

Prescott Creeks Preservation Association In-Lieu Fee Mitigation Program

Draft Prospectus



Submitted To:

The US Army Corps of Engineers and Interagency Review Team

April 2012



**Prescott Creeks Preservation Association
In-Lieu Fee Mitigation Program – Draft Prospectus
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**Prescott Creeks Preservation Association
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1.0 Introduction

Prescott Creeks Preservation Association (Prescott Creeks) is pleased to present to the US Army Corps of Engineers, Los Angeles District (CESPL), and the Interagency Review Team (IRT), this Draft Prospectus for the establishment of the proposed Prescott Creeks In-Lieu Fee Program (ILF), located in central Arizona within the Verde River Watershed.

2.0 Goals and Objectives

The goal of the ILF is to provide compensatory mitigation for unavoidable losses to the aquatic environment (riparian habitats, wetlands, and other waters of the US) as authorized by CESPL permits, by the restoration, establishment, enhancement, establishment, and/or preservation of these aquatic resources within the Verde River Watershed, United States Geological Survey (USGS) Hydrologic Unit Code (HUC) 150602 (Figure 1). In order to obtain this goal, Prescott Creeks is committed to complete the following objectives:

- Identify appropriate mitigation sites/projects and service areas by utilizing a watershed approach;
- Conduct site specific baseline inventories for each mitigation site/project;
- Develop and implement mitigation activities (hydrologic improvements, earthwork, plantings, site protection);
- Provide effective short/long term management, monitoring, and maintenance activities; and
- Educate the community on the importance of aquatic, riparian, and wetland habitats.

3.0 Establishment and Operation

Prescott Creeks shall be the Sponsor, and will establish and operate the ILF in accordance with 33 CFR, Part 332, “*Compensatory Mitigation for Losses of Aquatic Resources*,” April 10, 2008 (Final Rule). Prescott Creeks shall develop a Compensation Planning Framework (CPF) that will be used to select, secure, and implement aquatic resource restoration, establishment, enhancement, and/or preservation activities. The CPF will support a watershed approach to compensatory mitigation, and all specific mitigation projects used to provide compensation for CESPL permits will be consistent with this CPF, which is described in Section 9 of this document. Any modifications to the CPF must be approved as a significant modification to the instrument by the CESPL, after consultation with the IRT.

The review and approval of the ILF is a multi-agency process that will involve any or all of the following federal and state agencies, which make up the Arizona IRT: The CESPL, Region IX of the US Environmental Protection Agency (EPA), US Fish and Wildlife Service (USFWS), Arizona Department of Environmental Quality (ADEQ), Arizona Game and Fish Department (AGFD), Pima County Office of Conservation Science and Environment, Pima County Regional Flood Control District, and the City of Phoenix.

The Prescott Creeks ILF is intended to primarily service the 3 individual watersheds within the Verde River Watershed: Big Chino-Williamson Valley (HUC #15060601), Upper Verde River (HUC #15060202), and the Lower Verde River (HUC #15060203). However, the ILF may service other watersheds within the Lower Colorado Watershed as deemed appropriate by the CESPL. Once the ILF is established, individual mitigation projects will be identified and prioritized based on activities and circumstances in specific areas within the Verde River Watershed. These activities /circumstances may

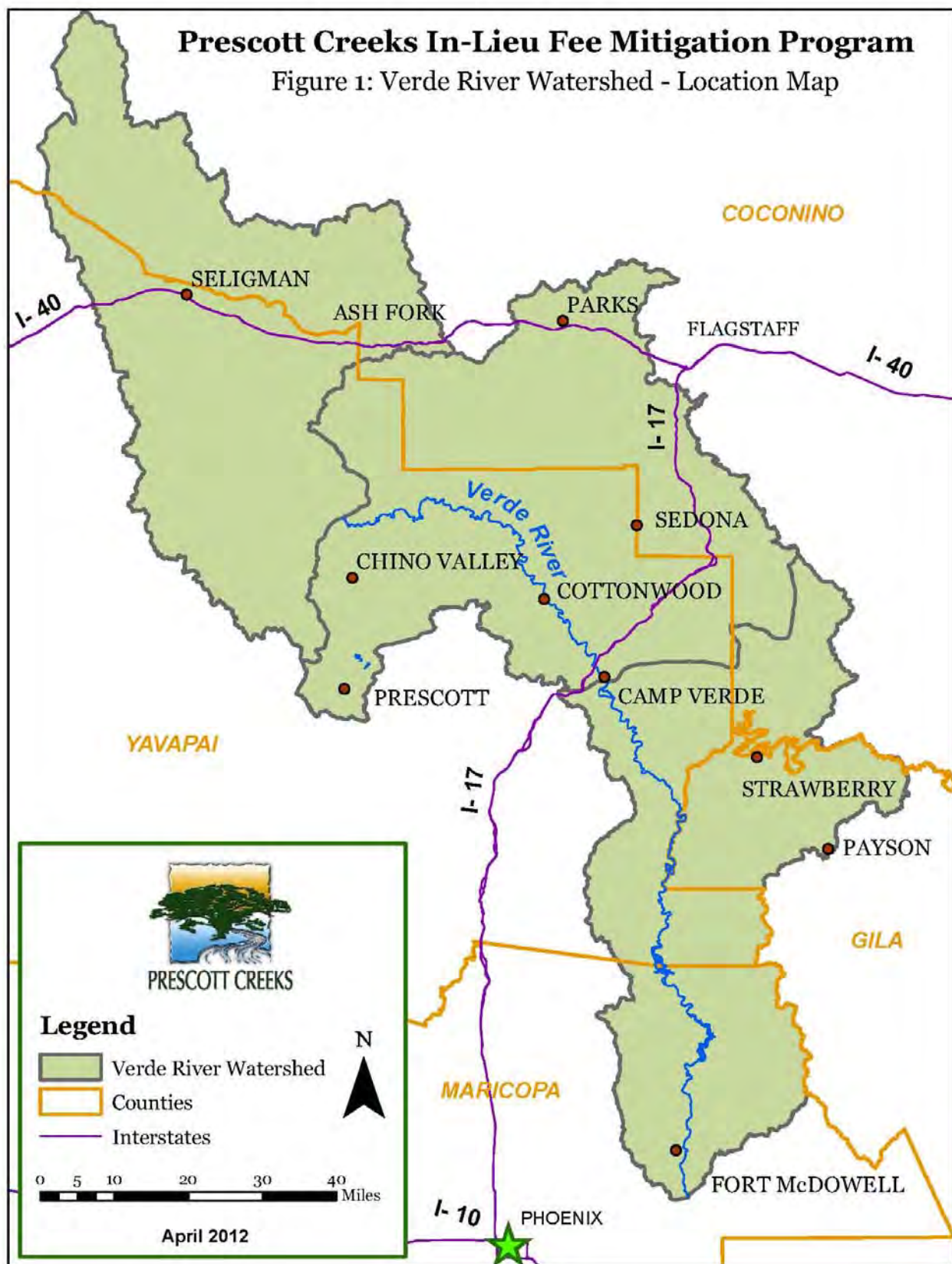


Figure 1-Verde River Watershed Location Map

include development (historic trends and planned projects), current aquatic resource conditions, and foreseeable potential losses to the aquatic environment.

The ILF and final instrument will serve as the “umbrella” beneath which individual mitigation projects within each service area(s) will be established. Each mitigation project will have a separate mitigation plan and CPF signed by Prescott Creeks and the IRT and added as an amendment to the ILF instrument. Mitigation plans will be developed and implemented in accordance with the Final Rule, and will include the following elements:

1. Project Objectives
2. Site Selection
3. Site Protection Instrument
4. Baseline Information
5. Determination of Credits
6. Mitigation Work Plan
7. Maintenance Plan
8. Performance Standards
9. Monitoring Requirements
10. Long-Term Management Plan
11. Adaptive Management Plan
12. Financial Assurances/Long Term Funding Mechanism

The ILF and specific mitigation projects are designed to generate credits for sale or transfer within a designated service area. These shall either be in the form of “advance” or “released” credits, as defined in §332.2:

- *Advance Credits*-means any credits of an approved in-lieu fee program that are available for sale prior to being fulfilled in accordance with an approved mitigation project plan. Advance credit sales require an approved in-lieu fee program instrument that meets all applicable requirements including a specific allocation of advance credits, by service area where applicable. The instrument must also contain a schedule for fulfillment of advance credit sales.
- *Released Credits*-means a determination by the district engineer, in consultation with the IRT, that credits associated with an approved mitigation plan are available for sale or transfer, or in the case of an in-lieu fee program, for fulfillment of advance credit sales. A proportion of projected credits for specific mitigation bank or in-lieu fee project may be released upon approval of the mitigation plan, with additional credits released as milestones specified in the credit release schedule are achieved.

The CESPL is authorized to issue permits pursuant to Section 404 of the Clean Water Act (33 U.S.C 1344) and/or Sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C 401, 403). Under these regulations, permittees are required to avoid and minimize adverse impacts to waters of the United States to the maximum extent practicable. Compensatory mitigation may then be required to ensure that an activity requiring a permit complies with the Section 404(b) (1) Guidelines. In order to comply with these aforementioned regulations, permittees may be approved by the Corps to pay monies into the Prescott Creeks ILF Account, in order to provide a funding mechanism for mitigation activities (restoration, establishment, enhancement, and/or preservation).

The Prescott Creeks ILF is intended to provide compensatory mitigation for CESPL Standard/Individual Permits and Nationwide/General Permits. Also, the ILF may provide compensatory mitigation under the Endangered Species Act/Habitat Conservation Plans and other tribal, state, or local wetlands regulatory

programs, along with other federal programs and Department of Defense military construction projects, consistent with the terms and requirements of these programs and provided that all requirements at §332.3(j)(1) are met.

4.0 Proposed Service Area (s)

The Prescott Creeks ILF is intended to service the USGS Accounting Unit HUC 150602 (Verde River), and the following individual Cataloging Units: HUC #15060201-Big Chino-Williamson Valley, HUC #15060202-Upper Verde River, and HUC #15060203-Lower Verde River.

As individual mitigation projects are identified and implemented, the corresponding USGS Cataloging Unit for each of these mitigation projects shall act as the primary service area. Generally, impacts to the aquatic environment authorized by CESPL permits shall be mitigated within the same USGS Cataloging Unit. However, if deemed necessary and appropriate by the CESPL, the 150602 Accounting Unit may act as a secondary service area for individual mitigation projects. Any uses beyond these stated service areas (i.e. Subregion/Region) may only be authorized by the CESPL on a case-by-case basis.

4.1 Initial Primary Service Area-HUC #15060202

The Upper Verde River Watershed, USGS HUC #15060202 (Figure 2) represents the initial primary service area for the ILF. The Upper Verde River Watershed contains the beginning of the Verde River's perennial flow, the Little Chino Aquifer, several perennial waterways, and other significant tributaries. In addition, the watershed contains a relatively large human population in major cities/towns such as Prescott, Chino Valley, Sedona, Cottonwood, Camp Verde, and a growing rural population. In order to provide compensatory mitigation for CESPL-authorized impacts to the aquatic environment within Verde River Watershed, Prescott Creeks proposes to utilize the existing Watson Woods Riparian Preserve as an individual mitigation site, which is currently an approved CESPL mitigation area through Prescott Creeks' existing ILF Memorandum of Agreement.

A. Initial Mitigation Site-Watson Woods Riparian Preserve Mitigation Area

Watson Woods Riparian Preserve Mitigation Area (Watson Woods) is a Fremont cottonwood/red willow riparian gallery forest located along Granite Creek, a mixed perennial/intermittent creek in the Upper Verde River Watershed. The 126-acre preserve is the remaining portion of what was once a 1,000-acre riparian gallery forest near Prescott, AZ (Appendix A contains a series of general maps and recent photographs). On-going ecological management activities within Watson Woods since approximately 1995 have led to significant improvements within Watson Woods. The overall goals of this project are to enhance and restore creek function and riparian habitat and create additional riparian/wetland habitat. Additionally, the project aims to educate and involve the community in the restoration process. The objectives include:

- Restore the stability of the Granite Creek stream channel, while maintaining natural dynamic stream processes; proper hydrologic conditions and functions, stream morphology and channel characteristics, and floodplain function.
- Enhance, restore, and create riparian vegetation and habitat within the Watson Woods Riparian Preserve.
- Educate and involve community members in the restoration process.
- Monitor the biota and abiotic environment to evaluate and communicate project performance
- Provide long-term protection and management



Figure 2-Upper Verde River Watershed

Intended Benefits

Public benefits such as improved water quality, groundwater availability, and outdoor recreational/educational opportunities are examples of what will be realized as a result of the ongoing efforts at Watson Woods. Improved water quality will be achieved by the improved stream channel function of Granite Creek along with associated vegetative plantings in both the riparian corridor and surrounding wetlands. Increased vegetation and expanded flood plain as a result of the channel enhancement/restoration will also promote water retention and improve groundwater recharge. Prescott Creeks is dedicated to improving public awareness of the importance of our aquatic resources by providing non-consumptive recreation, volunteer events, and education programs.

Many animal species will also directly benefit from an improved riparian corridor. These animals may include, but are not limited to 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 (*Rana yavapaiensis*), and Sonoran mud-turtle (*Kinosternon sonoriense*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*). A list of recently documented animal species within Watson Woods is provided in Appendix B.

Site History

As stated above, Watson Woods was once part of a larger 1,000 acre riparian gallery forest, and as late as the 1860s showed both vibrant health and heavy use. A dense riparian forest, consisting of cottonwood (likely *Populus fremontii*), ash (likely *Fraxinus velutina*), willow (likely *Salix laevigata*, *S. lasiolepis* and possibly *S. exigua* and *S. gooddingii*), and chokecherry (likely *Prunus virginiana*) shaded a Granite Creek channel that flowed perennially from south to north above ground in areas with groundwater just a few feet below. The quality of the water at the time was excellent and was utilized by livestock and people alike.

The early to mid-1900s saw continued stock grazing in and along Granite Creek. In addition to grazing, various industries including dam building for irrigation, sand and gravel mining, redistribution of fill, timber harvesting, and sewage disposal have impacted Watson Woods' stream channel, floodplain, terraces, riparian vegetation and water quality. The direct effects of land uses in recent decades in combination with historic impacts from the 1800s have left the riparian area degraded in many ways. The majority of the vegetation found within the Preserve today has developed in the last 30 to 40 years; very few older trees exist, and age class and structural diversity is generally poor.

Existing Hydrology

The primary drainage feature of Watson Woods is Granite Creek, which flows generally in a south-north direction, eventually reaching the Verde River approximately 20 miles downstream. Approximately 3,500 of the channel represents recently restored "reaches", with the other portions of the creek being natural and "braided" in some areas. Flows in Granite Creek are seasonal, with continuous flows during the winter months. During late spring/summer, flows are present only immediately following a rain/storm event.

Zoning and Designated Land Use

Watson Woods is currently zoned by the City of Prescott as “Natural Open Space.” According to the Prescott Land Development Code (Amended 2009), Natural Open Space is a passive use recreational district, with intentions to conserve private and public natural and scenic resources of community value. Official “Permitted” uses of Natural Open Space are limited to Parks/Nature Preserves, Minor Utilities, and Utility Installation/Service. One of the “Primary Intents” of the Land Development Code is to “promote natural resource conservation.”

Water Rights

The Salt River Project (SRP) currently holds senior water rights over the surface water within Watson Woods and Granite Creek. Granite Creek flows into Watson Lake, which is impounded by the Watson Lake Dam. The City of Prescott is in agreement with SRP to withdraw approximately 3,500 acre-feet of water per year from Watson Lake.

Jurisdictional Determination

A Jurisdictional Determination for Watson Woods was made by the CESPL on August 12, 2008 (CESPL Project #SPL 2007-01294-DE), and is provided in Appendix C.

Methods

To achieve the aforementioned goals, habitat, and species improvement, Prescott Creeks preformed the following activities within Watson Woods, illustrated in the attached “as built drawings.” (Appendix D). The following major activities have been conducted:

- *Granite Creek Restoration:* Utilizing heavy equipment (bulldozers, excavators, etc), Prescott Creeks restored 3550 linear feet of the Granite Creek channel within 4 individual “Reaches.” Following earth moving/channel realignment, Prescott Creeks installed rock for toe stability, coir logs, erosion control matting, and native herbaceous seed mix where appropriate. In addition, cottonwood and willow pole cuttings (harvest on-site) were installed. Total riparian acreage is approximately 4.1 acres (50ft average riparian zone width). Direct funding for the Granite Creek channel restoration was provided by the major grants-ADEQ and Arizona Water Protection Fund (WPF)
- *Critical Planting Areas:* Prescott Creeks also conducted planting activities within several “critical planting areas” and wetland areas totaling approximately 21 acres. In order to conduct these activities, the planting areas/wetlands were prepared by excavating/filling to achieve a level surface, and planted with cottonwoods and willows harvested from on-site. Direct funding for the critical planting areas was provided by the major grants (ADEQ and WPF)
- *ILF Projects:* With funding from 2 ILF mitigation sales (\$32,145 and \$17,247.46), Prescott Creeks conducted a 2.5-acre wetland restoration and a 0.4 acre restoration within Watson Woods, respectively. Typical activities such as land leveling/grading and plantings were involved. Also, Prescott Creeks conducted administrative and training activities using ILF funds, with a current balance of \$8,946.98 in the ILF account.
- *Other activities:* Additional restoration/enhancement activities throughout Watson Woods included the removal of trash/debris, installation of perimeter fencing, and continuous maintenance/monitoring/management.

Credits and Acreages

Watson Woods encompasses 126 acres. Currently, grant funding programs have directly led to the restoration/enhancement of 25.1 acres (critical planting area, wetlands, and riparian corridor of Granite Creek), while ILF funding has resulted directly in the restoration of 2.9 acres of wetlands.

Prescott Creeks intends to conduct up to 52 acres of additional wetland restoration/enhancement and 49 acres of preservation within Watson Woods directly through the ILF. A specific mitigation plan and CPF for Watson Woods will be provided as described in Section 3.0. Mitigation activities may include vegetative plantings, improved boundary control, additional hydrologic improvements, and removal/management of Siberian elm (*Ulmus pumila*), Salt cedar (*Tamarix*), Spotted knapweed (*Centaurea maculosa*), Scotch thistle (*Onopordum acanthium*), Dalmation toadflax (*Linaria dalmatica*), and Common teasel (*Dipsacus foliolosus*).

Functions and Values

Prescott Creeks intends for the following wetland/riparian function and values to be achieved by its past/current restoration effort as well as future projected mitigation activities:

- Hydrological and Floodplain Improvements
- Groundwater Recharge
- Proper Stream Geomorphology
- Expanded Riparian and Wetland Habitat
- Improved Water Quality
- Improved Vegetative Species Diversity
- Improved Wildlife Habitat

Ownership and Access

Watson Woods is currently owned by the City of Prescott, with Prescott Creeks as the active land-manager. The current lease agreement is 25 years (beginning in 1995), and discussions with the City to renew this lease and provide a more permanent agreement are underway with a favorable initial response. Based on current information, it appears the City of Prescott also retains mineral rights within Watson Woods. City of Prescott Contact Information: 201 S. Cortez; Prescott AZ 86303; 928-777-1100.

Pedestrian access is opened to the public, however public use is generally limited when compared to other recreational areas within Prescott. Non-consumptive use will remain a priority for the long-term management of Watson Woods. Vehicular access is limited to Prescott Creeks' personnel and other authorized users (city, utility companies). A wire fence built to USFWS "Game Fence" standards also surrounds the Watson Woods.

Other Funding/Public Projects

As stated above, beginning in approximately 1989, several projects at the planning/development to implementation/construction level have been conducted within Watson Woods. Primary funding includes approximately \$1,788,162 in major grants from the AZ Department of Environmental Quality and AZ Water Protection Fund, along with other grants/funding from the City of Prescott, Coors Pure Water, River Network, Arizona Community Foundation, and other programs. In total, Watson Woods has been the recipient of approximate \$2M+ in grant programs along with ~12,000 volunteer hours (channel maintenance, cleanup events, etc.) recorded.

5.0 General Need and Technical Feasibility

The general need for the Prescott Creeks ILF is primarily evident in the general lack of available compensatory mitigation sites and In-Lieu Fee Programs within the Verde River Watershed. The Verde River is one of the few remaining perennial waterways in Arizona and the southwest. The Verde River Watershed is approximately 6,662 square miles, and contains over 9,037 miles of streams (Arizona NEMO 2005), along with associated wetlands and riparian areas.

Riparian ecosystems are highly valued resources in the southwestern United States owing their high use by Neotropical migratory animals, their high productivity and biodiversity, and their function in stabilizing riverine environments (Ohmart and Anderson 1982). Riparian ecosystems serve as the primary link between upland terrestrial and aquatic ecosystems (Gregory et al 1991), and are the ultimate expression of ground-water and surface-water interactions (Webb and Leake 2005).

As impacts (draining, filling, pollution, groundwater pumping, etc.) continue to impact the Verde River and its associated riparian and wetland ecosystems, there is a strong public need to provide appropriate compensatory mitigation through the Section 404/10 Permitting Program. Prescott Creeks intends to conduct stream, riparian, and wetland mitigation activities, as well as provide effective management, monitoring, and maintenance over the short and long term. In addition, appropriate site protection instruments will be in place for each individual mitigation project, which will ensure that the restored, established, enhanced, and/or preserved aquatic resources are protected in perpetuity. Prescott Creeks has the necessary resources, expertise, track record, and strong community support to successfully develop and implement specific mitigation activities. This ability is evident primarily in the successful construction and on-going management of the existing Watson Woods Mitigation Area, already part of an approved ILF.

A detailed analysis of the existing conditions, general trends, and projected activities that affect the Verde River Watershed are described in Section 9 (Compensation Planning Framework) of this document.

6.0 Long Term Management Strategy and Ownership Arrangements

Prescott Creeks shall be responsible for developing, implementing, and managing mitigation activities under the ILF. The long term management strategy for the ILF is described in Section 9.I of this document. In regard to ownership arrangements, Prescott Creek shall own individual mitigation sites through fee title or shall have a management agreement for publically owned properties. All individual mitigation sites shall have a perpetual conservation easement, deed restriction, or other similar real-estate instrument, with the goals of the ILF and watershed being the primary focus of each protective instrument.

7.0 Qualifications of the Sponsor and Contact Information

Prescott Creeks is a 501(c) (3) nonprofit organization with the mission to promote, protect and celebrate the ecological integrity of riparian systems and associated wetlands in the central Arizona watersheds through conservation, restoration and education. Founded in 1990, Prescott Creeks is an established organization with a proven track record with grant writing and other funds development for project implementation, management, monitoring, and maintenance. Prescott Creeks has successfully operated its current ILF since 2002, and is currently seeking to update this program in accordance with the Final Rule.

Prescott Creeks is managed by a full-time professional staff and volunteer Board of Directors. Michael Byrd, Executive Director of Prescott Creeks, has been with the organization since 1995. The

organization has secured and administered over \$2.2 million for the Watson Woods Riparian Preserve project alone and therefore is well positioned to receive and manage ILF Program funds. Completion of many successful projects can be demonstrated through Prescott Creeks' work with the AZ Water Protection Fund, the AZ Department of Environmental Quality-Water Quality Improvement Grant Program, and the City of Prescott. For more information, please visit www.PrescottCreeks.org, or contact: Michael Byrd, Executive Director; PO Box 3004; Prescott AZ 86302; 928-445-5669.

8.0 Record Keeping and Financial Management

Prescott Creeks will maintain accurate records of the ILF transactions including a database identifying monies accepted for each project, CESPL project number, impact location and acreage, type of mitigation required, type of habitat impacted, required mitigation acreage, fee amount, date of CESPL approval, and date monies were received. Records of ILF expenditures will include cost of land acquisitions, project planning, construction, monitoring, maintenance, contingencies, and administration will be identified in the annual report. Also, each individual mitigation project will contain separate accounts and records with the aforementioned information.

Prescott Creeks will establish and maintain a tracking system for the production of credits, credit transactions, and financial transactions between Prescott Creeks and permittees. Credit production, credit transactions, and financial transactions will be tracked by service area and separated for each individual mitigation project.

9.0 Compensation Planning Framework

A. Service Area

Verde River Watershed

The Prescott Creeks ILF is intended to utilize the Verde River Watershed, USGS Accounting Unit #150602 (Figure 1) as its service area. The Verde River Watershed is located in central Arizona, and spans four counties; Coconino, Gila, Maricopa, and Yavapai, with 50% of the watershed being in Yavapai County (Arizona NEMO 2005). The major cities/towns within the Verde River Watershed include Prescott, Sedona, Seligman, Ash Fork, Chino Valley, Camp Verde, and Cottonwood. The Verde River Watershed also contains portions of the Phoenix Metropolitan Area (US Census Bureau 2010), and delivers nearly 40% of the surface water in Phoenix (Verde River Basin Partnership 2012).

The Verde River watershed is located in the Transition Zone between the Colorado Plateau and the Basin and Range physiographic provinces (Springer and Haney 2008), and ranges from 1,323 to 12,617 feet above sea level over its 6,622 square miles (Arizona NEMO 2005). Streamflow in the upper 26 miles of the Verde River is sustained by surface runoff and groundwater discharge from the upper Verde River Springs, and spring discharge is comprised chiefly of water from the Big Chino (80%) and Little Chino (14%) aquifers (Wirt et al 2005). Streamflow in the middle Verde River is sustained by surface runoff, base flow from the upper Verde River, groundwater sources, and contributions from tributaries, where the flow of the river then increases significantly (Springer and Haney 2008) into the lower Verde River.

The Verde River is a tributary to the Salt River in the Colorado River Basin. Its major tributaries are Chino Wash, Williamson Valley Wash, Walnut Creek, Granite Creek, Hell Canyon, Sycamore Creek, Oak Creek, Beaver Creek, and West Clear Creek (Springer and Haney 2008), illustrated in Figure 3. The Verde River is perennial from a group of springs near the confluence

of Granite Creek to the Horseshoe/Bartlett Reservoirs, and “unlike many rivers in the West, most of the watershed is unregulated (no significant dams) and thus retains a natural flood regime (Pearthree 2008).”

The Verde River supports 10 native fish species, including the federally endangered razorback sucker (*Xyrauchen texanus*) and Colorado pikeminnow (*Ptychocheilus Lucius*), along with the threatened spikedace (*Meda fulgida*). Three sensitive riparian herpetofauna species survive in the watershed; the northern Mexican gartersnake, the narrow headed gartersnake, and the lowland leopard frog. The Verde River supports over 200 recorded resident and neo-tropical migratory birds, and species such as the federally endangered southwestern willow flycatcher and the yellow-billed cuckoo depend on the river’s woody riparian forests. Finally, the Verde River supports the largest number of bald eagle breeding areas any river in the state, is one of only three rivers in Arizona with population of river otter (*Lontra canadensis*) (Northern Arizona University), and an increasing population of beaver (*Castor canadensis*).

The Verde River Watershed supports a variety of diverse riparian habitats such as cottonwood/willow gallery forests, velvet mesquite (*Prosopis velutina*) bosques, and mixed broadleaf communities consisting of Arizona sycamore (*Platanus wrightii*), velvet ash (*Fraxinus velutina*), cottonwood, Arizona alder (*Alnus oblongifolia*), Arizona walnut (*Juglans major*), and willows. Upland habitats include Semi-desert Grassland, Great Basin Conifer Woodland, Sonoran Desert scrub (Rivers.gov), Pinyon pine (*Pinus edulis*) and Juniper (*Junipersu sp*) forests, and Ponderosa pine (*Pinus ponderosa*) forests.

The Verde River Watershed is made up of three smaller watersheds (USGS Cataloging Units): HUC #15060201-Big Chino-Williamson Valley, HUC #15060202-Upper Verde River, and HUC #15060203-Lower Verde River (Figure 3). Prescott Creeks shall use a watershed approach and landscape perspective within each of these watersheds to identify types and locations of individual mitigation projects and subsequently design projects to maximize the watershed benefit and offset impacts to aquatic resources caused by CESPL permitted activities.

B. Existing Threats to Aquatic Resources

Essentially, all riparian ecosystems in the Southwest are considered to be at risk for decline (Dobyns 1981). In 2006, American Rivers pronounced the Verde River as the 10th Most Endangered River in the United States (Smith et al 2009). Although this is due primarily to excessive groundwater pumping, other threats to the watershed include population growth and development activities, tourism, agriculture/livestock activities, water control projects, invasive vegetation, and mining.

Groundwater

Major aquifers such as the Big Chino Aquifer and Little Chino Aquifer supply at least 80% and 14% the base flow of the upper Verde River, respectively. All domestic, municipal, and industrial water comes from groundwater pumping in the watershed, and additional irrigation water also comes from groundwater in the Big and Little Chino aquifers, above the Verde River’s headwater springs (Northern Arizona University). Current and historical excessive use of these aquifers is a threat to the natural flow of the Verde River and the health of its riparian and wetland areas.

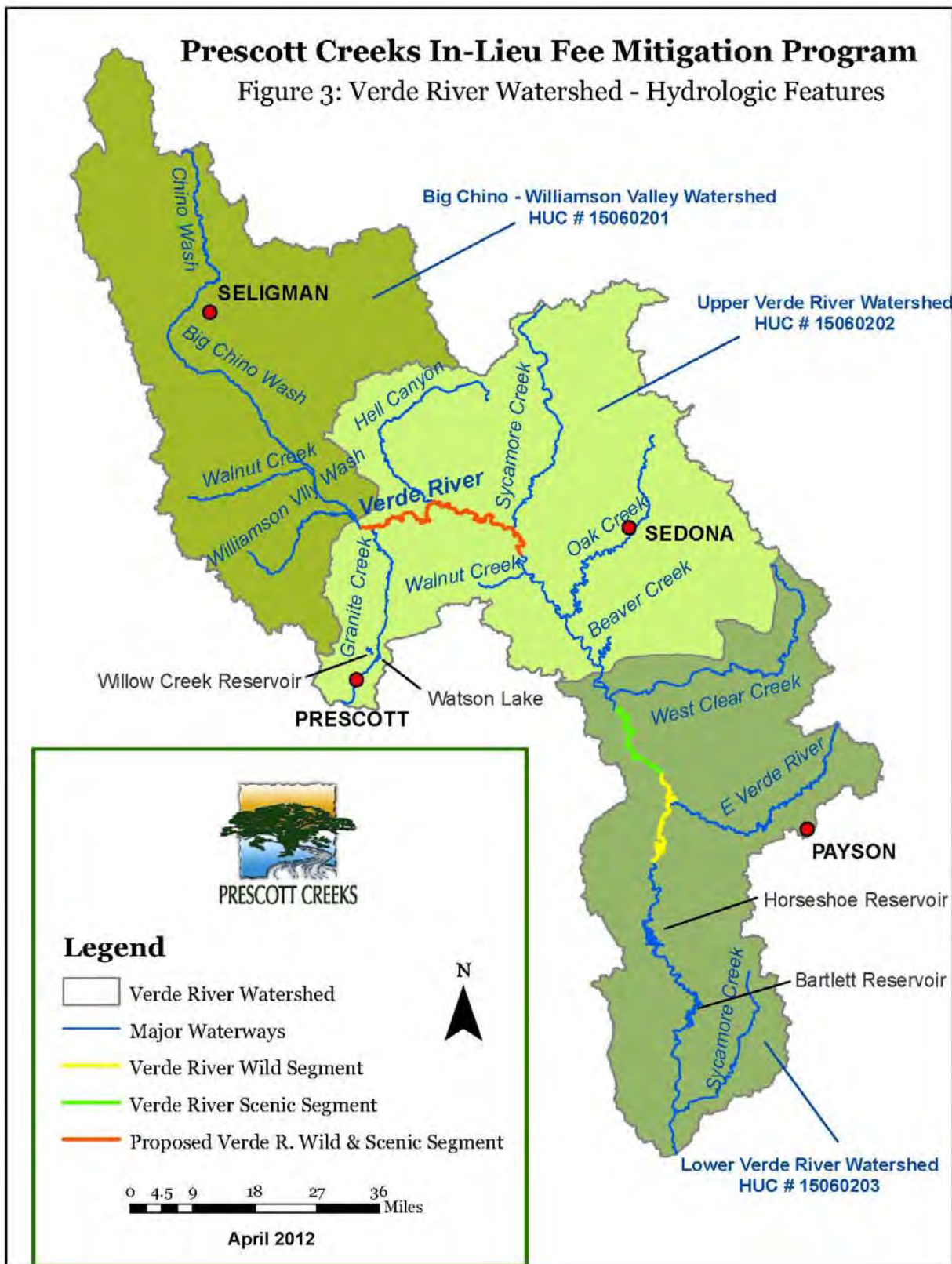


Figure 3-Verde River Watershed-Hydrologic Features

In order to manage the usage of these valuable aquifers, the Prescott Active Management Area (AMA) was created by the 1980 Groundwater Code. Operating under the Arizona Department of Water Resources (ADWR), the AMA includes the municipalities of Prescott, Chino Valley, Prescott Valley, Dewey-Humbolt, and other unincorporated areas of Yavapai County (Figure 4).

The AMA was created to reduce localized groundwater overdraft and achieve a “safe-yield” by 2025. Safe-yield means that the amount of groundwater pumped from the aquifer on an annual basis must not exceed the amount that is natural or artificially recharged (University of Arizona). Current studies, programs, and planning are underway to accommodate and consider the recent growth in urban and suburban areas, climate change, improve water quality, and alternative water supplies.

A major potential threat to the Verde River is the Big Chino Ranch (BCR) Project, a project that was recently created after the ADWR declared that the Prescott AMA was no longer at a safe-yield. This triggered full implementation of the Assured Water Supply Rules, requiring that only renewable or imported water supplies from outside the AMA be utilized. As a result, Prescott and Prescott Valley purchased the BCR (located above the Big Chino Aquifer), with the intentions of building a series of groundwater wells to extract water from the aquifer, and a 30 mile pipeline from the BCR to Paulden and Chino Valley (Figure 4), which would then tie-into the AMA member’s current water-supply system. The system would be designed to extract and transport up to 12,400 acre-feet of groundwater per year (City of Prescott).

The construction of a 30-mile pipeline and associated facilities will likely have to traverse wetlands, riparian areas, and/or waters of the US, resulting in direct/indirect and permanent/temporary impacts. In regard to groundwater extraction, as rivers and streams are “dewatered,” a succession of plant life overtakes the former riparian corridor. Phreatophytes like cottonwoods and willows are slowly replaced by a succession of upland species. The Verde River is at risk of becoming an intermittent waterway-If that were to happen, biological diversity would plummet, and riparian zones would disappear. Also as floods continue to occur, a lack of riparian areas would lead to severe channelization, bank down-cutting, lateral erosion, and changes in streambed topography (Von Gausig et al 2011) throughout the watershed.

In order to mitigate for historic and future losses due to excessive groundwater extraction and construction impacts, Prescott Creeks shall develop and implement the restoration, establishment, enhancement, and/or preservation of aquatic resources. Riparian and wetland habitat are critical to achieving natural surface flow and contributing to groundwater recharge. In addition, the conservation of water through natural riparian habitats reduces the need to extract groundwater for irrigation, commercial/industrial, or residential use.

Population Growth and Development

The Verde River Watershed contains Yavapai, Maricopa, Gila, and Coconino Counties. According to the US Census Bureau, these 4 counties contained 66% of Arizona’s population in 2010. Yavapai County, which makes up 50% of the watershed, has seen a 49% population growth from 1990-2010 (106,895 to 211,033). Also, the Prescott General Plan forecasts that by 2020, the unincorporated areas of Yavapai County are predicted to grow by 53%. Coconino County, another large presence (34%) within the watershed, has experienced a 28% population growth from 1990-2010 (96,591 to 134,421).

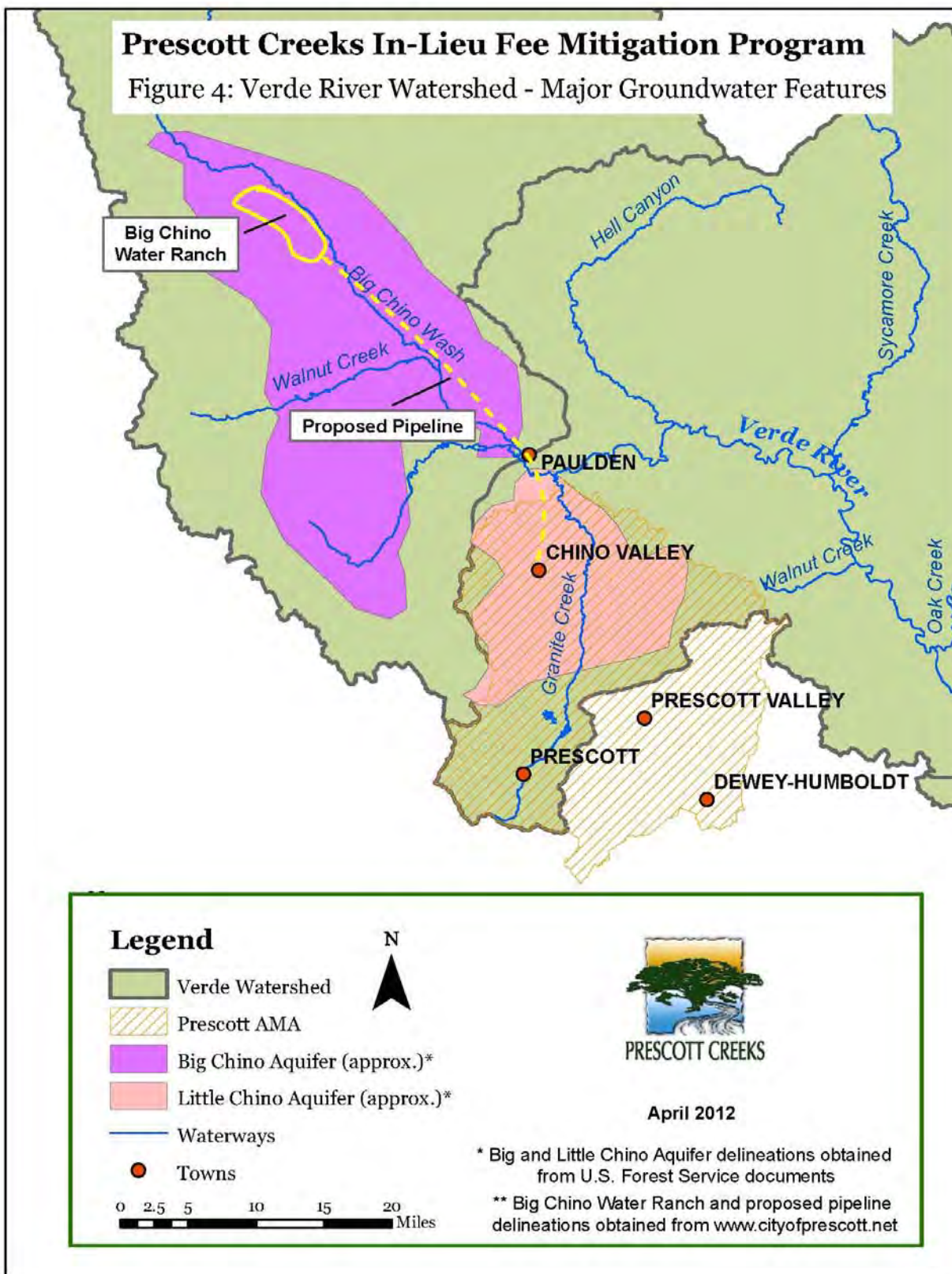


Figure 4-Verde River Watershed-Major Groundwater Features

As population growth in these areas increases, so does the need for additional roads, infrastructure projects, and supporting development activities, which may result in adverse impacts to the aquatic environment. According to City-Data.com, Prescott, AZ was #26 of cities in the United States with the most local government spending on highway construction per resident. The Arizona Department of Transportation (ADOT) has planned \$70.2 million worth of highway projects in Yavapai County through 2016; this includes improvements to turnoffs/exits to Sedona, 12 miles worth of improvements to I-40 near Ash Fork, roadway reconstruction projects near Cottonwood, and a widening of 30 miles of I-17 between the new Cordes Junction and Black Canyon City (Journalaz.com). All of these road projects are designed to accommodate historic, current, and projected development growth.

Sewer improvement projects also have the potential to adversely impact riparian and aquatic ecosystems. For example, in Prescott, many of the existing sewer lines are beneath the actual creek/stream bottom and are in need of repair-any replacement/repair activities would require channel excavation and temporary access/storage in wetlands/riparian areas. Also, Prescott has several projects planned such as improvements to the Airport Water Reclamation Facility and new forcemain projects that will likely affect aquatic ecosystems.

Providing appropriate compensatory mitigation for development-related activities is critical to achieving Prescott Creeks' aquatic resource goals and objectives, as this represents a funding mechanism to implement the projects and realize the benefits that will be achieved by aquatic resource restoration, establishment, enhancement, and/or preservation activities. As credits are secured through the ILF, Prescott Creeks will develop and implement mitigation activities commensurate with the impacts to aquatic resources.

Tourism

Because the Verde River represents one of the last perennial waterways in Arizona, many tourists travel from inside and outside Arizona to visit the Verde River and its tributaries for hiking/camping, swimming, boating, and hunting and fishing. According to the Arizona Office of Tourism, in 2006-2007, at least one third of the visitors to the Verde Valley came from Arizona, and that visiting state and national parks and historic places were the most popular activities, along with activities directly related to the natural beauty of the Verde Valley and often directly linked to the Verde River itself (Smith and Haney 2008). Visitors to the Verde Valley bring an estimated total economic impact of \$772 million to the area.

Although tourism and water-based recreational activities provide a public benefit, these same activities can adversely impact aquatic ecosystems. Sport fishing and hunting aquatic animals can lead to population declines and affect predator-prey interactions. Off-highway vehicles can lead to habitat destruction and loss of streambank stability and erosion, along with providing access to remote areas, which increases stress and pressure on fish and wildlife in previously inaccessible areas. Pollution from "gray water" and hydrocarbon residues from camping and boating also occurs, which also negatively affects riparian/wetland systems (Regional Aquatics Monitoring Program). Finally, a strong tourism industry increases the need to update/improve road systems and provide additional commercial services-being that the Verde River Valley provides such a significant economic value in regards to tourism, it is likely that new development activities may be located near or at the river itself.

Aquatic resources directly/indirectly impacted by tourism related development shall be compensated by the restoration, establishment, enhancement, and preservation of riparian and wetland areas. Also, mitigation activities will help reduce the amount of pollutants in the water. Finally, education through the ILF program shall increase awareness of how boating, OHV use, and camping can effect aquatic resources, and provide techniques to reduce this impact.

Agriculture and Livestock

Surface water in the Verde Valley is used mostly for irrigation purposes (Arizona Department of Water Resources), which is especially evident in the southern part of the Verde Valley (Owen-Joyce and Bell 1983). Natural waterways are channelized, filled, and diverted to supply this water to farms, which causes erosion, increased sedimentation, loss of natural riparian habitat, and associated water quality issues. High sodium levels from continuous “recycling” of water in the Verde River and its tributaries occur downstream from Camp Verde. Turbidity is also a persistent problem partly due to inadequate range management (AZ Department of Water Resources). Fertilizers also contribute to increased levels of nitrogen, phosphorus, and potassium, which lead to excessive growth of aquatic vegetation, ultimately resulting in low dissolved oxygen levels in the water.

Grazing by domestic animals (i.e. cattle, sheep, goats) has direct and indirect effects on riparian ecosystems (Ohmart 1996). Livestock heavily use riparian areas because of their high productivity of herbaceous species and readily available water and shade (Webb and Leake 2005). Adverse effects to riparian areas include consumption and trampling of native-plant seedlings, soil compaction, destabilization of channel banks, increase in streamflow sediment concentrations; and displacement of wildlife (Lusby et al 1971; Ohmart 1996).

Prescott Creeks will help offset impacts resulting from these threats by restoring/enhancing riparian areas to reduce the level of pollutants in the water and increase stream bank stability. Also, removing livestock from individual mitigation sites, providing effective seasonal management, and/or effective boundary control shall allow for native vegetative regrowth and improve water quality and wildlife habitat.

Water Control Projects

The Verde River Watershed contains several water control projects/features that have the potential to adversely impact the watershed. The major projects include the Watson Lake Dam, Willow Lake Dam, the Barlett Dam, and the Horseshoe Dam. Any change in operation, maintenance projects, or any new construction activities associated with these dams has the potential to directly and/or indirectly affect aquatic resources. As additional riparian areas, wetlands, and/or waterways are filled by additional structures or temporarily impacted for access and construction, securing restored, enhanced, or preserved wetlands/riparian areas at an appropriate ratio shall provide mitigation for these activities.

Invasive Vegetation

Invasive vegetative species in riparian, wetland, and upland buffer areas also represent existing threats to aquatic resources. Invasive species out-compete native grasses, shrubs, and trees, and in some cases can even alter the chemical composition of the soil. Examples of invasive species include, but are not limited to Spotted/Russian Knapweed, Scotch Thistle, Common Teasel, Dalmatian Toadflax, Siberian Elm, and Salt Cedar. Prescott Creeks intends to control/manage invasive vegetation on all mitigation sites through means such as physical removal, herbicides where appropriate, supplemental plantings of native vegetation, and active management.

Mining

The Verde River Watershed and surrounding areas are home to numerous active and abandoned copper, gold, sand/gravel, and other mineral mines. Although current National Pollutant Discharge Elimination Systems (NPDES) permitting programs are now in place, past mining operations have resulted in high levels of sodium, turbidity, boron, mercury, iron, ammonium, and selenium in some areas in the Verde River Watershed (Northern Arizona University). Examples of how mitigation activities will address these threats include the restoration of riparian areas/buffer zones to provide filtration of these pollutants or restoring abandoned mining sites into wetlands.

C. Historic Aquatic Resource Losses

In the United States, the lower 48 states have lost over 50% of its original wetlands; ~220 million acres in the 1600's to 103.3 million acres in the mid-1980s (Dahl and Johnson 1991). Major loss of wetland habitat occurred during the mid-1950s to mid-1970s, but since then the rate of loss has decreased to 70,000 to 90,000 acres annually. In addition to the wetlands that have been completely lost, others have just been degraded by chemical contamination and excessive nutrients, fertilizers, and sediments flow. The increase in flood damages, drought damages, and the declining bird populations are, in part, the result of wetland degradation and destruction (USGS 2003).

According to the USGS (2003), less than 1% (729,600 acres) of Arizona's landscape has wetlands. Since the late 1800's, streams and wetlands throughout Arizona have been modified or drained, resulting in the loss of more than one-third of the state's original wetlands (~2.2 million acres). The most extensive Arizona wetlands are in riparian zones, oxbow lakes, marshes, cinegas, and bosques.

The Verde River Watershed makes up approximately 6% (6,622 square miles) of Arizona's 114,000 square miles. By applying the USGS's 1% wetland figure to 6,622 square miles of the watershed's size, the Verde River Watershed contains approximately 42,380 acres of wetlands. Using this information, Prescott Creeks has developed the following wetland loss analysis:

- In the late 1800's (1890), there were approximately 63,570 acres of wetlands
- Since 1890, the Verde River Watershed has lost 21,190 acres of wetlands
- Since 1890, the Verde River Watershed has lost 174 acres of wetlands per year

D. Current Aquatic Resource Conditions

The Verde River and the Verde River Watershed contain a significant number of aquatic resources when compared to the remainder of Arizona and much of the southwest. As such, the watershed is home to many unique plant species and ecosystems which have great intrinsic value, but also serve as habitat for a number of animal species (Stevens et al 2008). The AGFD identifies 10 types of riparian areas, and Brown, Lowe and Pace (1979) classified vegetation in the watershed into 9 different biotic communities.

Cottonwood-willow areas cover only 0.13% of the riparian area of the watershed, but are among the riparian types that are more widely used in the watershed by non-fish vertebrates, and are highly sensitive to changes in streamflow (Stromberg 2008, Stevens et al 2008, Smith et al 2009). The Verde River seasonally supports over 248 species of birds (Schmidt et al 2005, Stevens et al 2008), 92 species of mammals (Hoffmeister 1986; Feldhamer et al 2003; Schmidt et al 2005; Stevens et al 2008), and 10 native fish species.

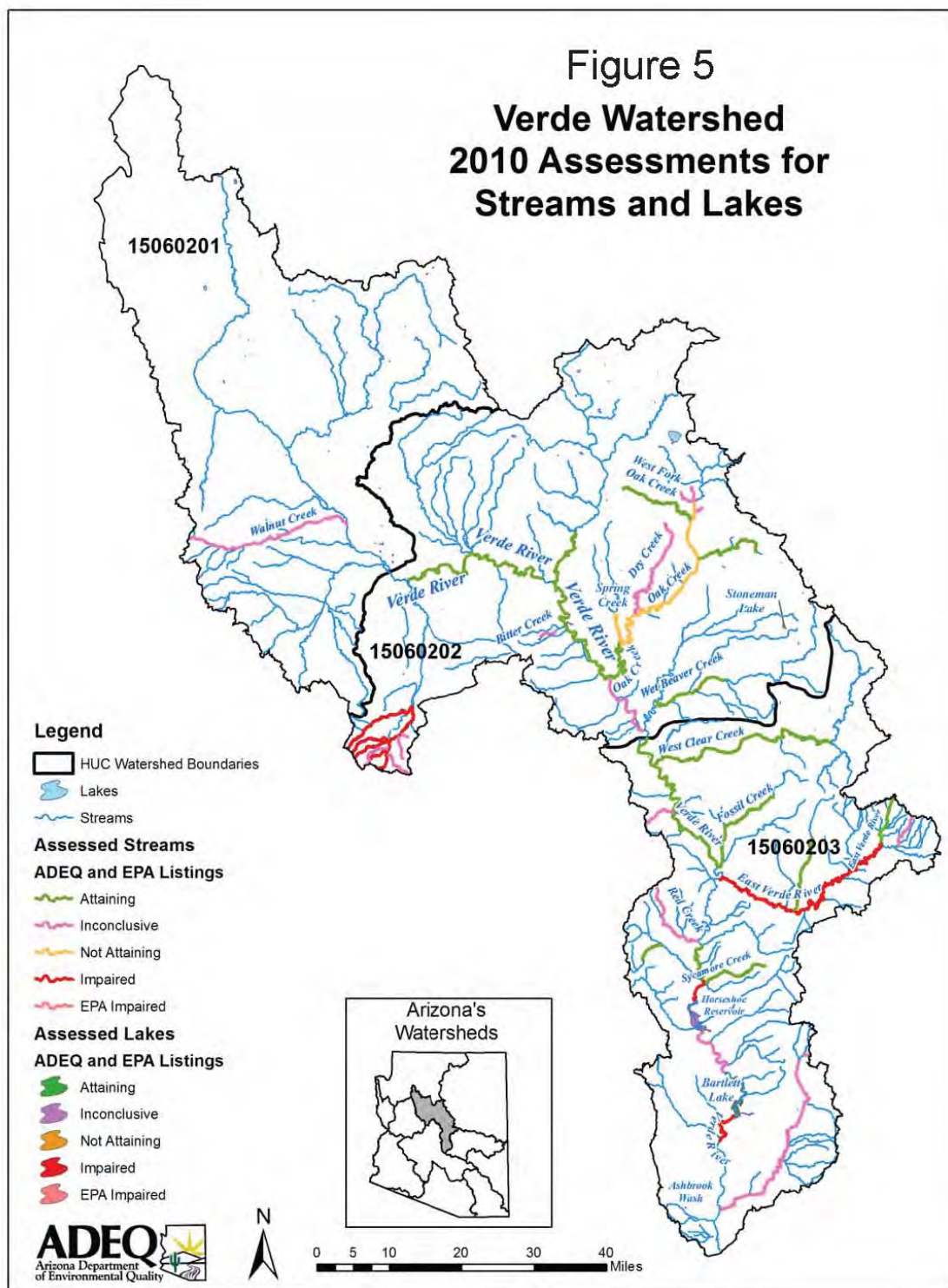
Because of the unique ecological attributes of the Verde River, a portion of the river between Beasley Flats and Sheep Bridge is designated as the only “Wild and Scenic” river in Arizona (Smith et al 2009). According to the National Wildland and Scenic Rivers System (2007), this portion of the river corridor contained outstandingly remarkable scenic, fish and wildlife, and historic and cultural values. Also, additional portions of the Verde River are currently being proposed for Wild and Scenic River Designation (Figure 3-page 12).

While the Verde River Watershed contains many aquatic resources that provide habitat for wildlife, these same attributes have attracted many anthropogenic activities in recent times that have adversely impacted the watershed. The Arizona Department of Environmental Quality’s 2010 Verde River Watershed Assessment (Figure 5) shows many of the streams, rivers, and lakes are officially designated as “impaired” including major contributing waterways in the Upper Granite Creek Watershed (Willow, Miller, Butte, Manzanita, and Granite Creeks), the East Verde River, and a portion of the Verde River just downstream from the Bartlett Dam-the last major water control structure before the Phoenix Metropolitan Area. However, several waterways such as segments of the Verde River, West Fork Oak Creek, West Clear Creek, and Fossil Creek are listed as “attaining” appropriate water quality standards.

Waterways attaining water quality standards in the Verde River Watershed are evidence that human development activity and the natural environment can successfully share the unique aquatic resources offered by the Verde River. In addition, there are numerous ecologically-based programs throughout the watershed that focus on riparian/wetland restoration/conservation, wildlife habitat, water quality, and education/awareness to maintain and/or further improve the aquatic resource conditions of the Verde River Watershed.

According to the ADWR, the watershed contains 434,000 acres of wilderness areas, and 71% of the watershed is federally owned and managed by the United States Forest Service. Also, 20.2% of the land is private, with a majority of this private land being in the northwestern portion of the watershed, which shares a “checkerboard” pattern with state land (7.4% of the watershed). Because the state/private land contains the most heavily populated and developed areas, the aquatic resources in this portion of the watershed are in the worst condition. Figure 6 illustrates the current land-ownership within the Verde River Watershed.

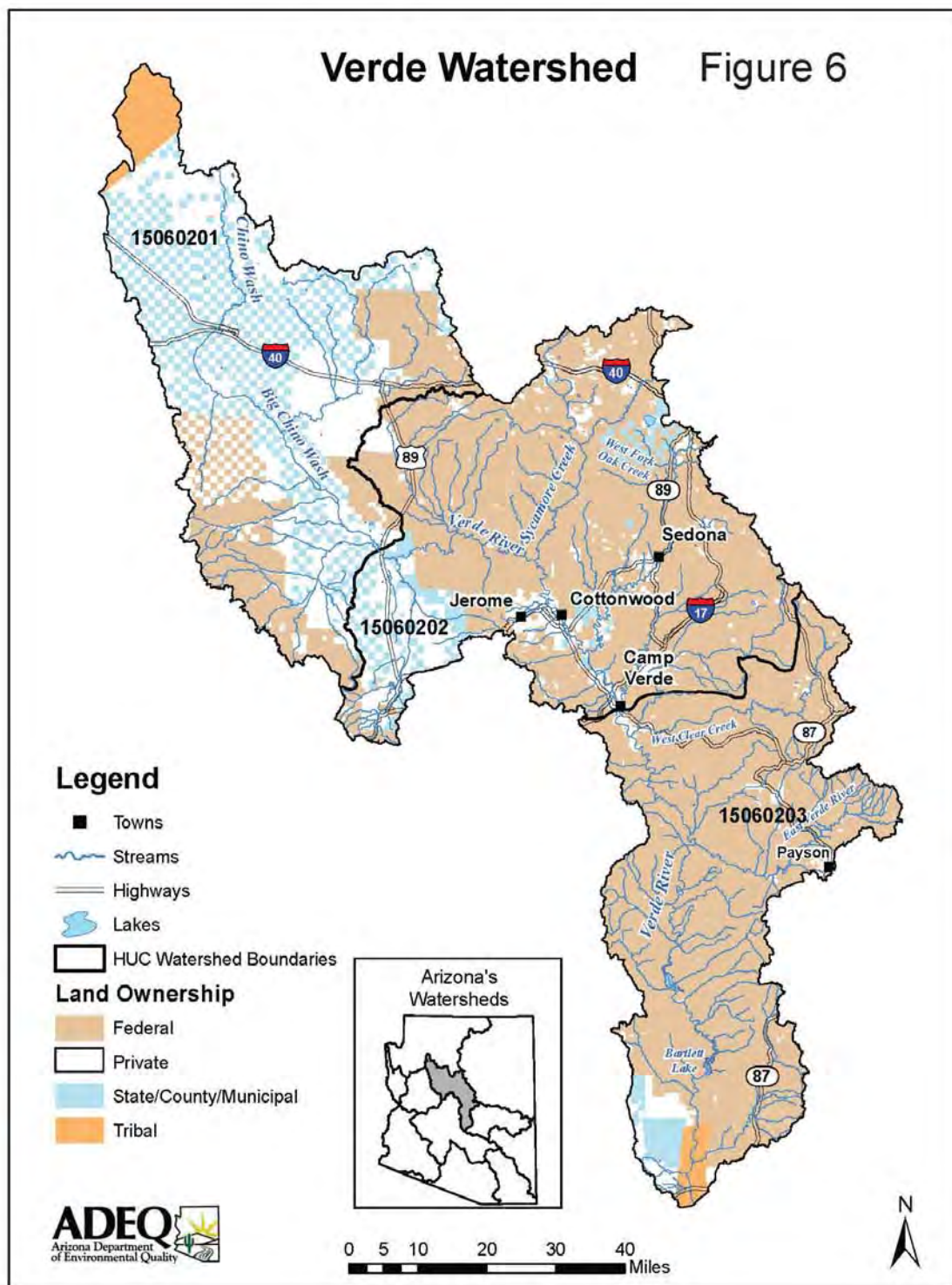
Verde



Verde River Watershed Assessments - 3

Figure 5-Verde River Watershed 2010 ADEQ Assessment

Verde



Verde River Watershed Assessments - 2

Figure 6-Verde River Watershed ADEQ Land Ownership

E. Aquatic Resource Goals and Objectives

Prescott Creeks has developed a series of goals and objectives within the Verde River Watershed in order to improve the functional capacity of aquatic resources, wetlands, and riparian areas.

1) Meet the national goal of no overall loss of wetlands

- Restore, enhance, establish, and preserve wetlands and riparian areas
- Remove invasive vegetative species to promote native plant growth
- Remove non-native animal species, such as cattle
- Conduct active and adaptive management, maintenance, and monitoring
- Provide long-term protection for mitigation sites

2) Improve water quality and quantity

- Restore wetlands, riparian areas, and associated buffer areas
- Monitor water quality to document wetland/riparian recovery and water quality improvements
- Educate the public on best management practices and the importance of water quality
- Encourage stormwater/surface water management programs to conserve water and promote groundwater recharge

3) Improve wildlife and threatened and endangered species habitat

- Restore wetlands, riparian, and associated buffer areas
- Remove invasive vegetative species
- Remove non-native animal species to reduce competition, predation, and parasitism
- Monitor mitigation sites to document wetland recovery and wildlife usage

4) Promote and celebrate the ecological integrity of riparian systems and wetlands

- Provide educational opportunities for elementary, high school, and college students, as well as adults
- Present informative literature to the public, and provide relevant information at public meetings
- Engage volunteers for cleanup events, water monitoring, maintenance activities, and fundraising events
- Lead guided hikes and tours
- Construct and maintain low impact interpretive trails systems where appropriate

F. Prioritization of Mitigation Areas and Activities

Prescott Creeks will prioritize mitigation activities based on the ecological needs of the watershed and the practicability to secure mitigation sites, implement mitigation plans, and manage/protect these activities for perpetuity. Also, mitigation sites should be located in an area that will provide the most benefit to the public, as humans depend on the aquatic resources in the Verde River Watershed. With these considerations in mind, Prescott Creeks has developed a list of priorities that will be applied to identify and implement mitigation activities.

Priority Areas-Figure 7

1) Granite Creek Watershed

The City of Prescott is located within the Upper Granite Creek Watershed (sub-watershed of the Upper Verde River Watershed), which as stated above has 5 creeks/waterways officially listed as “impaired” by the DEQ. Also, Prescott represents the “hub” of Yavapai County (50% of the watershed) and the 3rd largest metropolitan area in Arizona. Although the presence of humans and associated development activities has historically and will likely continue to impact aquatic resources in this area, the primary state/private land ownership represents a means to implement compensatory mitigation activities that will benefit both the environment and the public.

The confluence of Granite Creek into the Verde River represents the approximate location of the river’s perennial flow and convergence of the Big Chino/Williamson and Upper Verde River Watershed. Therefore, restoration and conservation of riparian habitat in this sub-watershed is critical to the overall condition of the Verde River, as this will benefit the downstream portions of the Upper Verde River Watershed, as well as the Lower Verde River Watershed. In addition, the Granite Creek Watershed is located above the Little Chino Aquifer and portions of the Big Chino Aquifer-restoring, enhancing, and/or preserving wetland/riparian habitat in this area will help improve natural hydrology and subsequent groundwater recharge, and will help maintain the Verde River’s perennial flow.

Prescott Creeks has recognized the importance of the Granite Creek Watershed and is currently involved with existing programs such as Watson Woods, a 126-acre riparian Preserve which contains Granite Creek and extensive stand of cottonwoods, willows, and riparian habitat. Major funding for this project has come from the Water Protection Fund (WPF), the Arizona Department of Environmental Quality, and CESPL mitigation projects. With many wetland/riparian areas already restored/enhanced, Prescott Creeks intends to conduct an additional 52 acres of restoration/enhancement activities, 49 acres of preservation, along with protecting the entire site in perpetuity.

Prescott Creeks is the chair of the Granite Creek Watershed Improvement Council which is currently identifying sources of water impairment, proposing corrective measures, Best Management Practices, as well as identifying potential riparian improvement areas. In addition, Prescott Creeks hosts an annual “Granite Creek Cleanup” event, which directly removed over 10 tons of trash/debris in 2011 from various waterways in Prescott. Finally, Prescott Creeks is dedicated to providing educational/awareness opportunities from the elementary to college level along with the general public.

2) Lower Big Chino Wash/Williamson Valley Wash Watersheds

The Lower Big Chino Wash and the Williamson Valley Wash Watersheds are sub-watersheds to the larger Big Chino/Williamson Valley Watershed (HUC #15060201). Beneath these 2 watersheds lies the Big Chino Aquifer, which supplies up to 80% of the Verde River’s base flow. Therefore, the restoration of wetland and riparian zones in this area is important to maintaining and improving the health of the Verde River. Also, the land in these watersheds is primarily state and privately owned, so it is likely that a mitigation project in this area will be practicable and will provide a public benefit.

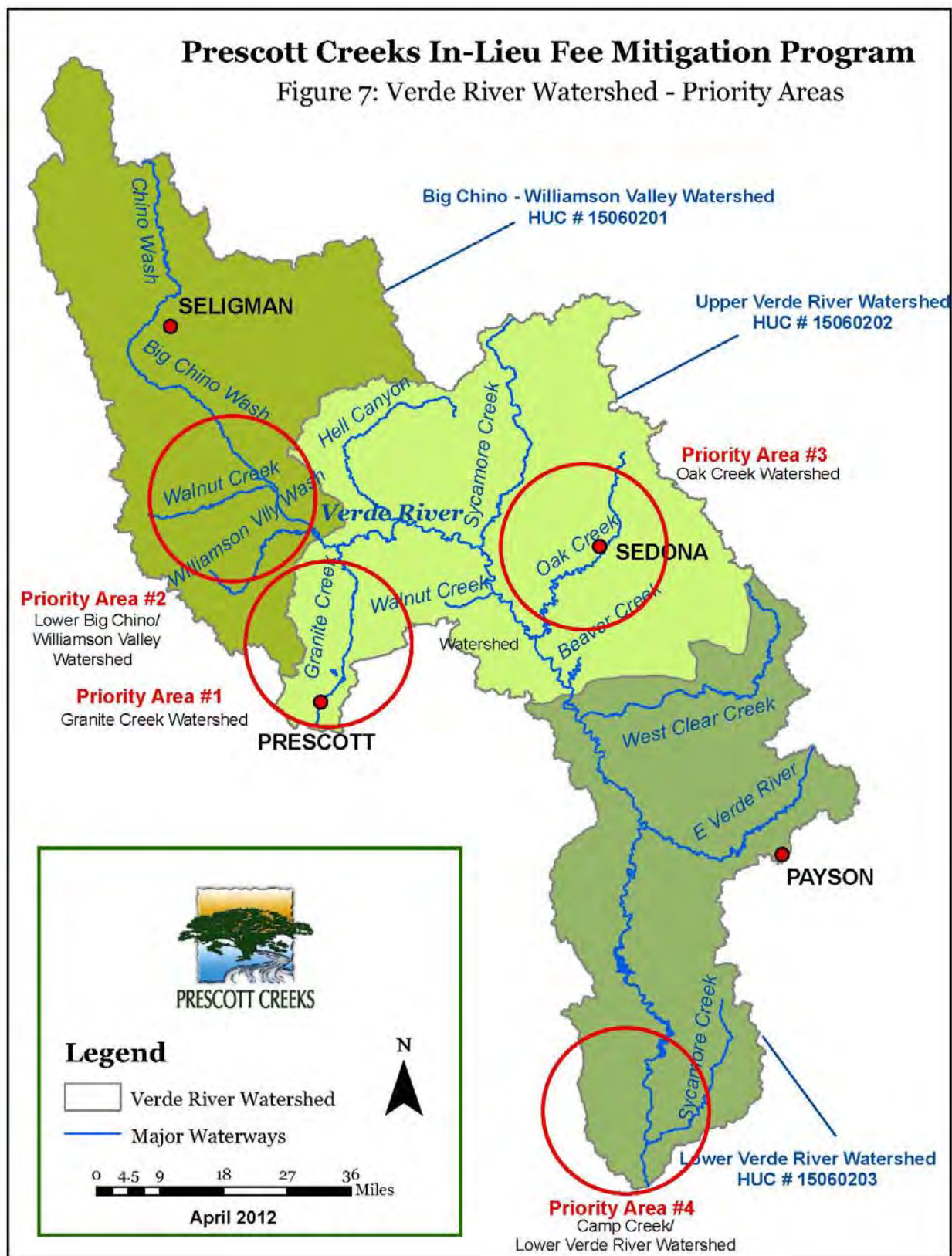


Figure 7-Verde River Watershed Priority Areas

3) *Oak Creek Watershed*

The Oak Creek Watershed is a sub-watershed of the Upper Verde River Watershed, and contains the city of Sedona, a highly valued area for tourism, natural beauty, and the perennial waterway, Oak Creek. The Oak Creek Watershed is also upstream of Cottonwood and Camp Verde. Oak Creek is officially designated as “not attaining” water quality standards by the ADEQ. Because of frequent human contact with the aquatic resources within this watershed, and this area is considered a high priority because of potential future impairments as well as the potential public benefit that would be achieved by the restoration, establishment, enhancement, and/or preservation of wetland/riparian areas.

4) *Camp Creek-Lower Verde River Watershed*

The Camp Creek-Lower Verde River Watershed is a sub-watershed of the Lower Verde River Watershed, and contains the community of Rio Verde and portions of Fountain Hills. This watershed is just downstream of the Bartlett Reservoir and contains the segment of the Verde River that is officially classified as “impaired.” Also, this watershed contains several agricultural sites that are within the floodplain of the river, which suggests direct loss of riparian and habitat from clearing/filling, ditching, and agricultural planting activities. Landownership in this area is also represented by many state and private interests, so therefore implementing a mitigation project may be practicable.

Priority Activities

1) *Cottonwood-Willow Gallery Forests*

Cottonwood-willow gallery forests are among the rarest riparian habitat type within the Verde River watershed. As stated previously, this habitat type represents approximately 0.13% of riparian areas, but also is utilized extensively by wildlife. Cottonwoods and willows also stabilize stream banks, provide shade, and allow for increased retention of surface water. Having a stable stream bank/riparian system increases natural biological processes throughout the flood plain of a particular waterway.

As demonstrated in the current Watson Woods Riparian Preserve Mitigation Area, cottonwoods and willow “pole cuttings” can be harvested from the branches of existing, larger trees at a relatively inexpensive cost. Coupled with proper hydrological restoration, this technique has been proven effective at Watson Woods, as a recent fall 2011 monitoring survey showed an approximate 80% survival rate. Through the ILF, Prescott Creeks intends to continue this technique as a priority activity throughout the Verde River Watershed where appropriate.

2) *Urban Riparian Areas*

The Verde River Watershed contains numerous waterways and riparian areas that provide habitat for many vegetative and animals species. These same attributes have also attracted humans to conduct development activities along these waterways, which has resulted in many degraded aquatic systems within the Verde River Watershed. Restoring, enhancing, or preserving these waterways and riparian areas in an urban setting and providing long term protection will provide numerous public benefits such as improved water quality, air quality, wildlife habitat, and aesthetics that are not currently being realized in many developed areas.

3) *Riparian Buffers/Upland Areas*

As the buffer area between wetland and terrestrial habitats, grass shrub, and woodland habitats adjacent to riparian zones provide benefits for both wetlands and terrestrial species. They provide rookeries and stopover grounds for migratory birds, foraging habitat, flood refuge, and dispersal corridors for a variety of animal species. As part of the ILF, Prescott Creeks will consider the inclusion of these areas in the development and implementation of its individual mitigation projects.

G. Use of Preservation

Prescott Creeks considers the use of preservation as a key component of the ILF and individual mitigation projects because wetlands and riparian areas occupy such a small percentage of land within the Verde River Watershed. Based on the historical wetland loss (174 acres/year) and numerous studies, wetlands and riparian areas within the Verde River Watershed are under a demonstrable threat. Prescott Creeks intends to use preservation along with specific wetland/riparian restoration, enhancement, and establishment activities in order to provide a suite of functions and values that will benefit the watershed. Preservation may be used to compensate for CESPL permits provided that all of the following criteria are met:

- 1) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
- 2) The resources to be preserved contribute significantly to the ecological sustainability of the watershed;
- 3) Preservation is determined by the CESPL to be appropriate and practicable;
- 4) The resources to be preserved are under a demonstrable threat of destruction or adverse modifications; and
- 5) The preserved site will be permanently protected through an appropriate legal instrument.

H. Stakeholder Involvement

Assembling the diverse interests and talents in the watershed will provide the basis for successful mitigation projects. Stakeholder involvement is a key component of almost any Prescott Creeks effort. The organization has built strong partnerships with federal, state and local governments and agencies (CESPL, Prescott National Forest, AZ Department of Environmental Quality, AZ Water Protection Fund Commission, AZ Department of Transportation, City of Prescott, Yavapai County, Yavapai-Prescott Indian Tribe), Prescott College, community businesses (Prescott Chamber of Commerce, Fann Environmental, Natural Channel Design, etc.), and local community members (e.g.; practicing and retired engineers, administrators, interested citizens). Also, Prescott Creeks chairs the Granite Creek Watershed Improvement Council, which contains many of the aforementioned organizations/individuals, and meets on a monthly basis to discuss watershed-related topics and action items.

In addition to CESPL mitigation projects, Prescott Creeks and its stakeholders have conducted and implemented the following aquatic resource restoration/conservation projects. As stated in §332.3(j) (2), these projects were/are intended to be undertaken in conjunction with and supplemental to the ILF, in order to maximize the overall ecological benefits of the ILF.

- 1) *Watson Woods Riparian Preserve* (Prescott Creeks 2008-present) Purpose: To restore 4 reaches of Granite Creek and critical planting areas/wetlands to improve wildlife habitat and water quality. Project Cost: \$2+M. Major Funding: ADEQ and AZ WPF
- 2) *Watershed Improvement Plan* (Prescott Creeks, 2009-Present) Purpose: To identify sources of impairment to water quality and promote watershed management activities that can be implemented by municipalities and individuals to improve watershed health. Project Cost: \$500,000. Funding: ADEQ
- 3) *Granite Creek Cleanup* (Prescott Creeks 1989-Present) Purpose: To engage the community to beautify their creeks by removing trash and debris from local waterways. Project Cost: ~\$4,000/year. Funding: Corporate Sponsors and private donations
- 4) *Rambling River* (Prescott Creeks 2009) Purpose: To educate the community through interaction with a stream table/watershed model. Project Cost: \$67,875. Funding ADEQ
- 5) *Yavapai County Stormwater Quality Improvement Project at Pioneer Park* (Yavapai County 2009) Purpose: To reduce/remove pollutant input from Granite Creek and promote groundwater recharge. Project Cost: \$620,000. Funding: ADEQ
- 6) *Stormwater Detention Basin, Prescott Lakes Parkway* (Prescott Creeks 2007) Purpose: to manage runoff from a recently constructed four lane roadway that drains into Granite Creek, Watson Woods, and Watson Lake. Project Cost: \$123,000. Funding: ADEQ
- 7) *Storm Drain Markers* (Prescott Creeks 2007). Purpose: To educate the public on the connection of stormwater to local water bodies. Project Cost: \$15,000. Funding: ADEQ
- 8) *Yavapai Reservation Slaughterhouse Gulch Wetland Restoration* (Yavapai-Prescott Tribe 2000). Purpose: to restore wetland habitat along Granite Creek. Project Cost: \$88,000. Funding: EPA
- 9) *Creek Signing Project* (Prescott Creeks 2000-Present) Purpose: Increase public awareness regarding the existence of creeks. Project Cost: \$12,000 Funding: Private donations and the City of Prescott

Prescott Creeks also solicits stakeholder involvement through the use of watershed residents' social surveys and provides an interactive website that is updated regularly to provide resources and information to the public. Also, community volunteers typically accomplish riparian and/or wetland restoration, establishment, enhancement, and preservation tasks in the field for Prescott Creeks, which further increases public awareness of the importance of aquatic resources.

In regards to the Verde River Watershed as a whole, the Verde River Basin Partnership (VRBP) consists of a number of non-profit organizations, local businesses, water managers, and federal, state, and local agencies which have invested in the scientific understanding and protection of the Verde River. The VRBP organizes research, outreach, and talent among these groups. As a group, the VRBP agrees on “The Verde River Guiding Principles” to guide research, education, and decision making for the benefit of the Verde River and fellow citizens (VRBP 2012). As a member of the VRBP, Prescott Creeks agrees to incorporate these principles into the operation and management of the ILF and individual mitigation projects:

The Verde River Guiding Principles

- 1) Water makes earth habitable; fresh water, a finite resource, is essential for all life on land.
- 2) The Verde River and its tributaries, seeps, and springs, are interconnected – to each other, the Colorado River system, and ultimately to the Ocean via the Sea of Cortez.
- 3) Groundwater and surface water are interconnected and affect each other; groundwater depletion ultimately depletes surface flows and surface waters depletion can potentially impact groundwater recharge.
- 4) Climate and drought have an impact on the Verde River, including the amount of water available for riparian habitat, wildlife, and human use.
- 5) The Verde River and its perennial tributaries support a broad diversity of life and ecosystems and provide a rare and important corridor for migrating species.
- 6) The Verde River is one of the last perennial river systems in Arizona and has the state’s longest stretch of continuous interconnected riparian habitat. The value of the riparian habitat and flows are beyond calculation and must be protected.
- 7) The Verde River system is a regional, state, and national treasure. The river and humans within its watershed are inextricably interconnected. The river is socially, economically, environmentally, and culturally important.
- 8) The Verde River system is a national asset. More than two-thirds of its watershed is managed by federal agencies on behalf of the American public.
- 9) Research to date provides a basic understanding of the Verde River system, yet more remains to be learned, and unbiased science is crucial to water and growth policy and decision making. Providing the public with scientific information about the Verde River system give them a stronger voice in the decision-making process.
- 10) Collaborative decision-making amongst all stakeholders is crucial to protecting the interests of all who depend on the Verde River.

I. Long Term Protection and Management

To ensure permanent protection of each individual mitigation site, Prescott Creeks and/or a qualified organization shall execute in-perpetuity conservation easements, deed restrictions, or other similar protective instruments which shall be recorded in the Yavapai County Courthouse or other appropriate county registry. Prescott Creeks ensures that the holder of these conservation easements/protective instruments shall be an environmental and/or conservation – based 501(c)(3) non-profit or government organization to be determined. The easement/deed restriction will inure and run with the property title, and will prohibit activities such as clear cutting, unapproved fill discharges, cattle grazing, or other surface development that would diminish the quality or quantity of wetland, riparian, and associated buffer areas.

Prescott Creeks shall be responsible for the long-term management of each individual mitigation project and the ILF to ensure long-term viability as functional aquatic resources. Although each individual mitigation project shall be designed to require little or no long-term management efforts once performance standards have been achieved, Prescott Creeks shall maintain responsibility unless the long-term management responsibility is formally transferred to a long-term manager with IRT approval. The long-term management plan developed for each project will include a description of the anticipated management needs with annual cost estimates and an identified funding mechanism such as non-wasting endowments, escrow accounts, trusts, contractual arrangements with future responsible parties, or other appropriate financial instruments.

J. Monitoring, Adaptive Management, and Reporting

Prescott Creeks shall be responsible for mitigation monitoring and shall provide annual monitoring reports for a minimum of five years from the date of the initiation of mitigation activities at each individual mitigation site. The monitoring reports shall contain, at minimum, a documentation of relative success of each mitigation activity as it pertains to stated performance standards, geomorphology reporting, survivorship of planted species, evidence of natural vegetative growth, and photographic documentation. Specific monitoring plans for each individual mitigation site shall be submitted as part of each individual mitigation plan.

Prescott Creeks shall employ an adaptive management plan for the ILF and individual mitigation projects in order to ensure that the needs of the watershed are met. If any information or circumstances are discovered during regular monitoring and management that may interfere with these needs, or if the needs of the watershed change, Prescott Creeks shall implement corrective measures to address these unforeseen situations. All adaptive and corrective measures will be coordinated with the IRT prior to implementation, and the ILF Program and individual mitigation plans shall be revised as necessary to ensure long term sustainability and protection of these corrective measures.

Prescott Creeks shall maintain accurate records for the expenditure of ILF funds and documentation of restored areas, including the date restoration work began at each individual mitigation site, the total number of acres restored, and all annual monitoring reports. Prescott Creeks shall provide the CESPL with an annual financial report containing a detailed account of how all monies from the ILF fund were expended or collected during the preceding year. The report shall be submitted to the IRT by March 1st of each year.

10.0 Program Account

Prescott Creeks will establish an ILF account and individual mitigation project accounts at a financial institution that is a member of the Federal Deposit Insurance Corporation (FDIC). All interests and earnings accruing to the program will remain in that account for use by the ILF for the purposes of providing compensatory mitigation. The CESPL shall have the authority to direct those funds to alternative compensatory mitigation projects in cases where Prescott Creeks does not provide compensatory mitigation in accordance with a specified time frame. The CESPL shall have the authority to audit all programs accounts associated with the ILF at any time. All reports associated with the program account will be prepared and submitted in accordance with Section 9.J of this document.

11.0 Conclusion

The Prescott Creeks ILF Program has the potential to effectively compensate for CESPL authorized impacts to the aquatic environment within the Verde River Watershed. By utilizing a watershed-approach, Prescott Creeks will develop and implement appropriate mitigation projects that will benefit the public and provide improved wetland and riparian habitat. Also, Prescott Creeks is committed to protecting and managing these mitigation projects in perpetuity.

12.0 References

- Arizona Department of Environmental Quality. 2010. Verde River Watershed Assessment. www.azdeq.gov. Accessed January 2012
- Arizona Department of Water Resources. 2008. "Verde River Watershed" www.azwater.gov. Accessed January 2012
- Arizona NEMO. 2005 Watershed Based Plan, Verde Watershed. <http://www.snr.arizona.edu/nemo> Accessed January 2012
- Arizona Office of Tourism. 2008. Verde Valley Tourism Survey. Prepared for the Arizona Office of Tourism by Arizona Hospitality Research and Resource Center, the Center for Business Outreach, and the W.A. Franke College of Business, Northern Arizona University, Flagstaff, AZ
- Big Chino Ranch Project. City of Prescott, Arizona. www.cityofprescott.net/services/water/chino.php. Accessed February 2012.
- Brown, D.E., C.H. Lowe, and C.P. Pace. 1979. A Digitized Classification System for the Biotic Communities of North America, with Community (Series) and Association Examples for the Southwest. Journal of the Arizona-Nevada Academy of Sciences 14
- City of Prescott, Community Development Department. Land Development Code. Amended 5.12.2009
- Dahl, T.E., and Johnson, C.E., 1991, Wetlands--Status and trends in the conterminous United States, mid-1970's to mid-1980's: Washington, D.C., U.S. Fish and Wildlife Service
- Dobyns, H.F. 1981. From fire to flood: Historic human destruction of Sonoran Desert riverine oases. Ballena Press, Socorro, N.M.
- Feldhamer, G.A., B.C. Thompson, J.A. Chapman. 2003. *Wild Mammals of North America: Biology, management and conservation*. John's Hopkins University Press. Baltimore, MD.
- Gregory, Stanley V., Frederick J. Swanson, W. Arthur McKee, and Kenneth W. Cummins. 1991. An Ecosystem Perspective of Riparian Zones: Focus on links between land and water. Bioscience, 41(8):540-549.
- Haney, J.A., D.S. Turner, A.E. Springer, J.C. Stromberg, L.E. Stevens, P.A. Pearthree, and V. Supplee. 2008. Ecological Implications of Verde River Flows. A report by the Verde River Basin Partnership, Arizona Water Institute, and The Nature Conservancy.

- Hoffmeister, D. 1986. Mammals of Arizona. University of Arizona Press, Tucson, AZ.
- Lineberger, Mark. 2011. Preliminary ADOT Plan Slates \$70M To Be Spent In County. JournalAZ.com www.journalaz.com. Accessed February 2012
- Lusby, G.G.; Reid, V.H.; Knipe, O.D. 1971. Effects of grazing on the hydrology and biology of the Badger Wash Basin in western Colorado, 1953-1966. Hydrologic effects of land use. Geological Survey Water-Supply Paper 1532-D. United States Government Printing Office, Washington
- National Wildland and Scenic Rivers System. 2007. <http://www.rivers.gov/wsr-verde.html>
- Northern Arizona University. 2011. Upper Verde River. Arizona Heritage Waters. www.azheritagewaters.nau.edu/loc_verderiver.html. Accessed December 2011
- Ohmart, R.D. and B.W. Anderson. 1982. North American desert riparian ecosystems. Reference Handbook on the Deserts of North America.
- Ohmart, R.D., 1996. Historical and present impacts of livestock grazing on fish and wildlife resources in western riparian habitats. In: Krauseman, P.R. (Ed.), Rangeland Wildlife. Society of Range Management, Denver, CO
- Owen-Joyce, S.J., and C.K. Bell. 1983. Appraisal of water resources in the Upper Verde River area, Yavapai and Coconino Counties, Arizona: Arizona Department of Water Resources Bulletin 2
- Pearthree, P.A. 2008. Chapter 3. Background: Falluvial Geomorphology and Flood History of the Verde River. Pp 15-32 in Haney, J.A., D.S. Turner, A.E. Springer, J.C. Stromberg, L.E. Stevens, P.A. Pearthree, V. Suplee. 2008. Ecological Implications of Verde River Flows. A report by the Arizona Water Institute, The Nature Conservancy, and the Verde River Basin Partnership.
- Potential Effects from Tourism and Recreation on Aquatic Ecosystems. Regional Aquatics Monitoring Program. www.ramp-alberta.org/resources/tourism/wildlife.aspx. Access January 2012
- Prescott, Arizona. City-Data.com. www.citydata.com. Accessed November 2011
- Smith, D.H, West, and Auberle. 2009. Valuing the Verde River Watershed: An Assessment. Working Paper Series – 09-03. Northern Arizona University, The W.A. Franke College of Business
- Schmidt, C.A., B.F. Powell, and W.L. Halvorson. 2005. Vascular Plant and Vertebrate Inventory of Tuzigoot National Monument. U.S. Geological Survey Open-File Report 2005-1347
- Springer, A.E., J.A. Haney. 2008. Chapter 2. Background: Hydrology of the Upper and Middle Verde River. Pp 5-14 in Haney, J.A., D.S. Turner, A.E. Springer, J.C. Stromberg, L.E. Stevens, P.A.
- University of Arizona. 2004. Prescott Active Management Area. Managing Arid and Semi-Arid Watersheds. www.ag.arizona.edu/oals/watershed/highlands/Prescott.html
- Verde River Basin Partnership. 2012. The Verde River Guiding Principles. <http://VRBP.org>

- Von Gausig, Doug, Becky O'Bannon, Casey Rooney. 2011. Verde River Economic Development Study. Final Report for Public Distribution. Presented to The Walton Family Foundation. Clarkdale, AZ
- Webb, Robert, S.A. Leake. 2005. Ground-water surface-water interactions and long-term change in riverine riparian vegetation in the southwestern United States. USGS. Journal of Hydrology 320 (2006) 302-323.
- Wirt, L., E. DeWitt, and V. E. Langenheim, eds. 2005. Geologic Framework of Aquifer Units and Ground-water Flow Paths, Verde River Headwaters, North-central Arizona. U. S. Geological Survey Open-File Report 204-1411.
- Wolfe, Ed. 2011. The Verde River-A Cautionary Tale of Two Streamgages
- Yuhas, Roberta. 2003. Loss of Wetlands in the Southwestern United States. US Geological Survey Water Supply Paper 2425, National Water Summary on Wetland Resources. 1996.
www.water.usgs.gov. Accessed January 2012