of the Landsward Foundation in competing within Arizona Water Protection Fund Commission's Fiscal Year 2019 Funding Cycle. First, my bona fides. I am a director and senior scientist with SWCA Environmental Consultants, a company I founded 37 years ago. SWCA, now employee-owned, has expanded from a small business in Flagstaff, Arizona, to a nationwide concern that employs more than 900 scientists (e.g., biologists, ecologists, hydrologists, geomorphologists, paleontologists, and archaeologists), environmental planners, and technical specialists in 30 offices stretching from Massachusetts to Hawaii. Our business centers on aiding both private and public entities comply with environmental laws and regulations, but we also partner with conservation-minded landowners to protect and enhance natural and cultural resources on their property.

SWCA has been working closely with the Landsward Foundation since 2011. Conservation-related work performed by SWCA in association with the Landsward Foundation and Babbitt Ranches (creator of the Landsward Foundation) includes several projects centered on the Babbitt-owned CO Bar, Cataract, and Espee Ranches in northern Arizona. Together, the three ranches comprise over 700,000 acres of shortgrass rangeland wildlife habitat. Project activities include eight years of golden eagle nest surveys and monitoring on the ranches and contiguous areas; an experimental supplemental feeding program to improve golden eagle productivity; a long-term telemetry study of golden eagle movement and habitat use; and a study of soils in the 12,160-acre Windy Wilson Prairie Dog Research Conservation Area on Espee Ranch. The Windy Ranch conservation area was established to promote research on the Gunnison's prairie dog and provide a suitable release site for the endangered black-footed ferret. Plans for a study of ectoparasites in golden eagle nests are in development. SWCA also prepared a comprehensive conservation plan for each of the three ranches, a draft survey protocol for the endangered Fickeisen plains cactus (now under review by the U.S. Fish and Wildlife Service), and a Fickeisen plains cactus management plan for the Babbitt rangelands.



In striving to have a positive social and environmental impact, not only through the work SWCA does for clients, but also in how we give back to our communities, I've found synergy with the Landsward Foundation. As a native Arizonan, long-time resident of Flagstaff, devotee of healthy riparian biomes, and admirer of the Babbitt's demonstrated sense of land stewardship and thorough professionalism, I am delighted to endorse the Landsward Foundation's ***Little Colorado River Valley Conservation Area Restoration Project***. If ever there was a stream in need of restoration, the Little Colorado River is it. The Landsward Foundation's incremental approach to furthering that goal is sound, doable, and worthy of support.

Respectfully,

A handwritten signature in black ink that reads "Steven W. Carothers". The signature is written in a cursive, flowing style.

Steven W. Carothers, Ph.D.
Founder, Director, Senior Scientist
SWCA, Inc. – Flagstaff
scarothers@swca.com
www.swca.com



Little Colorado River Valley Conservation Area Restoration Project

PLANS

Detailed plans to meet each objective follow:

<i>Utilize cut-stump and basal bark herbicide methods to release old-growth Fremont cottonwood galleries from direct resource competition with thick, monotypic stands of salt cedar</i>			
Activity	Task	Budget	Related Equipment
<i>Study/Research Designs</i>	Attain approved permits, authorizations, clearances and agreements	\$400	
<i>Study/Research Designs</i>	Develop <i>Invasive Plant Control Plan</i>	\$0	
<i>Efforts to Remove Invasive Species</i>	Control populations of invasive plant species on 8 acres of cut-stump tamarisk by enacting salt cedar control around old growth cottonwood trees	\$91,879	
<i>Efforts to Remove Invasive Species</i>	Burn tamarisk debris piles (from both sites) and clear debris from work site	\$4,965	Crew buggy rental 3/4-ton truck rental
<i>Control Russian knapweed and camelthorn infestations with herbicides within cottonwood understory to open up opportunity for successful natural and supplementary revegetation to occur</i>			
Activity	Task	Budget	Related Equipment

<i>Revegetation Efforts</i>	Enact 8 acres of foliar herbicide treatments on herbaceous weeds (via herbicide applications with backpack and tank sprayers)	\$5,448	
<i>Revegetate cleared cottonwood understory with native vegetation using irrigationless methods and native plants that compete against future invasive weed invasion to create refugia for native avian species, since riparian habitats are critical for migrating and breeding birds and are currently in decline in the Southwest</i>			
Activity	Task	Budget	Related Equipment
<i>Study/Research Designs</i>	Create <i>Revegetation Plan, Monitoring Plan, and Photographic Monitoring Plan</i>	\$20,626	GPS rental
<i>Revegetation Efforts</i>	Install 6,600 feet of wildlife-safe fencing, gates and braces around designated revegetation area	\$20,846	Fencing supplies Swing gates Utility task vehicle rental Gas-powered auger rental Mechanical post pounder rental
<i>Revegetation Efforts</i>	Supply Cottonwood saplings sufficient for 8 acres of native plant revegetation	\$9,864	

<i>Revegetation Efforts</i>	Fast-track restoration process by establishing native plant sources that offer natural competition against invasive plant species, therein providing wildlife forage and habitat 8 acres sown with native seeds, willow pole plantings and cottonwood saplings	\$47,427	Mini-excavator rental Auger bit rental All-terrain vehicle rental Crimper rental
<i>Protect project sites from further invasive plant invasion, while assessing whether restoration tasks are successful and determining the causes of success or failure</i>			
Activity	Task	Budget	Related Equipment
<i>Revegetation Efforts</i>	Keep revegetated sites intact and assist in establishment of flora/wildlife refugia by retreated tamarisk re-sprouts and/or seedlings, treated new Russian knapweed or camelthorn invasions, and repaired fencing throughout project duration	\$26,509	Fencing repair materials
<i>Photographic Monitoring</i>	Qualitatively monitor vegetation via photography that captures benefits to plant and avian	\$5,390	Camera

	communities by establishing a baseline, standardizing the direction of photos, and taking one photo per year throughout the duration of the restoration effort		
<i>Plant Surveys</i>	Monitor changes in vegetation communities over time via vegetation surveys, in order to evaluate the effectiveness of invasive plant control and revegetation efforts and generate scientific reports of findings	\$23,700	Vegetation plots
<i>Avian Surveys</i>	Monitor bird communities before, during and after restoration efforts, to ascertain whether non-native management and native revegetation benefits native wildlife and generate scientific reports of findings	\$38,910	GPS units Laser range finder Binoculars Computer equipment All-terrain vehicle rental
	Summarize project (including inventories, metrics	\$3,000	

<i>Sampling/Monitoring</i>	monitored, and overall success) and share final results with Arizona Water Protection Fund Commission, via a written report and formal, in-person oral presentation		
<i>Create a successful, replicable riparian restoration model that can be utilized by Landsward and neighboring land owners and agencies within nearby/adjacent reaches of the Lower Little Colorado River Valley</i>			
Activity	Task	Budget	Related Equipment
<i>Study/Research Designs</i>	Create a template that is easily-replicated by land owners	\$348	
<i>Revegetation Efforts</i>	Identify partners who could benefit from embracing model, by learning more about on-the-ground restoration that works best regionally	\$0	
<i>Revegetation Efforts</i>	Inspire neighboring land owners to implement restoration model by hosting Landsward Discovery Community Expo in conjunction with the annual Flagstaff Festival of Science, wherein model is revealed, described, and celebrated	\$2,000	



Little Colorado River Valley Conservation Area Restoration Project

PROJECT SITE PHOTOGRAPHS



Looking NORTH

This aerial image depicts ponds and the Little Colorado River, which are a focal point for wildlife. The project's South Unit is in the upper grouping of tamarisk (above and to the right of the ponds) – you can just make out the white old growth cottonwood tree stringers that this project focuses on protecting. The project's North Unit is further north and not visible in this photo.



Looking NORTH

The project is located along the intermittent Little Colorado River, within the Little Colorado River Valley Conservation Area. This view of the river is from the project's South Unit (on the left bank – the Navajo Nation has a similar landscape across the river, including old growth cottonwood, on the right bank).



Looking WEST

Surviving cottonwoods (tallest trees) emerge from a sea of invasive tamarisk at the project's South Unit. This project includes removing the tamarisk understory to protect these native trees from wildfire hazards and freeing them from competition for vital resources (like water and sunlight).