



Our Stories

Southwest Science Applications

Interagency Cooperation Helps Save Arizona's Apache Trout

State Fish Steadily Recovers Despite Complex Set of Challenges

There's a fish tale out of Arizona that tells a remarkable story of restoration for the threatened Apache trout. It's a story worth telling because it serves as a model of how effective public-private partnerships and the Strategic Habitat Conservation approach are contributing to successful recovery of a species. And it's the kind of story that bodes well for further successes elsewhere under the Endangered Species Act.

This particular tale also has the virtue of being true; the opposite of the proverbial "one that got away," this is the story of "one that didn't get away."

The story begins with U.S. Fish and Wildlife Service, which has stewardship responsibilities for wildlife living on millions of acres in many of Arizona's most wild and scenic places. Tasked with the challenge of reversing trends that have pushed species to the brink of extinction, the Service, in partnership with a Native American tribe and state and federal agencies, collaborated to rescue the once-endangered (now threatened) Apache trout in the White



Photo Credit: Craig Springer/USFWS. The Apache trout, Arizona's official state fish, was one of the first species to be federally listed as endangered. Since then its status has been upgraded to threatened.

Mountains of Arizona.

A Strategic Approach

At the heart of this project's success is a conservation approach known as Strategic Habitat Conservation (SHC). This approach uses biological planning, conservation design, conservation delivery, and assumption-based monitoring and research in a feedback loop to achieve shared biologically-based conservation goals.

Working with its partners in the initiative, the Service defined biological objectives for the species, and identified what water and habitat management practices were needed to achieve those objectives. Using information gathered through collaborative scientific monitoring, partners have successfully brought Apache trout very close to delisting under the Endangered Species Act.

Arizona's official state fish, the Apache trout (*Oncorhynchus apache*), can only be found in deep, cool streams that flow

down the high country of the White Mountain Apache homelands in eastern Arizona. For thousands of years this trout occupied 600 miles of streams in the headwaters of the Salt and Little Colorado rivers. But due to overfishing and habitat infringement, by the 1940s the trout was found in only 30 miles of streams.

"The White Mountain Apache Tribe had recognized that the populations were declining in the 1950s and began to take conservation action before the Endangered Species Act was even passed," said Service Fish Biologist and Project Coordinator Jeremy Voeltz. "They closed areas to angling and to the public. They quit stocking non-native trout species and stopped cutting forests that were surrounding these streams," he said.

Despite the Tribe's efforts, the Apache trout's status continued to be perilous, and by 1969 it became one of the first species to be federally listed as endangered.

Progress Through Partnership

Following the listing of the species, collaboration efforts took shape when the Arizona Game and Fish Department, the White Mountain Apache Tribe, the Service and the USDA Forest Service established the Apache Trout Recovery Team. The team's mission required a strategy that laid out a recovery and long-term survival plan for the Apache trout in its historic range.

Using the "conservation design" step in the SHC process, the team identified key habitat areas for Apache trout protection. The team put up fencing along stream banks, worked with ranchers to modify livestock grazing practices and built fish barriers in those areas. "The goal was to use those structures to create artificial dams that prevent the brown or rainbow trout that are downstream from swimming upstream," explained Voeltz.

Barriers were designed to ensure recovery and survival of Apache trout. The goal was to preclude interbreeding with closely related rainbow trout, which causes dilution in the genetic stock. The team monitored results, and realized their management actions were bearing results. By late 1975, the recovery team's conservation work led

to the Apache trout being down-listed from endangered to threatened. The objective for the recovery team, and for the tribal, state, and federal entities that support recovery, was to have the Apache trout completely delisted, which the team defined as when 30 self-sustaining populations exist in their native waters.

Continuing their efforts to achieve that goal, the team identified other key streams to implement conservation actions. Scientific monitoring from Crooked Creek in 2006 revealed that brown trout outnumbered Apache trout nearly three to one. "Our conservation plan and design included restoration that required the mechanical removal of brown trout in several streams," said Voeltz.

By 2011 that ratio had radically changed to more than 53 to one in favor of Apache trout in Crooked Creek. The recovery team was able to successfully test their hypothesis that Apache trout population would respond positively when the brown trout were removed.

"The current Apache trout recovery strategy fits very nicely in the SHC approach of planning, design, delivery, and monitoring," said Voeltz. "For instance, biological planning guided the

recovery partners to create the 2008 business plan with the National Fish and Wildlife Foundation (NFWF) that outlines desired outcomes over the next ten years and beyond. NFWF now provides significant funding to implement these conservation programs designed to meet objective criteria over time. And finally, the Service's five year review in 2010 evaluated the monitoring data and showed that our initial biological assumptions were being met, something we expect to continue to see into the future."

Voeltz, who is part of the team, said, "we were pretty close (to achieving 30 self-sustaining populations) toward the end of 2010 and then the Wallow Wildfire in 2011 impacted some of our recovery populations and so we're evaluating the overall effects from the fire and what that's going to mean for the timeline."

The Wallow Wildfire was the largest fire in Arizona history, burning over 841 square miles in eastern Arizona and western New Mexico. The fire, believed to have been caused by an abandoned campfire, consumed over 522,000 acres in the White Mountains—home to the Apache trout.

While the fire delayed the delisting of the Apache trout, Voeltz says the project continues to move forward and the recovery team is working on creating a new timeline.

A Fish of Many Values

Apache trout also play an important cultural and economic role, and is a key recreational focus for the White Mountain Apache Tribe and the state of Arizona. The Strategic Habitat Conservation approach helps support these objectives as well. Specific goals are delineated for recreational populations, separately managed from the populations protected in species recovery areas. Hatchery production is utilized as the major tool to support fisheries at those recreational sites, adapting stocking rates and times to address changing conditions and management goals that consider both short-term and long-term variables.

The Alchesay-Williams Creek National Fish Hatchery on the White Mountain Apache Reservation supports captive production of Apache trout. With data and feedback from federal, tribal and state agencies, the fish hatchery produces eggs, and hatches and raises catchable-sized Apache trout. Several



Photo Credit: USFWS. Afterburn of the Wallow Fire. Recovery partners were close to meeting the objectives for declaring the Apache trout recovered when in 2011 the largest wildfire in Arizona's history tore through some of the fish's primary habitat. Biologists are evaluating the impacts and adapting their restoration efforts so they can reach the recovery goal of 30 self-sustaining Apache trout populations.

million Apache trout have been nurtured and stocked in the nearby streams for recreational fishing. It's a success story for both conservation of the species and economic development for the Tribe, allowing the creation of jobs and revenue from recreational tourism.

According to Voeltz, the Apache trout plays an important part in the overall ecology puzzle. "It is the only native trout found in that part of Arizona, the only place in the world where Apache trout exist and it is part of the food chain as a prey for birds and mammals and as predator of insects and small creatures. And like the Apache people, the Apache trout have existed in this area since time immemorial."

Using biological planning, conservation design, conservation delivery, and assumption-based monitoring and research—the main components of the Strategic Habitat Conservation approach—has also enabled other success stories such as the Tennessee purple coneflower and the Lake Erie watersnake. Both these species are now flourishing and have been removed from federally endangered and threatened lists. ♦ *By the USFWS Southwest Region Fisheries and Science Applications Programs*



Photo Credit: Craig Springer/USFWS. Apache trout eggs in jars at the Alchesay-Williams Creek National Fish Hatchery Complex in Whiteriver, AZ.

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