Hatcheries Promote Fish Recovery

Over the past decade, the number of fishes listed as threatened or endangered has nearly doubled to 112, comprising nearly 25 percent of 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

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.
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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.”

Apache Trout
Of the many species of sport fish in
North America, the threatened Apache
tout is among the rarest. With the
Service’s help, however, the Apache
trot 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 Recov-
ery” 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
exclosures, and non-native fish removal.
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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 reintro-
duction 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 estab-
lished 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
A network of desert springs known
as Byas Springs, lying adjacent to the
Gila River on the San Carlos Indian
Reservation in Arizona, was once home
to a thriving population of Gila topmin-
nows. 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.), intro-
duced 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 remain-
ning natural populations of the Gila
topminnow have been reintroduced
successfully into restored habitat in
Byas 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 de-
pended 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 Hatch-
eries 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 Albu-
quereque, New Mexico, Regional Office.