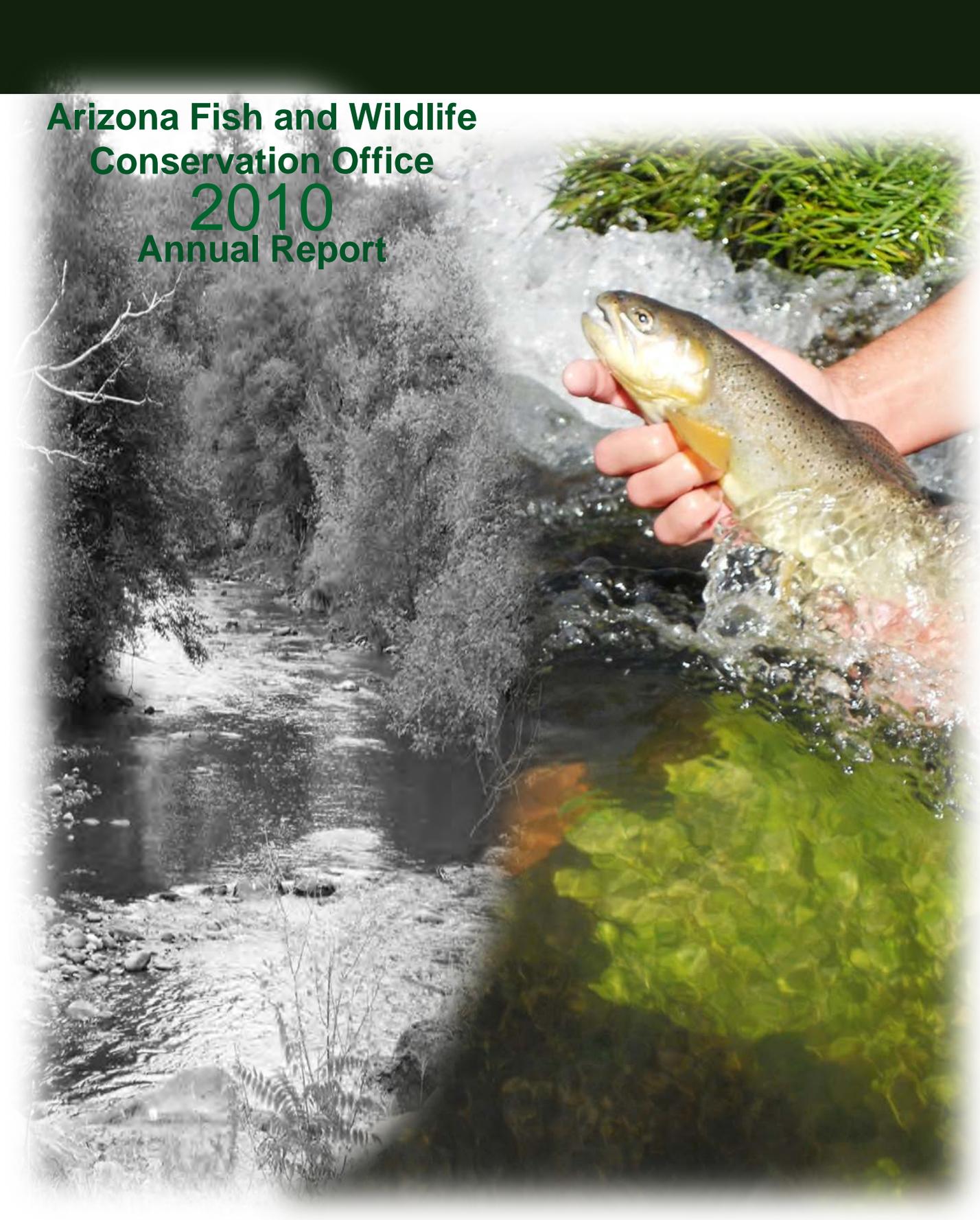


Arizona Fish and Wildlife
Conservation Office
2010
Annual Report



Celebrating Our 6th Decade

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

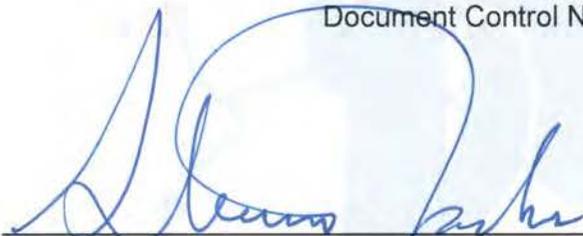
FY2010 Annual Report

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2010 ANNUAL REPORT
Arizona Fish & Wildlife Conservation Office
U.S. Fish & Wildlife Service

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INTRODUCTION

“Plans to protect air and water, wilderness and wildlife are in fact plans to protect man.”

-Stewart Udall, 1920 – 2010

From its labyrinthine river canyons that meander in the north through one of the world's greatest natural phenomena to its signature saguaro-studded expanses in the south to its rugged, ponderosa pine-covered mountains in the east, Arizona boasts some of most incredible natural and geographical diversity on the continent. Add to this an appealing year-round climate and some dynamic metropolitan centers and it's easy to see how Arizona has become one of the fastest growing states in the country since becoming a state in 1912 (U.S. Census Bureau 2010).



The Little Colorado River in the Grand Canyon.

Today, however, as we approach the state's centennial, the impact of competing interests on ever-dwindling resources is more evident than ever before. The importance of conserving the state's natural heritage has become not only a crucial part of preserving the past, but also an urgent appeal for a more secure future. Indeed, the declining status of so many desert fishes highlights the importance of preserving aquatic habitats so that water is available not only for fish, but also for future generations of humans. To this end, we are excited and encouraged to be part of the new Desert Fish Habitat Partnership (page 11), a comprehensive, multi-agency approach to addressing conservation needs that will likely play an important role in safeguarding water in the West for future generations.

Former Secretary of the Interior and Arizona Congressman and resident Stewart Udall understood the inextricable link between the fate of nature and the fate of our own species – and dedicated his life's work to fostering a greater respect for it. By working toward a better future for our natural resources and, therefore, a better future for our children, we at the Arizona Fish and Wildlife Conservation Office are proud to honor this legacy.

Who We Are and What We Do

The Arizona Fish and Wildlife Conservation Office is part of the U.S. Fish & Wildlife Service's Southwest Region, which encompasses Arizona, New Mexico, Texas, and Oklahoma. We are one of 64 offices located across the country. Along with 70 National Fish Hatcheries, nine Fish Health Centers, and seven Fish Technology Centers, these stations make up the Service's Fisheries Program.

Our office is staffed with professionals (Appendix A) that possess expertise in a wide variety of specialties. Individually, we are many parts: biologists, ecologists, ichthyologists, sport fish managers, outreach specialists, cartographers, grant writers, teachers, and budget and finance professionals. Collectively, we are the sum of these parts, a group of professionals who share the goal of conserving, protecting and enhancing fish and other aquatic organisms and their habitats in Arizona.



Apache trout crew members ready to work.

Indeed, the conservation of native fish species and their habitat is a top priority for this office. We are the Service's lead station for recovery of the threatened Apache trout and Little Colorado spinedace. We also work with loach minnow, Gila topminnow, desert pupfish, and the "big river" fish, razorback sucker, humpback chub, and bonytail that inhabit the Colorado River. Our recovery efforts include renovating streams and other aquatic habitats inhabited by nonnative fishes that out-compete and often prey upon native fish. Additional efforts include constructing barriers to prevent upstream migration of nonnative species, replicating native fish populations into suitable habitat, restoring fish passage to previously inaccessible habitat, and monitoring native fish populations.

During Fiscal Year (FY) 2010, a large portion of our annual budget was allocated to these various efforts (Appendix B), and our investments of funding, time, and energy are certainly yielding rewards: 1) We saw signs of success in recovery work for several imperiled native fish and worked productively with partners in restoring aquatic habitat, 2) We continued our diligent efforts to prevent the spread of invasive species, which pose serious ecological menaces on both land and in water, 3) We worked with partners in promoting and managing sport fishing in waters throughout the state and developed funding requests to continue these types of projects (Appendix C), and 4) We continued to share our findings with our partners and other natural resource managers, the public, and the conservation community at large by conducting scores of presentations (Appendix D) and producing work in a variety of publications (Appendix E).

Why We Do What We Do

For all of our accomplishments over the last year, there's never an end, a "finish line" when it comes to natural resource management and conservation. Arizona is far from the exception. Many rivers in Arizona were dammed and diverted in the early half of last century, and now seldom resemble the waterways they once were. Urbanization, groundwater pumping, agricultural practices, and grazing all represent current issues affecting the health of our rivers, streams, and lakes – and the aquatic species that inhabit them. It is estimated that less than 10% of Arizona's original riparian acreage remains in its natural form (Arizona Riparian Council 2006). In the arid Southwest, 70% of threatened and endangered vertebrate species are listed

as riparian obligates (Johnson et al. 1989). In addition, at least 84 species of nonnative fish have been either intentionally or inadvertently introduced into Arizona's waters (Fuller et al. 1999). As a result of habitat fragmentation, destruction, and introductions of nonnative fish, native fish populations are declining (Rinne and Minckley 1991). One of the 35 fish species native to Arizona is extinct and approximately 75% are federally listed as threatened or endangered, proposed for listing, or candidates for listing. So we have work to do.

On the other hand, supporting sport fishing programs is another important aspect of work that we do. In 2006, 422,000 people 16 years old and older fished in Arizona and spent \$802 million on fishing-related expenses (U.S. Dept. of Interior 2006). Not only is sport fishing an important source of economic revenue, we believe that it helps foster a love of the outdoors that, in turn, promotes ideals and practices of responsible stewardship and conservation, which are likely to become increasingly important in the coming decades.

Lending even more of a sense of urgency to our work, climate change promises to exacerbate existing ecological problems and add to the challenges we face in managing water supply, water quality, flood risks, wastewater, aquatic ecosystems, and energy production. According to testimony made by the Commissioner of the Bureau of Reclamation before the Senate's Committee on Energy and Natural Resources, these new stresses are likely to be felt first in the western United States, the fastest growing region of the nation.

Seven Focus Areas

The report that follows provides detailed information on our work over the course of FY 2010. For organizational purposes, we are using the following seven focus areas identified by the Service's Fisheries Program in 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 be able to report accomplishments in each of these categories during FY 2010. Many could easily be categorized under several focus areas simultaneously. For our current purposes however, the seven focus areas provide a simple framework for the arrangement of this report.



Left, netting humpback chub in the Little Colorado River. Right, netting in the lower Colorado River.

AQUATIC SPECIES CONSERVATION & MANAGEMENT

The Fisheries 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.

NATIVE TROUT: Apache and Gila Trout

Apache Trout

One of the first species listed under the Endangered Species Preservation Act of 1966, the Apache trout has suffered from habitat degradation and hybridization with nonnative trout. Thanks to a cooperative recovery program, the species was downlisted to the status of threatened species in 1975 – and, with continued efforts, may become the first fish to be delisted through recovery.



Apache trout crew with an Apache trout from a stream survey.

Objectives for Apache trout recovery include the establishment and maintenance of 30 self-sustaining populations and monitoring of those populations. Toward these ends, we continued to make significant progress on the ground during the last year. With help from our partners we: 1) augmented two Apache trout populations with wild fish, 2) repaired, evaluated, and maintained several artificial stream barriers to inhibit encroachment of nonnative trout, 3) conducted mechanical removal of nonnative trout in six streams, and 4) conducted habitat and population monitoring on 13 streams.

Our office also continued making strategic outreach and administrative strides on behalf of the species throughout the year. We continued implementing the National Fish and Wildlife Foundation's 10-year business plan for restoring Apache trout; we participated in numerous outreach events focusing on native fishes including Apache trout; and we completed a 5-year review for the species, which recommends no change in status for the species as yet.

Gila Trout

As with the Apache trout, the Gila trout has been endangered for decades. Thanks to the cooperative work of numerous partners however, the species was down-listed to "threatened" in 2006. To further enhance its recovery, our office completed a Cooperative Agreement with Arizona Game and Fish Department and obligated funds for a project that will restore and improve habitat for Gila trout in southeastern Arizona. Our office is also engaged in a three-phase project to establish three populations of Gila trout on Mount Graham in southeastern Arizona. Last year, Phase One involved the stocking of 500 Gila trout, which were grown and transported by staff at the Mora National Fish Health and Technology Center, into Frye Creek on the Coronado National Forest.



Flying in Gila trout to be stocked into Frye Creek.

For the benefit of both trout species, our office has also been active in an ongoing Apache Trout and Gila Trout Partnership that includes the Service, Arizona Game and Fish Department, U.S. Forest Service, White Mountain Apache Tribe, and several angler groups.

CLINGING TO LIFE ON THE COLORADO RIVER: Bonytail and Razorback Sucker

Bonytail

If the future for Apache trout and Gila trout looks hopeful, it appears more daunting for the bonytail, one of the most endangered fish in North America. Without intensive management and conservation efforts, the species is likely to continue to decline as a result of habitat loss and competition from and predation by nonnative fish. With the cooperation of a number of partners, our efforts, we believe, will help reverse the decline of the species. We continue working toward the goal of reestablishing self-sustaining populations of bonytail along the Colorado River to help meet down-listing and delisting criteria.

Last year, our office continued to aggressively monitor conditions, growth, and populations of bonytail in six different backwater sites along the Colorado River, on both private and federal lands, with the goal of providing predator-free genetic refuges for the fish in off-channel ponds and habitats. At Bill Williams River National Wildlife Refuge, our staff trammel-netted lakes and inflow areas to capture bonytail to monitor population and growth conditions.

We assisted Willow Beach National Fish Hatchery with the stocking of nearly 29,000 bonytail chub into Beal Lake on Havasu National Wildlife Refuge. Similarly, in the Bill Williams River area of Lake Havasu, we worked with Dexter National Fish Hatchery and Technology Center to stock 2,000 bonytail chub. At Parker Dam Pond, the only place in the lower Colorado River where a self-sustaining bonytail population exists in a natural setting, we monitored the fish using snorkeling surveys to minimize handling impacts. We are encouraged to report that reproduction has been documented here and currently three size classes exist in the pond.

Razorback Sucker

Razorback sucker was once one of the most abundant native fish in the Colorado River, but, like bonytail chub, the species has dramatically suffered from habitat loss and competition with nonnative fish species. The most abundant razorback sucker populations are now mostly comprised of fish stocked from our hatcheries into Lake Mohave and Lake Havasu, where monitoring remains a vital component to survival. Another important component to staving off extinction is the bolstering of existing populations by collecting larval fish, growing them up to fingerlings at Willow Beach National Fish Hatchery, stocking them into grow-out sites for additional growth, and finally, restocking them into the reservoirs or backwater habitats at a size large enough to avoid predation.



A razorback sucker from Lake Havasu.

Since 2000, annual surveys for razorback suckers have been conducted on the lower Colorado River to monitor populations, gather life history information, and habitat use of native fishes.

Last year, our monitoring efforts helped evaluate whether stockings under the Multispecies Conservation Plan were effective. Fortunately, we have documented new spawning populations upstream of historical areas. These new spawning aggregations are composed entirely of repatriated fish or fish that were collected as larvae. These results are encouraging given that the senescent original population in Lake Mohave is at very low numbers; less than 100 wild spawned fish remain. Additionally, in cooperation with the Arizona Game and Fish Department, we created off-channel habitats that we hope will serve the fish well into the future.

THE NATIVE FISH OF GRAND CANYON: Humpback Chub and Others

The Little Colorado River provides important spawning and rearing habitat for four native fish species due to a historical flow pattern along the lower 22 kilometers. The native species include humpback chub, bluehead sucker, flannelmouth sucker, and speckled dace. One of the species, the humpback chub has been endangered since 1967 and is the focus of intensive monitoring and recovery efforts by the Service and our partners. Historically, humpback chub in the Colorado River system were abundant and widespread. But factors including habitat fragmentation, lower water temperatures, and predation by nonnative fishes have reduced the native cyprinid to small, fragmented populations within the Colorado River basin.



Last year, our staff led four fish monitoring trips in the lower 14 kilometers of the Little Colorado River to estimate the numbers of humpback chub. A total of 2,223 hoop net sets were deployed, yielding 50,756 hours of fishing effort. We also conducted an additional mark-recapture effort to estimate the abundance of age-0 fish via the use of Visible Elastomer tags, which yielded an estimate of 1,727 fish. Estimating the numbers of small fish is important for management efforts such as translocations and refuge development for these endangered fish. In all trips, humpback chub were the most commonly captured species followed closely by native bluehead sucker. Important population data on flannelmouth sucker, bluehead sucker, and speckled dace populations were also collected with the sampling efforts. Abundance estimates based on these data will advise management actions for sustained growth and expansion of the humpback chub population in the Colorado River and the Little Colorado River. Fish were identified to species, measured for total length, examined for sexual condition and native fish larger than 150mm were given a passive integrated transponder tag to track movements and growth.

The native fish conservation work conducted in the Grand Canyon is directed by the Glen

Pictured top to bottom; checking a hoop net, a humpback chub, the Little Colorado River.

Canyon Adaptive Management Program which oversees the work with the Grand Canyon Monitoring and Research Center and cooperating agencies such as the U.S. Fish & Wildlife Service, National Park Service, Arizona Game and Fish Department, and others.

BROADENING THE RANGE: Translocation of Humpback Chub above Chute Falls

The humpback chub has lost much of its habitat; its current range in the Grand Canyon is mostly confined to the lower 14 kilometers of the Little Colorado River and a few small aggregations in the mainstem Colorado River. Where it once thrived, fragmentation and groundwater pumping, which has diminished perennial water in the river, have made survival all but impossible for the native fish. Furthermore, nonnative predators such as channel catfish and black bullhead also pose formidable challenges for the humpback chub.

To give the native fish more of a fighting chance, our office has been closely monitoring humpback chub and translocating some to a stretch of river above Chute Falls, just upriver of its current range in the Little Colorado River. While the continued existence of the largest remnant population of endangered humpback chub currently depends on the spawning and juvenile rearing habitats located in the perennial, lower Little Colorado River, we hope to extend its range. Since 2003, we have translocated more than 1,500 juvenile humpback chub above Chute Falls. Preliminary findings from monitoring efforts indicate that the translocated fish were growing atypically fast, many becoming adults; however, most individuals would eventually migrate downriver below Chute Falls and seldom return above the falls. Nonetheless, these findings provide some optimism that this uppermost corridor might someday become, or return to, a natural extension of spawning and rearing habitats used by humpback chub.

Last year, we conducted monitoring efforts above Chute Falls, but were surprised to find few of the translocated fish and believe that heavy winter snows and rains may have contributed to a movement downstream during high flow events. We translocated 109 humpback chub above Chute Falls, and worked with the National Park Service on the translocation and stocking of 300 humpback chub in Grand Canyon National Park. Furthermore, we worked to extend the reach of our own efforts by consulting with the National Park Service and the Arizona Game and Fish Department on the feasibility of using a state hatchery as a potential holding site for future humpback chub translocation projects.



Flying humpback chub out of the Little Colorado River for translocation projects.

AQUATIC HABITAT CONSERVATION & 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.

FIGHTING A GIANT: Giant Salvinia

As its name might imply, giant salvinia poses a gargantuan threat to the waters of Arizona. Discovered in the lower Colorado River in 1999, the invasive plant can overtake waters and degrade water quality through reduction of dissolved oxygen, which can decimate both native and sport fish populations. The actual plant biomass can even reduce the ability of boats to use invaded waters. Fortunately, control efforts were started before the plant became too widespread. Still, diligent control will be required to keep the constant threat in check.



Preparing for another day of invasive weed spraying.

After a cold winter last year, giant salvinia experienced a significant die-off along the Lower Colorado River. However, as soon as water temperatures began to increase, the plant began to reappear along the drains and canals adjacent to the Colorado River. Together with our partner, Palo Verde Irrigation District, we developed a new technique to remove existing cattails along some canals so that areas harboring the invasive plant could be reached more effectively with sprayers. Furthermore, our spraying crew has perfected a spraying technique that targets salvinia and we initiated an aggressive search and destroy mission into one of three of the District's sections, achieving a positive result of 90% containment in the area.

Unfortunately, another species may pose problems in some of the same areas favored by giant salvinia. Arundo is an invasive cane species now prevalent in stretches of the Colorado River, and our staff was involved in an initial survey with the U.S. Bureau of Reclamation to determine if control of the invasive plant is even feasible.

Aquatic Nuisance Species

Aquatic nuisance species have become a significant part of aquatic ecosystems. Because of this serious issue, Congress passed the U.S. Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 and the National Invasive Species Act of 1996. Indeed, aquatic nuisance species are a costly part of natural resource management, resulting in loss and degradation of habitat, loss of native species, loss of recreational opportunities, and an increased cost of aquatic-related industries. Once such a species becomes established, it is often difficult or impossible to eradicate. That's why our office continues to pursue a three-tiered strategy for dealing with this costly problem: prevent the introduction or spread of invasive species in Arizona; control or eradicate existing invasive species in Arizona; and train others in prevention and control techniques.



Conducting nonnative trout removal on an Apache trout stream.

In 2010, we worked with partners on controlling giant salvinia, salt cedar, and nonnative fish; and on monitoring the quagga mussel and New Zealand mudsnail. We conducted both chemical and mechanical removal efforts of nonnative trout for Apache trout recovery. Additionally, we worked with partners to develop an Arizona Invasive Species Management Plan; we participated in the State Invasive Species Task Force general and leadership committee meetings; we conducted Hazard Analysis Critical Control Point training as part of a Department of Interior-Motorboat Operator Certification Course, and, after working with

others to update the Hazard Analysis Critical Control Point - Invasive Species Risk Assessment training, we introduced a pilot course of the new version. We also co-authored a chapter on aquatic nuisance prevention and control methods in fishery field work for an American Fishery Society-published book titled "Standard Methods for Sampling North American Freshwater Fishes."

Verde River Headwaters Restoration Project

The headwaters of the Verde River represent one of the last undammed streams that still provide habitat for native fishes in Arizona. But the area is also home to a rapidly burgeoning human population that threatens perennial flow in the river; and the headwaters, which are primarily isolated from the main stem of the river by a berm, have been teeming with predatory, nonnative fish and invasive crayfish and bullfrogs. Restoration of these headwaters and the elimination of nonnative fish are crucial to the conservation of threatened and endangered native fish.

Last year, after nearly five years of planning, we helped reclaim the headwaters of the Verde River at Stillman Lake for native fishes. In FY2009, our staff, along with other Service biologists and Arizona Game and Fish Department personnel, treated the five-acre area with rotenone. In FY2010, the piscicide was again applied to the headwaters area and nonnative fishes were mechanically removed. Follow-up monitoring indicated that the nonnative fishes have been removed. In spring 2010, we stocked 3,700 native roundtail chub from Arizona state hatcheries as part of the first phase to reintroduce native fish here.

Water Quality Sampling and Pond Renovation

The success of fish conservation will largely rely on the environments that help breed these fish. That idea may not be rocket science, but there is a methodical science involved in ensuring water quality which our office has made routine. Last year, we conducted bimonthly water quality samplings at two ponds on golf courses that are used as grow-out sites for endangered bonytail chub and razorback sucker. We also installed a water quality monitoring device that will record daily water quality conditions in a U.S. Army Corps of Engineers pond near Painted

Rock Reservoir to assess the potential for the site to be used as a native fish grow-out site. We also renovated two native fish backwater ponds at Imperial National Wildlife Refuge, which will be stocked with razorback sucker and bonytail this summer. Additionally, our office conducted a renovation of backwater ponds at Imperial National Wildlife Refuge, where native fish grow-out ponds had been invaded by mosquitofish.

MAKING PASSES

National Fish Passage Program: Black Draw

Throughout the country, the National Fish Passage Program has helped fish literally pass across formidable obstacles that would otherwise hinder their movement. In Arizona, the program has benefited a number of imperiled native fish. Adding to several existing fish passage projects in Arizona, last year we helped the San Bernardino National Wildlife Refuge design and construct fish passage culverts at a road crossing on Black Draw where a section of the important Rio Yaqui drainage occurs. While it is a small drainage, the Rio Yaqui contains nearly one quarter of the fish species native to Arizona. The fish passage project here will allow native Black Draw fish populations to maintain connectivity.



Black Draw on San Bernardino National Wildlife Refuge.

National Fish Passage Program: Training

Reconnecting habitat that barriers have fragmented is critical for improvement of aquatic organisms throughout the Southwest. There is increasing concern about connectivity and the methods of restoring access to aquatic habitat where barriers are present. In 2010, our office organized three workshops in the state of Arizona with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for fish passage. Through these workshops, we trained others and collaborated with partners on technical fish passage issues such as culvert design and barrier removal, and identification of future on-the-ground fish passage projects. It is our hope that the workshops engender opportunities for site visits for proposed or completed fish passage projects, and serve to broaden the reach of the program's success.

PARTNERSHIPS & 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.

PLAN OF ACTION

National Fish Habitat Action Plan

Loss or degradation of fish habitat is the number one problem facing fishery managers and affects both sportfish and non-sport fish. Protection and management of aquatic habitats are very important. Without quality fish habitat, valuable fish populations will continue to decline. Established in 2006, the National Fish Habitat Action Plan (NFHAP) is the first nationally-coordinated effort to restore and protect fish habitat. In order to better coordinate efforts, secure funding, and implement real improvements on the ground, the plan seeks to unite a wide array

of partners, including states, federal agencies, Tribes, non-governmental partners, and the public.

Last year, our office proudly participated in this ambitious effort in various ways. We hired a Desert Fish Habitat Partnership (DFHP) Coordinator who worked with the DFHP Steering Committee to develop a Request for Proposals for next year's projects and priorities. She also gave several presentations and initiated a newsletter that will help partners retain focus on pertinent issues and efforts within the DFHP. Also, our office participated in monthly NFHAP conference calls to address funding issues and timelines, candidate partnerships, legislation, and future plans. We presented NFHAP information at three professional society meetings. We also participated in the NFHAP Workshop and disseminated relevant NFHAP information to regional field stations. Also, a staff member joined the NFHAP Communications Committee.

NFHAP in Action: Gila Trout Restoration

In addition to the many planning and outreach efforts our office was engaged in regards to the NFHAP, we also used the program to establish groundwork for important Gila trout restoration efforts. To date, there are no Gila trout streams in Arizona that count towards recovering the San Francisco-Gila River mixed lineage population region. After executing a cooperative agreement with Arizona Game and Fish Department and the U.S. Forest Service completed National Environmental Policy Act and Endangered Species Act compliance, work began in May 2010. With our partners, we surveyed three creeks in southern Arizona to establish baseline fishery and habitat information and prepare for renovation work on one of the creeks. All three streams provide excellent trout habitat and are protected from nonnative trout because of natural barriers. Eventually, this project will establish Gila trout within historical habitat, providing more than 23 miles of stream in the San Francisco-Gila River mixed lineage population region identified in the Gila Trout Recovery Plan. Successful establishment of Gila trout in these streams would bring Gila trout closer to recovery and meet almost one third of the criteria for delisting identified in the recovery plan.



Gila trout newly stocked in Frye Creek.

Desert Fish Habitat Partnership

Our office is very excited to help lead efforts as part of the newly created DFHP, which will benefit 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. Arizona Fish and Wildlife Conservation Office staff coordinated and facilitated the work of the Desert Fish Habitat Partnership and also served on the Executive and Technical committees. The partnership'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, the DFHP will pursue more effective management strategies than are generally achieved on a local,



smaller scale. The program will address fish and habitat issues over a broad geographic area that encompasses the entirety of the Great Basin and Mohave deserts, 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.

Lower Colorado River Multi-Species Conservation Program

Another coordinated, comprehensive, long-term multi-agency effort, the Lower Colorado River Multi-Species Conservation Program (MSCP) is aimed at endangered species, and the protection of their habitat on the lower Colorado River. 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.

The MSCP is a 50-year effort that includes the goal of creating more than 8,100 acres of riparian, marsh, and backwater habitat for four listed species and 16 other species native to the lower Colorado River. The implementation activities are based on adaptive management principles, which allow conservation measures to be adjusted over time based on monitoring and research.



Netting a Colorado River backwater.

Last year, our office and staff from several regional fish hatcheries met with the U.S. Bureau of Reclamation, which is leading the program, to discuss work-plans, partnerships, and implementing field station agreements. We also discussed the possibility of working with the Colorado River Indian Tribes on fish and habitat surveys on their Reservation. Additionally, we also made efforts to address how regional fisheries field stations can submit project proposals under the comprehensive program's purview.

Partners for Fish and Wildlife Program

Large portions of important habitat for federal trust species and other wildlife occur on non-federal lands. The Partners for Fish and Wildlife (PF&W) Program provides necessary technical and financial assistance to non-federal landowners interested in wildlife habitat restoration, creation, and enhancement. Our PF&W Program has long-provided assistance for habitat conservation efforts throughout Arizona.



A Partners for Fish & Wildlife project site.

During FY2010, our PF&W Program completed four projects, partnering with two private landowners, the White Mountain Apache Tribe, and The Nature Conservancy. In summary, these projects restored, enhanced, or created 18 wetland acres, 661 upland acres, and 2.4 stream miles. Completed projects benefited native fish, migratory birds, raptors, ungulates, and riparian species. Technical assistance was provided on three other habitat restoration projects involving wetlands and riparian protection.

Our PF&W Program initiated seven new projects during FY2010. Projects will be completed with cooperation from the Town of Pinetop-Lakeside, Lower Colorado River Resource Conservation and Development Council, Black Canyon Community Association, Bat Conservation International, Bureau of Land Management, and five private landowners. Benefits of these projects include: 1) riparian and upland habitat protection for at-risk migratory birds and native fishes; 2) refuge habitat creation for Gila chub, Gila topminnow, desert pupfish, spikedace, and loach minnow; 3) roost protection for California leaf-nosed and Pale Townsend's big-eared bats; 4) wetland habitat creation for marsh birds and waterfowl; 5) upland habitat restoration for migratory birds and various reptilian species; and 6) natural resource education for desert and wetland habitats.

Habitat Conservation Plans

Many of Arizona's native fishes occur on private lands, but landowners can be hesitant to assist with recovery efforts for fear of the implications of having endangered species on their properties.

That's why a suite of innovative partnerships geared toward protecting the interests of both landowners and the species on their properties has been developed and implemented. Habitat Conservation Plans have been extremely successful in Arizona, where El Coronado Ranch set the stage for the first completion of such a plan in the state back in 1998 to enhance conservation and recovery efforts for Rio Yaqui drainage native fishes.

Last year, our staff participated in and passed an audit of our Fishery Information System data, reports, and proposals. Additionally, we are making great strides in putting all of our reports and scientific findings into an electronic database to facilitate easier access to data for our staff and our many partners.

Par for the Course

Our office is engaged in some unique partnerships with several municipal golf courses where ponds are being used as important grow-out sites for the benefit of endangered native fish. Last year, in cooperation with the Arizona Game and Fish Department, our office renovated ponds on the Cerbat Cliffs Golf Course in Kingman, AZ, where we removed black bullhead, goldfish, and mosquitofish from ponds that will become grow-out sites for razorback sucker and bonytail. Here, we also installed solar powered aeration systems in the ponds. At various golf courses in Needles, CA, and at the Emerald Canyon Golf Course, in Parker, AZ, we conducted strenuous surveys of native fish ponds, all with encouraging results. On behalf of the Arizona-New Mexico Chapter of the American Fisheries Society, our staff presented Emerald Canyon Golf Course with the "2009 Conservationist of the Year" award for cooperating with efforts to help razorback sucker and bonytail.



Last year, our office monitored populations of rare and endangered Rio Yaqui fishes identified in the El Coronado Ranch Habitat Conservation Plan. We conducted comprehensive surveys to determine the population size of Yaqui chub on the El Coronado Ranch, and were encouraged to catch more than 5,000 of these endangered fish at four sampling areas in addition to the other three native Rio Yaqui fish species found on the ranch. We also removed nonnative fishes from the creek below an artificial fish barrier on the ranch.

A Little 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, the following represent only a few of the partners we have worked with recently: Arizona Game and Fish Department, U.S. Bureau of Reclamation, White Mountain Apache Tribe, National Fish and Wildlife Foundation, Colorado River Indian Tribes, National Wildlife Refuges, U.S. Forest Service, National Park Service, San Carlos Apache Tribe, Navajo Nation, Town of Pinetop-Lakeside, University of Arizona, numerous private landowners, Hualapai Tribe, Black Canyon City, California Fish and Game Department, Kaibab Paiute Tribe, Nevada Department of Wildlife, Desert Fish Habitat Partnership, Western Native Trout Initiative, National Reservoir Partnership, Arizona Center for Afterschool Excellence, Big Brothers and Big Sister, and many more.

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 (U.S. Dept. of Interior 2006). A significant 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 and management recommendations, and provide advice on law enforcement issues related to sportfish management.

In 2010, our office coordinated trout stockings with the San Carlos Apache, White Mountain Apache, Hopi, Colorado River Indian Tribes, Hualapai, Quechan, and Kaibab Paiute Tribes and the Navajo Nation. We coordinated the stocking of three lakes with fingerling Apache trout as part of a larger project to determine if alternative hatchery strategies can be effective in meeting sportfish management goals for the White Mountain Apache Tribe.

Additionally, last year our office was involved in assisting the Navajo Nation with their annual lake and stream fishery surveys and in moving flannelmouth and bluehead suckers through the fish ladder on the San Juan River. We engaged in discussions with the Havasupai, Hopi, Navajo, Hualapai, Kaibab Paiute, and Zuni tribes about ways to deal with nonnative fish removal in the Grand Canyon. We met with Fort Mojave Tribal staff to discuss the possibility of developing a trout fishery in one of their backwater lakes. And we hosted a GIS workshop for staff from tribal natural resource departments in AZ.



The Tribal GIS Workshop put on by AZFWCO personnel.

HELPING APACHE FISHERIES: White Mountain Apache and San Carlos Apache

With more than 800 miles of streams and 2,300 acres of lakes, the Fort Apache Indian Reservation encompasses 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 is proud to be able to routinely provide technical assistance to the White Mountain Apache Tribe to aid in managing their fishery resources. Last year, we assisted with 15 stream surveys as part of Apache trout recovery work; we conducted water quality monitoring in six lakes and streams; we coordinated several trout and catfish stockings; we continued with systematic brown trout removal efforts; and we assisted with their annual fishing derby in June.

Like their White Mountain Apache neighbors, the San Carlos Apache Tribe hosts a variety of recreational fishing opportunities that represent an important source of economic revenue for them. Last year, working closely with the San Carlos Recreation and Wildlife Department, we completed electrofishing surveys on five lakes to continue a long-term data collection protocol; stocked 3-5 inch channel catfish from Tishomingo National Fish Hatchery into several ponds; we coordinated delivery of rainbow trout and brown trout stockings throughout the fall, winter, and spring months; we mechanically removed nonnative trout in Bear Wallow Creek; and we responded to numerous requests for technical assistance on various projects.



Conducting electrofishing surveys on Tribal waters.

Colorado River Indian Tribes Tribal Assistance

A long-time partner of the Fish and Wildlife Service, the Colorado River Indian Tribes own and manage lands that contain important habitat in the lower Colorado River ecosystem. But the Tribes do not have the staff, equipment, or training to pursue all of the conservation work that they would like. In 2010, we continued to provide assistance to the Colorado River Indian Tribes in managing approximately 45 miles of the Colorado River, 60 miles of canals, and five impoundments. We also participated jointly with the Tribe's natural resource department in surveying the impoundments and more than 45 miles of irrigation canals. We have also been working with the Tribes to complete an updated Memorandum of Understanding that outlines fishery management goals and objectives for their lands through the Lower Colorado River area. Included in this MOU will be clarification on surveys and the disposition of information collected on Tribal lands. Our office will continue to partner with the Tribe on all surveys and work together on conservation and recovery for endangered fishes in the Lower Colorado River.

PUBLIC USE

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.

Water Quality Monitoring at Alamo and Painted Rock Reservoirs

Both Alamo Reservoir and Painted Rock Reservoir are popular sportfishing destinations in Arizona, despite longstanding concerns about contamination and poor water quality in the two lakes, both managed by the U.S. Army Corps of Engineers. Additionally, water releases from Alamo Dam flow down the Bill Williams River into the National Wildlife Refuge, where the refuge supports a highly diverse riparian area and wildlife corridor. For more than 20 years, our office has been conducting water quality monitoring and taking samples for analysis.

Last year, through an ongoing contract with the U.S. Army Corps of Engineers, our office continued to collect water quality data along with bacteriological samples from Alamo Lake Reservoir in southwestern Arizona. Our responsibilities include collection of samples, scheduling, logistics, quality assurance, and timely data reporting. These data are important for making management decisions on Alamo Lake as they relate to long-term water quality. The Arizona Game and Fish Department and U.S. Army Corps of Engineers use these data to manage the largemouth bass and black crappie fishery for Arizona residents.



Taking water quality samples.

Outreach

Individuals within our own agency don't always know about the work we do. It's little surprise then that the significance of our work is lost on a majority of the general public. Without an educated public, we can expect little public support in achieving our goals. 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 participate. That's why outreach is a high priority for this office, for which it is customary to participate in opportunities to reach out to our public constituents.





Kaibab-Paiute Tribal children with awards from their Fishing Derby.

In 2010, our office participated in a number of projects and events to extend the reach: we conducted 11 Biologist-in-Training courses for 200 students; we gave 58 presentations at professional meetings and to other groups; and we provided 37 scientific reports and stories for media publicity. We published "Currents," a newsletter highlighting Regional Fisheries Program accomplishments. Staff continued to partner with the U.S. Forest Service for "More Kids In The Woods." We also participated in three "Outdoor Expo" type events reaching more than 40,000 people and we established the "Loan a Rod" program with the Show Low Public Library. Our office has also been exploring ways to provide outdoor education for the Northland Youth Coalition Regional Meeting of the Arizona Center for Afterschool Excellence, which organizes afterschool and out-of-

school programs in Navajo and Apache counties. Additionally, we developed a special video highlighting the work on Apache trout recovery, which will be used as an outreach tool.

We also jumped into the social networking world and developed a facebook page for our office. We currently have 181 fans. We have also uploaded several videos onto our facebook and the national Fisheries Youtube pages highlighting our conservation work. You can find our facebook page at <http://www.facebook.com/AZFWCO>.



Through outreach, coordination meetings, and our volunteer program, our office is committed to developing increased awareness of our activities while nurturing a growing body of people to help us achieve our conservation goals.

Education, Naturally

Several Partners for Fish and Wildlife projects will, in addition to conserving habitat, provide outdoor education opportunities: the Yuma Conservation Garden, for example, will restore and protect riparian habitat for neotropical birds while serving as a natural classroom for the public along the Colorado River; the Town of Pinetop-Lakeside and the White Mountain Wildlife and Nature Center have agreed to host the creation of a small wetlands site that will feature an education component. Also, a staff member worked with her counterpart at Tishomingo NFH, Oklahoma, to develop the Region 2 Recreational Fishing and Outdoor Education Program, which will implement new, creative ways to energize youth and instill a life-long commitment to protect, preserve, and enjoy our natural environment and cultural treasures.

LEADERSHIP IN SCIENCE & 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 2010, staff was involved in various efforts from contributing to a long-term genetic study of razorback suckers to participating in a meeting of the International Symposium on Genetic Biocontrol of Invasive Fish, which addressed the creation, testing, and management of bio-engineered organisms. One staff member helped lead a survey for a Science Panel (comprised of representatives from the National Park Service, Arizona Game and Fish Department, U.S. Bureau of Reclamation, U.S. Geological Survey, and the Grand Canyon Monitoring and Research Center) to explore the feasibility of a humpback chub augmentation program in western Grand Canyon.

Additionally, we routinely work with 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, we provided 58 presentations at professional meetings, schools, and non-governmental group functions (Appendix D), and we produced 37 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.

Job Training and Career Development

Because natural resource management sciences encompass ever-changing and developing fields, and because safety lessons bear repeating at designated intervals, workforce training is a constant process. This office is devoted to furnishing its staff, and its partners, with the necessary training. In 2010, employees from this office participated in 94 courses and taught 11. Several employees currently serve on national and regional Service teams. All employees participated in a state-wide staff meeting to assess the past year, determine training needs, and plan for the upcoming year. All the STEP and seasonal employees participated in a career development workshop, and all new employees go



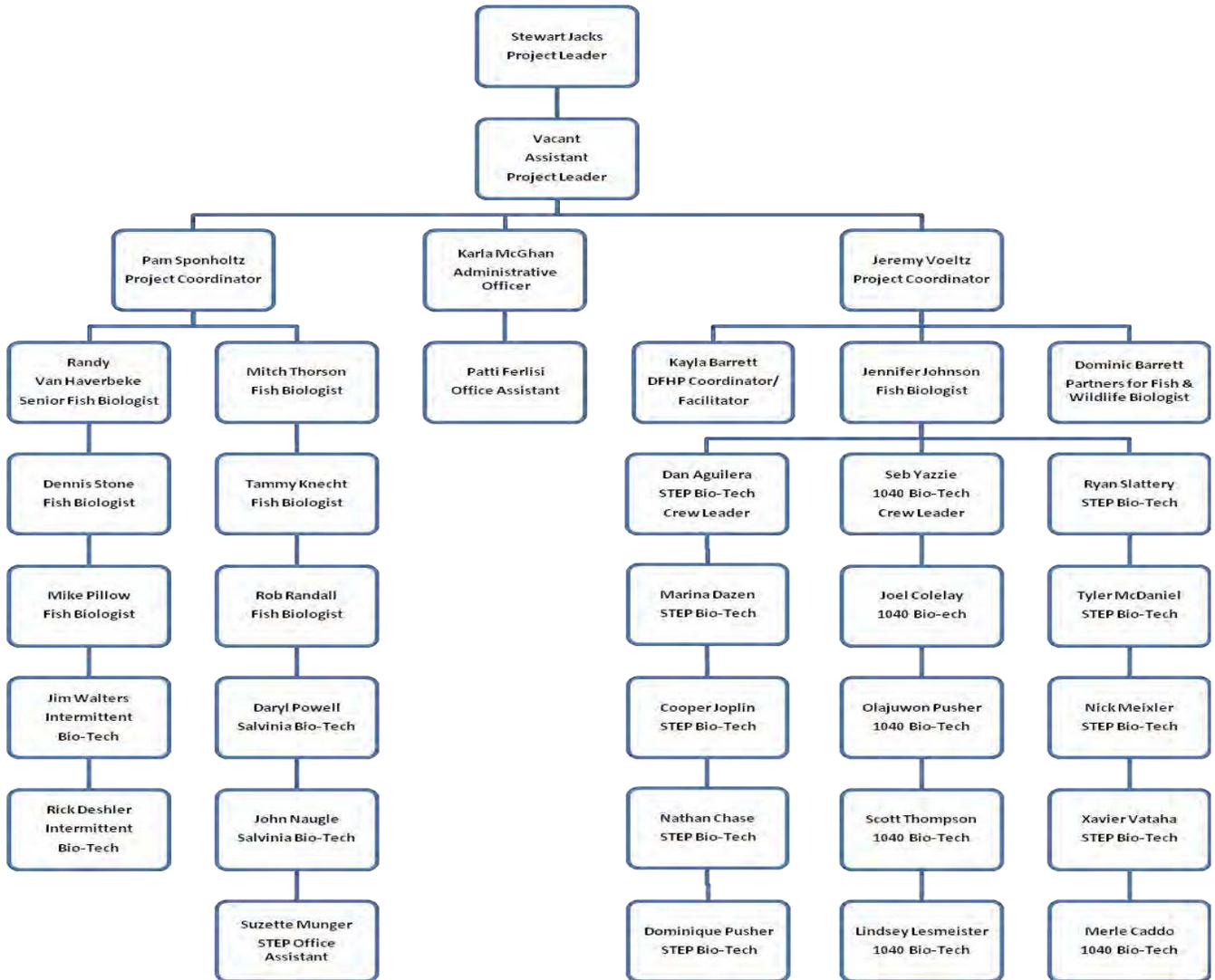
AZFWCO Career Development Workshop.

through an internally developed "New AZFWCO Employee Orientation." Also, all staff members updated their Individual Development Plans, which help us keep track of our respective professional goals while working as a team. Our office also greatly benefited from the work of many volunteers. And we, in turn, volunteered when needed: two staff members participated in extended details to assist with efforts pertaining to the Deep Horizon oil spill cleanup in the Gulf of Mexico.



*Left, Apache trout crew members at a natural barrier on an Apache trout stream.
Right, Apache trout crew members marking fish for a barrier evaluation.*

Appendix A. AZFWCO Organizational Chart



The AZFWCO staff.

Appendix B. AZFWCO Budget

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

Fiscal Year 2007 Budget: Total \$1,505,000

Reimbursables \$475,000
 Partners for Fish & Wildlife* \$210,000
 Apache Trout Recovery (Regional "Showing Success" Funds) \$167,000
 Fisheries** \$653,000

Fiscal Year 2006 Budget: Total \$1,113,389

Reimbursables \$473,708
 Partners for Fish & Wildlife \$116,603
 Apache Trout Recovery*** \$15,000
 Fisheries \$508,078

*Partners for Fish & Wildlife funding includes \$100,000 of on-the-ground, pass-through project money for FY 2010, \$56,000 for FY 2009, \$112,000 for FY 2008, and \$89,000 for FY 2007.

**Fisheries funding includes \$308,797 of on-the-ground, pass-through project money for Fish Passage and National Fish Habitat Action Plan projects for FY 2010, \$252,000 for FY 2009, \$165,000 for FY 2008, and \$125,000 for FY 2007.

***Apache Trout Recovery funding was provided by the Regional Office's Ecological Services Program for the support of 2 seasonal Biological Technicians.

Appendix C. AZFWCO Fisheries Operations Needs (FONS)

Project Title	Cost
<u>Apache Trout Restoration</u>	
Apache Trout Recovery (habitat and population management, APT Recovery Plan)	\$200,000
Total	\$200,000
<u>Education and Outreach</u>	
Youth Fishing Derbies - Connecting Kids with Nature	\$17,000
Kids in the Creeks - Connecting Kids with Nature	\$23,000
Trout in the Classroom - Connecting Kids with Nature	\$12,000
Biologist in Training - Connecting Children with Nature	\$45,000
Boy Scout Fishing Badge – Connecting Children with Nature	\$6,000
“Go Fish Girl” - Connecting Children with Nature	\$6,000
Linking Girls to the Land Patch - Connecting Children with Nature	\$6,000
Native Fish Showcase - Connecting Children with Nature	\$168,000
Arizona Rivers - High School Riparian Research Experience - Connecting Children with Nature	\$12,000
Total	\$295,000
<u>Habitat</u>	
Construction of a Refuge Pond on Raymond Wildlife Area for Little Colorado Spinedace	\$39,000
Mud Spring Fish Introduction and Habitat Protection	\$16,000
Cottonwood Artesian Fish Introduction and Habitat Protection	\$23,000
Management Needs at Desert Pupfish Refuge in California	\$39,000
Gila Trout Restoration in the West Fork of Oak Creek Phase II	\$73,000
Management of Backwater Habitats on the Lower Colorado River	\$112,000
Lake Havasu Fish Habitat Improvement Project	\$90,000
Improvement of the Topock Marsh Sport Fishery in Lake Havasu	\$56,000
Cienega Restoration on San Bernardino NWR	\$84,000
Gila Topminnow Restoration at Bylas Springs	\$56,000
Sharp Spring Gila Topminnow and Gila Chub Restoration	\$90,000
Backwater Habitat Enhancement for Colorado Pikeminnow Conservation in the Verde River	\$140,000
Aquatic Nuisance Species Prevention and Control in Arizona	\$84,000
Total	\$902,000
<u>Tribal</u>	
Tribal Hatchery Product Evaluation	\$112,000
Conduct Tribal Fishery Training Workshops	\$84,000
Colorado Cutthroat Trout Restoration in the Navajo Nation	\$84,000
Installation of a Stream Gage to Protect and Enhance Flows in Havasu Creek	\$73,000
Total	\$353,000
<u>Native Fish</u>	
Translocation of Endangered Humpback Chub into Havasu Creek on the Havasupai Reservation	\$135,000
Improvement of Flow Conditions for Razorback Sucker in Three Fingers Lake	\$90,000
Is Climate Change Affecting Small-Stream Desert Native Fishes?	\$112,000
Is Climate Change Affecting Causing Emerging Fish Health Problems in Wild Fish Stocks in AZ?	\$34,000
Total	\$371,000
<u>Fish Passage</u>	
Beaver Creek Culvert Replacement	\$112,000
Cherry Creek Road Crossing Repair	\$168,000
Evaluation of Fish Passage Projects Previously Funded and Completed in Arizona	\$75,000
Total	\$355,000
Total FONS	\$2,476,000

Appendix D. Presentations

The following is a list of presentations given by AZFWCO personnel in FY 2010:

- Barrett, D. 2010. The Emerald Canyon Golf Course – Award Winning Native Fish Project. Region 2 Partners for Fish & Wildlife Program and Coastal Program Regional Meeting. Port Aransas, TX.
- Barrett, D. 2010. The Partners for Fish & Wildlife Program in Arizona. Arizona Game & Fish Department Region 3 Staff Meeting. Seligman, AZ.
- Barrett, D. 2010. The Partners for Fish & Wildlife Program, Working with Tribes. 25th Annual Southwest Regional - Native American Fish and Wildlife Society Conference. Phoenix, AZ.
- Barrett, D. 2010. The Partners for Fish & Wildlife Program. Arizona Fish & Wildlife Conservation Office Fish Passage and Other Habitat Programs Workshop. Pinetop, and Phoenix, AZ.
- Barrett, D. 2010. An Introduction to GIS. Introduction to GIS for Natural Resource Management Workshop. Pinetop, AZ.
- Barrett, D. and P.J. Sponholtz, 2010. Careers in Biology and the U.S. Fish & Wildlife Service. Arizona Fish & Wildlife Conservation Office Career Development Workshop. Pinetop, AZ.
- Barrett, K. 2010. The Desert Fish Habitat Partnership. Arizona Fish & Wildlife Conservation Office Fish Passage and Other Habitat Programs Workshop. Pinetop, and Phoenix, AZ.
- Barrett, K. 2010. The Desert Fish Habitat Partnership. National Fish Habitat Action Plan Federal Caucus. Washington, DC.
- Dazen, M.R. and O. Pusher. 2010. Stream Electrofishing Techniques. Future Generations Service Learning Camp. Whiteriver, AZ.
- Jacks, L.S. 2009. Fisheries Program Status in Arizona and Opportunities for Cooperation with National Wildlife Refuges. Annual Arizona Refuge Managers Meeting. Tucson, AZ.
- Jacks, L.S. 2009. Careers in Biology and the U.S. Fish & Wildlife Service. Blue Ridge Junior High School Career Day. Pinetop, AZ.
- Jacks, L.S. 2010. Apache Trout Status and Recovery Updates. Apache Trout & Gila Trout Partnership Meeting. Phoenix, AZ.
- Jacks, L.S. 2010. Career and Personal Development in the U.S. Fish & Wildlife Service. 2010 Fisheries Academy. Shepherdstown, WV.
- Jacks, L.S. 2010. Aquatic Nuisance Species Prevention and Control. DOI-Motorboat Operator Certification Course. Lake Havasu, AZ.
- Jacks, L.S. 2010. Fisheries & Habitat – Opportunities to Work Together. Region 2 Partners for Fish & Wildlife Program and Coastal Program Regional Meeting. Port Aransas, TX.
- Jacks, L.S. 2010. Insights & Inspiration. Region 2 Partners for Fish & Wildlife Program and Coastal Program Regional Meeting. Port Aransas, TX.
- Jacks, L.S. 2010. Invasive Species: Problems, Control, & Solutions. 25th Annual Southwest Regional - Native American Fish and Wildlife Society Conference. Phoenix, AZ.
- Jacks, L.S. 2010. The Partners for Fish & Wildlife Program and the Desert Fish Habitat Partnership. Arizona Fish & Wildlife Conservation Office Fish Passage and Other Habitat Programs Workshop. Flagstaff, AZ.
- Jacks, L.S. 2010. Career Development and Insights and Inspiration. Arizona Fish & Wildlife Conservation Office Career Development Workshop. Pinetop, AZ.
- Johnson, J.L. 2009. Native Fish Management in Arizona. 4th Annual Woodland Wildlife Festival. Pinetop, AZ.
- Johnson, J.L. 2009. Native Fish Management in Arizona. Arizona Game & Fish department Annual Outdoor Expo. Phoenix, AZ.

Appendix D. Presentations Continued

- Johnson, J.L. 2009. Native Fish Management in Arizona and the Biologist in Training. Sequoia Village School After-School Program. Linden, AZ.
- Johnson, J.L. 2009. Native Fish Management in Arizona and the Biologist in Training. White Mountain Montessori School Science Program. Pinetop, AZ.
- Johnson, J.L. 2010. Native Fish Management in Arizona and the Biologist in Training. Successful Beginnings Charter School. Pinetop, AZ.
- Johnson, J.L. 2010. Native Fish Management in Arizona and the Biologist in Training. Sequoia Village School's Summer Science, Technology Engineering, and Math Program. Linden, AZ.
- Johnson, J.L. 2010. Connecting People with Nature: AZFWCO FY09. 2nd Annual Region 2 Fish Biologists Meeting. San Marcos, TX.
- Johnson, J.L. 2010. Response of Apache Trout to Mechanical Removal of Brown Trout. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Johnson, J.L. 2010. Response of Apache Trout to Mechanical Removal of Brown Trout on the Fort Apache Indian Reservation. 2010 Western Division of the American Fisheries Society Annual Meeting. Salt Lake City, UT.
- Johnson, J.L. 2010. Apache Trout and Other Native Fish Management in Arizona and the Biologist in Training. U.S. Forest Service Kids in the Woods Program. Big Lake, AZ.
- Johnson, J.L. 2010. Connecting Children with Nature: Biologist in Training Program. 25th Annual Southwest Regional - Native American Fish and Wildlife Society Conference. Phoenix, AZ.
- Johnson, J.L., N. Chase, M.R. Dazen, and S. Yazzie. 2010. Native Fish Management in Arizona. White Mountain Apache Tribe - Youth Fishing Derby. Whiteriver, AZ.
- Johnson, J.L., P.J. Sponholtz, and M. Pillow. 2010. Native Fish Management in Arizona and the Biologist in Training. Flagstaff Athletic Club Summer Children's Program. Flagstaff, AZ.
- Johnson, J.L., S. Yazzie, and J. Colelay. 2010. An Introduction to Fish, Fishing, and the Great Outdoors. Big Brothers and Big Sisters Special Outdoors Workshop. Whiteriver, AZ.
- Johnson, J.L. and D. Aguilera. 2010. Apache Trout and Other Native Fish Management in Arizona. Forest L. Woods Outdoors Family Fun Day. Payson, AZ.
- Joplin, N. and L.S. Jacks. 2010. Fish Handling and Measuring Techniques. Future Generations Service Learning Camp. Whiteriver, AZ.
- Knecht, T.L. 2009. Careers in Biology and the U.S. Fish & Wildlife Service. Thunderbolt Middle School Career Fair. Lake Havasu City, AZ.
- Knecht, T.L. 2010. Native Fish Management and Protecting Our Waters in Arizona. Tucson Schools Extra-Science Program. Parker, AZ.
- Knecht, T.L. 2010. 2009 Update of AZFWCO Activities in the Lower Colorado River. Annual Colorado River Aquatic Biologists Meeting. Laughlin, NV.
- Knecht, T.L. 2010. Renovation of Cerbat Cliffs Golf Course Ponds in Kingman AZ. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Pillow, M. 2010. Closed Population Estimates of Humpback Chub (*Gila cypha*) in the Little Colorado River, Grand Canyon. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Sponholtz, P.J. 2009. Lower Colorado River Area Status Report. Desert Fishes Council Annual Meeting. Death Valley, CA.
- Sponholtz, P.J. 2010. Careers in Biology and the U.S. Fish & Wildlife Service. Coconino Recreation Environmental Corps and American Conservation Experience Career Workshop. Grand Canyon, AZ.

Appendix D. Presentations Continued

- Sponholtz, P.J. 2010. Humpback Chub Conservation and Recovery Efforts in the Grand Canyon National Park. 25th Annual Southwest Regional - Native American Fish and Wildlife Society Conference. Phoenix, AZ.
- Stone, D. 2010. Overriding Effects of Turbidity Thresholds on Hoop Net Catch Rates of Native Fishes in the Little Colorado River, Arizona. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Stone, D. 2010. Historical Removal Efforts and Potential Impacts of Ictalurids in the Little Colorado River. Grand Canyon Nonnative Fish Workshop. Flagstaff, AZ.
- Thorson, M. 2010. Summary of Giant Salvinia Spraying Activities on the Palo Verde Irrigation Drain, 2009. Annual Colorado River Aquatic Biologists Meeting. Laughlin, NV.
- Thorson, M. 2010. Fisheries Work in Western AZ. 2010 Fisheries Academy. Shepherdstown, WV.
- Van Haverbeke, D.R. 2009. Native Fish Management and Humpback Chub Recovery in the Grand Canyon. Department of Interior Grand Canyon Science Workshop. Grand Canyon, AZ.
- Van Haverbeke, D.R. 2010. Overview of Little Colorado River Stock Assessment and Translocation Activities for Humpback Chub. Annual Colorado River Aquatic Biologists Meeting. Laughlin, NV.
- Van Haverbeke, D.R. 2010. Overview of Little Colorado River Humpback Chub Stock Assessment and Translocation Activities. Glen Canyon Technical Workgroup Meeting. Phoenix, AZ.
- Van Haverbeke, D.R. 2010. Overview of Little Colorado River Humpback Chub Stock Assessment and Translocation Activities. Upper Colorado River Basin - Biology Researchers Meeting. Grand Junction, CO.
- Van Haverbeke, D.R. 2010. Estimating the Abundances of Age-0 and Age-1 Humpback Chub (*Gila cypha*) in the Little Colorado River. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Voeltz, J.B. 2009. Apache Trout Recovery. U.S. Fish & Wildlife Service's Spot-Light Species Pod-cast Series. Washington, D.C.
- Voeltz, J.B. 2010. Apache Trout Recovery. 2nd Annual Region 2 Fish Biologists Meeting. San Marcos, TX.
- Voeltz, J.B. 2010. Is Recovery of a Fish Possible – Especially in the Arid Southwest? Apache Trout: A Case Study. AZ/NM American Fisheries Society Annual Meeting. Flagstaff, AZ.
- Voeltz, J.B. 2010. Apache Trout Recovery - Is It Possible? 2010 Western Division of the American Fisheries Society Annual Meeting. Salt Lake City, UT.
- Voeltz, J.B. 2010. Apache Trout Recovery. Future Generations Service Learning Camp. Whiteriver, AZ.
- Voeltz, J.B. 2010. Opportunities with the U.S. Fish & Wildlife Service's Fish Passage Program. Arizona Fish & Wildlife Conservation Office Fish Passage and Other Habitat Programs Workshop. Pinetop, Flagstaff, and Phoenix, AZ.

Appendix E. Publications

The following is a list of publications, reports, and stories published in FY 2010 by AZFWCO personnel. Copies of these publications can be obtained by contacting:

Arizona Fish & Wildlife Conservation Office
P.O. Box 39
Pinetop, AZ 85935
928-338-4288

- Barrett, D.A. and D.M. Leslie, Jr. 2010. Current Distribution of North American Otters in Central and Eastern Oklahoma, with Seven New County Records. USFWS-AZFWCO-PT-10-016.
- Barrett, D.A. and D.M. Leslie, Jr. 2010. Contemporary Distribution of North American River Otters in Oklahoma, with Seven New County Records. Occasional Papers of the Museum of Texas Tech University.
- Barrett, K.D. 2010. Desert Fish Habitat Partnership Newsletter Volume 1 Number 1. USFWS-AZFWCO-PT-10-020
- Barrett, K.D. 2010. Desert Fish Habitat Partnership Newsletter Volume 1 Number 2. USFWS-AZFWCO-PT-10-021
- Barrett, K.D. 2010. Desert Fish Habitat Partnership Newsletter Volume 1 Number 3. USFWS-AZFWCO-PT-10-022
- Jacks, L.S. and B. Ikenson. 2010. AZFWCO Annual Report, FY 2009. USFWS-AZFWCO-PT-10-013.
- Johnson, J.L. 2010. Recreational Fishing and Outdoor Education Program for the Region 2 Fisheries Program.
- Knecht, T. 2010. 2009 Desert Pupfish Population Estimates – Imperial, Cibola and Bill Williams River National Wildlife Refuges. USFWS-AZFWCO-PA-10-001.
- Knecht, T. 2010. Tenth Annual Native Fish Roundup on Lake Havasu, AZ, 1–11 February 2010. USFWS-AZFRO-PA-10-003.
- Knecht, T. 2010. Electrofishing Surveys of the Lower Colorado River During the Month of June. USFWS-AZFRO-PA-10-006.
- Knecht, T. 2010. June 23rd Fish Survey of Long Pond on the Ft. Mohave Indian Nation. USFWS-AZFRO-PA-10-007.
- Knecht, T. 2010. Proposal to Use Bismarck Brown as a Marking Technique for Desert Pupfish (*Cyprinodon macularius macularius*). USFWS-AZFWCO-PA-10-008.
- Knecht, T. and R. Randall. 2010. Imperial National Wildlife Refuge Renovation of Pond 1 & 3. USFWS-AZFRO-PA-10-005.
- Pillow, M.J. 2010. Spring 2010 Monitoring of Humpback Chub (*Gila cypha*) and Other Fishes in the Lower 13.57 km of the Little Colorado River, Arizona. USFWS-AZFWCO-FL-10-007.
- Pillow, M.J. and D.R. Van Haverbeke. 2009. Fall 2009 Monitoring of Humpback Chub (*Gila cypha*) and Other Fishes in the Lower 13.6 km of the Little Colorado River, Arizona. USFWS-AZFWCO-FL-10-001.
- Protiva, F.R., B.E. Ralston, D.M. Stone, K.A. Kohl. M.D. Yard, and G.A. Haden. 2010. Effects of Glen Canyon Dam Discharges on Water Velocity and Temperatures at the Confluence of the Colorado and Little Colorado Rivers and Implications for Habitat for Young-of-Year Humpback Chub (*Gila cypha*). U.S. Geological Survey Open-File Report 2010-1137.
- Randall, R. 2010. Backwater Water Quality, April 2010. USFWS-AZFWCO-PA-10-009.
- Randall, R. 2010. Backwater Water Quality, May – August 2010. USFWS-AZFWCO-PA-10-010
- Randall, R. 2010. Painted Rock Survey of Potential Off-Channel Habitat. USFWS-AZFWCO-PA-10-011.

Appendix E. Publications Continued

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The Little Colorado River.

Arizona Fish & Wildlife Conservation Office

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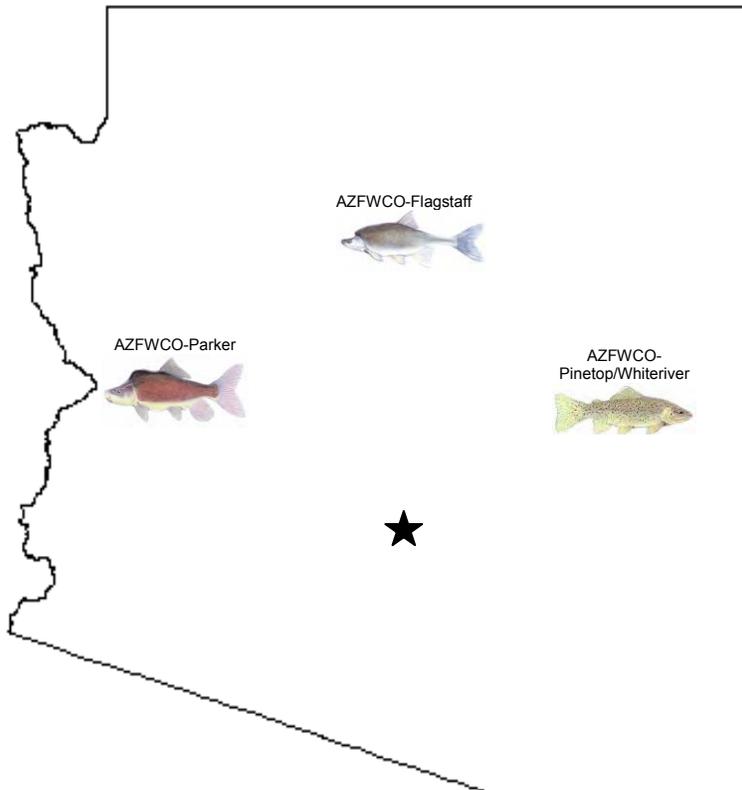
“Working with others to conserve, protect, and enhance fish and other aquatic organisms and their habitats in Arizona and the Southwest”

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:

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