DESERT FISH HABITAT PARTNERSHIP

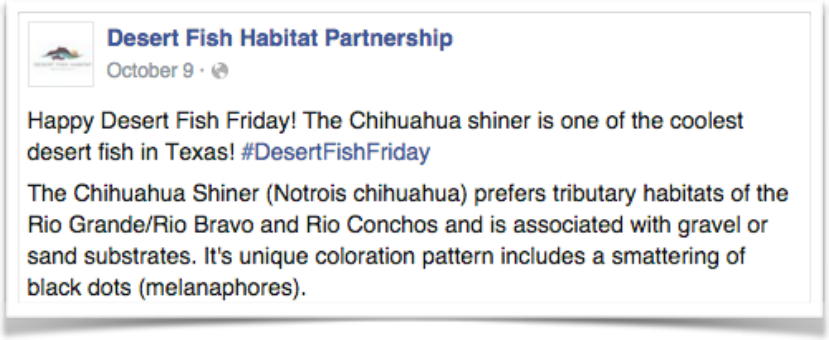
NEWSLETTER

I'M A SUCKER FOR DESERT FISH
desertfhp.org

DFHP's Has A New Look!

2015 was a big year for Desert Fish Habitat Partnership. We celebrated 10 years as a partnership and adopted a new look! We have a new logo, created new informational brochures, stickers, and more. Make sure to check out our website and let us know what you think!

Stay connected with us on Facebook and don't miss #DesertFishFriday where you will learn about desert fish and their habitats!



Conservation Assessment for Native Fish in the Colorado River Basin

By Joanna Whittier, Craig Paukert, and Nick Sievert;

Research is based on collaboration with Julian Olden, Angela Strecker, Kristen Pitts, and Thomas Pool

We applied a complementarity-based approach to develop conservation priority ranks (0 – 1; low to high) for the NHD plus V1 catchments in the Upper and Lower Colorado River basins. Although ranks were developed separately for the Upper and Lower Basins, we used the same methodology and framework so both sets of conservation priority ranks could be integrated into a cohesive unit. The purpose for developing a conservation priority data layer was to provide agencies and multi-agency partnerships with an additional tool to assist in the decision-making process for aquatic habitat conservation. This tool is based on spatial patterns in the predicted distribution of native species and threats to their persistence (i.e., non-native species, land use, and habitat fragmentation).

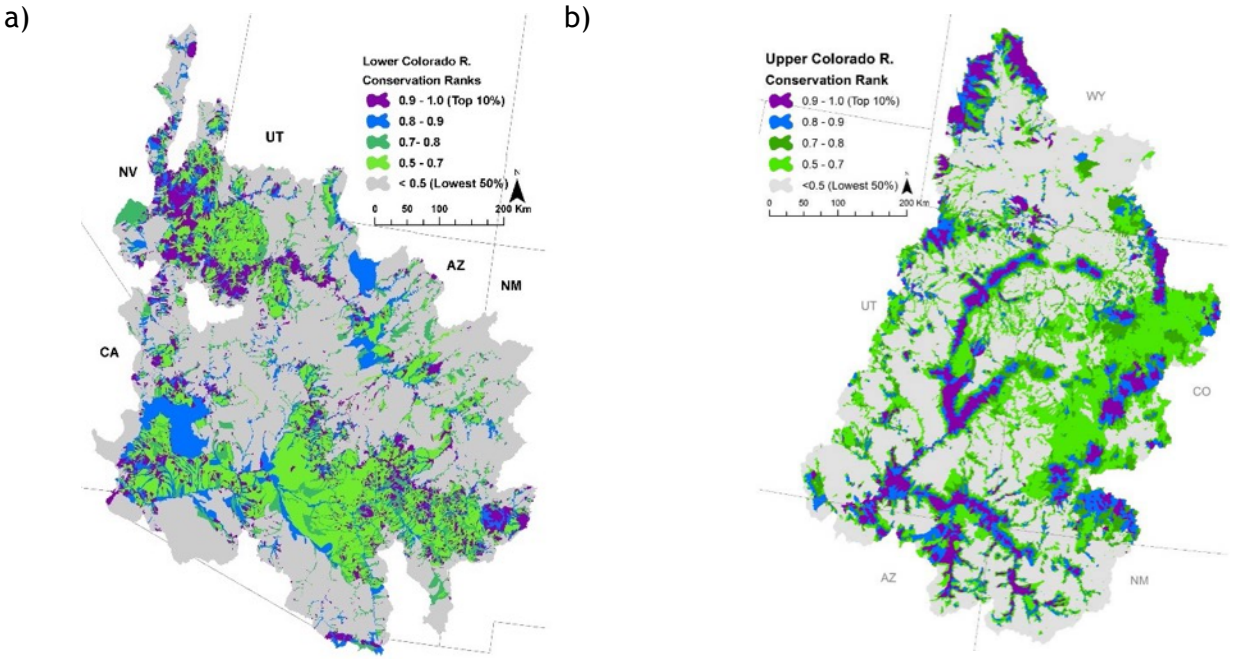


Figure 1. Map depicting the distribution of conservation priority value for catchments of the a) Lower Colorado River Basin and b) Upper Colorado River Basin. High values indicate greater potential conservation value.

Our approach incorporated an anthropogenic threat index, fish species distribution models, and other metrics (i.e., habitat fragmentation, non–native species richness) potentially impacting the conservation value of the riverscape. We developed the anthropogenic threat index based on the presence/absence of stressors known to influence the persistence of fish species. Metrics describing the topography, hydrology, land use, climate, and biogeography of the basin were used to model the predicted probability of occurrence for native and non-native species.

The conservation ranks are not meant to be used as a stand-alone tool, but instead are intended to be used in conjunction with other sources of information to aid land managers in the decision-making process regarding the strategic placement of conservation efforts. Potential uses are to: a) identify focal conservation areas, b) develop conservation strategies and c) compare/contrast factors influencing conservation value. Conservation strategies based on this information could include targeting catchment(s) with high conservation value but no legal protection for acquisition or partnerships with private land owners. Another use of this tool could be the identification of catchments for management. Catchments where native species are present, priority ranks are high, and manageable threats exist could be protected or restored using techniques such as non-native removal, habitat restoration, native species reintroduction, or land protection. Identification of threats can be accomplished using the datasets we are providing or using local knowledge. Because the Desert Fish Habitat Partnership and the Western Native Trout Initiative share overlapping geographic regions of interest, this could be used to identify regions of mutual conservation interest.

The datasets used for this conservation index can be downloaded from here and here. Reports providing more detail on the approach used can also be downloaded from these websites. Publications resulting from this research are Strecker et al. 2011, Paukert et al. 2011, and Pool et al. 2010.

Paukert, C. P., K. L. Pitts, J. B. Whittier, and J. D. Olden. 2011. Development and assessment of a landscape-level ecological threat index of the Lower Colorado River Basin. Ecological Indicators 11:304-310.

Pool, T. K., J. D. Olden, J. B. Whittier, and C. P. Paukert. 2010. Environmental drivers of fish functional diversity and composition in the lower Colorado River basin. Canadian Journal of Fisheries and Aquatic Sciences 67:1791-1807.

Strecker, A. L., J. D. Olden, J. B. Whittier, and C. P. Paukert. 2011. Defining conservation priorities for freshwater fishes according to taxonomic, functional, and phylogenetic diversity. Ecological Applications 21:3002-3013.

Note from DFHP - These assessments are now being utilized by DFHP during project ranking and prioritization. A big thank you to Joanna and the team for making this such a great tool for DFHP!

Fish crew seining in the Virgin River (AZ) and Virgin River Chub (NV). Photos by Zachary Shattuck.

Phoenix Rio Salado Audubon Center's Habitat Restoration

By Jeff Sorensen, Arizona Game and Fish Department

Recently, the Arizona Game and Fish Department's Native Fish Program worked with local Audubon Arizona staff and Wells Fargo "Green Team" volunteers to improve shoreline habitat at the Phoenix Rio Salado Audubon Center's wetland pond. The pond is a Safe Harbor Agreement-enrolled site for Gila Topminnow and Desert Pupfish. Three areas along the pond's shoreline, over-grown with cattails, were cleared to create open water habitat for the endangered fish. Ramps of paver stones and sand were also installed to help keep those areas open as nursery habitat for the native fish. Within hours, pupfish were foraging along the open shoreline ramps and moving in to lay claim on the improved real estate as nesting sites. These ramps will also make it easier for AGFD and Audubon staff to monitor the pond's fish population in the future. To learn more about this aquatic habitat improvement project, check out the video on YouTube!

Reports and Publications Highlights

Williams, R.N., D.C. Dauwalter, R.F. Thurow, D.P. Philipp, and J.E. Williams. 2014. Identifying Upper Snake River Native Fish Conservation Areas. Federation of Fly Fishers. Final Report to National Fish and Wildlife Foundation. Project #27139.

Scheerer, P.D., J.T. Peterson, and S. Clements. 2015. Distribution and Abundance of Alvord Chub in Oregon and Nevada. Northwestern Naturalist 96:118-132.

Peterson, J.T., P.D. Scheerer, and S. Clements. 2015. An Evaluation of the Efficiency of Minnow Traps for Estimating the Abundance of Minnows in Desert Spring Systems. North American Journal of Fisheries Management 35:491-502.

Cohen, Adam E., Ben J. Labay, Dean A. Hendrickson, Melissa Casarez, and Sahotra Sarkar. 2013. Final Report: Data Provision and Projected Impact of Climate Change on Fish Biodiversity within the Desert LCC. Submitted to United States Department of the Interior, Bureau of Reclamation, Desert Landscape Conservation Cooperative; Agreement Number: R11AP81527. Austin, Texas: University of Texas at Austin, November 30, 2013. 109 pages + online data. http://hdl.handle.net/2152/22475

Topminnow and Pupfish Safe Harbor Agreement Progress

By Jeff Sorensen, Arizona Game and Fish Department

Ranchers, private landowners, and local governments are helping to recover some of Arizona's endangered fishes through a Safe Harbor Agreement. State Wildlife Grant and Heritage Funds enable the AGFD to oversee and monitor landowner-enrolled sites under the Safe Harbor Agreement for Gila and Yaqui Topminnow and Desert and Rio Sonoyta Pupfish. Non-federal landowners have volunteered to host new populations of these rare fish on their property. To date, AGFD has enrolled 18 participating landowners and stocked 22 refuge ponds for conservation. Loss and degradation of natural habitat, competition and predation by non-native fish, disease and parasites have impacted these fish in the wild. These new Safe Harbor-enrolled populations help further recovery goals for these fish and provide a ready source of new fish for stocking and repatriation efforts. In addition, these fish also provide a native solution to mosquito control in local and rural neighborhoods; research has demonstrated that topminnow are just as effective as nonnative mosquitofish in preying on mosquito larvae.

News from the DLCC

✦ "Assessing the State of River Science, Water Resources Management Policies, and Water Resources Planning Tools for the Rio Grande/ Rio Bravo" is a project funded by the South Central Climate Science Center. Project PIs are Phaedra Budy, Jack Schmidt, Samuel Solis, and Sarah Null.

✦Mark your calendars - the DLCC is hosting a Rio Grande Basin Forum which will include a three day workshop (Spring 2017). Contact the DLCC for more information.

✦Visit the Desert LCC Conservation Planning Atlas

✦Don't miss the Desert LCC Webinar Series. They facilitate some great webinars like "The Rarest Fish in the World - Desert Fishes and Their Responses to a Changing Climate" and "Gila River Flow Needs Assessment". For more webinars, check out their website or YouTube channel.

✦Visit the Desert LCC website for more information.

2015 Oregon Chapter AFS Native Fish Conservationist of the Year

Congratulations to Paul Scheerer! Way to go!

Shoshone Springs Pupfish Habitat Project Selected as 2015 NFHP Waters to Watch

Shoshone pupfish are one of the most imperiled species in the Death Valley region due to their natural rarity, historic disruption of their habitats, lack of replication of the one remaining population, and genetic effects of small population size. Shoshone Spring and wetlands have been owned by one family for over 50 years. Endemic Shoshone pupfish were considered extinct by 1969, but rediscovered in a ditch near the springs in 1986. A single pond was built and stocked with 75 of these fish, believed to be the last of their kind. The purpose of the project was to construct two new additional habitats, one secluded in a mesquite bosque, and one in a landscaped tourist area. The project secured the existence of Shoshone pupfish in their native range far into the future, and will educate the public about their importance. The project quadrupled the habitat area occupied by endemic Shoshone pupfish, benefiting the entire known population in the one spring, springbrook, and spring supported riparian system where they naturally occur. The long term extinction risk of Shoshone pupfish due to stochastic factors is greatly reduced by spreading the risk among three populations, instead of one. Cumulative loss of genetic diversity due to genetic drift will be slowed or arrested by increasing the population size. Creation of a pond suitable for public viewing and interpretation in an existing ecotourism area has the ancillary benefit of promoting public and business support for conservation of pupfish, wildlife, and the environment. The pond also benefits riparian birds, waterfowl, and neotropical migrant birds. There is now a series of ponds along the original stream leading to the Amargosa River where the first pupfish were found. It also includes a pond in a public area that is landscaped with native vegetation. Walking trails have been created to guide the public to view points, and interpretive signs will soon be placed around the pond to educate residents and visitors about the pupfish, its native habitat, the importance of sustaining all endangered species, and about biodiversity. In addition to being drawn by birding and ecotourism, visitors to Shoshone Village have begun to ask "where can I see the pupfish?"

Project update from Steve Parmenter, California Department of Fish and Wildlife

At the beginning of this project, Shoshone Pupfish existed in just 25 square meters of relictual habitat in Shoshone, CA. The pupfish habitat has been increased to include 141 meters of spring brook and several new ponds. The largest of these interconnected habitats, the newly completed Bird Pond, was naturally colonized by pupfish in summer 2015. Currently the total habitat for Shoshone Pupfish is estimated to be 2,400 square meters.

Arizona Six Species of Native Fish Conservation Plan

By Jeff Sorensen, Arizona Game and Fish Department

Photo by B. Taubert

Under the Arizona Game and Fish Department's leadership, the Arizona Six Species of Native Fish Conservation Plan was finalized in August 2015. This plan outlines conservation actions and priorities for Roundtail Chub, Headwater Chub, Flannelmouth Sucker, Little Colorado River Sucker, Bluehead Sucker, and Zuni Bluehead Sucker. Since 2006, federal, state, tribal, and non-governmental organization partners worked together to implement 91% of the conservation actions in the original Six Species Conservation Agreement and Strategy. In September 2015, eight of those partners, including AGFD, reconfirmed their conservation commitments under the new plan. Arizona is one of the signatory member states to the 2006 Three Species Range-Wide Conservation Agreement and Strategy for Roundtail Chub, Flannelmouth Sucker, and Bluehead Sucker. Arizona Heritage Funds have been used to plan and implement many of the state-led actions to improve the status and distribution of Roundtail and Headwater Chub, Bluehead Sucker, and Little Colorado River Sucker. USFWS Partners for Fish and Wildlife Program funding and Arizona Heritage Funds were recently used in August 2015 to help complete renovations to the Lazy YJ Ranch Pond along the Blue River in eastern Arizona to reestablish a refuge for Eagle Creek-lineage Roundtail Chub.

Lake Powell Razorback Sucker Field Sampling

By Krissy Wilson, Utah Division of Wildlife Resources

The Utah Division of Wildlife Resources Moab Field Station in collaboration with USFWS Colorado River Fishery Project just completed its 2015 Lake Powell Razorback Sucker field sampling. This study primarily uses sampling techniques such as trammel netting, electrofishing and light trapping to monitor Razorback Suckers and other native fishes in the Colorado and San Juan arms of Lake Powell. During the last two weeks of 2015 55-day effort, biologists used several submersible PIT antennas to increase encounters of tagged fish. One antenna detected 77 individual Razorback Suckers in the 13 days it was deployed. These antennas are 1 meter in diameter and have a maximum read range of about 40 inches. To put this in context, this one antenna accounts for 20% of all Razorback Suckers encountered on Lake Powell during the 2015 effort. Pretty cool stuff!


UDWR Moab biologist B. Hines deploying a submersible PIT antenna in the Colorado arm of Lake Powell. Photo Credit: T. Francis, USFWS

Fishes of Texas Project Team Releases Version 2.0 of Website and Database

By Fishes of Texas Team, University of Texas at Austin

The Fishes of Texas Project team opened its online database to the world in 2011 and have continued to improve this award winning resource. They recently released a major update (Hendrickson, Dean A., and Adam E. Cohen. 2015. "Fishes of Texas Project Database (Version 2.0)" doi:10.17603/C3WC70. Accessed January 2016)and invite all interested to register as site users to receive updates about the project, or check the project's What's New page regularly.

The update is a significant step toward their goal of compiling, and making available to anyone with an internet connection, a comprehensive and high quality museum specimen-based database of fish occurrences covering the state of Texas going back to the mid-1800s. The project is unique in that all data have gone through time-intensive quality control, re-examination of specimens and museum documentation, data and specimen digitization, georeferencing, Species Distribution Modeling, and supplementation by recent gap sampling, all extensively documented online. Data from other states are also served, but quality control has focused on records from the state of Texas.

In Version 2, over 125,000 total records (double the size of the previous database) were made accessible along with approximately 6000 specimen images and 400 digitized field notes written at the time of collection relating details of the collection efforts that produced the specimens. The website also has many changes that improve users' experience including uploads of images, comments, and fieldnotes by registered users.

The team recognizes that more data are always better, but most applications also require high quality data. They feel that the regional and broadly collaborative data-sharing approach they promote is the best way to achieve that. They are also quick to point out the complementarity between the treasure trove of data based on specimens held in the world's vast museum collections that they already provide, and other non-vouchered types of data on the same fauna held by the general research and management community. They are now working closely with Texas Parks and Wildlife Department to provide selected fish-relevant TPWD datasets online alongside the museum-vouchered data. Look for those additional data sets here or contact the project for more information about what they are currently working on. They are also promoting the use of iNaturalist, a citizen science website where users submit photo vouchered natural history observations. Consider joining their iNaturalist project too.

Dr. Dean Hendrickson (project PI) and Dr. Doug Martin examining specimens at Tulane University.

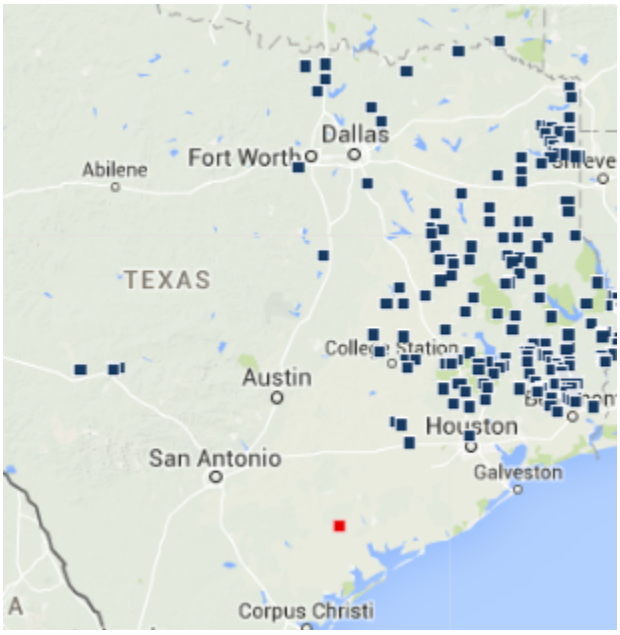
The process of data improvement will never end and they are now pleased to invite all interested persons to actively contribute by registering and uploading images and fieldnotes and commenting on any specimen or collection. They especially encourage those who have donated specimens collected in Texas to any museum to get involved with the project by proofing the data on their specimens and to consider uploading any fieldnotes and images they might have.

The data can, of course, also be further improved by continued collection and deposition of specimens in the collections that contribute data to the project. The FoTX crew is happy to accept any legally collected specimens and associated tissues into their own collection.

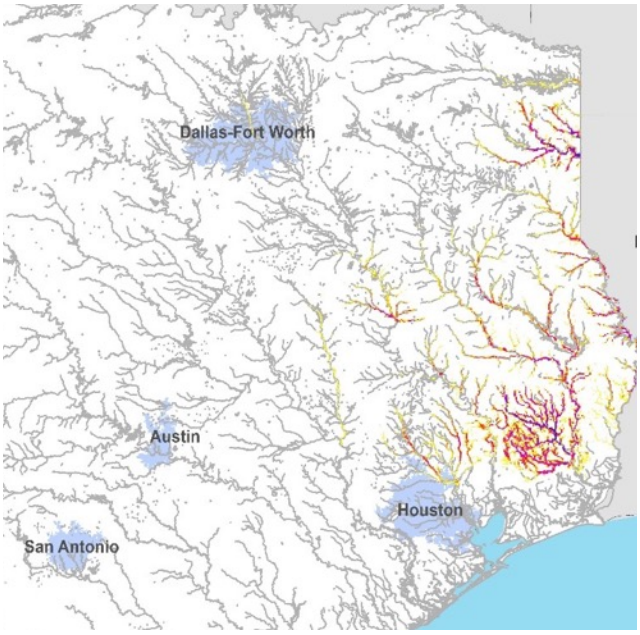
Project highlights: **42** donor institutions, **124,458** fish occurrence records, **88,090** georeferenced records, **8,427** locations, **6,234** specimen lots examined from **32** museums, **~6,000** images, **~400** field notes, downloadable Species Distributions Models for 95 species, and much more.

Website: **www.fishesoftexas.org**

Funding: University of Texas, Texas Parks and Wildlife Department, Texas Commission on Environmental Quality, and United States Department of the Interior.



Distribution map for *Minytrema melanops* from the Fishes of Texas website. Red dot indicates a "suspect" occurrence for which the team has not yet been able to examine the specimen and related original documentation.



Modeled distribution of *Minytrema melanops* from the Fishes of Texas website. Darker color indicates higher probability of occurrence. Species Distribution Models are available on the site for nearly all Texas freshwater species

Lower Weber River Diversion Project Update

By Paul Burnett, Trout Unlimited

In 2008, Trout Unlimited and many project partners were contacted by the water users on the Weber River at the mouth of Weber Canyon near Ogden, UT. The water users were faced with a challenge of maintaining their failing infrastructure on the Weber River. By engaging the fish community, the water users were able to leverage their resources to reconstruct their diversion. Likewise, the fisheries interests were able to incorporate fish passage and screening elements into the project. Unfortunately the original project, as designed, had serious flaws, which limited fish passage only to moderate flows, and the screens experienced clogging. With the continuation of this partnership and funding from the Fish Habitat Partnerships and the UDWR, we were able to retrofit important high flow passage at this site.

This shared WNTI and DFHP project was focused on securing fish passage at high flows, using Bluehead Sucker as the target species. Planning and data collection occurred on this project since 2012. Finally, in 2015, we had secured a final design and were under construction.
The fish passage design elements for this project included the construction of a vertical slot fish ladder with 6 inch drops, to maintain water velocities generally around 4 feet per second. Construction occurred in March of 2015 and was completed in April. High flows in May, 2015 exhibited that the fish ladder was operating as planned and Bluehead Suckers have been found above the structure!

YouTube Videos about Weber River Projects

Weber River Riparian Restoration

Lower Weber River Diversion North Side

Lower Weber River Diversion South Side

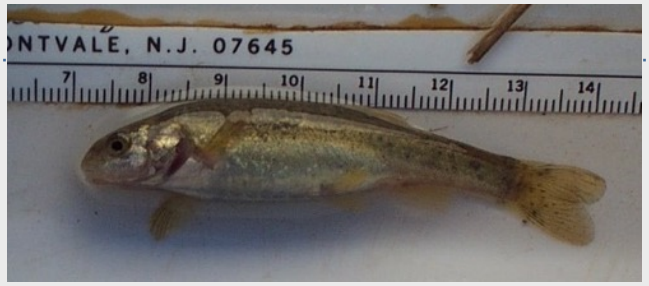
Lower Weber River Diversion Channel Reconstruction

Lower Weber River Diversion Fish Removal

Lower Weber River Diversion Fish Removal 2

Foskett Spring Speckled Dace Recovery

By Paul Scheerer, Oregon Department of Fish and Wildlife



Foskett Speckled Dace

The Foskett Spring Speckled Dace, *Rhinichthys osculus* ssp., is represented by a single population that inhabits Foskett Spring on the west side of Coleman Lake (Warner Lakes subbasin) in Lake County, south-central Oregon. Foskett Speckled Dace was listed as threatened under the federal Endangered Species Act in 1985. The Foskett Speckled Dace became isolated in Foskett Spring at the end of the Pluvial period, approximately 10,000 years ago. Foskett Spring is a natural spring that rises from a springhead pool, flows through a narrow spring brook into a series of shallow marshes, and then disappears into the soil of the normally dry Coleman Lake. A second population in Dace Spring, located approximately 0.8 kilometer south of Foskett Spring, was established in a large cattle trough in 1979-1980; however the introduction failed due to lack of suitable spawning habitat. In 1987, the U.S. Bureau of Land Management (BLM) acquired, through exchange, the 65 hectare parcel of land containing Foskett and Dace Springs. Both sites were fenced to exclude livestock.

Excavation of two pools at Dace Spring.

Oregon Department of Fish and Wildlife's (ODFW's) Native Fish Investigations Project has been monitoring the status and abundance of the population since 2005. Dace were found to be abundant (~3,000 adults) with multiple age-classes present and evidence of recent recruitment. However, we noted over time that population abundance was in steady decline as open water habitat was being lost by the encroachment of aquatic vegetation. In 2009, a cooperative project between the BLM, US Fish and Wildlife Service (USFWS), and ODFW was completed creating two permanent ponds at nearby Dace Springs. In 2013, ODFW introduced 200 dace from Foskett Spring into these ponds to reduce the risk of extinction and aid in recovery of this species. In 2014, this introduced population totaled over 500 fish. In 2012, the BLM conducted a prescribed burn in the Foskett spring marshes to restore open water habitat and hand excavated 11 open water pools. This increased open water habitat three fold and the dace population increased from ~1,800 fish in 2012 to nearly 25,000 fish in 2014. In 2015, ODFW, USFWS, and BLM signed a cooperative management agreement to manage these habitats and prevent future declines. In 2015, the USFWS completed a "five-year review" and recommended delisting the species.

Jimmy Leal (BLM) Hand excavating at Foskett Spring


Jimmy Leal (BLM) conducting BLM prescribed burn


Paul introducing Foskett Speckled Dace into Dace Spring

Photo of the Month

Photo by Sarah Robertson, Texas Parks and Wildlife Department

Manantial Roundness Minnow in the Devils River, Texas

DFHP Annual Meeting

This year's annual meeting was held in November in Las Vegas, Nevada. DFHP discussed funding, collaboration opportunities, projects, science and data needs, and education and outreach needs. Aimee Roberson joined us for the meeting to give a presentation about the Desert Landscape Cooperative and current initiatives. DFHP thanks USFWS for providing the location!

Service Recognition

Kayla Barrett

Kayla left the Coordinator position in June after her family moved to Colorado. She was a wonderful collaborator, passionate conservationist, and avid advocate for desert fish. We wish her and her family the best as they start a new adventure in Colorado!!

Jeff Sorenson

Jeff has served on the Steering Committee and as a State Co-chair representing AGFD and state agencies. He is now spending his days at AGFD as the Invertebrate Wildlife Program Manager. We will miss your insight and dedication to DFHP!

2015 DFHP Projects Funded

San Francisco River Riparian Zone Fence Project on Black Bob Allotment

The project will enhance approximately 220 acres of the river channel and riparian zone on the San Francisco River through the installation of 3.5 miles of cattle exclosure fence and the development of an upland well system. Implementation of a well system will provide alternate water sources for livestock and wildlife. The project is expected to reduce siltation, trampling of riparian vegetation and excessive nutrient input from cattle, and would improve habitat quality for native fish and other sensitive riparian species. DFHP also funded the beginning of a long term monitoring project to measure the recovery of the riparian area, stream habitat, and fish assemblage. Partners: US Forest Service and US Fish and Wildlife Service.

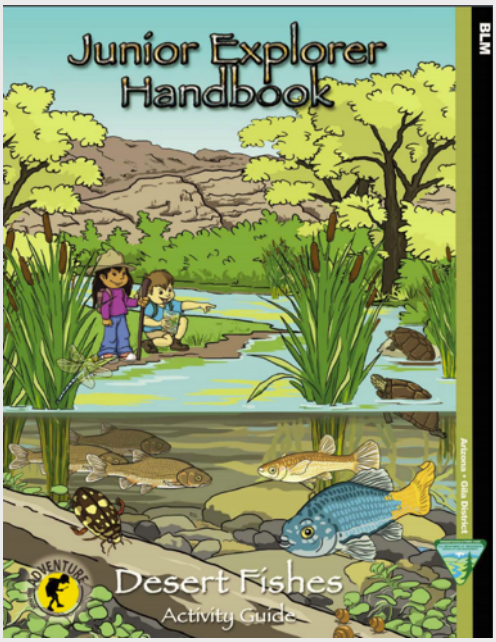
Streambank along the San Francisco River that will benefit from the fence and alternate water sites.

Restoration of the Five Springs Complex on Ash Meadows National Wildlife Refuge

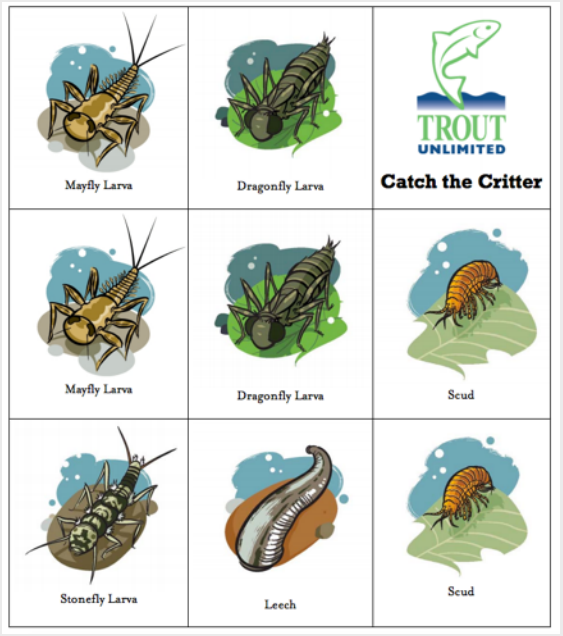
This project will restore natural hydrologic connectivity between the Five Springs complex and outflow habitats downstream to address direct threats of small population size and genetic isolation of Ash Meadows Amargosa Pupfish. Restoration of natural floods will restore vital ecosystem dynamics currently hindered by a road and fallow field; this restoration will benefit the pupfish, Ash Meadows Speckled Dace, and biodiversity. The proposed activities are a priority of the Ash Meadows Recovery Implementation Team and Draft Genetic Management Plans for the listed fish. Partners: Ash Meadows National Wildlife Refuge, Nevada Department of Wildlife, US Geological Survey, Southern Oregon University, The Great Basin Institute, and Dr. Andrew Martin.

Desert Fish Educational Materials

Here is a selection of resources to use the next time you have a youth education and outreach event (click on title below resource to visit webpage). Please contact us if you have materials, resources, or links to add to the list!

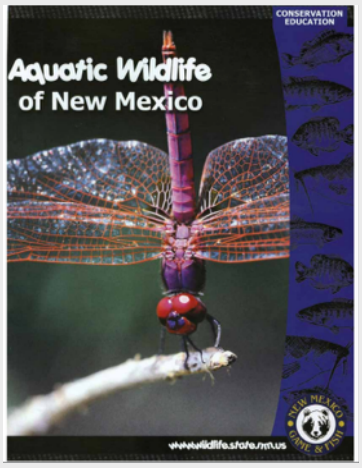


Published by the BLM



Published by Colorado Trout Unlimited

Texas Parks and Wildlife



New Mexico Game & Fish

Nevada Department of Wildlife

Sharing Tails: A State-Wide Public Outreach Program Teaching Children About Native Arizona Fish

Stream Explorers by Colorado Trout Unlimited

Contact Us!

Coordinator - a new coordinator will be joining DFHP this February. Stay tuned to meet them!

State Co-Chair and Rio Grande Representative
Megan Bean
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Parting Shot

Fish, amphibians, mussels, and bugs aren't the only cool things you can find in rivers. This carnosaur track was found in a river bed. Thanks C. Gardiner (Texas) for sharing the photo!

Protect. Restore. Enhance.

Desert Fish Habitat Partnership conserves native desert fish by protecting, restoring, and enhancing their habitats. Our partnership engages state and tribal fish and wildlife agencies, federal resource agencies, research and private organizations, and interested individuals.