

**Arizona Water Protection Fund  
FY 2014 Grant Application Review**

Application # WPF0420 Applicant: Prescott Creeks Preservation Association

Title of Project: Watson Woods Riparian Preserve  
Restoration Project - Phase II

Additional materials were submitted with this application that could not be reproduced and distributed for review. These materials may be reviewed in person at the Arizona Water Protection Fund offices at (3550 N. Central Avenue, 2<sup>nd</sup> Floor, Phoenix). The additional materials available are the following:

Maps  
 Photographs  
 Disk  
 Other

WPF0420  
**Arizona Water Protection Fund**  
**Application Cover Page**  
**FY 2014**

RECEIVED  
**AUG 28 2013**  
**Water Protection Fund**

**Title of Project:** Watson Woods Riparian Preserve Restoration Project – Phase II

<b>Type of Project:</b> <input checked="" type="checkbox"/> Capital or Other <input type="checkbox"/> Water Conservation <input type="checkbox"/> Research	<b>Stream Type:</b> <input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral	<b>Your level of commitment to maintenance of project benefits and capital improvements:</b> <input type="checkbox"/> < 5 years <input checked="" type="checkbox"/> 5-10 years <input type="checkbox"/> 11-15 years <input type="checkbox"/> 16-20 years
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<b>Applicant Information:</b> Name/Organization: Prescott Creeks Preservation Association Address 1: PO Box 3004 Address 2: City: Prescott State: AZ ZIP Code: 86302-3004 Phone: (928) 445-5669 Fax: N/A Tax ID No.: <span style="background-color: black; color: black;">XXXXXXXXXX</span>	<b>Inside an AMA:</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  <b>If yes, which AMA:</b> <input type="checkbox"/> Phoenix <input type="checkbox"/> Tucson <input checked="" type="checkbox"/> Prescott <input type="checkbox"/> Pinal <input type="checkbox"/> Santa Cruz
<b>Type of Application:</b> <input type="checkbox"/> New <input type="checkbox"/> Continuation	

<b>Contact Person:</b> Name: Michael Byrd Title: Executive Director Phone: (928) 445-5669 Fax: N/A e-mail: MByrd@PrescottCreeks.org	<b>Any Previous AWPf Grants:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <b>If yes, please provide Grant #(s):</b> 95-012WPF; 96-0008WPF; 96-0009WPF; 99-0076WPF; 04-122WPF, 08-158WPF
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<b>Arizona Water Protection Fund Grant Amount Requested:</b>  <div style="text-align: center; font-size: 1.2em; font-weight: bold;">\$494,779</div> If the application is funded, will the Grantee intend to request an advance: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Matching Funds Obtained and Secured:</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Applicant/Agency/Organization:</th> <th style="text-align: right; border-bottom: 1px solid black;">Amount (\$):</th> </tr> </thead> <tbody> <tr> <td>1. Prescott Creeks (Applicant)</td> <td style="text-align: right;">\$ 11,052.41</td> </tr> <tr> <td>2. Project Partners</td> <td style="text-align: right;">\$ 71,851.12</td> </tr> <tr> <td>3. Anonymous Donor</td> <td style="text-align: right;">\$ 3,000.00</td> </tr> <tr> <td style="text-align: right;"><b>Total:</b></td> <td style="text-align: right;"><b>\$ 85,903.53</b></td> </tr> </tbody> </table>	Applicant/Agency/Organization:	Amount (\$):	1. Prescott Creeks (Applicant)	\$ 11,052.41	2. Project Partners	\$ 71,851.12	3. Anonymous Donor	\$ 3,000.00	<b>Total:</b>	<b>\$ 85,903.53</b>
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<b>Total:</b>	<b>\$ 85,903.53</b>										

Has your legal counsel or contracting authority reviewed and accepted the Grant Award Contract General Provisions?  
 Yes    No    N/A

**Signature of the undersigned certifies understanding and compliance with all terms, conditions and specifications in the attached application. Additionally, signature certifies that all information provided by the applicant is true and accurate. The undersigned acknowledges that intentional presentation of any false or fraudulent information, or knowingly concealing a material fact regarding this application is subject to criminal penalties as provided in A.R.S. Title 13. The Arizona Water Protection Fund Commission may approve Grant Awards with modifications to scope items, methodology, schedule, final products and/or budget.**

Michael Byrd <b>Typed Name of Applicant or Applicant's Authorized Representative</b>	Executive Director, (928) 445-5669 <b>Title and Telephone Number</b>
 <b>Signature</b>	28 AUGUST 2013 <b>Date Signed</b>

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## **Executive Summary**

The goals of this project are to further enhance and restore function of Granite Creek to improve water quality and increase biological diversity. Additionally protection and restoration of existing riparian habitats will occur through agree efforts to remove invasive nonnative plant species. Prime objectives of the project are to involve the community in the restoration process to broaden understanding and appreciation of the issues, as well as to monitor for implementation effectiveness. This unique riparian ecosystem in the Verde River Watershed represents the best remaining riparian habitat along Granite Creek. The project will further restore hydrologic function, and proper stream geomorphology associated with Granite Creek. The enhancements to this reach are expected to directly benefit wildlife resources dependent upon proper stream function and riparian resources (such as bald eagle (*Haliaeetus leucocephalus*), black-hawk (*Buteogallus anthracinus*), zone-tailed hawk (*Buteo albonotatus*), southwestern willow flycatcher (*Empidonax trailii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), southwestern toad (*Bufo microscaphus*), narrow-headed garter snake (*Thamnophis rufipunctatus*), Mexican garter snake (*Thamnophis eques*), lowland leopard frog (*Lithobates yavapaiensis*), and Sonoran mud-turtle (*Kinosternon sonoriense*)).

Prescott Creeks, a community-based, grassroots 501(c)(3) non-profit organization, will build upon over ten years of research and planning to restore this degraded ecosystem. A management plan (grant #95-012WPF), and subsequent baseline inventories (grants #96-0008WPF, #96-0009WPF, #99-076WPF), led to a restoration feasibility project (grant #04-122WPF) for the Watson Woods Riparian Preserve project area. This plan was then implemented between 2008 and 2013 (grant #08-158WPF).

The natural channel form for Granite Creek is a low gradient riffle – pool sequence meandering in a broad valley. During the initial construction phase, a riffle cross-section template was utilized to construct the channel through the Preserve with the intent that the channel bed pools would naturally form. To date, the pool habitats have not fully developed. The lack of pools in the meanders increases the possibility of erosion along meanders and limits the amount of deeper, low velocity habitat for invertebrates, fish and reptiles. The pool habitat features will be developed in appropriate areas along the meanders and a sedge/rush community planted along the banks, thereby creating additional important aquatic and riparian habitat. Mechanical creation of the pool habitats along with the existing riffles will improve the long-term stability and quality of the existing restoration.

In conjunction with the channel improvement removal of invasive plant species will be a priority. Monitoring data from Phase I of the restoration project showed that between 2009 and 2012 cover of exotic perennials and annuals reached 46% in study plots before declining to 37%. The decline is likely the result of a combination of planted native vegetation excelling and manual removal efforts by Preserve staff and volunteers. While this is encouraging, the rapid spread of non-native species within the Preserve could prove to be extremely detrimental to native flora and fauna.

Additional features of the project include the education and involvement of community members in the restoration process, and in subsequent project monitoring. This will provide a positive example of government, non-profit and community members working together to restore a severely degraded stream reach and its riparian habitat. An educated and involved community ideally will become long-term stewards of this and other riparian areas in Arizona and the Southwest.

Monitoring of the biota and abiotic environment, along with other inventories, are useful in judging the degree to which goals have been achieved.<sup>1</sup> Monitoring data will be essential to evaluation and communication of project performance to the Arizona Water Protection Fund Commission, Project Managers and the public at large. Monitoring will also add to the deficient scientific record for riparian areas in the southwest.

*This project will build upon the Arizona Water Protection Fund's past investments by further implementing needed ecological restoration activities at Watson Woods Riparian Preserve.*

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<sup>1</sup> Society for Ecological Restoration International Science & Policy Working Group, 2004. *The SER International Primer on Ecological Restoration*. www.ser.org & Tucson: Society for Ecological Restoration International.

## PROJECT OVERVIEW

### Historical Background of the Project:

*Prescott Creeks is a 501 (c)(3) nonprofit organization with a “mission to protect and celebrate the ecological integrity of the Granite Creek Watershed riparian systems and associated wetlands through conservation, restoration and education.” Established in 1990, the organization has worked on projects ranging from Greenway trails in downtown Prescott, AZ to volunteer monitoring in the Granite Creek Watershed. Since 1995 Prescott Creeks has demonstrated a commitment to the preservation and ecological restoration of Watson Woods Riparian Preserve.*

Watson Woods Riparian Preserve is a Frémont cottonwood/red willow riparian gallery forest located along Granite Creek, a mixed perennial/intermittent creek in the Upper Verde Watershed. The 126-acre Preserve is the remaining portion of what was once a 1,000-acre riparian gallery forest near Prescott, Arizona. Following trends around the southwest, the riparian habitat at Watson Woods has been lost or severely degraded due to human activities and general neglect. Its watershed has been subjected to urbanization, channelization, stock grazing, diversions and pollution (non-point source, and two EPA Superfund sites). Within its borders, illegal dumping, sand and gravel mining, hunting, woodcutting and 4-wheel drive road "carving" occurred. Rapid growth in the Prescott region and on the neighboring slopes continues to put pressures on the health and function of the Watson Woods floodplain.

In spite of its degradation, Prescott Creeks Preservation Association (Prescott Creeks), its membership and volunteers (from ages 3 to 82), and its many partners are protecting and restoring this endangered ecosystem!

The unique attributes of Watson Woods were formally recognized as early as 1973, when the Arizona Department of Economic Planning and Development recommended establishing an "Educational and Recreational Natural Area at the south end of Watson Lake..." (Johnson and Smith 1973). The current effort to protect and restore this area began in 1989. With support from the City of Prescott, Coors Pure Water 2000, Arizona State Parks Heritage Fund Environmental Education Grants program and the Kiwanis Club of Prescott, Prescott Creeks and the City of Prescott established Watson Woods Riparian Preserve with a legally binding 25-year lease executed in July of 1995. Since that time, Prescott Creeks' work at Watson Woods Riparian Preserve has helped it to fulfill its mission.

With support from the City of Prescott and a grant from the Arizona Water Protection Fund Commission, Prescott Creeks developed the *Watson Woods Riparian Preserve Comprehensive Plan* (95-012WPF) to guide management, inventory and monitoring, restoration and educational activities at Watson Woods Riparian Preserve. Following the development of *Comprehensive Plan* in 1996, the Arizona Water Protection Fund Commission has generously supported the *Plan's* implementation and subsequent restoration work.

- Watson Woods Riparian Preserve Vegetation Inventory (96-0008WPF)
- Watson Woods Riparian Preserve Visitor Management (96-0009WPF)
- Watson Woods Riparian Preserve Herpetological Guide & Checklist (99-076WPF)
- Watson Woods Riparian Preserve Restoration Feasibility Project (04-122WPF)
- Watson Woods Riparian Preserve Restoration Project (08-158WPF)

*This project will build upon the Arizona Water Protection Fund's past investments by implementing additional ecological restoration activities at Watson Woods Riparian Preserve.*

**Goal(s):**

**1. Further enhance and restore function of Granite Creek to improve water quality and increase biological diversity.**

While the Granite Creek channel exhibits a markedly improved condition as the result of the Restoration Project (ca. 2008-20012), additional treatments, including pool development, are needed and desired to fully enhance and restore function and increase biological diversity.

**2. Protect and restore existing riparian habitats through invasive species removal.**

Monitoring data from the restoration project showed that between 2009 and 2012 cover of exotic perennials and annuals reached 46% in study plots before declining to 37%. The decline is likely the result of a combination of planted native vegetation excelling and manual removal efforts by Preserve staff and volunteers. While this is encouraging, the rapid spread of non-native species within the Preserve could prove to be extremely detrimental to native flora and fauna.

Additionally, invasive species have a direct impact on the functionality of riparian buffers and their ability to filter pollutants from surface runoff and provide quality wildlife habitat. The 2012 Upper Granite Creek Watershed Improvement Plan<sup>2</sup> recommends coordinated efforts to address invasive species, independently and as a component of water quality improvement and restoration projects.

**Objective(s):**

1. Increase biological diversity through the further development of pool habitats and by increasing diverse bank habitats along the Granite Creek channel. The natural channel form for Granite Creek is a low gradient riffle – pool sequence meandering in a broad valley. During the initial construction phase, a riffle cross-section template was utilized to construct the channel through the Preserve with the intent that the channel bed pools would naturally form. To date, the pool habitats have not fully developed. Pools are important stream formations that dissipate stream energy. The lack of pools in the meanders increases the possibility of erosion along meanders and limits the amount of deeper, low velocity habitat for invertebrates, fish and reptiles. During this grant cycle the pool habitat features would be developed in appropriate areas along the meanders and a sedge/rush community planted along the banks, thereby creating additional important aquatic and riparian habitat. Mechanical creation of the pool habitats in conjunction with the existing riffles will improve the long-term stability and quality of the existing restoration.
2. Enhance, restore and (re)create riparian vegetation and habitat along the Watson Woods Riparian Preserve reach of Granite Creek. An increase in native riparian vegetation along with a decrease in non-native species (salt-cedar, Siberian elm, Scotch thistle, etc.) is expected to expand and increase riparian habitat values and/or reintroduction potential for threatened species such as the (bald eagle (*Haliaeetus leucocephalus*), black-hawk (*Buteogallus anthracinus*), zone-tailed hawk (*Buteo albonotatus*), southwestern willow flycatcher (*Empidonax trailii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), southwestern toad (*Anaxyrus microscaphus*), narrow-headed garter snake (*Thamnophis rufipunctatus*), Mexican garter snake (*Thamnophis eques*), lowland leopard frog (*Lithobates yavapaiensis*), and Sonoran mud-turtle (*Kinosternon sonoriense*).

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<sup>2</sup> Granite Creek and the downstream Watson Lake were listed as “impaired” by the US EPA in 2004. The Upper Granite Creek Watershed Improvement Plan was the result of a multi-year, collaborative planning effort funded by the Arizona Department of Environmental Quality to identify sources of pollutants causing impairments in the watershed and prioritize watershed improvement projects critical to the restoration of surface water quality.

3. Educate and involve community members in the restoration and monitoring process. This will provide a positive example of multiple stakeholders from governments, non-profits and community members working together to restore a severely degraded stream reach and its riparian habitat. An educated and involved community ideally will become long-term stewards of this and other riparian areas in Arizona and the Southwest.
4. Monitoring of the biota and abiotic environment is necessary to determine implementation effectiveness of the restoration effort and the degree to which goals have been achieved.<sup>3</sup> Additional inventories of taxa not yet studied at the Preserve will be included. Inventory and monitoring data will be essential to evaluation and communication of project performance to the Arizona Water Protection Fund Commission, Project Managers and the public at large. Inventory and monitoring will also add to the deficient scientific record for riparian areas in the southwest.

**Statement of problem(s):**

Although Watson Woods Riparian Preserve represents the best remaining riparian habitat along Granite Creek, evidence of extensive gravel mining is found throughout the Preserve. Based on historic photos and the existing topography, the entire valley appears to have been lowered by 6-10 feet and completely regraded. In many areas the stream channel is unstable with some combination of non-functioning floodplain or unstable banks and riparian habitats are absent or well below their potential. The resulting situation is a severely degraded system with a developing noxious weed problem. While Phase I restoration activities were beneficial and largely met project goals, the riparian system can still be improved with additional treatments to improve channel function (pool creation) and to enhance bank habitats for a diversity of animal species.

**Statement of cause(s) of the problem(s):**

Baseline flora and fauna inventories, review of historic aerial photography, and a restoration feasibility project (all funded in whole, or part, by the Arizona Water Protection Fund Commission) indicate that the primary degrading factor to the Watson Woods Riparian Preserve reach of Granite Creek is the result of mid 20<sup>th</sup> Century mining operations. In many areas of the Preserve, remnant piles, berms and dikes from sand and gravel extraction operations have led to channelization, bank erosion and loss of connection with floodplains. These conditions have not allowed for natural maintenance and riparian habitats have degraded without the occurrence of significant recruitment. Additionally, over time, the area was also treated as a public commons until the Preserve was established in 1995. Human impacts continued in the form of unregulated 4-wheel drive traffic, small scale dumping, target practice, renegade cattle grazing (escapees from neighboring ranches) and firewood cutting.

**Statement of project-related remedies or solutions:**

Prescott Creeks' six Arizona Water Protection Fund projects grants (#95-012WPF, #96-0008WPF, #96-0009WPF, #99-076WPF, #04-122WPF, #08-158WPF) have contributed to the development of remedies and solutions to the problems listed above. Restoration activities for Watson Woods Riparian Preserve were performed from 2009 to 2013 with support from the Commission (grant #008-158WPF) and were largely successful at achieving goals and objectives.

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<sup>3</sup> Society for Ecological Restoration International Science & Policy Working Group, 2004. *The SER International Primer on Ecological Restoration*. www.ser.org & Tucson: Society for Ecological Restoration International.

1. Additional work is relevant and needed to improve conditions at the Preserve. The project managers believe that mechanical creation of pool features associated with existing riffles in the realigned reaches of Granite Creek will improve stability of the system and protect the investment made by Prescott Creeks, the City of Prescott, and the State of Arizona.
2. As indicated above, noxious weeds are of concern within Watson Woods Riparian Preserve. Surveys documented the presence and spread of non-native plant species. In particular, Spotted knapweed (*Centaurea maculosa*), Scotch thistle (*Onopordum acanthium*), Common teasel (*Dipsacus fullonum*), Dalmatian toadflax (*Linaria dalmatica*), Saltcedar (*Tamarix ramosissima*), Siberian elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*). Prescott Creeks will mobilize crews from the American Conservation Experience (ACE) to aggressively treat infested areas. Crews will use a combination of approaches – employing both mechanical and chemical techniques. Noxious weed eradication projects will occur on approximately 20 acres of the Preserve during this project.
3. Education and community involvement will occur through a variety of hands-on, volunteer opportunities in a variety of tasks that could range from channel modification to revegetation, from monitoring to noxious weed eradication. Based on methodologies established during previous projects at Watson Woods Riparian Preserve, Prescott Creeks will recruit community volunteers (from local schools, civic organizations, businesses, etc.) to participate in on-the-ground project activities. Interpretive, educational and information signs and materials will also be designed, fabricated and installed, or distributed, as part of the project.
4. Attributes demonstrating restoration will be assessed. Quantitative and qualitative data from scheduled monitoring of the biota and abiotic environment, along with other inventories, are useful in judging the degree to which goals have been achieved. Monitoring data will be essential to evaluation and communication of project performance to the Arizona Water Protection Fund Commission, Project Managers and the public at large.

**Statement of project years of benefit:**

This project is a continuation of the project entitled Watson Woods Riparian Preserve Comprehensive Plan (grant #95-012WPF) and five other projects: Vegetation Inventory (grant #96-0008WPF), Visitor Management (grant #96-0009WPF), Herpetological Guide & Checklist (grant #99-076WPF), Restoration Feasibility Project (grant #04-122WPF), and Restoration Project (grant #08-158WPF). It will provide long-term benefit for the Preserve. Implementation of the restoration design will substantially restore hydrologic function, proper stream geomorphology, improve floodplain function, and (re)create wetland/backwater areas associated with Granite Creek, revegetate areas with appropriate riparian vegetation, include community members in the restoration process, and monitor the biota and abiotic environment to assess and evaluate project performance. Use of natural channel design process is intended to restore Granite Creek within Watson Woods Riparian Preserve to a self-maintaining ecosystem that will persist for generations.

All findings from the project will be used locally and regionally as a model for community-based ecological restoration methods and techniques, education, and collaborative problem solving.

- Your level of commitment to maintenance of project benefits and capital improvements:
- |  |                                      |
|--|--------------------------------------|
| <input type="checkbox"/> < 5 years             | <input type="checkbox"/> 11-15 years |
| <input checked="" type="checkbox"/> 5-10 years | <input type="checkbox"/> 16-20 years |

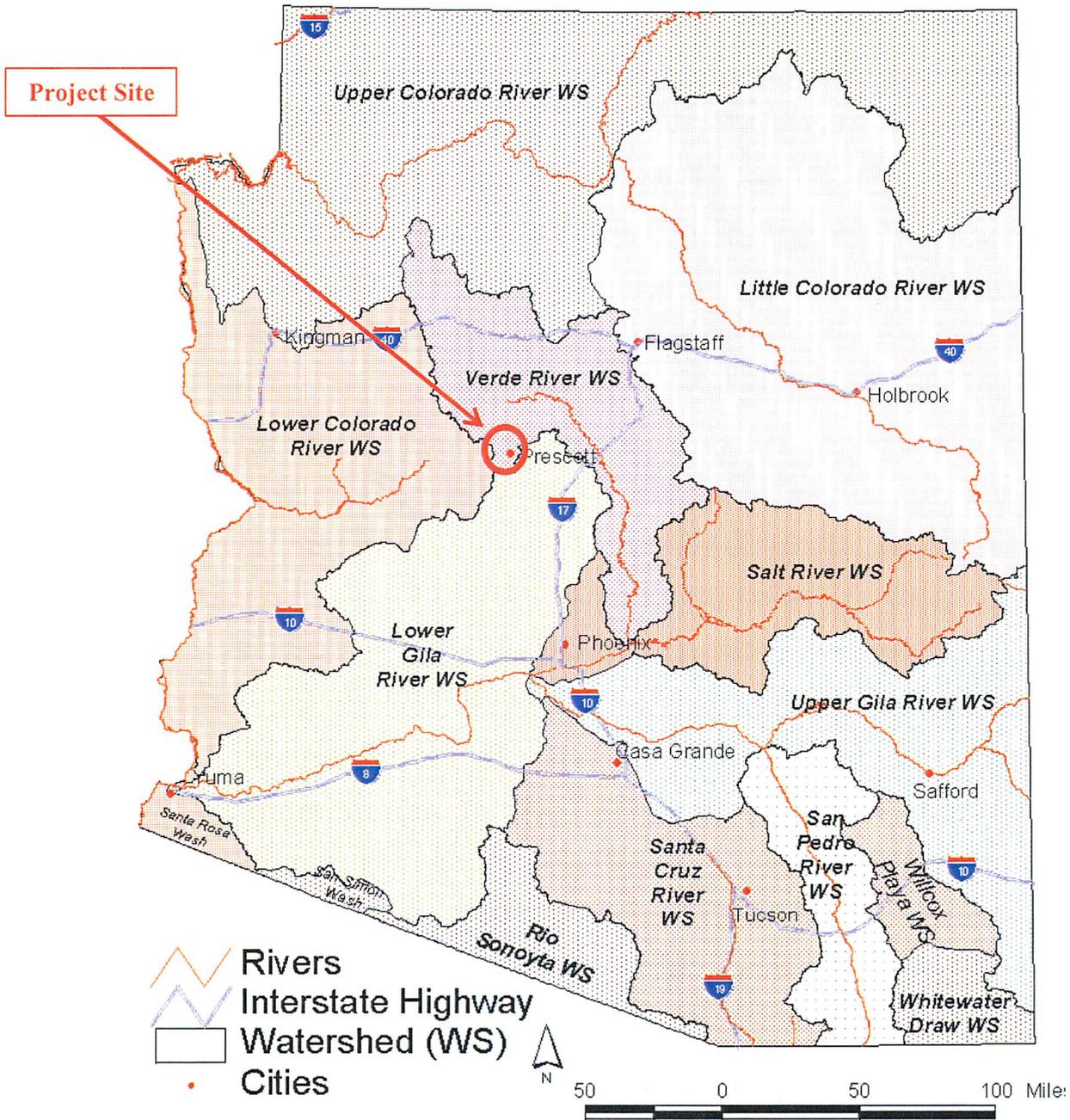
Prescott Creeks is committed to the project for 20 or more years. We are lease we hold with the City of Prescott is due for renewal in 2020, and therefore necessitates the response above.

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## Project Location & Environmental Contaminant Information FY 2014

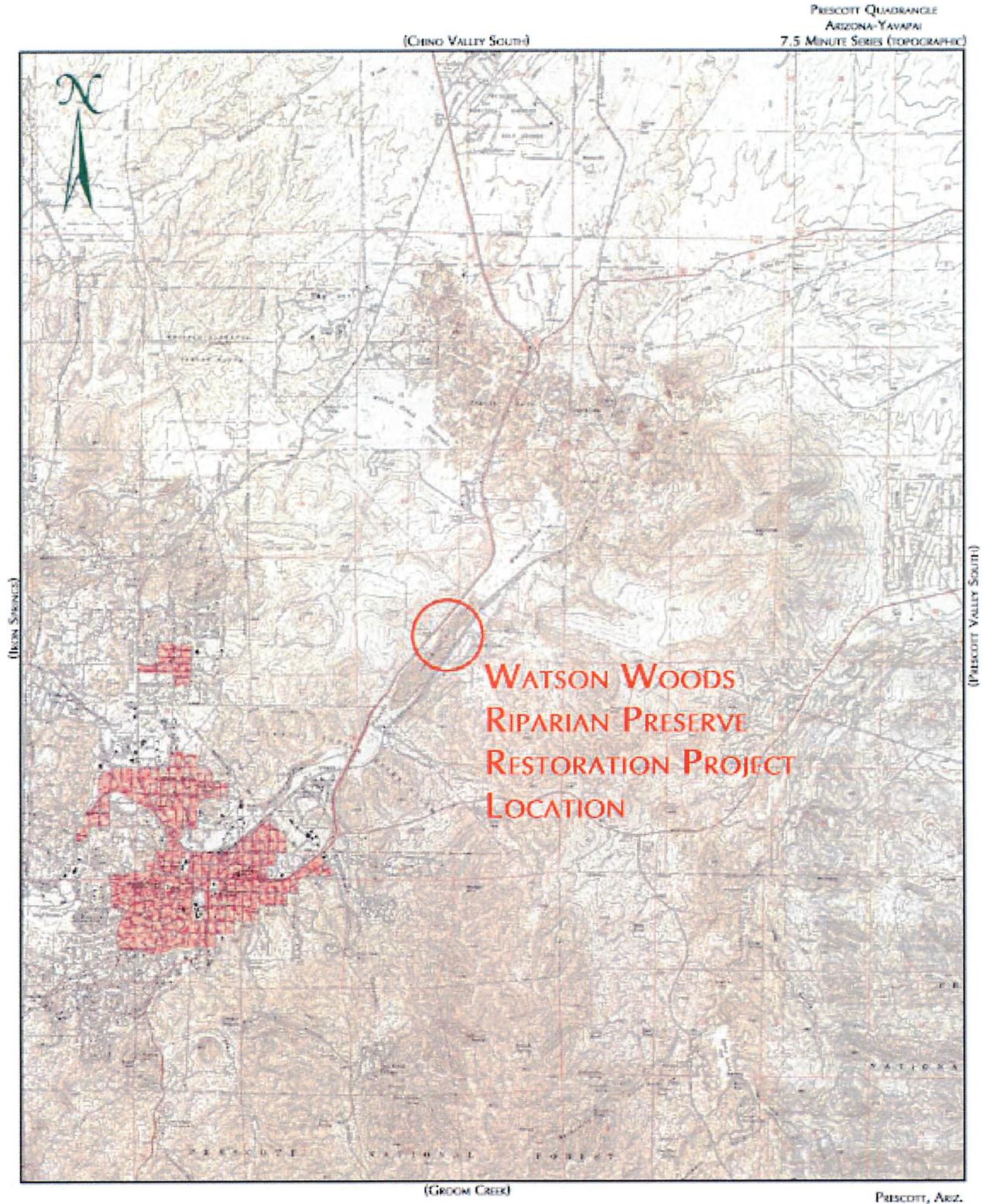
<b>Project Location Information</b>			
1. County: <u>Yavapai</u>	2. Section: <u>23, 24, 26</u>	3. Township: <u>14N</u>	4. Range: <u>2W</u>
5. Watershed: <u>Verde River</u> 6. 8 or 10 Digit Hydrologic Unit Code (HUC): <u>15060202-15</u> 7. Name of USGS Topographic Map where project area is located: <u>Prescott</u> 8. State Legislative District: <u>1</u> (Information available at: <a href="http://azredistricting.org/districtlocator/">http://azredistricting.org/districtlocator/</a> ) 9. Land ownership of project area: <u>City of Prescott</u> 10. Current land use of project area: <u>Natural Open Space (NOS) leased and managed by applicant as Watson Woods Riparian Preserve</u> 11. Size of project area (in acres): <u>126 acres</u> 12. Stream Name: <u>Granite Creek</u> 13. Length of stream through project area: <u>~ 1 mile</u> 14. Miles of stream benefited: <u>~ 1 miles</u> 15. Acres of riparian habitat: <u>~25 acres</u> will be: <div style="margin-left: 300px;"> <input checked="" type="checkbox"/> Enhanced  <input type="checkbox"/> Maintained  <input checked="" type="checkbox"/> Restored  <input type="checkbox"/> Created           </div>			
16. Provide directions to the project site from the nearest city or town. List any special access requirements:  From Prescott take Highway 89 North for 2.2 miles. Turn right onto Prescott Lakes Parkway. Turn left at Sundog Ranch Rd. and then left again into the parking area shared with the Prescott Peavine Trail. Follow the trail for about 100 meters and turn left at the Preserve walk-in gate and kiosk. There are no special access requirements for foot traffic.			
<b>Environmental Contaminant Location Information</b>			
1. Does your project site contain known environmental contaminants? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: N/A			
2. Are there known environmental contaminants in the project vicinity? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: N/A			
3. Are you asking for Arizona Water Protection Fund monies to identify whether or not environmental contaminants are present? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			

## Arizona Watershed Map FY 2014



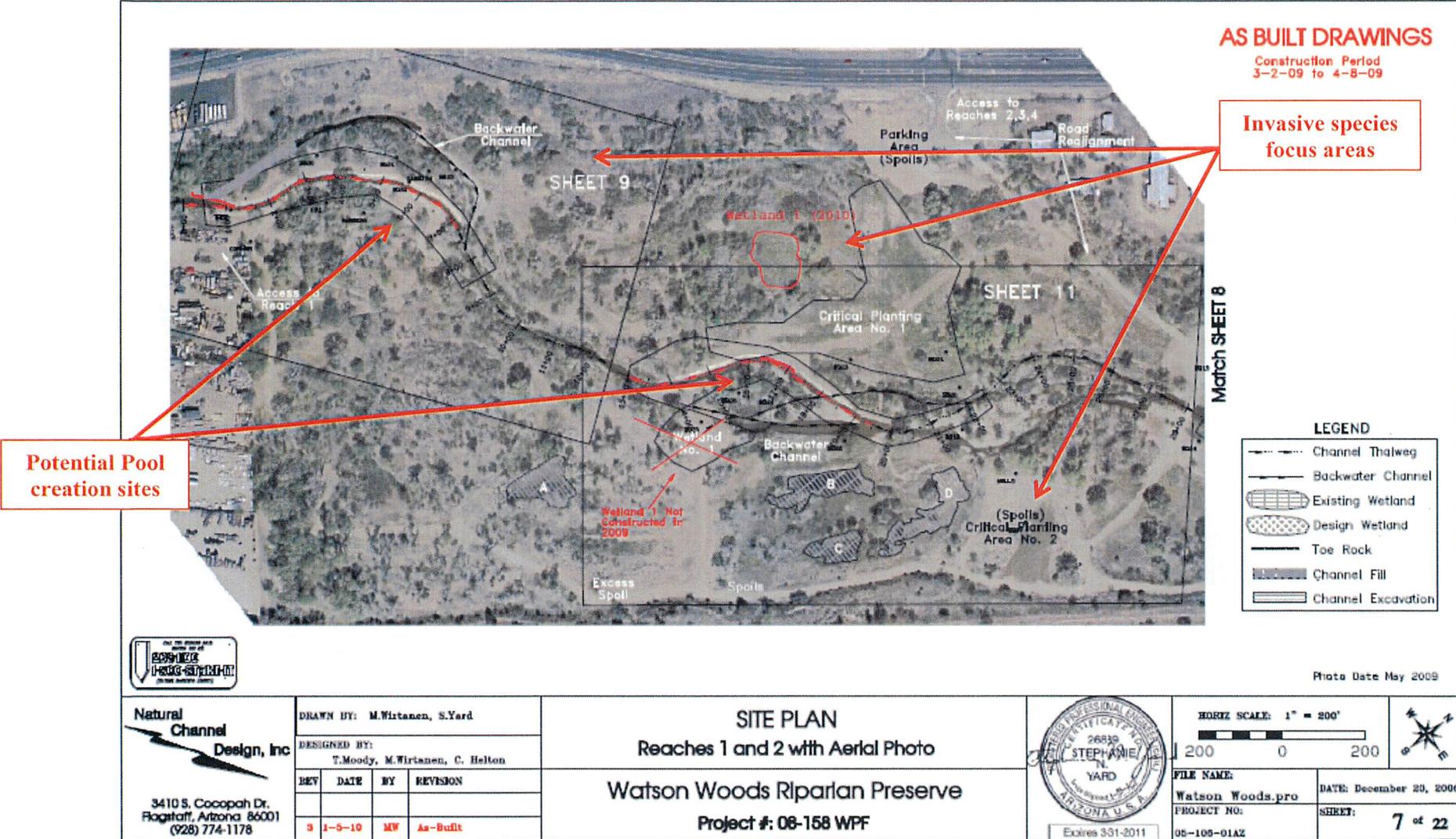
Title of Project: Watson Woods Riparian Preserve Restoration Project Phase II

### Location/Ownership Map



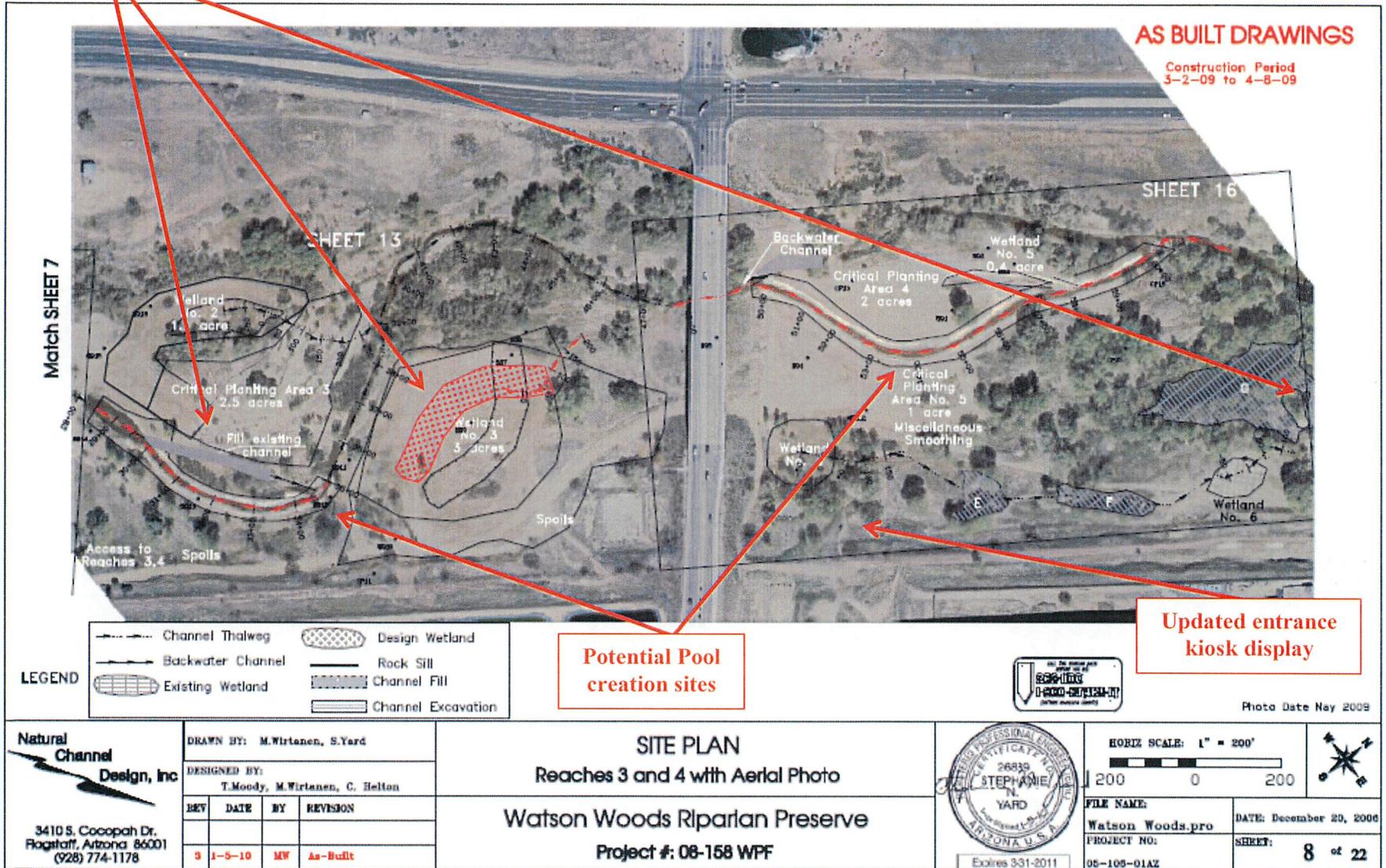
Watson Woods Riparian Preserve shown on USGS topos. The Preserve is NE of Prescott, AZ. City of Prescott is the landowner.

Project Schematics



As Built drawings showing the upper two reaches of Granite Creek within Watson Woods Riparian Preserve after the initial construction and revegetation for Phase I of the restoration project. Granite Creek flows from left to right in the image.

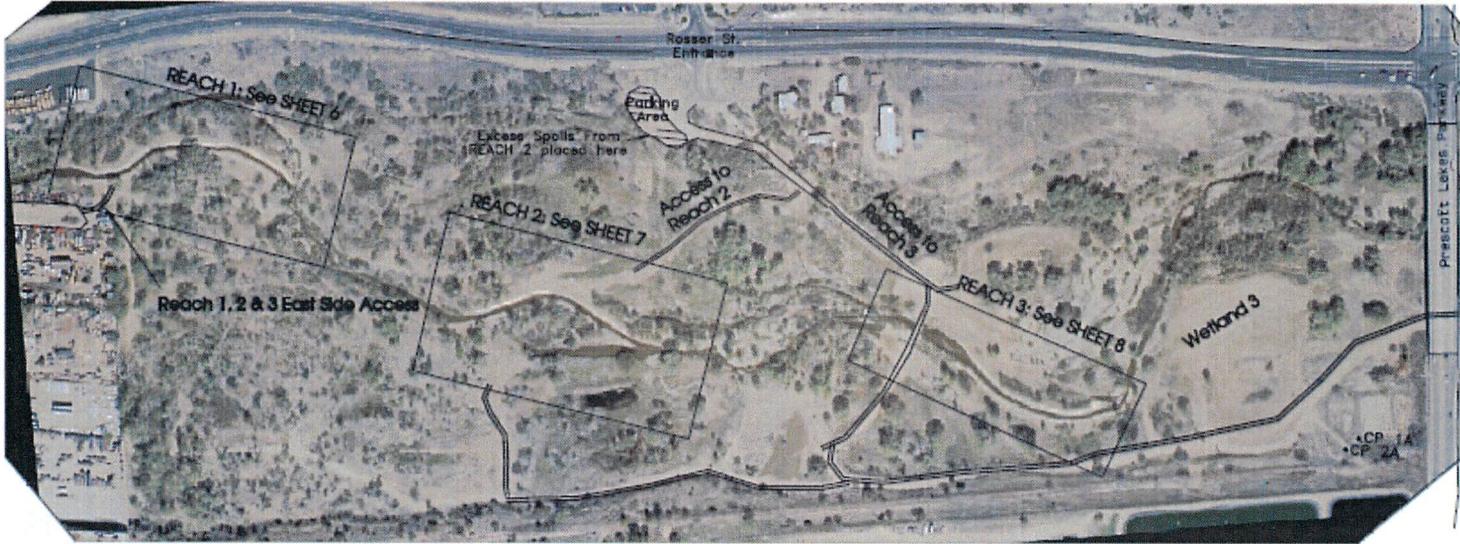
**Invasive species focus areas**



**Potential Pool creation sites**

**Updated entrance kiosk display**

As Built drawings showing the lower two reaches of Granite Creek within Watson Woods Riparian Preserve after the initial construction and revegetation for Phase I of the restoration project. Granite Creek flows from left to right in the image.



**CONSTRUCTION NOTES:**

- REACH 1:** Repair 30 feet of toe rock by reinstalling new rock; reslope/recontour cut banks in old channel as needed and plant willow clusters; install two log sills and four brush trenches; construct 150 feet of new channel to eliminate headcut and install willow clusters.
- REACH 2:** Remove mound and use spoils as fill for repair further downstream; Reslope cut bank and fill with spoils from mound, install 80 ft of coir logs and plant willow clusters; Plant two rows of willow trenches. Repair upstream toe rock by reinstalling new rock.
- REACH 3:** Remove culverts, reslope banks as necessary and plant willow clusters; reslope outbank at downstream end of reach, install coir logs and plant willow clusters.

**CONTROL POINTS**

Point	Northing	Easting	Elev.	Description
CP 1A	1300852.5090	545494.2700	5188.91	NCD CAP
CP 2A	1300899.9090	545493.5630	5186.69	NCD CAP

Additional control to be established prior to construction.



**Natural Channel Design, Inc**  
 3410 S. Cocopah Dr.  
 Flagstaff, Arizona 86001  
 (928) 774-1178

DRAWN BY: M.Wirtanen, R.Lyman			
DESIGNED BY: M.Wirtanen, A.Haden			
REV	DATE	BY	REVISION

**PROJECT SITE**  
 Control, Access, Spoil Areas

Watson Woods Riparian Preserve Restoration Project  
 Post Flood Repair (January 2010)  
 Project #: 08-158 WPF



**AS-BUILT DRAWINGS**  
 Construction Period  
 Nov 8 - Dec 8, 2010

FILE NAME: Watson Woods.pro  
 PROJECT NO: 08-158WPF

March 22, 2010  
 SHEET: **5** of 11

As Built drawings showing the upper three reaches of Granite Creek within Watson Woods Riparian Preserve after the final construction and revegetation for Phase I of the restoration project. Granite Creek flows from left to right in the image.

## SCOPE OF WORK

### Task #1: Permits, Authorizations, Clearances and Agreements

**Task Description:** Based upon surveys from prior Arizona Water Protection Fund projects the Grantee does not expect to encounter endangered species. The Grantee shall obtain all permits, authorizations, clearances and agreements necessary to complete the tasks described in this Scope of Work, including but not limited to:

- Subcontractor agreements
- Cultural resource clearance (SHPO),
- Army Corps of Engineers 404 permit,
- US Fish and Wildlife Service, Section 7 consultation as necessary,
- Other permits, authorizations, clearances and agreements as necessary.

The grantee will also submit copies of sub-contractor agreements describing activities to be performed and delineating responsible parties for each activity.

**Task Purpose/Objective:** To comply with local, state and federal permit requirements and environmental laws.

**Deliverable Description:** (1) Copy of sub-contractor agreements  
(2) Copies of permits, authorizations, clearances and agreements.

**Deliverable Due Date:** (1) Prior to initiation of sub-contracted work  
(2) Prior to any ground disturbing activities

**AWPF Reimbursable Cost:** **\$41,210.24**

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### Task #2: Design Plans

**Task Description:**

**Task Purpose/Objective:** To develop detailed design plans for the project that take into consideration sound engineering principles, environmental considerations, as well as stakeholder input. Also to provide the Arizona Water Protection Fund Commission and Project Managers, as well as the Prescott Creeks project personnel, subcontractors and the public a clear plan from which to manage and complete the project.

**Deliverable Description:** Restoration Design and Monitoring Plan.

**Deliverable Due Date:** Prior to any ground disturbing activities.

**AWPF Reimbursable Cost:** **\$29,215.15**

### **Task #3: Initial Construction, Revegetation & Eradication**

**Task Description:** The Grantee will perform all activities as described in the Plan in Task #2 above. The task is scheduled to minimize disturbance to wildlife and riparian vegetation. Construction will take place under the supervision of the design engineer or a designated representative, and the Preserve Manager or a designated representative. Revegetation, weed eradication and associated activities will take place under the supervision of the Preserve Manager or a designated representative, and/or the design engineer or designated representative. Where feasible, construction and revegetation tasks will be supported by community volunteers.

An Initial Construction & Revegetation Report will describe the field activities and photographs of the project area.

**Task Purpose/Objective:** To implement the Restoration Design Plan as described in Task #2 above. This task represents the main thrust of on the ground restoration work for Watson Woods Riparian Preserve.

**Deliverable Description:** Initial Construction & Revegetation Report.

**Deliverable Due Date:** April 30, 2015

**AWPF Reimbursable Cost:** **\$148,788.94**

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### **Task #4: Final Construction, Revegetation & Eradication**

**Task Description:** After one growing season, the Grantee will assess the success of the Initial Construction, Revegetation & Eradication efforts and identify additional practices necessary to project success. There may be uncontrollable results after the first year (i.e. damage from high flows – as seen during the restoration project, failure of some revegetation areas, and/or structural or bioengineering failures) that necessitate additional attention. A Final Construction Activities Design Report will be prepared that describes the practices planned for Task #4, Construction, Revegetation & Eradication. Final Construction & Revegetation will begin in the winter of the second year.

A Final Construction & Revegetation Report will be prepared and submitted to the Arizona Water Protection Fund Program Manager at the conclusion of this task. This report will describe project activities for Task #4 (Final Construction & Revegetation) and include photographs of the project area.

**Task Purpose/Objective:** To implement corrective measures (for Initial Construction & Revegetation, Task #3) resulting from damage from high flows, failure of some revegetation areas, and/or structural or bioengineering failures, and/or to implement additional work as necessary.

**Deliverable Description:** (1) Final Construction Activities Design.  
(2) Final Construction & Revegetation Report.

**Deliverable Due Date:** (1) October 31, 2015  
(2) April 30, 2016

**AWPF Reimbursable Cost: \$70,800.77**

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**Task #5: Conduct Monitoring**

**Task Description:** Monitoring described in the Watson Woods Riparian Preserve Restoration Monitoring Design Plan (as described in Task #2 above) will be conducted under this task. Annual monitoring will take place for two and three seasons (prior to on-the-ground work, after initial construction and revegetation, after final construction and revegetation) as described in the Watson Woods Riparian.

Annual monitoring reports will be submitted to the Arizona Water Protection Fund Program Manager. A summary of monitoring data and analyses will be included in the Final Report.

**Task Purpose/Objective:** To assess attributes demonstrating restoration. Quantitative and qualitative data from scheduled monitoring of the biota and abiotic environment, along with other inventories, are useful in judging the degree to which goals have been achieved. To quantitatively and qualitatively assess and evaluate project performance and progress as well as communicate project performance to the Arizona Water Protection Fund Commission, Project Managers and the public at large.

**Deliverable Description:** (1) Annual Progress Reports  
(2) Progress Reports as relevant

**Deliverable Due Date:** (1) January 31, 2014, 2015, 2016  
(2) As relevant during the project period

**AWPF Reimbursable Cost: \$134,230.74**

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**Task #6: Community Involvement & Education**

**Task Description:** The Grantee will conduct Community Involvement and Education activities through public presentations and hands-on participation in on-the-ground restoration activities (revegetation, monitoring, maintenance). An annual report will be submitted to the Arizona Water Protection Fund Program Manager that will; provide representative documentation of activities

**Task Purpose/Objective:** To educate community members, and to provide opportunities for their hands-on involvement in the restoration project. This will foster as sense of stewardship and will help individuals understand how the restored riparian ecosystem can benefit them personally. Also to recruit volunteer labor for implementation of Tasks #3 - #6.

**Deliverable Description:** (1) Annual Progress Reports

(2) Progress Reports as relevant

**Deliverable Due Date:** (1) January 31, 2014, 2015, 2016  
(2) As relevant during the project period

**AWPF Reimbursable Cost: \$50,409.45**

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**Task #7: Final Report**

**Task Description:** The Grantee will prepare and submit a comprehensive final report consistent with the Final Report Guidelines from the Arizona Water Protection Fund Policies and Application Guidelines Manual. As built drawings will be included in this report.

**Task Purpose/Objective:** To provide the Arizona Water Protection Fund Commission, Project Managers, project partners, the Prescott Creeks Board of Directors and general membership, as well as the public with final results of the project.

**Deliverable description:** Final project report will summarize methodologies used, outcome of tasks, summarize and analyze project data & monitoring data, suggest any further changes needed in the project and evaluate project success measured against the objective.

**Deliverable due date:** March 31, 2017

**AWPF Fixed Cost: \$20,123.25**

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**Total WPF Project Cost: \$494,778.53**

<b>Watson Woods Riparian Preserve - Restoration Project - Phase II</b>					
		<b>Rate</b>	<b># of Unit</b>	<b>Units</b>	<b>Total Cost</b>
<b>1 Permits, Authorizations, Agreements</b>					
	Riparian Ecologist/Executive Director	50.00	94	hours	\$4,700.00
	Outreach & Communication Director	36.00	87	hours	\$3,132.00
	Conservation Coordinator	36.00	135	hours	\$4,860.00
	Project Technician	25.00	115	hours	\$2,875.00
	Lead Engineer	115.00	5	hours	\$575.00
	Engineer	105.00	25	hours	\$2,625.00
	Aquatic Ecologist	95.00	45	hours	\$4,275.00
	Egineering Technician	75.00	50	hours	\$3,750.00
	Certified Delineator	105.00	6	hours	\$630.00
	Restoration Ecologist	85.00	50	hours	\$4,250.00
	Arc/CAD Designer	75.00	50	hours	\$3,750.00
	Biologist	95.00	4	hours	\$380.00
	Botanist	85.00	5	hours	\$425.00
	Herpetologist	55.00	10	hours	\$550.00
	Ornithologist	25.00	8	hours	\$200.00
	Supplies	100.00	3	each	\$300.00
	Equipment (GPS Rental)	132.00	2	each	\$264.00
	Mileage	0.565	1,290	miles	\$728.85
	Lodging & Per Diem	163.00	6	nights	\$978.00
<b>Task Subtotal:</b>					<b>\$39,247.85</b>
<b>2 Develop Design Plans</b>					
<u>Channel Design Plan</u>					
	Riparian Ecologist/Executive Director	50.00	25	hours	\$1,250.00
	Outreach & Communication Director	36.00	10	hours	\$360.00
	Conservation Coordinator	36.00	30	hours	\$1,080.00
	Project Technician	25.00	10	hours	\$250.00
	Lead Engineer	115.00	10	hours	\$1,150.00
	Engineer	105.00	40	hours	\$4,200.00
	Aquatic Ecologist	95.00	20	hours	\$1,900.00
	Egineering Technician	75.00	40	hours	\$3,000.00
	Botanist	85.00	10	hours	\$850.00
	Aquatic Ecologist	75.00	5	hours	\$375.00
	Herpetologist	55.00	10	hours	\$550.00
	Ornithologist	25.00	20	hours	\$500.00
	Licensed Applicator	50.00	15	hours	\$750.00
<u>Monitoring Design Plans</u>					
	Riparian Ecologist/Executive Director	50.00	18	hours	\$900.00
	Outreach & Communication Director	36.00	12	hours	\$432.00
	Conservation Coordinator	36.00	60	hours	\$2,160.00
	Project Technician	25.00	6	hours	\$150.00
	Lead Engineer	115.00	0.5	hours	\$57.50
	Engineer	105.00	0.5	hours	\$52.50
	Aquatic Ecologist	95.00	5	hours	\$475.00
	Egineering Technician	75.00	10	hours	\$750.00
	Botanist	85.00	10	hours	\$850.00
	Aquatic Ecologist	75.00	15	hours	\$1,125.00
	Herpetologist	55.00	15	hours	\$825.00
	Ornithologist	25.00	40	hours	\$1,000.00
	Zoologist	75.00	30	hours	\$2,250.00
	Mileage	0.565	1,030	miles	\$581.95
<b>Task Subtotal:</b>					<b>\$27,823.95</b>

<b>3 Initial Construction, Revegetation &amp; Eradication</b>	<b>Rate</b>	<b># of Unit</b>	<b>Units</b>	<b>Total Cost</b>
Riparian Ecologist/Executive Director	50.00	92	hours	\$4,600.00
Outreach & Communication Director	36.00	52	hours	\$1,872.00
Conservation Coordinator	36.00	490	hours	\$17,640.00
Project Technician	25.00	86	hours	\$2,150.00
Lead Engineer	115.00	2	hours	\$230.00
Engineer	105.00	10	hours	\$1,050.00
Aquatic Ecologist	95.00	15	hours	\$1,425.00
Engineering Technician	75.00	90	hours	\$6,750.00
Herpetologist	55.00	8	hours	\$440.00
Earthwork (Equipment & Labor)				
Mob/Demob	2,000.00	1	each	\$2,000.00
Riifle/Pool Creation	16.50	2,071	cy	\$34,171.50
Stream Bank Improvements	16.50	1,170	lf	\$19,305.00
Revegetation (American Conservation Experience)				
Crew Leader	16.50	80	hours	\$1,320.00
Crew (10 people)	9.50	800	hours	\$7,600.00
Lodging - Revegetation Crew	45.00	8	nights	\$360.00
Invasive Species Removal (American Conservation Experience)				
<u>Spring 2014</u>				
Crew Leader 1	16.50	80	hours	\$1,320.00
Crew 1 (5 people)	9.50	400	hours	\$3,800.00
Crew Leader 2	16.50	80	hours	\$1,320.00
Crew 2 (5 people)	9.50	400	hours	\$3,800.00
<u>Spring 2015</u>				
Crew Leader 1	16.50	80	hours	\$1,320.00
Crew 1 (5 people)	9.50	400	hours	\$3,800.00
Crew Leader 2	16.50	80	hours	\$1,320.00
Crew 2 (5 people)	9.50	400	hours	\$3,800.00
Lodging - Invasive Species Crews	45.00	16	nights	\$720.00
Supplies				
Plant Materials				
Wetlands Plugs/Nursery Stock	3.59	1,250	1 gallon	\$4,487.50
Native Grass Seed Mix	390.75	6	acres	\$2,344.50
Other Materials				
Herbicide	752.00	3	each	\$2,256.00
Erosion Fabric - Double Net	38.75	7	rolls	\$271.25
Erosion Fabric - Single Net	35.63	8	rolls	\$285.00
Coir Logs	62.50	25	each	\$1,562.50
Wooden Stakes	3.75	1,450	each	\$5,437.50
Rope	15.00	5	boxes	\$75.00
Shipping	275.00	2	each	\$550.00
Mileage	0.565	1,800	miles	\$1,017.00
Lodging & Per Diem	163.00	8	nights	\$1,304.00
<b>Task Subtotal:</b>				<b>\$141,703.75</b>

<b>4 Final Construction, Revegetation &amp; Eradication</b>		<b>Rate</b>	<b># of Unit</b>	<b>Units</b>	<b>Total Cost</b>
	Riparian Ecologist/Executive Director	50.00	84	hours	\$4,200.00
	Outreach & Communication Director	36.00	48	hours	\$1,728.00
	Conservation Coordinator	36.00	410	hours	\$14,760.00
	Project Technician	25.00	78	hours	\$1,950.00
	Lead Engineer	115.00	2	hours	\$230.00
	Engineer	105.00	10	hours	\$1,050.00
	Aquatic Ecologist	95.00	15	hours	\$1,425.00
	Engineering Technician	75.00	90	hours	\$6,750.00
	Herpetologist	55.00	8	hours	\$440.00
	Earthwork (Equipment & Labor)				
	Mob/Demob	2,000.00	1	each	\$2,000.00
	Riifle/Pool Creation	16.50	414	cy	\$6,834.30
	Stream Bank Improvements	16.50	234	lf	\$3,861.00
	Revegetation (American Conservation Experience)				
	Crew Leader	16.50	80	hours	\$1,320.00
	Crew (10 people)	9.50	800	hours	\$7,600.00
	Lodging - Revegetation Crew	45.00	8	nights	\$360.00
	Invasive Species Removal (American Conservation Experience) Spring 2016				
	Crew Leader 1	16.50	80	hours	\$1,320.00
	Crew 1 (5 people)	9.50	400	hours	\$3,800.00
	Crew Leader 2	16.50	80	hours	\$1,320.00
	Crew 2 (5 people)	9.50	400	hours	\$3,800.00
	Lodging - Invasive Species Crew	45.00	8	nights	\$360.00
	Mileage	0.565	1,800	miles	\$1,017.00
	Lodging & Per Diem	163.00	8	nights	\$1,304.00
				<b>Task Subtotal:</b>	<b>\$67,429.30</b>
<b>5 Conduct Monitoring</b>					
	Riparian Ecologist/Executive Director	50.00	83	hours	\$4,150.00
	Outreach & Communication Director	36.00	44	hours	\$1,584.00
	Conservation Coordinator	36.00	183	hours	\$6,588.00
	Project Technician	25.00	46	hours	\$1,150.00
	Lead Engineer	115.00	11	hours	\$1,265.00
	Engineer	105.00	11	hours	\$1,155.00
	Aquatic Ecologist	95.00	94	hours	\$8,930.00
	Engineering Technician	75.00	94	hours	\$7,050.00
	Botanist	85.00	105	hours	\$8,925.00
	Botanical Technician	30.00	90	hours	\$2,700.00
	Aquatic Ecologist	50.00	420	hours	\$21,000.00
	Herpetologist	55.00	230	hours	\$12,650.00
	Herps Technician	20.00	800	hours	\$16,000.00
	Zoologist	75.00	210	hours	\$15,750.00
	Supplies				
	Geomorphological Monitoring	150.00	2	each	\$300.00
	Vegetation Monitoring	100.00	3	each	\$300.00
	Marcroinvertebrate Monitoring/BioAssessment	290.00	3	each	\$870.00
	Herpetological Monitoring	150.00	3	each	\$450.00
	Large Manmal Inventory and Monitoring	200.00	2	each	\$400.00
	Equipment				
	Manmal Inventory & Monitoring - Motion Activated Camera	750.00	1	cameras	\$750.00
	Mileage	0.565	7,320	miles	\$4,135.80
	Lodging & Per Diem	163.00	72	nights	\$11,736.00
				<b>Task Subtotal:</b>	<b>\$127,838.80</b>

<b>6 Community Involvement &amp; Education</b>		<b>Rate</b>	<b># of Unit</b>	<b>Units</b>	<b>Total Cost</b>
Presentations, Media Coordination & Volunteer Recruitment					
	Riparian Ecologist/Executive Director	50.00	60	hours	\$3,000.00
	Outreach & Communication Director	36.00	657	hours	\$23,652.00
	Conservation Coordinator	36.00	237	hours	\$8,532.00
	Project Technician	25.00	198	hours	\$4,950.00
Informational & Interpretive Signs					
	Peavive Kiosk Display (~72" x 48")	1,950.00	1	each	\$1,950.00
	Interpretive Panels (~36" x 24")	2,962.50	2	each	\$5,925.00
<b>Task Subtotal:</b>					<b>\$48,009.00</b>
<b>7 Final Report</b>					
	Riparian Ecologist/Executive Director	50.00	15	hours	\$750.00
	Outreach & Communication Director	36.00	5	hours	\$180.00
	Conservation Coordinator	36.00	40	hours	\$1,440.00
	Project Technician	25.00	10	hours	\$250.00
	Lead Engineer	115.00	1	hours	\$115.00
	Engineer	105.00	1	hours	\$105.00
	Aquatic Ecologist	95.00	15	hours	\$1,425.00
	Engineering Technician	75.00	15	hours	\$1,125.00
	Botanist	85.00	25	hours	\$2,125.00
	Aquatic Ecologist	50.00	40	hours	\$2,000.00
	Herpetologist	55.00	20	hours	\$1,100.00
	Ornithologist	25.00	30	hours	\$750.00
	Zoologist	75.00	20	hours	\$1,500.00
	Graphic Designer (final report design & layout)	60.00	75	hours	\$4,500.00
	Supplies/Materials & Printing (Report printing)	60.00	30	each	\$1,800.00
<b>Task Subtotal:</b>					<b>\$19,165.00</b>
<b>5% Overhead</b>					<b>\$23,560.88</b>
<b><i>Watson Woods Preserve Restoration Project - Phase II Total:</i></b>					<b><i>\$494,779</i></b>

TASK # and short description		AWPF FUNDS REQUESTED						
		A	B	C	D	E	F	G
Do not write in shaded areas.		DIRECT LABOR COSTS	OTHER DIRECT COSTS	OUTSIDE SERVICES	CAPITAL OUTLAY	TOTAL PROJECT COSTS	ADMIN COSTS	TOTAL AMOUNT REQUESTED
						A+B+C+D=E	E * .05=F	E+F=G
1	Permits, Authorizations, Agreements	\$15,567.00	\$2,270.85	\$21,410.00		\$39,247.85	\$1,962.39	\$41,210.24
2	Develop Design Plans	\$6,582.00	\$581.95	\$20,660.00		\$27,823.95	\$1,391.20	\$29,215.15
3	Initial Construction, Revegetation & Eradication	\$26,262.00	\$20,670.25	\$94,771.50		\$141,703.75	\$7,085.19	\$148,788.94
4	Final Construction, Revegetation & Eradication	\$22,638.00	\$3,041.00	\$41,750.30		\$67,429.30	\$3,371.47	\$70,800.77
5	Conduct Monitoring	\$13,472.00	\$18,191.80	\$95,425.00	\$750.00	\$127,838.80	\$6,391.94	\$134,230.74
6	Community Involvement & Education	\$40,134.00			\$7,875.00	\$48,009.00	\$2,400.45	\$50,409.45
7	Final Report	\$2,620.00	\$1,800.00	\$14,745.00		\$19,165.00	\$958.25	\$20,123.25
<b>AWPF TOTALS:</b>		<b>\$127,275.00</b>	<b>\$46,555.85</b>	<b>\$288,761.80</b>	<b>\$8,625.00</b>	<b>\$471,217.65</b>	<b>\$23,560.88</b>	<b>\$494,778.53</b>

TASK# and short description		OTHER FUNDS (MATCHING)						
		A	B	C	D	E	F	G
Do not write in shaded areas.		DIRECT LABOR COSTS	OTHER DIRECT COSTS	OUTSIDE SERVICES <sup>1</sup>	CAPITAL OUTLAY	TOTAL PROJECT COSTS	ADMIN COSTS <sup>2</sup>	TOTAL AMOUNT REQUESTED
						A+B+C+D=E	E * 14%=F	E+F=G
1	Permits, Authorizations, Agreements		\$141.25			\$141.25	\$19.78	\$161.03
2	Develop Design Plans					\$0.00	\$0.00	\$0.00
3	Initial Construction, Revegetation & Eradication		\$203.40	\$32,592.00		\$32,795.40	\$4,591.36	\$37,386.76
4	Final Construction, Revegetation & Eradication		\$158.20	\$21,577.60		\$21,735.80	\$3,043.01	\$24,778.81
5	Conduct Monitoring		\$678.00	\$17,003.52	\$3,000.00	\$20,681.52	\$2,895.41	\$23,576.93
6	Community Involvement & Education					\$0.00	\$0.00	\$0.00
7	Final Report					\$0.00	\$0.00	\$0.00
<b>AWPF TOTALS:</b>		<b>\$0.00</b>	<b>\$1,180.85</b>	<b>\$71,173.12</b>	<b>\$3,000.00</b>	<b>\$75,353.97</b>	<b>\$10,549.56</b>	<b>\$85,903.53</b>

**Notes:**

1 ACE matching figures were calculated by subtracting the ACE hourly billing rate from the current IndependentSector.org national volunteer value of \$22.14. The result was then multiplied by hours served to arrive at the matching figure.

2 Prescott Creeks has calculated its administrative costs at 19%. Match represents the balance of administrative costs after accounting for the AWPf allowed 5%.

		<b>Watson Woods Riparian Preserve Restoration Project - Phase II</b>																							
		2014												2015											
Task	Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Notification of Funding																									
Contract Signed/Authorization to Proceed																									
<b>1</b>	<b>Permits, Authorizations, Agreements</b>																								
	Subcontracts																								
	SHPO																								
	US Army Corps of Engineers - 404 Permitting																								
	ADEQ - 401 Permitting																								
	USFWS Section 7																								
	Other																								
<b>2</b>	<b>Develop Design Plans</b>																								
	Channel Design																								
	Monitoring Design																								
<b>3</b>	<b>Initial Construction, Revegetation &amp; Eradication</b>																								
<b>4</b>	<b>Final Construction, Revegetation &amp; Eradication</b>																								
<b>5</b>	<b>Conduct Monitoring</b>																								
	Geomorphology																								
	Vegetation																								
	Herpetology																								
	Birds																								
	Macroinvertebrates																								
	Mammals																								
	Annual Reports																								
<b>6</b>	<b>Community Involvement &amp; Education</b>																								
	Council Presentation																								
	Public Presentations																								
	Media Coordination (Traditional & Social)																								
	Volunteer Recruitment																								
	Interpretive Signage																								
<b>7</b>	<b>Final Report</b>																								
	Final Report																								

<b>Watson Woods Riparian Preserve Restoration Project - Phase II</b>																								
Task	Date	2016												2017										
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Notification of Funding																								
Contract Signed/Authorization to Proceed																								
<b>1</b>	<b>Permits, Authorizations, Agreements</b>																							
	Subcontracts																							
	SHPO																							
	US Army Corps of Engineers - 404 Permitting																							
	ADEQ - 401 Permitting																							
	USFWS Section 7																							
	Other																							
<b>2</b>	<b>Develop Design Plans</b>																							
	Channel Design																							
	Monitoring Design																							
<b>3</b>	<b>Initial Construction, Revegetation &amp; Eradication</b>																							
<b>4</b>	<b>Final Construction, Revegetation &amp; Eradication</b>																							
<b>5</b>	<b>Conduct Monitoring</b>																							
	Geomorphology																							
	Vegetation																							
	Herpetology																							
	Birds																							
	Macroinvertebrates																							
	Mammals																							
	Annual Reports																							
<b>6</b>	<b>Community Involvement &amp; Education</b>																							
	Council Presentation																							
	Public Presentations																							
	Media Coordination (Traditional & Social)																							
	Volunteer Recruitment																							
	Interpretive Signage																							
<b>7</b>	<b>Final Report</b>																							
	Final Report																							

# **SUPPLEMENTAL INFORMATION**

## STATE HISTORIC PRESERVATION OFFICE Review Form

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

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

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

### Please answer the following questions:

1. Grant Program: Arizona Water Protection Fund Commission FY 2014 Cycle
2. Project Title: Watson Woods Riparian Preserve Restoration Project Phase II
3. Applicant Name and Address: Prescott Creeks Preserv. Assoc., PO Box 3004, Prescott, AZ 86302
4. Current Land Owner/Manager(s): City of Prescott
5. Project Location, including Township, Range, Section: 14N, 2W, Sections 23, 24, 26
6. Total Project Area in Acres (or total miles if trail): 126 acres
7. Does the proposed project have the potential to disturb the surface and/or subsurface of the ground?     YES     NO
8. Please provide a brief description of the proposed project and specifically identify any surface or subsurface impacts that are expected: Surface impacts in the form of bank sloping, excavation of pools within the Granite Creek channel, revegetation, noxious weed eradication, installation of interpretive signs and/or similar activities will be part of the project.
9. Describe the condition of the current ground surface within the entire project boundary area (for example, is the ground in a natural undisturbed condition, or has it been bladed, paved, graded,

etc.). Estimate horizontal and vertical extent of existing disturbance. Also, attach photographs of project area to document condition: The ground surface was disturbed by sand and gravel mining operations during the mid-20th century. Over the past five years Watson Woods Riparian Preserve has undergone extensive restoration affecting approximately 50 of the 126 acres. The specific sites for the impacts described above were disturbed as part of the restoration process.

10. Are there any known prehistoric and/or historic archaeological sites in or near the project area?  
 YES    NO

11. Has the project area been previously surveyed for cultural resources by a qualified archaeologist?  
 YES    NO    UNKOWN

*An Archeological Survey of Watson Woods, A Nature Preserve in Granite Creek, City of Prescott, Prescott Arizona. ASM Permit No. 1995-94BL*

*REPORT ON FILE WITH SHPO.*    *REPORT ON FILE WITH AWPf.*

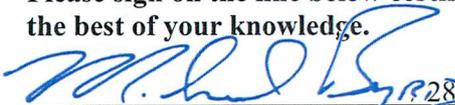
12. Are there any buildings or structures (including mines, bridges, dams, canals, etc.), which are 50-years or older in or adjacent to the project area?    YES    NO

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

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

**If YES, name of the district:** N/A

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

 28 Aug 2013  
 Applicant Signature                      /Date

Michael Byrd  
 Applicant Printed Name

<b>FOR SHPO USE ONLY</b>	
SHPO Finding: <input type="checkbox"/> Funding this project will not affect historic properties. <input type="checkbox"/> Survey necessary – further GRANTS/SHPO consultation required ( <i>grant funds will not be released until consultation has been completed</i> ) <input type="checkbox"/> Cultural resources present – further GRANTS/SHPO consultation required ( <i>grant funds will not be released until consultation has been completed</i> )	
SHPO Comments	
For State Historic Preservation Office:	Date:

## STATE OF ARIZONA HISTORIC PROPERTY INVENTORY FORM

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

### PROPERTY IDENTIFICATION

For properties identified through survey: Site No. \_\_\_\_\_ Survey Area: \_\_\_\_\_

Historic Names (enter the name(s), if any that best reflect the property's historic importance): \_\_\_\_\_

Address: \_\_\_\_\_

City or Town: \_\_\_\_\_  Vicinity County: \_\_\_\_\_ Tax Parcel No.: \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ Section: \_\_\_\_\_ Quarters: \_\_\_\_\_ Acreage: \_\_\_\_\_

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

UTM Reference – Zone: \_\_\_\_\_ Easting: \_\_\_\_\_ Northing: \_\_\_\_\_

USGS 7.5' quadrangle map: \_\_\_\_\_

ARCHITECT: \_\_\_\_\_  not determined  known Source: \_\_\_\_\_

BUILDER: \_\_\_\_\_  not determined  known Source: \_\_\_\_\_

CONSTRUCTION DATE: \_\_\_\_\_  known  estimated Source: \_\_\_\_\_

### STRUCTURAL CONDITION

Good (well maintained; no serious problems apparent)

Fair (some problems apparent) Describe: \_\_\_\_\_

Poor (major problems; imminent threat) Describe: \_\_\_\_\_

Ruin/Uninhabitable

### USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: \_\_\_\_\_

Sources: \_\_\_\_\_

### PHOTO INFORMATION

Date of photo: \_\_\_\_\_

View Direction (looking towards): \_\_\_\_\_

Attach a recent photograph of property in this space.  
Additional photographs may be appended.

### SIGNIFICANCE

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

- A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: \_\_\_\_\_
- B. PERSONS – List and describe persons with an important association with the building: \_\_\_\_\_
- C. ARCHITECTURE – Style: \_\_\_\_\_  no style
- Stories: \_\_\_\_\_  Basement Roof Form: \_\_\_\_\_
- Describe other character-defining features of its massing, size and scale: \_\_\_\_\_

**INTEGRITY**

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

Location -  Original Site  Moved: Date: \_\_\_\_\_ Original Site: \_\_\_\_\_

**DESIGN**

Describe alterations from the original design, including dates: \_\_\_\_\_

**MATERIALS**

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

Walls (structure): \_\_\_\_\_

Walls (sheathing): \_\_\_\_\_

Windows: \_\_\_\_\_

Roof: \_\_\_\_\_

Foundation: \_\_\_\_\_

**SETTING**

Describe the natural and/or built environment around the property: \_\_\_\_\_

How has the environment changed since the property was constructed? \_\_\_\_\_

**WORKMANSHIP**

Describe the distinctive elements, if any, of craftsmanship or method of construction: \_\_\_\_\_

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

Individually Listed;  Contributor;  Non-contributor to \_\_\_\_\_ Historic District

Date Listed: \_\_\_\_\_  Determined eligible by Keeper of National Register (date: \_\_\_\_\_)

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

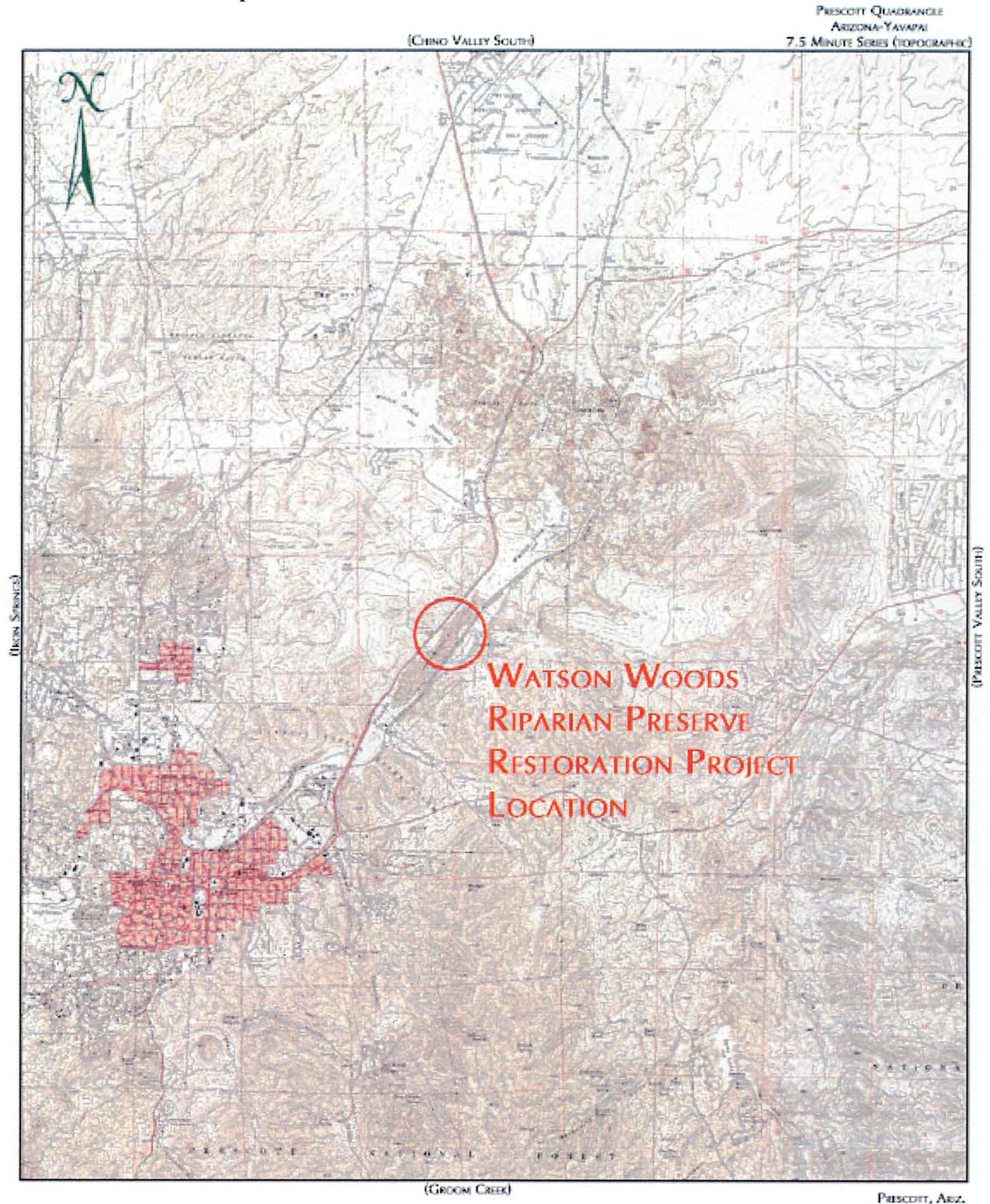
Property  is  is not eligible individually.

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

More information needed to evaluate.

If not considered eligible, state reason: \_\_\_\_\_

### SHPO Location Map



Watson Woods Riparian Preserve shown on USGS topos. The Preserve is NE of Prescott, AZ. City of Prescott is the landowner.

SHPO Photos



**SHPO Photo 1:** Rock Plug in Reach 1. This structure was repaired in 2010. Soil was spread over the surface to encourage vegetation growth.



**SHPO Photo 2:** Channel cross-section 2 photo taken September 2012 showing straight run without riffing or pools.

**Key Personnel**

**Prescott Creeks - Personnel<sup>4</sup>**

<b>Michael Byrd</b>	<b>Executive Director</b>	<b>Prescott Creeks</b>
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Michael’s interest and attention to creeks dates to early childhood when he played along the banks Turkey Run in a Midwestern park. As Executive Director, Michael advances the organization's mission, supports the all-volunteer board of directors, and directs the organization’s professional staff. Prior to his appointment as Executive Director in 2003, he was the first Watson Woods Riparian Preserve Manager for 7 years, and a volunteer. Five years in private consulting focused on delivering riparian-based research, education, and restoration projects for clients in Arizona followed receipt of his B.A. in Environmental Conservation from Prescott College. Michael also brings experience as a Wilderness Ranger, a painter, and as a landscaper to his work with Prescott Creeks.

<b>Ann-Marie Benz</b>	<b>Outreach &amp; Communication Director</b>	<b>Prescott Creeks</b>
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Helping people learn about and care for creeks is the most fulfilling job around, especially for someone who grew up without flowing creeks. As Outreach and Communications Director, Ann-Marie is the primary contact between Prescott Creeks and the community. Previous to that position she was the Watershed Program Coordinator for Prescott Creeks. She has been involved in project management for water quality improvement projects, developed community outreach programs, and organizes grant reporting and billing. Ann-Marie studied Watershed Management and Sustainable Community Development at Prescott College. Prior to changing to watershed work, Ann-Marie spent a decade doing job cost accounting for construction companies.

<b>TBD</b>	<b>Conservation Coordinator</b>	<b>Prescott Creeks</b>
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Position currently vacant

<b>TBD</b>	<b>Program Technician</b>	<b>Prescott Creeks</b>
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Position currently vacant

<b>Subcontractors<sup>5</sup></b>		
Stephanie Yard, P.E.	Civil Engineer	Natural Channel Design
Mark Wirtanen	Riparian Biologist & Engineering Tech.	Natural Channel Design
Marc Baker, Ph.D.	Botanist	Southwest Botanical Research
Erika Nowak, Ph.D.	Herpetologist	Northern Arizona University
Patrice Spindler	Aquatic Ecologist	Patrice Spindler
Karen O’Neil	Ornithologist	Prescott Audubon Society
Mark Garff	Senior Landscape Architect	The Watershed Company
Mariana Altrichter	Wildlife Biologist	Mariana Altrichter

**Prescott Creeks – Board of Directors**

Karen O’Neil	Board Chair
Joel Hiller	Director
Ed Lutz	Director
Douglas Bunch	Director
Paula Cooperrider	Director
Matthew Einsohn	Director

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<sup>4</sup> Résumés attached below.

<sup>5</sup> Résumés/Vitae attached below.





## Ann-Marie Benz

12/7/2012



444 Campbell St.  
Prescott, AZ 86301  
(928) 830-1780  
benzannmarie@gmail.com

### OBJECTIVE

To use my strong organizational skills, communications background and ability to work well with people in a company that makes a difference in our community and for the environment.

### EXPERIENCE

Outreach and Communication Director | Prescott Creeks  
September 2009 - Present

As the Outreach and Communication Director, I am responsible for planning and implementing outreach, education, and community involvement in Prescott Creeks' projects. This has encompassed annual media planning, community and media outreach, and working with our corps of volunteers and various groups to promote and carry out our mission. Over the past seven years I oversaw the revitalization of the Granite Creek Cleanup, bringing the number of people involved from 100 to over 650 annually and trash removed up to 10 tons per event. I developed programs promoting environmental literacy through art, including One Man's Treasure, an upcycled art show and auction, and Fill the Recyclasaurus, a 9'x13' traveling recyclables-eating upcycled dinosaur. Social media marketing has doubled the number of community members we connect with on a regular basis. I have been involved in writing grants of over \$2 million. I also continue to do the billing and reporting for multiple grants and a variety of agencies.

Watershed Program Coordinator | Prescott Creeks  
February 2005 – September 2009

In this position I was responsible for the development, implementation, coordination and management of the watershed programs. To move us into water quality monitoring, I developed the initial water quality monitoring program and the necessary supporting planning, including the *Sampling and Analysis Plan* and the *Quality Assurance Project Plan*. I was the Project Manager for the design and construction of a four-acre stormwater basin associated with our Watson Woods Riparian Preserve. Working with other staff members, we developed the foundation for the Granite Creek Watershed Improvement Council, a group dedicated to a collaborative planning process involving stakeholders. Some of my other projects

included developing and overseeing the installation of local stormwater drain marking program, and connecting to local schools to have watersheds become an integral part of their educational planning.

Consultant | **Self Employed**

March 2004 – January 2005

Designed job-costing programs for heavy construction companies. Worked with companies to develop programs that integrated the various aspects of bookkeeping for project management and planning.

Job Cost Accountant | **URS / Banshee Construction**

September 2000 – March 2004

Processed payroll for over one hundred employees, including seasonal, salary, hourly union, and non-union. Paid and tracked commercial accounts of approximately half a million dollars per week. Initiated program with suppliers for prompt pay discounts, with an average of 2% savings. Created a job-costing program that combined payroll, accounts payable, and equipment utilized. Developed and oversaw the implementation of job cost procedures to track and fully account for all costs associated with projects.

**PROFESSIONAL TRAINING**

National River Rally 2005, 2006, 2007, 2009, 2010, 2011 & 2012

River Action Day 2006, 2007 & 2008

StormCon 2005, 2006 & 2007

White Water Rescue, CPR, and First Aid certified

San Geronio Wilderness Assoc. trails maintenance training

Bradshaw Mountain Wildlife animal rescue and care training

**SKILLS & ACTIVITIES**

Grant Writing individually and as part of a team totaling over \$2,000,000

City of Prescott Water Conservation & Safe Yield Committee

Dexter Neighborhood Steering Committee

Yavapai Big Brothers Big Sisters

Northpoint Community Action Team Board Member

**INTERESTS & HOBIES**

Kayaking

Motorcycling

Mountain Biking

Hiking

Climbing

**EDUCATION**

**Prescott College**

Studied Watershed Management and Sustainable Community Development.

## **Natural Channel Design, Inc. (NCD): Technical Subcontractor**

Natural Channel Design, Inc. (NCD) will be subcontracted to provide technical assistance with this project. NCD is a consulting engineering firm specializing in education, research, assessment, and restoration design of natural stream channels in the arid southwest. NCD combines the geomorphic approach to channel assessment and design with traditional engineering methods. The geomorphic or natural channel approach is based on 40 years of empirical work by Luna Leopold and others and includes the stream classification and assessment techniques developed by David Rosgen. The approach seeks to assess and restore stream channels by moving them toward their potential stable form. Bioengineering practices utilizing native plant and structural materials are extensively incorporated in restoration design.

### **Key Technical Personnel**

**Stephanie Yard, P.E.** Civil Engineer. Ms. Yard will serve as assistant project engineer. She will oversee fieldwork, data assessment, and project design.

**Mark Wirtanen**, Riparian Ecologist/Engineering Technician. Mr. Wirtanen will serve as assistant to the project engineers. He will provide technical maps and assist field coordination.

### **Natural Channel Design, Inc.**

NCD has extensive experience in stabilization and enhancement of natural stream channels in the arid southwest and has applied that expertise to design and permitting of projects for federal and state agencies, tribal entities, municipalities, and private developers. NCD staff has experience in the Little Colorado having prepared the Little Colorado River Concept Plan and the assessment, design, and construction supervision for the AWPf LCR demonstration riparian restoration project downstream. NCD has professional engineering licenses in Arizona and Utah.

#### **Specific Expertise**

- Stream enhancement/restoration for riparian, aquatic, stability, and water quality objectives.
- Stream bank protection and stability.
- Enhancements for riparian and aquatic species.
- Research into stream morphology and related aquatic, riparian resources.
- Assessments of stream stability and productivity
- Permitting for stream enhancement and transportation projects under sections 404 and 401 of the Clean Water Act.
- Engineering design of water diversions, low water road crossings, and other transportation infrastructure relating to stream channels.

### **Principal**

**Stephanie Yard, P.E.** Stephanie is a licensed civil engineer in Arizona, Alaska, New Mexico, Nevada, and Utah and is the owner of Natural Channel Design, Inc. She has more than 20 years of professional experience in natural resource planning and conservation engineering. Stephanie has worked for a site development civil consulting firm, served as an Area Engineer with the USDA Natural Resources Conservation Service, and currently owns and manages Natural Channel Design where she provides leadership to the firm in project planning, design and implementation. She has extensive experience in hydrology, hydraulics, drainage, erosion control, irrigation, streambank stabilization, and riparian and wetland restoration and enhancement in the arid southwest and has applied that expertise to design and permitting of projects for federal and state agencies, tribal entities, municipalities, and private

landowners. She provides training in conservation planning and has conducted a variety of training workshops on the natural channel approach to stream assessment and restoration. Stephanie is a native of Flagstaff Arizona and spends a portion of each year working in Southeast Alaska.

*Technical Education and Training:*

Ms. Yard has a degree in Civil Engineering from Northern Arizona University and has completed the Level I – IV workshops in the inventory, classification, assessment, and design of natural channels from David Rosgen at Wildland Hydrology. She has received formal NRCS training in wetland restoration, bioengineering, and natural resource planning and application. Ms. Yard is a licensed Civil Engineer in the State of Arizona (#26889).

**Mark Wirtanen** serves as a field manager of Natural Channel Design, Inc. for riparian and geomorphic studies of the rivers of the arid southwest. He has performed stream assessments and assisted in restoration designs for channels in Arizona, New Mexico and Utah. He has a degree in wildlife biology and a broad knowledge of field methods as well as digital terrain software and CAD systems. Over the past four years he has conducted basic research into natural channels of Arizona, New Mexico, and the Navajo Nation and co-authored a report on regional relationships of bankfull stage on stream channels in New Mexico and the Navajo Nation. He has conducted training workshops utilizing the geomorphic approach to natural channel morphology and assessment. Mark lives in Flagstaff, Arizona with his wife, 7-year-old daughter and 1-year-old son.

*Technical Education and Training:*

Mr. Wirtanen has a degree in Wildlife Biology from Northern Arizona University and has completed the Level I – III workshops in the inventory, classification, and assessment of natural channels from David Rosgen at Wildland Hydrology.

## VITAE

### MARC A. BAKER, Ph.D.

1217 GRANITE CREEK LANE, CHINO VALLEY, ARIZONA 86323

TEL: (928) 636-0252; (928) 713-7009; e-mail: cholla@northlink.com;

marc.baker@asu.edu

### RESEARCH INTERESTS

Evolution and systematics of *Echinocereus*, *Opuntia*, and *Cylindropuntia* (Cactaceae); the role of polyploidy, hybridization, asexual reproduction, and geographic isolation in evolution. Flora, plant community dynamics, and ecology of the Southwestern United States, especially within the Sonoran Desert Biome; rare plant biology;

### RESEARCH SKILLS

Transmission electron microscopy, scanning electron microscopy, thin-layer chromatography, high-performance liquid chromatography, cytological analysis of chromosomes of root-tips and microsporogenesis, herbarium techniques, ethnographic techniques, GPS, vegetation sampling and plant identification, especially for Arizona, Baja California, California, and New Mexico, computer data base systems, GIS, and graphics.

### INSTITUTIONAL AFFILIATIONS

Southwest Botanical Research (duns no. 80-367-5776), Chino Valley, AZ: sole proprietor

Graduate Advisor, Prescott College, Prescott, Arizona

Adjunct Professor, Arizona State University, Tempe, Arizona

Native Plant Law Technical Advisory Board, Phoenix, AZ: member

### ORGANIZATIONAL MEMBERSHIPS

Botanical Society of America  
International Association of Plant Taxonomists  
Arizona-Nevada Academy of Sciences  
Arizona Riparian Council  
California Botanical Society  
California Native Plant Society

## EDUCATION

Ph.D., Botany (Systematic Botany), May, 1985, Arizona State University Tempe, Arizona.  
Dissertation: Evolution of a hybrid polyploid complex in *Opuntia*, subgenus *Cylindropuntia* (Cactaceae).

M.A., Biology (Systematic Botany and Ethnobotany), June, 1980, Humboldt State University, Arcata, California. Thesis: Ethnobotany of the Yurok, Karok, and Tolowa Indians of Northwest California.

B.A., Botany, June, 1975, San Jose State University, San Jose, California.

A.A., Forestry, June, 1972, Bakersfield Community College, Bakersfield, California.

Foreign Languages: Spanish

## BOTANICAL EXPERIENCE

1988 to present. Owner of Southwest Botanical Research. Consulting services that include Biological Assessments and Evaluations and the collection, identification, survey, and other types of research on vascular plants of Arizona, California, Nevada, and New Mexico.

1995 to present. Botanical consultant for Environet, Inc., Phoenix, Arizona. Projects include surveys for special status species, and Biological Assessment and Evaluations. Principle contact: Jill Himes, tel: (602) 438-0318.

1997-2002. Botanical consultant for Ecosystems Management, Inc. Projects include sensitive plant surveys for the Navajo Transmission line, Arizona/ New Mexico; sensitive plant survey for the Pittsburgh & Midway Coal Mine expansion near Ratón, New Mexico; and B.I.A. range surveys for the Navajo Partition Land, east of Flagstaff, AZ; range analysis for the Roswell BLM District, Roswell, NM. Principle contact: Bill Hevron, tel: (505) 884-8300.

1997 to 2002. Botanical consultant for Biozone, Inc., Prescott, Arizona. Projects include Vegetation characterization of the Watson Woods Riparian Preserve, Vegetation Characterization of the Walnut Creek Research and Learning Center, Survey for T&E species for the Hopi Reservation, and surveys.

1998. Biological consultant for Mojave Engineering Associates, Inc. Projects include Biological Assessment and Evaluations.

1994-1999. Botanical consultant for Johnson Associates Inc. Owner: Robert Johnson, tel: (408) 897-2473; projects have included biological surveys for housing developments and land fills.

1995. Botanical consultant for Hughes Environmental Consultants. Project included pipeline right-of-way Desert tortoise and botanical survey near Bullhead City, AZ and pipeline right-of-way botanical survey near Farmington, NM.

Aug 1990-1996. Botanical consultant for SWCA Associates. Subcontract duties included plant identification, vegetation mapping and vegetation volume sampling for ASARCO, Kearny, Arizona; vegetation sampling for the San Tan Tortoise Survey, Maricopa County, Arizona; sensitive plant survey for the Wickieup-Bagdad gas pipeline, vegetation mapping for the Phelps Dodge Mine Expansion Project, Morenci and Safford, AZ, the distribution and taxonomy of *Echinocereus arizonicus* and related taxa in Arizona and New Mexico; Project coordinators: Jim Tress, Tina Lee, Scott Mills, tel: 602-325-9141.

1993-1994. Botanical consultant for Resources Management International (RMI), including a plant survey for the Wickieup-Bagdad proposed Citizens' gas pipeline, project coordinator: Catherine LeBlanc.

Jan 1991-January 1995. Botanical consultant for the Department of Anthropology, Contract Archeology, Arizona State University. Research included vegetation mapping and floristic analysis of the Tonto Basin, Arizona. Project coordinator: Glen Rice, tel: 602-479-2406, 965-7181.

Aug 1993-present. Botanical consultant for Kiva Biological Consulting during the Arizona Game & Fish Desert Tortoise Survey (contract # G30061-B). Study includes plant identification and vegetation sampling. Project coordinator: Pete Woodman.

1991-1992. Botanical consultant for the Army Corps of Engineers. Duties include plant collection and identification for the construction of an herbarium of Arizona wetlands plants. Project coordinator: Karen Reichhardt.

1988-1991. Botanical consultant for Ruffner Associates. Subcontracts included a three year study of the sensitive plant species of Organ Pipe Cactus National Monument; *Tumamoca* surveys for private firms; and Vegetation mapping in southern California for the Riverside Water District.

1985-1987. New York Botanical Garden, Chief Investigator, *Plant Resources of the Ecuadorean Amazon* Project. Duties included creating an integrated program of teaching and ethnography with the Shuar (Jivaro) culture.

#### CONTRACTS AND RESEARCH AWARDS

2005. Plant surveys for the Lincoln National Forest. Alamogordo, New Mexico.

2005. Floristic study of Rancho del Cielo, Pima County, Arizona. U. S. Bureau of Reclamation. Phoenix, Arizona. (Order no. 05PG321037).

2005. A phenetic analysis of the Acuña cactus, *Echinomastus erectocentra* var. *acunensis* and its relatives: *E. erectocentrus* var. *erectocentrus*, and *E. johnsonii*. Arizona Department of Game & Fish, Phoenix, Arizona.

2004. Geographic distribution and DNA analysis of *Coryphantha robustispina* ssp. *robustispina*. Arizona Department of Game & Fish, Phoenix, Arizona.

2004. Five-year monitoring study for the Pima pineapple cactus (*Coryphantha robustispina* ssp. *robustispina*). U. S. Bureau of Reclamation. Phoenix, Arizona.

2003. Rare plant surveys for the Coronado National Forest, Tucson, Arizona. (Order no. 43-8197-3-0038, \$12,200)

2003. Botanical survey of the Timberon/Culp Peak Fuel Reduction Project. Lincoln National Forest, Alamogordo, New Mexico. (Order No. 0308-03-10).

2003. Elucidation of the intraspecific taxonomy of *Coryphantha scheeri* using multivariate techniques. A study in cooperation with the U. S. Fish and Wildlife Service, Tucson, Arizona.

2003. Re-measurement of riparian transects along the lower Verde River. Rocky Mountain Forest and Range Experimental Station.

2002-3. Status report of *Cylindropuntia multigeniculata*, including further morphometric studies. U. S. Fish and Wildlife Service, Las Vegas, Nevada.

2002-3. Monitoring of *Coryphantha scheeri* for the Arizona-Sonora Desert Museum, Tucson, Arizona.

2001. Rare Plant and noxious weed survey of the Bradshaw Ranger District. Prescott National Forest. (order no. 43-94TZ-1-0164; \$15,800)

2002. Survey and documentation of noxious weeds for the Coconino County Department of Public Works, Flagstaff, Arizona. (\$6,100).

2002. Range analysis for the Chino Valley Ranger District (Prescott National Forest), Chino Valley, Arizona.

2001. Botanical surveys and monitoring for the Scott Able Fire, Sacramento Ranger District, Lincoln National Forest, New Mexico. (\$54,000).
2001. Geographic survey of the a new species of *Leptodactylon* from Arizona. Prescott National Forest. (\$2,500).
2001. Re-measurement of riparian transects along the upper Verde River and its tributaries. Rocky Mountain Forest and Range Experimental Station (\$18,000).
2001. Riparian vegetation monitoring for the Hubbell Trading Post National Historic Site, Ganado, Arizona.
2000. Re-measurement of riparian transects along the upper Verde River. Rocky Mountain Forest and Range Experimental Station (REC206, \$5,000).
2000. Surveys and autecology of the Pima Pineapple Cactus (*Coryphantha scheeri*). Bureau of Reclamation. (OOPG321054; \$14,123.23).
2000. Vegetation mapping of the Peoria Planning Area. Maricopa County Water Conservation District, Phoenix, Arizona (\$18,000). [study included mapping 40,000 acres of Sonoran Desert vegetation).
1999. Plant Status Reports for five plant species (*Conioselinum mexicanum*, *Erigeron arisolius*, *Eupatorium bigelovii*, *Lupinus huachucanus*, and *Stellaria porsildii*). Coronado National Forest (43-8197-9-0099, \$2,500).
1999. Vegetation mapping of the greater Phoenix and Tucson Metropolitan Planning Areas as a part of the CAP water reallocation EA. Bureau of Reclamation, Phoenix, Arizona (\$55,000). [study includes mapping 1.2 million acres of Sonoran Desert vegetation]
1999. Vegetation mapping of the Santa Cruz River Flood Plain, Pima Co., Arizona. Bureau of Reclamation, Phoenix. (Contract no. 99320500061, \$9,750).
1999. Weed survey for the Coronado National Forest, Tucson, Arizona. (contact nos. 43-8167-8-0089, 43-8197-9-0077, \$21,350, \$4,600).
1999. Rare plant survey for the Lincoln National Forest. Alamogordo, New Mexico. (Contract no. 443-7512-8-0081, \$1,850).
1998. Multivariate analysis and DNA study of the Blue Diamond Cholla and related taxa. U.S.F.W.S., Reno, Nevada.
1998. Riparian vegetation inventory for the middle Verde River, Rocky Mountain Research Station (contract no. 43-8167-8-0069, \$5,000).
1998. Range analysis for the Prescott National Forest (contract no. 43-8167-8-0089, \$23,000).
1998. Riparian vegetation baseline for the Hubbell Trading Post National Historic Site (\$2,900).
1998. Floristic analysis of the Walnut Creek Riparian Preserve.
1998. Cactus research at Carlsbad National Park (contract no. 1443-cx-7170-98-001, \$10,000).
1997. Range analysis for the Prescott National Forest (contract no. 43-8191-7-0106, \$8,600).

1997. Riparian vegetation inventory for the upper Verde River, Prescott National Forest. (contract no. 43-8191-7-0104, \$5,000).
1996. Vegetation characterization of the Watson Woods Riparian Preserve, Prescott, Arizona (\$12,761).
1996. Identification and annotation of the Yavapai College Herbarium (YCH). Yavapai College, Prescott, Arizona (\$6,270).
1996. Plant identification for the USDA, Forest Service Intermountain Research Station, Ogdon, Utah.
1995. Plant inventory in the Wet Beaver Creek Wilderness, Arizona. Coconino National Forest, U. S. Forest Service P. O. 43-8167-5-033 (6,800).
1995. Vegetation characterization of Cooks Lake, Arizona. U. S. Bureau of Reclamation contract No. 1425-5-PG-32-03630 (14,400).
1995. Botanical survey of the China Dam Grazing Allotment, Chino Valley Ranger District, Prescott National Forest, Chino Valley, Arizona. Share-Cost Agreement No. CCS-09-01-95-0127-MC-26801 (\$37,616).
1995. Survey for endangered or candidate plant taxa of proposed National Forest land exchanges within the Verde Valley, Yavapai County, Arizona. Coconino National Forest contract No. 43-8167-5-0171 (\$2,450).
1994. Botanical survey of the Limestone Grazing Allotment, Chino Valley Ranger District, Prescott National Forest, Chino Valley, Arizona. Share Cost Agreement No. CCS-09-94-076-26201 (\$36,810)
1994. Reproductive status of *Vauquelinia californica* ssp. *pauciflora*. Contract from the Arizona Department of Agriculture, Phoenix, Arizona through the Arizona State University Department of Botany, ASU No. 94-0925 (4,000).
1994. Nutrioso milk-vetch (*Astragalus nutriosensis*) status survey. Contract from the Arizona Department of Agriculture, Phoenix, Arizona (\$4,000).
1993. Botanical survey of the Camp Wood, Williamson Valley, Yolo North, and Yolo South grazing allotment of the Chino Valley Ranger District, U. S. Forest Service, Chino Valley, Arizona. Contact No. 43-8191-3-0132 (\$22,292).
1992. Prescott National Forest. Botanical Survey of the Woodchute, Juniper Mesa, Sycamore Canyon and Apache Creek Wilderness Areas. Contact No. 43-8191-2-0221 (\$17,797).
1992. U. S. Army Corps of Engineers. Construction of a Arizona Riparian plant reference collection. Contract No. DACW09-92-M-0103 (\$2,500).
1991. U. S. Army Corps of Engineers. Construction of a Arizona Riparian plant reference collection. Contract No. DACW09-91-M-0342 (\$2,500).
1982. Research assistantship, cytogenetic analysis of *Cowania* and *Fallugia* (Rosaceae). The feasibility of host range expansion in nitrogen\_fixing non\_legumes. Arizona State University Research Fund 521475, and National Science Foundation grant # TCM\_8204885. Tempe, Arizona.

1981. Research assistantship, alkaloid analysis of *Opuntia* (Cactaceae). Arizona State University, Tempe, Arizona.
1980. Inventory of the rare and endangered species of Six Rivers National Forest. United States Forest Service contract, Eureka, California.
1979. Distribution of the rare and endangered plant species, *Arabis mcdonaldiana*. United States Forest Service contract, Eureka, California.
- 1978-1979. Sensitive species inventories for proposed timber sales. Bureau of Indian Affairs; Eureka, California.
1978. Autecology of the rare plant species, *Pityopus californicus*. United States Forest Service contact. Eureka, California.

#### TEACHING AND RELATED EXPERIENCE

- 1996 to present. Graduate advisor for Prescott College, Prescott, Arizona.
1996. Short courses in plant identification for the U. S. Forest Service Intermountain Research Station and the Prescott National Forest.
- 1987-1997. Independent study advisor for Prescott College, Prescott, Arizona.
1986. Lecturer. Plant systematics and tropical dendrology. Ministry of Agriculture and Instituto Normal Bilingue Intercultural Shuar, Ecuador.
- 1980-1982. Lab instructor. Cytogenetics, one semester; Arizona Flora, three semesters; Plants, Pleasures, and Poisons, one semester. Arizona State University.
- 1976\_1978. Lab instructor. General Botany, three quarters; Plant Systematics; Plants and Man. Humboldt State University.
- 1973-1975. Technical assistant. Plant Anatomy; Plant Morphology; Plant Taxonomy. San Jose State University.

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- Baker, M. A. & T. M. Wright. 1995. Survey for endangered or candidate plant taxa of proposed National Forest land exchanges within the Verde Valley, Yavapai County, Arizona. 20pp., illust.
- Baker, M. A. & T. M. Wright. 1995. Botanical survey of the Limestone Grazing Allotment, Chino Valley Ranger District, Prescott National Forest, Arizona. 89pp., illust.
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- REFEREED PUBLICATIONS**
- Baker, M. A. 2006. Circumscription of *Echinocereus arizonicus* subsp. *arizonicus*. Phenetic analysis of morphological characters in section *Triglochidiatus* (Cactaceae), part II. Madroño, in press.
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D. J. Pinkava, J. P. Rebman, and M. A. Baker. 1999. Chromosome numbers for some cacti of Western North America VII. Haseltonia no. 6:32-41.

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## PROFESSIONAL REFERENCES

Dr. Donald J. Pinkava, Professor of Botany. Director of the herbarium. Department of Botany and Microbiology, Arizona State University, Tempe, Arizona, 85287. (602) 965-3179.

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## **EDUCATION**

- Ph.D., School of Renewable Natural Resources, University of Arizona. Major in Natural Resources and minor in Cultural Anthropology. 2005.
- M.Sc., Regional Program for Mesoamerica and the Caribbean, National University of Costa Rica. Wildlife Conservation and Management. 1997.
- BS (equivalent to a US M.Sc.), Natural Sciences School, National University of Cordoba, Argentina. Biological Sciences. 1994.

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## **TEACHING experience**

- Prescott College, Arizona. Master of Arts Program. Graduate Mentor. 2010-present.
- Prescott College, Arizona. Environmental Studies and Cultural & Regional Studies. Instructor 2010-2012.
  - Globalization and Environment in Latin America
  - Urban-wildland interface
  - Community-based Conservation in Costa Rica
  - Conservation of Biodiversity and Indigenous Cultures in Mexico
- University of Redlands, Environmental Studies Center. Assistant professor. 2006-2010.
  - Restoring The Earth
  - Living Green
  - Development and Environment in Latin America
  - Ecology for Environmental Scientists
  - Sustainable Development in Latin America
  - Conservation in Practice
  - Community organization and Conservation in Costa Rica
- University of Arizona. 2004 - 2005.
  - TA Molecular and General Biology.
- University of Arizona. June 2003, 2005.
  - Field course: Tropical biology & nature photography in Costa Rica.
- OTS (Organization of Tropical Studies). June 2000.
  - TA Tropical Biodiversity.
- OTS (Organization of Tropical Studies). January-March 2000.

- TA Tropical Ecology and Conservation.
- WWF, National University of Costa Rica. 1999.
  - Conservation & Ecology of Oceanic Islands. Coco's Island, Costa Rica.
- Córdoba Committee on Nature Conservation. 1990-1993.
  - Environmental Education.
- United Nations Environmental Program. 1989-1992.
  - Elementary & High School Environmental Education.

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### research experience

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- Co-principal investigator: Chacoan peccary *Catagonus wagneri* assessment of distribution and conservation status in Argentina, Bolivia and Paraguay. Present.
- Co-principal investigator: Experimental reintroduction of collared peccary (*Pecari Tajacu*) in Ibera natural reserve, Argentina. Funded by *The Conservation Land Trust*. 2011-present.
- Principal investigator: Effects of the structural adjustment policies on biodiversity and local peasants' livelihoods in the Argentine Chaco. 2009-present.
- Principal investigator: Workshops for training local governmental agents working with wildlife, forests and protected areas in Northern Argentina. Funded by *US Fish & Wildlife Service*. 2010.
- Principal investigator: Assessment of conservation status of endangered species in the Argentine Chaco for the Global Mammal Assessment. Funded by *International Union for the Conservation of Nature (IUCN)*. 2008-2010.
- Consultant for the *National Wildlife Service of Argentina*. Potentials for sustainable uses of peccaries in the Argentine Chaco. Funded by *CITES Authorities of Switzerland and Italy*. 2000-2005.
- Principal investigator: Jaguar' distribution and conservation status. Funded by *Idea Wild*. 2003-2005.
- Consultant for *The Nature Conservancy*. Research Program in Costa Rica; Indigenous people and biodiversity. 2005-2007.
- Consultant for *IUCN* and *WWF*. Environmental education and enhancement of local institutions in Costa Rica. 1999.
- Co-coordinator for the project: Lowland Tapir (*Tapirus terrestris*) and White-Lipped Peccary (*Tayassu pecari*) Range-Wide Geographical Status Analysis and Conservation Priority Setting. Funded by *Moore Foundation*, *Wildlife Conservation Society* and *Wildlife Trust*. 2005-2010.
- Principal investigator: White-lipped peccary ecology, conservation and importance for local people as source of food. Costa Rica. Funded by *WWF* and *WCS*. 1995-2000.

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## publications

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### Peer reviewed journals

1. Stoker, P., C. Willett, M. Altrichter & P. Sherman. 2012. Use of habitats by coyotes (*Canis latrans*) in Joshua Tree National Park, California. *The Southwestern Naturalist*, 57(2): 214-216.
2. Altrichter, M. 2011. Importance of wildlife as source of food for indigenous people in Talamanca, Costa Rica (Spanish). *Biocenosis*, 25: 1-2.
3. Altrichter, M. *et al.*, 2011. Range-wide declines of a key Neotropical ecosystem architect, the Near Threatened white-lipped peccary *Tayassu pecari*. *Oryx*, 46(1): 87-98.
4. Gongora, J., C. Biondo, J. Cooper, A. Taber, A. Keuroghlian, M. Altrichter. *et al.*, 2010. Revisiting the species status of *Pecari maximus* van Roosmalen *et al.*, 2007 (Mammalia) from the Brazilian Amazon. *Bonn Zoological Bulletin*, 60: 95-101.
5. Altrichter, M. & X. Basurto. 2008. Effects of Land Privatisation on the Use of Common-pool Resources of Varying Mobility in the Argentine Chaco. *Conservation and Society*, 6(2): 154-165.
6. Altrichter, M. 2008. Assessing potential for community-based management of peccaries through common pool resource theory in the rural area of the Argentine Chaco. *AMBIO: A Journal of the Human Environment*, 37 (2): 108-113.
7. Altrichter, M., G. Boaglio & P. Perovic. 2006. The decline of jaguars *Panthera onca* in the Argentine Chaco. *Oryx*, 40: 302-309.
8. Lopez, M., T., M. Altrichter, E. Eduarte & J. Sáenz. 2006. Nutritional aspects of the diet of the white-lipped peccary *Tayassu pecari* in Corcovado National Park, Costa Rica. *Biología Tropical*, 54: 687-700.
9. Altrichter, M. 2006a. Wildlife in the life of local people in the Argentine Chaco. *Biodiversity and Conservation*, 15: 2719-2736.
10. Altrichter, M. 2006b. The sustainability of subsistence hunting of peccaries in the Argentine Chaco. *Biological Conservation*, 126: 351-362.
11. Perin, J., M. Altrichter, R. Cudney-Bueno, J. Gulick, & M. Hershendorfer. 2005. Computer Recycling: Networks and Possibilities for Expansion in Tucson, Arizona. *Arizona Anthropologist*, 16.
12. Altrichter, M. & G. Boaglio. 2004. Distribution and abundance of peccaries in the Argentinean Chaco: its associations with human factors. *Biological Conservation*, 116: 217-225.

13. Gavier, G., M. Kufner, L. Giraud, M. Sironi, M. Altrichter & D. Tamburini. 2003. Herpetological communities of la Quebrada reserve, Rio Ceballos, Cordoba, Argentina. *Cuadernos de herpetología*, 17 (1-2): 51-64.
14. Altrichter, M. & R. Almeida. 2002. Exploitation of white-lipped peccaries (*Tayassu pecary*) on the Osa Peninsula, Costa Rica. *Oryx*, 36: 126-131.
15. Altrichter, M., C. Drews, J. Sáenz, & E. Carrillo. 2002. Time budget of the White-lipped peccary *Tayassu pecari* in a rainforest in Costa Rica. *Biotropica*, 34:136-143.
16. Altrichter, M., E. Carrillo, J. Sáenz & T. Fuller. 2001. White-lipped peccary (*Tayassu pecari*, Artiodactyla: Tayassuidae) diet and fruit availability in a Costa Rican rain forest. *Biología Tropical*, 49: 1183-1192.
17. Altrichter, M., C. Drews, J. Sáenz, & E. Carrillo. 2001. Sex ratio and breeding of white-lipped peccary (*Tayassu pecari*) in a Costa Rican rain forest. *Biología Tropical*, 49: 383-389.
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21. Altrichter, M. & I. Jiménez. 1999. Hunting and consumption of wildlife in San Juan del Norte, Indio Maíz Biological Reserve, Nicaragua. *Mesoamericana*, 4: 117-126.
22. Altrichter, M. 1999. Importance of wild mammals in the diet of local people in the Osa Peninsula, Costa Rica (Spanish). *Revista Mexicana de Mastozoología*, 4: 99-107.
23. Altrichter, M. & P. Sherman. 1999. Distribution and Abundance of the American alligator (*Alligator mississippiensis*) in the Welder Wildlife Refuge, Texas. *Texas Journal of Science*, 51: 139-146.
24. Sierra C., I. Jiménez, M. Altrichter, *et al.*, 1999. New Data About *Saimiri Oerstedii citrinellus*. *Primate Conservation*, 19: 5-10.
25. Kufner, M., L. Giraud, D. Tamburini, M. Altrichter, M. Sironi & G. Gavier, 1998. Terrestrial wildlife species and their habitats in La Quebrada Reserve, Córdoba Argentina (Spanish). *Acta Zoológica Lilloana*, 44: 177-184.

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26. Altrichter, M. & F. Carbonell. Effects of hunting in the Talamanca Bribri-Cabécar Indigenous Reserve and Importance of the La Amistad International Park, Costa Rica (Spanish). *Revista Latinoamericana de Conservacion*.

### **In preparation**

27. Reyna-Hurtado R., H. Beck, C. Chapman, A. Keuroghlian, M. Altrichter *et al.*, What ecological and anthropogenic factors affect group size in white-lipped peccaries (*Tayassu pecari*)? *Biotropica*.
28. Altrichter, M. Traditional ecological knowledge and the cultural context of the use of wildlife by the indigenous peoples of Talamanca, Costa Rica. *Biological Conservation*.

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1. Taber, A., S. Chalukian, M. Altrichter *et al.* 2009. *The faith of the neotropical forest architects: Evaluation of the distribution and conservation status of the white-lipped peccary and the lowland tapir*. IUCN, Wildlife Trust, New York, USA.
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1. Taber, A., M. Altrichter, H. Beck, & J. Gongora. 2011. *Tayassuidae Family*. In: *Handbook of the Mammals of the World*. Lynx Promotions, S.L.
2. Di Bitetti, M., M. Altrichter *et al.*, *The jaguar in Argentina*. In: *Jaguars on the Edge: an assessment and perspectives of jaguar continental conservation*. *In press*.
3. Chalukian, S., S. Bustos, M. Altrichter, *et al.*, *Tayassuidae*. In: *Argentina Mammals Red Book, Tayasuidae family* (Spanish). National Science Committee, Buenos Aires. *In press*.

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5. Gilbert, L.E. *et al.*, *Pacific Lowland Forest*. In: *The Ecosystems of Costa Rica*. M. Kappell & L. Diego Gomez (Eds.) Chicago Press Book. *In prep*.
6. Taber, A., H. Beck, S. Gonzalez, M. Altrichter, M. Barbanti, & R. Reyna-Hurtado. *Conservation's orphans –threatened livelihoods: Neotropical forest ungulates*. *In prep*.

### ***Educational and non-peer reviewed publications***

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2. Altrichter, M. & R. Almeida. 2009. White-lipped peccaries have personal guards in the Osa Peninsula, Costa Rica. (Spanish). *Suiform Soundings* 9 (1): 8.
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13. Chalukian, S., S. Bustos & M. Altrichter. 2008. Monitoring wildlife populations. US F&WS.
14. Gongora, J., A. Taber, A. Keuroghlian, M. Altrichter, *et al.*, 2007. Re-examining the evidence for a 'new' peccary species, '*Pecari maximus*', from the Brazilian Amazon. *Suiform Soundings* 7 (2): 19.
15. Reyna-Hurtado, R., M. Altrichter & E. Amorim Moraes. 2006. A summary overview of methods for the study of peccaries in the wild. *Suiform Soundings* 6 (2): 23.
16. Altrichter, M. & G. Boaglio. 2003. White-lipped peccaries in the Argentinean Chaco (Spanish). *Direccion Nacional de Fauna y Flora, Buenos Aires, Argentina*. (Booklet distributed among local communities and schools in the Argentine Chaco).

### **Technical reports presented to governments and NGOs**

1. Jimenez, I. & M. Altrichter, 2011. Experimental reintroduction of collared peccary (*Pecari Tajacu*) in Ibera natural reserve, Argentina. (Spanish). Land Conservation Trust.
2. Altrichter, M. 2003. Feasibility of commercial hunting in the Argentinean Chaco. Report presented to the Wildlife Service of Argentina, the Federal Office of Veterinarie, CITES, Switzerland, and the Servizio Conservazione della Natura, Ministero dell' Ambiente, CITES, Italy.
3. Altrichter, M., F. Carbonel, R. Almeida & U. D'ambrosio. 1999. Use and perceptions of wildlife in Rural and Indigenous communities in the Osa Península. (Spanish). Report presented to IUCN, WWF and Ministry of Natural Resources of Costa Rica.
4. Altrichter, M. 1999. Conservation problems surrounding Corcovado National Park. (Spanish). Report presented to the Ministry of Natural Resources of Costa Rica (MINAE).
5. Altrichter, M. & I. Jiménez. 1998. The importance of game meat in the diet of rural people of San Juan del Norte, Southern Nicaragua. (Spanish). Report presented to the Ministry of Natural Resources of Nicaragua.
6. Jiménez, I. & M. Altrichter. 1998. The conservation status and distribution of manatee (*Trichechus manatus*) in Indio Maiz National Reserve, Nicaragua. (Spanish). Report presented to the Ministry of Natural Resources of Nicaragua.
7. Altrichter, M. 1998. The Abundance of Javelinas (*Tayassu tajacu*) in Welder Wildlife Refuge. Report presented to Welder Wildlife Refuge, Texas.

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1. Camino M., S. Cortez, M. Altrichter & S.D. Matteucci. **September 2012**. Evaluation of participatory sampling as a wildlife research tool in the Argentinean Chaco (Spanish). **XXV Meeting of the Argentinean Society of Mammals. Lujan, Buenos Aires.**
2. Beck, H. & M. Altrichter. February 2012. Raising our Visibility: How to Disseminate Species Assessments to a broader audience. IUCN / SSC Chairs' meeting. Abu Dhabi.
3. Camino M., S. Cortez, M. Altrichter, S.D. Matteucci. May 2012. Application of a wildlife monitoring participatory research in the Argentinean Chaco (Spanish). VII International conference on Wildlife Management in Amazonia and Latin America. Salta, Argentina.
4. Altrichter, M. *et al.* August 2009. Biology, Conservation, Health and Management of Peccaries and Pigs. 10th International Mammalogical Conference, Mendoza, Argentina.
5. Chalukian, S., A. Taber, M. Altrichter. *et al.* August 2009. Conservation status of the lowland tapir. 10th International Mammalogical M Conference, Mendoza, Argentina.
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7. Altrichter, M. & G. Boaglio. August 2006. Distribution and conservation status of jaguars in Northern Argentina. National Conference of the Mammals' Association (Spanish). Cordoba, Argentina.
8. Altrichter, M. & G. Boaglio. August 2006. Use of wildlife by peasants in Northern Argentina. National Conference of the Mammals' Association (Spanish). Cordoba, Argentina. 2006.
9. Altrichter, M. September 2006. Current research and conservation projects on peccaries in Latin America. VII International conference on Wildlife Management in Amazonia and Latin America. Bahia, Brazil.
10. Altrichter, M. September 2006. A Range-Wide Status Analysis of Lowland Tapir & White-lipped Peccaries. International conference on Wildlife Management in Amazonia and Latin America. Bahia, Brazil.
11. Altrichter, M. September 2006. Evaluating the sustainability of subsistence hunting in the Chaco. International conference on Wildlife Management in Amazonia and Latin America. Bahia, Brazil.

12. Altrichter, M. June 2005. White-lipped peccary conservation issues in Argentina and Costa Rica. Invited participant to the “Lowland Tapir (*Tapirus terrestris*) and White-Lipped Peccary (*Tayassu pecari*) Range-Wide Geographical Status Analysis and Conservation Priority Setting”. WCS, La Paz, Bolivia.
13. Altrichter, M. November 2004. Obstacles for the implementation of community-based conservation in the rural Argentine Chaco. VI International conference on Wildlife Management in Amazonia and Latin America. Iquitos, Peru.
14. Lopez, M., J. Saenz, M. Altrichter & E. Duarte. November 2004. Nutritional aspects of the diet of white-lipped peccary in Corcovado national Park, Costa Rica. VI International conference on Wildlife Management in Amazonia and Latin America. Iquitos, Peru.
15. Altrichter, M., G. Boaglio & P. Perovic. November 2004. Distribution and abundance of jaguars in the Argentine Chaco. VI International conference on Wildlife Management in Amazonia and Latin America. Iquitos, Peru.
16. Altrichter, M., & W. Shaw. September 2001. Conservation and management of peccaries in the Argentinean Chaco. V International Meeting on Wildlife Management in Amazonia and Latin America, Cartagena, Colombia.
17. Altrichter, M., & R. Almeida. September 2001. Long movements of peccaries and their susceptibility to hunting. V International Meeting on Wildlife Management in Amazonia and Latin America, Cartagena, Colombia.
18. Altrichter, M. July 1999. Importance of wild mammals for the rural local people of the Osa Peninsula, Costa Rica. Mesoamerican Society for Biology and Conservation. Guatemala.
19. Altrichter, M., E. Carrillo, J. Sáenz & T. K Fuller. June 1997. Feeding Habits of White-lipped peccaries *Tayassu pecari* in Corcovado National Park, Costa Rica. Association for Tropical Biology. Costa Rica.
20. Carrillo, E., J. Sáenz, T. K. Fuller & M. Altrichter. June 1997. Size and Stability of White-lipped peccary *Tayassu pecari* herds in Corcovado National Park, Costa Rica. Association for Tropical Biology. Costa Rica.
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22. Fernández, M. T., M. Altrichter, *et al.* June 1997a. Habitat Fragmentation and Protection Status Evaluation of the Squirrel Monkey *Saimiri oerstedii citrinellus* population in Central Pacific Region, Costa Rica. Association for Tropical Biology. Costa Rica.

23. Fernández, M., M. Altrichter, L. Gómez, J. Gonzáles, C. Hernández, H. Herrera, *et al.* June 1997b. A Multivariate Analysis to Assess the Effect of Patchiness on Squirrel Monkey Population. International Theriological Congress. México.
24. Altrichter, M., M. B. Kufner, L. Giraudo, G. Gavier, D. Tamburini, & M. Sironi. August 1994. The Temporal and Spatial Variation of a Small Mammal Community, Argentina. Symposium of the Argentinean Society of Mammalogy. Argentina.
25. Giraudo, L., M. B. Kufner, D. Tamburini, M. Sironi, G. Gavier & M. Altrichter. 1994. The Influence of Human Habitat Modification on Forest and Grassland Bird Communities, Argentina. VII Symposium for Vertebrate Biodiversity and Zoology of South America. Peru.
26. Gavier, G., M. Kufner, L. Giraudo, M. Sironi, D. Tamburini, M. Altrichter & N. Cech. 1994. The Composition, Diversity and Spatial Distribution of Reptiles and Amphibians in La Quebrada Reserve, Argentina. X Symposium of Herpetological Communications. Argentina.
27. Kufner, M. B., M. Altrichter, L. Giraudo, G. Gavier, D. Tamburini, & M. Sironi. 1994. Temporal and Spatial Variation of a Small Mammal Community in Relation with Habitat Structure. VII Symposium for Vertebrate Biodiversity and Zoology of South America. Peru.

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### **workshops and symposium organization**

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1. Taber, A., M. Altrichter & H. Beck. August 2009. Symposium. Biology, Conservation, Health and Management of Peccaries and Pigs. 10th International Mammalogical Conference, Mendoza, Argentina.
2. Altrichter, M. & F. Carbonell. September 2007. Conservation of wildlife in Talamanca. Two days workshop with indigenous people, NGOs members, governmental representatives, and the national park service. Costa Rica. Funded by *The Nature Conservancy*.
3. Altrichter, M. *et al.* September 2006. Conservation and research on peccaries. Fours hours workshop with peccary experts from North and South America. VII International conference on Wildlife Management in Amazonia and Latin America. Bahia, Brazil.

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### **workshop participation**

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1. Lowland Tapir (*Tapirus terrestris*) and White-Lipped Peccary (*Tayassu pecari*) Range-Wide Geographical Status Analysis and Conservation Priority Setting. 2005. WCS, La Paz, Bolivia.
2. Conservation and Management of Amazonian Ungulates. 2001. V International Meeting on Wildlife Management in Amazonian and Latin America, Cartagena, Colombia.

3. Conservation Perspectives of Squirrel Monkey, *Saimiri oerstedii citrinellus*, in Costa Rica. 1995. SSC-IUCN, PRMVS, Fundación Pro Zoológicos, Fundación Manuel Antonio Pro Conservación del Mono tití. Costa Rica.
4. Wild Animals Rehabilitation and Liberation: Criterion and Feasibility. 1995. First International Symposium Universities for Sustainable Development. Costa Rica.

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### **professional service**

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- Co-Leader of the International Union for the Conservation of Nature (IUCN) Peccaries Specialist Group. 2010-current.
- Focal Authority for peccaries for the Red List of the International Union for the Conservation of Nature (IUCN). 2009-2012.
- Associate Editor *Suiform Soundings Newsletter*, IUCN. 2005-2011.
- Member of the *EDGE Community* (Evolutionarily Distinct and Globally Endangered Species): Research and conservation initiative of the Zoological Society of London. 2007-present.

### **Recent grant and paper reviews**

- National Geographic 2012
- Rufford Foundation 2011
- National Geographic 2009
- Conservation Biology 2009
- Biological Conservation 2009
- Oryx 2008
- Journal of Zoology 2007, 2008
- Oryx 2007
- Biotropica, two papers 2007
- Revista de manejo de vida silvestre en Latinoamérica 2006
- Biological Conservation 2005

## grants

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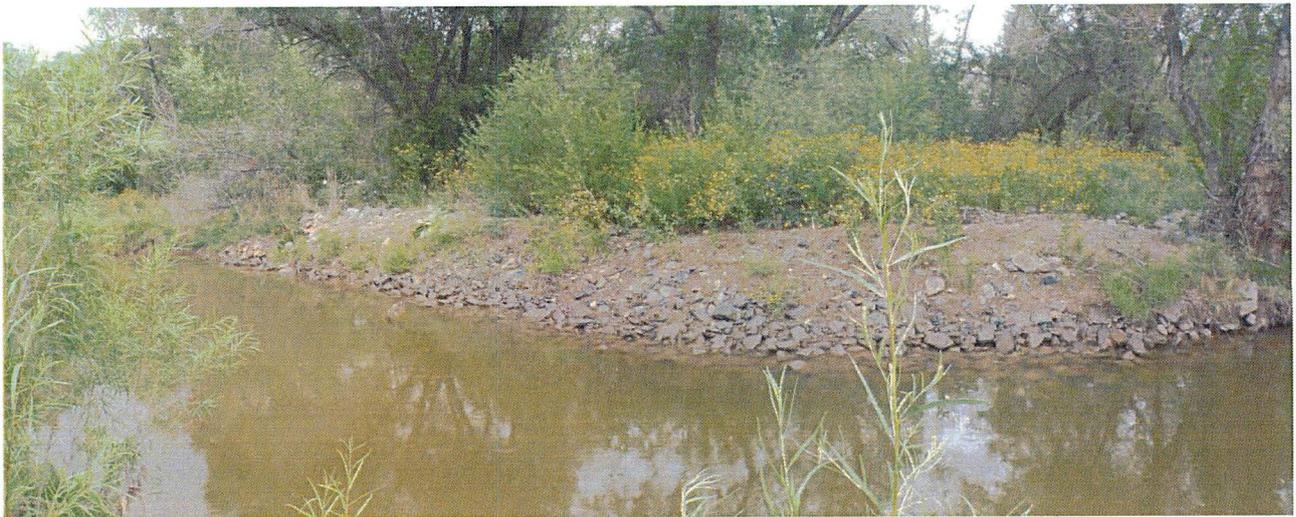
- University of Redlands. Faculty research grant. 2009. Effects of Structural Adjustments in local livelihoods in the Argentine Chaco
- Wildlife Trust. 2008. Lowland Tapir (*Tapirus terrestris*) and White-Lipped Peccary (*Tayassu pecari*) Range-Wide Geographical Status Analysis and Conservation Priority Setting.
- University of Redlands, Faculty research grant. 2007. Effects of Structural Adjustments in local livelihoods in the Argentine Chaco.
- US Fish & Wildlife Service. 2007-2009. Training local wildlife agents in Northern Argentina.
- TNC. 2006-2007. Indigenous people and wildlife in the Talamanca Biosphere reserve, Costa Rica.
- Fellowship Wallace Research. 2000-2005. Ph.D. studies.
- Federal Office of Veterinarie, CITES Authority, Switzerland, Government of Switzerland. 2000-2005. Potential sustainable exploitation of peccaries in the Argentine Chaco.
- Servizio Conservazione della Natura, Ministero dell' Ambiente, CITES Italy, Italy. 2000-2005. Potential sustainable exploitation of peccaries in the Argentine Chaco.
- Idea Wild. 2003. Distribution and conservation status of jaguars in the Argentine Chaco.
- WWF. 2000. Course Oceanic Islands ecology and conservation.
- Fellowship MUTIS. International Agency of Cooperation, Spain Government. 1995-1997. Master Studies.
- Fish & Wildlife Service of United States. 1997-1999. Usage of natural resources by Rural and Indigenous Peoples Surrounding Corcovado National Park, Costa Rica.
- IUCN. 1997-1999. Usage of natural resources by Rural and Indigenous Peoples Surrounding Corcovado National Park, Costa Rica.

**Other small funding:** Sigma Xi (2001), Tinker Grant Program for Latin America Studies of U of A (2001 and 2003), Graduate College of U of A (2002 and 2004), Women Studies of U of A (2004), College of Agriculture of U of A (2004).

## Project Site Photographs



**Photo 1:** Reference conditions within Watson Woods Riparian Preserve



**Photo 2:** Rock Plug in Reach 1. This structure was repaired in 2010. Soil was spread over the surface to encourage vegetation growth.



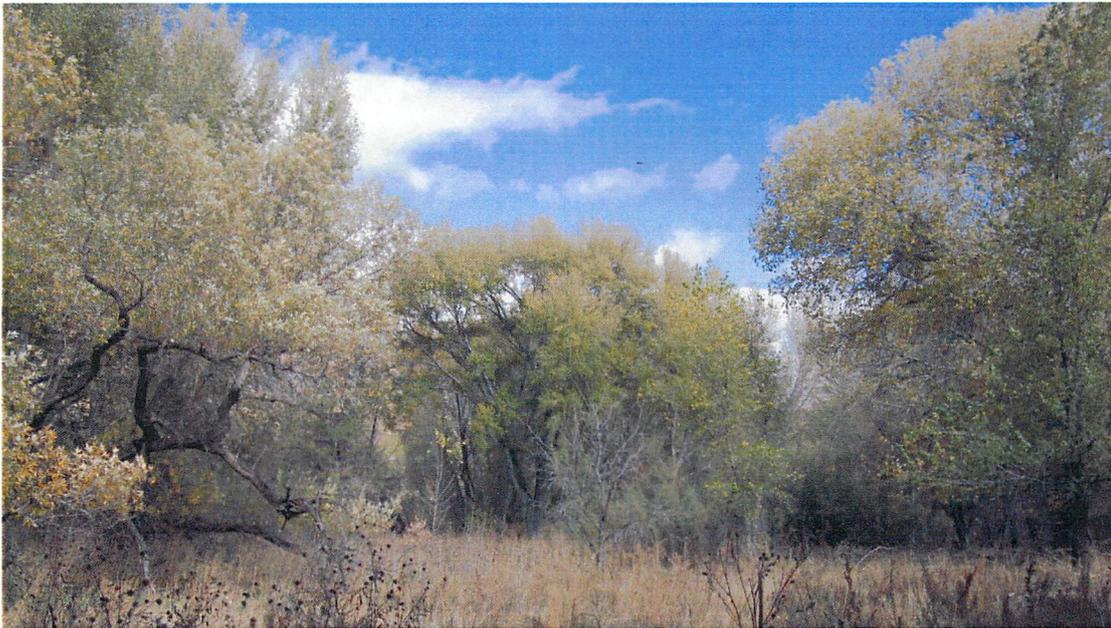
**Photo 3:** Channel cross-section 2 photo taken September 2012 showing straight run without riffling or pools.



**Photo 4:** BEHI 1 photo monitoring of channel cross section taken September 2011.



**Photo 5:** This photo depicts a significant stand of common teasel (*Dipsacus fullunom*), a species on the Prescott Creeks noxious weed list. As part of the project, Prescott Creeks will conduct noxious weed eradication activities.



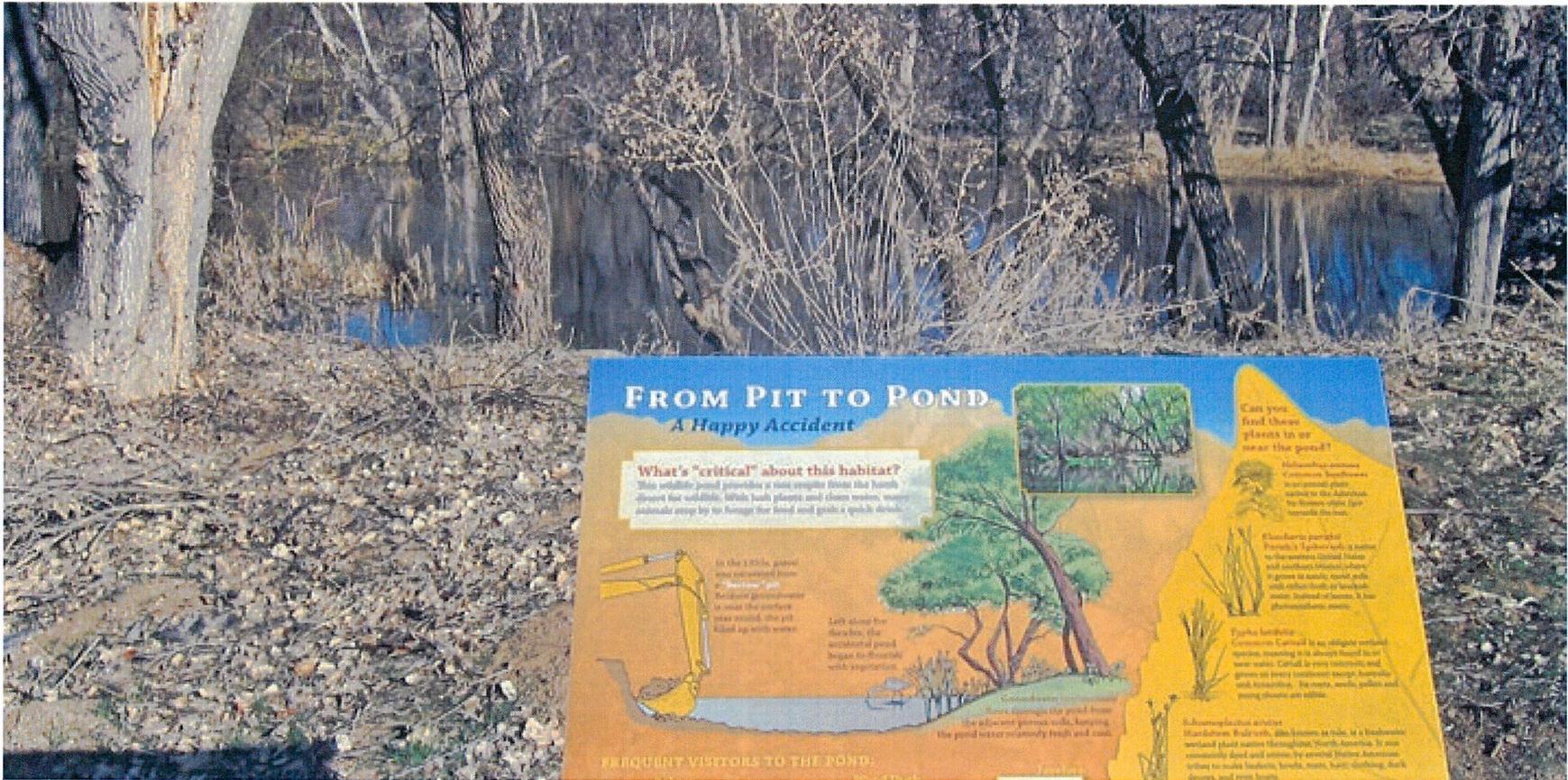
**Photo 6:** Additional common teasel stands.



**Photo 7:** Common black hawk chicks in the nest.



**Photo 8:** Woods ducks only nest in two areas of Arizona. One is the Granite Dells, near Watson Woods. The pond located at the North end of the preserve is a remnant of the gravel mining era, but has proven to be valuable habitat.

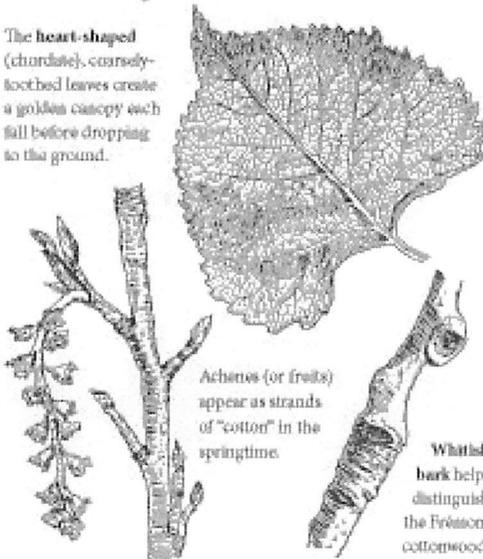


The above interpretive panel was produced and installed at the Preserve during Phase I of the restoration project. Two additional panels will be designed and installed. Panel is approximately 36” x 24”

**Frémont Cottonwood**  
*Populus fremontii* Family: Salicaceae

This tree can reach 100 feet in height and 5 feet in diameter. As with the other cottonwoods, its roots must tap into groundwater to survive. Flattened petioles cause leaves to wave in the wind, much like the quaking aspen. Native Americans used the bark and leaves for relief of swelling and headaches.

The heart-shaped (cordate), coarsely-toothed leaves create a golden canopy each fall before dropping to the ground.



Achenes (or fruits) appear as strands of "cotton" in the springtime.

Whitish bark helps distinguish the Frémont cottonwood.

The Arizona Water Protection Fund Commission, an Arizona Department of Environmental Quality (ADEQ) of the U.S. Environmental Protection Agency, is authorized to provide this information. The project is funded in part by the Arizona Water Protection Fund. It is not intended to replace the services of the Arizona Department of Environmental Quality or the U.S. Environmental Protection Agency.

**Narrowleaf Cottonwood**  
*Populus angustifolia* Family: Salicaceae

A riparian obligate, this tree provides a high canopy which provides nesting and shade for wildlife, reaching up to 65 feet at the crown. Its bark can be smooth or furrowed. Due to its slender leaves, this cottonwood can easily be mistaken for a willow.

Fluffy white catkins appear as cotton, while winter buds are sticky and gummy.



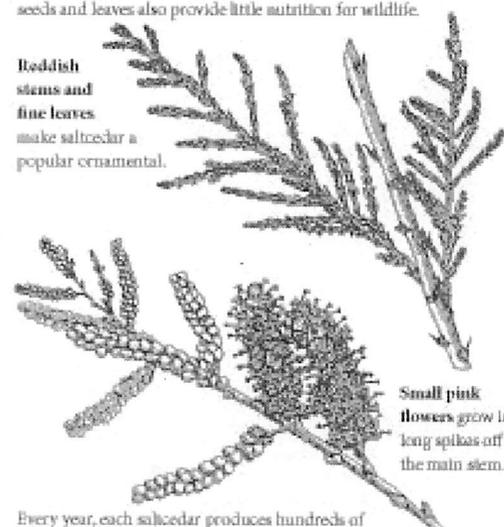
Lance-shaped leaves are yellowish-green with scalloped margins.

The Arizona Water Protection Fund Commission, an Arizona Department of Environmental Quality (ADEQ) of the U.S. Environmental Protection Agency, is authorized to provide this information. The project is funded in part by the Arizona Water Protection Fund. It is not intended to replace the services of the Arizona Department of Environmental Quality or the U.S. Environmental Protection Agency.

**Saltcedar** **[INVASIVE]**  
*Tamarix ramosissima* Family: Tamaricaceae

Saltcedar, native to Europe and Asia, is a hardy deciduous shrub that grows up to 20 feet tall. In the Southwest, this invasive species threatens native riparian species by dominating groundwater use while forming dense thickets and choking out other plants. Its seeds and leaves also provide little nutrition for wildlife.

Reddish stems and fine leaves make saltcedar a popular ornamental.



Small pink flowers grow in long spikes off the main stem.

Every year, each saltcedar produces hundreds of thousands of seeds. Pink to yellow seedpods split open to release the tiny seeds into the wind or to float downstream.

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Ten engraved metal plaques with hand-drawn botanical illustrations help visitors identify common native and non-native plants throughout the Preserve. Funded through grant project 08-158WPF, these signs have been a hit and we look forward to producing more as time and budgets allow.



The new entrance kiosk that was designed and installed with funding from the Water Protection Fund features a detailed map, Preserve guidelines and relevant information about the importance of riparian areas. This panel will be adapted to fit our Peavine Trail entrance – updating a well-worn panel made possible by the Commission in the mid-1990s.

## Description of Plans for Monitoring/Sampling

Monitoring of the biota and abiotic environment is useful in judging the degree to which restoration project goals have been achieved.<sup>6</sup> Originally called for in the *Watson Woods Riparian Preserve Comprehensive Plan*, formal monitoring at the Preserve began between 1997 and 2001 with the installation of groundwater monitoring wells, followed by a vegetation characterization, and inventories of small mammals, birds and herpetofauna. The effort continued with photographic monitoring, a repeat of the vegetation characterization and geomorphic and hydrologic investigations as part of a project entitled *Watson Woods Riparian Preserve Restoration Feasibility* (funded by the Arizona Water Protection Fund – grant #04-122WPF).

Monitoring to date has included hydrologic, vegetation, water quality, geomorphological, macroinvertebrate, herpetological, and photo. These will continue, with the addition of mammals.

The information presented below is a combination of protocols developed for the above monitoring efforts and of new protocols not previously implemented at the Preserve. Monitoring data will be essential to evaluation and communication of project performance to Project Managers, project funders, and the public at large. Monitoring will also add to the deficient scientific record for riparian areas in the southwest.

### Permitting

Regulatory permitting is an essential task of every riparian restoration project. SHPO has the Prescott Creeks Cultural resource survey on file. If additional work is warranted surveys will be conducted along all areas planned for disturbance. An evaluation of the impacts to biological resources will be prepared for submittal to the Army Corps of Engineers under Section 404 of the Clean Water Act. Section 7 consultations with the US Fish and Wildlife Service are possible and budgeted.

## **PHOTOGRAPHIC MONITORING**

Photographs are indispensable tools to qualitatively document and assess change in any environment. Prescott Creeks will continue photographic monitoring efforts to document changing conditions at Watson Woods Riparian Preserve. This photographic record will have direct value to Preserve managers and project contractors as it holds value for demonstrating both natural and/or human-induced changes. Photographs will be used in reporting, GIS applications, educational presentations, interpretive materials, etc.

### *Photographic Monitoring Points*

Photographic monitoring points were established throughout, as well as around the periphery of the Preserve. Since restoration plans include both physical (channel modification) and biological (revegetation/species eradication) efforts, photo-point monitoring will occur twice yearly (during dormant and growing seasons) to highlight different subjects. Where possible, photo-points were located at permanent physical features within or adjacent to the Preserve (monitoring wells, fence corners, roadways, bridges, etc.). In locations where permanent physical features are not present, points were marked with rebar, rock cairns or other durable materials, and then referenced from permanent features. To aid future relocation of all photo-points, UTM coordinates were recorded to the nearest 5m (using an agreed upon datum) and mapped. Future photographic monitoring will follow the protocols described above and occur at previously established points. Additional points may be added as needed.

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<sup>6</sup> Society for Ecological Restoration International Science & Policy Working Group, 2004. *The SER International Primer on Ecological Restoration*. www.ser.org & Tucson: Society for Ecological Restoration International.

## **WATER QUALITY**

### **Project Description**

The goal of Prescott Creeks' water quality monitoring (initiated with 319 funding from ADEQ in 2006) is to determine the pollutant sources of the water in the upper reaches of Granite Creek and in the named creeks that are tributary to it, including the impaired water bodies. Samples are collected to determine current water quality and to provide a baseline for determining potential changes in water quality. Specifically, this data is used to:

- Determine if current designated uses are being supported or impaired;
- Determine the extent and frequency of contamination from stormwater and nonpoint sources;
- Provide additional water quality data to local, state and federal decision makers, as well as the public at large.

Section 303(d) of the federal Clean Water Act requires states to develop a list of impaired waters, commonly referred to as the "303(d) list." A water body is considered impaired if: a) the current water quality does not meet the numeric or narrative criteria in a water quality standard, or b) the designated use is not being achieved. Every two years states submit their recommendations for the 303(d) list to the EPA. The EPA then reviews and revises the list.

The Upper Granite Creek Watershed has two impaired lakes and four impaired creeks. Once a water body has been listed as impaired, the state or the EPA must determine the conditions that would return the water to a condition that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load plan (TMDL) for each water body on the list. A TMDL identifies allowable pollutant loads to a water body from both point and non-point sources that will prevent a violation of water quality standards.

Prescott Creeks' water quality monitoring is designed to support the TMDL process by providing baseline information. Additionally it provides monitoring for point source pollution and for any drastic changes in the watershed at 'screening level' only. All monitoring information will be forwarded to the City of Prescott, the State of Arizona (ADEQ), the U.S. EPA, and/or other relevant agencies for further scrutiny and action if deemed necessary.

### **Target Conditions and Monitoring Frequency**

The tributary creeks are intermittent, and flow will vary considerably with weather. It is expected that pollutant concentrations will vary with flow. Pollutant concentration may be high during periods of high flow from a "washing" effect. Pollutant concentrations may also be high during periods of low flow because of little available dilution. An attempt will be made to monitor under a range of flows to determine the effect of flow on water quality. However, monitoring during very large storms will be avoided to ensure the health and safety of sampling personnel.

### **Water Quality Parameters**

Selection of monitoring parameters is continually evaluated in consideration of their potential as pollutants, their use as related or supporting information, and the analytical limitations of the study. Impairments include bacteria, nutrients, ammonia, low dissolved oxygen, and high pH.

The Upper Granite Creek Watershed does not contain point source discharges except stormwater. Stormwater and nonpoint discharges are the identified sources of pollutants.

## GEOMORPHOLOGIC AND HYDROLOGIC ASSESSMENTS

### **MORPHOLOGIC ASSESSMENTS**

Detailed data was collected for the stream and floodplain condition evaluation as part of the restoration feasibility project. It consisted of four main activities: 1) Stream channel morphology survey (dimension, pattern, profile); 2) bed and bank material sampling; 3) bank stability, and 4) photographic documentation. The morphologic sampling methodologies were conducted at both project and reference sites and will be repeated over time to assess project performance. Results from morphologic assessments can be found as part of this plan in Section 3: Restoration.

#### **Stream Channel Morphology**

*Rationale:* Morphology includes the physical dimension, pattern, and profile of the stream channel and associated floodplains and terraces. These physical features create the foundation for the physical and biological process and riparian habitats. Understanding of morphological features was integrated with riparian vegetation/habitat assessments to develop an integrated assessment and design.

*Protocols:* Initially, a topographic map of the entire project area was produced from an aerial survey and overlaid on an associated aerial photograph. This provided a base map for all phases of the project. The topographic map and aerial photo allowed characterization of channel pattern. Sets of cross-section (Figure 28) and longitudinal profiles (Figure 29) were surveyed at representative sites (riffle and meander) within both project and reference reaches to assess channel/floodplain dimension and profile (Harrelson et al). Station and elevation were necessary to create two dimensional representations of cross-sections and longitudinal profiles. A tape was stretched across areas to be surveyed; perpendicular to stream flow for cross-sections and along the thalweg for longitudinal profile. Stationing or horizontal distance was read from the tape. A laser level (Topcon) was used to measure elevation data. The laser level projects a laser beam in a level plane above the ground providing a local reference point. Receivers attached to extendable rods were raised until they broke the plane producing a characteristic sound. The height between the ground and laser beam (rod height) was read from the rod and recorded. Bankfull elevation was determined using methods described in Dunne & Leopold 1978.

Cross-sections and profile data at individual sites were relative to a common base elevation. This created a 3-dimensional characterization of the site. A series of these surveys were used to characterize the entire project area and reference sites. Each survey location was identified on the base map and photograph. Since channel dimension and profile was the data required, surveys were not linked to the universal coordinate system. All cross-sections within the project area were monumented with rebar and caps at each endpoint and latitude/longitude identified with GPS. These cross-sections allow remeasurements if required. Surveys in reference sites were not monumented.

Cross-section and longitudinal profile data were entered into specially created MS Excel worksheets for analysis. Rod heights were converted to relative elevations. A number of morphologic parameters described in Rosgen (1996) were identified. These include bankfull width, mean depth, maximum depth, floodprone width, width-depth ratio, entrenchment ratio, meander width, meander length, radius of curvature, and average channel slope. Dimensionless ratios for these parameters were used to compare project and reference sites with different sized watersheds and to compare project data with regional data.

*Data Collected:* Station and elevation in feet and tenths was collected to characterize channel cross-section and profile. Alluvial features including channel thalweg, water surface, bankfull stage, and terrace were recorded. Bedforms (riffle, pool, run) of the channel bed were recorded.

#### **Bed and bank substrate**

*Rationale:* An understanding of channel bed and bank substrate is important to assessing hydraulics, sediment transport, and bank stability.

*Protocols:* Distribution of bed and bank material was characterized using the Wolman Pebble Count (Wolman 1954). A minimum of a 100 substrate samples were collected in a consistent, random method. In general samples are collected by teams zigzagging across the stream channel (Figure 30). Samples are selected at consistent intervals (commonly every two steps) by selecting the particle (without looking) directly off the samplers toe. The median diameter of each particle was measured using a metric ruler and recorded on field sheets. Bed and bank data was recorded separately to allow analysis of each. Sampling was conducted at a minimum of 4 sites within the project area to characterize the range of conditions. The number of samples at each reference site was based on the length of stream segment and range of conditions.

Bed-bank material data was entered into specially created MS Excel worksheets for analysis. A number of morphologic parameters described in Rosgen (1996) were identified. Channel bed and bank material distribution will be characterized by creating a cumulative distribution and percent exceedence calculated ( $d_{15}$ ,  $d_{50}$ ,  $d_{85}$ ,  $d_{100}$ ). Bar graphs were created with the data to test for bi-modal or other distribution characteristics.

*Data Collected:* Median diameter in millimeters was recorded for each particle sample and the sample was returned to the stream.

#### Stream bank stability

*Rationale:* Stream bank instability was characterized by active erosion with the impacts of additional sediment supply, reduction in riparian vegetation/habitat, and changes to channel morphology. The extent and intensity of stream bank instability is important to assessment of relative stream stability and riparian vegetation/habitat. The extent of bank instability is the measure of the amount of bank (or length) instability present. The intensity of instability is an estimate of the rate of erosion. Both are important in assessing the degree instability present in the system and to determining underlying causes.

*Protocols:* The Bank Erodibility Hazard Index (BEHI) provides a methodology for assessing the extent and intensity of stream bank erosion (Rosgen 2002). The intensity or rate of erosion was established at a bank site by surveying a cross-section at the site. The erodibility of the bank (Bank Erodibility Potential or BEP) was estimated by assessing a set of physical parameters (Figure 31). The hydraulic forces (Near Bank Stress or NBS) were estimated using a ratio of maximum depth in the near bank region (defined as the 1/3 of the channel adjacent to the bank) and mean depth of the channel. BEP and NBS values were translated into a instability rating of extreme, very high, high, moderate, low, and very low. From these ratings an average annual erosion rate was estimated. The model was developed in Colorado and Wyoming but has been validated in Arizona and New Mexico.

The extent of instability was assessed by creating a “Reach BEHI”. A set of stream banks with similar characteristics (height, slope, material, cover, channel shape, etc) were identified within the project and each reference site. The location and lengths of banks with these characteristics were identified. Average erosion rates were developed (see previous paragraph) for each bank type. Annual erosion rate was multiplied by bank height and total length to estimate an annual volume of erosion. Volumes for all bank types were summed and divided by total linear feet of bank to produce an average volume of erosion per linear foot.

*Data Collected:* Bank erodibility data for the BEHI assessment was collected at each eroding bank. These physical parameters include bank height ratio, root depth ratio, root density, bank slope, bank material, and stratification. The field data was used to develop the BEP rating according to Rosgen methodologies. The location and extent of each eroding stream bank was identified on the topographic base map.

#### Photographic Documentation

*Rationale:* The collection of detailed quantitative survey and sediment data was augmented with photo documentation of the channel and floodplain.

*Protocols:* Photos were taken of the stream (upstream, downstream, cross-stream, and floodplain) from every instrument set up station. In addition, upstream, downstream, and cross-stream photos were taken at every sediment sampling location, at all BEHI bank sites, at all cross-section survey locations (project and reference), and at locations of interest where the stream appears to be departing from stable conditions. The locations of all photographs will be identified on the project base map. Aerial photographs (as described above) were also used.

*Data Collected:* Digital photos as described above. Photo locations were recorded on appropriate field sheets (cross-section, profile, pebble count, BEHI).

## **HYDROLOGY**

The objective of monitoring groundwater levels within Watson Woods Riparian Preserve was to help Preserve managers determine groundwater elevation at any given time for any given portion of the Preserve (relative to sampling frequency and well location). Groundwater elevation directly affects the development of riparian plant root systems, plant vigor, and distribution of important riparian species. Therefore, detailed information from the groundwater monitoring wells was significant for interpretation of current and future patterns of plant species composition and structure, and for the development of restoration plans for the Preserve (Byrd et al 1996). Results from groundwater monitoring can be found as part of this plan in Section 3: Restoration.

In early 1997, eight shallow groundwater-monitoring wells were installed at the Preserve for the purpose of long-term observation of water level and water quality. Installation of the wells was coordinated through the City of Prescott and funded by the Arizona Game and Fish Department's Heritage Fund. Each well was installed and has been maintained to high standards; ensuring the ability to conduct future water quality testing. Installation and monitoring standards have met Environmental Protection Agency guidelines as well as standards set forth by the environmental consulting industry in general (Sander 1999). Detailed information and data from the first three years of monitoring can be found in the report entitled *Monitoring Well Project for the Watson Woods Riparian Preserve* released by Robert B. Sander for Prescott Creeks and the Arizona Game and Fish Department's Heritage Fund program in May 1999. The project was coordinated with the Arizona Department of Water Resources. As required, each well is registered with the agency.

Groundwater elevation data was collected monthly by volunteers for the first three years of the project, and then collected sporadically until April of 2004. During the restoration feasibility project, volunteers resumed regularly scheduled collection of groundwater data on a weekly basis. The groundwater monitoring described herein will continue indefinitely.

### **Data Collection**

Collection of groundwater level data was a simple procedure that was conducted by Prescott Creeks' trained volunteers. Data collection was ongoing throughout the Restoration Feasibility project period and will continue indefinitely to add to the groundwater levels record at the Preserve.

#### **Manual Data Collection**

Depth to groundwater was recorded by opening the protective steel casing of each well, opening each PVC well casing and lowering an electronic sensor connected to a calibrated cord into each well (Slope Indicator® Water Level Indicator). Audible and visual signals are sent to the housing unit when the sensor encounters water. A narrow-gauge clipboard or other straightedge was then used to record the depth to groundwater (from the calibrated cord) relative to the top edge of the steel well casing. Recorded depth to water was later converted to groundwater elevation within the Well Monitoring spreadsheet maintained on the 'N:' drive of the Prescott Creeks file server. Once the data was recorded, the well was closed in the reverse procedure as it was opened.

During data collection, measures were taken to prevent chemicals from being introduced to the monitoring wells. Small amounts of contaminants can affect future (water quality) sampling results. Decontamination of all equipment occurred at regular intervals. Between each well, the last few feet of measuring wire and the probe of the water meter was cleaned using a spray-bottle filled with a solution of Alconox® laboratory cleaner and distilled water. (The entire measuring line and instrument was also be cleaned at regular intervals.)

There is no request for additional funding to Arizona Water Protection Fund for water level monitoring as part of this proposal.

## **FLORA**

### Transect method

Vegetation sampling using transects was conducted within one month of the period of the highest average rainfall for central Arizona (Bulk 1985). In September of 1997 twenty-six 40m transects were established, including one along the creek channel near the northwestern corner of the preserve. In September 2005 the sampling was repeated with the exception of one transect that had been buried by construction of the Prescott Lakes Parkway Bridge and another that had been inundated by the swelling of the pond at the north end to the Preserve. The latter was relocated as a straight transect to the east-southeast of the pond. Foliar height density was estimated as the total number hits, by taxon, at each of 20 points along each transect. This parameter is very similar to vegetation volume. The method is a modified version of the vertical-line intercept of MacArthur & Horn (1969) and vegetation volume of Mills et al. (1991). FHD estimation was chosen over the line intercept method because the latter estimates vegetation cover only and does not account for vegetation height or structure within the canopy. Both Total FHD and total vegetation volume (the sum total of cubic decimeters within the site boundaries that contain vegetation) correlate closely with breeding bird densities (Mills et al. 1991), which is a primary management concern for the Preserve.

Transects were relocated using the seven reference points established in 1997. Four reference points were established at preexisting well sites and three at fence posts. All reference points were photographed in both 1997 and in 2005.

In 1997, starting points for all transects were fixed by measuring their distance and direction from a specified reference point. In 2005, Universal Transverse Mercator (UTM) coordinates using the NAD27 grid (datum of the most recent USGS 7.5' topographic quadrangle) were recorded to the nearest 5m for all of the reference points and transect starting points. Most transects continued in the same direction along the determined heading (from reference point) for 20m and then proceed perpendicular for another 20m to the right. Each starting, pivot, and ending point was marked in 1997 with rebar. Rebar was not placed in water-saturated soil. Two transects continued without the 90° bend for 40m along the eastern edge (toe zone) of the bank of Granite Creek.

Five reference reach transects were non-randomly located and sampled during spring 2006 within the portions of the Preserve that possessed, based on 1997 data, the apparent oldest, highest density, and diversity of native species; lowest density and diversity of exotic species; and most apparent stability in terms of geomorphic characters (Moody 2006). Two transects were located along toe zone of Granite Creek, which affectively sampled vegetation within the canopy from the toe and bank zones. A single transect was located within the low to high overbank zone (suitable habitat was lacking for a second transect in this zone) and two transects were located within the transition zone (upland habitat).

### Percent cover of annuals

At each 2m point along each transect a 20cm by 50cm (0.1m<sup>2</sup>) Daubenmire Grid was laid on top of the herbaceous layer and the cover of annuals was estimated by counting the number of squares (cm<sup>2</sup>) occupied.

The cover was recorded as cover classes one through six 1= trace-5%, 2= 5-25%, 3= 25-50%, 4= 50-75%, 5= 75-95%, 6= 95-100%).

#### Point Center Quarter Method

The Point Center Quarter Method, as described by Krebs (1998) was conducted both in the spring and fall 2005 to estimate density of woody individuals, by species; and modified to estimate annual plant cover, perennial plant cover, height of woody individuals, and percent canopy cover. Two subplots were sampled, one representing vegetation along the perennial water channel and the other representing the non-channel vegetation. Fifty non-permanent points were selected randomly within each of the two subplots by acquiring X:Y coordinates from a table of random numbers (Elzinga et al. 1998). The ranges of coordinates were determined from a UTM grid overlay of the study area. Coordinates of the sampling sites were then downloaded into a GPS unit and points were visited parsimoniously using the "nearest waypoint" function. Tree and shrub density was estimated by measuring the distance from the point to the nearest individual in each quarter. Absolute density of individuals, by species, was calculated using the following equation: Absolute density (individuals/ha) = (10,000m<sup>2</sup>/ha) / (mean)<sup>2</sup>, where the mean is the sum of the distances divided by the total number of quadrates. Cover of perennial and annual plants was estimated with the Daubenmire Grid at the base of each point. Percent canopy cover was estimated using a clear Plexiglass® square marked with randomly distributed black dots. Percent cover was simply calculated as the number of dots covered by canopy per 100 counts.

#### Vegetation mapping

Vegetation was mapped May-September 1997 using the relative cover occurrence of the dominant plant species (see Munz & Keck 1949-1950, Whittaker 1962). The method follows traditional approaches to vegetation mapping in Arizona (Brown et al. 1979, Warren et al. 1982). Procedure generally followed that of Kuchler's comprehensive method (Kuchler 1967) and Braun-Blanquet's table method (see Ellenberg 1956). Mapping resolution was ca. 5m. The approach used in 2005 made use of GIS technology that was unavailable to the author in 1998. WWRP was visited on three separate occasions and over 300 waypoints were entered into a Garmin® GPS unit. For each waypoint, a tree or shrub species, or a floristic cover designation was recorded, such as annual disturbed, perennial disturbed, or grassland. GPS data were then downloaded using DNR Garmin® software and used to create an Arcview® shapefile. Field data were added to the shapefile by importing the database portion of the shapefile into Excel®. The spreadsheet was then pasted into the annotation editor of ALL TOPO V7®, converted from NAD27 to State Plane, and exported back into an Arcview® shapefile. The new shapefile was then overlaid onto the winter and summer WWRP ortho-rectified digital aerial photographs to aid in the creation of a shapefile composed of polygons.

#### Floristics

The study site was visited in early spring, late spring/early summer before monsoon rains, and late summer/early fall after monsoon rains. At least two collections were made from reproductive individuals of all new or previously uncollected plant taxa encountered. Specimens were processed on site using a 12" X 18" field press and later rearranged and repressed using a standard herbarium press. Presses were placed within a well-ventilated plant press dryer. Field notes included elevation, locality data (including both latitude/longitude [DD° MM.M'] and the NAD27 Universal Transverse Mercator [UTM] grid system), name of USGS 7.5' quadrangle, distances from major landmarks, date, collection number, substrate type, community type, frequency of individuals, and plant associates. In addition, a record was made of characteristics of the plant that would not be apparent after the specimen was pressed and dried. Photographs were taken for most collections, including views of habitat, habit, and close-ups of flowers and/or fruits. Specimens were deposited in public herbaria in the following priority: Arizona State University (ASU), University of Arizona (ARIZ), Northern Arizona University (ASC), and institutions of the taxonomic specialists. For each collection, at least one duplicate was mounted with MO type glue on U/C type 11.5 × 16.5in herbarium mounting paper. Fragment packets and labels were made of 100% cotton, acid-free paper and affixed with acid-free adhesive.

Full results from the 2006 Vegetation Characterization can be found in Appendix E. All vegetation monitoring described above will be repeated on the schedule described in the Restoration Plan Budget and Timeline (available under separate cover).

### 1) **Noxious Weed Monitoring**

Previously, the Watson Woods Riparian Preserve was divided into ten meter belts that ran from the west to the east end of the Preserve. Starting at the north end of the Preserve student volunteers walked down 181 belts and documented the presence of noxious weeds in the Preserve. Species of particular interest included spotted knapweed (*Centaurea maculosa*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), scotch thistle (*Onopordum acanthium*), dalmatian toadflax (*Linaria dalmatica*), common teasel (*Dipsacus fullonum*), Russian olive (*Elaeagnus angustifolia*), and saltcedar (*Tamarix ramosissima*). It should be noted that five meter belts were used from approximately the north boundary to the Prescott Lakes Bridge. The use of five meter belts was deemed unnecessarily time constraining and tedious for the purposes of this survey.

Rapidly spreading weeds, such as *Festuca arundinacea*, *Centaurea stoebe*, and *Lepidium latifolium* could prove to be extremely detrimental to the native flora.

Noxious weed monitoring will follow the methodologies presented above or other methodologies developed as needed.

## **FAUNA**

### **Birds**

Avian monitoring was conducted in order to document bird population and to analyze these results in comparison to the Restoration Project. Surveys were conducted during the months of January, March, April, May, June, July, August, September and November using three survey protocols as designed by the Arizona Important Bird Area (IBA) Program—transect surveys, point count surveys, and census surveys. Point count surveys occurred in March, June, and July, while transect surveys were conducted during the other months as above. Both transect surveys and point count surveys are field sampling surveys which take a sample of avian populations. Transect surveys involve counting the number of individual birds by species along a transect (Granite Creek) within 50 meters of the transect line. Point counts are taken from the same point during each point count survey and individual birds are counted by species within 100 meters of each point. Census surveys are used for water bodies and water body edges, and are designed to count 95% of all the individual birds present on the water body and along the edge.

Results suggest an increased trend in numbers of two neotropical migrant species, common black-hawk and Bullock's oriole. It is anticipated that the continued growth of the recently planted vegetation (especially cottonwood and willow trees) will continue to improve avian populations.

### **Herpetofauna (reptiles & amphibians)**

We conducted herpetological monitoring in Watson Woods Riparian Preserve in Prescott, Arizona, between 2009 and 2012, in conjunction with ongoing habitat restoration efforts at the Preserve. The objectives of the herpetological component of the restoration project were to:

1) use existing baseline data (from surveys in 2000) and standardized survey methods to conduct monitoring of the herpetofauna of Watson Woods; and 2) to foster public appreciation of the ecological importance of riparian herpetofauna.

Future herpetological projects will include:

Secure trap sites (stake boards to rebar, number traps)

- Additional analyses of previously collected data: changes in distribution, abundance, and diversity in response to habitat restoration; differences in recruitment, survival, and fitness (parasite loads) between sites; differences in detection probabilities between sites
- Continued monitoring
- Amphibian breeding areas relative to restoration treatments (vegetation height/density) and road noise
- Species accumulation (watch for non-natives)
- Artificial snake den
- Compare distribution and abundance of tree lizards and Plateau fence lizards
- Research (e.g. endocrine disruptors, Dr. Propper, NAU)

## **Mammals**

Large mammals play a pivotal role in regulating ecosystem health and function, and at the same time, those species are the most likely to have been eliminated by past human activities. The understanding of species number and relative abundance allows to examine several ecological attributes of ecosystems health. For example, in the most degraded ecosystems, a few species dominate while overall richness is greatly reduced (Whittaker 1975). Differences in species number and relative abundance from the expected patterns based on studies of unaltered areas can often be explained by historic events, often related to human activities.

### Methods

To increase the likelihood of obtaining an accurate account of all species that use the Watson Woods Preserve we will conduct field work over a period of one year, covering sufficient time within each season, and will use a variety of techniques:

- 1) Visual encounter surveys
- 2) Baited track plates
- 3) Motion sensor cameras
- 4) Survey of the area in search of signs of presence of species (scats, tracks, trails, etc.)
- 5) Literature review and interviews

## **MACROINVERTEBRATES**

Streams of an intermittent nature weave down from surrounding mountains into the town of Prescott, Arizona creating what we know today as the Granite Creek Watershed. Each creek can be found dry for months at a time, intermittent with small pools of life, trickling with steady flows, or flash floods with white rapids growing river-like in size. These creeks create niches for the trees, plants, birds, animals, and many other forms of life that are part of the complex systems within our riparian areas. Many of these creatures aren't often thought about or seen, such as the invertebrates inhabiting the mud, silt, and undersides of stones in the creek beds. These invertebrates are an extremely important part of all fresh water systems.

Macroinvertebrate monitoring at the Preserve will be implemented in coordination with other similar monitoring within the Granite Creek Watershed by Prescott Creeks in coordination with the Arizona Department of Environmental Quality. This will be a bio-assessment /bio-monitoring plan that will use a single biological component, benthic macroinvertebrates, to evaluate stream conditions. Benthic macroinvertebrates are often referred to as aquatic insects and other invertebrates that reside on stream bottom substrates and generally include: stoneflies, mayflies, caddisflies, snails, and beetles. Macroinvertebrates can also be used to evaluate the effectiveness of restoration practices designed to improve stream health.

Macroinvertebrate projects will include:  
Conduct volunteer monitoring training

Conduct volunteer monitoring of macroinvertebrates & stream habitat annually in April to track trends  
Complete inventory of aquatic species in Watson Woods by obtaining adult specimens and genus & species identifications  
Make monthly visits in winter at Watson Woods to look for presence of stoneflies, indicator of recovery  
Determine distribution of crayfish from Granite Creek – Watson Woods & trap/remove

## Description of Existing Plans

Below is a brief summary of the many projects contributing to the project proposed herein.

### Arizona Water Protection Fund supported Plans:

#### **Watson Woods Riparian Preserve Restoration Project Final Report (grant 08-158WPF)**

Completed in the spring of 2013, this report was the culmination of the five year restoration effort at Watson Woods Riparian Preserve. Jointly funded by the Water Protection Fund Commission and the AZ Department of Environmental Quality, the project featured the realignment four reaches of the Granite Creek channel, construction of ephemeral wetlands, extensive revegetation of streambanks and floodplain areas, as well as monitoring all-encompassing monitoring activities.

#### **Watson Woods Riparian Preserve Final Restoration Design Plan (grant #04-122WPF):**

This plan was recently completed as part of Prescott Creeks' AWPf grant #04-122WPF. The plan consists of several integrated components including, but not limited to: Project background, management issues and considerations, restoration design (channels & revegetation), education and community involvement, monitoring and maintenance. *This plan serves as the basis for implementation of the restoration project proposed in this grant application.*

#### **Watson Woods Riparian Preserve Herpetological Guide & Checklist (grant #99-0076WPF):**

Similar to the Vegetation described above, this project was the first comprehensive investigation of the reptiles and amphibians found within Watson Woods Riparian Preserve. Data from this project serves as baseline information against which restoration efforts can be assessed.

#### **Watson Woods Riparian Preserve Vegetation Survey (grant #98-0008WPF):**

The project resulted in the first comprehensive characterization of the vegetation within Watson Woods Riparian Preserve. Permanent sampling points were established, approximately 300 specimens were collected and mounted to establish the Prescott Creeks herbarium, and a vegetation map was established. Data from this project serves as baseline information against which restoration efforts can be assessed.

#### **Watson Woods Riparian Preserve Comprehensive Plan (grant #95-012WPF):**

In 1996, Prescott Creeks' developed a five-year plan for Watson Woods entitled the Watson Woods Riparian Preserve Comprehensive Plan. The plan details four programs at the Preserve: Management, Inventory and Monitoring, Restoration, and Environmental Education.

### Other Plans and Projects:

#### **Watson Woods Preserve Riparian Revegetation 2000:**

Through a combination of sponsors, this project revegetated approximately two acres of cottonwood/willow forest within Watson Woods Riparian Preserve. Survival rates for this project were approximately 40% due to a number of factors that might include: Vegetation planted was harvested from a location on Miller Creek and stored in a refrigerated facility for seven months before planting, and planting was conducted in May when water tables were up to ten feet deep. The following year was one with below average precipitation.

#### **City of Prescott Rail to Trail Conversion:**

The City of Prescott acquired title to the abandoned Atchinson, Topeka and Santa Fe Railroad bed that forms the eastern boundary of Watson Woods Riparian Preserve. Once clear title was secured, the City worked with the Prescott Rail-Trail Coalition to convert the railbed to a useable non-motorized trail-way. The City of Prescott, the Prescott Rail-Trail Coalition and Prescott Creeks Preservation Association worked together to develop a joint trailhead for the trail and Preserve users.

### **City of Prescott Watson and Willow Lake Purchase:**

In May of 1997, the citizens of Prescott voted to purchase Watson and Willow Lakes through a \$15 million bond. While these lakes fall within the City limits, the water rights belonged to the Chino Valley Irrigation District and have been used for agriculture for the better part of this century. The purchase of these lakes has proven to be a giant leap forward, showing the City's initiative and commitment to acquire and preserve open space. Currently, a "master planning committee" is meeting to juggle the wants and needs of different user (passive recreation, motor boating, fishing, etc.). The committee also will prioritize additional enhancements to the lakes such as development of a swimming beach, a boat ramp, waterfowl habitat creation and enhancement, and riparian revegetation and creation.

Informal conversations between applicable City staff members and Prescott Creeks Directors have indicated that portions of the lakes will be co-managed between the City and Prescott Creeks. Wildlife habitat, and riparian revegetation and creation will likely result in co-management. Additionally, the south end of Watson Lake that borders Watson Woods Riparian Preserve may be annexed to the existing 126 acres of the Preserve. There are approximately 40 acres of riparian forest between the lake and the Preserve, thereby increasing Watson Woods Preserve by about 40%.

### **City of Prescott, Prescott Lakes Parkway (formerly known as 89/69 Connector Road & Bridge):**

During this two-year period beginning July 1<sup>st</sup>, 2000 and ending June 30<sup>th</sup>, 2002, the management of the Prescott Lakes Parkway (formerly known as the 69/89 Connector Road) road and bridge construction project dominated Prescott Creeks' work at the Preserve. This management resulted from several agreements between Prescott Creeks and the City of Prescott. At the close of construction, Prescott Creeks initiated a revegetation project funded by the City of Prescott.

As part of the bridge design, the City of Prescott and/or its contractor commissioned a hydrology study for Granite Creek. This study is currently being located by City staff and will be provided to Prescott Creeks as a resource for this restoration feasibility project.

**The Watson Woods Mitigation Planting 2002** project reduced the impact of the construction-related loss of native vegetation at the Preserve during 2000 and 2001. The project actually mitigated lost vegetation at an approximate ratio of four new *individuals* to one individual lost to construction. This is a significantly greater contribution to the native vegetation at Watson Woods than the originally proposed 4 to 1 ratio proposed in the "Bridge Agreement." The original ratio was based on "inches of caliper" rather than individuals. Only 540 individuals, representing seven species, would have been planted by following the original ratio, while this project design included almost four times as many individuals, representing eleven species.

In addition to native species revegetation, the project was designed to include local community members in all implementation and monitoring tasks. Prescott Creeks protects and restores the Preserve by providing people with meaningful interactions with the land. Participants experienced a service-learning project that provided them with information and "tools" to expand their ecological awareness, appreciation, and sense of stewardship for the Preserve and the creeks in Prescott. Nearly 200 community volunteers participated in the project.

**The "Watson Woods Ecosystem: Important Bird Area" (IBA)** was recently designated in coordination with the Prescott Audubon Society and the Arizona Department of Game and Fish. While management and implementation plans for the IBA will be forthcoming, a comprehensive survey for resident and migrant species is eminent. Available funding was not sufficient to initiate the study this year, but it is anticipated in following years' budgets. In addition to the funding requested in this grant proposal Prescott Creeks and other Watson Woods IBA participants are cooperatively looking for funding to monitoring bird populations within the entire IBA – not just the Watson Woods Riparian Preserve.

**Arizona Department of Environmental Quality (ADEQ)/ Total Maximum Daily Load (TMDL) analyses:**

ADEQ is initiating monitoring to support development of Total Maximum Daily Load (TMDL) analyses for nutrient related constituents in Watson Lake. This lake was listed as impaired due to nitrogen, pH, and low dissolved oxygen by the US Environmental Protection Agency (EPA) in 2004. In addition, a fish kill in 2000 was associated with a blue-green algae bloom and high pH values, which is further evidence of excess nutrient concentrations in the lake. The monitoring and TMDL will establish load reductions for sources contributing nutrients from the greater watershed. To do this, ADEQ will be monitoring Watson Lake, Granite Creek and its tributaries, and Willow Lake, gathering information to establish a nutrient budget (inputs and outputs) from surface and ground water. ADEQ will also be monitoring during different types of flow to estimate nutrient loadings caused by potential discharges, land uses, and riparian conditions in the watershed.

EPA also listed Granite Creek as impaired by low dissolved oxygen in 2004. Extensive restoration work on Granite Creek (implemented by Prescott Creeks and funded in part through ADEQ’s Watershed Improvement Grant Program) should substantially improve conditions on Granite Creek, including the low dissolved oxygen levels. After the project is completed, extensive monitoring to evaluate the success of the project is planned by the Prescott Creeks, and ADEQ will determine if low dissolved oxygen levels are still occurring.

**Other Plans and Efforts**

In addition to the plans listed above, numerous other efforts that may indirectly affect the Preserve exist. In 2000, the citizens of Prescott voted to extend a sales tax. Income generated from the tax (up to \$40.7 million) will be used to purchase identified “open space” properties in and around Prescott. Just two examples of the properties eligible for purchase with this funding include Glassford Hill to the north and east of the Preserve, and Badger “P” Mountain several miles to the south.

The City of Prescott recently approved a new General Plan, and the City Parks, Recreation and Library Department has a citywide Trail Plan that addresses trail issues in the Watson Woods/Peavine Trail/Watson Lake area. Finally, Prescott Creeks is engaged with the City of Prescott and multiple other NGOs in the Prescott area to implement the Prescott Greenways—a creek-side trail in the downtown area. Eventually this trail will connect with the Peavine Trail and Watson Woods Riparian Preserve.

**Community Support**

Several letters of support have been included with this grant representing a diversity of relevant interests. In addition to these comments, Prescott Creeks has worked in Prescott on the following community based projects:

- 1.) *Community tree planting/revegetation projects* - Prescott Creeks has hosted three major riparian tree-planting efforts at Watson Woods. As part of these events, well over 1000 people have participated.
- 2.) *Riparian Field Trips* – Annually, Prescott Creeks hosts many field trips in Watson Woods with audiences ranging from the Arizona Riparian Council and the Arizona Department of Water Resources to the Prescott and Chino Valley Public Schools. Just a few examples include tours for: the Yavapai County Water Advisory Committee Coordinator, John Rassmussen, and the City of Prescott Water Conservation Coordinator, Shaun Rydell; multiple Prescott College classes; the Highlands for Natural History; Heritage Park Zoo Camp; and others.
- 3.) *Riparian Ecology through Ecological Restoration College Course* - Past Prescott Creeks Directors and staff members have taught a field-based Riparian and Restoration course at Prescott College. This yearly course involves twelve college students in the study of riparian ecology and restoration ecology at Watson Woods Riparian Preserve.
- 4.) *Riparian Education* - Prescott Creeks has coordinated with Professors Doug Hulmes and Joel Barnes at Prescott College on a project that yearly involves hundreds of fifth graders in riparian issues in the upper Verde River Watershed. One aspect of this program involves students in experiential activities throughout Watson Woods and other creeks in Prescott.

- 5.) *Granite Creek Cleanup* - Prescott Creeks hosts the annual Granite Creek Cleanup. During this event, hundreds of Prescott citizens volunteer an April Saturday morning to help remove trash from the creeks of Prescott. Hundreds of tires and over 30 tons of trash have been removed from Watson Woods alone.

These are only a few of the projects that demonstrate Prescott Creeks' commitment to involving our community in this and other projects. This is not surprising as all of our board members live and work in the Prescott area. This is our home; we want to *preserve, restore* and *celebrate* the natural beauty and ecological integrity of the land upon which we live, and we must involve other members of our community to do so. Projects such as the Watson Woods Riparian Preserve Restoration Project cannot be successful without broad community support, strong educational ethics, and heartfelt commitment.

## Letters of Support

We are pleased to offer the following letters of support with this proposal:

The Nature Conservancy  
Oak Creek Watershed Council  
Prescott College  
River Network  
Yavapai County Water Advisory Committee  
Primavera School  
University of Arizona Cooperative Extension, Yavapai County  
Granite Dells Preservation Foundation

In addition to the enclosed letters we understand that several others have opted to forward their letters of support directly to the Commission. You should also be receiving letters from:

Prescott Audubon Society  
Prescott Native Plant Society



Verde River Program  
115 S McCormick Suite 2  
Prescott AZ 86303

Tel (928) 925-9221  
Email [kschonek@tnc.org](mailto:kschonek@tnc.org)

[nature.org/](http://nature.org/)  
Arizona

August 16, 2013

Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

RE: Letter of Support for Prescott Creeks Watson Woods Riparian Preserve Restoration Project – Phase II

Dear Mr. Held:

It is my pleasure write a letter in support of the proposal “Watson Woods Riparian Preserve Restoration Project – Phase II” being submitted by Prescott Creeks for funding consideration by the Arizona Water Protection Fund. Prescott Creeks has an excellent track record of completing restoration projects in a timely manner with a high degree of professionalism and are well qualified to complete the work described in the grant proposal.

Granite Creek is the first tributary to the Verde River; it joins flow water from the Big and Little Chino Aquifers near the Conservancy’s Verde Springs Preserve. From there the Verde grows into one of the most important rivers in the state supporting diverse wildlife from birds, snakes fish and mammals. Additionally over 3 million people depend on the Verde for water from Prescott to Phoenix. Specifically this project will improve habitat important for fish, wildlife and birds in the Prescott area serving as a model for other conservation groups working to improve the Verde River Watershed. These benefits translate downstream as well as throughout Northern Arizona.

Sincerely,

*Kimberly Schonek*

Kimberly Schonek  
Verde River Project Manager

Oak Creek Watershed  
COUNCIL



Letter of Support for  
Prescott Creeks  
Watson Woods Riparian Preserve Restoration Project

August 17, 2013

Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

Dear Mr. Held:

I am writing to express support for the Prescott Creeks funding proposal at Watson Woods Riparian Preserve. As the Executive Director for the Oak Creek Watershed Council, I am aware of the importance this effort holds for riparian habitat in central Arizona.

It is estimated that nearly 75% of Arizona's wildlife depends upon healthy riparian habitat; restoration of Watson Woods Riparian Preserve will not only increase the quality of areas habitat, but will also increase the available acreage of habitat.

Please allow me to add my support and endorsement for Prescott Creeks' application. The Granite Creek Watershed is a significant riparian asset in our central Arizona, and improvements to Watson Woods will help to improve downstream habitat.

Sincerely,

A handwritten signature in black ink that reads "Barry Allan". The signature is written in a cursive, flowing style.

Barry Allan  
Executive Director



# Prescott College

For the Liberal Arts, the Environment, and Social Justice

August 15, 2013

Rodney Held, Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

Dear Mr. Held:

I am writing to voice my full support for Prescott Creek's grant request for the second phase of restoration in the Watson Woods Riparian Preserve (WWRP). This grant proposal represents an important contribution to the health of our watershed's riparian habitat and water quality. The WWRP is vital to our region, and Prescott Creeks continues to work hard at sustainable restoration of this critical habitat.

Restoration projects like the ones in this proposal are such an important, community-based demonstration of the value of open space and wilderness. These projects create a living classroom and field laboratory for environmental education that engage students from our local schools and colleges, as well as citizens from Prescott and beyond. Additionally, the specific area that will benefit from further funding has been a critical site that Prescott College has utilized for our environmental education programming over the past several decades.

With additional funding from the Arizona Water Protection Fund, Prescott Creeks will continue restoring this area toward its full ecological potential. These restoration projects will serve as teaching tools that will engage students and the public at large in hands-on experiences that will help cultivate a "sense of place" and watershed-based stewardship.

Regards,

*Joel C. Barnes, Ph.D.*

*Professor, Adventure Ed. & Environmental Studies, On-Campus Undergraduate Program*

*Director, Master of Arts Graduate Teaching Assistant Program*

*Affiliate Faculty, Sustainability Education, PhD Program*

*work phone: 928-350-2206*

*cell phone: 928-925-6592*

*work email: <[jbarnes@prescott.edu](mailto:jbarnes@prescott.edu)>*

**Master of Arts Program**  
220 GROVE AVENUE • PRESCOTT • ARIZONA 86301  
(928) 776-7116 • Fax: (928) 776-5151



# River Network

*Connecting People, Saving Rivers*

Prescott Creeks  
Restoration Project – Phase II  
Final Proposal – August 2013

August 19, 2013

Arizona Water Protection Fund Commission  
3550 N. Central Avenue  
Phoenix, AZ 85012

Dear Review Committee:

River Network, a national nonprofit organization dedicated to supporting river conservation efforts throughout the country, is pleased to offer this letter of support for Prescott Creeks' Watson Woods Riparian Preserve Restoration Project (Phase 2).

Prescott Creeks Preservation Association is a model community-initiated watershed protection organization striving to protect the ecological integrity of central Arizona's riparian systems. The success of Prescott Creeks in meeting their goals is the result of a unique combination involving strong leadership, diverse community support and innovative approaches to working with local corporations, landowners, conservationists and government.

In a part of the country faced with drought conditions, population growth and convoluted water rights, the ability of Prescott Creeks to complete numerous complex, collaborative restoration projects; educate and involve a growing number of community members as volunteers; and maintain a sustainable nonprofit organization representing various interests from within the watershed is both impressive and rare. Established in 1995, Watson Woods is a 126-acre preserve that plays host to wildlife, riparian forests and passive recreational opportunities. The continued work to protect and restore the Preserve will service – at very little cost to taxpayers – both the community and the State by providing flood and erosion control, ground water recharge and purification, nonpoint pollution control and habitat protection. Based upon the lessons learned from Phase 1, good-standing within the local community, and a reality-based proposal, Prescott Creeks is well poised to successfully continue their efforts on the Watson Woods Riparian Preserve Restoration Project.

River Network has closely followed and supported the work of this outstanding organization and views Prescott Creeks as an excellent model for similar groups throughout the nation. We encourage your serious consideration of their request for assistance and recognition through the AWPf. Should you have any questions, please do not hesitate to contact me.

Sincerely,

Katherine Luscher  
Education Program Manager  
River Network  
209 SW Oak #300  
Portland, OR 97204  
503/542-8387

# YAVAPAI COUNTY BOARD OF SUPERVISORS

A.G. “CHIP” DAVIS – Chairman  
District 3  
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JACK SMITH – Member  
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[www.co.yavapai.az.us](http://www.co.yavapai.az.us)

PHIL BOURDON  
County Administrator  
[phil.bourdon@yavapai.us](mailto:phil.bourdon@yavapai.us)

DAVID S. HUNT  
Assistant County Administrator  
[dave.hunt@yavapai.us](mailto:dave.hunt@yavapai.us)

ANA WAYMAN-TRUJILLO  
Clerk of the Board/  
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JACK FIELDS  
Board Counsel  
[jack.fields@yavapai.us](mailto:jack.fields@yavapai.us)

August 16, 2013

Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

RE: Support for Prescott Creeks Watson Woods Riparian Preserve Restoration Project

Dear Mr. Held:

As coordinator of the Yavapai County Water Advisory Committee (WAC), I am pleased to offer my support of the above referenced enhancement and protection proposal. The WAC has identified effective water resource stewardship as a priority for our region. This proposal represents effective stewardship and is aligned with the management and education goals of the WAC. For example, the work represented in the proposal will generate healthy functioning stream systems (e.g. water quality and baseflow). Additionally, the work will inspire natural resource values, uphold community involvement/education, and promote healthy local economies through visitation to the restored and functioning area.

Prescott Creeks is appreciated by the communities represented on the WAC because they have demonstrated measurable success and have responsible leadership. And importantly, Prescott Creeks does not participate in the politics surrounding water resources in Yavapai County.

In addition to the value stated above, I am particularly interested in lending support to this proposal for the monitoring data for the area. I would also like to use the success of Prescott Creeks as support and evidence for other similar projects elsewhere in Yavapai County.

Kind Regards,

John Rasmussen  
Coordinator Yavapai County Water Advisory Committee

Prescott Creeks  
Watson Woods Riparian Preserve Restoration Project – Phase II  
Arizona Water Protection Fund Proposal – August 2013

**Letter of Support for  
Prescott Creeks  
Watson Woods Riparian Preserve Restoration Project**

August 16, 2013

Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

Dear Mr. Held:

As an elementary educator who utilizes nature as an outdoor classroom, I support Prescott Creeks' Watson Woods Preserve Restoration Project proposed to the Arizona Water Protection Fund. Having Watson Woods Riparian Preserve restored to its optimal function and integrity as a meandering stream with sufficient floodplain would provide an education site to observe the natural function of our beloved Granite Creek. As I am sure you are aware, this is becoming an increasing rare ecosystem, especially in the fast growing region of Prescott.

I am very excited include my students in this real-world project as we work with Prescott Creeks to learn more about the water quality of our local streams. As a teacher, I see service-learning opportunities that Prescott Creeks can provide with funding from the Water Quality Improvement Grant for students as an invaluable and exciting way for students to feel empowered in their learning. Further, it can bridge the multiple curricular concepts while contributing service towards positive change, culminating with the understanding of and need for environmental stewardship.

At Primavera School, I teach students about local riparian ecosystems and incorporate water quality monitoring projects in The Upper Granite Creek Watershed. We conduct science experiments around many of the creeks that are adjacent to our school and in Miller and Granite Creeks at West Granite Creek Park in downtown Prescott.

I view the water-testing program that we developed for Primavera School as a model to implement with volunteers and in other schools throughout the watershed. With expanded monitoring in the upper stretches of creeks that flow into Granite Creek, we can have an idea of some of the factors that influence the health of the watershed and Watson Woods Riparian Preserve.

In addition to the hands-on monitoring, I look forward to including my students with elements of Prescott Creeks' on-the-ground projects included in their proposal. Planting native species is a favorite activity for students and adults alike. We also look forward to the field trip opportunities that both the repaired stormwater basin and the livestock best management practices demonstration projects will provide.

The Arizona Water Protection Fund's funding of Prescott Creeks' proposal will surely accelerate the speed with which Granite Creek and Watson Lake can be removed from the Impaired Waters list. As we move closer to this goal, we can look to Watson Woods as a model of returning a degraded riparian ecosystem to one of proper function and habitat.

Sincerely,

Daniel E. Jannone  
Primavera School



COLLEGE OF AGRICULTURE  
AND LIFE SCIENCES  
COOPERATIVE EXTENSION

Yavapai County

840 Rodeo Drive, Building C, Prescott AZ 86305-2318 • 928-445-6590 • Fax: 928-445-6593

2830 N. Commonwealth Drive, Suite 103, Camp Verde AZ 86322 • 928-554-8999 • Fax: 928-554-8996

[extension.arizona.edu/yavapai](http://extension.arizona.edu/yavapai)

August 23, 2013  
Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

Dear Mr. Held:

This letter is to express my support for the Prescott Creeks restoration proposal for Watson Woods Riparian Preserve.

Prescott Creeks has featured their work at Watson Woods Riparian Preserve and their Watershed Monitoring efforts at our Master Watershed Stewards speaker's forum each year. Due to the high quality of their programs, many of our Master Watershed Stewards have fulfilled the required 40 hours of volunteer service with Prescott Creeks. We are excited about the continued opportunities for involvement this project will provide to our Watershed Stewards.

The Southwest has lost 90% or more of its riparian habitat since the early 1800s and Prescott Creeks' efforts to restore Watson Woods Riparian Preserve are commendable. They have patiently explored the complex issues associated with restoring natural hydrologic and geomorphic conditions, as well as replanting the banks of the creek historically described as being "...lined with extensive growth of jungle willows, wild vines, cottonwood and ash trees..." While some have doubted their efforts, they have determined that restoration of this area is feasible.

The University of Arizona Cooperative Extension looks forward to additional opportunities to partner with Prescott Creeks on this project through providing technical assistance, providing needed volunteer labor, or working with them to demonstrate the value of this important project. Please lend your support to this exemplary organization and their request for funding.

Sincerely,

*Edessa Carr*

Program Coordinator  
Water Resource Education  
University of Arizona  
Cooperative Extension, Yavapai County  
840 Rodeo Drive, #C  
Prescott, AZ 86305  
Phone: 928-445-6590 ext. 227  
[edessa@calis.arizona.edu](mailto:edessa@calis.arizona.edu)



**Granite Dells  
Preservation  
Foundation  
PO Box 284  
Prescott, AZ 86302**

August 27, 2013

Rodney Held  
Executive Director  
Arizona Water Protection Fund  
3550 North Central Avenue  
Phoenix, AZ 85012

Dear Mr. Held:

The Board of Directors for the Granite Dells Preservation Foundation is pleased to offer this letter of support for Prescott Creeks Preservation Association's Phase II of the Watson Woods Riparian Preserve Restoration Project.

Prescott Creeks is a model community-initiated watershed protection organization striving to achieve healthy watersheds and clean waters in central Arizona for the benefit of people. The success of Prescott Creeks in meeting their goals is the result of a strong leadership, diverse community support, and innovative approaches to working with local stakeholders.

In a part of the country faced with drought conditions, population growth and convoluted water rights, the ability of Prescott Creeks to complete numerous complex, collaborative restoration projects; educate and involve a growing number of community members as volunteers; and maintain a sustainable nonprofit organization representing various interests from within the watershed is both impressive and rare. Established in 1995, Watson Woods is a unique 126-acre preserve that plays an important ecological and recreational role for Prescott and the Verde River Watershed. The Foundation is working to protect the ecological and scenic integrity of the Dells area and the Preserve's location at the "doorstep of the Dells" makes this a relevant and important project. The continued work to protect and restore the Preserve will service – at very little cost to taxpayers – both the community and the State by providing flood and erosion control, ground water recharge and purification, nonpoint pollution control and habitat protection. Based upon momentum gained from their previous successes, good-standing within the local community, and a reality-based proposal, Prescott Creeks is well poised to successfully carryout the Watson Woods Riparian Preserve Restoration Project.

Since its formation in 2010 the Granite Dells Preservation Foundation has closely followed and supported the work of this outstanding organization. We encourage your serious consideration of their request for assistance and recognition through the Fund. Should you have any questions, please do not hesitate to contact me.

Sincerely,  
Dan Campbell, Secretary of Board

**Placeholder for  
Letter of support from  
Prescott Audubon Society**

**Placeholder for  
Letter of support from**

**Prescott Native Plant Society**

## **Evidence of Control and Tenure of Land**

Prescott Creeks and the City of Prescott established Watson Woods Riparian Preserve with a legally binding 25-year, renewable lease executed in July of 1995. The lease is expected to be renewed for at least an additional 25 years.

Please see the attached Prescott Creeks/City of Prescott lease agreement for detailed information.

## **Evidence of physical and legal availability of water:**

While this restoration project does call for the use of supplemental irrigation (supplied by the City of Prescott through their municipal distribution system), this project *does not* include the use of effluent, or CAP water. Please see the letter of support from the City of Prescott regarding supplemental drip irrigation.

The ephemeral wetlands described above and in the Watson Woods Riparian Preserve Restoration Plan (as developed for grant #04-122WPF) will fill with surface water and/or groundwater during overbank flows in Granite Creek. Approximately 2 acres of ephemeral wetlands could fill to an average depth of 1 to 1.5 feet during such events. Prescott Creeks has consulted with current water right holders (City of Prescott, Salt River Project and Yavapai-Prescott Indian Tribe) to begin a dialogue regarding this issue. Each right holder has indicated an understanding of Prescott Creeks' proposed restoration design elements and no formal objections have been expressed. Prescott Creeks is committed to securing water rights as necessary for implementation of the ephemeral wetlands aspect of the Watson Woods Riparian Preserve Restoration Plan.

#95-076

LEASE

LESSOR: THE CITY OF PRESCOTT, an Arizona municipal corporation

LESSEE: PRESCOTT CREEK PRESERVATION ASSOCIATION, an Arizona non-profit corporation

THIS LEASE made on the 27<sup>th</sup> day of JULY, 1995, by and between PRESCOTT CREEK PRESERVATION ASSOCIATION, an Arizona non-profit corporation, hereinafter referred to as "Lessee," and THE CITY OF PRESCOTT, an Arizona municipal corporation, hereinafter referred to as "Lessor":

W I T N E S S E T H:

In consideration of the mutual covenants contained herein, the parties agree as follows:

1. Premises. Lessor hereby leases to Lessee, and Lessee hereby leases from Lessor, those certain premises, hereinafter referred to as the "Premises," known as WATSON WOODS, as more fully set forth in the legal description and map attached hereto as Exhibit "A", together with the appurtenances thereto and the buildings and improvements now or hereafter erected thereon.

2. Term. The term of this lease shall be for twenty-five (25) years, commencing upon execution of this agreement and terminating twenty-five (25) years thereafter.

3. Early Termination. The parties agree that within One-

hundred twenty days (120) from the execution of this lease the parties will prepare and mutually agree to a long-term development for the use of the denised premises. The assent of Lessor will be indicated by the signature of the City Clerk of Lessor, after council action, and the assent of Lessee shall be indicated by the signature of Lessee's president. If a mutual consent to a development plan is not reached within the time set forth above, this lease is terminable at will, by either party, upon written notice from the terminating party to the other party.

The continuation of this lease, once a development plan has been agreed to is contingent upon Lessee's compliance with the development plan. In the event that, within forty-five (45) days after the end of any of the five (5) year periods described in the plan, the Lessor determines that the Lessee is in material non-compliance with the plan, the Lessor may give written notice to the Lessee that it intends to terminate the lease. The Lessee will then have thirty (30) days to respond in writing. If the Lessee does not respond, the lease will automatically terminate upon the expiration of the response time. If Lessee responds, the dispute will automatically proceed to a determination before a three member non-binding arbitration panel which will attempt to resolve the parties' dispute. The panel shall consist of one member chosen by Lessor, one member chosen by Lessee (neither of which shall be affiliated with their appointive bodies) and the chairman of the panel, who will be selected by the other two arbitrators. The arbitration shall be conducted according to such rules as may be

adopted by the arbitration panel.

No litigation in any forum may be commenced by either party until this arbitration process has been completed. In the event that any litigation is commenced once the arbitration panel has rendered its decision and a party has not participated in good faith in the arbitration process, the decision of the arbitration panel is admissible into evidence in any hearing or trial that may be conducted in such litigation.

4. Option To Extend. Lessor hereby grants to Lessee the option to extend the term of the subject lease, said option shall be for an additional TWENTY-FIVE (25) years. Such option shall be exercised, if at all, by written notice from Lessee to Lessor at least one hundred and twenty (120) days prior to the expiration of the then-existing term of the subject lease. As a condition precedent to Lessee's right to exercise this option, Lessee shall as of the date of exercise, be not in default in performance of any obligation of Lessee pursuant to the terms of the subject lease. The extended term or terms, as the case may be, shall be on the same terms, conditions and covenants as set forth herein.

5. Base Rent. As base rent, Lessee shall pay Lessor the sum of ONE DOLLAR (\$1.00) on or before the 1st day of each calendar year during the term hereof.

6. Property Taxes and Assessments. Real property taxes and any assessments against leased Premises shall be paid by Lessee.

7. Utilities. Lessee shall be responsible for and shall

pay and discharge before the same become delinquent, all bills for electricity, gas, telephone and any other service or utility used by Lessee in connection with the Premises.

6. Construction or Operation. Lessee shall maintain and operate the premises in accord with the stipulations attached hereto as Exhibit "A". Any deviation from or modification of this stipulation statement shall require the written consent of the Recreation Services Director of Lessor.

The parties agree that the premises will be operated on a non-profit basis and shall be open and available to the citizens of Lessor. No commercial activities shall be permitted on the premises.

Lessee shall keep all structures located on the Premises in as good order and/or repair as they are at the date of the commencement of this Lease, reasonable wear and tear excepted.

If Lessee shall fail to maintain and/or repair leased Premises in good condition, Lessor shall have the right, after ten (10) days written notice to Lessee, to have the repairs completed, which, in its sole judgment, are necessary, and Lessee agrees to pay for said repairs immediately upon presentation of bills. Failure of Lessee to pay said bills within ten (10) days after presentation shall constitute a material breach under the terms of this lease.

7. Furniture and Equipment. Lessor agrees to permit Lessee to install and maintain such structures, improvements, furnishings and equipment in and upon the Premises as may be required by Lessee

to execute the mission statement attached as Exhibit "B", however, such activities must be approved in writing by the Recreation Services Director of Lessor. Such authority includes the ability to remove such structures, improvements and fixtures on the Premises that are not in accord with the mission statement

10. Liability Insurance. Lessee shall maintain general public liability insurance against claims for personal injury, death or property damage occurring in or about the Premises, such insurance to afford protection of not less than \$1,000,000 in respect to injury or death of one or more persons, and \$100,000 for property damage. Such policy or policies of insurance shall name Lessor as an additional insured thereunder and Lessee shall furnish Lessor with a copy of such policy or policies, or with a certificate of the company issuing such insurance certifying that the same is in full force and effect. Said policy shall be written to take effect prior to Lessee commencing any improvements or modifications to the premises or prior to Lessee making the premises available to the general public, whichever comes first.

All insurance must be written by an insurance company authorized to do business in the State of Arizona, to be evidenced by a Certificate of Authority as defined by A.R.S. §20-217, a copy of which certificate is to be attached to the applicable insurance policy or certificate of insurance.

11. Hold Harmless. Lessee shall indemnify and hold harmless Lessor from and against any and all claims arising from Lessee's use of the premises or from the conduct of Lessee's activities

thereof or from any activity, work, or things done, permitted, or suffered by Lessee in or about the premises or elsewhere and shall further indemnify and hold harmless Lessor from and against any and all claims arising from any breach or default in the performance of any obligations on Lessee's part to be performed under the terms of the lease or arising from any negligence of the Lessee, or any of the Lessee's agents, contractors, or employees, and from and against all costs, attorney's fees, expenses, and liabilities incurred in the defense of any such claim or any action or proceeding brought thereon, and in case any action or proceeding be brought against Lessee by reason of any such claim. Lessee, as a material part of the consideration to Lessor, hereby assumes all risks of damage to property or injury to persons, in, upon, or about the premises arising from any cause and Lessee hereby waives all claims in respect thereof against Lessor.

11. Compliance With Authorities. Lessee shall promptly comply with any and all laws, ordinances, rules and regulations of any and all municipal, county, state and federal authorities, boards, commissions and other governmental agencies with respect to the premises and the business conducted therein. Lessor agrees not to do anything in the premises which may result in a violation of the rules of any municipal, state or federal department or agency concerned with the occupancy of the premises or the business conducted therein.

12. Signs. Lessor shall have the right to place signs upon the premises. All signs constructed or placed upon the premises

shall be in compliance with all applicable city ordinances and regulations and approved by Lessor.

14. Quiet Enjoyment. As long as Lessee is not in default in any of its covenants herein contained, it shall enjoy peaceful and quiet possession of the Premises, subject to Lessor's right to make periodic inspections of the leased premises. Any such inspections will be made in a manner so as not to disturb Lessee or its invitees.

15. Assignment; Sublease. Lessee shall not assign this lease, or any interest herein, and shall not sublet the Premises, or any part thereof, without the prior written consent of Lessor, which consent may be withheld at the sole discretion of Lessor.

16. Default. If:

- a. Lessee shall default in the observance or performance of any covenant or provision of this lease; or
- b. Lessee shall make an assignment for the benefit of creditors; or
- c. A voluntary or involuntary petition is filed by or against Lessee under any law for the purpose of adjudication of Lessee as a bankrupt, or for the extension of time or payment, composition, arrangement, adjustment, modification, settlement or satisfaction of the liabilities of Lessee or for the reorganization of Lessee under the Bankruptcy Act of the United States having the same general purpose, or receiver is appointed for Lessee by reason of insolvency or alleged insolvency of Lessee, and such adjudication, order, adjustment, decree, custody and supervision has not been vacated or set aside or appeal taken or otherwise terminated or permanently stayed within sixty (60) days after the date of entry of beginning thereof;

then and in the event of the occurrence of any of the events hereinabove set forth and upon the expiration of any grace period

within which to cure said default, Lessor may, in addition to any other remedy at equity or at law, at its option, elect any one or more of the following remedies:

- a. Terminate this lease by written notice of its election to terminate and this lease shall terminate as of the date of said written notice without further action on the part of Lessor;
- b. To immediately re-enter and resume possession of the Premises or any part thereof and to remove all persons and property from the Premises and such property may be stored in a public warehouse or elsewhere at the cost of and for the account of Lessee, all without service of notice or resort to legal process (all of which Lessee expressly waives) and without being deemed guilty of trespass or becoming liable for any loss or damage which may be occasioned thereby;

In the event of a default, Lessee shall have ten (10) days from the written notice of said default to cure any such default prior to the Lessor exercising its remedies as set forth above. No right or remedy herein conferred upon or reserved to Lessor is intended to be exclusive of any other right or remedy herein or by law provided but each shall be cumulative and in addition to every other right or remedy given herein or now or hereafter existing at law or in equity or by statute. No waiver by Lessor by any breach by Lessee shall be a waiver of any subsequent breach or of any obligation, agreement or covenant nor shall any forbearance by Lessor to seek a remedy for any breach by Lessee be a waiver by Lessor of its rights and remedies with respect to or any subsequent breach.

17. Removal of Liens. Lessee further agrees to keep the Premises free from any lien of any kind created by or due to Lessee's acts or admissions Lessee agrees to indemnify and hold

harmless Lessor from and against any such lien or claims of lien.

18. Surrender. Lessee agrees that at the expiration of the term of this lease or the early termination thereof to surrender peaceful possession of the Premises and all improvements thereon to the Lessor, ordinary wear and tear excepted.

19. Conflict of Interest cancellation. Pursuant to A.R.S. Section 38-511, the City of Prescott may cancel this agreement, without penalty or further obligation, if any person significantly involved in initiating, negotiating, securing, drafting or creating the agreement on behalf of the City is, at any time while the agreement or any extension of the agreement is in effect, an employee or agent of any other party to the agreement in any capacity or a consultant to any other party of the agreement with respect to the subject matter of the agreement. In the event of the foregoing, the City of Prescott further elects to recoup any fee or commission paid or due to any person significantly involved in initiating, negotiating, securing, drafting or creating this agreement on behalf of the City of Prescott from any other party to the agreement arising as a result of this agreement.

20. Non-Discrimination. The Lessee will not discriminate on the grounds of race, color, national origin, religion, sex, disability or familial status in the selection and retention of subcontractors, including procurement of materials and leases of equipment, nor with respect to making the facilities subject to this agreement available to the public. The Lessee will not participate either directly or indirectly in the discrimination

prohibited by or pursuant to Title VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Section 104 of the Housing and Community Development Act of 1974, the Age Discrimination Act of 1975, and Executive Order 11246 as amended.

21. Non-assertion of Status. It is expressly agreed and understood by and between the parties that as a result of the Agreement that neither the Lessee, nor its agents nor employees, shall become a City employee, and are not entitled to payment or compensation from the City or to any fringe benefits to which other City employees are entitled. The Lessee further agrees that it will neither hold itself out nor claim to be an officer or employee of the City by reason thereof, and that it will not make any claim, demand or application to or for any right or privilege applicable to or for any officer or employee of the City, including but not limited to workman's compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

22. Regulated Agreement. This Agreement is the result of negotiations by and between the parties. Therefore, any ambiguity in this Agreement is not to be construed against either party.

The making, execution and delivery of this lease has not been induced by any representation, statement, warranties or agreements other than those herein expressed. It is mutually agreed by and between the parties hereto that this agreement supersedes all other previous and/or other agreements bearing upon the above premises, and it is further agreed that no changes to or in this lease shall

be made without being in writing, signed by all of the parties hereto.

23. No Warranties Made. At the commencement of the term Lessee shall accept the premises and fixtures in its existing condition. No representations, statements or warranties, express or implied, have been made by or on behalf of the Lessor as to the condition thereof. In no event shall the Lessor be liable for any defect in such property or for any limitation on its use.

24. Lessee Shall Not Encumber Property. Lessee shall have no power to do any act or to make any contract that may create or be the foundation for any lien upon the premises or other estate or reversion of the Lessors in the demised premises or upon any building or improvement thereon, and should any such lien be filed, the Lessee at its own cost and expense shall bond or otherwise discharge the same within ten days after the filing thereof.

25. Lessor's Reservation of Rights. Lessor reserves the right to make improvements and alterations upon the real property. Any such improvements and alterations shall be the property of the Lessor, and shall not be deemed part of the premises leased to the Lessee.

Prior to undertaking any improvements or additions, Lessor will consult with Lessee, and shall take into consideration biological, environmental, and aesthetic concerns in determining the nature and location of any such improvements or additions.

26. Lessors Retention and Relocation of Structures and

IMPROVEMENTS. Notwithstanding anything to the contrary herein, it is expressly agreed and understood by and between the parties that those items identified in the attached Exhibit "C" will be relocated outside of the demised premises by the Lessor within five (5) years from the effective date of this Agreement; provided, however, that the Lessor shall be entitled to retain the existing roadway, as identified in Exhibit "C" until one of the following events occurs: that the Lessor's D-9 is disposed of and not replaced with a similar piece of equipment, or the Lessor's Landfill is closed and no further maintenance or other requirements relating to the closure thereof are required of Lessor, or a new Sundog Bridge is constructed; and further provided that the gravel storage pit located adjacent to Highway 89 and identified in the attached Exhibit "C" may be retained on the demised premises until a new Sundog Bridge is constructed.

27. Suit. In any suit which may be brought by either party to enforce this Lease or any part hereof or to recover damages for the breach hereof, the court, sitting without a jury, shall award a reasonable amount as and for attorney's fees to the prevailing party.

28. Waiver. The waiver by the Lessor of any breach or breaches by the lessee of any one or more of the covenants, agreements, conditions, or obligations herein contained or the acceptance of any delinquent payments shall not bar the Lessor's right to declare a forfeiture or to employ any other rights or remedies of the said Lessor in the event of any subsequent breach

of any such or other covenants, agreements, conditions, or obligations. Any entry and/or re-entry by the Lessor, whether had or taken under what is generally known as summary proceedings, or otherwise, as provided by the terms of this lease, shall not be deemed to absolve or discharge the Lessee from liability hereunder.

29. Titles. The titles which are used following the number of each paragraph are so used only for convenience in locating various provisions of this Lease and shall not be deemed to affect the interpretation or construction of such provisions.

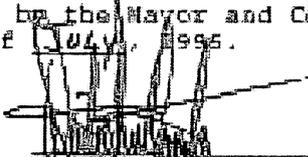
30. Time of Essence. Time is of the essence of this Lease.

31. Covenants Binding on Successors. The covenants and conditions herein contained shall, subject to the provisions as to assignment, apply to and be binding upon the heirs, personal representatives, successors and assigns of the parties hereto.

32. Construction. The terms and conditions of this agreement shall be construed and governed in accordance with the laws of the State of Arizona.

IN WITNESS WHEREOF, Lessor and Lessee have executed this Lease, in duplicate, as of the day and year first above written.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the City of Prescott this 25 day of JULY, 1996.

  
\_\_\_\_\_  
DAITON RUTKOWSKI, Mayor

ATTEST:

  
\_\_\_\_\_  
MARIE L. WATSON  
City Clerk

APPROVED AS TO FORM:

  
\_\_\_\_\_  
JOHN HOFFERT  
City Attorney

ACCEPTED AND APPROVED this 25 day of July, 1995.

PRESMONT CREEK PRESERVATION ASSOCIATION, an Arizona  
non-profit corporation,

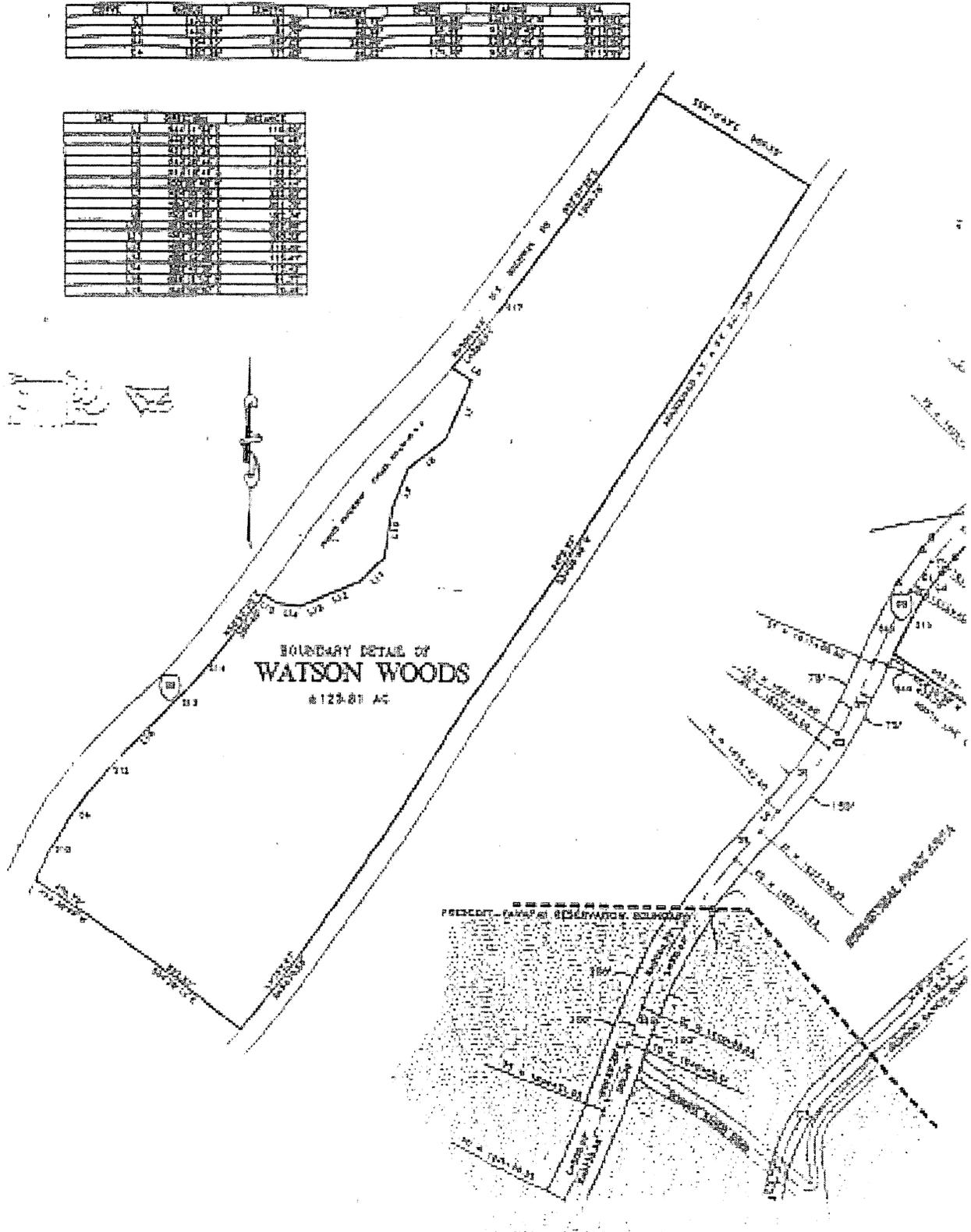
By [Signature] President, PCPA  
July 13, 1995

~~10/1/95~~

[Signature] V. President PCPA  
July 13, 1995

**EXHIBIT "A"**

This is the map & legal description of the Watson Woods area. It is too large to copy for distribution in the Council packet. Two originals are available for your review - one is with the City Clerk, and one is with the City Attorney.





**FAMAS LAND SURVEYORS, INC.**

P.O. Box 4267 Prescott, Arizona 86302  
Phone (520)-717-2844 Fax 717-2840

PROPERTY DESCRIPTION  
125.81 ACRE WATSON WOODS PARCEL

July 18, 1995

All that portion of Sections 23, 24 and 26, Township 14 North, Range 2 West, of the Gila and Salt River Base and Meridian, Yavapai County, Arizona, laying Easterly of U.S. Highway 89 and Westerly of the Abandoned Atchison, Topeka and Santa Fe Railroad, described as follows:

BEGINNING at the Southeast corner of Section 23 as shown on that Record of Survey found in Book 1 of Land Surveys, Page 143 in the Yavapai County Recorders Office;

Thence North  $01^{\circ}31'32''$  West 2538.08 feet along the Easterly line of Section 23 (basis of bearing) as shown on said Record of Survey to a point on the Easterly right-of-way of U.S. Highway 89 at Station 1566+59.96, said point also being THE TRUE POINT OF BEGINNING;

Thence North  $37^{\circ}31'33''$  East 196.25 feet along said right-of-way to a one-half inch rebar;

Thence South  $59^{\circ}14'43''$  East 909.35 feet to a point on the Westerly right-of-way of the abandoned Atchison, Topeka and Santa Fe Railroad;

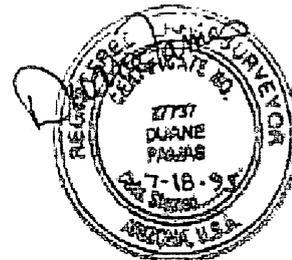
Thence South  $34^{\circ}08'49''$  West 4473.92 feet along said right-of-way to the beginning of a curve;

Thence 722.97 feet along a curve to the right with a radius of 5679.58 feet, delta =  $07^{\circ}17'36''$  and a chord bearing South  $37^{\circ}47'37''$  West 722.48 feet to a found one-half inch rebar;

Thence North  $54^{\circ}26'13''$  West 1310.67 feet to a point on the Easterly right-of-way of U.S. Highway 89;

Thence Northeasterly 323.53 feet along said right-of-way on a non-tangent, spiral curve to the right with a radius of 1357.39 feet and a chord bearing North  $26^{\circ}44'23''$  East 323.28 feet to a point;

page 1 of 3



July 10, 1995

PROPERTY DESCRIPTION

Thence 171.82 feet along said right-of-way on a curve to the right with a radius of 1357.39 feet, theta = 07°15'09", and a chord bearing North 35°16'49" East 171.70 feet to a point;

Thence 389.53 feet along said right-of-way on a spiral curve to the right with a radius of 1357.39 feet, theta = 08°00'00", and a chord bearing North 44°13'08" East 389.18 feet to a point;

Thence North 46°50'57" East 76.46 feet along said right-of-way to a found one-half inch rebar;

Thence 314.30 feet along said right-of-way on a spiral curve to the left with a radius of 1984.86 feet, theta = 04°37'25", and a chord bearing North 45°17'36" East 314.21 feet to a point;

Thence 322.46 feet along said right-of-way on a spiral curve to the left with a radius of 1984.86 feet, theta = 04°44'37", and a chord bearing North 39°04'41" East 322.36 feet to a point;

Thence North 30°52'20" East 268.40 feet along said right-of-way to a point;

Thence South 58°17'50" East 91.79 feet (South 58°30'30" East 92.20 feet record) to a found one-half inch rebar;

Thence South 62°38'30" East 112.40 feet to a found one-half inch rebar;

Thence North 68°11'30" East 118.40 feet to a found one-half inch rebar;

Thence North 68°03'30" East 219.20 feet to a found one-half inch rebar;

Thence North 47°23'30" East 160.25 feet to a found one-half inch rebar;

Thence North 10°51'30" East 252.20 feet to a found one-half inch rebar;

Thence North 22°45'30" East 162.70 feet to a found one-half inch rebar;

Thence North 53°00'00" East 251.90 feet to a found one-half inch rebar;

Thence North 24°05'30" East 302.12 feet to a found one-half inch rebar;

Thence North 55°08'48" West 120.44 feet (North 55°05'00" West 118.50 feet record) to a point on the Easterly right-of-way of U.S. Highway 88;

continued...

JULY 19, 1990

#### PROPERTY DESCRIPTION

Thence 360.51 feet along said right-of-way on a non-tangent curve to the left with a radius of 5604.56 feet, delta =  $03^{\circ}33'31''$ , and a chord bearing North  $39^{\circ}48'19''$  East 360.45 feet to a point;

Thence 100.65 feet along a spiral curve to the left with a radius of 5604.56 feet, theta =  $00^{\circ}30'00''$ , and a chord bearing North  $37^{\circ}41'35''$  East 100.16 feet to a point;

Thence North  $37^{\circ}31'33''$  East 1094.01 feet to THE TRUE POINT OF BEGINNING.

Containing 125.81 acres more or less.

## **Attachment B**

### **Mission Of Prescott Creeks Preservation Association**

**PCPA aims at achieving a balance between economic development and conservation practices while striving to maintain and improve riparian corridors, water quality and water quantity. PCPA also hopes to improve cooperative management of these systems in addition to developing educational programs for all creek related resources and use**