

ENDANGERED *Species* BULLETIN

February 2007

Vol. XXXII No. 1



For over a century, the Fish and Wildlife Service has played a vital role in conserving America's fishery resources. In 1871, Congress established what is now known as the National Fish Hatchery System. Its original purpose was to provide domestic food fish to replace declining native fish. Over the past 30 years, in the face of increasing demands on aquatic systems and growing environmental threats to those systems, the mission of the National Fish Hatchery System expanded and diversified. In addition to restoring native fish populations, mitigating for fisheries lost as a result of federal water projects, and providing fish to benefit tribes and national wildlife refuges, the system has a unique responsibility in helping to recover various aquatic species listed under the Endangered Species Act.

ENDANGERED *Species* BULLETIN

Telephone: (703) 358-2390
Fax: (703) 358-1735
E-mail: esb@fus.gov

Web site:
www.fus.gov/angered/bulletin.html

Editor
Michael Bender

Editorial Assistance
Ann Haas

Layout
Dennis & Sackett Design, Inc.

Contributors
Stuart C. Leon
Jeff M. Finley
Craig Springer
Richard Shelton
Wade Fredenberg
Mark Maskill
Yvette Converse
Tom Brandt

On the Cover

Photographed in a clear, shallow stream, this Lahontan cutthroat trout displays its lateral line, which is a sensory organ used to detect movement in the surrounding water.

© Michael Graybrook



The *Endangered Species Bulletin* is now an on-line publication. Three electronic editions are posted each year at www.fus.gov/angered/bulletin.html, and one print edition of highlights will be published each year. To be notified when a new on-line edition has been posted, you can sign up for our list-serv by clicking on "E-Mail List" on the [Bulletin web page](#).

The *Bulletin* welcomes manuscripts on a wide range of topics related to endangered species. We are particularly interested in news about recovery, habitat conservation plans, and cooperative ventures. Please contact the Editor before preparing a manuscript. We cannot guarantee publication.

The *Bulletin* is reprinted by the University of Michigan as part of its own publication, the *Endangered Species UPDATE*. To subscribe, write the *Endangered Species UPDATE*, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI 48109-1115; or call (734) 763-3243.

Please send us your comments and ideas! E-mail them to us at esb@fus.gov.

IN THIS ISSUE

- 4 The National Fish Hatchery System
- 6 A Living Fossil Fights for Survival
- 10 The Return of a Lake-dwelling Giant
- 12 Hatcheries are for More Than Fish
- 14 Apache Trout: Swimming Towards Recovery
- 16 The Texas Blind Salamander
- 18 National Fish Hatchery System Facilities
- 20 The "Running of the Bulls" at Creston NFH
- 22 Mora NFH&TC Brings Gila Trout Closer to Recovery
- 24 Mussels Enjoy the Waters of White Sulphur Springs
- 26 Hatchery Breeds Wyoming's Rarest Toad
- 28 The Science Behind Fish Nutrition
- 30 Mussels on Road to Recovery at Genoa NFH
- 32 Diet Research for the Shortnose Sturgeon
- 34 Fountain Darter Parasites and Conservation

The Return of a Lake-dwelling Giant

by Craig Springer



Craig Springer/USFWS

A Lahontan cutthroat trout photographed in a shallow stream. In its lake habitats, Lahontan cutthroat trout can grow to larger than 60 pounds.

Jay Bigelow holds a male Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), one about three years old and 16 inches (40 centimeters) long, and admires the sunlight reflecting off the black-spotted silvery-white flanks. It's part of a unique brood stock he's developing. Bigelow supervises operations at the Lahontan National Fish Hatchery in Gardnerville, Nevada, on the banks of the Carson River. The hatchery is part of a larger integrated fisheries complex that includes the Nevada Fishery Resources Office and Marble Bluff Fish Passage Facility. These stations coordinate programs to plan and implement the recovery of the threatened Lahontan cutthroat trout.

One of 13 cutthroat trout subspecies in the American West, this fish evolved in ancient Lake Lahontan, which at its

maximum size inundated about 8,600 square miles (22,300 sq. kilometers) of northwestern Nevada and parts of surrounding states. As glaciers retreated at the end of the last ice age, an attendant climate change dried the basin, and Lake Lahontan receded to form the few isolated lakes found today. With gradual climate change, the Lahontan cutthroat trout developed into a fish able to withstand environmental extremes that today readily kill other fish species. Two forms of the Lahontan cutthroat arose: one accustomed to life in flowing waters; the other, a lake-dweller.

Pyramid and Walker lakes at the bottom of the present-day basin held native Lahontan cutthroat trout. These are terminal lakes, meaning that water leaves them only by evaporation. As a result, their mineral content is extremely high.



© Michael Graybrook



Hatchery Supervisor Jay Bigelow feeds the facility's Lahontan cutthroat trout.

Lahontan cutthroat trout not only tolerate this condition, they evolved to thrive in it. These lake-form fish had other remarkable adaptations. The numbers of cartilaginous filaments or gill rakers inside their throat are exceedingly high, indicating a habit of feeding on microscopic animals. The fish also has a digestive track for preying on fish. For eons it was atop the food chain, wreaking havoc on fish like the cui-ui (*Chasmistes cujus*) and tui chub (*Gila bicolor*), and most likely cannibalizing its own. In its lake habitats, the Lahontan cutthroat trout grew to phenomenal size. The largest known specimen tipped the scale at 62 pounds (28 kilograms) in 1916.

In 1905, the Bureau of Reclamation's first water development project, the Newlands Project, altered water availability and flow to Lahontan cutthroat trout. Pyramid and Walker lake levels dropped as farmers diverted water to irrigate fields, and fish lost their access from Pyramid Lake to their spawning gravels in the Truckee River. Due to

a lack of available spawning habitat, Pyramid Lake was devoid of the trout by 1939. Although reduced numbers of river-dwelling Lahontan cutthroat trout remained, the native strain of lake-dwelling trout that carried the genes for tremendous growth in the face of harsh conditions appeared to be extinct.

At some point in the past, trout were transferred from Pyramid Lake into a small fishless stream, Morrison Creek, on Pilot Peak in Utah, an event that proved priceless for conservation. When and by whom the transfer was made is unknown. Fast forward to the 1970s. As a precaution against extinction, Bryce Nelson of the Utah Department of Natural Resources later transferred some of the Morrison Creek fish to nearby fishless Bettridge Creek on Bureau of Land Management lands. Genetic studies commissioned by Lisa Heki, Project Leader of the integrated Lahontan NFH Complex, and conducted by Dr. Mary Peacock, University of Nevada-Reno, found that the fish surviving in the Utah

streams are pure representatives of the original lake-dwelling form of Lahontan cutthroat trout.

Through Heki's 12 years of recovery work, the Lahontan National Fish Hatchery has moved from a focus on a short-term put-and-take sport fishery to a facility centered on the recovery of a native threatened species, but one with even greater sport fishing qualities. Heki is optimistic. "Yes, it can be done, and quicker than people believe—if there is cooperation," she says. "Twenty years down the road, we could have 20- to 30-pound cutthroat trout running the river right through downtown Reno."

Building brood stocks from wild fish takes time. Bigelow and crew carefully manage the brood stock to maintain a robust line and genetic integrity. To "keep the wild in the fish," fertilized eggs from Morrison Creek trout are brought to the hatchery and infused into the brood stock. The hatchery complex has a willing and able partner in Steve Douady, a conservation-minded citizen who owns the land over which Morrison Creek flows.

In 2001 the hatchery achieved success in its hatching efforts, and in 2004 the hatchery placed 13,197 fish into Pyramid Lake. There they are expected to significantly contribute to the recreational fishery managed by the Paiute Indian tribe.

The hatchery continues to meet rigorous demands for fish health. Some of the fish will be stocked in California's Fallen Leaf Lake and perhaps in Lake Tahoe. The fish culture expertise will be applied as eggs are incubated at the Marble Bluff Fish Passage Facility, located near the terminus of the Truckee River above Pyramid Lake. To imprint the young fish on the river water and get the adults to swim back through the passage into the Truckee to spawn, the eggs will be incubated in Truckee River water. It will be a few years before success can be measured, but now this unique fish has a real chance for recovery.