

ARIZONA WATER PROTECTION FUND



PROTECTING ARIZONA'S
RIVER & RIPARIAN
RESOURCES

ANNUAL REPORT

2005 - 2006



Arizona Water Protection Fund Commission

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July 31, 2006

Honorable Janet Napolitano
Governor of Arizona, and

Honorable Members
Arizona State Legislature

I am pleased to submit to you the Fiscal Year 2006 Annual Report of the Arizona Water Protection Fund Commission. This report provides an overview of program accomplishments from July 1, 2005 through June 30, 2006.

This was the eleventh year of our statewide public grants program for restoring, maintaining and enhancing rivers, streams and riparian habitats. Although the Commission was not provided with an appropriation in the state budget this fiscal year, it did utilize limited funding from in-lieu fees deposited by Central Arizona Project in Fiscal Year 2005. The Commission used those funds to award six new grants in support of our statutory directive.

To date, the Commission has awarded 167 grants totaling about \$31 million. Projects have been funded in every county and have benefited more than 1,387 miles of rivers and streams throughout Arizona. The Arizona Water Protection Fund staff also continues to demonstrate leadership and expertise in providing technical advice and assistance for designing and implementing an effective riparian protection program. Through these efforts, the Arizona Water Protection Fund has contributed significantly to statewide natural resource protection and invested in the future of Arizona.

The Commission is proud to oversee the Arizona Water Protection Fund and to provide an important function of protecting, restoring and enhancing some of the State's most valuable natural resources. Please contact me at (623) 869-2338 if I can answer any questions.

Sincerely,

John D. Newman
Chair

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Background

In 1994, the Arizona Legislature established the Arizona Water Protection Fund (AWPF). The purpose of the AWPF is to provide monies to the public through a grant process for the implementation of projects to maintain, enhance and restore rivers and streams and associated riparian resources. This includes fish and wildlife that are dependent on these important habitats.

By statute, the AWPF is to receive \$5 million annually to provide grants for projects benefiting rivers and riparian habitat. Any individual or entity, state or federal agency, or political subdivision of Arizona may submit an application for an Arizona Water Protection Fund grant. All projects must be located in Arizona, be consistent with State water law, and respond to the overall goals of the legislation.



The Arizona Water Protection Fund

Commission, which oversees the AWPF, is comprised of 15 citizen-voting members and 2 non-voting members. The 15 voting members represent a diversity of interests and are appointed by various government entities to serve staggered 3-year terms (Table 1).

The Arizona Department of Water Resources provides staff and administrative support to the Commission. The Arizona State Land Department staff position that acts as a special liaison between the Commission and the Natural Resource Conservation Districts has remained vacant.

Statement of Problem

Rivers, streams and wetlands are important resources to the people of Arizona and humans have been using and changing these resources for centuries. Through time, we have learned that proper land and watershed management can make a profound difference in the health of our rivers and wetlands.

There is also an increasing awareness that healthy waterways and their associated riparian areas have economic value. Economic benefits take many forms including ecotourism, recreation, streambank stabilization, fish and wildlife habitat, water quality improvement, groundwater recharge, water storage in streambanks which maintains stream base flows, and food sources for pollinators and insectivores. In addition, real estate that is located on the edge of a riparian area often benefits economically from the area's aesthetic and natural values.

Table 1. Arizona Water Protection Fund Commissioners

Commission Member Name	Statutory Category Represented – Affiliation	Term Expires	Appointing Authority
Aja, Benny	Agriculture – Range Conservation	2007	House Speaker
Brick, Paul	Natural Resource Conservation Districts – San Pedro Natural Resource Conservation District	2007	Governor
Campana, Sam Kathryn	Environmental Organization w/ Riparian Expertise – Arizona Audubon Society	2007	Governor
Howard, Robert, Sr.	Indian Tribe – San Carlos Apache Tribe	2008	Intertribal Council of Arizona
Keane, John	Agricultural Improvement District w/ Natural Resource Expertise – Salt River Project	2008	Governor
Kirchner, David **	Member of Public – Basin & Range Hydrogeologists	2008	Senate President
Light, Marie	Member of Public – Private Sector Hydrologist	2009	Senate President
Munderloh, John	Member of Public & population <500,000 – Town of Prescott Valley	2008	House Speaker
Myers, Mark	Environmental Organization w/ Riparian Expertise – The Nature Conservancy	2006	Governor
Newman, John*	Multi-County Water Conservation District – Central Arizona Project (CAP)	2006	District Governing Board (CAWCD)
Olson, Steven	Municipality w/ CAP Subcontract & County w/ >1.2 million population – Arizona Municipal Water Users Association	2006	Governor
Rankin, Tom	Municipality w/CAP Subcontract and County w/ <500,000 population – Town of Florence	2006	House Speaker
Uhlman, Kristine	Member of Public – University of Arizona	2007	Governor
VACANT	Industrial Water User w/ CAP Subcontract		Governor
VACANT	Municipality w/ CAP Subcontract & County w/ >500,000 & <1.2 million population		Senate President
*Commission Chair **Commission Vice-Chair			

Consider the cost avoidance benefits of flood damage that a healthy riparian area can produce. Barren streambanks will erode quickly during a flood event and can result in the loss of acres of land and topsoil. More than 10,000 acres of land were lost to erosion due to high flood flows in 1993.¹ Soil erosion contributes to siltation in our reservoirs, resulting in loss of water storage capacity and increased dredging costs. In other cases, increased erosion causes soil deposition downstream, raising the stream bottom and increasing the threat of floods to adjacent developed lands. Riparian restoration is valued by the public, however, the more degraded a system becomes, the more expensive it is to restore. For instance, the Rio Salado (Salt River) restoration through Mesa, Tempe and Phoenix has been estimated at \$84 million. In Tucson, restoration of a portion of Rillito Basin has been estimated to cost between \$25 million to \$35 million and restoration of a 6-mile reach of the Santa Cruz River to cost \$40 million.

Philosophy

The AWPf is intended to be a proactive response to possible federal intervention in Arizona's stream and riparian resource issues. The AWPf was created to address Arizona river and riparian associated issues by using incentives rather than regulation and emphasizing local implementation.

The AWPf statutes and operation are based on a "bottom-up" rather than a "top-down" approach. The AWPf is a public granting program that asks the public to propose local riparian solutions, rather than having the State dictate specific measures, priorities or areas of concern.

The Grant Application Process

The Commission accepts grant applications annually. Applications are made available for public review and comment for 45 days after the application deadline. Commission staff conducts a technical review of the projects and evaluates them according to a system created by the Commission. Summaries of the evaluations are provided to the Commissioners and the Applicant. Applicants are then given an opportunity to make an oral presentation to the Commission about their project. During this presentation, the Applicant may address any issues, omissions, or misinterpretations of information raised during the review process. Commissioners take all this information into consideration; however, use their own additional criteria and judgment to select projects. Funding decisions occur approximately four months after the application deadline. Projects are awarded funding upon receiving a majority vote of the Commission members present at the time of voting.

Grants are implemented through contracting with the Grantees. Grants can extend over a three-year period. Funds are paid out over the term of the contract as activities are accomplished.

Accomplishments

Grant Awards

In Fiscal Year 2006, the Commission funded 6 of the 11 grant applications received. Through its eleven previous grant cycles, the Commission has awarded 167 grants, ranging in amounts from

¹ Arizona Game and Fish Department, Statewide Riparian Inventory Database, 1996.

\$7,390 to \$2,562,000. Grants have been awarded in every county of the State. The Commission has funded a wide range of projects, including channel restoration, riparian revegetation, wetland restoration, wetland creation, watershed management plans, applied research, fencing and grazing improvements, upland restoration and erosion control projects.

The Map, Map Key and Appendix in this report contain a compilation of grants awarded between FY 1995 – 2006 that have been implemented through contracts and had expenditures made against the grant award. Of the grants awarded in all years, some were unable to be brought to contract. In those cases, monies were unobligated and were awarded to new applicants. Grants that have been unobligated have been omitted from our lists in this report.

Table 2: Map Key

Map #	Grant #	Project Title	Grant Amount²
1	95-001	Stable Isotope Assessment of Groundwater and Surface Water Interaction – Application to the Verde River Headwaters	\$21,508.00
5	95-002	Partnership for Riparian Conservation in Northeastern Pima County	\$78,100.00
6	95-003	Sycamore Creek Riparian Management Area	\$115,522.00
10	95-004	Road Reclamation to Improve Riparian Habitat Along the Hassayampa and Verde Rivers	\$45,693.00
12	95-008	Picacho Reservoir Riparian Enhancement Project	\$2,400,000.00
15	95-009	Regeneration and Survivorship of Arizona Sycamore	\$34,617.00
16	95-010	Assessment of the Role of Effluent Dominated Rivers in Supporting Riparian Functions	\$46,750.00
19	95-012	The Comprehensive Plan for the Watson Woods Riparian Preserve	\$33,267.34
26	95-007	Marana High Plains Effluent Recharge Project	\$189,000.00
28	95-006	Riparian Habitat Restoration Along a Perennial Reach of a Verde River Tributary	\$102,535.00
32	95-005	Preservation of the San Pedro River Utilizing Effluent Recharge	\$2,585,724.53
36	95-014	Gila Box Riparian and Water Quality Improvement Project	\$239,766.98
37	95-015	San Pedro Riparian National Conservation Area Watershed Rehabilitation/ Restoration Project	\$286,000.00
38	95-016	Refinement of Geologic Model, Lower Cienega Basin, Pima County, Arizona	\$7,390.00
49	95-017	Restoration of Fossil Creek Riparian Ecosystem	\$59,693.00
54	95-018	Autecology and Restoration of <i>Sporobolus Wrightii</i> Riparian Grasslands in Southern Arizona	\$53,734.00
55	95-019	Quantifying Anti-Erosion Traits of Streambank Graminoids	\$14,910.00
61	95-020	Teran Watershed Enhancement	\$151,753.00
65	95-021	Lofer Cienega Restoration Project	\$161,204.00
66	95-022	Gooseberry Watershed Restoration Project	\$126,406.00
69	95-023	Sabino Creek Riparian Ecosystem Protection Project	\$16,385.00
80	95-024	Potrero Creek Wetland Characterization and Management Plan	\$75,300.00
83	96-0004	Hydrologic Investigation & Conservation Planning: Pipe Springs	\$50,000.00
90	96-0010	Rehabilitating the Puertocito Wash on the Buenos Aires National Wildlife Refuge	\$83,432.00
92	96-0016	'Ahakhav Tribal Preserve	\$931,477.00
93	96-0017	Big Sandy River Riparian Project	\$92,000.00
94	96-0019	Response of Bebb Willow to Riparian Restoration	\$34,924.00
96	96-0003	Hoxworth Springs Riparian Restoration Project	\$31,545.00
99	96-0007	Ash Creek Riparian Protection Project	\$19,248.00
100	96-0012	Eagle Creek Watershed and Riparian Stabilization	\$80,626.00

² The “Grant Amount” column represents the full grant awarded for each project and will total more than the grant disbursements and grant obligations sections on the financial page. Some grants have been completed for less money than the amount budgeted while others have terminated prior to expenditure of the full grant amount. This column has not been changed to reflect these situations.

Table 2: Map Key (Continued)

Map #	Grant #	Project Title	Grant Amount
101	96-0005	Tres Rios River Management & Constructed Wetlands Project	\$1,000,000.00
103	96-0022	Saffell Canyon and Murray Basin Watershed Restoration	\$27,143.62
108	96-0025	Tsaile Creek Watershed Restoration Demonstration	\$152,775.00
109	96-0011	Lower Colorado River – Imperial Division Restoration	\$435,928.00
113	96-0014	Klondyke Tailings Response Strategy Analysis (RSA)	\$77,614.00
115	96-0023	Watershed Restoration at the Yuma Conservation Gardens	\$31,050.00
118	96-0008	Watson Woods Vegetation Inventory	\$16,115.00
119	96-0009	Watson Woods Riparian Preserve Visitor Management	\$8,556.79
120	96-0006	Hydrogeologic Investigation of Groundwater Movement and Sources of Base Flow to Sonoita Creek and Implementation of Long-Term Monitoring Program	\$155,715.00
122	96-0018	San Carlos Spring Protection Project	\$131,540.00
124	96-0013	Happy Valley Riparian Area Restoration Project	\$64,697.00
127	96-0015	Abandonment of an Artesian Geothermal Well	\$113,360.00
130	96-0002	Completion Phase: Hi-Point Well Project	\$77,844.00
133	96-0026	Riparian Restoration on the San Xavier Indian Reservation Community	\$591,319.00
135	96-0020	Cienega Creek Stream Restoration	\$210,700.00
140	96-0001	San Pedro Riparian National Conservation Area Watershed Protection and Improvement Project	\$89,250.00
151	96-0021	Riparian Vegetation and Stream Channel Changes Associated with Water Management along the Bill Williams River	\$14,788.00
153	97-027	Lyle Canyon Allotment Restoration Project	\$60,359.57
155	97-028	Creation of a Reference Riparian Area in the Gila Valley – Discovery Park	\$182,000.00
159	97-029	Demonstration Enhancement of Pueblo Colorado Wash at Hubbell Trading Post	\$91,110.00
160	97-030	Walnut Creek Center for Education and Research – Biological Inventory	\$50,580.00
161	97-031	Lincoln Park Riparian Habitat Project (f.k.a. Atturbury Wash Project)	\$154,580.00
162	97-032	'Ahakhav Tribal Preserve – Deer Island Revegetation	\$228,800.00
163	97-033	Proctor Vegetation Modification	\$11,487.00
164	97-034	Oak Tree Gully Stabilization	\$42,491.00
165	97-035	Watershed Improvement to Restore Riparian and Aquatic Habitat on the Muleshoe Ranch CMA	\$128,315.00
166	97-036	Stable Isotopes as Tracers of Water Quality Constituents in the Upper Gila River	\$27,338.00
168	97-037	Talastima (Blue Canyon) Watershed Restoration Project	\$310,192.00
171	97-038	Tres Rios Wetland Heavy Metal Bioavailability Design for Denitrification and Microbial Water Quality	\$117,028.00
175	97-040	Bingham Cienega Riparian Restoration Project	\$84,679.00
178	97-041	Altar Valley Watershed Resource Assessment	\$88,730.00
180	97-042	Queen Creek Restoration and Management Plan	\$207,595.00
185	97-044	San Pedro River Preserve Riparian Habitat Restoration Project	\$346,127.00
188	97-045	Santa Cruz Headwaters Project	\$100,445.00

Table 2: Map Key (Continued)

Map #	Grant #	Project Title	Grant Amount
189	98-046	EC Bar Ranch Water Well Project	\$20,300.00
190	98-047	Upper Verde Adaptive Management Unit	\$115,300.00
193	98-049	Empire/Cienega/Empirita Fencing Project	\$54,850.00
197	98-050	Watershed Restoration of a High Elevation Riparian Community	\$304,775.00
198	98-051	Evaluation of Carex Species for Use in Riparian Restoration	\$47,907.00
200	98-052	Tritium as a Tracer of Groundwater Sources and Movement in the Upper Gila River Drainage	\$41,028.00
203	98-054	Fluvial Geomorphology Study and Demonstration Projects to Enhance and Restore Riparian Habitat on the Gila River from the New Mexico Border	\$449,872.00
206	98-055	Horseshoe Allotment: Verde Riparian Project II	\$82,561.99
208	98-057	Upper Verde Valley Riparian Area Historical Analysis	\$44,019.00
209	98-058	Effects of Removal of Livestock Grazing on Riparian Vegetation and Channel Conditions of Selected Reaches of the Upper Verde River	\$116,500.00
212	98-059	Verde River Headwaters Riparian Restoration Demonstration Project	\$204,629.00
214	98-061	Watershed Enhancement on the Antelope Allotment	\$137,307.00
215	98-062	Partnership for Riparian Conservation in Northeastern Pima County II	\$54,734.55
220	98-066	Hay Mountain Watershed Rehabilitation	\$116,525.00
223	99-067	EC Bar Ranch Wildlife Drinker Project	\$30,500.00
224	99-068	Lower Cienega Creek Restoration Evaluation Project	\$83,272.00
225	99-069	Riparian and Watershed Enhancements on the A7 Ranch – Lower San Pedro River	\$521,197.45
227	99-070	Lyle Canyon Allotment Riparian Area Restoration Project --- Phase 2	\$214,211.00
230	99-071	Protection of Spring and Seep Resources of the South Rim, Grand Canyon National Park by Measuring Water Quality, Flow, and Associated Biota	\$238,953.00
231	99-072	Leopard Frog Habitat and Population Conservation at Buenos Aires National Wildlife Refuge	\$120,485.00
232	99-073	Colorado River Nature Center Backwater --- Phase 2	\$41,500.00
233	99-074	Proposal to Inventory, Assess, and Recommend Recovery Priorities for Arizona Strip Springs, Seeps, and Natural Ponds	\$101,856.00
234	99-075	Glen and Grand Canyon Riparian Restoration Project	\$371,285.00
235	99-076	Watson Woods Preserve Herpetological Interpretive Guide and Checklist	\$31,255.55
236	99-077	Blue Box Crossing	\$150,000.00
237	99-078	Aquifer Framework and Ground-Water Flow Paths in Big and Little Chino Basins	\$188,140.00
238	99-079	Little Colorado River Riparian Restoration Project	\$404,587.00
239	99-080	Cortaro Mesquite Bosque	\$486,650.00
242	99-083	Cherry Creek Enhancement Demonstration Project	\$263,225.00
243	99-084	Assessments of Riparian Zones in the Little Colorado River Watershed	\$79,443.50
244	99-085	Kirkland Creek Watershed Resource Assessment	\$131,430.00
245	99-086	Abandonment of Gila Oil Syndicate Well #1	\$333,790.00
246	99-087	Rillito Creek Habitat Restoration Project	\$293,000.00
247	99-088	Wickenburg High School Stream Habitat Creation	\$69,100.00
248	99-089	Town of Eager/Round Valley Water Users Association Pressure Irrigation Feasibility Study & Preliminary Design	\$320,540.00

Table 2: Map Key (Continued)

Map #	Grant #	Project Title	Grant Amount
249	99-090	Redrock Riparian Improvement	\$62,350.00
250	99-091	Effects of Livestock Use Levels on Riparian Trees on the Verde River	\$41,417.00
251	99-092	Little Colorado River Enhancement Demonstration Project	\$348,627.94
252	99-093	Coconino Plateau Regional Water Study	\$134,200.00
253	99-094	Santa Cruz River Park Extension	\$434,684.00
254	99-095	Brown Creek Riparian Restoration	\$34,037.00
256	99-096	Upper Santa Cruz Watershed Restoration	\$184,950.00
258	99-097	Dakini Valley Riparian Project	\$66,130.00
259	99-098	Rio Salado Habitat Restoration Project	\$950,408.00
261	00-099	Gila Reference Riparian Area, Discovery Park	\$152,850.80
262	00-100	Willow Creek Riparian Restoration Project	\$33,480.00
263	00-101	Murray Basin and Saffell Canyon Watershed Restoration Project	\$260,727.83
264	00-102	Upper Eagle Creek Restoration on East Eagle Allotment: 4 Drag Ranch	\$66,330.00
265	00-103	Riparian Restoration on the Santa Cruz River – Santa Fe Ranch	\$49,008.00
266	00-104	Continued Enhancement of Pueblo Colorado Wash at Hubbell Trading Post National Historic Site	\$69,349.00
267	00-105	Hubbell Trading Post Riparian Restoration with Treated Effluent	\$81,951.00
268	00-106	Tres Alamos Dirt-Tanks-To-Aquatic-Habitat-Conversion	\$69,220.56
271	00-108	Lake Mary Watershed Streams Restoration	\$253,119.00
272	00-109	Lower San Pedro Watershed Project	\$249,871.00
273	00-110	Upper Fairchild Draw Riparian Restoration	\$35,515.00
275	00-111	Cooperative Grazing Management for Riparian Improvement on the San Pedro	\$228,701.00
276	00-112	Town of Eagar/Round Valley Water Users Association Pressure Irrigation Feasibility Study and Preliminary Design – Additional Mapping for Water Quality Improvements in the Watershed	\$151,829.00
277	00-113	Polacca Wash Grazing Management	\$267,511.00
278	00-114	The Papago Park Greenline Project	\$229,152.00
279	00-115	Tucson Audubon Society North Simpson Farm Riparian Recovery Project	\$127,409.30
281	03-116	Cottonwood Creek Restoration	\$185,772.50
283	03-117	Lynx Creek Restoration at Sediment Trap #2	\$179,771.50
284	03-118	Verde River Riparian Area Partnership Project	\$111,221.00
285	03-119	Wet Meadows for Water Quality and Wildlife – A Riparian Restoration Project	\$137,027.30
292	04-120	Verde River Headwaters 3-D Hydrogeological Model Framework and Visualization	\$46,634.00
296	04-121	Lynx Creek Restoration	\$266,020.00
299	04-122	Watson Woods Riparian Preserve Restoration Feasibility Project	\$198,627.00
300	04-123	Tucson Audubon Society, Santa Cruz River Habitat Project, North Simpson Site, Phase 2	\$130,786.00
301	04-124	Yuma East Wetlands Riparian Revegetation Project	\$285,878.25
302	05-125	Wilkins' family Little Colorado River Riparian Enhancement Project	\$293,618.00
304	05-126	X Diamond Ranch LCR Riparian Enhancement Project	\$352,119.00

Table 2: Map Key (Continued)

Map #	Grant #	Project Title	Grant Amount
305	05-127	EC Bar Ranch Reach 8 Water Well and Drinker Project	\$22,235.00
306	05-128	Canyon Creek Riparian Restoration Project, Reach 4-5	\$100,919.00
308	05-129	Georges Lake Riparian Restoration Project	\$168,636.50
310	05-130	Riparian Restoration on the San Xavier District – Project Two	\$32,688.00
313	05-131	Management & Control of Tamarisk and Other Invasive Vegetation at Backcountry Seeps, Springs, and Tributaries in Grand Canyon National Park	\$189,304.00
314	05-132	Esperanza Ranch Riparian Restoration Project	\$279,411.50
315	05-133	Verde Wild and Scenic River Fence Enclosure	\$63,888.50
317	05-134	Quechan Indian Nation Yuma East Wetlands Restoration Project – Phase I	\$263,803.25
318	06-135	Double Circle Ranch Riparian Fencing Project	\$88,448.00
321	06-136	The Arboretum at Flagstaff Wetland Habitat Enhancement	\$91,000.00
323	06-137	Pakoon Springs Restoration Design and Implementation Project	\$262,103.00
324	06-138	Management and Control of Tamarisk and Other Invasive Vegetation at Backcountry Seeps, Springs, and Tributaries in Grand Canyon National Park - Second Year of Phase II	\$258,397.00
325	06-139	Coal Mine Fence	\$182,005.00
327	06-140	Yuma Crossing National Heritage Area Yuma East Wetlands Restoration Project - Phase I	\$256,790.00

APPENDIX A: SUMMARY OF GRANTS

AWARDED DURING FY '96

95-001WPF: Stable Isotope Assessment of Groundwater and Surface Water Interaction - Application to the Verde River Headwaters

Map #: 1
Grantee: Arizona State University County: Yavapai
AWPF Funding: \$21,508.00 Completion Date: September 1997

Project Description: This project, located in the headwaters of the Verde River near Paulden, Arizona, was a one-year study to sample surface and groundwater in the Chino Valley and to analyze the waters for naturally occurring stable isotopes of hydrogen and oxygen. The main goal of the study was to determine if a hydraulic connection exists between the aquifers of the Chino Valley and the Verde River. This information would assist in determining the effects, if any, of groundwater pumping within the Chino Valley on the flow in the Upper Verde River.

95-002WPF: Partnership for Riparian Conservation in Northeastern Pima County (PROPIMA)

Map #: 5
Grantee: Rincon Institute County: Pima
AWPF Funding: \$78,100.00 Completion Date: August 1998

Project Description: The Rincon Institute designed and implemented landowner-based strategies for protecting healthy riparian ecosystems from urbanization pressures in the Tanque Verde Creek and Rincon Creek watersheds. The project focused on identification and development of restoration strategies for damaged riparian ecosystems in these two watersheds. The Grantee was the Rincon Institute, but the partnership involved in this study consisted of personnel from the Coronado National Forest, Saguaro National Park, University of Arizona, U.S. Geological Survey, developers and landowners in the watersheds.

95-003WPF: Sycamore Creek Riparian Management Area

Map #: 6
Grantee: Tonto National Forest County: Maricopa
AWPF Funding: \$115,522.00 Completion Date: May 1999

Project Description: The purpose of the project was to restore and protect a 19-mile reach of Sycamore Creek, a major tributary of the Verde River, from uncontrolled livestock grazing and off road vehicle use. To stop further damage to the creek, 15 miles of fence was constructed to enclose the riparian corridor. The objective was to increase the canopy cover and density of riparian vegetation within the corridor.

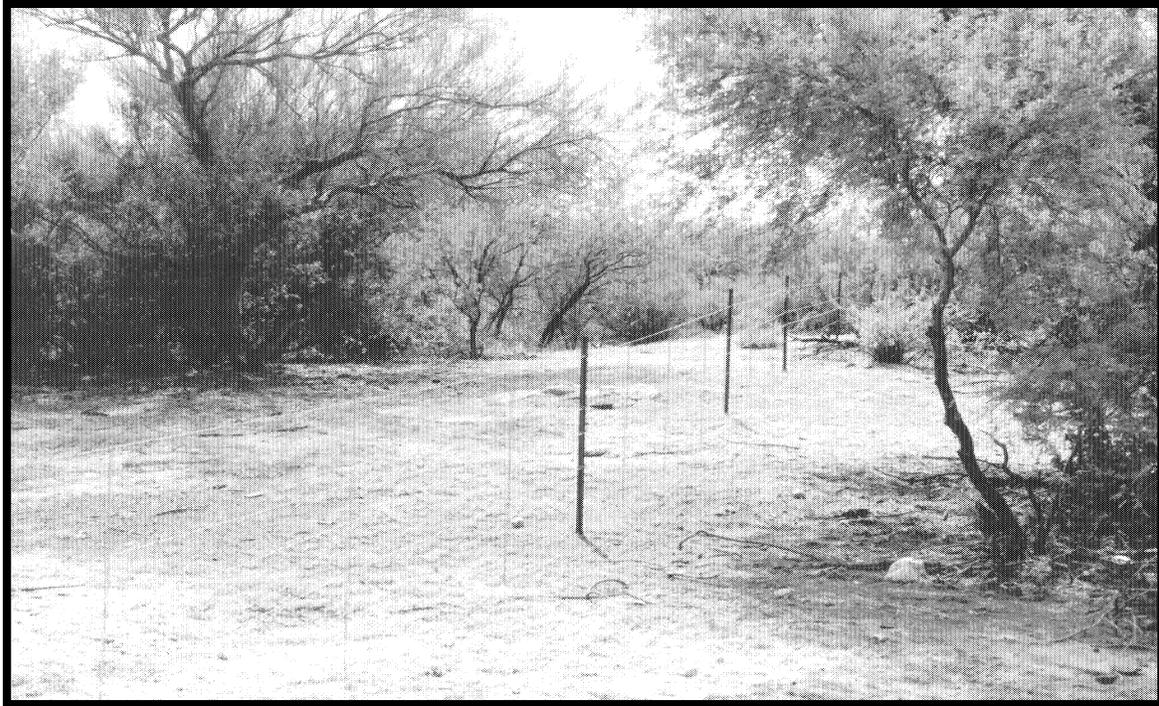


Figure 2. Fencing constructed at the Sycamore Creek Management Area to prevent uncontrolled livestock grazing and off-road vehicle damage. 95-003WPF

95-004WPF: Road Reclamation to Improve Riparian Habitat along the Hassayampa and Verde Rivers

Map #: 10
Grantee: Prescott National Forest County: Yavapai
AWPF Funding: \$45,693.00 Completion Date: April 1999

Project Description: This three-year project resulted in closure and revegetation of 19.7 miles of roads adjacent to the Hassayampa and Verde Rivers within the Prescott National Forest. The goal of the project was to reduce erosion and sedimentation into the rivers, restore riparian and upland vegetation on the closed and reclaimed road surfaces, and eliminate unauthorized roads.

95-005WPF: Preservation of the San Pedro River Utilizing Effluent Recharge

Map #: 32
Grantee: City of Sierra Vista County: Cochise
AWPF Funding: \$2,585,724.53 Completion Date: October 2002

Project Description: This project was a partnership between the City of Sierra Vista, the Arizona Water Protection Fund, and the U.S. Bureau of Reclamation. The City built a constructed wetland and recharge facility as part of the expansion of their wastewater treatment facility. The wetland will improve the effluent water quality so it can be recharged back into the aquifer. By recharging effluent, the City hopes to minimize any adverse effects on the flow of the San Pedro River from groundwater pumping.

95-006WPF: Riparian Habitat Restoration along a Perennial Reach of a Verde River Tributary

Map #: 28
Grantee: Northern Arizona University County: Coconino
AWPF Funding: \$102,535.00 Completion Date: March 1999

Project Description: The primary purpose of this three-year project was to restore habitat critical to the successful regeneration of a Bebb willow-mixed graminoid riparian plant community in the area of Hart Prairie located northwest of Flagstaff on a tributary to Sycamore Creek. The project involved removing an existing surface water diversion, restoring the natural drainage channel, fencing critical areas, and monitoring vegetation response to hydrologic changes.



Figure 3. Researcher collecting soil moisture data at Hart Prairie. 95-006WPF

95-007WPF: Marana High Plains Effluent Recharge Project

Map #: 26
Grantee: Pima County
Flood Control
District
County: Pima
AWPF Funding: \$189,000.00
Completion Date: June 2002

Project Description: This project integrated riparian protection and enhancement with operation of a groundwater recharge facility. The project is located along the effluent-dominated riparian corridor of the Santa Cruz River in the northwest portion of the Tucson Active Management Area and was the first component of a much larger project that will stretch for several miles within the floodplain of the Santa Cruz River. Pima County Flood Control District is conducting this project in conjunction with several federal, state and local agencies.

95-008WPF: Picacho Reservoir Riparian Enhancement Project

Map #: 12

Grantee: Pinal County Department of Civil Works County: Pinal

AWPF Funding: \$2,400,000.00 Completion Date: Terminated

Project Description: This project was to enable Pinal County to purchase sufficient quantities of CAP water over a 15-20 year period to protect and enhance the 2,400-acre riparian and wetland habitat that currently exists within the Picacho Reservoir. The habitat was periodically threatened by lack of water or dry-out from irrigation drawdown and drought. Under this grant, Pinal County was going to establish a minimum pool within the reservoir to provide protection and enhancement of wildlife and aquatic resources.

**95-009WPF:
Regeneration and Survivorship of
Arizona Sycamore**

Map #: 15

Grantee: Arizona State University

County: Maricopa

AWPF Funding: \$34,617.00

Completion Date: January 1999

Project Description: The goal of this research project was to develop information to help determine where and under what conditions sycamore trees grow best. The project involved collection of field data along several perennial, intermittent, and ephemeral streams in southern and central Arizona, with the primary goal of increasing the understanding of factors that influence regeneration and survivorship of Arizona sycamore. Factors related to water availability and land use were evaluated in the study.

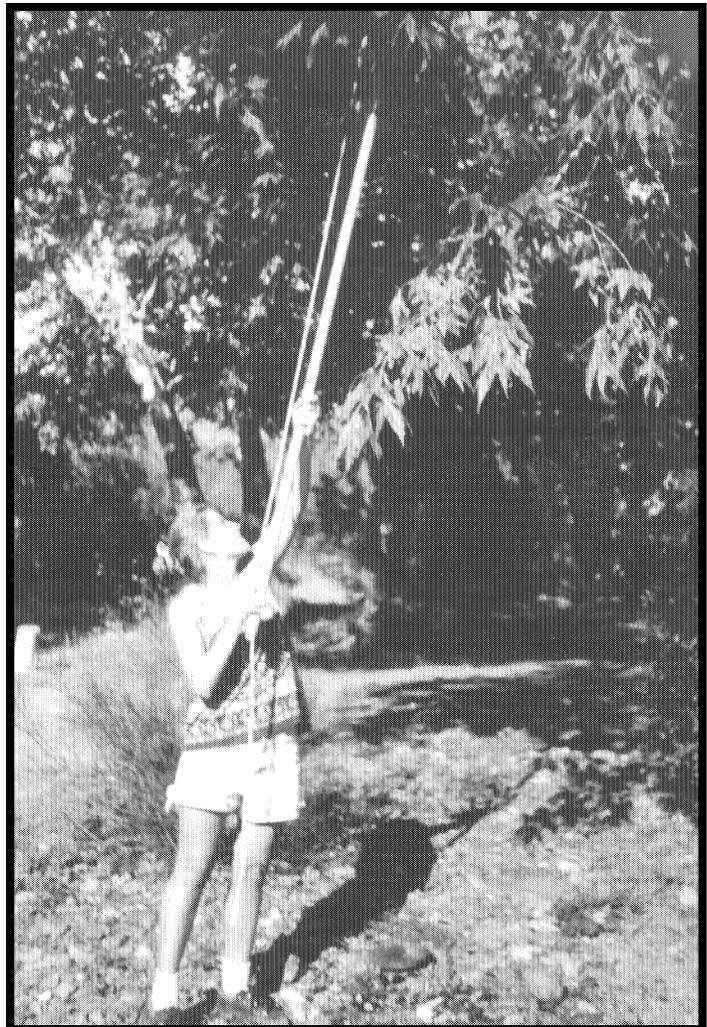


Figure 4. Collecting Samples from an Arizona Sycamore. 95-009WPF

95-010WPF: Assessment of the Role of Effluent Dominated Rivers in Supporting Riparian Functions

Map #: 16

Grantee: Arizona State University

County: Maricopa

AWPF Funding: \$46,750.00

Completion Date: August 1997

Project Description: Researchers studied sites along six reaches of three Arizona streams (two reaches per stream), where both an effluent dominated section and a natural perennial section existed. The study concentrated on one of the selected streams and compared some of the functions of the riparian ecosystem along the effluent-dominated and non-effluent dominated reaches. The objective was to determine whether there were differences in ecosystem responses between effluent-dominated reaches and non-effluent dominated reaches.



Figure 5. Watson Woods Preserve. 95-012WPF

95-012WPF: The Comprehensive Plan for the Watson Woods Riparian Preserve

Map #: 19

Grantee: Prescott Creeks Preservation Association

County: Yavapai

AWPF Funding: \$33,267.34

Completion Date: December 1996

Project Description: This project produced a comprehensive plan to manage Watson Woods, a 125-acre riparian gallery forest located along Granite Creek in Prescott, Arizona. The comprehensive plan addressed management, restoration, monitoring, and environmental education program plans.

95-014WPF: Gila Box Riparian and Water Quality Improvement Project

Map #: 36
Grantee: Bureau of Land Management County: Graham & Greenlee
AWPF Funding: \$239,766.98 Completion Date: April 2001

Project Description: This project improved and enhanced the riparian habitat and water quality of the Gila Box Riparian National Conservation Area (RNCA) on the upper Gila River by moving livestock grazing from the river to the adjacent upland areas. Approximately six miles of fencing was constructed; water lines, stock tanks and water pumps were installed to provide water to the upland areas.

95-015WPF: San Pedro Riparian National Conservation Area Watershed Rehabilitation/Restoration Project

Map #: 37
Grantee: Bureau of Land Management County: Cochise
AWPF Funding: \$286,000.00 Completion Date: April 2000

Project Description: The objective of this project was to rehabilitate and restore approximately 4,450 acres of eroded, ephemeral washes and upland areas that are located 0.5 to 1 mile from the San Pedro River within the San Pedro Riparian National Conservation Area (SPRNCA). This was accomplished by recontouring ephemeral washes and adjacent uplands and by revegetating these areas with native plant species.

95-016WPF: Refinement of Geologic Model, Lower Cienega Basin, Pima County, Arizona

Map #: 38
Grantee: Arizona Geological Survey County: Pima
AWPF Funding: \$7,390.00 Completion Date: September 1996

Project Description: This research project was designed to produce a refined geologic model for the lower Cienega Basin, located southeast of Tucson. The geologic model is an important component of computer models that are used to predict the impact of groundwater pumping within the basin on perennial and intermittent flowing reaches of lower Cienega Creek.

95-017WPF: Restoration of Fossil Creek Riparian Ecosystem

Map #: 49
Grantee: Rocky Mountain Research Station County: Gila
AWPF Funding: \$59,693.00 Completion Date: March 1999

Project Description: This study determined the potential effects that re-establishment of part or all of the presently diverted flows of Fossil Creek could have on re-establishment of riparian vegetation along the stream's corridor. A major component of this project was to compare and contrast historical vegetation with present vegetation to determine the consequences of adding additional water into the creek. The stream has been de-watered for approximately 80 years by diversions for hydroelectric use, but may receive some or all of this water within the next few years due to the relicensing process for the hydroelectric power plant.

95-018WPF: Autecology & Restoration of *Sporobolus wrightii* Riparian Grasslands in Southern Arizona

Map #: 54

Grantee: Arizona State University

County: Cochise, Santa Cruz, Pima

AWPF Funding: \$53,734.00

Completion Date: June 2000

Project Description: This study acquired ecological information necessary to understand the natural processes allowing for regeneration and maintenance of *Sporobolus wrightii* (giant sacaton) riparian grasslands along rivers in southern Arizona. This information will continue to be used to determine the natural recovery and restoration potential of this type of community on abandoned agricultural fields located along these alluvial river systems.

95-019WPF: Quantifying Anti-Erosion Traits of Streambank Graminoids

Map #: 55

Grantee: Arizona State University

County: Pima

AWPF Funding: \$14,910.00

Completion Date: December 1997

Project Description: This study measured and compared physical traits of streamside grasses and grass-like plants (graminoids) to determine their potential capacity to stabilize streambanks. The study sites were located on Cienega Creek in Pima County. The study looked at grasses and graminoids in terms of their erosion-prevention effectiveness for stream restoration and bank stabilization projects.

95-020WPF: Teran Watershed Enhancement

Map #: 61

Grantee: Redington Natural Resource Conservation District

County: Cochise

AWPF Funding: \$151,753.00

Completion Date: April 1999

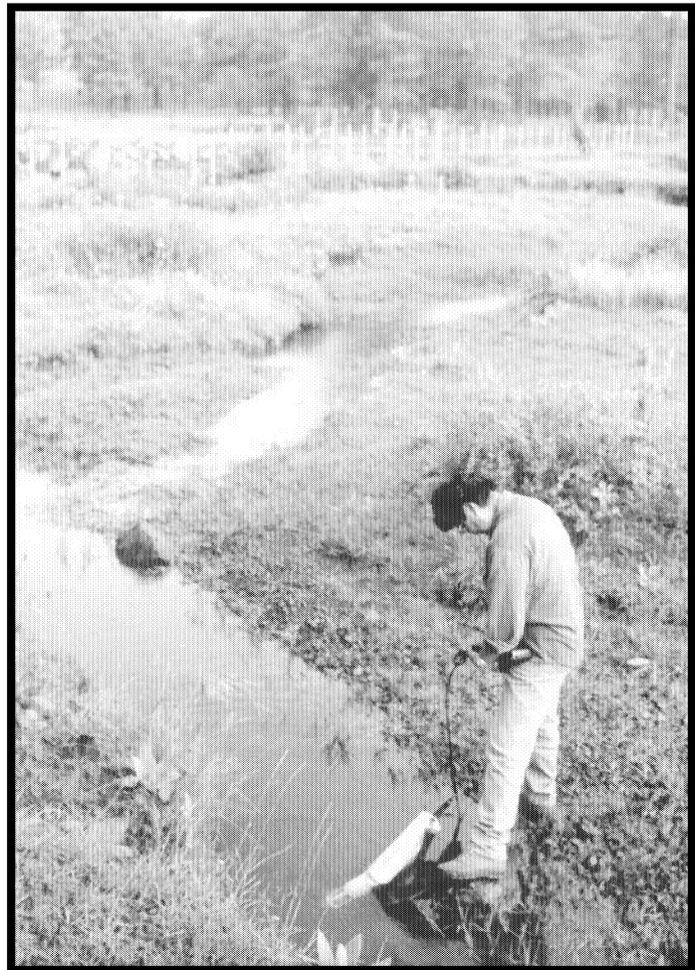


Figure 6. Water testing at a wet meadow in Gooseberry Watershed. 95-022WPF

Project Description: The purpose of this project was to improve watershed conditions within the Teran Watershed, located along the San Pedro River. Thousands of small, loose-rock dam structures have been constructed in an attempt to reduce surface water runoff rates, increase duration of channel flow, improve groundwater recharge and enhance riparian habitat for wildlife.

95-021WPF: Lofer Cienega Restoration Project

Map #: 65

Grantee: White Mountain Apache Tribe

County: Apache

AWPF Funding: \$161,204.00

Completion Date: March 1999

Project Description: This project incorporated stream assessments, long-term monitoring, fence construction, grazing management, biological assessments, and feral horse trapping and removal in an attempt to restore Lofer Cienega. Lofer Cienega is one of the largest cienegas on the Fort Apache Indian Reservation and when restored, should provide critical wildlife and fish habitat. In addition it is a significant cultural resource to the tribe.

95-022WPF: Gooseberry Watershed Restoration Project

Map #: 66

Grantee: White Mountain Apache Tribe

County: Apache

AWPF Funding: \$126,406.00

Completion Date: March 1999

Project Description: The primary purpose of this project was to restore the health of Gooseberry Watershed by improving management of the riparian meadows and reconstructing stream crossings. The project incorporated stream assessments, improved riparian grazing management, clean-up projects and public education, channel restoration and biologic assessments to meet its goals.

95-0023WPF: Sabino Creek Riparian Ecosystem Protection Project

Map #: 69

Grantee: Hidden Valley Homeowners Association

County: Pima

AWPF Funding: \$16,385.00

Completion Date: April 1999

Project Description: Through this project, the Hidden Valley Homeowners Association acquired the necessary equipment to record streamflow measurements and wrote a report which analyzes and presents data in a format that was submitted to the Arizona Department of Water Resources in support of an application for non-consumptive, instream flow water right for a reach of Sabino Creek. The project area is a privately owned natural riparian park owned by the Hidden Valley Homeowner's Association in Tucson.

95-0024WPF: Potrero Creek Wetland Characterization and Management Plan

Map #: 80

Grantee: EnviroNet, Inc.

County: Santa Cruz

AWPF Funding: \$75,300.00

Completion Date: April 1997

Project Description: This wetland/riparian area is located adjacent to Nogales. The purpose of this one-year project was to determine the source of water that sustains the wetland/riparian area, and to determine factors critical to its continuation as a wetland area. The Grantee also evaluated the area's potential for habitat improvement or habitat replication. The project included both a biologic and hydrogeologic evaluation of the site as well as development of a wetland management plan.

AWARDED DURING FY '97

96-0001WPF: San Pedro Riparian National Conservation Area Watershed Protection and Improvement Project

Map #: 140
Grantee: Bureau of Land Management County: Cochise
AWPF Funding: \$89,250.00 Completion Date: September 1998

Project Description: The project's purpose was to improve, enhance and protect the riparian habitats and water quality in the San Pedro National Riparian Conservation Area. Part of the funds were spent on installation of 12 miles of fencing to eliminate livestock trespass on 36 miles of the San Pedro River. This project will enhance the riparian ecosystem and associated wildlife habitats without undue impacts to upland grazing allotments.

96-0002WPF: Completion Phase: Hi-Point Well Project

Map #: 130
Grantee: Navajo County Natural County: Coconino
Resource Conservation District
AWPF Funding: \$77,844.00 Completion Date: December 1999

Project Description: This project developed 24 water troughs and 3.5 miles of fencing to more evenly distribute grazing by livestock and ungulates. The objective was to improve vegetative cover, thereby reducing erosion and sediment deposition in both Chevelon Creek and Clear Creek, perennial tributaries to the Little Colorado River.

96-0003WPF: Hoxworth Springs Riparian Restoration Project

Map #: 96
Grantee: Northern Arizona University County: Coconino
AWPF Funding: \$31,545.00 Completion Date: June 1999

Project Description: Researchers at NAU worked with the Coronado National Forest to restore the historic stream channel to a portion of a perennial stream that flows from Hoxworth Springs. The stream has experienced downcutting and a significant loss of riparian vegetation due to channelization and intense grazing from livestock and elk. Channel stabilization was accomplished using earth moving equipment and revegetation. Elk exclosures were constructed to reduce grazing pressure during restoration efforts.

96-0004WPF: Hydrologic Investigation and Conservation Planning, Pipe Springs, AZ

Map #: 83
Grantee: National Park Service, County: Mohave
Pipe Springs National Monument
AWPF Funding: \$50,000.00 Completion Date: November 1998

Project Description: This project included a detailed chemical analysis of water from Pipe Springs and from springs and wells in the surrounding area. The objective was to determine the

cause(s) of decreased spring flow. A conceptual model was developed of the groundwater flow system feeding the springs. The project provided a better understanding of the groundwater hydrology of the aquifer associated with the springs and wells in the immediate vicinity, providing information for wise water use planning for all area users.

96-0005WPF: Tres-Rios River Management and Constructed Wetlands Project

Map #: 101
Grantee: City of Phoenix
County: Maricopa
AWPF Funding: \$1,000,000.00
Completion Date: May 2000

Project Description: This grant funded part of the costs associated with preparing an environmental impact statement for the Tres-Rios wetlands. The Tres-Rios project will provide a continuous and constant source of water in the Salt River that will maintain riparian vegetative communities and associated wildlife habitat.



Figure 7. Spring at Pipe Springs National Monument. 96-0004

96-0006WPF: Hydrogeologic Investigation of Groundwater Movement and Sources of Base Flow to Sonoita Creek and Implementation of Long-Term Monitoring Program

Map #: 120
Grantee: The Nature Conservancy
AWPF Funding: \$155,715.00
County: Santa Cruz
Completion Date: October 1999

Project Description: This project obtained hydrogeologic data from new groundwater monitoring wells and determined sources of groundwater discharge that sustain base flow in the perennial reach of Sonoita Creek upstream from Lake Patagonia in Santa Cruz County.

96-0007WPF: Ash Creek Riparian Protection Project

Map #: 99
Grantee: Mingus Springs Camp; Henry Dahlberg Foundation
AWPF Funding: \$19,248.00
County: Yavapai
Completion Date: October 1999

Project Description: The Ash Creek project was a joint effort between the Mingus Springs Camp and the U.S. Forest Service to restore the riparian habitat fed by several springs. The project was to improve turkey habitat and extend the riparian area by increasing water retention through the construction of gabions and log dams.

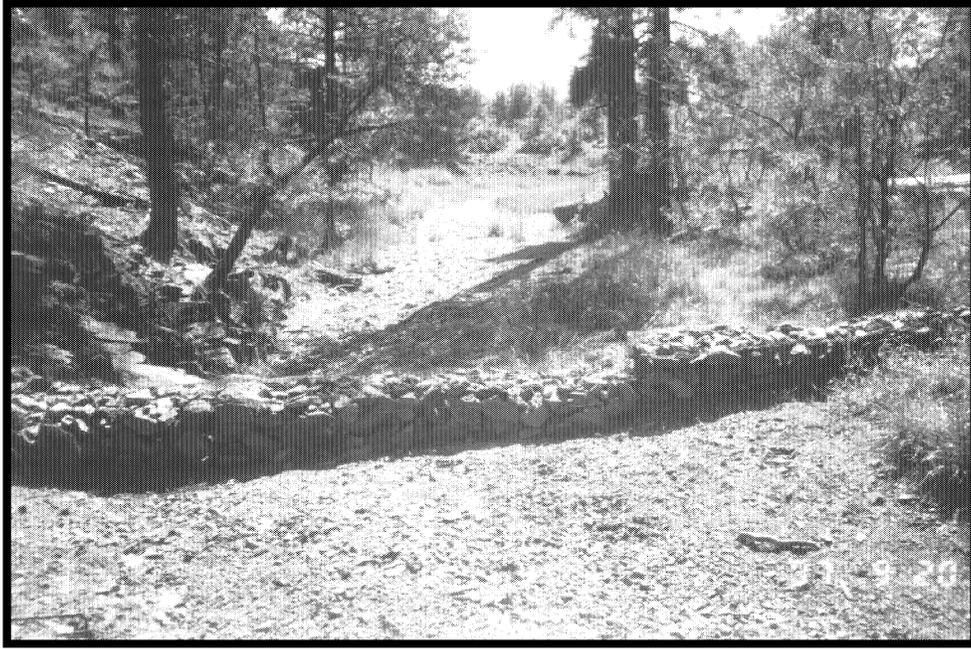


Figure 8. Erosion Control Structure at Mingus Springs Camp. 96-0007WPF

96-0008WPF: Watson Woods Vegetation Inventory

Map #: 118

Grantee: Prescott Creeks Preservation Association County: Yavapai

AWPF Funding: \$16,115.00 Completion Date: April 1998

Description: The Watson Woods Vegetation Inventory characterized the vegetative communities within the Watson Woods Riparian Preserve in order to describe baseline conditions at the site. This information will be used to guide management and restoration efforts at the preserve.

96-0009WPF: Watson Woods Riparian Preserve Visitor Management

Map #: 119

Grantee: Prescott Creeks Preservation Assoc. County: Yavapai

AWPF Funding: \$8,556.79 Completion Date: August 1997

Project Description: The Watson Woods Riparian Preserve has an on-going need to manage visitor activities including control of access, maintenance of infrastructure, public outreach and educational information. This grant allowed preserve managers to develop a plan that will facilitate a better quality visitor experience and will protect the park itself from degradation due to inappropriate use.

96-0010WPF: Rehabilitating Puertocito Wash on Buenos Aires National Refuge

Map #: 90

Grantee: Arizona Conservation Voters Habitat Fund County: Pima

AWPF Funding: \$83,432.00 Completion Date: November 1999

Project Description: This project rehabilitated Puertocito Wash, an eroded ephemeral stream, through the construction of two gabions along the stream course and the re-establishment of native grasses. A resource-monitoring program was designed and implemented and a watershed demonstration area was established for local ranchers and other members of the public.

96-0011WPF: Lower Colorado River - Imperial Division Restoration

Map #: 109
Grantee: Bureau of Reclamation County: Yuma
AWPF Funding: \$435,928.00 Completion Date: September 2002

Project Description: This project restored streamflow to small backwater channels and approximately 50 acres of dried-out wetlands along the lower Colorado River. The Grantee's goal was to create higher quality riparian and aquatic habitat along this reach of the river.

96-0012WPF: Eagle Creek Watershed and Riparian Stabilization

Map #: 100
Grantee: James F. Holder County: Greenlee
AWPF Funding: \$80,626.00 Completion Date: June 2001

Project Description: This project improved the watershed, upland range and riparian community of Eagle Creek through the installation of fencing, grazing management, and the expansion of an existing pipeline to distribute water sources throughout the upland area.

96-0013WPF: Happy Valley Riparian Area Restoration Project

Map #: 124
Grantee: Coronado National Forest County: Pima
AWPF Funding: \$64,697.00 Completion Date: August 1999

Project Description: The Paige Creek riparian area is a unique, large riparian gallery located on the east side of the Rincon Mountains. The Grantee fenced the riparian area, created upland water sources for ungulates, constructed an instream structure to reduce water velocity and constructed a pipe barrier fence to restrict vehicle access to sensitive areas.

96-0014WPF: Klondyke Tailings Response Strategy Analysis

Map #: 113
Grantee: Arizona Department of Environmental Quality County: Graham
AWPF Funding: \$77,614.00 Completion Date: April 1998

Project Description: In this project, a team of scientists led by Arizona Department of Environmental Quality collected data to determine the extent of impact on Aravaipa Creek from runoff or leaching of contaminated mine tailings at the Klondyke tailings pile. The team developed a response strategy to determine the best methods of treating the tailings pile to reduce or prevent groundwater and stream contamination by leaching, runoff or erosion of the tailings into the stream.

96-0015WPF: Abandonment of an Artesian Geothermal Well

Map #: 127

Grantee: Smithville Canal Company

County: Graham

AWPF Funding: \$113,360.00

Completion Date: December 1999

Project Description: The Grantee capped a deep, artesian geothermal well, near the Gila River, north of Thatcher Arizona. Discharge from the well was highly saline and was degrading soils and plants in the vicinity and possibly degrading downstream water quality in the Gila River. The Grantee will continue monitoring the site to evaluate changes due to well abandonment.

96-0016WPF: The 'Ahakhav Tribal Preserve

Map #: 92

Grantee: Colorado River
Indian Tribes

County: La Paz

AWPF Funding: \$931,477.00

Completion Date: October 2000

Project Description: The Colorado River Indian Tribes re-established riparian and wetland habitat in a 110 acre area of the 'Ahakhav Tribal Preserve. The Grantee re-established fish and wildlife riparian and wetland habitat by dredging some historic backwater river channels, revegetating native riparian vegetation and establishing a monitoring program to ensure successful restoration of the riparian habitat along the Colorado River.



**Figure 9. Revegetation site at the 'Ahakav Tribal Preserve.
96-0016WPF**

96-0017WPF: Big Sandy River Riparian Project

Map #: 93

Grantee: Bureau of Land Management

County: Mohave

AWPF Funding: \$92,000.00

Completion Date: April 2000

Project Description: This project restored an approximately 8 mile perennial reach along the Big Sandy River south of the Kingman Resource Area near Alamo Lake. Under this grant, pasture fencing was constructed to help manage livestock. Additionally upland livestock water sources were developed to facilitate the management of livestock grazing outside of the riparian area.

96-0018WPF: San Carlos Spring Project

Map #: 122

Grantee: San Carlos Apache Tribe

AWPF Funding: \$131,540.00

County: Graham

Completion Date: Withdrawn by Grantee

Project Description: Prior to cancellation, the Grantee fenced 8 springs on the San Carlos Apache Reservation to protect the springs from grazing and trampling by livestock. Pipelines and water troughs were installed to provide water to the livestock away from the spring sites.

96-0019WPF: Response of Bebb Willow to Riparian Restoration

Map #: 94

Grantee: Northern Arizona University

County: Coconino

AWPF Funding: \$34,924.00

Completion Date: June 2000

Project Description: This project restored water flow through a decadent Bebb willow ecosystem, and then quantified and compared the response of the plant community to the water flow. The project improved the understanding of the structure, function, and dynamics of a watershed and its associated terrestrial and riparian ecosystems.



Figure 10. Flume installed to measure stream flow at Hart Prairie. 96-0019WPF.

96-0020WPF: Cienega Creek Stream Restoration

Map #: 135

Grantee: Bureau of Land Management

County: Pima

AWPF Funding: \$210,700.00

Completion Date: October 1999

Project Description: This project removed an agricultural diversion canal that was no longer used, and re-establish flow through the Cienega Creek channel. Volunteers from Sonoita and Tucson collected and maintained plant material salvaged from the project site and revegetated areas disturbed during project activities.

96-0021WPF: Riparian Vegetation and Stream Channel Changes Associated with Water Management along the Bill Williams River

Map #: 151

Grantee: Arizona State University

AWPF Funding: \$14,788.00

County: Mohave

Completion Date: October 1998

Project Description: The project produced quantitative data on the relationship between streamflow and historic changes in the riparian community and channel morphology along Bill Williams River below Alamo Dam. This information will be used in an ongoing effort to define reservoir operation regimes that will ensure protection of the riparian habitat downstream of Alamo Dam.

96-0022WPF: Saffel Canyon and Murray Basin Watershed Restoration Project

Map #: 103

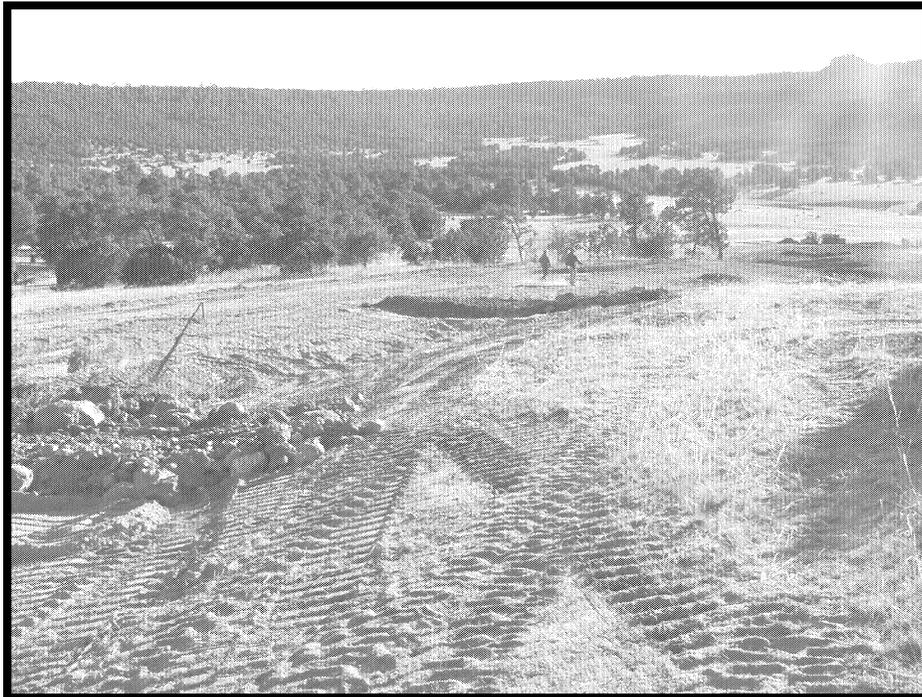
Grantee: Apache Sitgreaves
National Forest

County: Apache

AWPF Funding: \$27,143.62

Completion Date: January 2000

Project Description: The objectives of this project were to restore watershed health and improve water quality in Murray Basin and Saffel Canyon. The Grantee determined the best methods to reduce and reverse soil erosion in the watershed and these methods are being used in the implementation phase of AWPF Grant #00-101WPF. The Murray Basin and Saffel Canyon watersheds have been severely damaged by past management practices.



**Figure 11. Saffel Canyon and Murray Basin Project during construction.
96-022WPF**

96-0023WPF: Watershed Restoration at the Yuma Conservation Gardens

Map #: 115

Grantee: Yuma Conservation Garden

County: Yuma

AWPF Funding: \$31,050.00

Completion Date: March 1999

Project Description: This project renovated a five-acre model watershed that is used as an outdoor classroom at the Yuma Conservation Garden (YCG). The YCG is a 28-acre natural area established in the 1950's for education and recreational purposes. The project area was established in 1962, and is used to teach the public about watershed issues in the Yuma area.

**96-0025WPF: Tsaille Creek
Watershed Restoration
Demonstration**

Map #: 108
Grantee: The Navajo Nation
County: Apache
AWPF Funding: \$152,775.00
Completion Date: November 2000

Project Description: This project developed six watershed restoration projects and demonstrated riparian restoration concepts to local residents, tribal employees and resource conservation professionals. The projects focus on biological restoration approaches. The Grantee will use these projects to build community support for broader watershed restoration efforts.



Figure 12. Site of potential road failure due to bank erosion, Canyon del Muerto. 96-0025WPF

**96-0026WPF: Riparian Restoration
on the San Xavier Indian Reservation
Community**

Map #: 133
Grantee: San Xavier Indian Reservation
County: Pima
AWPF Funding: \$591,319.00
Completion Date: January 2004

Project Description: The San Xavier District of the Tohono O'odham Tribe evaluated various options for riparian restoration on their lands. The entire community had an opportunity to be involved in the planning and decision process. Sites for riparian restoration were chosen based on physical/biological conditions and community preference. A restoration plan was developed and implemented.

AWARDED DURING FY '98

97-027WPF Lyle Canyon Allotment Area Restoration Project

Map #: 153
Grantee: Byrd Lyndsey
County: Cochise, Santa Cruz
AWPF Funding: \$60,359.57
Completion Date: October 2001

Project Description: The Lyle Canyon project restored and protected the riparian areas on the Lyle Canyon Allotment through the installation of a variety of range improvements, including fences and upland water developments to better distribute cattle grazing in the upland portions of the allotment, and away from the riparian areas. The Grantee and the University of Arizona

Cooperative Extension Office developed a monitoring plan to record the condition of riparian and upland habitats on the Lyle Canyon Allotment. The monitoring plan includes a quantitative assessment of the riparian and upland vegetation, a “Proper Functioning Condition” assessment of the riparian areas, and photo point monitoring. If livestock grazing management changes are warranted by the monitoring data, the Grantee will coordinate with the U.S. Forest Service to incorporate those changes into the Allotment Management Plan.

97-028WPF: Creation of a “Reference” Riparian Area in the Gila Valley

Map #: 155
Grantee: Mt. Graham International Science & Culture Foundation
County: Graham
AWPF Funding: \$182,000.00
Completion Date: June 2000



**Figure 13. An ephemeral pond created in Discovery Park with the help of impoundment structures designed to catch storm runoff.
 97-028 WPF**

Project Description: This project created a riparian system at Discovery Park along a tributary to the environmentally significant Gila River. The creation of this area in the Gila Valley provides on-site riparian benefits to wildlife and the watershed. The project had a significant outreach and educational component that explained the benefits of establishing riparian areas. The Grantee also provided information on the techniques used to land management agencies and to the public.

97-029WPF: Demonstration Enhancement of Pueblo Colorado Wash at Hubbell Trading Post

Map #: 159
Grantee: National Park Service, Hubbell Trading Post National Historic Site
County: Apache
AWPF Funding: \$91,110.00
Completion Date: May 2001

Project Description: The National Park Service re-established, enhanced and conserved one-half mile of the Pueblo Colorado Wash within the boundaries of the Hubbell Trading Post Historic Site. The stream channel was restored using low-tech instream structures that restored meanders and pools. Invasive plant species were removed from the riparian area. The stream channel and riparian areas were revegetated with appropriate native species such as willows and cottonwoods. Restoration efforts and water quantity were evaluated to determine changes that resulted from project activities.

97-030WPF: Walnut Creek Center for Education and Research - Biological Inventory

Map #: 160
Grantee: Yavapai College
County: Yavapai
AWPF Funding: \$50,580.00
Completion Date: May 2001

Project Description: The Walnut Center for Education and Research is located approximately 35 miles northwest of Prescott in the Williamson Valley. The site is being leased from the Prescott National Forest under a special use permit. The Walnut Creek Center for Education and Research is a partnership comprised of staff from NAU, Prescott College, Sharlot Hall Museum and Yavapai College. The purpose of the project was to conduct a two-year inventory of the 280-acre site.

Specifically, inventories of vegetation, birds, mammals and reptiles were conducted and physical components of stream geomorphology, topography and soils were evaluated. Upon completion, these data were used to establish a baseline condition for the site's physical and biological resources as a precursor to the development of a long-term management and operational plan for the Center site.



Figure 14. Low-tech in-stream structures installed to restore meanders and pools along a portion of the Pueblo Colorado Wash at Hubbell Trading Post National Historic Site. 97-029WPF

97-031WPF: Lincoln Park Riparian Habitat Project (fka: Atturbury Wash Project)

Map #: 161
Grantee: City of Tucson Water Dept. County: Pima
AWPF Funding: \$154,580.00 Completion Date: April 2004

Project Description: The City of Tucson's Lincoln Park Riparian Habitat Project established a sustainable riparian habitat, approximately five acres in size along a one-half mile long tributary of the Atturbury Wash within Lincoln Regional Park. The water source for the project is secondary effluent produced at the City's Roger Road Reclaimed Wastewater Treatment Plant. The purpose of the project is to enhance and maintain an existing riparian habitat with periodic releases of reclaimed water.

97-032WPF: 'Ahakhav Tribal Preserve - Deer Island Revegetation

Map #: 162
Grantee: Colorado River Indian Tribes County: La Paz
AWPF Funding: \$228,800.00 Completion Date: February 2000

Project Description: The 'Ahakhav Tribal Preserve on the Colorado River Indian Reservation is approximately 1042 acres in size. The construction of dams and channelization of the Colorado River, as well as the introduction of the exotic and invasive saltcedar, has left the Preserve nearly devoid of cottonwoods and willows. Because saltcedar does not provide adequate cover, food and thermal protection, this habitat type supports a significantly lower diversity of insects, birds and other wildlife. The Grantee removed low-quality exotic plants near the Deer Island backwater, and revegetated the site with native plants including cottonwood, willow, mesquite, wolfberry and four-wing saltbush.

97-033WPF: Proctor Vegetation Modification

Map #: 163

Grantee: Coronado National Forest

County: Pima

AWPF Funding: \$11,487.00

Completion Date: March 2001

Project Description: This project site was about 200 acres of upland area along Madera Canyon within Pima County. The project reduced the upland mesquite component of the existing overstory with minimal harm to other tree species and restored the herbaceous understory to a condition dominated by native perennial grass species. There was little perennial grass understory at this site due to shading from the excessive mesquite overstory. Perennial grasses are important to soil stability by reducing soil erosion and the resulting turbidity in streams, allowing beneficial water retention, litter development and organic matter levels within the soils, and improving rainfall percolation into the ground.

97-034WPF: Oak Tree Gully Stabilization

Map #: 164

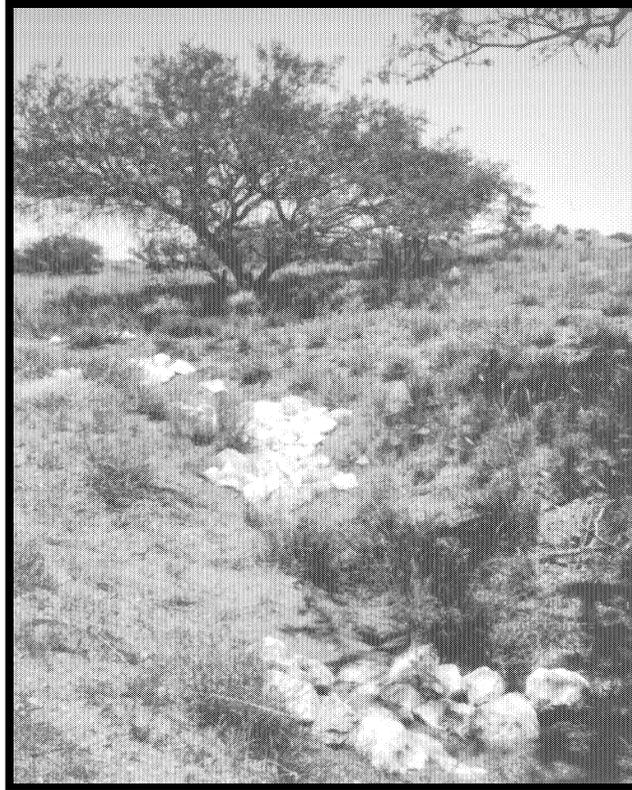
Grantee: Coronado National Forest

County: Pima

AWPF Funding: \$42,491.00

Completion Date: April 2001

Project Description: The advancement of headcuts in the Oak Tree Canyon and Empire Gulch impacted Cienega Creek through erosional activities. Cienega Creek has been designated as a Unique Water, under the Clean Water Act and it was believed that headcutting in the tributaries was leading to increased turbidity in the Creek. The headcuts appeared to be deteriorating primarily as a result of the presence of the Forest Service road and unauthorized vehicular use throughout the area. The project involved the treatment of 30 headcuts in the Oak Tree Canyon and Empire Gulch areas through reshaping of the gullies and mechanisms designed to decrease flow velocity and energy to reduce head- and side-cutting. Monitoring of the headcuts and erosional activity was performed throughout the project duration and will continue long-term using photo points, and examining structural integrity and channel morphology.



**Figure 15. Headcut treatments in Oak Tree Canyon designed to decrease flow velocity and energy.
97-034WPF**

97-035WPF: Watershed Improvement to Restore Riparian and Aquatic Habitat on the Muleshoe Ranch CMA

Map #: 165
Grantee: The Nature Conservancy County: Cochise
AWPF Funding: \$128,315.00 Completion Date: June 2001

Project Description: This project restored riparian and aquatic habitat in four perennial streams on the Muleshoe Ranch Cooperative Management Area (CMA) by enhancing watershed vegetation and function. This was accomplished by using fire as a natural process in the watershed through prescribed burns. The Grantee proposed to continue grazing rest until vegetation recovery occurred. A comprehensive monitoring program will be maintained for at least ten years, including monitoring of short-term effects of prescribed burns. Fencing was constructed along 1.5 miles within the project area.

97-036WPF: Stable Isotopes As Tracers of Water Quality Constituents in the Upper Gila River

Map #: 166
Grantee: Arizona Geological Survey County: Cochise, Graham, Greenlee
AWPF Funding: \$27,338.00 Completion Date: July 1999

Project Description: Water quality issues are becoming increasingly important in the upper Gila River drainage area. Decades of water quality measurements have documented the concentrations of total dissolved solids (TDS) in the Gila River and groundwater, but the precise sources (natural and human) of the TDS were not known. This project identified the sources and conveyance points of dissolved solids entering the upper Gila River through the use of naturally occurring stable isotopes. The study area encompassed approximately 200 square miles in southeastern Arizona. Based on the results of the study, the Grantee developed recommendations for mitigation and further studies in the region.

97-037WPF: Talastima (Blue Canyon) Watershed Restoration Project

Map #: 168

Grantee: The Hope Tribe

County: Coconino, Navajo

AWPF Funding: \$310,192.00

Completion Date: May 2002

Project Description: The purpose of this project was to restore the Talastima watershed, including almost 8,000 acres containing 19 miles of streams and wetlands on Hopi lands. Restoration measures included a tamarisk and Russian olive removal demonstration project, completion of livestock exclosures with fencing, installation of a monitoring well and seven drive-point wells, and a study of road impacts on riparian health. Monitoring was conducted using on-ground data collection combined with remote sensing techniques.

97-038WPF: Tres Rios Wetland Heavy Metal Bioavailability Design for Denitrification and Microbial Water Quality

Map #: 171

Grantee: City of Phoenix

County: Maricopa

AWPF Funding: \$117,028.00

Completion Date: July 2002

Project Description: This project investigated three issues identified during operation of the Tres Rios Wetland Demonstration Project: 1) Are heavy metals in the wetlands bioavailable and are there operational strategies that would mitigate or exacerbate this phenomena? 2) What is the contribution of autotrophic bacteria to the overall denitrification efficiency of the wetland and can this information be used to better estimate wetland surface area requirements? and 3) Are bacteria/pathogen concentrations due to wildlife inputs or re-growth, and what is the survivability of pathogens in a constructed wetland? Sampling and analysis of water, sediment, vegetation and fish tissue were conducted to achieve the project objectives, and the findings of this study are presented in the final report.

97-040WPF: Bingham Cienega Riparian Restoration Project

Map #: 175

Grantee: Pima County Flood
Control District

County: Pima

AWPF Funding: \$84,679.00

Completion Date: September 2001

Project Description: The objective of the project was to restore native riparian vegetation to 50 acres of abandoned agricultural fields at Bingham Cienega along the San Pedro River. Planting areas were delineated based on site hydrology factors such as groundwater gradients. Plant species were selected based on published relationships between riparian plant distribution and

depth-to-groundwater. Three planting areas were delineated and planted to restore different riparian community types.

97-041WPF: Altar Valley Watershed Resource Assessment

Map #: 178
Grantee: Altar Valley Conservation Alliance County: Pima, Santa Cruz
AWPF Funding: \$88,730.00 Completion Date: December 2000

Project Description: The Pima Natural Resource Conservation District, in association with the Altar Valley Conservation Alliance, conducted an assessment of the Altar Valley natural resources and identified problems and areas for improvement. The Grantee researched historic conditions, described existing conditions, conducted detailed vegetation mapping, and produced community outreach materials. The end product was an action plan for the restoration of the watershed which identifies and prioritizes problem areas needing attention, describes feasible remedies, and identifies the potential financial means to implement the appropriate land treatments, ranch conservation improvements and resource management changes.

97-042WPF: Queen Creek Restoration & Management Plan

Map #: 180
Grantee: Town of Superior County: Pinal
AWPF Funding: \$207,595.00 Completion Date: November 1999

Project Description: The Queen Creek Restoration and Management Plan was developed for the Queen Creek corridor that extends from the headwaters on Tonto National Forest, through the Town of Superior to the Boyce Thompson Southwestern Arboretum. The plan addresses restoration of stream flow and riparian vegetation, and technical studies were conducted to determine riparian vegetation water needs and channel flood conveyance capacity. A Committee of Stakeholders, including affected landowners and other interested entities was established and two public workshops were conducted.

97-044WPF: San Pedro River Preserve Riparian Habitat Restoration Project

Map #: 185
Grantee: The Nature Conservancy County: Pinal
AWPF Funding: \$336,127.00 Completion Date: July 2002

Project Description: The intent of this project was to enhance and protect existing riparian forest along three miles of the San Pedro River. The Grantee restored native grassland communities on the near river slopes and terraces, implemented measures as needed to stabilize riverbanks, and re-established native riparian vegetation in areas of defunct aquaculture ponds and agricultural fields on a site encompassing 860 acres. The Grantee also developed and demonstrated new techniques for restoring abandoned agricultural fields to riparian habitat.

97-045WPF: Santa Cruz Headwaters Project

Map #: 188
Grantee: The Nature Conservancy County: Santa Cruz
AWPF Funding: \$100,445.00 Completion Date: March 2002

Project Description: The purpose of this project was to restore and maintain seven miles of riparian and wetland corridor of the Santa Cruz River headwaters. A grazing management plan was developed and the Grantee constructed fences and water developments to control and manage livestock grazing in the riparian corridor.

AWARDED DURING FY '99

98-046WPF: EC Bar Ranch Water Well Project

Map #: 189
Grantee: James W. Crosswhite County: Apache
AWPF Funding: \$20,300.00 Completion Date: March 2002

Project Description: This project developed an alternative water source for livestock and wildlife in order to eliminate the need for the animals to utilize a water gap in a fenced section of Nutrioso Creek, a degraded perennial stream. This objective was met through the drilling of two water wells, installation of solar pumps, and distribution of water to storage tanks and drinkers.

98-047WPF: Upper Verde Adaptive Management Unit

Map #: 190
Grantee: Almida Land and Cattle Company
County: Yavapai
AWPF Funding: \$115,300.00
Completion Date: March 2002

Project Description: To maintain continued health of the riparian habitat along the Verde River, the Almida Land & Cattle Co. developed a livestock grazing system that exclude cattle from the river. The project fenced the riparian corridor along the river and provided water replacement facilities in the uplands. To achieve this, the Grantee built six miles of fencing, constructed seven miles of underground pipeline, installed twelve drinkers, and two 20,000-gallon storage tanks.



Figure 16. Two 20,000-gallon storage tanks to provide water replacement facilities upland. 98-047WPF

98-049WPF: Empire/Cienega/Empirita Fencing Project

Map #: 193
Grantee: Empire Ranch County: Pima
AWPF Funding: \$54,850.00 Completion Date: December 2003

Project Description: The purpose of this project was to develop several ranch improvements in addition to improved livestock management, which will benefit the health of the Cienega Creek ecosystem. These improvements included extending an existing fence, separating sacaton benches, creating a livestock enclosure for monitoring, and creating an alternate wildlife/livestock water source by fitting an existing well.

98-050WPF: Watershed Restoration of a High-Elevation Riparian Community

Map #: 197

Grantee: Northern Arizona University County: Coconino

AWPF Funding: \$304,775.00 Completion Date: February 2004

Project Description: The intent of this project was to modify upland watershed conditions to increase and sustain water flows into the riparian community at Hart Prairie in Northern Arizona. Previous AWPF-funded riparian restoration work at this site improved moisture conditions by successfully increasing surface discharge and groundwater storage, however monitoring results indicate incomplete recovery due to a need to address upland watershed conditions. The Grantee conducted the following to increase and sustain water flows: reduced the density of pines encroaching the wet meadow by tree thinning and prescribed burns, constructed fencing to manage grazing of large ungulates, reduced/ eliminated stock tanks, restored stream channels in the upland watershed, and continued and expanded watershed, vegetation, stream flow and fluvial geomorphology monitoring.

98-051WPF: Evaluation of Carex Species for Use in Riparian Restoration

Map #: 198

Grantee: Northern Arizona University County: Coconino

AWPF Funding: \$47,907.00 Completion Date: July 2001

Project Description: This research project developed transplant guidelines for the use of sedges in riparian restoration projects. The Grantee 1) evaluated the performance of transplanted plugs of various sizes and species of sedges, under three different grazing regimes, 2) quantified the herbaceous species composition and arrangement of grazed and ungrazed plant communities at two study sites, and 3) evaluated the effects of water stress and grazing on transplanted plugs of sedges under greenhouse conditions. Two montane riparian study sites were evaluated, Hoxworth Springs and Buck Springs. Each site contains healthy, functional, and degraded channel reaches. Hoxworth Springs is the site of an ongoing AWPF grant to study the performance of channel restoration work and to assess the impacts of various grazing regimes. The Buck Springs site is also in the Coconino National Forest and was monitored from 1992 until 1996 by the Rocky Mountain Research Station.

98-052WPF: Tritium as a Tracer of Groundwater Sources and Movement in the Upper Gila Drainage

Map #: 200

Grantee: Arizona Geological Survey County: Graham, Greenlee

AWPF Funding: \$41,028.00 Completion Date: October 2000

Project Description: The purpose of this project was to evaluate whether or not a radioactive isotope, tritium, can be used to distinguish between the various sources of groundwater

influencing the composition (and salinity) of the Gila River. Tritium can be used to determine the age of groundwater. This study assessed the utility of using tritium to determine the degree of mixing between deep groundwater in contact with highly soluble salts in the basin-fill sediments, and shallow groundwater – a mixture of subflow from tributaries, infiltration of Gila River water and possible infiltration of irrigation water.

98-054 WPF: Fluvial Geomorphology Study and Demonstration Projects to Enhance and Restore Riparian Habitat on the Gila River from the New Mexico Border to the San Carlos Nation

Map #: 203
Grantee: Graham County County: Graham, Greenlee
AWPF Funding: \$449,872.00 Completion Date: October 2004

Project Description: The purpose of this project was to conduct a fluvial geomorphology study of 100 miles of the Gila River from the New Mexico border to the San Carlos Nation border. This study is to form the basis for the development of demonstration projects, which will be implemented at optimum sites along the river to restore riparian vegetation, reduce flood velocity, and create a stable channel.

98-055 WPF: Horseshoe Allotment: Verde Riparian Project II

Map #: 206
Grantee: George and Sharon Yard County: Yavapai
AWPF Funding: \$82,561.99 Completion Date: December 2001

Project Description: The Grantees currently have a cattle operation on deeded and U.S. Forest Service lands along the Verde River. The goal of the project was to benefit 3.75 miles of the Verde River by creating an off-river pasture through development of a currently dry pasture. This goal was achieved through the construction of pasture division fencing, river fencing, and construction of a distribution system consisting of cattle drinkers, small wildlife drinkers, and storage tanks.

98-057 WPF: Upper Verde Valley Riparian Area Historical Analysis

Map #: 208
Grantee: Northern Arizona University County: Yavapai
AWPF Funding: \$44,019.00 Completion Date: April 2001

Project Description: The goal of this research project was to compare the historical riparian system of a seven-mile reach along the Verde River with the current system to determine what changes have occurred in riparian vegetation. The Grantee assessed the relationships between vegetation changes and climatic factors, human land use activities, and varying groundwater levels to determine which vegetation changes were caused by human activities in the watershed. Based on the results of this study, Northern Arizona University will make recommendations for preservation, restoration, and enhancement of riparian habitat.

98-058WPF: Effects of Removal of Livestock Grazing on Riparian Vegetation and Channel Conditions of Selected Reaches on the Upper Verde River

Map #: 209
Grantee: Rocky Mountain Research Station County: Yavapai/Coconino
AWPF Funding: \$116,500.00 Completion Date: Terminated

Project Description: The Grantee was to conduct a 3 year study to determine changes in riparian vegetation, channel characteristics, and selected water quality attributes resulting from the removal of livestock grazing on allotments in the headwaters of the Verde River. The objectives of the study were to: (1) determine the changes in vegetation resulting from removal of livestock grazing on riparian habitats, (2) determine changes in channel geomorphology, macro-invertebrates and substrates, (3) establish a long-term database, and (4) compare resultant changes in vegetation/channel attributes to available historic databases. Cattle have been removed from these allotments either voluntarily, or under mandate by the Prescott National Forest.

98-059WPF: Verde River Headwaters Riparian Restoration Demonstration Project

Map #: 212
Grantee: Northern Arizona University
County: Coconino
AWPF Funding: \$204,629.00
Completion Date: February 2003

Project Description: The purpose of this project was to restore the channel and riparian vegetation along 2600 ft. of a channelized portion of a perennial stream that flows in the Clover Springs valley. The restored area is located in the Coconino National Forest about 5.5 miles south of Clint's Well on Hwy. 87.



Figure 17. The informational kiosk and reconstructed channel (background) at the Clover Springs project site. 98-059WPF

Specific project objectives were: (1) development and implementation of a channel stabilization and wetland protection plan for the Clover Springs reach. This included removal of existing channel structures, reshaping and redirecting the channel and use of low impact structures to encourage natural channel stability; (2) determine the causative factors and timing of aggradation and incision in the reach of concern through investigation of past floodplain activity, radiocarbon dating and description of sediments, tree ring dating and historic photos; and (3) develop an information kiosk or signage at the site to explain the role of meadow ecosystems, historic disturbances, current conditions, desired conditions, and restoration techniques.

98-061WPF: Watershed Enhancement on the Antelope Allotment

Map #: 214
Grantee: Foremaster Revocable Trust County: Mohave
AWPF Funding: \$137,307.00 Completion Date: November 2002

Project Description: The Antelope Allotment on the Arizona Strip consists of approximately 17,655 acres of which 40 acres is privately owned, 16,325 acres are Bureau of Land Management (BLM) land, and 1,300 acres of Arizona State Land Department land. The Grantees used AWPf monies to install range improvements such as a submersible pump and generator, pipeline, watering troughs for livestock and wildlife, and a water storage tank. These improvements allowed for the implementation of a grazing system consistent with the Natural Resource Conservation Service Conservation Plan and BLM Allotment Management Plan.

98-062WPF: Partnership for Riparian Conservation in NE Pima Co. II (PROPIMA II)

Map #: 215

Grantee: Rincon Institute

County: Pima

AWPF Funding: \$54,734.55

Completion Date: May 2002

Project Description: The Grantee worked with private landowners along Tanque Verde Creek and Rincon Creek on two separate projects. One project involved the restoration of riparian vegetation on 2 acres of former pastureland. Funding was used for a site characterization study, fencing, seed collection and propagation of revegetation materials, irrigation line construction, and site preparation and plantings. The second project implemented long-term riparian conservation planning and public education.



Figure 18. Rincon Institute Staff installing irrigation control valves at the Llewellyn revegetation site. 98-062WPF

98-066WPF: Hay Mountain Watershed Rehabilitation

Map #: 220

Grantee: Ruth Evelyn Cowan

County: Cochise

AWPF Funding: \$116,525.00

Completion Date: August 2002

Project Description: The Grantee worked in conjunction with the Natural Resource Conservation Service, the Arizona State Land Department, the Douglas Whitewater Draw Conservation District, Rocky Mountain Elk Foundation, and the Game and Fish Department to restore and rehabilitate the Hay Mountain Watershed (approximately 1000 acres) on the NI Ranch. The watershed is located northwest of Douglas in the southeastern part of the state. The site suffered from over-grazing, resulting in the reduction of native grasses and subsequent increases in overland flow. The ephemeral streams have increased width-depth ratios, increased sediment transport and some gullying within the larger arroyos. AWPf monies were used to install four miles of pipelines and three 10,000 gallon water storage tanks with drinkers, rip and

seed native grasses, reshape and recontour two erosion sites, and to install a variety of flood control structures. These watershed improvements are designed to reduce flooding and erosion by increasing infiltration of rainfall into the soil.

AWARDED DURING FY '00

99-067WPF: EC Bar Ranch Wildlife Drinker Project

Map #: 223
Grantee: James W. Crosswhite County: Apache
AWPF Funding: \$30,500.00 Completion Date: May 2003

Project Description: The project purpose was to fund four wildlife (elk) drinking water sources along the west and east sides of Nutrioso Creek in order to deter elk from using the creek and impacting the riparian vegetation. The Grantee stated that elk are a threat to the recovery of the Nutrioso Creek ecosystem. Livestock management of the area was improved by the addition of upland water sources and livestock fencing. Livestock will continue to use the riparian area under a management plan formulated in conjunction with the NRCS. Project funding was used to purchase and install conveyance pipe, drinkers, etc. at 4 locations, with water to be provided from an AWPf previously funded well. The project-funded features are on private lands.

99-068WPF: Lower Cienega Creek Restoration Evaluation Project

Map #: 224
Grantee: AZ Dept. of Environmental County: Pima
Quality (ADEQ)
AWPF Funding: \$83,272.00 Completion Date: January 2004

Project Description: The purpose of the lower Cienega Creek Restoration Evaluation Project was to survey Cienega Creek in development of data for identification of those physical indicators that will be used to better manage the streams and rivers of the state. The data will be used by ADEQ to develop Total Maximum Daily Load measures. The project will assist in a better understanding of the erosive processes of dryland streams as erosion and sedimentation are major problems throughout the state.

99-069WPF: Riparian and Watershed Enhancements of the A7 Ranch – Lower San Pedro River

Map # 225
Grantee: City of Tucson County: Pima/Cochise
AWPF Funding: \$521,197.45 Completion Date: April 2005

Project Description: The Grantee implemented numerous range improvements on the 41,000-acre ranch to protect sensitive riparian areas and overgrazed lands. These improvements included new and upgraded fences, wells, water distribution systems, and watering facilities. The A7 Ranch was sold and is now owned and operated by Pima County.

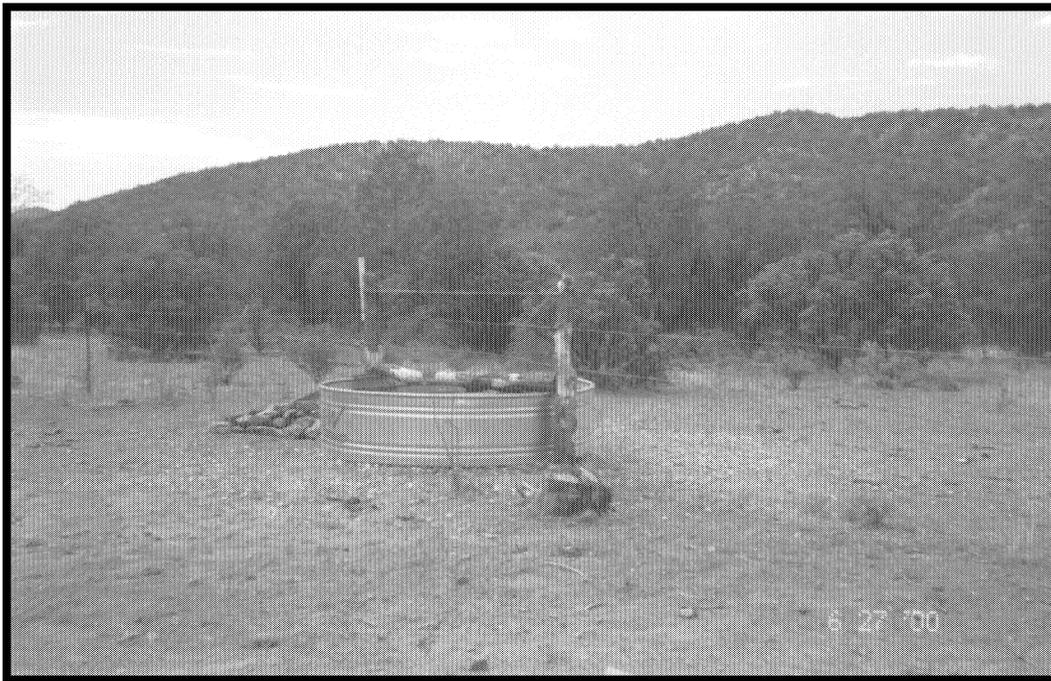
99-070WPF: Lyle Canyon Allotment Riparian Area Restoration Project --- Phase 2

Map #: 227

Grantee: Byrd B. Lindsey County: Cochise/Santa Cruz

AWPF Funding: \$214,211.00 Expected Completion Date: September 2006

Project Description: The Grantee intends to restore and protect the riparian areas and better manage livestock grazing in the Lyle Canyon Allotment and Collins Allotment of the Coronado National Forest by constructing 3 new wells, 28 miles of pipeline, 39 water troughs, 1-3,000 gallon water tank, and 3-12,000 gallon water storage tanks. The Lyle Canyon Allotment has grazing management improvements previously funded by the AWPf.



**Figure 19. Off Channel livestock watering troughs similar to this will be installed to lessen grazing impacts in riparian areas.
99-070WPF**

99-071WPF: Protection of Spring and Seep Resources of the South Rim, Grand Canyon National Park by Measuring Water Quality, Flow, and Associated Biota

Map # 230

Grantee: Grand Canyon National Park, County: Coconino
National Park Service

AWPF Funding: \$238,953.00 Completion Date: August 2004

Project Description: The Grantee conducted a hydrologic and biologic assessment of twelve seeps and springs on the South Rim of the Grand Canyon National Park. The assessments were to ensure that water quality, spring flora, and associated invertebrate fauna was inventoried, monitored, and protected. Management objectives and strategies were developed, and stakeholders were involved through a public outreach effort.

99-072WPF: Leopard Frog Habitat and Population Conservation at Buenos Aires National Wildlife Refuge

Map #: 231
Grantee: University of Arizona County: Pima
AWPF Funding: \$120,485.00 Completion Date: Terminated

Project Description: The Grantee proposed to design and implement a ranch-based model to create and protect native leopard frog populations on the Buenos Aires National Wildlife Refuge (BANWR). This native riparian and wetland dependent amphibian species has been virtually eliminated by drying of habitats and spread of non-native predators such as the bullfrog. BANWR currently has one known population.

99-073WPF: Colorado River Nature Center Backwater – Phase 2

Map #: 232
Grantee: AZ Game and Fish Department County: Mohave
AWPF Funding: \$41,500.00 Completion Date: June 2003

Project Description: The Grantee developed design-engineering plans to begin Phase 2 of a backwater restoration project at the Colorado River Nature Center. These plans delineated the following: all grading/surfacing work, site revegetation potential, backwater cross-sections, and linear and re-circulation pipe specifications. The Grantee also developed sampling, revegetation, and monitoring plans during the project period at no cost to AWPF. The overall project involved a Cooperative Management Agreement (executed in 1987) between the Arizona Game and Fish Department, the U.S. Bureau of Land Management and Bullhead City.

99-074WPF: Proposal to Inventory, Assess, and Recommend Recovery Priorities for Arizona Strip Springs, Seeps, and Natural Ponds

Map #: 233
Grantee: Grand Canyon Wildlands Council County: Coconino/Mohave
AWPF Funding: \$101,856.00 Completion Date: December 2002

Project Description: The Grantee initially reviewed and compiled all existing information on spring and seep locations in the Arizona Strip, which is the portion of Arizona north of the Colorado River and south of the Arizona-Utah border. Then conducted a site visits and evaluated 100 spring, seep or natural pond ecosystems distributed across the Arizona Strip by collecting discharged, water quality, permanence of water, riparian vegetation, and other information. A subset of 10 representative sites were selected for repeat visitation with additional field work and collection of more in-depth data. The springs, seeps, and ponds were classified according to their hydrological & biological resources and conservation value. Draft recommendations were made to the land management agencies for monitoring, protection, and restoration. The cooperating land management agencies are the U.S. Forest Service, U.S. Bureau of Land Management, and National Park Service. Researchers did not visit private or tribal lands unless access was granted.

99-075WPF: Glen and Grand Canyon Riparian Restoration Project

Map #: 234
Grantee: Grand Canyon Wildlands Council
County: Coconino/Mohave
AWPF Funding: \$371,285.00
Completion Date: December 2004

Project Description: The purpose of the project was two-fold: (1) eradicating Tamarisk and restore 10 acres of native cottonwood-willow habitat along the Colorado River at Lee's Ferry as a demonstration project and (2) eradicating Tamarisk from 63 tributaries of the Colorado River in Grand Canyon National Park and monitoring the eradication effects.



Figure 20. The 10-acre project site at Lee's Ferry following saltceder removal. 99-075WPF

99-076WPF: Watson Woods Herpetological Interpretive Guide and Checklist

Map #: 235
Grantee: Prescott Creeks Preservation Assoc.
County: Yavapai
AWPF Funding: \$31,255.55
Completion Date: June 2001

Project Description: The Grantee developed a Herpetological Interpretive Guide and Checklist for the Watson Woods Riparian Reserve that will assist management (by determining baseline diversity, relative abundance, and spatial and temporal distribution of reptile and amphibian species within the Preserve) and provide educational opportunities for visitors.

99-077WPF: Blue Box Crossing

Map #: 236
Grantee: Greenlee County
AWPF Funding: \$150,000.00
County: Greenlee
Completion Date: September 2001

Project Description: The Grantee constructed a hardened (concrete and rip-rap) crossing on the Blue River. The project site lies within a steep canyon of the Blue River, characterized by high intensity flows (a flow of 17,000 CFS was estimated in the 1983 flood). The previous gravel crossing washed out in high flows increasing the sediment downstream. The area is habitat for the loach minnow, a threatened species with the potential to be listed to endangered.

99-078WPF: Aquifer Framework and Ground-Water Flow Paths in Big and Little Chino Basin

Map #: 237

Grantee: U.S. Geological Survey

County: Yavapai

AWPF Funding: \$188,140.00

Completion Date: January 2004

Project Description: The Grantee proposes to address three major gaps in the understanding of hydrology in the Big and Little Chino Basins. In particular, the Grantee is delineating subsurface geology using airborne geophysics, determining the travel time along four major flow paths using isotopes to examine contributions from areas where data is scarce, and finally, determining the contribution of groundwater through a tracer dilution study.



**Figure 21. Public visiting key locations of the Big and Little Chino Basin Study.
99-078WPF**

99-079WPF: Little Colorado River Riparian Restoration Project

Map #: 238

Grantee: The Pueblo of Zuni

County: Apache

AWPF Funding: \$404,587.00

Completion Date: August 2005

Project Description: The Grantee is restoring a working riparian area and wetland ecosystem along the Little Colorado River in Hunt Valley. The project involves testing and reconditioning an existing well and constructing a pipeline to an area that would restore a series of wetlands and numerous acres of riparian habitat. The Grantee is committed to maintaining the project in perpetuity and has obtained matching funding from the U.S. Bureau of Reclamation and U.S. EPA for monitoring efforts on the project.

99-080WPF: Cortaro Mesquite Bosque

Map #: 239
Grantee: Pima County Flood Control District County: Pima
AWPF Funding: \$486,650.00 Completion Date: Terminated

Project Description: The Grantee intended to establish 80 acres of riparian habitat (7 marsh/wetland and 73 mesquite bosques) on the floodplain terraces in the Town of Marana along the Santa Cruz River. The vegetation was to be irrigated by effluent produced by two metropolitan wastewater treatment plants.

99-083WPF: Cherry Creek Enhancement Demonstration Project

Map #: 242
Grantee: Tonto National Forest County: Gila
AWPF Funding: \$263,225.00 Completion Date: February 2006

Project Description: The Grantee is restoring a degraded one-mile perennial reach of Cherry Creek. The Grantee will be conducting a site-specific assessment for the project site, including a topographic survey and evaluation of site characteristics and hydrology. The Grantee will also select a reference reach and evaluate the dimension, pattern, and profile of the reference channel. This reference reach will be used as a guide to design the restoration channel reconfiguration. Native riparian vegetation will be planted once the channel characteristics have been restored.

99-084WPF: Assessments of Riparian Zones in the Little Colorado River Watershed

Map #: 243
Grantee: Little Colorado River Plateau RC&D County: Apache/Coconino/Navajo
AWPF Funding: \$79,443.50 Completion Date: August 2002

Project Description: This project developed a comprehensive riparian zone database that will assist in planning and implementing riparian restoration projects in the Little Colorado River Watershed. An expert panel developed parameters that best defined critical riparian zones as part of this project. The defined parameters were used in conjunction with the database to designate critical riparian areas within the watershed. This project will become the basis for the Little Colorado River Multiple Objective Management Process (LCR MOM) riparian zone restoration program.

99-085WPF: Kirkland Creek Watershed Resource Assessment

Map #: 244
Grantee: Triangle NRCD County: Yavapai
AWPF Funding: \$131,430.00 Completion Date: April 2003

Project Description: This project conducted a thorough resource assessment of the Kirkland Creek Watershed to define baseline conditions and provide direction for future enhancement actions. This project had a strong community outreach component, including newsletters and public meetings to keep local residents informed and promote community input.

Project personnel used the information obtained from the watershed assessment to prepare a long-term action plan, including an implementation schedule for watershed enhancement activities. In addition, project personnel assisted ranchers with updating resource management plans.

99-086WPF: Abandonment of Gila Oil Syndicate Well #1

Map #: 245

Grantee: Gila Valley Natural Resource Conservation District (NRCD) County: Graham

AWPF Funding: \$333,790.00 Completion Date: December 2003

Project Description: The Grantee capped and abandoned the Gila Oil Syndicate Well #1, and monitored the impacts of the abandonment on nearby wells. Well #1 is the saltiest of all known saline wells in the Gila Valley, with Total Dissolved Solids (TDS) in excess of 19,000 mg/l. The abandonment of saline wells in the Gila Valley is one part of an over-all water quality improvement strategy developed by the Gila Valley NRCD. The Grantee will investigate potential funding sources to cap and abandon these other saline wells in the area and determined ranking criteria for future abandonment projects.

99-087WPF: Rillito Creek Habitat Restoration Project

Map #: 246

Grantee: City of Tucson County: Pima

AWPF Funding: \$293,000.00 Completion Date: Withdrawn by Grantee

Project Description: The intent of this project was to restore a mesquite bosque along a portion of the Rillito River, and provide recreational and educational opportunities for schools and the public. The project was to involve a cooperative effort between the City of Tucson and Pima County Floodplain Management to form partnerships with neighborhood groups, schools, and the general public in restoring riparian habitat. City staff was to guide neighborhood and educational groups in the revegetation and maintenance efforts. A single trail was to be developed to allow access, and would join with the adjacent River Park. The project was to use of reclaimed water to irrigate and establish native plants.

99-088WPF: Wickenburg High School Stream Habitat Creation

Map #: 247

Grantee: Wickenburg Unified School District County: Maricopa

AWPF Funding: \$69,100.00 Completion Date: June 2003

Project Description: The Grantee added a recirculating stream to a wastewater treatment wetland to provide additional aeration to the open water portion of the treatment wetland. The Grantee also created a riparian and xeroriparian vegetative community at the 15-acre project site. Mesquite, willow and cottonwood trees were planted as well as a native shrub/scrub mixture. Students, as part of the educational component of this project, conducted basic monitoring.



**Figure 22. Portion of the wetland facility at Wickenburg High School.
99-088WPF**

99-089WPF: Town of Eager/Round Valley Water Users Association Pressure Irrigation Feasibility Study & Preliminary Design

Map #: 248

Grantee: Town of Eager/Round Valley Water Users Association County: Apache

AWPF Funding: \$320,540.00 Completion Date: June 2001

Project Description: The Grantee conducted a feasibility study and developed a preliminary design for making improvements to the Round Valley Water Users Association irrigation system. Substantial improvements to the irrigation system can potentially enhance the quality and quantity of water in the Upper Little Colorado River, and increase upstream storage. Irrigation water is currently delivered through unlined open ditch canals, and extremely high water losses occur through percolation. These losses result in more water being diverted from the Upper Little Colorado River than is actually utilized. This study identified the extent of water loss in the current irrigation ditch and canal system, and provided a preliminary design for the most feasible method to resolve these water losses. Implementation of potential recommendations from this study could enhance riparian habitats along the Upper Little Colorado River and benefit fish and wildlife that depend on these habitats.

99-090WPF: Redrock Riparian Improvement

Map #: 249

Grantee: Coronado National Forest County: Santa Cruz

AWPF Funding: \$62,350.00 Completion Date: Terminated

Project Description: The intent of this project was to improve riparian conditions and expand Gila topminnow habitat while maintaining multiple use in the Redrock Canyon watershed. The Grantee proposed a series of rangeland improvements to accomplish this goal. Existing electrical fence frequently shorts out and requires continual maintenance. There was a need to replace electrical fencing with barbed wire and to expand the existing enclosure to protect a perennial reach of the canyon from grazing pressure. Extension of the enclosure intersected a forest trail and road. The road was to be re-routed to allow continued access by motor vehicles. In addition, there was a need to provide an off-stream livestock water source.

99-091WPF: Effects of Livestock Use on Riparian Trees on the Verde River

Map #: 250

Grantee: Arizona State University

County: Yavapai

AWPF Funding: \$41,417.00

Completion Date: March 2003

Project Description: The Grantee studied how various livestock use levels affect growth, survival and population dynamics of Goodding Willow and Fremont Cottonwood trees along the Verde River. Under the terms of a Biological Opinion for the Skeleton Ridge Allotment, no more than 40 percent of the meristems of these woody species may be used. This standard has been adopted by the Tonto National Forest, for riparian areas with federally listed species. Anecdotal information supports this level of use but little quantitative data exists to support this standard.

99-092WPF: Little Colorado River Enhancement Demonstration Project

Map #: 251

Grantee: Apache Natural Resources
Conservation District (NRCD)

County: Apache

AWPF Funding: \$348,627.94

Expected Completion Date: December 2006

Project Description: This project will develop a site-specific concept plan and constructed a river restoration demonstration project on a reach of the Upper Little Colorado River. The Arizona Game and Fish Department has agreed to allow the restoration project to occur on their property. The project incorporates a natural channel approach that will demonstrate an effective means for restoring a destabilized stream channel. The demonstration project will educate other landowners and natural resource managers about stream and riparian restoration techniques. The Apache NRCD will continue to use the demonstration project as an outdoor classroom to supplement their curriculum on aquatic and riparian systems, biology, and domestic livestock and wildlife interactions.



Figure 23. The Little Colorado River Enhancement Demonstration Project is using natural channel design approaches to restore a segment of the Little Colorado River. 99-092WPF

99-093WPF: Coconino Plateau Regional Water Study

Map #: 252

Grantee: City of Williams

County: Coconino

AWPF Funding: \$134,200.00

Completion Date: June 2002

Project Description: The Grantee contracted with the U.S. Geological Survey to determine the physical boundaries and flow direction for the systems that supply the major springs of the Coconino Plateau in the Greater Grand Canyon region. The project examined the geohydrologic controls and provided the basic data needed to estimate impacts of development on the springs and riparian habitats, through well and spring inventories. The project determined additional data needs and analysis required to evaluate the sustainability of natural flows, and will develop a monitoring plan for future collection of baseline data.

99-094WPF: Santa Cruz River Park Extension

Map #: 253

Grantee: City of Tucson Department
of Transportation

County: Pima

AWPF Funding: \$434,684.00

Completion Date: Withdrawn by Grantee

Project Description: The Grantee intended to create a riparian and upland riparian habitat on a denuded 50-acre lot at the confluence of Irvington Wash and the Santa Cruz River. Seven acres of land near the wash were to be planted with native riparian vegetation; the remaining 40 acres were intended to be mesquite bosque. The Grantee intended to design and build the distribution system to deliver reclaimed water to the site. The Grantee was to design and build a public access trail system with interpretive signs. Hydro-riparian plants were to be planted in the non-bank protected Irvington Wash where gabions and flow-detaining structures would have increased soil moisture levels, potentially allowing vegetation to be self-sustaining.

99-095WPF: Brown Creek Riparian Restoration

Map #: 254

Grantee: Apache-Sitgreaves National Forest - Lakeside Ranger District County: Navajo

AWPF Funding: \$34,037.00 Completion Date: December 2005

Project Description: The Grantee is building one livestock watering facility, conducting a baseline inventory, and monitoring a perennial area of Brown Creek on the Lakeside Ranger District. The project area includes the spring and approximately 1½ miles of the upper reach of Brown Creek, which is one of the few perennial streams on the Lakeside District.

99-096WPF: Upper Santa Cruz Watershed Restoration

Map #: 256

Grantee: Lazy J2 Ranch County: Santa Cruz

AWPF Funding: \$184,950.00 Completion Date: Withdrawn by Grantee

Project Description: The Grantee intended to install fencing and water developments to more evenly distribute livestock grazing impacts throughout the A Bar Draw Allotment in the San Rafael Valley. Nine dirt tanks were to be cleaned. A few tanks were intended to provide habitat for the endangered Sonoran Tiger Salamander, and would be fitted with sediment traps, and partially fenced to exclude livestock use. The Grantee intended to reconstruct two corrals to treat livestock without moving them to headquarters, two miles to the west. According to the Forest Service the allotment has insufficient vegetative cover and litter accumulation, which results in increased runoff and suspended sediment, and decreased water percolation. This degraded condition is the result of drought and improper grazing management by the prior permittee.

99-097WPF: Dakini Valley Riparian Project

Map #: 258

Grantee: Dakini Valley LLC County: Gila

AWPF Funding: \$66,130.00 Completion Date: Terminated

Project Description: The Grantee intended to protect an approximate one-half mile reach of Gordon Creek from overgrazing by constructing a two-mile long elk fence around the area. The Grantee cut down cat claw that had invaded two acres of Gordon Creek terrace, and intended to re-seed with native grasses, revegetate the stream bank, repair two dirt tanks at Bear Flat to provide off-channel water for cattle and elk, and construct informational signs and literature describing the project resource issues and goals for visitors and guests at Dakini Valley.

99-098WPF: Rio Salado Habitat Restoration Project

Map #: 259

Grantee: City of Phoenix Parks, Recreation, and Library Department County: Maricopa

AWPF Funding: \$950,408.00 Completion Date: December 2004

Project Description: The Grantee is creating a demonstration project to 1) test the performance of various plant materials planned for use in the greater Rio Salado project under various supplemental irrigation strategies and 2) evaluate the treatment quality of the created wetlands for treating storm water, one of the water sources to the project. The greater Rio Salado project will create authentic Sonoran Desert riparian habitat, adapted for the highly altered Salt River channel as it passes through Phoenix.

AWARDED DURING FY '01

00-099WPF: Gila Reference Riparian Area, Discovery Park

Map #: 261

Grantee: Mt. Graham International County: Graham
Science & Culture Foundation,
Inc.

AWPF Funding: \$152,850.80 Completion Date: Withdrawn by Grantee

Project Description: Discovery Park is a 125-acre scientific, historic and cultural theme park that provides education through hands on experience for both children and adults. In 1997 the Commission funded habitat enhancements at the park including a greenhouse, water delivery and measurement devises, information kiosk, brochures and technical releases about propagation techniques, imprinting and seeding with native grasses.

In this Grant, the Grantee intended to 1) propagate native plants for additional 65 acre revegetation site, 2) install six monitoring wells to determine depth to water and to aid in selecting appropriate planting sites, 3) monitor and evaluate a number of propagation and revegetation techniques to determine which are most successful and 4) continue exotic weed eradication in the existing and new revegetation sites.

00-100WPF: Willow Creek Riparian Restoration Project

Map #: 262

Grantee: David Movius County: Mohave

AWPF Funding: \$33,480.00 Completion Date: December 2004

Project Description: The purpose of this project was to restore, augment, and protect the historic riparian habitat along a portion of Willow Creek. The subject property was a 40-acre parcel that was once part of the Willows Ranch and has been over grazed for many years. This project developed a revegetation plan to restore native species and a temporary, low volume irrigation system has been installed to establish the vegetation. In addition, 2,600 linear feet of fencing was installed to protect the riparian zone.

00-101WPF: Murray Basin and Saffel Canyon Watershed Restoration Project

Map #: 263

Grantee: Apache-Sitgreaves County: Apache
National Forest

AWPF Funding: \$260,727.83 Completion Date: September 2004

Project Description: The intent of Murray Basin and Saffel Canyon Watershed Restoration project was to restore two severely degraded upper watersheds to satisfactory conditions, reduce erosion processes currently in force, and restore channels to their natural form and function. Plans for watershed restoration included gully stabilization structures, pinion-juniper thinning, herbaceous revegetation of the uplands, and road obliteration and rehabilitation. AWPf funds were requested for construction of gully stabilization structures, including heavy equipment rentals, materials and labor. Funding was also requested for contracting pinion-juniper thinning of the uplands, obliteration of designated roads and two-tracks, and revegetation of all disturbed sites.

00-102WPF: Upper Eagle Creek Restoration on East Eagle Allotment: Four Drag Ranch

Map #: 264
Grantee: Gary and Darcy Ely County: Greenlee
AWPF Funding: \$66,330.00 Completion Date: June 2005

Project Description: The goal of the Upper Eagle Creek Restoration Project is to construct range improvements that will protect and improve watershed and riparian conditions and result in the restoration of riparian habitat and perennial stream, which is critical to the survival of the threatened spikedace and loach minnow. AWPf funding would result in:

1. Construction of permanent off-riparian livestock water in Steer Pasture. This entails construction of 2 miles of pipeline, solar pump and panels, storage tank and trough. Water source is Eagle Creek.
2. Construction of about 5.7 miles of fencing along East Eagle and Robinson Creeks.
3. Reconstruction of 7.5 miles of San Carlos Apache Indian Reservation/East Eagle Creek allotment boundary/livestock fencing.

Project features are on US Forest Service lands. US Forest Service, Clifton Ranger District is in support of and will participate in various aspects of the project implementation.

00-103WPF: Riparian Restoration on Santa Cruz River - Santa Fe Ranch

Map #: 265
Grantee: Coronado Resource Conservation and Development Area, Inc. County: Santa Cruz
AWPF Funding: \$49,008.00 Completion Date: December 2005

Project Description: The purpose of the project is for erosion control and revegetation of the Grantee's riparian area on private lands and to increase public awareness of riparian systems and values. AWPf monies are funding revegetation of a degraded riparian corridor along the Santa Cruz, building a cattle enclosure fence, and constructing a supplemental irrigation system with the intent of establishing self-sustaining riparian vegetation. The Grantee will develop a teacher's guide to riparian education through the Coronado RC&D, conduct an informational tour of the site and develop a photographic display and brochure of the project site for use at institutional gatherings such as the Arizona Cattle Growers Association. The RC&D has established a technical project team consisting of an engineer, plant material specialist, rangeland management specialist, educational consultant, county extension service agent, and the science instructor from the Little Red School House, Nogales to oversee project planning, implementation, monitoring, and evaluation.



Figure 24. Southwest Strategy group members participate in a tour of the project site at Hubbell Trading Post National Historic Site. 00-104WPF

00-104WPF: Continued Enhancement of Pueblo Colorado Wash at Hubbell Trading Post National Historic Site

Map #: 266
Grantee: National Park Service – Hubbell Trading Post National Historic Site County: Apache
AWPF Funding: \$69,349.00 Completion Date: August 2004

Project Description: The Grantee continued the enhancement and monitoring of the AWPF project funded during the 1997 cycle. This project strove to restore the Pueblo Colorado Wash within the Hubbell Trading Post boundaries to a functioning condition. The current project used natural channel design and has experienced substantial success in re-establishing the sinuosity, function and vegetation in the area. The Grantee has been undertaking a Tamarisk and Russian Olive eradication effort combined with revegetation of cottonwoods and willows. This project (1) continued the monitoring of existing structures and the system (NPS will contribute the match of maintaining the existing structures); (2) conducted a baseline wildlife survey for Hubbell Trading Post; (3) installed new structures where needed; and (4) continued the public outreach program. The restoration project has received awards from the NPS and USEPA.

00-105WPF: Hubbell Trading Post Riparian Restoration with Treated Effluent

Map #: 267
Grantee: National Park Service – Hubbell Trading Post National Historic Site County: Apache
AWPF Funding: \$81,951.00 Completion Date: December 2005

Project Description: The Grantee proposes to use secondary treated effluent from the nearby treatment facility to restore approximately four-acres of the floodplain at the Hubbell Trading Post in cooperation with the U.S. Bureau of Reclamation, Navajo Tribal Utility Authority, and Navajo Department of Water Resources. The Grantee will design the distribution system, subsurface irrigation system, construct the systems, eradicate Tamarisk and Russian Olive, vegetate and monitor the site for survivability, vigor, regrowth of exotics, water quantity and quality, as well as establishing photo points.



**Figure 25. Buck Tank at Tres Alamos Ranch prior to fencing and revegetation.
00-106WPF**

00-106WPF: Tres Alamos Ranch Dirt-Tanks-To-Aquatic-Habitat Conversion

Map #: 268

Grantee: Tres Alamos Ranch

County: Yavapai

AWPF Funding: \$69,220.56

Completion Date: June 2003

Project Description: The Grantee 1) cleaned out five dirt tanks 2) constructed sediment traps above the tanks 3) fenced the tanks to eliminate livestock access 4) replanted three of the tank sites with native aquatic plants and compared regeneration of non-revegetated tank sites with revegetated sites and 5) rehabilitated existing wells, installed storage tanks and drinkers with wildlife escape ramps to provide alternate livestock water. Approximately 35 acres were fenced to eliminate livestock use. The Grantee, Prescott Audubon Society, and Wickenburg High School students monitored the results of the revegetation as well as bird, mammal, amphibian, reptile and invertebrate use of the dirt tank sites.

00-108WPF: Lake Mary Watershed Streams Restoration

Map #: 271
Grantee: Northern Arizona University County: Coconino
AWPF Funding: \$253,119.00 Expected Completion Date: March 2006

Project Description: The Grantee, in partnership with the U.S. Forest Service, proposes to restore two degraded reaches that impact both Upper and Lower Lake Mary primarily with excessive sedimentation. The Grantee plans to use a natural channel design approach beginning with a site assessment and final design. The Grantee will survey the lake bottom at Lake Mary, install crest gages, modify the channels and revegetate along the two reaches based on the final design developed during the project. Where possible, the existing road will be relocated away from the existing stream channel. The Grantee will monitor the channel morphology, water and sediment discharge, vegetation and conduct photopoint monitoring as well.



Figure 26. A Lake Mary tributary during restoration activities. 00-108WPF

00-109WPF: Lower San Pedro Watershed Project (f.k.a. Middle San Pedro Watershed Project)

Map #: 272
Grantee: Redington Natural Resource Conservation District County: Cochise, Graham, Pima, Pinal
AWPF Funding: \$249,871.00 Expected Completion Date: August 2006

Project Description: The Lower San Pedro Watershed Project will provide a watershed resource assessment, including historical and current conditions, and develop a watershed action alternatives plan to propose potential methods for improving watershed conditions. In addition, the project aims to bring the local communities together to address watershed issues and solicit community input.

00-110WPF: Upper Fairchild Draw Riparian Restoration

Map #: 273
Grantee: Apache-Sitgreaves County: Apache
National Forest
AWPF Funding: \$35,515.00 Completion Date: November 2004

Project Description: The Upper Fairchild Draw Riparian Restoration Project was designed to protect approximately 15 acres of wet meadow and .05 miles of an intermittent stream channel in the headwaters of the Willow Creek watershed from detrimental ungulate impacts. The specific objectives were to increase the vigor and abundance of existing species of native riparian vegetation, restore a Bebb Willow community that once dominated the Cienega in the project site, and improve the channel drainage morphology in the stream. AWPF funds were used to construct enclosure around the cienega, plant Bebb Willows inside the enclosure, and monitor riparian vegetation and channel morphology responses to removal of ungulate impacts.

00-111WPF: Cooperative Grazing Management for Riparian Improvement on the San Pedro

Map #: 275
Grantee: Double Check Ranch/ County: Pinal
The Nature Conservancy
AWPF Funding: \$228,701.00 Completion Date: March 2005

Project Description: The Grantee is coordinating joint management of the project area in the form of a cooperative grazing management plan, for the Double Check Ranch and the TNC State Lease land. To facilitate implementation of a cooperative grazing management plan, additional fencing and water developments are needed on both the State Lease land and the Grantee's deeded property. Grantee will also organize and host herding workshops for ranchers throughout the state. Grantee proposes to host six facilitated meetings to assist the community in developing a shared vision of the future for the area to safeguard the environment, watershed and the riparian habitat.

00-112WPF: Town of Eagar/Round Valley Water Users Association Pressure Irrigation Feasibility Study and Preliminary Design - Additional Mapping for Water Quality Improvements in the Watershed

Map #: 276
Grantee: Town of Eagar/Round Valley County: Apache
Water Users Association
AWPF Funding: \$151,829.00 Completion Date: May 2004

Project Description: The purpose of this grant was to provide additional funding to complete mapping in the Upper Little Colorado River Watershed, specifically the rest of Springerville and surrounding area, the Upper Little Colorado River channel from Round Valley to Lyman Lake, and Nutrioso Creek.

00-113WPF: Polacca Wash Grazing Management

Map #: 277

Grantee: The Hopi Tribe

County: Navajo

AWPF Funding: \$267,511.00

Completion Date: Terminated

Project Description: The intent of the Polacca Wash project was to restore perennial reaches of Polacca Wash by excluding livestock, eradicating tamarisk and revegetating the area with native plants. The Grantee was to construct 14 miles of wildlife fencing on both sides of the wash to exclude livestock and provide off-riparian livestock water. Tamarisk was to be eradicated on 29 acres along two perennial reaches of Polacca Wash. The wash area was to be revegetated with native riparian and wetland plants and the upland would have been reseeded with native grasses.

00-114WPF: The Papago Park Green Line Project

Map #: 278

Grantee: City of Tempe

County: Maricopa

AWPF Funding: \$229,152.00

Expected Completion Date: December 2006

Project Description: The project provides funding to guarantee water to riparian habitat threatened with future reduction of water flows from the John G. Martinez Water Treatment Plant (JGMWTP). The Papago Green Line is a diverse urban riparian area established over the past thirty-three years along a formerly ephemeral desert wash. The riparian ecosystem has evolved primarily from intermittent water releases from JGMWTP, in the form of overflows of filter backwash water from the holding pond down the Green Line drainage. The purpose of this project is to secure a twenty-year water supply to sustain the Green Line riparian area. In addition to the secured water supply, a master flow-metering program would be developed to monitor all water flows into and out of the Green Line and the lower pond area. Also, this project contains a riparian restoration and revegetation component. Finally, a comprehensive interpretive and educational riparian program will be developed and implemented.

00-115WPF: Tucson Audubon Society North Simpson Farm Riparian Recovery Project

Map #: 279

Grantee: Tucson Audubon Society

County: Pima

AWPF Funding: \$127,409.30

Completion Date: September 2005

Project Description: The Grantee is enhancing a degraded portion of the Santa Cruz River near Marana. Overall, the site is within a 350-acre parcel that has received 404 Clean Water Act mitigation funding as well as US Fish and Wildlife Service funding to complete restoration activities. The Partners for Wildlife Fund will help to prepare a site assessment of the entire area and lay the groundwork for determining the precise location of the proposed AWPF activities. The Grantee intends to increase the diversity and resiliency of the vegetation in this area and thereby increase the stability of the site. This area has experienced a high degree of erosion, due to flooding, and other activities including trespass grazing, and unauthorized motor vehicle use. The Grantee will use a combination of rainwater harvesting, mulching, increasing vegetative species and diversity, fencing to control cattle and unauthorized vehicle use, and a public outreach program. The City of Tucson has agreed to provide temporary water to the vegetation as needed from on-site wells.

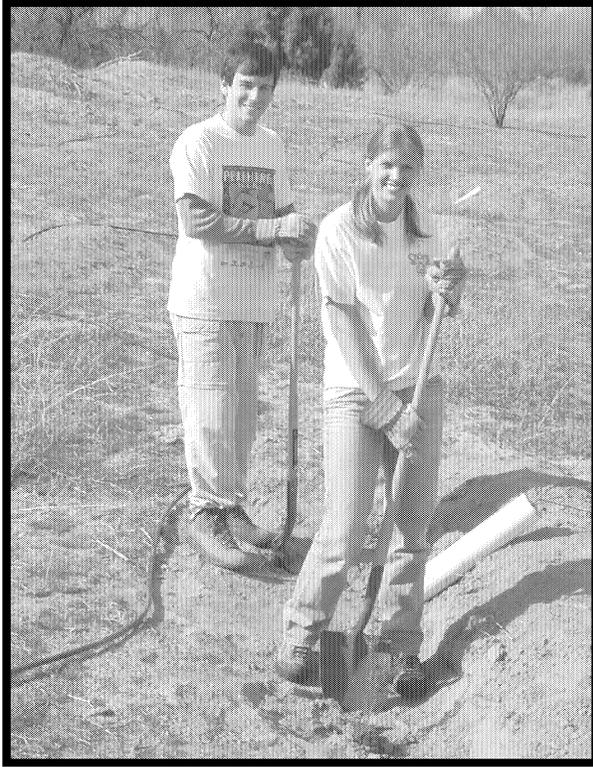


Figure 27. Volunteers working at the Tucson Audubon Society North Simpson Farm project site. 00-115WPF

AWARDED DURING FY '03

03-116WPF: Cottonwood Creek Restoration

Map #: 281
Grantee: Coronado Resource and Development Area, Inc.
County: Cochise
AWPF Funding: \$185,772.50
Completion Date: June 2006

Project Description: The Grantee and its cooperators intend to increase the duration of annual stream flow in Cottonwood Creek and enhance the riparian area along the creek and upland communities. The project will include installation of 750-800 rock structures throughout the Cottonwood Creek watershed in the uplands, and the development and implementation of a grazing management and fencing plan along the creek.

03-117WPF: Lynx Creek Restoration at Sediment Trap #2

Map #: 283
Grantee: Prescott National Forest
AWPF Funding: \$179,771.50
County: Yavapai
Expected Completion Date: August 2006

Project Description: The proposed project involves the restoration of a 0.30-mile intermittently flowing section of Lynx Creek and at least two adjacent springs/seeps. The site encompasses approximately 3 acres of potential riparian/wetland habitat.

03-118WPF: Verde River Riparian Area Partnership Project

Map #: 284
Grantee: Mingus Union High School
AWPF Funding: \$111,221.00
County: Yavapai
Completion Date: Withdrawn by Grantee

Project Description: The project was to enhance the Verde River riparian zone by reducing invasive species, sedimentation and turbidity and improving the condition of springs and streams tributary to the Verde River by constructing and maintaining exclosures.

03-119WPF: Wet Meadows for Water Quality and Wildlife – A Riparian Restoration Project

Map #: 285
Grantee: National Wild Turkey Federation County: Apache
AWPF Funding: \$137,027.30 Expected Completion Date: March 2006

Project Description:

This project is a cooperative effort between the National Wild Turkey Federation (NWTF) and the U.S. Forest Service, Springerville Ranger District, to construct elk proof exclosures in five wet meadow habitats (~ 27 acres total) to reduce soil compaction and ungulate grazing on riparian plant species. The benefits intended will be: 1) improved water quality by reducing soil compaction and increasing infiltration, 2) providing protection for populations of native plant species such as Bebb’s Willows, and 3) enhancing wildlife habitat that will help the NWTF in its wild turkey restoration efforts in the Southwest. Informational signage will be installed and educational brochures will be produced and distributed to the general public defining the benefits wet meadows have on water quality and wildlife.



Figure 28. One of five elk proof exclosures constructed by the National Wild Turkey Federation to protect springs and wet meadow habitats in the Apache-Sitgreaves National Forest, Springerville Ranger District. 03-119WPF

AWARDED DURING FY ‘04

04-120WPF: Verde Headwaters 3-D Hydrogeological Model Framework and Visualization

Map #: 292
Grantee: Northern Arizona University County: Yavapai
AWPF Funding: \$46,634.00 Expected Completion Date: December 2006

Project Description: The applicant will build and present an interactive three-dimensional hydrogeological visualization of the Verde River Headwaters area. Because the Verde Headwaters occur in a very complicated geological terrain, conventional two-dimensional hydrogeological maps and display products have been inadequate to help understand and describe the sources of water for the springs, which form the headwaters for the perennial reach of the Verde River below Paulden, Arizona.

04-121WPF: Lynx Creek Restoration

Map #: 296
Grantee: Prescott National Forest County: Yavapai
AWPF Funding: \$266,020.00 Expected Completion Date: April 2007

Project Description: The primary objective of this project is to return the stream channel and associated floodplain process and riparian features to a properly functioning condition. Two wetlands areas are included in the stream design to improve riparian function, and channel entrenchment and appropriate floodprone width have been calculated.

04-122WPF: Watson Woods Riparian Preserve Restoration Feasibility Project

Map #: 299
Grantee: Prescott Creeks County: Yavapai
Preservation Association
AWPF Funding: \$198,627.00 Expected Completion Date: January 2007

Project Description: The Grantee will complete a feasibility study on a one-mile section of Granite Creek within the Watson Woods Riparian Preserve. Comprehensive data collection and analysis will be conducted to determine the most feasible means to restore the creek and its associated floodplain using the principles of natural channel design and appropriate revegetation techniques. This project will also incorporate a public outreach and participation component to help educate people on the importance of riparian systems. The final product of this project will be the comprehensive Watson Woods Riparian Preserve Restoration Plan.

04-123WPF: Tucson Audubon Society, Santa Cruz River Habitat Project, North Simpson Site, Phase 2

Map #: 300
Grantee: Tucson Audubon Society County: Pima
AWPF Funding: \$130,786.00 Expected Completion Date: March 2007

Project Description: The purpose of this project is to expand the area undergoing riparian recovery at the Tucson Audubon Society's Santa Cruz River - North Simpson Site. This work will be designed to increase the diversity, resiliency and sustainability of the vegetative community; engage the local and regional community in learning from and supporting recovery activities here; and develop a long range strategy for stewarding this site that addresses habitat connectivity, human access, response to changing hydrologic conditions and site maintenance.

04-124WPF: Yuma East Wetlands Riparian Revegetation Project

Map #: 301
Grantee: City of Yuma County: Yuma
AWPF Funding: \$285,878.25 Expected Completion Date: July 2007

Project Description: The project will restore 25 acres of cottonwood/willow habitat along the Lower Colorado River in east Yuma, AZ. This project is part of the much larger (1,418 acre) overall Yuma East Wetlands Restoration Project (YEW) that is currently in different phases of design and installation. The overall project will restore, protect, and enhance critical wetland, aquatic, and riparian habitats, and involves a variety of federal, state (AZ and CA), and local

agencies, as well as local government, tribal entities, and private landowners. The restoration activities included in the AWPf grant award contract include a site analysis, removal of exotic species (saltcedar and giant cane), revegetation with native species, and vegetation and photo monitoring.



Figure 29. Overview of invasive vegetation removal and restoration activities along the Lower Colorado River at the Yuma East Wetlands Restoration Project. 04-124WPF

AWARDED DURING FY '05

05-125WPF: Wilkins' Family Little Colorado River Riparian Enhancement Project

Map #: 302

Grantee: Phelps & Kay Wilkins

County: Apache

AWPF Funding: \$293,618.00

Expected Completion Date: March 2008

Project Description: The goals of this project are to restore and protect riparian vegetation and habitats; restore proper hydrologic conditions/functions; and restore proper stream geomorphology/channel characteristics including floodplains, wetlands, and backwaters along a 3/4-mile stretch of the Little Colorado River near Springerville, Arizona. This project is a cooperative effort between Phelps and Kay Wilkins, Rulon Bigelow, and the Arizona Game and Fish Department. The project will improve the natural functions of the stream channel, decrease fine sediments in the streambed that impact native fish species, and improve the quantity and quality of native riparian plant community for wildlife habitats. This application is a direct result of the earlier AWPf Grant #99-092WPF that supported a riparian enhancement project on the Little Colorado River.

05-126WPF: X Diamond Ranch LCR Riparian Enhancement Project

Map #: 304
Grantee: X Diamond Ranch County: Apache
AWPF Funding: \$352,119.00 Expected Completion Date: January 2008

Project Description: The goals of this project are to restore and protect riparian vegetation and habitats; restore proper hydrologic conditions/functions; and restore proper stream geomorphology/channel characteristics including floodplains, wetlands, and backwater areas of the Little Colorado River. The project will improve the natural functions of the stream channel, decrease fine sediments in the streambed that impact native fish species, and improve the quantity and quality of native riparian plant community for wildlife habitats. This application is a direct result of the earlier AWPF Grant #99-092WPF that supported a riparian enhancement project on the Little Colorado River.

05-127WPF: EC Bar Ranch Reach 8 Water Well and Drinker Project

Map #: 305
Grantee: Jim Crosswhite County: Apache
AWPF Funding: \$22,235.00 Expected Completion Date: February 2006

Project Description: The Grantee is going to develop an alternative water source for livestock and wildlife in order to eliminate the need for the animals to utilize a water gap in a fenced section of Nutrioso Creek. The project area will consist of an off-channel groundwater well and drinker to be installed in a 10-acre upland pasture adjoining a 5-acre riparian area.

05-128WPF: Canyon Creek Riparian Restoration Project, Reach 4-5

Map #: 306
Grantee: Arizona Game and Fish Dept. County: Gila
AWPF Funding: \$100,919.00 Expected Completion Date: May 2008

Project Description: The purpose of this project is to construct a temporary (5-10 year) elk/ungulate enclosure to protect an approximate 1/2 mile reach of Canyon Creek from all grazing pressure, and to improve habitat and stream quality with the ultimate goal of restoring native fish populations and a Blue Ribbon brown trout fishery. The project will also implement an interdisciplinary monitoring program along with an educational outreach component. This project is a cooperative effort between the Arizona Game and Fish Department, Tonto National Forest, and several non-government organizations.

05-129WPF: Georges Lake Riparian Restoration Project

Map #: 308
Grantee: National Wild Turkey Federation County: Apache
AWPF Funding: \$168,636.50 Expected Completion Date: February 2008

Project Description: The purpose of this project is to preserve, protect, and enhance a wet meadow site (15 acres total) in the Apache-Sitgreaves National Forest through the use of enclosures/exclosures (fencing). By preventing ungulate grazing, this project intends to protect plant cover, facilitate regeneration, and prevent damage from compaction/erosion. In addition,

modified fencing designs will allow smaller wildlife to utilize the protected/restored habitat. This project will also include a riparian habitat inventory to assess and classify riparian ecosystems on the Apache-Sitgreaves National Forest to help identify and prioritize areas for future restoration.

05-130WPF: Riparian Restoration on the San Xavier District – Project Two

Map #: 310
Grantee: San Xavier District of The Tohono O'odham Nation County: Pima
AWPF Funding: \$32,688.00 Expected Completion Date: December 2006

Project Description: This project will reestablish five acres of riparian deciduous and mesquite bosque plant communities along the Santa Cruz River 1.5 miles upstream of Martinez Hill. In addition to providing a habitat for a variety of wildlife species, the project will establish a biologically significant area where tribal members can participate in the restoration and management of a desert riparian system that is culturally and aesthetically valuable to the Tohono O'odham Nation. This project will be a collaborative effort between the San Xavier District, Mark Briggs (restoration ecologist), the Sonoran Joint Venture, and the US Fish & Wildlife Service.



Figure 30. Crews removing non-native vegetation from tributaries to the Colorado River in Grand Canyon National Park. 05-131WPF

05-131WPF: Management & Control of Tamarisk and Other Invasive Vegetation at Backcountry Seeps, Springs, and Tributaries in Grand Canyon National Park

Map #: 313
Grantee: Grand Canyon National Park Foundation County: Coconino
AWPF Funding: \$189,304.00 Expected Completion Date: December 2006

Project Description: This project will remove tamarisk and other invasive vegetation from 35 selected project sites within tributaries of the Colorado River in Grand Canyon National Park. The goals of this project are to promote re-establishment of native vegetation by decreasing the colonization of non-native invasive vegetation, restore native wildlife habitat, restore hydrologic balance in the project areas, and promote stewardship through the utilization of volunteers. Phase I of this initiative began in 2000 with support from AWPf Grant #99-075WPF to remove tamarisk from 63 tributaries within Grand Canyon National Park. Phase II (100 project areas) is anticipated to be completed over a three year period. This project begins the first year of Phase II. In addition to invasive vegetation removal, the applicant also intends to educate the public about non-native invasive vegetation and its effect on riparian habitats.

05-132WPF: Esperanza Ranch Riparian Restoration Project

Map #: 314
Grantee: Tucson Audubon Society County: Santa Cruz
AWPF Funding: \$279,411.50 Expected Completion Date: January 2008

Project Description: This project will conduct riparian restoration on a 300-acre conservation easement the Tucson Audubon Society is acquiring on the Esperanza Ranch site in northern Santa Cruz County. The project site includes portions of riparian corridor along both sides of the Santa Cruz River and a part of Chivas Wash. Restoration will increase the diversity, density, and sustainability of riparian habitat for the benefit of birds and other wildlife, and engage the local and regional communities in site activities. Long-term stewardship plans will also be addressed.

05-133WPF: Verde Wild and Scenic River Fence Exclosure

Map #: 315
Grantee: Prescott National Forest County: Yavapai
AWPF Funding: \$63,888.50 Expected Completion Date: January 2008

Project Description: This project will install fences to exclude livestock from grazing the Verde River riparian areas on the Brown Springs allotment of the Prescott National Forest. This will be the implementation of the Verde Wild and Scenic River Comprehensive River Management Plan. Excluding livestock from the riparian areas will allow vegetation to recover and diversify, banks will become stabilized, and wildlife and fish habitats will be improved.

05-134WPF: Quechan Indian Nation Yuma East Wetlands Restoration Project – Phase I

Map #: 317
Grantee: Quechan Indian Nation County: Yuma
AWPF Funding: \$263,803.25 Expected Completion Date: March 2008

Project Description: This project will restore 25 acres of native cottonwood/willow forest in conjunction with 20 acres of historic river channels and 10 acres of cattail/bulrush wetland habitat within the Yuma East Wetlands Restoration Project on the Lower Colorado River. This project is the third sub-phase of Phase 1 of the Yuma East Wetlands Restoration Project; a multi-phase plan being implemented to restore, protect and enhance 1418 acres of critical wetland, aquatic and riparian habitats along four miles of the Colorado River, beginning at the Ocean to Ocean Bridge and extending east to the confluence of the Gila and Colorado Rivers in Yuma, Arizona.

AWARDED DURING FY '06

06-135WPF: Double Circle Ranch Riparian Fencing Project

Map #: 318
Grantee: Wilma Jenkins County: Greenlee
AWPF Funding: \$88,448.00 Expected Completion Date: January 2009

Project Description: The Double Circle Ranch fencing project intends to protect existing riparian habitats and improve water quality for aquatic habitat and downstream municipal use, as well as highly valued recreational use. This fencing project coordinates with other watershed work that is being done by the USFS, Gila Watershed Partnership and the San Carlos Indian Tribe.

06-136WPF: The Arboretum at Flagstaff Wetland Habitat Enhancement

Map #: 321
Grantee: The Arboretum at Flagstaff County: Coconino
AWPF Funding: \$91,000.00 Expected Completion Date: January 2009

Project Description: The Grantee's goals are to restore and enhance the hydrologic function of historically modified wetlands within their public garden area. The restored wetlands would increase the arboretum's capacity as a multiple endangered/sensitive species management area and provide a valuable public outreach experience for their many visitors.

06-137WPF: Pakoon Springs Restoration Design and Implementation Project

Map #: 323
Grantee: Bureau of Land Management County: Mohave
AWPF Funding: \$262,103.00 Expected Completion Date: May 2009

Project Description: The purposes of this project are to restore and enhance the native biodiversity, ecological function, and the pre-development riparian habitat characteristics of Pakoon Springs, and to provide an outdoor venue for natural and cultural resource education, spring restoration interpretation, and recreation on the Grand Canyon-Parashant National Monument.

06-138WPF: Management and Control of Tamarisk and Other Invasive Vegetation at Backcountry Seeps, Springs, and Tributaries in Grand Canyon National Park – Second Year of Phase II

Map #: 324
Grantee: Grand Canyon National Park County: Coconino
Foundation
AWPF Funding: \$258,397.00 Expected Completion Date: January 2008

Project Description: This project will remove tamarisk and other invasive vegetation from targeted riparian habitat communities in Grand Canyon National Park and on adjacent Hualapai Tribal lands. The project aims at protecting native plant communities and restoring affected riparian habitat, restoring hydrologic balance, mitigating impacts to archaeological sites within the Park, promoting citizen stewardship (through the utilization of volunteers) and developing cooperative partnerships with Native American Tribes on adjacent lands.

06-139WPF: Coal Mine Fence

Map #: 325
Grantee: Arizona Game and Fish Department County: Santa Cruz
AWPF Funding: \$182,005.00 Expected Completion Date: January 2010

Project Description: Twelve miles of wildlife friendly fence will be constructed along the boundary of the Coal Mine Springs property to keep trespass cattle off the property, protect riparian habitat that is occupied by the endangered Gila Topminnow, and to protect watershed and riparian habitat important for other listed and sensitive wildlife species that occur in the vicinity of the project area. The applicant seeks funding for 62.5% of the expected fencing costs, necessary permitting requirements, and three years of wildlife and photo monitoring. Through a cooperative agreement with Arizona State Parks, the property will be managed as part of the Sonoita Creek State Natural Area.

06-140WPF: Yuma Crossing National Heritage Area Yuma East Wetlands Restoration Project - Phase I

Map #: 327
Grantee: Yuma Crossing National Heritage Area County: Yuma
AWPF Funding: \$256,790.00 Expected Completion Date: June 2009

Project Description: This application seeks funding to restore 25 acres of native riparian vegetation, which includes 16.5 acres of cottonwood/willow/mesquite forest and 8.5 acres of adjacent native upland riparian area consisting of four-wing saltbush and quailbush, along the Lower Colorado River. As a match for this project, 20 acres of historic river channels and backwaters will be reconstructed along the North Channel Restoration area within the overall 1,418 acre Yuma East Wetlands Restoration Project. Restoration will be implemented through the removal of Tamarisk and Phragmites, and revegetation of the project site with native riparian species according to the restoration and revegetation plans that will be developed through this project.

ARIZONA WATER PROTECTION FUND
 Combined Statement of Receipts, Expenditures and Fund Balance
 From Inception July 1, 1994 Through 13th Month, 2006
 (000's Omitted)

RECEIPTS:		
Transfers In-		
Appropriation From General Fund		
FY 94 through FY 99	21,116	
From Picacho Reservoir Project 3/31/00	1,594	22,710
Investment Income	6,491	
Interstate Water Sales (CAP)	3,290	
Receipts and Donations	10	9,791
TOTAL RECEIPTS		32,501
EXPENDITURES:		
ADWR Support	4,891	
ASLD Support	215	
Commission Expenses	72	
Grant Disbursements	22,922	
TOTAL EXPENDITURE		28,100
FUND CASH BALANCE		4,401
LESS REMAINING GRANT OBLIGATIONS		-3,280
TOTAL		1,121
ACCOUNTS		
GRANT FUNDS		687
ADMINISTRATION EXPENSES		434
TOTAL ACCOUNTS		1,121