

# Arizona Fish and Wildlife Conservation Office 2015 Annual Report



**U.S. Fish & Wildlife Service  
Arizona Fish and Wildlife Conservation Office**

**FY2015 Annual Report**

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928-556-2016

May 1, 2016

Document Control Number: USFWS-AZFWCO-FL-16-003



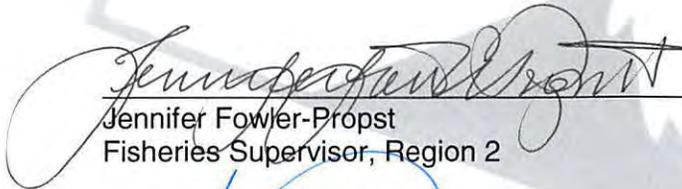
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### ***Acknowledgements***

We would like to thank those within the Arizona Fish and Wildlife Conservation Office who contributed stories and photos for inclusion in this report. We would like to thank the many partners who made significant contributions towards accomplishments described in this report. All photos within this report are credited as USFWS property except where noted otherwise.

## INTRODUCTION

The Arizona Fish and Wildlife Conservation Office (AZFWCO) is part of the U.S. Fish and Wildlife Service's (USFWS) Fish and Aquatic Conservation Program (FAC). The nationwide FAC program is comprised of 64 FWCOs, 70 National Fish Hatcheries, 9 Fish Health Centers, and 7 Fish Technology Centers. We are part of the USFWS Southwest Region (Region 2), which encompasses Arizona, New Mexico, Texas, and Oklahoma.

In Fiscal Year (FY) 2015, AZFWCO accomplishments were the result of the dedicated efforts of 20 staff (Appendix A) and 16 volunteers located in our three offices across Arizona: Flagstaff; Pinetop/Whiteriver; and Parker, AZ. Collectively, we are a group of professionals who share the same mission to work with others to conserve, protect, and enhance fish and other aquatic organisms and their habitat in Arizona and the Southwest. We are the Service's lead station for recovery of the threatened Apache Trout. We also work with Little Colorado Spinedace, Loach Minnow, Gila Topminnow, desert pupfish, and the "big river" fish: Razorback Sucker, Humpback Chub, and Bonytail that inhabit the Colorado River.

The report that follows provides detailed information on our work over the course of FY 2015. Our work is organized according to the following seven focus areas identified by the FAC Program's "Vision for the Future" document set forth in 2002 (USFWS 2002): Aquatic Species Conservation and Management; Aquatic Habitat Conservation and Management; Partnerships and Accountability; Cooperation with Native Americans; Public Use; Leadership in Science and Technology, and Workforce Management. Our office is proud to report accomplishments in each of these categories. Also, we are pleased to announce that, at the close of FY 2015, the FAC Program published a new national Strategic Plan that will guide our work for FY2016-2020 (USFWS 2015).

## FISH AND AQUATIC CONSERVATION PROGRAM FOCUS AREAS

### **Aquatic Species Conservation and Management**

*The Fish and Aquatic Conservation Program maintains and implements a comprehensive set of tools and activities to conserve and manage self-sustaining populations of native fish and other aquatic resources. These tools and activities are linked to management and recovery plans that help achieve restoration and recovery goals, provide recreational benefits and address federal trust responsibilities. Sound science, effective partnerships and careful planning and evaluation are integral to conservation and management efforts.*

### **Apache Trout**

While the White Mountain Apache Tribe began conservation actions for Apache Trout (*Oncorhynchus gilae apache*) in the 1940s and 1950s, by the late 1960s its range had

still been reduced from some six hundred miles of mountain streams in eastern Arizona to less than 40. In 1973, the Apache Trout became one of the first fish listed as an endangered species.

Fortunately, an ongoing cooperative recovery program enabled the species to be downlisted to the status of threatened in 1975 and, with continued efforts, it may become recovered in the near future. Objectives for Apache Trout recovery include the establishment and maintenance of 30 self-sustaining populations and monitoring of these populations. Toward these ends, we continued to make progress in FY 2015.

We continued Brown Trout (*Salmo trutta*) and Brook Trout (*Salvelinus fontinalis*) mechanical removal efforts in Apache Trout recovery streams (Figure 1). During FY 2015 multi-pass mechanical removal efforts on six streams resulted in the elimination of 985 nonnative trout (Brown Trout and Brook Trout), and the capture and release of 1,961 Apache Trout (Johnson 2016). Brown Trout reproduction has not been documented in Crooked Creek since 2010; Little Bonito Creek since 2011; and Squaw Creek since 2012, an indication that our removal efforts are effective and will ultimately lead to complete eradication of the nonnative trout.

The crew also completed five artificial fish barrier evaluations in FY 2015 (Crooked Creek, Little Bonito Creek, Paradise Creek, Smith Creek, and Squaw Creek). No fin-clipped trout were found above the fish barriers, supporting the hypothesis that these barriers are effectively excluding nonnative trout from Apache Trout recovery populations. We also installed 10 trail cameras near barriers on Apache Trout recovery streams. The trail cameras will document how the barriers function under varying flow regimes.

With funding provided from the Region 2 Emphasis Area program, we entered into a Cooperative Agreement with the Arizona Game and Fish Department to modify an artificial fish barrier on lower Bear Wallow Creek on the San Carlos Apache Indian Reservation. The 2011 Wallow Fire and subsequent new hydrograph compromised this fish barrier. The structure needs to be maintained/modified to prevent nonnative fish movement upstream and facilitate the recovery of Apache Trout and endangered Loach Minnow. Repairs are scheduled to take place in 2016.

Overall, we remain optimistic that continued efforts on behalf of Apache Trout will ultimately meet recovery objectives.

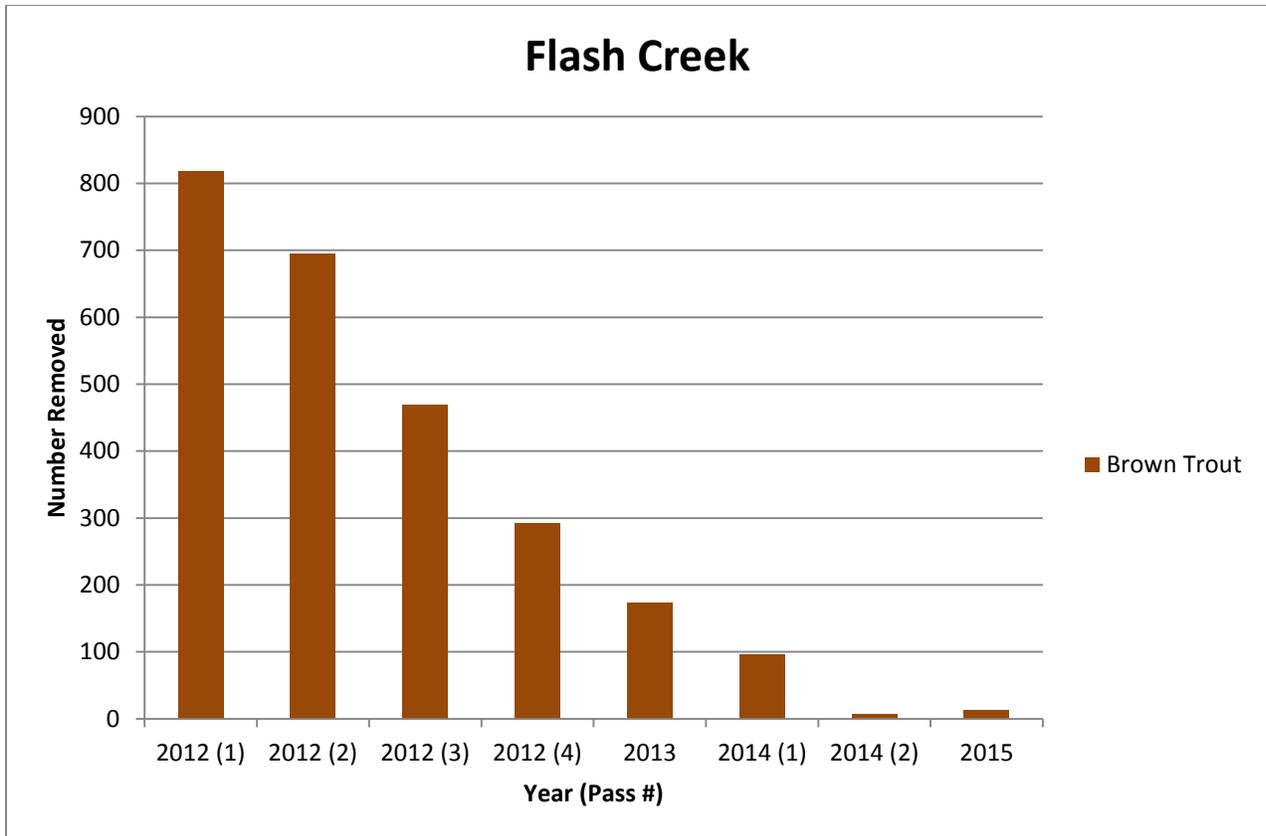


Figure 1. Brown Trout removal efforts in Flash Creek: 2012-2015.

### Gila Trout

Jennifer Johnson assisted with the salvage of Gila Trout (*Oncorhynchus gilae*) from Ash Creek on Mount Graham in southeastern Arizona. Gila trout were stocked in June 2012 after being salvaged from Spruce Creek, located within the burn area of the Whitewater-Baldy Fire in New Mexico. The Arizona Game and Fish Department completed surveys in the summer and fall of 2014 and found poor recruitment in Ash Creek. Eighty-two Gila Trout were collected and taken to Mora National Fish Hatchery where the fish will be used as broodstock for future stockings.



AZFWCO staff electrofishing KP Creek.

Whiteriver staff worked with Arizona Game and Fish Department (AGFD) on a survey of KP Creek. KP Creek, a tributary to the Blue River, is currently occupied by wild Apache/Rainbow Trout hybrids, although the creek is identified now as a potential recovery stream for Gila Trout. The KP Creek watershed was negatively affected by the Wallow Fire in 2011, leading to a significant reduction in the hybrid trout population. The AGFD has conducted mechanical removals of the hybrid trout in KP Creek with the goal of eradicating the few remaining individuals to avoid the need for an eventual chemical treatment. At this point in the KP Creek removal project, trout are absent or extremely rare during removal passes with backpack electrofishing crews.

### **Bonytail and Razorback Sucker**

Bonytail (*Gila elegans*) and Razorback Sucker (*Xyrauchen texanus*) were once abundant and widespread throughout the lower Colorado River basin. Today, their numbers and range have declined to a point where they are federally listed as endangered. Primary threats to both species include habitat loss, and competition and predation from nonnative fish species. Managers continue intensive conservation efforts that consist of reestablishing populations with hatchery-produced fish, and providing survival habitat free of, or ineffective for, nonnative predators.

We continue to work with multiple entities that represent the Lower Colorado River Multi-Species Conservation Program (LCR-MSCP). We have conducted fish surveys to monitor fish populations, habitat usage, and fish movement on the lower Colorado River near Parker, Arizona (including Colorado River Indian Tribal lands).

### **Stocking and Monitoring**

We provided logistical support in the stocking of 2097 Razorback Suckers at River Island State Park below Parker Dam. There were two separate stocking events in February 2015. The first stocking consisted of 1307 individual fish with a mean total length (TL) of 344 mm. The second stocking consisted of 790 individual fish with a mean TL of 384 mm. All fish were reared at the Bubbling Ponds Native Fish Research Facility managed by Arizona Game and Fish Department. We also stocked 279

Bonytail in September 2015 into Cibola High Levee Pond located on Cibola National Wildlife Refuge with a mean TL of 293 mm. These fish were provided by the Southwestern Native Aquatic Resources and Recovery Center and are expected to supplement the current Bonytail stock in High Levee Pond.

Each year the Parker Office participates in interagency monitoring efforts on both Lake Mohave and Lake Havasu. The goal of these efforts is to monitor the native fish populations, particularly Razorback Sucker and Bonytail, in these reservoirs using trammel netting equipment. The Parker Office is responsible for sampling the Bill Williams National Wildlife Refuge zone in Lake Havasu and Yuma Cove in Lake Mohave. In Lake Mohave, the Parker Office worked concurrently with AGFD biologists to sample Yuma Cove and Owl Point.

No native fish were captured in the monitoring efforts on Lake Havasu and several nonnative species were detected. However, in Lake Mohave, several Razorback Sucker were encountered. A total of eight Razorback Sucker were captured at Owl Point and a total of 42 were captured at Yuma Cove. Of the 50 fish, 10 were identified as males, 38 were identified as females, and no sex was determined on two of the individuals. The Razorback had a mean TL of 597 mm, ranging from 390-685 mm, and a mean weight of 2400 g, ranging from 660-3340 g. Overall, monitoring was reduced due to staff vacancies in FY 2015.

Future monitoring and stocking efforts will be conducted in FY 2016 to further study the fate of native fish being stocked in the mainstem Colorado River below Parker Dam as well as backwaters such as High Levee Pond on Cibola National Wildlife Refuge, Office Cove on Bill Williams National Wildlife Refuge, and Topock Marsh on Havasu National Wildlife Refuge.

### **Humpback Chub**

Humpback Chub (*Gila cypha*) is a federally endangered cyprinid fish species endemic to the Colorado River basin of western United States. Five populations currently exist in the Colorado River; four in the upper basin above Lake Powell and one in Grand Canyon below Lake Powell. The Grand Canyon population is the largest of these, and is almost entirely dependent upon the Little Colorado River for spawning and rearing (USFWS 2002).

AZFWCO is involved in several projects working toward the recovery and conservation of Humpback Chub. These include monitoring population status and trend in the Little Colorado River, monitoring status in the mainstem Colorado River, and conducting translocations of the species in Grand Canyon. These studies occur with cooperation and collaboration of U.S. Geological Survey (USGS) Grand Canyon Monitoring and Research Center (GCMRC), National Park Service (Grand Canyon), and Arizona Game and Fish Department.

### *Little Colorado River, Grand Canyon*

Since 2000, monitoring using hoop nets has been conducted in the lower 13.6 km of the Little Colorado River to track abundance and trend of Humpback Chub, and to monitor other fishes. These monitoring activities occur during the spring and fall seasons. Closed Chapman Petersen mark-recapture methods and catch per unit effort (CPUE) data have been used to estimate absolute or relative abundances of Humpback Chub of various size classes (Van Haverbeke et al. 2013).

Population estimates indicate that sometime between the early 1990s and 2000, the abundance of adult Humpback Chub ( $\geq 200$  mm) underwent a decline in the Little Colorado River (Coggins et al. 2006). This was followed by a period of relatively low but stable abundance between 2000 and 2006, and by a post-2006 period of significant increasing trend (Figure 2). This trend was also reflected in Humpback Chub  $\geq 150$  mm. The post-2006 increases in Humpback Chub  $\geq 150$  mm and  $\geq 200$  mm were visible during both the spring and fall seasons, but were more apparent during spring (Figure 2-A and 2-B). In spring of 2015, we estimated the Humpback Chub population was 3,999 (SE = 314) and 3,078 (SE = 246) for size classes  $\geq 150$  mm and  $\geq 200$  mm respectively. This represented a significant decline in the spring abundance of Humpback Chub in the Little Colorado River from the 2014 estimates. Smaller size classes of Humpback Chub ( $< 150$  mm) have displayed significant annual variation thought to be related to the LCR hydrograph (Van Haverbeke et al. 2013, 2016). Bluehead Sucker (*Catostomus discobolus*) and Flannelmouth Sucker (*C. latipinnis*) have been monitored using CPUE. Similar to Humpback Chub, Bluehead and Flannelmouth suckers underwent a post-2006 period of significant increase, although this increase was noticeably less for Flannelmouth Sucker. Since 2008 Bluehead Sucker have been trending downward, as have Flannelmouth Sucker since 2010 (Figure 3). For May 2015, CPUE was 0.21 (SE=0.08) for Bluehead Sucker and 0.27 (SE = 0.05) for Flannelmouth Sucker (Van Haverbeke et al. 2016).

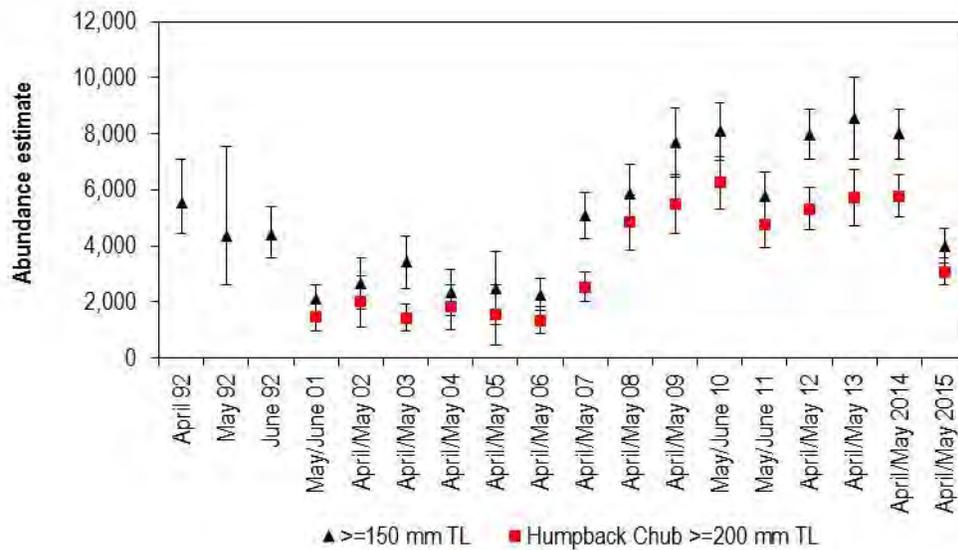
Reasons for the post-2006 increases of Humpback Chub, Bluehead Sucker, and Flannelmouth Sucker are thought to be related to several factors, including warmer mainstem Colorado River water temperatures since 2003, and mechanical removal of nonnative fish in the mainstem Colorado River during the 2003-2006 timeframe (Coggins et al. 2011). Additionally, it is thought that translocations of Humpback Chub within the Little Colorado River watershed have contributed to increasing abundances.

Reasons for the sudden apparent significant decline of Humpback Chub in spring 2015 are unknown, and the decline may not represent actual population reduction. There is some evidence from independent sampling programs that many Humpback Chub may be temporarily residing in the nearby mainstem Colorado River, although it is unknown why they would vacate or fail to enter the Little Colorado River.

USFWS has functioned as the lead in several projects to physically move juvenile Humpback Chub from the Little Colorado River for recovery and conservation purposes. First among these has been establishment of a genetic refuge of Humpback Chub at the Southwestern Native Aquatic Resources and Recovery Center (SNARRC) in

Dexter, New Mexico. Currently, approximately 1,000 Humpback Chub are successfully being held alive at SNARRC for this purpose. Because this number of fish meets the goals of the program for SNARRC, no additional chub have been collected for SNARRC since 2013. Second, juvenile Humpback Chub have been collected from the lower portions of the Little Colorado River (<13.6 km), and moved (translocated) to an area higher in the Little Colorado River watershed historically unoccupied by Humpback Chub (above 14.1 km). These activities are known as the Chute Falls translocation efforts, because the juvenile chub are released above a large travertine/waterfall structure known as Chute Falls that has historically acted as somewhat of a physical barrier (Van Haverbeke 2010). Since 2003, a series of these translocations have occurred, resulting in the release of ~2,969 fish above Chute Falls, of which ~303 were released in October 2015. Annual monitoring has shown that the translocated chub characteristically undergo unusually fast growth rates and reach sexual maturity one to two years earlier than their downstream source population, typically disperse downstream, and are assisting in augmenting the Little Colorado River population. Third, USFWS has worked with the National Park Service to collect juvenile Humpback Chub from the Little Colorado River for translocations into other side tributaries in Grand Canyon, including Shinumo and Havasu creeks, located some 50 and 100 miles downriver from the Little Colorado River confluence respectively. Juvenile chub are annually collected, transported to SNARRC for grow out, tagged, and released into their new sites (Trammel et al. 2012). In May 2015 approximately 315 larval Humpback Chub were collected and transported to SNARRC for grow out and scheduled release into Shinumo or Havasu creeks during 2016. Preliminary results have demonstrated that the translocated chub are successfully surviving in their new habitat and many are dispersing into the mainstem Colorado River to augment existing mainstem “aggregations” of Humpback Chub (Persons et al. *in prep*). Efforts within the past two years have evolved to collecting Humpback Chub in the larval rather than the juvenile life stage in order to minimize effects on the Little Colorado River population (Pine et al. 2013).

A.



B.

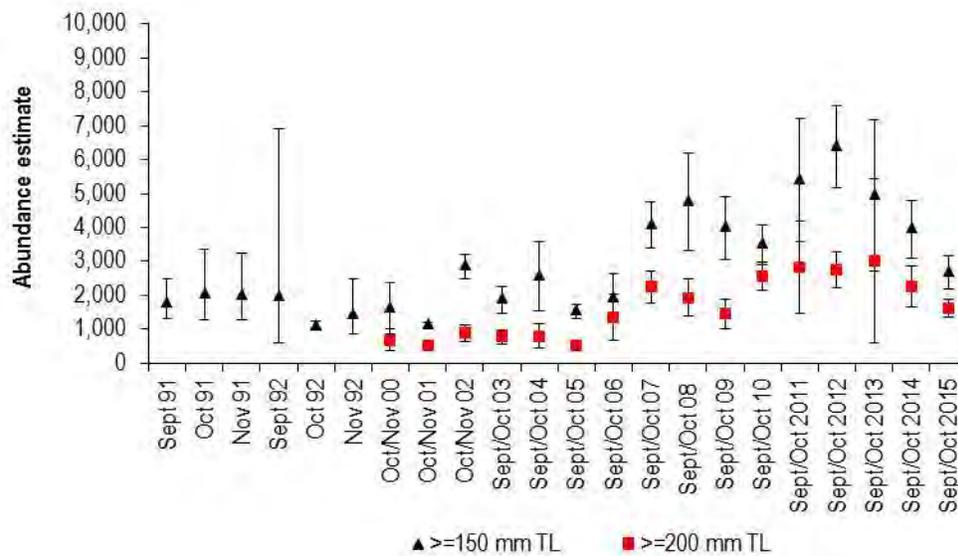


Figure 2. Abundance estimates ( $\pm 95\%$  CI) of Humpback Chub  $\geq 150$  mm and  $\geq 200$  mm in the Little Colorado River during (A) spring (2001-2015) and (B) fall seasons (2000-2015). Closed spring and fall abundance estimates of Humpback Chub  $> 150$  mm in the Little Colorado River during 1991 and 1992 are from Douglas and Marsh (1996).

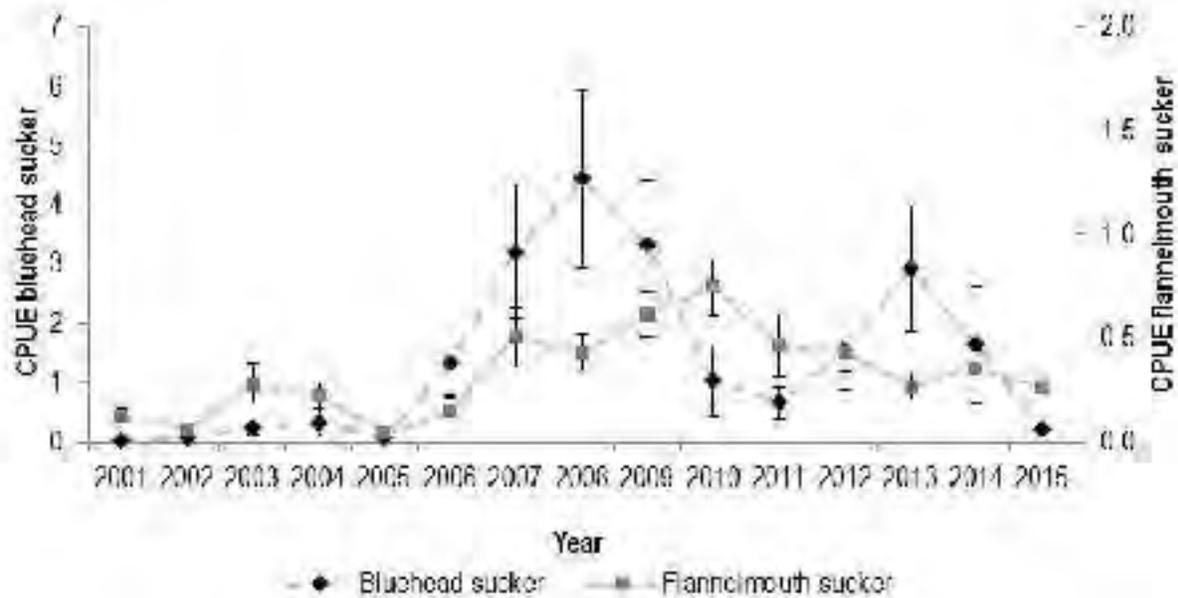


Figure 3. Relative abundance (catch per unit effort, CPUE  $\pm$  95% CI) of Bluehead and Flannemouth sucker  $\geq 150$  mm during the spring season in the Little Colorado River (river km 0-13.57), 2001-2015.

#### *Mainstem Colorado River, Grand Canyon*

USFWS works with GCMRC to monitor the status of Humpback Chub residing in the mainstem Colorado River throughout Grand Canyon. Targeted monitoring of Humpback Chub in the mainstem began in the early 1990s by Grand Canyon researchers (Valdez and Ryel 1995). During September 2015, one mainstem Colorado River trip was conducted to monitor Humpback Chub. The trip was successful in that Humpback Chub were captured at all locations sampled. Highlights included the capture of adult Humpback Chub near some springs in Marble Canyon (~river mile [RM] 34.5). This has been a relatively new and important finding since 2013 and one of the largest aggregations outside the Little Colorado River (N = 300 adults, CI = 109-491, estimated from 2014 closed mark-recapture).

In addition, juvenile Humpback Chub of mixed size classes were captured in western Grand Canyon (below ~RM 196). This also represents a relatively new and important finding and may indicate that a self-sustaining population of Humpback Chub is developing in western Grand Canyon, although the mechanisms for this process are not well understood (e.g., where and when the fish spawn). Additionally, we witnessed an unusually high CPUE of Humpback Chub near the Little Colorado River Inflow to the mainstem Colorado River during the 2015 sampling trip (Figure 4). This finding provided a potential explanation for the significant decrease in Humpback Chub that occurred in the Little Colorado River during 2015. Within the past several years (2010-2015) CPUE data suggest that Humpback Chub in the mainstem have been increasing compared to earlier sampling periods (1990-1993 and 2002-2006; Figure 4). Again, it is thought that warmer mainstem waters resulting from drought and mechanical removal of predaceous salmonids have contributed to these apparent increases. Finally on the

September 2015 mainstem trip, seven portable PIT tag receivers were deployed at survey locations and resulted in 548 unique fish recapture detections (see Leadership in Science and Technology section).

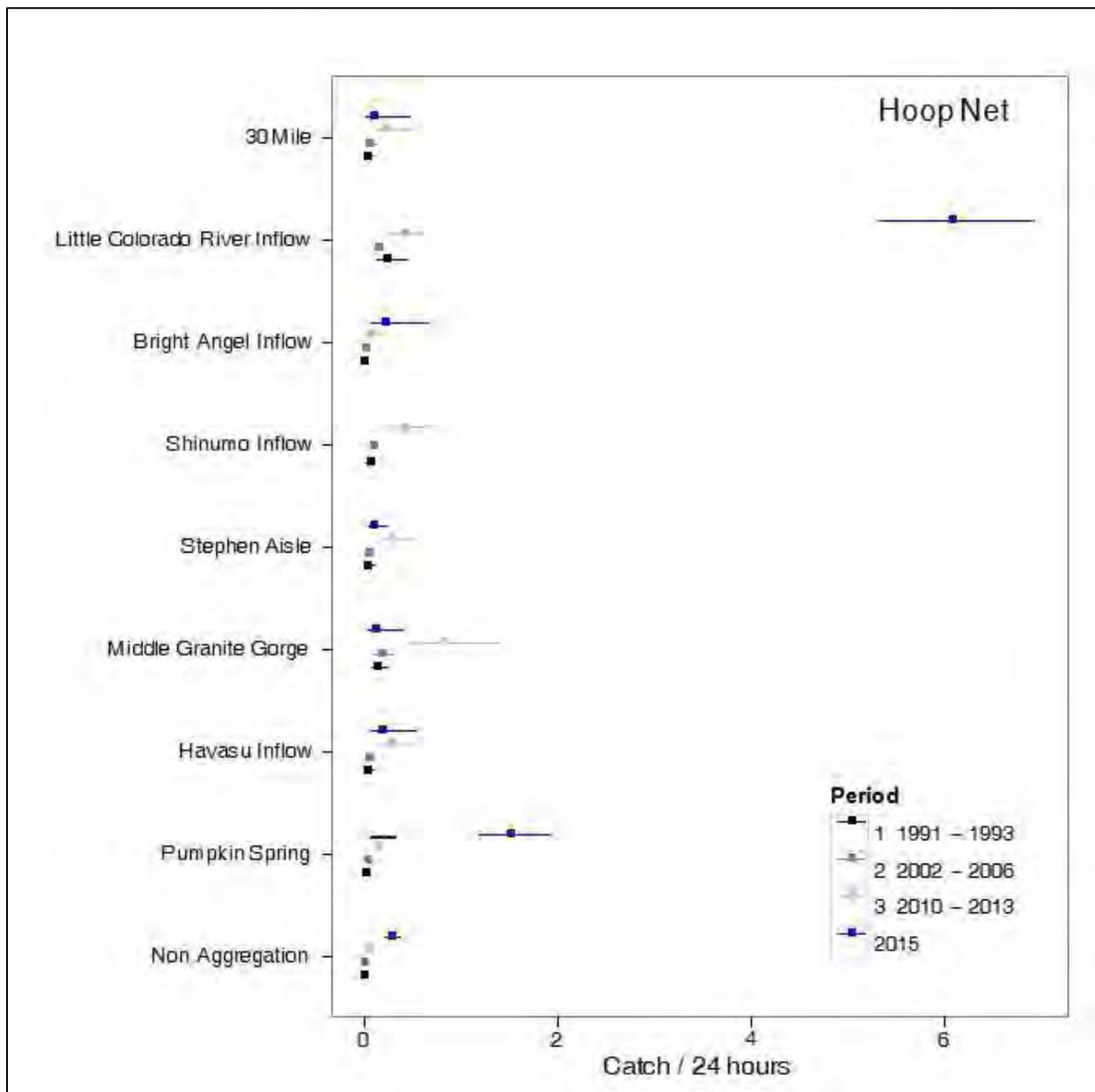


Figure 4. Catch per unit effort of Humpback Chub at nine mainstem Colorado River aggregation locations in Grand Canyon during 4 time periods. Figure from Mike Dodrill (USGS).

### Narrow-headed Gartersnake

In 2014, we entered into a new partnership with Northern Arizona University (NAU) and Arizona Ecological Services Field Office (AESO, USFWS) to further recovery efforts for the threatened Narrow-headed Gartersnake (*Thamnophis rufipunctatus*). This species is an aquatic snake and is strongly associated with clear, rocky streams using predominantly pool and riffle habitat that includes cobbles and boulders, but it has also

been observed using lake shoreline habitat. Narrow-headed Gartersnakes specialize on fish as their primary prey item and often anchor to stream cobbles and ambush passing fish. Through this new partnership, we provided financial assistance to expand the captive propagation and holding facility at NAU and conduct post-Slide Fire population assessments in the Oak Creek watershed.

### *Gartersnake Surveys*

Our partners at NAU conducted over 800 person-hours of visual encounter surveys at seven sites and conducted an additional 858 trap-hours of minnow-trapping at five of the seven sites in Oak Creek in the 2014 and 2015 field seasons. A total of 66 Narrow-headed Gartersnakes were detected during surveys. Forty-three gartersnakes were captured, and 11 juveniles (five females and six males) were collected for the captive breeding program at NAU from the five sites likely to be affected by flooding.

Despite detection of increased silt levels in 2014 compared to pre-flood levels, fish surveys conducted in Oak Creek indicated that fish populations did not suffer obvious declines either in 2014 or in 2015 at any sites. In addition, surveys for gartersnakes indicated that detection rates, although lower than those previously detected (e.g. during monitoring surveys pre-2012), have remained relatively steady since 2012-2013. There was successful reproduction by wild gartersnakes in 2014 and 2015: during both years recently-born gartersnakes were observed in surveys between July and September. These are all indications that the Narrow-headed Gartersnake population in Oak Creek has survived the initial two years following the Slide Fire without obvious declines. However, it remains unclear what the El Niño projected winter of 2015-2016 will bring in terms of flood events.

### *Gartersnake Captive Propagation and Holding Facility*

The eleven Narrow-headed Gartersnakes that were brought into captivity have thrived at the NAU propagation and holding facility. There have been no health issues. One male that was brought in with severe wounds to its mid-body (from unknown causes, but likely a failed predation attempt) has recovered and is growing. In 2014, the change in snout-vent length (SVL) of the captives between June and November ranged from 67 - 178 millimeters (mm; average  $112 + 33$  mm); and the change in mass ranged from 12.6 - 48.5 grams (g; av.  $24.3 + 10.5$  g). Based on visual comparison with Black River captives, we expect that the Oak Creek snakes are sufficiently large for breeding and will attempt this in spring 2016.

After an extensive scoping, design, and permitting process, construction was initiated on the gartersnake propagation/holding facility in August 2015. Completed components to date include: 1) installing the concrete curb that will contain the structure and some plumbing components, including smoothing rough edges and sealing the concrete with a fish-safe coating; 2) installing electrical components; 3) repairing building roof damage over the planned vivarium; 4) installing the screen and door components of the vivarium; 5) building brumation boxes that will be installed in the enclosure; 6) working with the NAU research greenhouse to secure native plants; and 6) securing and sterilizing some of the topsoil substrate.



*Completed screening in gartersnake captive propagation and holding facility, Northern Arizona University*

### **Use of Ammonia to Eliminate Aquatic Invasive Species**

In 2014, we entered into a new partnership with USGS to develop and refine the use of ammonia as a means to control aquatic invasive species. Predation, competition, and hybridization by aquatic invasive species are primary threats to rare and federally listed native aquatic species. The Service's and its partner's ability to control and eliminate aquatic invasive species is directly proportional to the prospect of improving the status or recovering aquatic species. Currently there exist only two effective tools that can be used to eliminate aquatic invasive species from complex natural systems: desiccation and the chemical rotenone. These available techniques do not eliminate the highly invasive crayfish. David Ward, a scientist with USGS, has pioneered the use of ammonia to eliminate aquatic invasive species, including crayfish, in a laboratory setting (Ward et al. 2013). An important next step in further development and testing of this approach is its application in a non-laboratory setting. In 2015 our Interagency Agreement with USGS was finalized and work began with looking into the permit requirements and an appropriate site for use in a non-laboratory setting.

### **Aquatic Habitat Conservation and Management**

*Loss and alteration of aquatic habitats are principal factors in the decline of native fish and other aquatic resources and the loss of biodiversity. Seventy percent of the nation's rivers have altered flows, and 50 percent of the waterways cannot support the various life stages of fish that require free movement up and downstream.*

### **National Fish Passage Program in Arizona Programmatic EIS**

The National Fish Passage Program (NFPP) provides funding and technical assistance in all 50 States to reconnect aquatic habitat by eliminating or bypassing barriers. In

Region 2, NFPP efforts are guided by the document titled Programmatic Environmental Assessment for the Fish Passage Program in Region 2 (EIS, USFWS 2011). In FY 2015, AZFWCO worked with Arizona Ecological Services Office to complete the Arizona-specific Biological Opinion for projects carried out under this EIS, as required by the Endangered Species Act.

As identified in the EIS, the focus in Arizona is on road crossings of streams in the upper Salt River watershed (Figure 5). In FY 2015, we developed and implemented a rapid assessment process to identify a smaller subset of crossings for further on-the-ground evaluation. Results of the rapid assessment are illustrated in Figure 6. Results of the on-the-ground evaluations and barrier prioritization survey will be compiled in a final report in FY 2016, followed by NFPP project proposal development.

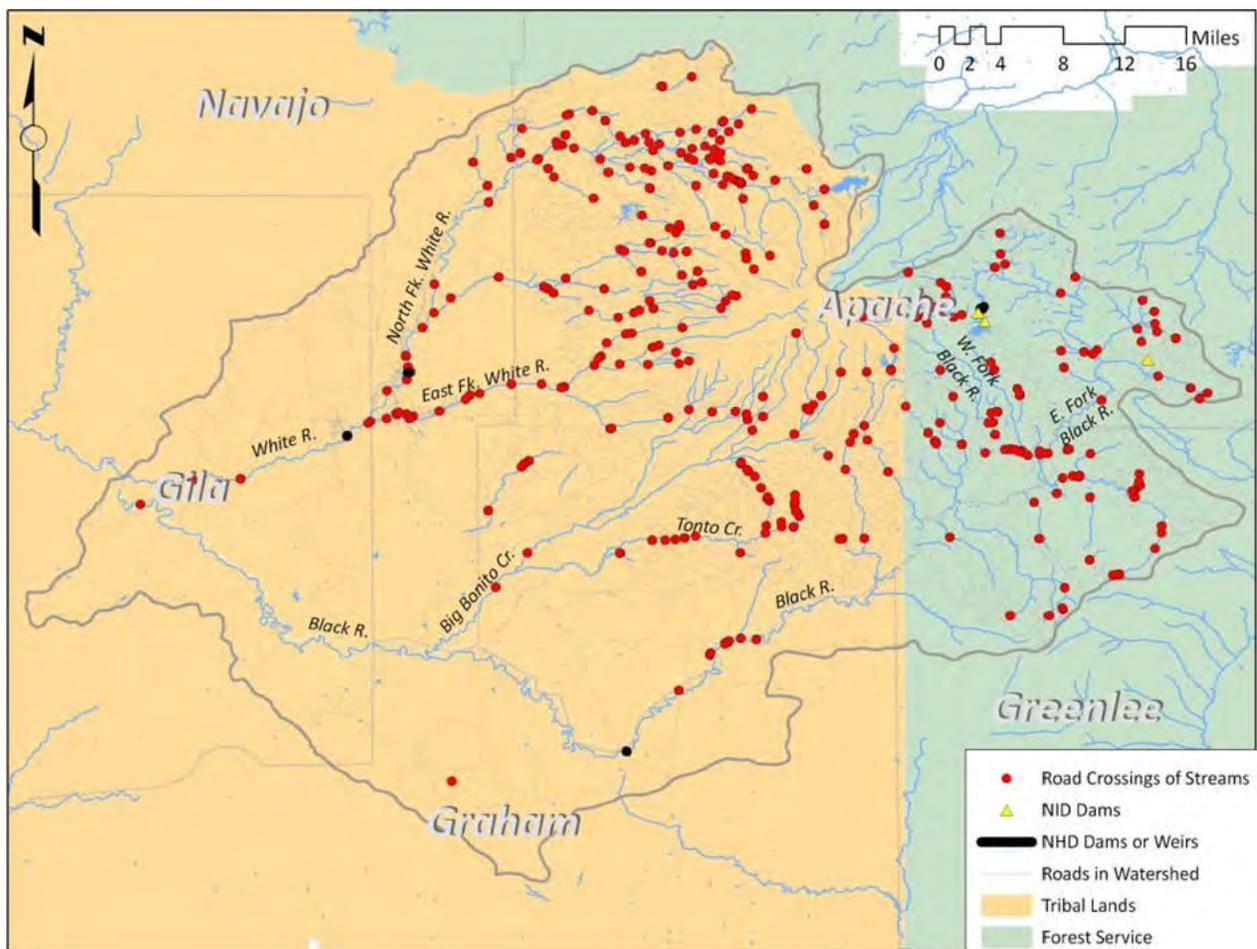


Figure 5. Road Crossings of Streams in the upper Salt River watershed, AZ (USFWS 2011).

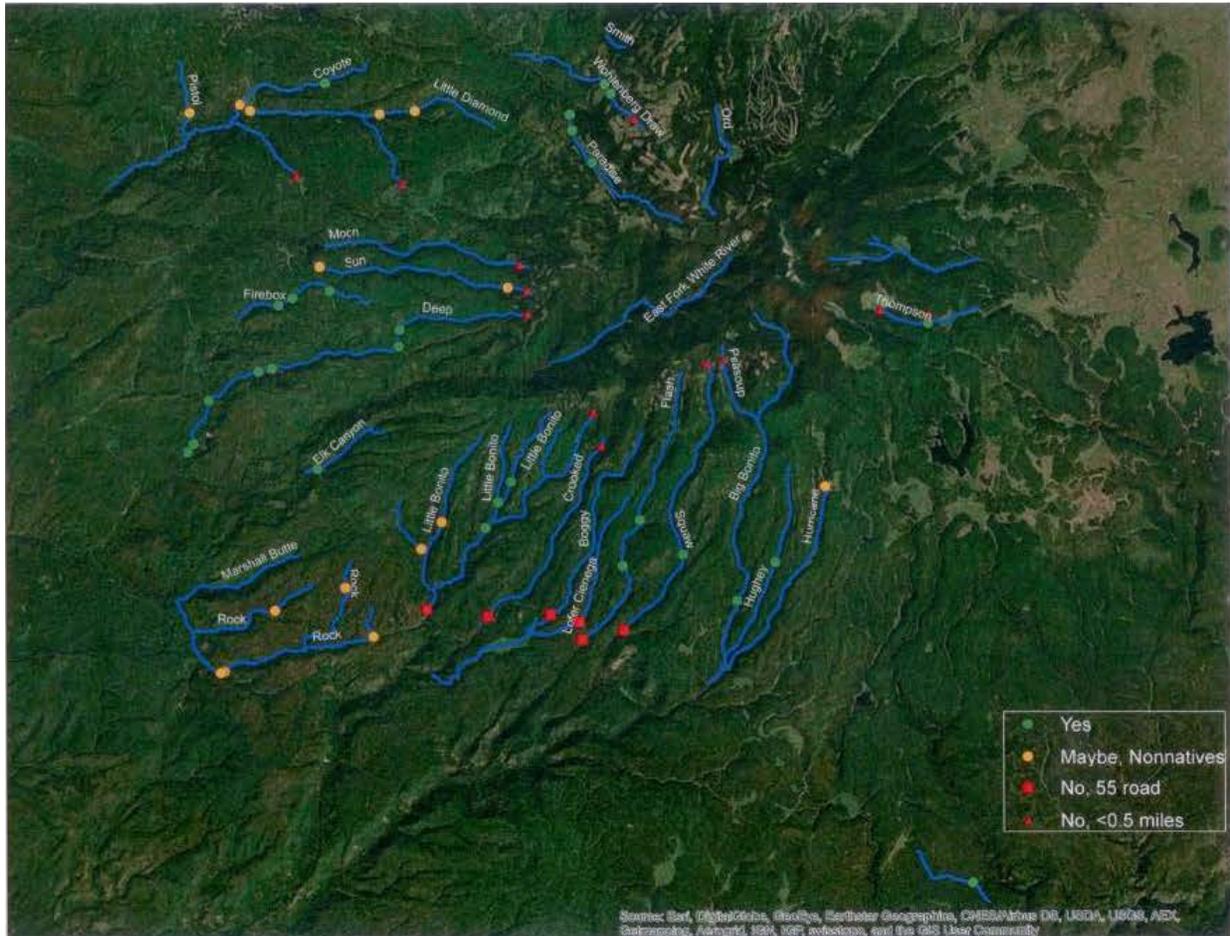


Figure 6: Results of AZFWCO fish barrier rapid assessment process and the resulting decision to conduct on-the-ground evaluations at stream crossings.

The Lee Valley Creek Fish Passage Project was completed in December 2014. The purpose of this project was to remove the current barrier on lower Lee Valley Creek to benefit Apache Trout by reconnecting 1.5 miles of habitat between Lee Valley Lake and Lee Valley Creek. The existing barrier was constructed in 1979 to protect Apache Trout in the creek, and was modified on multiple occasions, ultimately failing in 2007. Failure of the barrier resulted in erosion of the channel around the barrier and forming a headcut that threatened the stability of the channel. Natural Channel Design was the contractor for the design and implementation. The objectives were to remove the existing non-functional fish barrier, repair the existing headcut to protect wet meadow and the stream system upstream of the barrier, and improve fish passage to the upper portion of Lee Valley Creek. Construction was implemented during winter to allow for the driest conditions, the lowest chance of flood flows, and to provide the least disturbance to wildlife and the optimum establishment of native plant species. Earthwork and revegetation activities were completed as quickly as possible to reduce and maximize the healing of disturbed areas and establishment of native vegetation. Disturbed, bare earth areas located at the staging area or along the travel route were seeded with native grasses post-project. Wetland plugs were planted in areas along the

stream channel where there was a loss of vegetation resulting in bare soil conditions due to construction activities.



*Lee Valley Creek fish barrier before and immediately after removal and habitat restoration.*

### **Fighting a Giant**

Giant Salvinia (*Salvinia molesta*) poses a threat to the waters of Arizona. Discovered in the lower Colorado River in 1999, this invasive aquatic plant can overtake waters and diminish water quality through reduction of dissolved oxygen, which can decimate both native and sportfish populations. The actual plant biomass can even reduce the ability of boats to navigate invaded waters. Fortunately, control efforts were started before the plant could become widespread and diligent control is required to keep the constant threat in check.



*Giant Salvinia a fast-growing fern that can form mats 2 feet thick and deprive backwaters and lakes of oxygen.*

There were a total of 23 herbicide applications from June 2015 to October 2015 using 36 Liters (L) of AquaNeat® aquatic herbicide, 36 L of Nufarm® Diquat 2L herbicide, and 6 L of Sylgard® 309 surfactant. Parker staff identified a backwater containing Giant

Salvinia that could be a significant source for the plant. AZFWCO met with partners to address this new source including researching property ownership, treatment regimes, and the feasibility of closing off the backwater to isolate and contain the plant. No other new invasions were discovered, and the plant was found in only small quantities in the lower Colorado River indicating the herbicide treatments appear to be effectively controlling Giant Salvinia.

## **Water Quality/Contaminants Testing**

### *Alamo Lake*

Our office continues to work with the Army Corps of Engineers (ACE) through a contract that provides for monthly water quality collection on Alamo Lake. Parameters including temperature, pH, dissolved oxygen, specific conductance, oxidation-reduction potential, and secchi disk readings were measured monthly. Water samples were collected for subsequent analysis of general chemistry and chlorophyll and pheophytin and detailed chemistry analysis is performed and reported through a separate outside contract with ACE. Alamo Lake water quality data was within normal ranges in 2015.

### *Off-Channel Backwaters*

Due to staff vacancies, off-channel backwaters used for rearing Razorback Sucker and Bonytail were opportunistically monitored for water quality in 2015. These include various ponds located on Cibola National Wildlife Refuge, Emerald Canyon Golf Course (Parker, AZ), Bill Williams River National Wildlife Refuge, and River's Edge Golf Course (Needles, CA). All parameters were within normal ranges necessary to support aquatic life.

## **Partnerships and Accountability**

*Partnerships are essential for effective fisheries conservation. Many agencies, organizations and private individuals are involved in fisheries conservation and management, but no one can do it alone. Together, stakeholders combine efforts and expertise to tackle challenges facing fisheries conservation. The success of these partnerships depends on strong, two-way communication and accountability.*

### **Desert Fish Habitat Partnership**

Our office continues to coordinate the Desert Fish Habitat Partnership (DFHP), which benefits native desert fishes by bringing agencies, organizations, and the public together to work towards the recovery and conservation of these imperiled species and their habitats. The program's primary purpose is to conserve aquatic habitat in the arid west for desert fishes by protecting, restoring, and enhancing these unique habitats in cooperation with other Federal and State agencies, Tribes, conservation groups, local partners, and the public. By partnering across geo-political boundaries, DFHP pursues more effective management strategies than are generally achieved on a local, smaller scale to address fish and habitat issues over a broad geographic area that encompasses the entirety of the Great Basin and Mohave Desert, and those portions of the Sonoran and Chihuahuan Deserts that lie within the United States. The benefits of

aquatic habitat conservation extend beyond desert fishes to include humans and other animal and plant species.

We led the selection process for which projects would be funded for FY 2015 (see below) and ranked project submittals to be considered for funding in FY 2016. The following projects were selected by the Desert Fish Habitat Partnership for funding in FY 2015:

*Black Bob Allotment Water System and Fencing Project:* This project enhances ~ 220 acres of the river channel and riparian zone on the San Francisco River (New Mexico) through the installation of 3.5 miles of cattle exclosure fence on the east side of the San Francisco River and the development of an upland well system. The fence, in addition to 3.5 miles of natural barriers, will restrict cattle grazing and congregation along the river for 7 miles. Three designated water lanes will be constructed, but implementation of a well system would provide alternative water sources for livestock and wildlife, phasing out the need for water lanes. The installation of the fence was completed in 2015 and the well system is scheduled for completion in 2016. The project will reduce siltation, trampling of riparian vegetation, and excessive nutrient/waste input from cattle and will improve habitat quality for native fish and other sensitive riparian species. Post-project monitoring began in fall 2015 and will continue for several years to document changes and improvements in riparian habitat, aquatic habitat, and native fish populations.

*Restoration of the Five Springs complex at Ash Meadows National Wildlife Refuge, Nevada:* This project will restore natural hydrologic connectivity between the Five Springs complex and outflow habitats downstream (Upper Carson Slough) to address direct threats of small population size and genetic isolation of Ash Meadows Amargosa Pupfish. Restoration of natural floods will restore vital ecosystem dynamics currently hindered by a road and fallow field. This restoration will benefit the pupfish, Ash Meadows Speckled Dace (lives downstream), and other biodiversity. The proposed activities are a priority of the Ash Meadows Recovery Implementation Team and Draft Genetic Management Plans for the listed fish. The project's anticipated completion date is December of 2017.

We actively maintained close contact with partners and stakeholders, organized an annual meeting for members, and published a quarterly newsletter describing progress on various program projects that is distributed to not only USFWS staff and partners, but also various other conservation program coordinators, non-governmental organizations and others. The new website for the Desert Fish Habitat Partnership went live at the November 2014 annual meeting: [www.desertfhp.org](http://www.desertfhp.org), and we completed an update to the Partnership's strategic framework (DFHP, 2015).

AZFWCO staff participated in the Desert Fish Habitat Partnership annual meeting in November 2014 in Salt Lake City, Utah. Items discussed at meeting were: FY2015 FWS funding allocations, NFHP performance measures, FY2015 proposal selections, Upper Colorado River habitat assessment, and more.

### **Lower Colorado River Multi-Species Conservation Partnership**

The Lower Colorado River Multi-Species Conservation Program (LCR-MSCP) was created to balance the use of Colorado River water resources with the conservation of native species and their habitats. The program's primary purposes are threefold: to protect the lower Colorado River environment while ensuring the certainty of existing river water and power operations; to address the needs of threatened and endangered wildlife under the Endangered Species Act; and to reduce the likelihood of listing additional species along the lower Colorado River. This 50-year program includes the creation of more than 8,100 acres of riparian, marsh, and backwater habitat for four listed species and 16 other species native to the river. It also includes measures to protect and enhance habitat for an additional two listed and four non-listed species. The implementation activities are based on adaptive management principles, which allow conservation measures to be adjusted over time based on monitoring and research.

In 2015, AZFWCO and LCR-MSCP finalized a new interagency agreement. This agreement included, in part, staffing support for a Senior Fish Biologist with the USFWS at the Parker Office funded by the LCR-MSCP. Through this agreement, work plans will be established for the purpose of developing projects on the lower Colorado River to aid in the conservation of endangered species as well as assist the LCR-MSCP with field activities, management, and decision making.

### **Partners for Fish and Wildlife**

The Partners for Fish and Wildlife (PFW) Program is a longstanding cooperative initiative that has supported many conservation efforts throughout Arizona. In FY 2015 our office initiated and/or completed the following:

- Stamp Spring Livestock Management Project near Springerville, AZ was awarded funding by the Arizona Department of Environmental Quality, Water Quality Improvement Grant Program. Our office, working with AGFD, submitted the application for funding. The project will provide spring protection and improve livestock management on private and state lands.
- Our office completed a Subrecipient Landowner Agreement for the PFW-funded Marijilda Wash Native Fish Project near Safford, AZ. The project will create 7.2 acres of aquatic habitat for Desert Pupfish and Gila Topminnow. The project is a collaborative effort involving a private landowner, Natural Resources Conservation Service (NRCS), AGFD, and others.
- Smooth Knoll Livestock Management Project and the Pierce Wash Livestock Management Project. Both projects will restore historic grassland communities via mechanical removal of juniper while enhancing rangeland conditions by providing livestock waters.
- City of Sedona Wetland Education Project. The City of Sedona Wetland Education Project will involve installation of educational signage at the Sedona Wetland Preserve.
- Nutrioso Creek Riparian Restoration Project. The project will involve planting approximately 8,000 (combined) coyote willow and narrowleaf cottonwood poles

along 0.5 shoreline miles of Nutrioso Creek to benefit Little Colorado Spinedace, New Mexico Meadow Jumping Mouse, and Southwestern Willow Flycatcher.

- Milligan Valley Erosion Control Project. A contractor completed construction of several erosion control structures (e.g., Zuni bowls, one rock dams) throughout the project area. This project will improve watershed conditions by stopping soil erosion, capturing transported sediment in ephemeral washes, and enhancing a wet meadow.



*A Zuni bowl at the Milligan Valley Erosion Control Project.*

- In cooperation with the Apache Natural Resource Conservation District and the Natural Resources Conservation Service, AZFWCO PFW hosted the Apache County Watershed Restoration Workshop. Eleven landowners from eastern Arizona attended the free event. Watershed Artisans, Inc. presented information about range management, types of erosion, restoration considerations, treatments and strategies, and construction of erosion control structures. As part of the workshop, the group also visited the PFW-funded Milligan Valley Erosion Control Project.



*Apache County Watershed Restoration Workshop*

- Battle Tank Grassland Restoration Project. The project's objectives are to restore 400 acres of historic grassland communities, improve rangeland conditions, and increase suitable habitat for Swainson's Hawk, Ferruginous Hawk, Burrowing Owl, other avian species, and resident wildlife.

### **Lake Havasu Fisheries Improvement Partnership**

In FY2014, we worked with The Lake Havasu Fisheries Improvement Partnership to draft a new Memorandum of Understanding (MOU) covering the next 10 years. In 2015, this MOU was finalized and signed by all partner organizations. The goal of the partnership is to collectively manage fish, fish habitat, and angler access facilities of Lake Havasu; to support the economic, environmental, and social benefits of these resources for the public. In 2015, the Partnership focused on maintaining previous investments such as fishing docks that are now showing signs of normal aging. Partners include Bureau of Land Management, the Bureau of Reclamation, USFWS, the US Geological Survey; Arizona Game and Fish Department, Arizona State Parks; California Department of Fish and Wildlife; and Anglers United, Inc.

### **Grand Canyon Long Term Experimental Plan EIS**

We have been participating in the Long Term Experimental Management Plan Environmental Impact Statement (LTEMP EIS) as a cooperating agency and have been active in the development of alternatives and modeling for biological resources through attendance at webinars and providing comments to the joint lead agencies. LTEMP EIS will guide experimentation and management of Glen Canyon Dam and Grand Canyon resources for the next 20 years. AZFWCO led an interagency team of biologists from National Park Service (NPS), USGS, U.S. Bureau of Reclamation (USBR), and AGFD to assess and modify the existing Grand Canyon Adaptive Management Program nonnative trout removal triggers and responses. The review was precipitated by the LTEMP EIS process. A two tier approach was developed that emphasizes Humpback

Chub conservation actions to address population declines caused by a lack of recruitment. If conservation actions do not stop a population decline, trout removal will be triggered as a secondary tiered action. It is thought that the revised triggers will reduce the likelihood of trout removals, a costly and still unproven measure that greatly concerns Native American tribes associated with Grand Canyon. The revised triggers and supporting documentation were submitted to USBR and NPS as the Department of Interior leads for the LTEMP EIS.

### **We Get by with a LOT of Help from Our Friends**

So much of the work we do would not be possible without the partners and friends who help us in so many ways. To offer an idea of how far our network extends, Appendix F includes a list of the partners we have worked with recently.

### **Cooperation with Native Americans**

*Conserving the nation's fish and other aquatic resources cannot be successful without the partnership of tribes; they manage or influence some of the most important aquatic habitats both on and off reservations. In addition, the Fish and Wildlife Service has distinct, unique obligations toward tribes based on trust responsibility, treaty provisions, and statutory mandates. The Fisheries Program plays an important role in providing help and support to tribes as they exercise their sovereignty in the management of their fish and wildlife resources on more than 55 million acres of Federal Indian trust land and in treaty reserved areas.*

### **Trout Production, Stocking and Conservation**

In any given year in Arizona, State and Federal hatcheries produce approximately 4.9 million trout, and anglers spend an estimated \$831.5 million. A portion of this total, through permits to fish on Tribal lands, represents a significant source of income for Tribes in the State. Limited in budget and staff, the Tribes benefit from the help of partners in managing their fisheries resources, including the four million sportfish annually stocked through coordination by our office in conjunction with the National Fish Hatchery System. We also assist tribes with development of sportfishing opportunities, technical assistance such as creel surveys, provide management recommendations, and offer advice on law enforcement issues related to sportfish management.

### **White Mountain Apache**

With more than 800 miles of streams and 2,300 acres of lakes, the Fort Apache Indian Reservation features more than one third of the cold-water fishery resources in the State of Arizona. These waters provide an important economic resource for the White Mountain Apache Tribe via the sale of fishing permits. Our office routinely provides technical assistance to White Mountain Apache Tribe to aid in managing their fishery resources.

We enjoy a close working relationship with the White Mountain Apache Tribe's Wildlife and Outdoor Recreation Division, meeting with them and the Alchesay-Williams Creek National Fish Hatchery on a monthly basis to discuss fishery coordination issues. With

help from the Alchesay-Williams Creek National Fish Hatchery, we assisted the Tribe with stocking 17,000 channel catfish from Inks Dam National Fish Hatchery into 15 lakes and tanks on the Reservation in August.

### **San Carlos Apache**

The San Carlos Apache Tribe hosts a variety of recreational fishing opportunities that represent an important source of economic revenue for them. Last year, we worked with the Tribe to conduct annual spring sportfish surveys on San Carlos Reservoir and Talkalai Lake (Seneca Lake was unable to be sampled due to low water levels). Sportfish populations remain healthy in Talkalai Lake. Largemouth bass averaged nearly 18 inches in Talkalai. Talkalai also has a healthy catfish population; Flathead Catfish averaged over 19 inches.

In 2014 we conducted a spot-check survey on San Carlos Lake to determine if any sportfish survived the fish kill due to low water in the summer of 2012. At that time, we collected only Common Carp (*Cyprinus carpio*) in San Carlos Lake. In 2015, we collected 11 fish species (Common Carp, Flathead Catfish *Pylodictis olivaris*, Bluegill *Lepomis macrochirus*, Green Sunfish *Lepomis cyanellus*, Goldfish *Carassius auratus*, Channel Catfish *Ictalurus punctatus*, Black Crappie *Pomoxis nigromaculatus*, Redear Sunfish *Lepomis microlophus*, Largemouth Bass *Micropterus salmoides*, Yellow Bullhead *Ameiurus natalis*, and Gizzard Shad *Dorosoma cepedianum*) indicating the sport fishery is beginning to recover.



*Daniel Vann , San Carlos Apache Tribe game ranger, holds a largemouth bass from Talkalai Lake on the San Carlos Apache Indian Reservation.*



*A Black Crappie collected from San Carlos Lake on the San Carlos Apache Indian Reservation.*

### **Navajo Nation**

We assisted the Navajo Nation Department of Fish and Wildlife staff with an annual lake survey of Wheatfields Lake. Wheatfields Lake is managed as a “quality” put-and-take/put-grow-take trout fishery. Trout are usually stocked in the spring at around 7-8 inches. The crew collected 183 Rainbow Trout, averaging almost 12.0 inches, indicating good summer growth. This was the highest number of Rainbow Trout collected in recent years.



*Ferlin Begay , Navajo Nation Department of Fish and Wildlife, with a Rainbow Trout from Wheatfields Lake on the Navajo Nation.*

We also assisted the Navajo Nation Department of Fish and Wildlife and New Mexico Fish and Wildlife Conservation Office with Brown Trout removal in Whiskey Creek. The removal of Brown Trout is expected to benefit native Bluehead Sucker and Speckled Dace.



*Jennifer Johnson holds a Bluehead Sucker from Whiskey Creek on the Navajo Nation.*

### **Kaibab Band of Paiute Indians**

We delivered approximately 200 Rainbow Trout to the Kaibab Paiute Indian Tribe for their annual youth fishing clinic in May.

### **Hopi Tribe**

AZFWCO entered into a Cooperative Agreement with the Hopi Tribe to assist with a project at Pasture Canyon Lake near Tuba City, AZ. The dam is being repaired on the lake which will allow for the opportunity to remove undesirable Goldfish (*Carassius auratus*) and Green Sunfish (*Lepomis cyanellus*) from the lake. Work will be initiated in FY2016.

### **Colorado River Indian Tribes**

We continue to communicate with the Colorado River Indian Tribes (CRIT) over opportunities to assist in managing waters that contain important habitat for native fish in the lower Colorado River ecosystem. Although no native fish stockings were conducted on CRIT land in FY 2015, the tribes continue to allow stocking of endangered fish, and stockings will continue within reservation boundaries as part of MSCP funded projects.

## **Public Use and Outreach**

*As the population in the United States continues to grow, the potential for adverse impacts on aquatic resources, including habitat will increase. At the same time, demands for responsible, quality recreational fishing experiences will also increase. The Service has a long tradition of providing opportunities for public enjoyment of aquatic resources through recreational fishing, habitat restoration, education programs, and through mitigating impacts of Federal water projects.*

### **Outreach: In Class, On Screen, In Print, and Outdoors**

For people to be willing to support the conservation goals of the Service, it requires that they become informed of our mission and how they can be a part of it. That's why outreach is a high priority for this office.

### **In Class and Other Outreach**

We participated in the Blue Ridge Junior High School Career Day, giving presentations to students on careers in natural resources with an emphasis on fish biology and the U.S. Fish and Wildlife Service.

Our 2014-2015 "Trout in the Classroom" project was a success that involved two classrooms and more than 150 students. Trout in the Classroom is an environmental education program in which students raise trout, monitor tank water quality, engage in stream habitat studies, learn to understand ecosystems, learn to appreciate water resources, and begin to foster a conservation ethic. Through classroom experience of raising trout and coordinated activities, students experience first-hand the value of aquatic environments, the balance that must be met to maintain and preserve Arizona's fisheries and aquatic habitats, and how their personal actions affect these valuable resources. In May, students said goodbye to their Apache Trout before their summer breaks and participated in an art contest.



*Apache Trout in the Trout in the Classroom program.*

Staff gave several additional fisheries and career presentations to high school classes and community groups throughout the year.

We spent a morning with the summer school biology class from Alchesay High School. Students toured the Williams Creek National Fish Hatchery (NFH). After the hatchery tour the students received hands-on experience with electrofishing and discussed future career options with the Service. Staff spent a morning with 20 youth from the Apache Behavioral Health Youth Wellness Program at Williams Creek NFH. The group learned about Apache Trout and hatchery operations. The highlight for the youth was getting to feed the large Rainbow Trout in the settling pond.

### **On Screen & In Print**

Since 2010, our office has been maintaining a Facebook page where we post information on our staff, upcoming projects, educational events, and volunteer opportunities across the state. We have more than 760 fans from 45 countries. Check us out at [www.facebook.com/AZFWCO](http://www.facebook.com/AZFWCO)

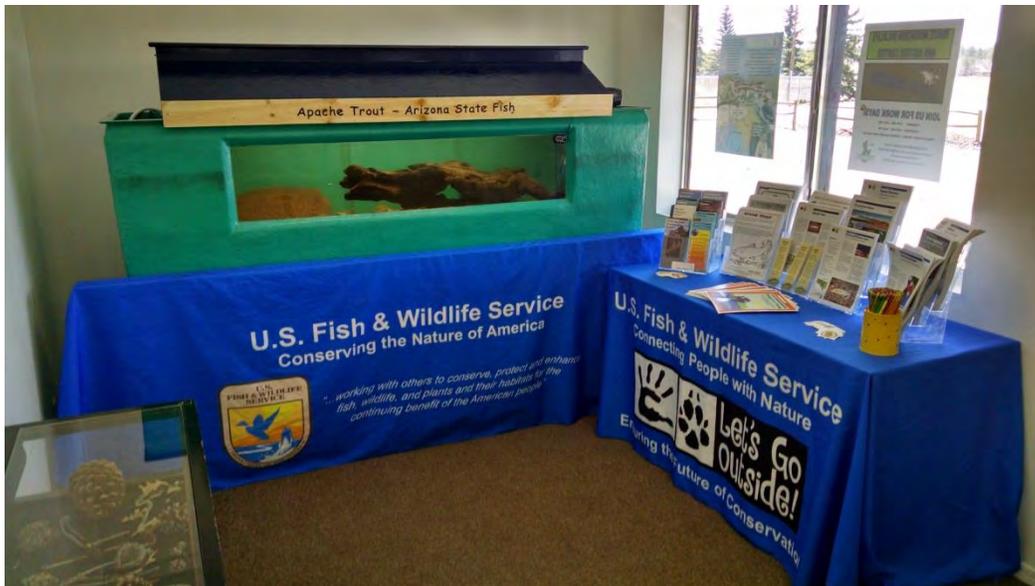
Our Desert Fish Habitat Partnership Coordinator developed and continues to manage a Facebook page for the program, where information on projects, requests for proposals, pictures and more are posted: <https://www.facebook.com/pages/Desert-Fish-Habitat-Partnership/193053497376208>

The Desert Fish Habitat Partnership website went live in FY 2015 and houses all of the information about the Partnership: [www.desertfhp.org](http://www.desertfhp.org)

### **Outdoors**

We participated in the 10th Annual "Woodland Wildlife Festival" in Pinetop, where the highlight of our display was the "Living Stream" that featured live Apache Trout. Youth learned what it was like to be a fish biologist by participating in a hands-on activity where they identified, measured, weighed, and tagged fish.

We setup our "Living Stream" with Apache Trout at the White Mountain Nature Center. At the end of the school year, Apache Trout from our Trout in the Classroom project are moved to the display tank. This partnership allows AZFWCO to share the USFWS mission with thousands of people. Our display includes information on Apache Trout, conserving nature and fisheries, careers, volunteer opportunities, and activities for youth.



*The 10th Annual "Woodland Wildlife Festival" in Pinetop, Arizona.*

We assisted AGFD and Youth Outdoors Unlimited, Inc., with the 4th Annual Post Wallow Fire Turkey Sciences Field Workshop and Hunting Camp. Junior hunters and others visiting the camp learned about turkey calling and hunting, archery, trapping techniques, wildlife conservation, and other outdoor interests. Ninety-six junior hunters and approximately 30 youth (non-hunters) attended the free event. Twenty-four junior hunters harvested a turkey. Three of the junior hunters that Dominic Barrett guided are photographed below after their hunt.



*Three successful junior hunters guided by FWS Dominic Barrett.*

AZFWCO coordinated involvement of 18 volunteers in four Little Colorado River and one mainstem Colorado River Humpback Chub survey trips. The typical outreach or education efforts rarely afford more than an hour of discussion and observation to inform and involve the public. Through our Grand Canyon activities, the 18 volunteers were provided rare in depth interactions with the Service and hands-on native fish

conservation actions in the Grand Canyon. There is little doubt that each of these volunteers has a greater appreciation for the wildlife resource and the Service, and will be future long standing advocates of both in their private and professional lives.



*Volunteers processing fish in the Little Colorado River.*

## **Leadership in Science and Technology**

*Science and technology form the foundation of successful fish and aquatic resource conservation and are used to structure and implement monitoring and evaluation programs that are critical to determine the success of management actions. The Service is committed to following established principles of sound science.*

## **Projects, Publications and Presentations**

Members of this office are respected leaders in various areas of natural resource management expertise. At any given time, we are actively involved in many cutting-edge research projects. In 2015, we were involved in various efforts including Long Term Experimental Management Plan Environmental Impact Statement; conducting and publishing on a series of experiments to evaluate mortality, tag retention and growth associated with tagging small Humpback Chub with currently used PIT tags (Ward et al. 2015), a new small version of PIT tag, and Visible Implant Elastomer tags; assessing new technology submersible portable PIT tag antennas; and drafting a Chute Falls Humpback Chub translocation manuscript.

## **A Laboratory Evaluation of Tagging-Related Mortality and Tag Loss in Juvenile Humpback Chub**

Working with staff from USGS and SNARRC, AZFWCO led an experiment to determine the smallest size that a Humpback Chub can be effectively PIT tagged. The experiment involved three treatments (8mm PIT tag; 12mm PIT tag; VIE tag) and a control applied across four size classes of fish (40-80mm TL). Mortality, tag shed, and growth were examined and compared across size groups. The tagging work will guide best management practices for future work with Humpback Chub and was published in the North American Journal of Fisheries Management in 2015.



*Humpback chub tagging experiment at SNARRC.*

### Submersible Portable PIT Tag Antennas

In 2015 we expanded our 2014 pilot project using submersible portable PIT tag antennas for Humpback Chub investigations in Grand Canyon. The antennas were built by Marsh and Associates and use rechargeable Li-ion batteries that yield up to 10 days of battery life. In 2015, seven submersible PIT tag antennas were deployed to assess if they interfere with fish catch rates in our standard hoop net survey and further assess their performance and value to our surveys. Baited submersible antennas were randomly paired (within 1 m) with baited hoop nets and Humpback Chub capture was compared for paired and unpaired nets. No differences in catch rates of Humpback Chub were observed (Figure 7).

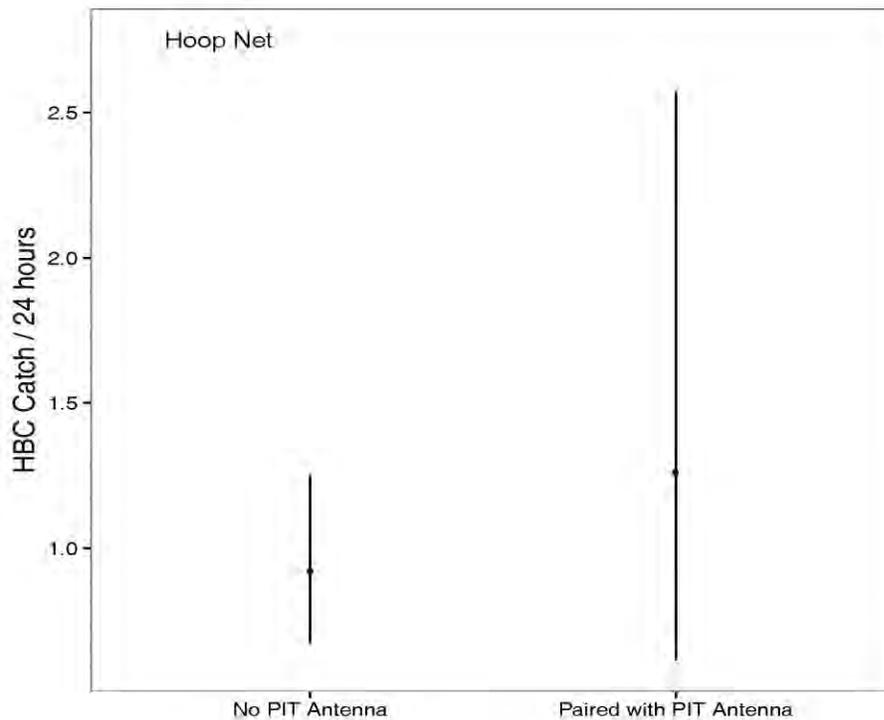
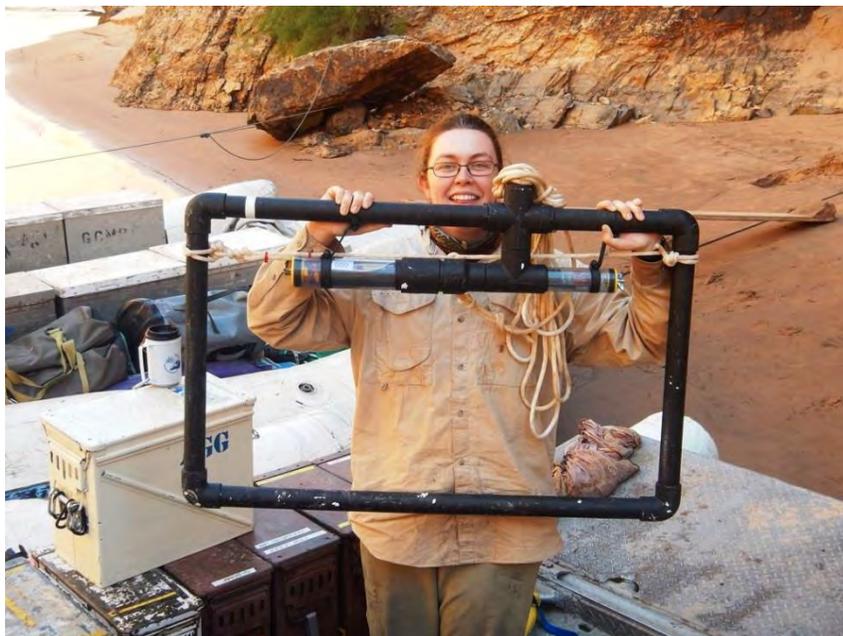


Figure 7. Comparison of Humpback Chub catch rate from hoop nets with and without antenna pairing.

Submersible PIT antennas accounted for nearly 60% of unique Humpback Chub and 43% of unique Flannelmouth Sucker recaptures. In addition, antennas provided all of the trout recaptures (n=11) during the September 2015 study (Table 1). Only 6% of fish were detected with both antennas and hoop net captures, indicating antennas are a valuable non-redundant method. Submersible antennas provide significantly increased recapture detections and do not confound long term baseline data generated from hoop nets. We plan to continue use of the antennas into the future.

Fish Captures & Detections							
Species	Antenna Only		Hoop net Only		Both		Total
	n	% total	n	% total	n	% total	
Brown Trout	2	100.0	0	0.00	0	0.0	2
Carp	2	66.7	1	33.3	0	0.0	3
Flannelmouth	219	42.5	255	49.5	41	8.0	515
Flannel/Razorback hybrid	0	0.0	1	100.0	0	0.0	1
Humpback	274	57.9	173	36.6	26	5.5	473
Rainbow Trout	9	100.0	0	0.0	0	0.0	9
Unknown	42	100.0	0	0.0	0	0.0	42
Total	548	52.4	430	41.1	67	6.4	1045

Table 1. September 2015 unique fish recaptures, Humpback Chub aggregation study, Colorado River, Grand Canyon.



Submersible PIT tag antenna deployed during September 2015 Humpback Chub aggregation study.

Additionally, we routinely avail ourselves to both resource managers and the public in order to share scientific findings, train others in management techniques, and educate the public on important conservation issues. Last year staff offered presentations at professional meetings, schools, and non-governmental group functions (Appendix D), and we produced scientific reports, non-technical reports, and stories in the media (Appendix E).

## **Workforce Management**

*The Fisheries Program relies on a broad range of professionals to accomplish its mission: biologists, managers, administrators, clerks, animal caretakers, and maintenance workers. Without their skills and dedication, the Fisheries Program cannot succeed. Employees must be trained, equipped, and supported in order to perform their jobs safely, often under demanding environmental conditions, and to keep current with the constantly expanding science of fish and aquatic resource management and conservation.*

The Parker and Whiteriver Offices experienced staff shortages with only one biologist on staff for most of 2015 in Parker, and two in Whiteriver for half of 2015. The term GS-5 Fish Biologist position in Parker was vacated in February 2014 and filled in August 2015 (vacant 90% of the reporting FY). Similarly, the permanent GS-9 Fish Biologist position in Parker was vacated in February 2015, converted to a term GS-11 Fish Biologist, and filled November 2015 (vacant 60% of the reporting FY). The permanent GS-9 Fish & Wildlife Biologist (Partners for Fish & Wildlife Program) and term GS-7 Desert Fish Habitat Partnership Coordinator positions in Whiteriver were vacated in May 2015 and not filled until FY 2016. In Addition, our Administrative Officer position was vacated in October 2014 and filled in February 2015. Correspondingly, accomplishments from the field office were reduced. Now fully staffed, we look forward to a return to strong conservation accomplishments in FY 2016.

AZFWCO said farewell to Dominic Barrett and Kayla Barrett at the end of May. Dominic accepted a position in Region 6 as the Deputy Regional Coordinator of the Partners for Fish and Wildlife Program. The Barrett family relocated to Denver, CO, and Dominic started his new position in early June.

## **Awards**

Jeremy Voeltz and Jennifer Johnson were the recipients of the Gila Trout Award presented by the Arizona Game and Fish Department and the Arizona Council of Trout Unlimited at the 6th Annual Native and Wild Trout Conference. The Gila Trout Award is awarded to an individual(s) for their work on conservation of native and wild trout.

Jeremy Voeltz and Jennifer Johnson (USFWS) have dedicated 17 years of their careers to the management and recovery of Apache trout. Jeremy's leadership has helped to secure long-term funding and Jennifer has worked with a cadre of seasonal hires to implement many recovery projects, including mechanical brown trout removal from several recovery populations on the Fort Apache Indian Reservation. One highlight is

Crooked Creek (one of the 14 remaining natural Apache trout populations) where their efforts have resulted in more than a 600% increase in Apache trout. Now after 8 years of intensive efforts, the effort appears to have resulted in the complete elimination of the nonnative predator. Jennifer and Jeremy were also instrumental in constructing a fish barrier in lower Bear Wallow Creek on San Carlos Apache Tribal lands. The Bear Wallow barrier will extend trout habitat by about 2 miles and has provided an opportunity for the San Carlos Apache Tribe to become a partner in the Apache trout recovery program. Jeremy and Jennifer have developed immense trust with our tribal partners and have translated this trust into tangible conservation gains for the Apache trout and other species. These are just a few examples of Jeremy and Jennifer's contributions working with many partners. Congratulations to the two of you and we appreciate your leadership and commitment towards the conservation of Apache trout.



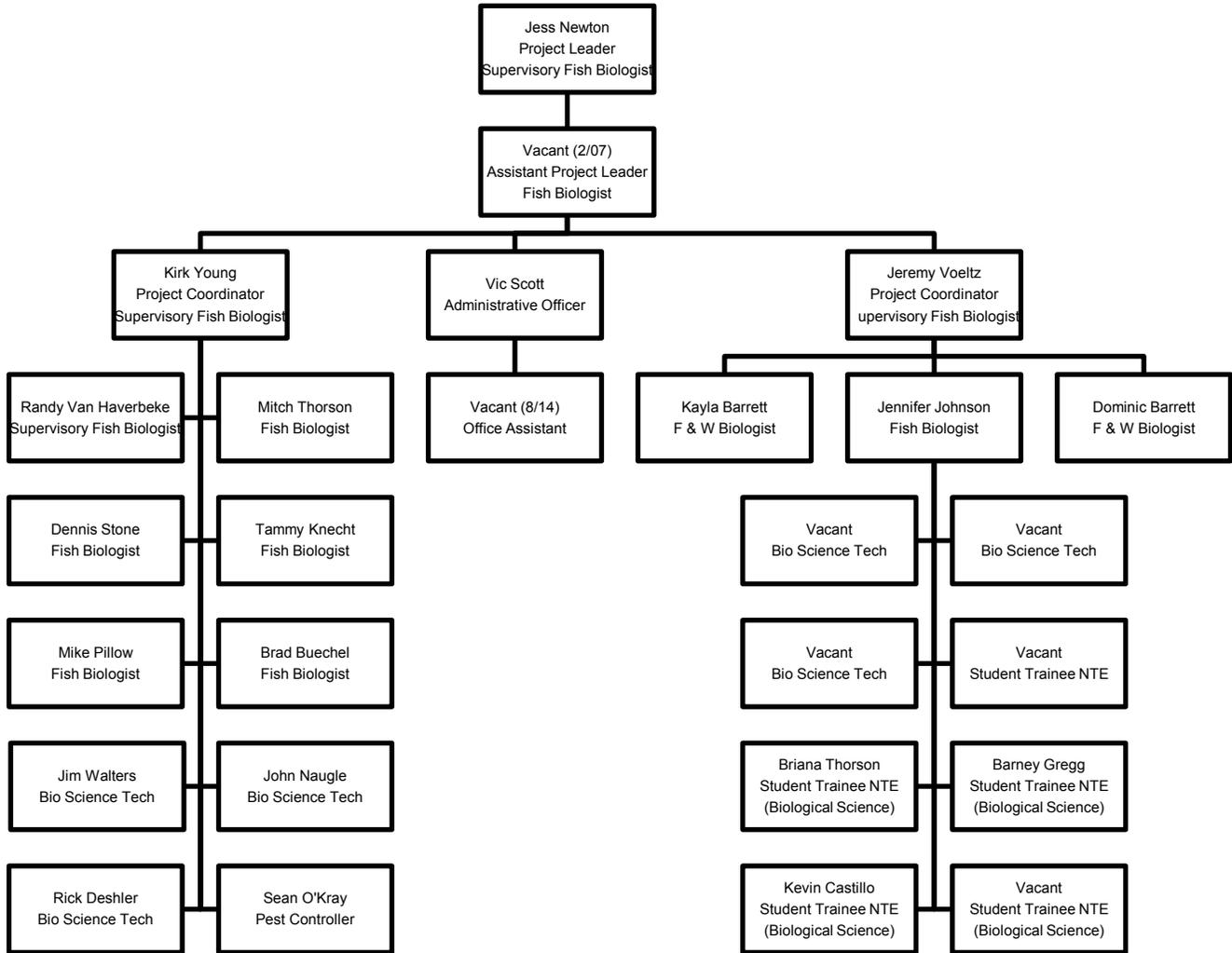
*Jeremy Voeltz and Jennifer Johnson, recipients of the 2015 Gila Trout Award.*

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# Appendix A. AZFWCO Organization Chart for FY2015



## Appendix B. AZFWCO Budget

**Fiscal Year 2015 Budget: Total ..... \$1,728,042**

Reimbursables ..... \$749,490  
Partners for Fish & Wildlife ..... \$246,372  
Fisheries ..... \$732,180

**Fiscal Year 2014 Budget: Total ..... \$1,728,952**

Reimbursables ..... \$705,187  
Partners for Fish & Wildlife ..... \$244,766  
Fisheries ..... \$778,999

**Fiscal Year 2013 Budget: Total ..... \$1,678,532**

Reimbursables ..... \$895,638  
Partners for Fish & Wildlife ..... \$238,894  
Fisheries ..... \$544,000

**Fiscal Year 2012 Budget: Total ..... \$1,888,204**

Reimbursables ..... \$905,117  
Partners for Fish & Wildlife ..... \$247,654  
Fisheries ..... \$735,433

**Fiscal Year 2011 Budget: Total ..... \$1,825,008**

Reimbursables ..... \$833,789  
Partners for Fish & Wildlife ..... \$220,411  
Fisheries ..... \$770,808

**Fiscal Year 2010 Budget: Total ..... \$1,721,950**

Reimbursables ..... \$624,685  
Partners for Fish & Wildlife ..... \$224,324  
Fisheries ..... \$872,941

**Fiscal Year 2009 Budget: Total ..... \$1,713,565**

Reimbursables ..... \$777,390  
Partners for Fish & Wildlife ..... \$169,012  
Fisheries ..... \$767,163

**Fiscal Year 2008 Budget: Total ..... \$1,498,484**

Reimbursables ..... \$607,190  
Partners for Fish & Wildlife ..... \$220,044  
Fisheries ..... \$671,250

## Appendix C. AZFWCO Fisheries Operations Needs (FONS)

### Project Title and 1<sup>st</sup> Year Cost

#### **Fish & Habitat Management (in order of priority)**

Willow Beach Rainbow Trout Stocking Evaluation – Below Davis Dam .....	\$74,000
Relationship between fish presence and hydrograph components in Arizona streams .....	\$26,000
Lower Colorado River Backwater & Off-Channel Habitat Fish Passage Restoration (NFPP).....	\$62,000
Fish Barrier Removal on Stinky Creek (NFPP) .....	\$15,000
Fish Barrier Removal on Hayground Creek (NFPP) .....	\$15,000
Fish Barrier Removal on lower Home Creek (NFPP) .....	\$15,000
Fish Barrier Removal on Upper Home Creek (NFPP).....	\$15,000
Sharp Spring Gila Topminnow and Gila Chub Restoration .....	\$80,000
Desert Fish Habitat Partnership: National Wildlife Refuges Desert Pupfish Pond .....	\$6,500
Management of Backwater Habitats on the Lower Colorado River .....	\$100,000
Aquatic Nuisance Species Prevention and Control in Arizona .....	\$75,000
National Fish Hatchery Stocking Evaluations on Tribal Lands in AZ.....	\$100,000
Colorado Cutthroat Trout Restoration in the Navajo Nation .....	\$75,000
Is Climate Change Affecting Small-Stream Desert Native Fishes? .....	\$100,000
Improvement of Flow Conditions for Razorback Sucker in Three Fingers Lake .....	\$80,000

#### **Education and Outreach (in order of priority)**

Trout in the Classroom - Connecting Kids with Nature .....	\$10,000
Desert Fish Habitat Partnership: Outreach Needs .....	\$3,000
Youth Fishing Derbies - Connecting Kids with Nature .....	\$15,000
Conduct Tribal Fishery Training Workshops .....	\$75,000
Native Fish Showcase - Connecting Children with Nature .....	\$150,000

## **Appendix D. Presentations**

*The following is a list of presentations given by AZFWCO personnel in FY 2015:*

VanHaverbeke, D.R. Young, K.L. 2015. Chute Falls Humpback Chub Translocations and LCR Population Evaluation Updates. Glen Canyon Technical Workgroup Annual Meeting.

Voeltz, J.B. and J.L. Johnson 2015. Evaluation of Long-Term Mechanical Removal of Brown Trout from Apache Trout Recovery Streams (2003-2014). Annual Meeting of the Arizona-New Mexico Chapter of the American Fisheries Society, Las Cruces, NM.

Voeltz, J.B. and J.L. Johnson 2015. Evaluation of Long-Term Mechanical Removal of Brown Trout from Apache Trout Recovery Streams (2003-2014). 6<sup>th</sup> Annual Meeting of the Native and Wild Trout Workshop hosted by the Arizona Council of Trout Unlimited, Phoenix, AZ.

Voeltz, J.B. and J.L. Johnson 2015. Evaluation of Long-Term Mechanical Removal of Brown Trout from Apache Trout Recovery Streams (2003-2014). Annual Meeting of the American Fisheries Society, Portland, OR.

Young, K.L. 2015. Humpback Chub Translocations and LCR Population. Glen Canyon Technical Workgroup Annual Meeting.

Young, K.L. 2015. Management Implications of Aquatic Ecology and Native and Nonnative Fish Monitoring and Research in Glen Canyon. Technical Workgroup Annual Meeting.

Young, K.L., D.R. VanHaverbeke, D.M. Stone, M.J. Pillow. 2015 Humpback chub in the Little Colorado River: Status and Trends. Glen Canyon Technical Workgroup Annual Meeting, Poster Presentation.

## Appendix E. Publications

*The following is a list of publications, reports, and stories published in FY 2015 by AZFWCO personnel. Copies of these publications can be obtained by contacting:*

Arizona Fish & Wildlife Conservation Office  
2500 S Pine Knoll Drive  
Flagstaff, AZ 86001  
928-556-2140

- Dzul, M.C., C.B. Yackulic, D.M. Stone, and D.R. Van Haverbeke. 2014. Survival, growth, and movement of subadult humpback chub, *Gila cypha*, in the Little Colorado River, Grand Canyon, AZ. River Research and Applications (wileyonlinelibrary.com) DOI: 10.1002/rra.2864
- Johnson, J.L. 2015a. Brown Trout Removal from Apache Trout Streams on the Fort Apache Indian Reservation 2013 Summary Report. USFWS-AZFWCO-PT-15-001.
- Johnson, J.L. 2015b. Apache Trout Stream Barrier Evaluations on the Fort Apache Indian Reservation 2008-2013 Summary Report. USFWS-AZFWCO-PT-15-002.
- Pillow, M.J. 2015. Spring 2015 monitoring of humpback chub (*Gila cypha*) and other fishes in the lower 13.57 km of the Little Colorado River, Arizona: Trip Report 14-24 April and 19-29 May 2015. Prepared for Grand Canyon Monitoring and Research Center, Flagstaff, AZ. U.S. Fish and Wildlife Service. Document No. USFWS-AZFWCO-FL-15-04. 9 pp.
- Stone, D.M. 2015. Spring 2015 monitoring of humpback chub (*Gila cypha*) and other fishes above Lower Atomizer Falls in the Little Colorado River, Arizona. Trip Report 19-26 May 2015. Prepared for Grand Canyon Monitoring and Research Center, Flagstaff, AZ. U.S. Fish and Wildlife Service, Flagstaff, AZ. Document No. USFWS-AZFWCO-FL-15-03. 12 pp.
- Ward D.L., W.R. Persons, K.L. Young, D.M. Stone, D.R. Van Haverbeke and W.K. Knight. 2015. A Laboratory Evaluation of Tagging-Related Mortality and Tag Loss in Juvenile Humpback Chub, N. Am. J. of Fisheries Management, 35:1, 135-140, DOI: [10.1080/02755947.2014.986345](https://doi.org/10.1080/02755947.2014.986345)
- Van Haverbeke, D.R., K. Young, D.M. Stone, and M.J. Pillow. 2016. Mark-Recapture and Fish Monitoring Activities in the Little Colorado River in Grand Canyon from 2000 to 2015. Submitted to USGS Grand Canyon Monitoring and Research Center, Flagstaff, Arizona. U.S. Fish and Wildlife Service, Flagstaff, Arizona. 46 pp.

## **Appendix F. AZFWCO Partners**

*Below is a list of Partners that the Arizona Fish & Wildlife Conservation Office is actively working with.*

### **State Agencies**

- Arizona Game & Fish Department
- Arizona State Parks

### **Tribes**

- White Mountain Apache Tribe
- San Carlos Apache Tribe
- Colorado River Indian Tribes
- Navajo Nation
- Hopi Tribe
- Hualapai Tribe
- Kaibab-Paiute Tribe
- Havasupai Tribe
- Fort Mojave Tribe
- Chemehuevi Tribe
- Fort Yuma

### **Federal Agencies**

- U.S. Forest Service
- U.S. Bureau of Reclamation
- National Park Service
- U.S. Geological Survey
- Bureau of Land Management
- Grand Canyon Monitoring & Research Center

### **Non-Governmental Organizations**

- Trout Unlimited
- Federation of Fly Fishers
- University of Arizona
- Arizona State University
- Northern Arizona University
- Anglers United

### **U.S. Fish & Wildlife Service Field Stations**

- Alchesay National Fish Hatchery
- Willow Beach National Fish Hatchery
- Inks Dam National Fish Hatchery
- Uvalde National Fish Hatchery
- Mora National Fish Hatchery
- Southwestern Native Aquatic Resources & Recovery Center
- New Mexico Fish & Wildlife Conservation Office
- Arizona Ecological Services Field Office
- Bill Williams River National Wildlife Refuge
- San Bernardino National Wildlife Refuge
- Havasu National Wildlife Refuge
- Cibola National Wildlife Refuge
- Imperial National Wildlife Refuge

# Arizona Fish & Wildlife Conservation Office

## Our Mission:

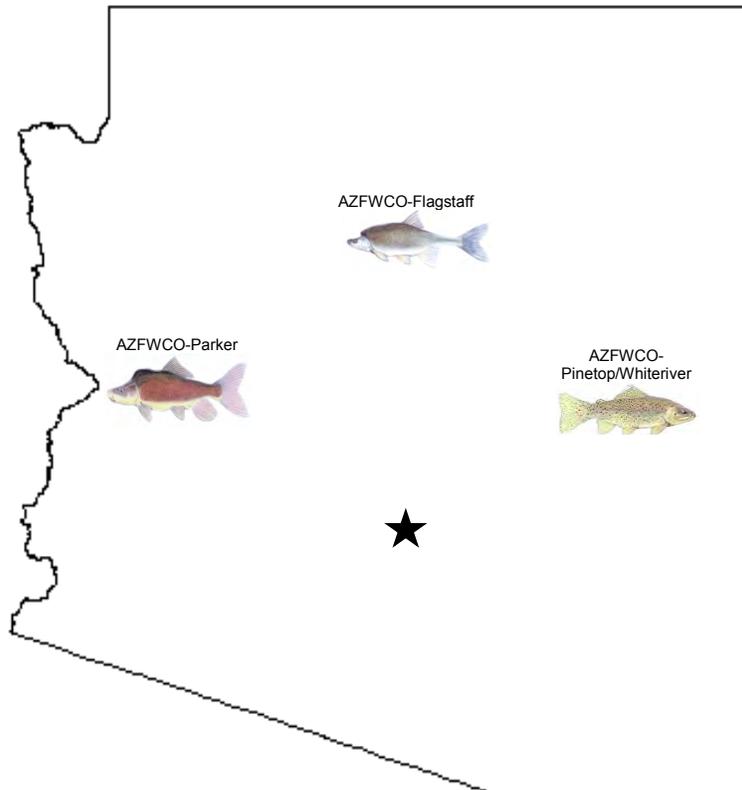
*“Working with others to conserve, protect, and enhance fish and other aquatic organisms and their habitats in Arizona and the Southwest”*

**For additional information regarding the Arizona Fish and Wildlife Conservation Office or any of the accomplishments highlighted within this report, please feel free to contact us at one of our three Arizona locations:**

AZFWCO-Pinetop/Whiteriver  
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AZFWCO-Flagstaff  
2500 S Pine Knoll Drive  
Flagstaff, AZ 86001  
928-556-2140

AZFWCO-Parker  
60911 Highway 95  
Parker, AZ 85344  
928-667-4785



**Flagstaff Office**

928-556-2016

Jess Newton

Kirk Young

Randy Van Haverbeke

Dennis Stone

Mike Pillow

Vic Scott

Jim Walters

Rick Deshler

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Dominic Barrett

Jennifer Johnson

Kayla Barrett

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Mitch Thorson

Tammy Knecht

Brad Buechel

John Naugle

Sean O'Kray

