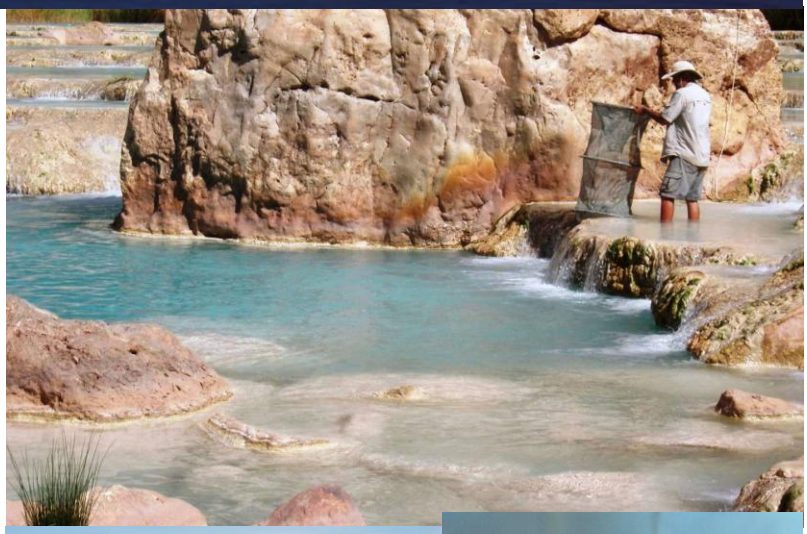
Arizona
Fish and Wildlife
Conservation Office

Annual Report

2011



Working with others to conserve, protect, and enhance fish and other aquatic organisms and their habitat in Arizona and the Southwest.

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

FY2011 Annual Report

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2011 ANNUAL REPORT
Arizona Fish and Wildlife Conservation Office
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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. Cover photo of Gila trout courtesy of George Andrejko (Arizona Game & Fish Department). Front and back cover design courtesy of Kayla Barrett

INTRODUCTION

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

-Stewart Udall, 1920 – 2010

As Arizona celebrates its Centennial, the conservation challenges it faces have never been greater. One of the fastest growing states in the country's fastest growing region, the impact of competing interests on resources in Arizona 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 sustainable 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 the native fish, but also for future generations of humans.

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 Service 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 and Wildlife Service's Southwest Region, which encompasses Arizona, New Mexico, Texas, and Oklahoma. We are one of 64 such offices located across the country. Together with 70 National Fish Hatcheries, nine Fish Health Centers, and six Fish Technology Centers, these stations make up the Service's Fisheries Program.

Our office is staffed with professionals (Appendix A) who possess expertise in a wide variety of specialties. Individually, we are many parts: biologists, ecologists and ichthyologists; sport fish managers and outreach specialists; cartographers, grant writers and 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.

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 "big river" fishes: razorback sucker, humpback chub, and bonytail that inhabit the Colorado River. Our recovery efforts include renovating streams and other aquatic habitats inhabited by nonnative fish species that out-compete and often prey upon native fish. Additional efforts include constructing barriers to prevent

upstream migration of nonnative species, translocating native fish populations into suitable habitat, restoring fish passage to previously inaccessible habitat, and monitoring native fish populations.

During Fiscal Year (FY) 2011, 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. We saw signs of success in recovery work for several imperiled native fish and worked productively with partners in restoring valuable habitat on their behalf. We continued our diligent efforts to prevent the spread of invasive species, which pose as serious ecological menaces on land and in water. We also worked with partners in promoting and managing sport fishing in waters throughout the state. We developed funding requests to continue these types of projects (Appendix C); and 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. And Arizona is far from the exception. Here, native fish populations have been in decline since pioneers first started settling the West in the 1880s. Rivers in Arizona were subjected to dam and diversion projects in the early half of last century, and now barely resemble the waterways they once were. Urbanization, excessive groundwater pumping, agricultural practices, and mismanaged cattle grazing all represent existing threats to the health of our rivers, streams and lakes – and the aquatic species that historically inhabited 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.

On the other hand, supporting sport fishing programs is another important aspect of our work. In 2006, 422,000 people 16 years or 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 the 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 all 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 2011. 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 2011. 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.

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.

Return of the Natives

Last year, our office continued pursuing the constant effort to return native fish to their rightful homes. With the help of volunteers, staff conducted native fish monitoring trips in the spring and fall in the Little Colorado River in the Grand Canyon. We also worked with U.S. Bureau of Reclamation personnel to conduct population abundance estimates for fish in Beal Lake on Havasu National Wildlife Refuge. And with assistance from the Bureau of Reclamation and Marsh and Associates, Inc., our staff conducted an annual fall harvest of native fish at Imperial National Wildlife Refuge, capturing, tagging, and releasing razorback suckers and bonytail. At the refuge, we also surveyed a number of native fish grow-out ponds.

Native 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.

Objectives for Apache trout recovery include the establishment and maintenance of 30 self-sustaining populations. Toward these ends, we continued to make progress last year. Our office's Apache Trout Crew resumed several recovery projects including brown trout removal efforts from Apache trout streams and stream habitat restoration work. Much of this work is taking place on Tribal lands.

Native Trout: Gila Trout

As with the Apache trout, the Gila trout has been endangered for decades. Thanks to the cooperative work of numerous partners, the species was down-listed to "threatened" in 2006. Our office has been working to further enhance its recovery as well as to establish the first sport fishery in the state.

In FY11, staff worked with personnel from Arizona Game and Fish Department to conduct a chemical renovation of Ash Creek on Mt. Graham in the southeastern part of the state, treating eight miles of the stream with rotenone to remove rainbow-Apache trout hybrids. Following completion of follow-up surveys, the stream was stocked twice with Gila trout, adding to a population that will help meet Gila trout recovery goals. Also on Mt. Graham, we stocked Frye Mesa Reservoir with Gila trout from Mora National Fish Hatchery, an effort that establishes the first sport fishery for Gila trout in the state.

Life Support on the Colorado River: 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.

In FY11, we worked with personnel from Marsh and Associates Inc., on a bonytail telemetry project in Lake Havasu. Also, with assistance from various partners, we participated in the Lake Havasu Native Fish Round-Up, during which 67 bonytail were captured as well as many sport fish species. Staff from this office also worked with Uvalde National Fish Hatchery to stock 91 adult bonytail into the waters on Bill Williams River National Wildlife Refuge.

Life Support on the Colorado River: Razorback Sucker

Razorback sucker was once one of the most abundant native fish in the Colorado River, but, like bonytail, 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. Because young razorbacks are threatened by predation from other species, another essential component to staving off extinction is the bolstering of existing populations by collecting larval fish, growing them out to fingerlings, stocking them into sites for additional growth, and finally, restocking them into the reservoirs, backwaters, or even the river's mainstem.

In FY11, our office worked on a number of efforts to help the fish. We worked with personnel from the U.S. Bureau of Reclamation to sample and harvest razorback suckers from Beal Lake on Havasu National Wildlife Refuge, collecting 64 and determining that 48 were large enough to be released into the mainstem of the Colorado River. Also working with personnel from the U.S. Bureau of Reclamation, staff conducted a fishery survey of the lower Colorado River between Laughlin, Nevada, and Needles, California, targeting known razorback sucker spawning areas and capturing 100 razorback suckers, 13 flannelmouth suckers, and several sportfish species. The razorback and flannelmouth suckers were PIT-tagged and all fish were released. Again with the U.S. Bureau of Reclamation, staff conducted a survey and harvest on three backwaters along the lower Colorado River, collecting approximately 375 razorbacks longer than 400 mm and stocking them into the Colorado River near Needles, California. We also conducted a fishery survey of the lower Colorado River below Parker Dam, capturing, measuring, tagging, and releasing largemouth bass, common carp, and 10 razorback suckers. With various partners, we conducted the Lake Mohave Native Fish Round-up, during which 117 adult razorback suckers were captured, along with several thousand razorback sucker larvae, and a suite of sport fish species. We conducted a survey and harvest of razorback suckers from ponds on Emerald Canyon Golf Course, collecting, tagging and stocking into the Colorado River 40 razorback suckers longer than 400 mm, returning the shorter ones to the ponds for further growth. We also assisted Bubbling Ponds State Native Fish Facility personnel with the stocking of more than 1,000 razorback suckers into the lower Colorado River, including into backwaters and ponds on the Bill Williams River and Cibola National Wildlife Refuges, Needles Golf Course, and Emerald Canyon Golf Course.

Helping Humpback Get Back

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. 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. However, 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. The same factors have been similarly detrimental to flannelmouth sucker, bluehead sucker, and speckled dace.

In FY11, staff from our office and volunteers conducted five native fish mark-recapture trips in the spring, summer, and fall in the Little Colorado River, primarily targeting humpback chub. The trips were successful with the crew tagging thousands of humpback chub including using Visual Implantable Elastomer tags for juvenile chub. The crew recaptured 41 juvenile humpback chub that had been marked with tags during the first fall survey, which will enable staff to estimate juvenile chub numbers in addition to the adult population estimates.

Staff worked with personnel from the National Park Service and Arizona Game and Fish Department to complete a fishery survey of Havasu Creek below Beaver Falls in the Grand Canyon. Additionally, the crew stocked 244 juvenile humpback chub into Havasu Creek. These fish had been captured in October 2010 and held for grow-out at Arizona Game and Fish Department's Bubbling Ponds State Fish Hatchery.

Staff also conducted an analysis to compare historic (2001-2009) Little Colorado River humpback chub capture-recapture population estimates with different sampling efforts. This analysis was requested to determine the effect of shortening future sampling trips. A staff member also analyzed historical trammel net data for humpback chub aggregations in the Grand Canyon using database records.

Along with National Park Service personnel, staff collected 600 young-of-year humpback chub from the Little Colorado River for 2011 translocation projects in two creeks in Grand Canyon National Park. While the fish were held at Bubbling Ponds State Fish Hatchery, a staff member helped conduct a fish health assessment for humpback chub, working with personnel from Arizona Game and Fish Department and Dexter Fish Health Center. Because these fish had been infected with a trematode during the winter, a full assessment including parasitology, bacteriology, and virology was required prior to their translocation into Shinumo and Havasu creeks in early summer. Analyses to date for the fish have shown them to be clean and cleared for stocking.

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 Fire

In the summer of 2011, the largest wildfire in Arizona's recorded history occurred, burning nearly 557,000 acres in east-central Arizona and a small portion of western New Mexico. Nearly 600 miles of perennial streams occur within the perimeter of the fire, which is home to 11 native fish species (one endangered, five threatened, one


Photo credit: USFS

candidate, and four U.S. Forest Service sensitive) and other imperiled aquatic species such as springsnails, leopard frogs, garter snakes, and mollusks. While the long-term effects of the fire will not be known for some time, the short-term affects to Apache trout were not as significant as originally feared. While the perimeter of the fire was huge, 69% of the burn area was classified as unburned or low burn intensity, basically how the ponderosa pine and mixed-conifer areas are supposed to burn. However, due to the negative short-term effects of ash and sediment laden run-off during monsoon season, the agencies salvaged and held several aquatic species (Apache trout, Little Colorado spinedace, loach minnow, roundtail chub, three forks springsnail, California floater, Little Colorado sucker, and bluehead sucker) to prevent total loss of populations. Long-term effects may include increased peak flow, increased water temperature, changes in stream substrate, increased siltation, loss of pools, changes in food availability, scouring of riparian/aquatic vegetation, and altered coarse woody debris delivery and storage. All of the agencies involved are working on monitoring programs to assess current and future conditions which will drive future management priorities.

Restoration Efforts for Native Fish

In FY11, staff from this office worked tirelessly in the constant effort to return native fishes to their ancestral habitat. We worked with the National Park Service to establish and maintain operation of a fish weir in the Grand Canyon on Bright Angel Creek near the confluence with the Colorado River to intercept spawning brown trout, an invasive fish that has wrought havoc on native populations. Once the weir was installed, the crew electro-fished 600 meters of the creek upstream of the weir structure, releasing native species and removing nonnative brown and rainbow trouts. Also with the National Park Service as well as the U.S. Geological Survey, we conducted a site survey of Iceberg Canyon in Lake Powell for assessment as a restoration site to remove nonnative fish as part of an upcoming renovation to benefit native fish.

With assistance from the Service's Arizona Ecological Services Office and the Arizona Game and Fish Department, staff conducted fishery monitoring of Stillman Lake in the upper Verde River. The lake had been renovated in 2009 to remove nonnative fish, but, unfortunately, green sunfish, smallmouth bass, and yellow bullhead catfish have invaded the lake, probably as a result of several floods in 2010. Only five roundtail chub, which were stocked in 2010, were captured during the sampling. Staff also worked with the Arizona Game and Fish Department and the U.S. Forest Service to conduct surveys on Fossil Creek in central Arizona to determine the spread of invasive smallmouth bass into the stream above a constructed fish barrier. Crews seined, snorkeled, and fished for smallmouth bass and we assisted in building a second "emergency" barrier upstream to prevent the movement of smallmouth bass further up the stream.

Our office was also involved in discussions with the U.S. Bureau of Reclamation regarding the management of Beal Lake on Havasu National Wildlife Refuge. We are exploring the possibilities of re-measuring the lake contours to see if significant sedimentation has occurred, examining water levels of Topock Marsh, and assessing the status of native fish populations and water quality there.

Going with the Flow

Staff worked extensively with personnel from the Arizona Ecological Services Office to develop a U.S. Bureau of Reclamation Biological Opinion for the Environmental Assessment for development and implementation of a high-flow protocol for Glen Canyon Dam in the Grand Canyon. Staff drafted science-based recommendations for the high-flow protocol and nonnative trout removal projects in Grand Canyon, to be used for this Biological Opinion. We also developed an alternative approach to evaluate possible effects on humpback chub from a proposed Fall High Flow Event in Grand Canyon, including the monitoring of small fish in the mainstem and the generating of population estimates for young-of-year fish in the Little Colorado River using Visual Implantable Elastomer tags.

Fish Passages

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 completed an interagency agreement with the U.S. Forest Service for a fish passage project on Beaver Creek on the Apache-Sitgreaves National Forest that will benefit Little Colorado spinedace and speckled dace. The project will be initiated upon final completion of NEPA clearances.

A Not So Jolly Green Giant: Giant Salvinia

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 reduce 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 could become too widespread. Still, diligent control is required to keep the constant threat in check.

Last year staff, along with U.S. Bureau of Reclamation personnel, conducted a pre-spraying season survey of the lower Colorado River area infested by giant salvinia to assess pre- and post-control efforts for 2011. Throughout the year, staff conducted giant salvinia control spraying in four sections of the Colorado River downstream of Blythe, California. Crews also conducted range and density surveys of the plant and collected water quality measurements in association with the spraying. At the end of

the year, the plant was essentially removed in two of the four sections, but still found in the remaining two.

Water Quality and Contaminants Testing

Water contamination can pose major problems for fish, natural habitat, and human health, not to mention seriously affect water quality. That's why this office has made water analyses and contaminations testing essential requirements of our work. Last year, as part of an ecological assessment of a local cement factory, staff worked with the Arizona Ecological Services Office to collect fish samples from the Verde River for contaminants testing. Our office also worked with the Arizona Ecological Services Office to collect fish as part of a contaminant study of Painted Rock Reservoir. We also conducted bi-monthly water quality sampling of native fish grow-out sites at Beal Lake, Emerald Canyon Golf Course, Needles Golf Course, Office Cove, Parker Dam Pond, High Levee Pond, and Three Fingers Lake, and, with the exception of the need to use a water colorant/shading chemical to deal with an algal bloom in one, determined that the sites are maintaining adequate water quality for fish survival. Additionally, a staff member from this office continued conducting monthly water quality survey at Alamo Lake as part of a special agreement with the U.S. Army Corps of Engineers.

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.

Partners for Fish and Wildlife

So much important habitat for threatened and endangered species exists on non-federal lands, and the Endangered Species Act alone is not always sufficient in recovering species or restoring habitat. That's why there are various innovative programs that help put the tools for recovery into the hands of landowners. The Partners for Fish and Wildlife (PFW) Program is a longstanding example that has been important in conservation efforts throughout Arizona. Last year, through the auspices of this program, our office completed and pursued many exciting projects.

The PFW Program saw the successful finish of the Ash Creek Riparian Fencing and Protection Project, which provides habitat protection for federal trust species including yellow-billed cuckoo, roundtail chub, and Gila topminnow. We completed the Hull Mine Protection Project, which benefited from PFW Program funds for a bat gate that will protect a maternal colony of California leaf-nosed bats. The PFW Program is also helping fund the Black Canyon Riparian Restoration Project, which includes construction of a native fish pond and stream that will provide habitat for desert pupfish, Gila chub, Gila

topminnow, loach minnow, and spikedace. A joint effort among the Arizona Game and Fish Department Landowner Relation Program, National Wild Turkey Federation, and the PFW Program will oversee the Beaver Creek Riparian Protection Project to work for better cattle management in order to protect approximately one mile of riparian habitat along Beaver Creek.

Other Program projects are underway as well with the completion of several new Private Lands Agreements. One project will support stream and riparian restoration efforts along the Little Colorado River north of Springerville, Arizona, to benefit the Little Colorado spinedace, other native fishes, and terrestrial wildlife, and to improve water quality. Another is expected to restore 477 acres of plains and Great Basin grasslands on the Colorado Plateau. A third project includes the removal of invasive Utah juniper and the restoration of approximately 150 acres of Plains and Great Basin grasslands.

Lower Colorado River Multi-Species Conservation Program

Another coordinated, comprehensive, long-term multi-agency effort, the Lower Colorado River Multi-Species Conservation Program, 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.

This 50-year long-term effort 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. It also includes measures to protect and enhance 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.

Last year, our office and staff from several regional fish hatcheries met with the U.S. Bureau of Reclamation, to discuss work-plans, partnerships, and field station agreements. We discussed upcoming plans for the management of Beal Lake on Havasu National Wildlife Refuge and the management of the newly acquired "Shark's Tooth", 650 acres of riparian and upland habitat, on Cibola National Wildlife Refuge. Additionally, much of our backwater management and monitoring work for razorback sucker and bonytail is done in conjunction with the Multi-Species Conservation Program.

National Fish Habitat Partnership

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 Partnership 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 regularly participated in National Fish Habitat Partnership Science and Data National Fish Habitat Assessment and general partnership coordinator teleconferences and worked closely with the Desert Fish Habitat Partnership, Western Native Trout Initiative, and National Reservoir Partnership to identify key projects for potential funding.

Desert Fish Habitat Partnership

Our office spearheaded the Desert Fish Habitat Partnership (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. 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 will pursue 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 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.

Last year, our DFHP Coordinator worked with DFHP's Executive Committee members to finalize the group's operating structure. She also published and distributed quarterly DFHP newsletters and developed a Facebook page for the partnership. She coauthored a poster titled "Targeting Native Desert Fish Recovery and Conservation in the West: The Desert Fish Habitat Partnership" for presentation at the World Wildlife Fund River Restoration meeting in Tucson, AZ. She developed DFHP's 2007-2010 Summary Report. With assistance from another staff member, she developed a GIS map for DFHP projects and submitted a DFHP project for a climate change story for the Service's "The Climate of Conservation: 50 Stories from 50 States in 50 Days" series.

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. 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, enhancing conservation and recovery efforts for Rio Yaqui native fishes. Last year, with assistance from the San Bernardino National Wildlife Refuge and Arizona Game and Fish Department, staff completed the annual fall native fish monitoring at the El Coronado Ranch, collecting 4,700 Yaqui chub from four ponds (and 150 Yaqui chub

from three monitoring stations on West Turkey Creek), more than 600 longfin dace, and 300 Mexican stonerollers.

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 4,900,000 trout, and anglers produce an estimated $831,500,000 in economic impact. Through permits to fish on tribal lands, a large portion of this total, 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, and we provide technical assistance, management recommendations, and advice on law enforcement issues related to sportfish management.

Education
Last year, staff from this office organized and conducted a Tribal Wetland Restoration and Construction Workshop which was attended by 25 members from seven Tribes in Arizona and New Mexico. We also presented information about the Partners for Fish and Wildlife Program at two workshops attended by more than 80 Navajo Nation natural resource employees, land permittees, and private landowners.

Colorado River Indian Tribes Tribal Assistance
A long-time partner of the Service, the Colorado River Indian Tribes (CRIT) owns and manages lands that contain important habitat in the lower Colorado River ecosystem. However, the tribes do not have the staff, equipment, or training to pursue all of the conservation work that they would like to. Last year, we continued to provide assistance to the tribes in managing approximately 45 miles of the Colorado River, 60 miles of canals, and five impoundments. In cooperation with biologists from the Dexter

Fish Health Center, we conducted a wild fish health survey of the Colorado River within the border of the CRIT. Staff members assisted Willow Beach NFH with the development of a draft Memorandum of Agreement for the operation of the Achii Hanyo native fish facility and fish management on CRIT lands. Along with personnel from the CRIT, staff sampled the lower Colorado River for razorback suckers.

HELPING APACHE FISHERIES: White Mountain Apache

With more than 800 miles of streams and 2,300 acres of lakes, the Fort Apache Indian Reservation supports 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 White Mountain Apache Tribe to aid in managing its fishery resources.

Last year, staff worked with personnel from the White Mountain Apache Tribe and Natural Resource Conservation Service to conduct an archaeological survey of Bonita Prairie on the Fort Apache Indian Reservation for a Partners for Fish and Wildlife Program project that will restore 300 acres of high elevation grassland habitat and protect three springs and create six sediment catchments in the Carrizo, Cibecue, and White River watersheds. Our office's Apache Trout Crew also conducted native fish surveys on Carrizo, Canyon, and Cibecue creeks on the Reservation.

Throughout the year, staff from this office conducted brown trout removal efforts in three Apache trout streams on the Fort Apache Indian Reservation. To date, a total of 1,234 brown trout have been removed and 8,360 Apache trout have been collected and released. The crew also conducted Apache trout population surveys on seven streams and continued with barrier evaluations on five streams on the Reservation, collecting and marking brown and Apache trouts with fin clips below barriers and checking above the barriers for marked fish.

Staff worked with the White Mountain Apache Tribe to conduct an electrofishing survey of Cooley Lake on the Reservation, catching and processing largemouth bass and channel catfish. The sport fisheries in Reservation lakes are a result of stocking from National Fish Hatcheries in the region.

Staff also assisted the White Mountain Apache Tribe with their annual Youth Fishing Derby on the Fort Apache Indian Reservation. More than 400 children participated in the event.

Hotchkiss National Fish Hatchery in the Service's Region 6 provided 8,000 catchable rainbow trout to the Tribe to make up for some of the fish shortages resulting from the

pipeline construction project at the Alchesay-Williams Creek National Fish Hatchery. Staff and hatchery personnel coordinated delivery and stocking of fish.

Also, with assistance from Inks Dam and Alchesay-Williams Creek National Fish Hatcheries and White Mountain and San Carlos Apache Tribe personnel, staff stocked 80,000 channel catfish from Uvalde National Fish Hatchery in Reservation waters.

HELPING APACHE FISHERIES: San Carlos Apache

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. Last year, working closely with the San Carlos Recreation and Wildlife Department, we conducted annual lake electrofishing surveys on the reservation. Also, our Partners for Fish and Wildlife Program coordinator met with San Carlos Apache Tribal Forestry Department and San Carlos Apache Tribal Soil and Moisture Conservation Program to discuss potential riparian, upland, and wetland restoration projects and outdoor classrooms and the Partners for Fish and Wildlife Program.

HELPING NAVAJO FISHERIES AND WILDLIFE

Staff worked with Navajo Nation Fish and Wildlife Department personnel to conduct a fishery survey of the Tsaile Creek watershed. Our office is examining the possibility of reintroducing Colorado River cutthroat trout within the Tsaile, Wheatfield, and Whiskey Creek watersheds. Tissue samples for genetic analyses were collected from 35 fish showing cutthroat trout characteristics. These samples were submitted to Dexter NFHTC for analyses.

Staff participated in a site visit with Grand Canyon Monitoring and Research Center and Navajo Nation personnel to two Little Colorado River native fish monitoring helipads to survey for Fickeisen plains cactus, an endangered plant found in limited areas along the south rim of the Grand Canyon. Neither of the helipads that are currently used has the cactus in the area.

Staff assisted with construction of a wetland on the Navajo Nation. A project sponsored by the Navajo Nation Department of Agriculture and Bat Conservation International, the wetland will provide benefits for amphibians, bats, grassland birds, and waterfowl.

Passing the Torch

Our office is committed to helping Tribes instill in their young people a conservation ethic that will doubtless be instrumental to protecting their resources in the future. Last year, some of our Apache Trout Crew STEP student and seasonal employees were among a group of native youth who joined Tribal elders, members of inter-tribal organizations, government officials and other dignitaries from across the country to discuss their participation in conservation activities and the possibilities for future

employment with natural resource agencies. One of these students was interviewed for a special podcast detailing the Service's efforts to bring Native American youth into natural resource conservation; and our project leader accepted a Directors Award for our office's commitment to working with Native American youth.

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.

Outreach: Online, In Class, and Outdoors

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 be a part of it. That's why outreach is a high priority for this office.

Online and 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 currently have 241 fans from 19 countries. Our page is visited more than 3,500 times per month! Check us out at www.facebook.com/AZFWCO

Our DFHP Coordinator also developed and manages a facebook page for the Desert Fish Habitat Partnership.

Also last year, a staff member from this office developed and posted an outreach page on the U.S. Geological Survey website describing our office's work in the Little Colorado River in order to educate Grand Canyon river rafters about the fish they might encounter.

Our office also continued to publish "Currents," the quarterly newsletter highlighting accomplishments of the Service's Southwest Fisheries Program that is widely distributed within the agency and to external partners.

In Class
We also participated in a number of educational opportunities geared towards turning young people onto the outdoors:

- We helped host a tour of Alchesay-Williams Creek National Fish Hatchery for 35 7th and 8th graders from the Blue Ridge Junior High School Science Club.
- We gave a presentation on the Service and natural resource careers to 400 8th graders in Lake Havasu City.
- Staff participated in the "Kids in the Woods" Career Fair in Springerville, AZ hosting a booth that featured a video on the Service's mission and a touch screen trivia game of different careers available in the Service for nearly 300 students in 8th, 9th, and 10th grades.
- We also partnered with the White Mountain Montessori School, in Pinetop, to offer our first "Fish in the Classroom" project as part of the Service's "Connecting People with Nature: Ensuring the Future of Conservation Initiative."

Outdoors
Of course, the larger point of our outreach work is to get people away from their computers and televisions and to embrace the great outdoors. To that end, we were involved in a number of events in 2011:

- We participated in the 5th Annual "Woodland Wildlife Festival" in Pinetop, hosting a display that featured live Apache trout.
- At the annual Arizona Game and Fish Department's Annual Outdoor Expo in Phoenix, which was attended by more than 42,000, we hosted a booth that included live Apache trout, native fish trivia, and brochures and handouts.

- Staff from our office assisted with the annual Junior Turkey Hunter Camp hosted by the Arizona Game and Fish Department, the National Wild Turkey Federation, and Youth Outdoors Unlimited in Alpine attended by approximately 80 youth.
- Staff helped arrange and served as a panel member on Show Low's City 4 television show for an episode featuring the partnership between our office and the Show Low Library that enables youth to "check out" fishing poles, backpacks with fishing tackle, and copies of fishing regulations from the library.
- Staff represented our office at the first annual "Every Kid Counts Open High School Fishing Tournament" at Roosevelt Lake, providing fishing tackle and digital cameras as prizes.

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. At any given time, we are actively involved in many cutting edge research projects. In 2011, personnel were involved in various efforts including: leading a Bioenergetics Workshop that focused on refining an ecosystem level model that incorporates the food-base information, mechanical removal of rainbow trout, and humpback chub capture data; developing an alternative approach to evaluate possible effects on humpback chub from a proposed Fall High Flow Event in Grand Canyon; describing a mechanism that would explain many of the discrepancies among findings of relatively high trout piscivory on young-of-year humpback chub and other fishes in the Colorado River; developing and deploying remote PIT tag scanners into native fish backwaters to monitor razorback sucker and bonytail; developing a stochastic and non-stochastic model for humpback chub in the Little Colorado River to address the issue of removing humpback chub from the stream for translocations; and developing alternative control methods to remove nonnative trout from Apache trout streams.

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 on important conservation issues. Last year staff made 40 presentations at professional meetings, schools, and non-governmental group functions (Appendix D.), and we produced 32 scientific reports, non-technical reports, and stories in the media (Appendix E.).

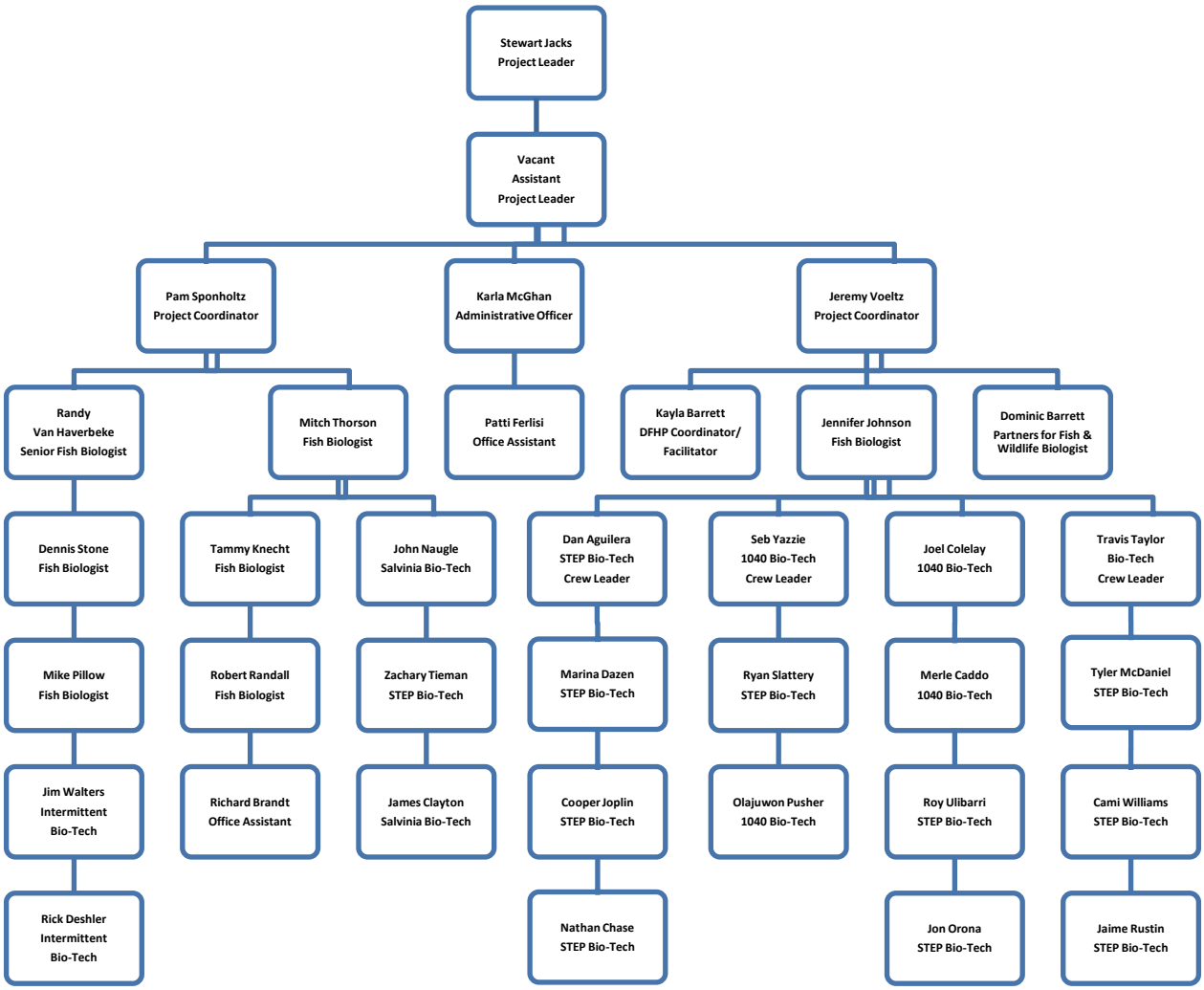
WORKFORCE MANAGEMENT

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. Last year, employees from this office completed 117 courses and taught 14.

Appendix A. AZFWCO Organizational Chart



Appendix B. AZFWCO Budget

Fiscal Year 2011 Budget: Total $1,825,008

Reimbursables $833,789
Partners for Fish and Wildlife* $220,411
Fisheries** $770,808

Fiscal Year 2010 Budget: Total $1,721,950

Reimbursables $624,685
Partners for Fish and Wildlife* $224,324
Fisheries** $872,941

Fiscal Year 2009 Budget: Total $1,713,565

Reimbursables $777,390
Partners for Fish and Wildlife* $169,012
Fisheries** $767,163

Fiscal Year 2008 Budget: Total $1,498,484

Reimbursables $607,190
Partners for Fish and Wildlife* $220,044
Fisheries** $671,250

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

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

*Partners for Fish and Wildlife funding includes: $100,000 of on-the-ground, pass-through project money for FY 2011, $100,000 for FY 2010, $56,000 for FY 2009, $112,000 for FY 2008, and $89,000 for FY 2007.

**Fisheries funding includes $116,000 of on-the-ground, pass-through project money for Fish Passage and National Fish Habitat Action Plan projects for FY 2011, $308,797 for FY 2010, $252,000 for FY 2009, $165,000 for FY 2008, and $125,000 for FY 2007.

Appendix C. AZFWCO Fisheries Operations Needs (FONS)

Project Title	**Cost**
Apache Trout Restoration	
Apache Trout Recovery (habitat and population management, APT Recovery Plan)	$200,000
Total	**$200,000**
Education and Outreach	
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**
Habitat	
Desert Fish Habitat Partnership: Desert Stream Environmental Flow Management	$58,000
Desert Fish Habitat Partnership: National Wildlife Refuges Desert Pupfish Pond	$7,000
Cottonwood Artesian Fish Introduction and Habitat Protection	$23,000
Western Native Trout Initiative: Gila Trout Restoration Streams Impacted by the Wallow Fire	$40,000
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	**$913,000**
Tribal	
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**
Native Fish	
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**
Fish Passage	
Cherry Creek Road Crossing Repair	$168,000
Evaluation of Fish Passage Projects Previously Funded and Completed in Arizona	$75,000
Total	**$243,000**
Total FONS	**$2,375,000**

Appendix D. Presentations

The following is a list of presentations given by AZFWCO personnel in FY 2011:

Barrett, D.A. 2011. Native Trout in Northeastern Arizona – Possibility of Another Native Salmonid. 2nd Annual Arizona Native Trout Workshop. Phoenix, AZ.

Barrett, D.A. 2011. Wetland Construction on Non-Federal Lands in Arizona. Tribal Wetland Restoration and Construction Workshop. Pinetop, AZ.

Barrett, D.A. 2011. U.S. Fish and Wildlife Service – Arizona Fish and Wildlife Conservation Office Tribal Training. Southwest Native American Fish and Wildlife Society Annual Meeting. Pojoaque, NM.

Barrett, D.A. 2011. Implementing the Partners for Fish and Wildlife Program in Arizona. Springerville Watershed Improvement Council Meeting. Springerville, AZ.

Barrett, D.A. 2011. Developing a Resume and Pursuing a Career as a Biologist. Career Explorations and Enhancement Workshop. Pinetop, AZ.

Barrett, K.D. 2011. Targeting Native Desert Fish Recovery and Conservation in the West: The Desert Fish Habitat Partnership. World Wildlife Fund River Restoration Meeting. Tucson, AZ.

Barrett, K.D. 2011. Targeting Native Desert Fish Recovery and Conservation in the West: The Desert Fish Habitat Partnership. River Restoration Workshop. Tucson, AZ.

Barrett, K.D. 2011. Western Fish Habitat Partnerships Data Confusion. American Fisheries Society Annual Meeting. Seattle, WA.

Barrett, K.D. 2011. Desert Fish Habitat Partnership Updates. American Fisheries Society Annual Meeting. Seattle, WA.

Jacks, L.S. 2011. The Real World of a Project Leader. Project Leader Academy. Shepherdstown, WV.

Jacks, L.S. 2011. Aquatic Nuisance Species Prevention and Control. DOI-Motorboat Operator Certification Course. Lake Havasu, AZ.

Jacks, L.S. 2011. Career and Personal Development in the U.S. Fish and Wildlife Service. Career Explorations and Enhancement Workshop. Pinetop, AZ.

Johnson, J.L. 2010. Connecting Children With Nature: Ensuring the Future of Conservation. Desert Fishes Council Annual Meeting. Moab, UT.

Johnson, J.L. 2011. Response of Apache Trout to Mechanical Removal of Brown Trout. AZ/NM Chapter American Fisheries Society-The Wildlife Society Annual Meeting. Pinetop, AZ.

Johnson, J.L. 2011. Connecting Children with Nature: Ensuring the Future of Conservation. AZ/NM Chapter American Fisheries Society-The Wildlife Society Annual Meeting. Pinetop, AZ.

Johnson, J.L. 2011. Connecting People With Nature. Show Low's City 4 Television. Show Low, 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 and Fish Department Annual Outdoor Expo. Phoenix, AZ.
Knecht, T. 2010. Successes and Failures of Renovating Two Ponds at Imperial National Wildlife Refuge (NWR). Desert Fishes Council Annual Meeting. Moab, UT.
Knecht. T. 2011. Successes and Failures of Renovating Two Ponds at Imperial National Wildlife Refuge. Colorado River Area Biologists Annual Meeting. Laughlin, NV.
Knecht, T. and R. Randall. 2011. Natural Resource Careers in the U.S. Fish and Wildlife Service. Thunderbolt Middle School Career Day. Lake Havasu City, AZ.
Pillow, M.J. 2011. Is Havasu Creek a Good Candidate Stream for Translocating Humpback Chub? AZ/NM Chapter American Fisheries Society-The Wildlife Society Annual Meeting. Pinetop, AZ.
Randall, R. 2010. Population Estimates and Water Quality Summary for Native Fish in Backwater Habitats (2009-2010). Desert Fishes Council Annual Meeting. Moab, UT.
Randall, R. 2011. Population Estimates and Water Quality Summary for Native Fish in Backwater Habitats (2009-2010). Colorado River Area Biologists Annual Meeting. Laughlin, NV.
Sponholtz, P.J. 2010. Is Havasu Creek a good candidate stream for translocating humpback chub? Desert Fishes Council Annual Meeting. Moab, UT.
Sponholtz, P.J. 2011. Humpback Chub Translocations in the Grand Canyon. American Fisheries Society Annual Meeting. Seattle, WA.
Stone, D.M. 2010. Overriding Effects of Species-Specific Turbidity Thresholds on Hoop-Net Catch Rates of Native Fishes in the Little Colorado River, Arizona. Desert Fishes Council Annual Meeting. Moab, UT.
Stone, D.M. 2011. Update on the Humpback Chub Translocation Experiment above Chute Falls in the Little Colorado River. Grand Canyon Fish Cooperators Meeting. Flagstaff, AZ.
Taylor, T. 2011. Brown Trout Removal from Three Apache Trout Streams on the Fort Apache Indian Reservation. Southwest Native American Fish and Wildlife Society Annual Meeting. Pojoaque, NM.
Taylor, T. 2011. Experiences and Advice of a Biological Technician. Career Explorations and Enhancement Workshop. Pinetop, AZ.
Thorson, M.S. 2011. An Update of 2010 AZFWCO Activities in the Lower Colorado River. Colorado River Area Biologists Annual Meeting. Laughlin, NV.
Van Haverbeke, D.R. 2010. Mark-recapture Estimates of Humpback Chub in the Little Colorado River. Desert Fishes Council Annual Meeting. Moab, UT.
Van Haverbeke, D.R. 2011. Population Status of Humpback Chub in the Grand Canyon Including the Little Colorado River. Grand Canyon Fish Cooperators Meeting. Flagstaff, AZ.
Van Haverbeke, D.R. 2011. An Overview of Humpback Chub Mark-Recapture Trips in the Little Colorado River During 2010. Glen Canyon Technical Workgroup Meeting. Phoenix, AZ.

Van Haverbeke, D.R. 2011. An Overview of Humpback Chub Translocations and Chute Falls Monitoring During 2010. Glen Canyon Technical Workgroup Meeting. Phoenix, AZ.
Van Haverbeke, D.R. 2011. Closed Population Estimates of Humpback Chub in the Little Colorado River, Grand Canyon. AZ/NM Chapter American Fisheries Society-The Wildlife Society Annual Meeting. Pinetop, AZ.
Voeltz, J.B. 2010. Lower Colorado River Basin Area Report. Desert Fishes Council Annual Meeting. Moab, UT.
Voeltz, J.B. 2011. Careers in the U.S. Fish and Wildlife Service. University of Arizona Student Recruitment Event. Tucson, AZ.
Voeltz, J.B. 2011. Status of Apache Trout Recovery. 2nd Annual Arizona Native Trout Workshop. Phoenix, AZ.
Voeltz, J.B. 2011. The Role of Wetlands in Native Fish Conservation. Tribal Wetland Restoration and Construction Workshop. Pinetop, AZ.

Appendix E. Publications

The following is a list of publications, reports, and stories published in FY 2011 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, K.D. 2011. Desert Fish Habitat Partnership, 2007 – 2010 Report. USFWS-AZFWCO-PT-11-021.

Barrett, K.D. 2011. Desert Fish Habitat Partnership Newsletter Volume 2, Number 1. USFWS-AZFWCO-PT-11-022.

Barrett, K.D. 2011. Desert Fish Habitat Partnership Newsletter Volume 2, Number 2. USFWS-AZFWCO-PT-11-029.

Jacks, L.S. 2011. AZFWCO Aquatic Nuisance Species FY2010 Activities Report. USFWS-AZFWCO-PT-11-013.

Jacks, L.S. and B. Ikenson. 2011. AZFWCO Annual Report, FY2010. USFWS-AZFWCO-PT-11-016.

Johnson, J.L. 2010. Apache Trout collection from Marshall Butte Creek. USFWS-AZFWCO-PT-11-001.

Johnson, J.L. 2010. Apache Trout collection in Boggy Creek. USFWS-AZFWCO-PT-11-002.

Johnson, J.L. 2010. Apache Trout survey on Paradise Creek. USFWS-AZFWCO-PT-11-003.

Johnson, J.L. 2010. Apache Trout collection in Wohlenberg Draw. USFWS-AZFWCO-PT-11-004.

Johnson, J.L. 2010. Apache Trout survey on Ord Creek. USFWS-AZFWCO-PT-11-006.

Johnson, J.L. 2010. Apache Trout collection in Coyote Creek. USFWS-AZFWCO-PT-11-007.

Johnson, J.L. 2010. Apache Trout collection in Firebox Creek. USFWS-AZFWCO-PT-11-008.

Johnson, J.L. 2011. Brown Trout Removal from Apache Trout Streams on the Fort Apache Indian Reservation, 2003 – 2010 Summary Report. USFWS-AZFWCO-PT-11-017.

Johnson, J.L. 2011. Apache Trout Streams Barrier Evaluations on the Fort Apache Indian Reservation, 2008 – 2010 Report. USFWS-AZFWCO-PT-11-018.

Johnson, J.L. 2011. Apache Trout Population Assessments on the Fort Apache Indian Reservation, 2007 – 2010 Summary Report. USFWS-AZFWCO-PT-11-020.

Knecht, T. 2011. Eleventh Annual Native Fish Roundup on Lake Havasu, AZ, 7-17 February 2011. USFWS-AZFWCO-PA-11-006.

Pillow, M.J. and D.R. Van Haverbeke. 2011. June 2011 Monitoring of Humpback Chub (Gila cypha) and other Fishes above Lower Atomizer Falls in the Little Colorado River, Arizona. USFWS-AZFWCO-FL-11-006.

Pillow, M.J. and D.R. Van Haverbeke. 2011. Spring 2011 Monitoring of Humpback Chub (Gila cypha) and Other Fishes in the Lower 13.57 km of the Little Colorado River, Arizona. USFWS-AZFWCO-FL-11-007.

Pillow, M.J. 2011. Havasu Creek Humpback Chub Baseline Monitoring and Translocation, June 23-29, 2011. USFWS-AZFWCO-FL-11-008.

Randall, R. 2011. Lower Colorado River Off-Channel Habitat Harvest Data. USFWS-AZFWCO-PA-11-002.

Randall, R. 2011. Lower Colorado River Off-Channel Habitat Stocking. USFWS-AZFWCO-PA-11-003.

Stone, D.M. 2010. Fall 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-11-001.

Stone, D.M. 2011. Translocation of Humpback Chub to Grand Canyon Tributaries and Related Nonnative Fish Control Activities: 2010 Annual Report. USFWS-AZFWCO-FL-11-005.

Thorson, M.S. 2011. Iceberg Canyon Pre-renovation Survey. USFWS-AZFWCO-PA-11-001.

Van Haverbeke, D.R., D.M. Stone, and M.J. Pillow. 2011. Mark-Recapture and Fish Monitoring Activities in the Little Colorado River in Grand Canyon during 2010. USFWS-AZFWCO-FL-11-002.

Van Haverbeke, D.R. 2011. Scope of Work: Little Colorado River HBC Monitoring, Lower 13.56 km, 2010. USFWS-AZFWCO-FL-11-003.

Van Haverbeke, D.R. 2011. Scope of Work: Stock Assessment and Translocation of Humpback Chub (Gila cypha) Above Atomizer Falls, 2011. USFWS-AZFWCO-FL-11-004.

Voeltz, J.B. 2010. El Coronado Ranch Habitat Conservation Plan 2010, Fish Monitoring Report. USFWS-AZFWCO-PT-11-009.

Voeltz, J.B. 2011. *Currents* Volume 6 Number 4. The Quarterly Newsletter Highlighting Region 2 Fisheries Program Accomplishments. USFWS-AZFWCO-PT-11-030.

Voeltz, J.B. 2011. *Currents* Volume 7 Number 1. The Quarterly Newsletter Highlighting Region 2 Fisheries Program Accomplishments. USFWS-AZFWCO-PT-11-031.

Voeltz, J.B. 2011. *Currents* Volume 7 Number 2. The Quarterly Newsletter Highlighting Region 2 Fisheries Program Accomplishments. USFWS-AZFWCO-PT-11-032.

Voeltz, J.B. 2011. *Currents* Volume 7 Number 3. The Quarterly Newsletter Highlighting Region 2 Fisheries Program Accomplishments. USFWS-AZFWCO-PT-11-033.

Appendix F. AZFWCO Partners

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

State Agencies
- Arizona Game and Fish Department
- California Fish and Game Department
- Nevada Department of Wildlife
- 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 Tribe

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 and Research Center

Non-Governmental Organizations
- Trout Unlimited
    - Zane Grey Chapter
    - Old Pueblo Chapter
- Federation of Fly Fishers
- University of Arizona
- Arizona State University
- Northern Arizona University
- Anglers United
- Arizona Cattle Growers Association
- National Wild Turkey Federation
- Bat Conservation International
- Southwest Region of the Native American Fish and Wildlife Society
- The Nature Conservancy
- Southwest Tribal Fisheries Commission

U.S. Fish and Wildlife Service Field Stations
- Alchesay/Williams Creek National Fish Hatchery
- Willow Beach National Fish Hatchery
- Inks Dam National Fish Hatchery
- Uvalde National Fish Hatchery
- Mora National Fish Hatchery
- Dexter National Fish Hatchery and Technology Center
- New Mexico Fish and 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

Appendix G. References

Arizona Riparian Council. 2006. Arizona Riparian Council Newsletter. Volume 19, Number 2.

Fuller, P.L., L.G. Nico, and J.D. Williams. 1999. Nonindigenous Fishes Introduced into Inland Waters of the United States. Special Publication 27. American Fisheries Society, Bethesda, MD. 613 pp.

Johnson, R. R., P. S. Bennett, and L. Haight. 1989. Southwestern woody riparian vegetation and succession: an evolutionary approach. Pp 135 - 139. In: Proceedings of the California Riparian Systems Conference. D.L. Abell (ed.). USDA Forest Service General Technical Report PSW - 110.

Rinne, J.N. and W.L. Minckley. 1991. Native fishes in arid lands: dwindling resources of the desert Southwest. USDA Forest Service, General Technical Report RM-206, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

U.S. Census Bureau. 2010. 2010 U.S. Census. Population Change Data.

U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

Arizona Fish & Wildlife Conservation Office

Our Mission:

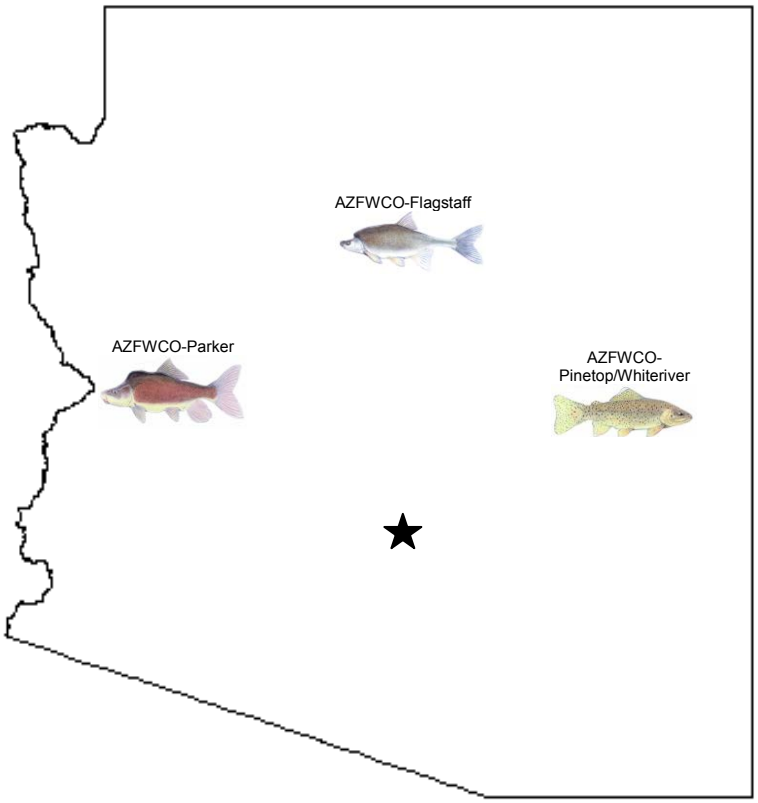
"Working with others to conserve, protect, and enhance fish and other aquatic organisms and their habitats in Arizona and the Southwest"

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
PO Box 39
Pinetop, AZ 85935
928-338-4288

AZFWCO-Flagstaff
PO Box 338
Flagstaff, AZ 86002
928-556-2124

AZFWCO-Parker
60911 Highway 95
Parker, AZ 85344



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