

by Linda Andreasen and
Craig Springer

Hatcheries Promote Fish Recovery



**Dexter National Fish Hatchery and
Technology Center**
USFWS photo

The FWS Fisheries Program comprises a nationwide network of National Fish Hatcheries, Fish Technology Centers, Fish Health Centers, and Fishery Resources Offices. Together, these facilities provide a wealth of expertise in fish restoration and recovery. The National Fish Hatchery System currently assists in the recovery of 33 listed species. Fishery Resource Offices work closely with hatcheries, recovery teams, and other partners to develop and implement captive propagation programs, monitor reintroduced and wild populations, and assess and restore habitat. Fish Technology Centers and Fish Health Centers provide technical support to produce healthy and genetically appropriate fish, evaluate stocking programs, and assess wild fish population health.

Over the past decade, the number of fishes listed as threatened or endangered has nearly doubled to 112, comprising nearly 25 percent of the all listed animal species in the United States. In the past 100 years, 3 genera, 27 species, and 13 subspecies of North American fishes have become extinct. A recent paper in the journal *Conservation Biology* projects the future extinction rate to be 4 percent per decade for North American freshwater fauna, suggesting that North America's temperate freshwater ecosystems are being depleted as rapidly as tropical forests. As the number of imperiled fish species has increased, so has the development of innovative partnerships and programs to reverse these disturbing trends.

A Conservation Tool

Captive propagation is perhaps most familiar through the reintroductions of such species as the whooping crane (*Grus americana*), red wolf (*Canis rufus*), and California condor (*Gymnogyps californianus*). This same tool has great utility in aquatic resource conservation and is gaining increasing recognition by groups such as the World Conservation Union, which recently added both a Captive Breeding and a Reintroduction Specialist Group to its Species Survival Commission.

The success of captive propagation for recovery depends upon a number of things, including careful genetics planning and management, concurrent habitat restoration, thorough evaluation studies—and funding. Propagation of imperiled fish species is often more than twice as costly as rearing non-native game fish due to genetic analyses, and special diet requirements and rearing

conditions that enhance survival in the wild. Such programs often represent long-term investments, with a number of years between stocking and the return of adult fish to spawning grounds. Further complicating matters are factors such as range-wide variability in habitat conditions that can affect survival. Despite the challenges, success stories that go beyond the realm of “fish tales” are growing and showcase the National Fish Hatchery System's dedication to good science and management.

National Fish Hatchery Role

The Fish and Wildlife Service's (FWS) National Fish Hatchery System has made impressive contributions to the restoration and recovery of imperiled fish populations through the development of captive propagation and holding techniques. Many of the species now in FWS hatcheries have never been cultured and require the development of special diets and state-of-the-art holding and propagation techniques. The Dexter National Fish Hatchery and Technology Center in New Mexico and other facilities have developed captive rearing techniques for some of our nation's rarest and most unique fish species, including the Colorado pikeminnow (*Ptychocheilus lucius*), an endangered minnow that grows to nearly 6 feet (2 meters) in length, the Gila topminnow (*Poeciliopsis occidentalis*), arguably among the rarest fish in the world, threatened native game fish such as the Apache and Gila trout (*Oncorhynchus apache* and *O. gilae*, respectively), and the pallid and shortnose sturgeons (*Scaphirhynchus albus* and *Acipenser brevirostrum*, respectively). Forty-two Fish Technology

Centers, Fish Hatcheries, and Fish Health Centers are working together with Fisheries Resource Offices, endangered species biologists, other Federal agencies, the States, academia, and the private sector to restore 58 imperiled aquatic species. Here are some of the fish recovery highlights:

Apache Trout

Of the many species of sport fish in North America, the threatened Apache trout is among the rarest. With the Service's help, however, the Apache trout truly has rebounded. Since 1983, the Alchesay-Williams Creek National Fish Hatchery complex, located on the Fort Apache Indian Reservation, has produced several million Apache trout for sportfishing, while the Arizona Fishery Resources Office restores habitat for wild populations. The Arizona Game and Fish Department depends on the expertise of FWS hatchery personnel to produce this difficult to rear native species for the State's stream restoration projects on National Forest lands. (See "Apache Trout: On the Brink of Recovery" in *Bulletin* Vol XXIV, No. 4).

Meanwhile, the White Mountain Apaches and Arizona Fishery Resource Office have built barriers to protect Apache trout from invasions of non-native fish and have restored habitat through riparian revegetation, livestock enclosures, and non-native fish removal. To keep fish disease in check, fish health biologists at the FWS Pinetop Fish Health Center monitor wild Apache trout populations and frequently inspect Alchesay-Williams Creek NFH for disease pathogens. The most recently renovated and stocked population marks number 29 of 30 populations needed to declare recovery. "After three decades, we're happy to see this fish return to its native habitat," says Daniel Parker, a White Mountain Apache tribal member and biologist with the FWS Arizona Fishery Resources Office. "When we establish just one more stream population, we could make history."

Greenback Cutthroat Trout

The greenback cutthroat trout (*Oncorhynchus clarki stomias*), native to high-elevation streams in Colorado, is another example of coordinated recovery efforts and successful reintroduction by the FWS and our partners. When the greenback was listed as endangered in 1973, only 2 or 3 remnant populations totaling 1,000 fish remained. To begin recovery, State, Tribal, and Federal biologists developed a recovery plan that included captive propagation. A broodstock was established at the Bozeman Fish Technology Center in Montana. Streams were cleared of non-native fishes and barriers were built to prevent their reinvasion. Already, 23 self-sustaining populations of greenback cutthroat trout have been recovered and the species has been reclassified to the less critical category of threatened. The greenback is expected to be proposed for delisting within the near future.

Gila Topminnow



Photo by Jim Johnson

A network of desert springs known as Bylas Springs, lying adjacent to the Gila River on the San Carlos Indian Reservation in Arizona, was once home to a thriving population of Gila topminnows. In the early 20th century, the springs became overrun with non-native mosquitofish, which were introduced for mosquito control, and choked with salt cedar trees (*Tamarix* spp.), introduced to stabilize embankments. The native Gila topminnow, once one of the most common fish in southern Arizona, had become one of the most endan-

gered vertebrates in the U.S. But, with the help of Dexter National Fish Hatchery, fish from 2 of the 11 remaining natural populations of the Gila topminnow have been reintroduced successfully into restored habitat in Bylas Springs. This project is part of ongoing efforts by the Service and its partners to restore the Gila River watershed, primarily through riparian restoration, and it will benefit the entire ecosystem, from fish and snails to reptiles, birds, and mammals.

The Gila topminnow has now been reintroduced into more than 20 historic sites, with others under consideration. The success of this project has depended upon partnerships. The San Carlos Apache Tribe granted access privileges, support, and equipment; the Dexter National Fish Hatchery held and propagated genetically appropriate Gila topminnows for reintroduction; and the Arizona State University and Arizona Department of Game & Fish provided expertise and assistance with surveys. The FWS Arizona Fishery Resources Office, using expertise from our Hatcheries and Ecological Services programs, designed this habitat restoration and reintroduction project. Continued restoration this year will be funded, in part, by EPA.

Our hatchery system provides a valuable management tool for the conservation of imperiled fishes. But that tool can only be successful with concurrent habitat restoration and sound scientific management—true keys to the success of any restoration or recovery program.

Linda Andreasen is a Fishery Biologist with the Division of Fish Hatcheries in the FWS Arlington, Virginia, headquarters office. Craig Springer is a Fishery Biologist with the Division of Fisheries in the FWS Albuquerque, New Mexico, Regional Office.