In this issue

**Swimming upstream**

San Juan River Basin Recovery Implementation Program
Upper Colorado River Endangered Fish Recovery Program

Bringing the endangered razorback sucker back from the brink of extinction

**Historically,** the razorback sucker (*Xyrauchen texanus*) was widespread and abundant in the Colorado River and its tributaries, but today wild populations are extremely rare. The razorback sucker is a unique fish with an abrupt, sharp-edged hump behind its head and the only member of the genus *Xyrauchen.*

The razorback sucker is a large river fish found only in the Colorado River Basin. Since the early 1900s, the installation of dams, the removal of water for human use and the introduction of non-native sport fish have changed the character of the Colorado River. The effects of these changes have contributed to the decline of this, and three other endangered fish species that exist nowhere else on earth — humpback chub (*Gila cypha*), bonytail (*Gila elegans*) and Colorado pikeminnow (*Ptychocheilus lucius*).

The razorback sucker was listed as endangered and given full protection under the Endangered Species Act in 1991. Razorback suckers can live for more than 40 years and grow to over three feet in length. The fish has a dark, brownish-green upper body with a yellow- to white-colored belly. Adults have a dark, brownish-green upper body with a yellow- to white-colored belly. Adults can reproduce at 3- to 4-year age. Playing an important ecological role, razorback suckers eat insects (including fly and mosquito larvae), plankton and decomposing plant matter on the bottom of the river.

**Life history**

The razorback sucker evolved in warm-water reaches of larger rivers of the Colorado River Basin from Wyoming to Mexico 325 million years ago. To complete its life cycle, the razorback sucker moves between adult, spawning and nursery habitats. Spawning occurs during high spring flows when razorback suckers migrate to cobble bars to lay their eggs. Larvae drift from the spawning areas and enter backwaters, or floodplain wetlands that provide a nursery environment with quiet, warm and shallow water.

Research shows that young razorback suckers can remain in floodplain wetlands where they grow to adult size. As they mature, razorback suckers leave the wetlands in search of deep eddies and backwaters where they remain relatively sedentary, staying mostly in quiet water near shore. In the spring, razorback suckers return to the spawning bar, often quite a long distance away, to begin the life cycle again.

**Colorado River Basin**

The Colorado River Basin is divided into upper and lower basins at Levee Ferry, Ariz. Fishery habitats are extremely varied, ranging from high mountain streams to red rock canyon walls in northern areas, to large mammal reservoirs and warm, turbulent, swift-flowing reaches with shifting sand and mucky borders in southern portions.

**Recovery efforts show success**

Partnerships of local, state and federal agencies, American Indian tribes, water and power interests, and environmental groups are working to conserve and recover the endangered fishes. The Upper Colorado River and San Juan River Basins Endangered Fish Recovery Programs span rivers in Colorado, Utah, Wyoming and New Mexico. The Lower Colorado River Basin (Lower Basin) encompasses portions of Arizona, Nevada and California and includes Lake Mohave, Lake Mead and Lake Havasu. Efforts to conserve rare species in the lower basin are managed primarily by the Lower Colorado River Multi-Species Conservation Program and the Lake Mohave Native Fish Work Group. The goal is to achieve natural, self-sustaining populations that no longer require protection under the federal Endangered Species Act.

This major undertaking involves restoring and managing stream flows and habitat, boosting wild populations with hatchery-raised endangered fish and reducing negative interactions with certain nonnative fish species. These actions include:

- Managing water to provide adequate instream flows to create beneficial water flow. Water resources are managed in accordance with state water laws, individual water rights and interstate compacts. Actions include water leases and contracts, coordinated water releases from upstream reservoirs, efficiency improvements to irrigation systems and reoperation of federal dams and reservoirs.
- Construction projects to improve river habitat. Fish passages and screens are in place at nearly all major diversion dams on the Upper Colorado, Gunnison and San Juan rivers, providing endangered fish with hundreds of miles of critical habitat. The programs are working to complete the few remaining fish screens and passages needed in the Upper Colorado River and San Juan River basins. A total of 2,700 acres of flood plain wetlands have been restored in the upper Colorado River system.
- Throughout 2007, six ponds were constructed in the Colorado River Basin from Wyoming to Mexico, half of the 60 ponds approved for construction in 2003. The ponds, total more than 80 surface acres, are being stocked with razorback suckers as well as bonytails. These will be managed as a native fish refuge.
- Relocating endangered fish populations through propagation and stocking. Hatchery facilities and multiple reservoirs can maintain genetic quality and age structure and produce the fish to restabilize wild razorback sucker populations. Since 1994, about 162,300 razorback suckers have been stocked in the Upper Colorado River system, and since 1994, about 48,300 razorback suckers have been stocked in the San Juan River from 1997 to the present, about 90,000 razorback suckers have been restablized in the Colorado River basin. Parks Dam, south of Lake Havasu City, Nev. In 2007, 20,012 razorback suckers were stocked through the Lower Basin. The stocking efforts show success:
  - Stocked razorback suckers are moving between the Colorado, Green and Gunnison rivers, suggesting the intrabasin suckers may eventually form a network of populations or subpopulations.
  - Some razorback suckers are being eaten as wild fish. They have been reported or observed in poor reproductive condition at spawning sites in the Green and San Juan rivers and, based on captures of wild fish, are reproducing in the wild in the Colorado, Gunnison, San Juan and San Juan rivers.

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Biotists work to remove and relocate nonnative fishes from the Yampa River.

**Now hear this, you predator fish, p. 3**

Studying the ear bones of smallmouth bass key to managing nonnative fish populations.

**Fish hatcheries help in recovery efforts, p. 4**

Six regional hatcheries work to increase endangered fishes’ chances of coping in the wild.

**Recovery programs recognized, p. 5**

Upper Colorado River and San Juan River recovery programs earn national award.

**Joy to the fishes (and the people), p. 6**

Dedication ceremony celebrates completion of fish passage at Price-Stubb Diversion Dam.
Strategy approved to restore Yampa River’s native fish populations

People from around the world visit northwest Colorado each year to witness the beauty and majesty of the Yampa River—one of the last free-flowing rivers in the west. Thirsty salmon enjoy rafing the river where it carves a spectacular canyon through the heart of Dinosaur National Monument on the Colorado-Utah border. Others prefer to swim, tube and fish in the cucumber waters downstream.

While people enjoy the scenic and recreational benefits of the river, Upper Colorado River Endangered Fish Recovery Program (Recovery Program) biologists view the Yampa River as one of the most important river habitats for native fish. Razorback sucker, longnose sucker, and bonytail—humpback chub, bonytail, Colorado pikeminnow and razorback sucker—are among the most endangered species in the North American rivers.

As the largest tributary to the Green River, the Yampa River plays a critical role in the lifecycle of the endangered fishes in the Upper Colorado River Basin (Upper Basin). Razorback suckers and Colorado pikeminnows spawn in the lower reaches of Yampa Canyon, which also harbors one of the remaining populations of humpback chub in the Upper Basin. In addition to directly providing habitat, the Yampa River delivers flows and sediment downstream to the Green River, helping to maintain a river system with hundreds of miles of habitat considered vital to the recovery of the endangered fishes.

Nonnative fish threaten survival of young endangered fish

Young endangered fish are at high risk of being eaten by abundant nonnative fish species that also live in the Yampa River. Northern pike and smallmouth bass are the two nonnative fish species that researchers are most concerned about because they are active predators that consume a wide size range of fish, including endangered fishes. Management of nonnative fishes is considered vital to the long-term conservation of endangered and other native fishes, including razorback chub, flannelmouth sucker, blueback sucker and speckled dace.

The Recovery Program has researched the effects of nonnative fish and worked to manage their numbers in various locations throughout the Upper Basin. Since 2004, the Recovery Program has implemented a comprehensive nonnative fish management plan in the Yampa River. The plan includes active removal and relocation of these problematic species as well as research studies to determine their source of origin. Biologists with the Colorado Division of Wildlife, Utah Division of Wildlife Resources, U.S. Fish and Wildlife Service and Colorado State University conduct the work for the Recovery Program. The management plan recognizes the dual responsibilities of state and federal fish and wildlife agencies to conserve species while providing sportfishing opportunities.

In the Yampa River, we’re using a variety of techniques to remove northern pike and smallmouth bass that include multi-pass electrofishing, hoop and trammel nets and seine,” said Tom Chart, nonnative fish coordinator for the Recovery Program. “Since we implemented these techniques in 2004, large-sized northern pike have been reduced in parts of the Yampa and Green rivers, but we have no measure of success with smallmouth bass. Low flows since 2000 have created conditions suitable to smallmouth bass reproduction and survival. Levels of effort to remove and relocate these fish may need to increase.”

Research models predict that the minimum annual removal rates of adult fish needed to prevent northern pike from recolonizing the Yampa River and smallmouth bass from expanding their habitat could be as high as 65 percent. The Recovery Program is achieving that level of removal in some reaches of the Yampa River but not in all.

“Our approach to the control of these predators of population is necessary to protect the survival of these predators to minimize the threat and enable native fish populations to recover,” said Tom Nesler, wildlife conservation manager, Colorado Division of Wildlife. “This plan represents the strategies we feel are necessary to properly manage this threat.

Yampa River nonnative fish management strategy approved to increase success

The Recovery Program approved a Yampa River Nonnative Fish Management Strategy this year to ensure that nonnative fish management actions are of sufficient scale and intensity to result in measurable success. The strategy is based on research findings and is consistent with the Recovery Program’s Nonnative Fish Management Policy.

The strategy expands current efforts and directs future management of nonnative species, but now the Yampa River nonnative fish management strategy consists of six elements with specific action items and timeframes:
• Information and education. Clear and accurate communication conveys the nature of management actions and why they are needed.
• Promotion. Regulating the introduction of nonnative fish species through stocking, natural reproduction or other sources helps reduce their numbers.
• Early detection and reporting. Awareness of new or suddenly increasing nonnative fish populations helps prevent their expansion.
• Information and data management. Accurate data leads to objective, science-based decisions on nonnative fish management.
• Mechanical removal. Study results show this is the most effective method to reduce the numbers of problematic fish species and effectively increase endangered and other native fish populations.
• Research and development. Research provides a better understanding of the life history of nonnative fish species and provides objective scientific basis for future actions.

Future actions

In spring and summer 2009, biologists plan to conduct the same number of sampling trips to remove nonnative northern pike and smallmouth bass in sections of river in the Upper Basin. Efforts will be further evaluated once a cumulative analysis of existing data is completed in 2010.

“The Recovery Program’s nonnative fish management actions are complex and large in scope,” said Recovery Program Director Bob Muth. “We are fortunate to have expert researchers from state and federal wildlife agencies, universities and private consulting firms involved in these efforts. Working together we can successfully manage nonnative fishes in the Yampa River and elsewhere in the Upper Basin.”

For more information, contact Tom Chart, 303-969-7322, ext. 226, tom_chart@fws.gov.

Nonnative fish management continues in San Juan River

As this issue of Stream Upstream went to press, the San Juan River Basin Recovery Implementation Program was completing its first full year of expanded efforts to reduce the numbers of nonnative channel catfish and common carp in the San Juan River. Last year, biologists noted an encouraging decline in the sizes of these large-bodied fish that compete with and prey upon endangered Colorado pikeminnows and razorback suckers.

Expanded work was a cooperative effort among the U.S. Fish and Wildlife Service, the New Mexico Department of Game and Fish, the University of New Mexico, the Bureau of Indian Affairs, and the Navajo Nation. Biologists from these agencies conducted eight removal passes throughout 94 miles of the San Juan River that had previously been sampled only on a limited scale. Results of this year’s work will be reported in the next issue of Stream Upstream.

For more information, contact Jason Davis, (505) 342-9900, ext. 108, or jason_c_davis@fws.gov.
Nonnative smallmouth bass populations were recently established and are now abundant in warmer reaches of the upper Colorado River system. Smallmouth bass are especially problematic in the lower Green River main-channel and shorelines habitats where they compete with, or prey upon, both smallmouth and native cutthroat trout.

The Upper Colorado River Endangered Fish Recovery Program is implementing management actions to reduce the abundance of smallmouth bass in river reaches occupied by the endangered fishes. A primary, ongoing technique is removal of large numbers of juvenile- to adult-size smallmouth bass. Combining this approach with efforts to reduce numbers of smaller-sized smallmouth bass may be an effective strategy to success- fully manage this species. Removal of just 150 adult smallmouth bass from the lower Green River outside the Upper Colorado River Basin (Upper Basin) shows that weathers or age stocked in Upper Basin rivers were unknown. However, when the stocking plan was finalized, survival rates should allow substantial populations to develop, providing those fish reproduce and their young survive.

If enough razorback suckers are stocked, those sur- vival rates should allow substantial populations to develop, providing those fish reproduce and their young survive. However, when the stocking plan was finalized, survival rates of hatchery-produced razorback suckers of any size or age stocked in Upper Basin rivers were unknown.

According to the Upper Colorado River Endangered Fish Recovery Program, the average per year survival rate of fish stocked in the Upper Basin was 25 percent. That rate is substantially lower than the typical survival rates of wild or native fish populations. The survival rates of stocked fish in the Upper Basin were estimated to range from 10 to 15 percent per year. Therefore, annual survival of adult fish is assumed to plateau at 70 percent based on data for wild razorback suckers.

The stocking plan directs hatchery managers to raise fish until they are at least 12 inches in length, which typically takes two years, before releasing them in rivers. The plan assumes that 50 percent of those 2-year-old fish will survive their first year and that 60 percent of those fish will survive as 3-year-olds. Therefore, annual survival of adult fish is assumed to plateau at 70 percent based on data for wild razorback suckers.

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In 2003, the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) finalized a stocking plan for smallmouth bass from streams in the summer and preserve them. The fish are returned to the laboratory where the otolith is removed from the head of the fish, placed on a microscope slide, and examined under a high- powered microscope. The otolith is the measured and the number of otolith rings is counted, which repre- sents the age of the fish in days.

Findings from other studies indi- cate that the first otolith ring is depos- ited about the time of hatching. Thus, by knowing when the fish was hatched, it is easy to subtract the age of the fish that was estimated by counting otolith rings to obtain the hatching date of that fish. By aging a large sample of fish, biologists can estimate when most fish in the population were hatched.

The development time of small- mouth bass eggs after fertilization is about 5-10 days, depending on water temperatures. This information helps researchers determine peak spawning times for that population. Analyses of this kind over a period of time provide an understand- ing of the flow levels and water tem- peratures during which smallmouth bass spawning occurs. Once these relationships are established, predic- tions about when smallmouth bass will spawn are improved.

A logical next question is how this information would be used to disad- vantage spawning success of small- mouth bass. Knowing when small- mouth bass will spawn allows biologists to physically dis- turb nests or remove guarding males, which would reduce the success of those nests. If excess disturbance can be controlled, fish may be able to spawn on a larger, river-reach scale by inducing low water tempera- tures or higher flows for short times during spawning. Such environmen- tal disturbances could be produced through release of colder or higher flows in streams such as the Green River, which is regulated by fluminating George Dam.

Similar stream flow experiments have been conducted in the recent past in the Grand Canyon reach of the Colorado River, where large volumes of water were released from Glen Canyon Dam to benefit downstream natural resources, including native fishes. Among many other factors, scientists need to know how other native and nonnative fish spe- cies would respond to short-term increases in flows or reduced water tempera- tures when combined with other techniques to reduce larger smallmouth bass, stream flow or produced water temperature manipulations to disadvantage young smallmouth bass may be necessary to reduce their abundance and assist with recovery of endangered and other native fishes in the Upper Basin.

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A great day for endangered fish! Community celebrates completion of capital projects in western Colorado

The Upper Colorado River Endangered Fish Recovery Program (Recovery Program) held a dedication ceremony on July 1, 2008, to celebrate completion of a 900-foot-long fish passage at the Price-Stubb Diversion Dam in western Colorado. The dam was the last remaining barrier to fish migration on the Colorado River from Utah’s Lake Powell to the upper end of critical habitat near Rifle, Colorado.

Other capital projects in western Colorado for endangered fish were also recognized. These include fish passages and screens at three privately owned and operated diversion dams; a hatchery raising endangered razorback suckers to stock in rivers; canal check structures that help conserve water, a barrier at a local reservoir that prevents nonnative sport fish from escaping into the Colorado River, and more than 1,100 acres of restored floodplain habitat.

Today, we celebrate the completion of capital projects in Colorado’s Great Basin to benefit endangered fish,” Deputy Secretary of the Interior Kris Polly said, “Reclamation has examined each project from different perspectives, tested new ideas and created state-of-the-art solutions for endangered fish recovery. Today, with screens installed to prevent anadromous migration, fish can freely swim upstream with access to restored floodplain habitat. It is a success for endangered fish recovery in the Grand Valley.”

City of Grand Junction Utility and Street Systems Director Greg Trainor addressed the city’s direct and indirect water interests related to the Colorado and Gunnison river systems as they relate to the needs of this growing western Colorado community. This include working with water users in the Grand Valley and upstream to provide water for irrigation, municipal use and recreation.

Reclamation Deputy Commissioner Kris Polly said, “Reclamation has provided all of us an opportunity to work together for the benefit of the endangered fish and for our own benefit,” he said. “The intended consequence of the program has been the development of 1,500 water projects with depletions of 2.2 million acre-feet from the stream systems. The unintended consequence is that the Recovery Program has provided a platform for the water users statewide, federal and state agencies, municipalities and others, to come together on many other water issues essential to their collective survival.”

While people benefit from these cooperative efforts, so do endangered and other native fish.

“We celebrate the completion of capital projects in the Grand Valley brings these rare, big-river fish a giant step closer to recovery,” said Jay Slack, deputy regional director, U.S. Fish and Wildlife Service.

The Bureau of Reclamation (Reclamation) supervised all aspects of the construction of the capital projects.

The five-year review of recovery goals stated for completion in 2009

The U.S. Fish and Wildlife Service approved recovery goals for the four endangered fishes in 2002 that provide objective, measurable criteria for downlisting to “threatened” and delisting (removal from Endangered Species Act protection).

Results of research-based adaptive management and monitoring of endangered fish populations provide information that may warrant changes in the recovery goals. The recovery goals are reviewed, and revised as needed, at least every five years. This first review is underway with completion slated for 2009.

For more information, contact Tom Czapla, 930-699-7322, ext. 228, tom_czapla@fws.gov.

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Reservoir operators coordinate releases for endangered fish

Upper Colorado River Basin reservoir operators voluntarily coordinate water releases last June to enhance spring peak flows. Water from Green Mountain, Ruedi, Windy Gap and Willow Creek reservoirs, combined with less flows from Wolford Mountain and Williams fork reservoirs, enhanced flows to benefit endangered fish.

Releases are part of the Recovery Program’s Coordinated Reservoir Operations Program established in 1995. When weather permits, reservoir operators release water to improve fish habitat without affecting reservoir yields. Most reservoirs also contribute water for late-summer, base-flow augmentation.

For more information, contact Kara Lamb, 970-962-4326, klamb@gp.usbr.gov.

Students raise razorback suckers in classrooms

Students in western Colorado have a hands-on opportunity to learn about endangered fishes and the river ecosystem through a unique program cosponsored by the Colorado Division of Wildlife (CDOW) and the Upper Colorado River Recovery Program. Since 2000, elementary and high school science classes have raised razorback suckers in classrooms for about two months in the school year during which they released them in the river each spring.

The fish are provided by the Grand Valley Endangered Fish Facility, and CDOW Education Specialist Kathleen Tabick oversees this important program and helps teachers transform their students into “young scientists.”

Catch a northern pike at Wolf mountain Reservoir, earn $20

That’s the deal the Colorado River District, owner of Wolf mountain Reservoir in Colorado, is offering anglers in an effort to help preserve the reservoir’s trout and kokanee salmon fishery.

The River District and the state of Colorado have invested in stock- ing the reservoir with trout and kokanee to create a thriving sport fishery. Northern pike threaten the success of the trout and kokanee.

As of early September, 25 northern pike have been turned in for cash,” said River District Senior Water Resources Engineer Ray Tenney.

For more information, contact Ray Tenney, 970-945-8522, rtenney@crwd.org, or visit the River District’s website: www.ColoradoRiverDistrict.org.

Following the dedication ceremony, many participants toured a fish passage and screen at the privately owned Redlands Water and Power Company facility. Redlands Water and Power Superintendent Kevin Jones and U.S. Fish and Wildlife Service Colorado River Fishery Project Leader Chuck McAda explained how these facilities work and how they contribute to recovery of the species.

Four tour participants then visited a restored floodplain wetland at the Grand Valley Audubon Society’s butterfly garden at Fertil Ela Wildlife Sanctuary where Grand Valley Audubon Society President Bob Wilson and Dan Alonso, manager of the Onaya National Wildlife Refuge and Colorado River Wildlife Management Area, explained how a floodplain wetland was restored and why floodplains play an important role in the life history of endangered fish.

Recovery Program news and updates

swimming upstream

Swimming upstream is a publication of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. These programs are national models of cost-effective, public and private partnerships. The programs are working to recover endangered fishes while water development continues. Each program works with federal and state agencies and interagency committees, including representatives of federal and state responsibilities to American Indian tribes.

Debra R. Fellor Editor

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David L. Campbell Coordinator

Program Partners

Bureau of Reclamation Bureau of Land Management Bureau of Reclamation Conservation Interests Carlsbad Water Conservation District El Paso County-Navajo Nation San Juan-San Miguel Counties State of New Mexico State of Utah U.S. Fish and Wildlife Service Water Development Interests

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Department of Interior recognizes programs with cooperative conservation award

The Upper Colorado River and San Juan River recovery programs were among 21 finalists who received the Department of the Interior’s Cooperative Conservation Award at a ceremony held April 21, 2008, in Washington, D.C. Secretary of the Interior Dirk Kempthorne presented the awards that recognized groups and individuals who achieved excellence in conservation through collaboration and partnerships.

“These outstanding partnerships and cooperative efforts represent a fundamental way in which our Department provides stewardship for America with integrity and excellence,” Secretary Kempthorne said. “They embody a broad spectrum of conservation activities, from restoring wetlands, riparian and mine lands to protecting wildlife, conserving water and fighting invasive species to teaching conservation values to the next generation.”

The Department of the Interior’s Cooperative Conservation Award program recognizes conservation achievements resulting from the cooperation and participation of individuals, communities, landowners; citizen groups; private sector, nongovernmental organizations; and federal, state, local, and/or tribal governments. More than 750 groups and individuals were nominated.

“The [recovery] programs deserve this distinction because they are national models for achieving conservation through collaboration,” said Benjamin N. Tuggle, Ph.D., regional director, U.S. Fish and Wildlife Service Southwest Region. “Both programs have demonstrated that endangered species conservation and water development and management can be compatible. The scope of their accomplishments could only be achieved by groups and individuals voluntarily coming together to solve environmental challenges.”

Actions completed by the recovery programs provide Endangered Species Act compliance for more than 1,600 federal and tribal and non-federal water projects and projects totaling more than 5.1 million acres-feet per year in the Upper Colorado River and San Juan rivers and their tributaries in Colorado, Utah, Wyoming and New Mexico.

“The dedication and commitment of program partners are essential in moving toward recovery of the endangered fishes,” said Steve Guertin, Mountain-Prairie regional director and Implementation Committee chairman for the Upper Colorado River program. “Cooperative relationships have resulted in each program’s ability to provide river flows, restore habitat, construct and operate fish passages and screens, produce and stock endangered fish, reduce predation and competition by nonnative fish, and monitor the results of these recovery actions.”

New regional director oversees endangered fish recovery efforts

Last February, Steve Guertin assumed his duties as regional director of the U.S. Fish and Wildlife Service’s (Service) Mountain-Prairie Region headquartered in Denver, Colo. The region includes Montana, Wyoming, Colorado, Utah, North Dakota, South Dakota, Nebraska and Kansas. Steve is also chairman of the Upper Colorado River Endangered Fish Recovery Program’s Implementation Committee which governs the Recovery Program and is comprised of one representative of each of the Recovery Program’s partners.

Steve came to Denver after working as the Service’s budget officer for the past eight years in Washington, D.C., and Department of the Interior for eight years. Prior to that, he served for eight years as an infantry officer in the United States Marine Corps in a variety of leadership assignments in Hawaii, California, Virginia and overseas.

“I am grateful for this opportunity to work with our state partners, other federal agencies, tribal governments, private organizations and the public to conserve and protect the outstanding natural resources found in the Mountain-Prairie Region,” Steve said. “I look forward to working more closely with Recovery Program partners, many of whom I met during their annual trip to Washington, D.C. I remain impressed with the Recovery Program’s cooperative approach toward species recovery.”

By Sharon Whitmore, Assistant Program Director

San Juan River Basin Recovery Implementation Program

The内陆河流和San Juan River河恢复计划是两个被认可的典范。这两个恢复计划提供了最佳的资源保护方法，并朝着恢复濒危物种的方向前进。我已经亲眼目睹过这些计划的成功。这些计划的成功证明了资源保护和水资源开发是可以共存的。这种合作关系已经结果了这些计划的成功，并将把这种成功转化为下一代人的利益。

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Hatcheries play vital role in recovery of endangered fishes

Seven hatcheries produce endangered fish for the Upper Colorado River and San Juan River Basin recovery programs to meet the annual and long-range stocking targets. The hatcheries manage broodstocks and raise endangered fishes to maximize their genetic diversity and increase the likelihood that stocked fish can cope with local habitat conditions in the wild.

Razorback suckers and bonytails were essentially gone from the Upper Colorado River Basin when stocking of hatchery-produced fish began to reestablish populations.

Both recovery programs finalized stocking plans in 2003 to expedite reestablishment of wild populations of endangered fish. Survival, growth, and reproduction of stocked fish are monitored to evaluate and improve stocking strategies.

Dexter National Fish Hatchery and Technology Center, Dexter, N.M. Established in 1931, originally to produce warmwater sportfish species. Today Dexter is the only facility in the nation dedicated to holding, studying, culturing and distributing endangered fish to restock in waters where they occurred naturally. Dexter produces Colorado pikeminnows to stock in the San Juan River, provides bonytail larvae to J.W. Mumma Native Aquatic Species Restoration Facility, Alamosa, Colo., and raises razorback suckers for the Upper Colorado River Recovery Program.

Grand Valley Endangered Fish Facility, Grand Junction, Colo. Originally established by the Upper Colorado River Recovery Program in 1992 with completion of grow-out ponds at Horsethief State Wildlife Area. A hatchery was built in 1996 to expand propagation efforts. This facility was expanded in 1998-1999. In addition to the hatchery expansion, several ponds have been acquired or leased throughout the Grand Valley and are used to grow-out razorback suckers to stock in the Colorado and Green rivers.

J.W. Mumma Native Aquatic Species Restoration Facility, Alamosa, Colo. Established by the State of Colorado in 2001 to culture aquatic species that were declining in numbers. In 2002, the facility received its first shipment of bonytail larvae from Dexter National Fish Hatchery and Technology Center. The hatchery raises and stocks these fish in the Colorado and Green rivers. This year, the hatchery conducted a research project to simulate river flows in the hatchery to acclimate the fish to the river environment before they are stocked.

Ouray National Fish Hatchery, Ouray, Utah. Originally established in 1996 as a fish refuge and technology-development facility to assist in recovery of the endangered fishes. Currently, Ouray’s primary focus is production of razorback suckers. Ouray maintains the primary Green River razorback sucker broodstock and produces razorback suckers to stock in the Green River.

Uvalde National Fish Hatchery, Uvalde, Texas. Established in 1937, originally to produce sportfish to stock in Utah’s Lake Powell. The Hatchery facility is currently a multipurpose facility, raising bonytails and holding razorback suckers for the Upper Colorado River Recovery Program. Hatchery maintains a back-up broodstock of Green River razorback suckers, and raises bonytails to stock in the Colorado and Green rivers.

These hatcheries are staffed with highly knowledgeable professionals who have overcome many challenges to ensure that hatchery operations are sound and provide genetically diverse fish to meet stocking plans,” said Upper Colorado River Recovery Program Propagation Coordinator Tom Czapla. “Stocking endangered fish to enhance or reestablish self-sustaining populations is a key element in the overall recovery efforts.”

San Juan Program welcomes staff biologist

Biology Scott Durst joined the San Juan River Basin Recovery Implementation Program staff in September to coordinate the many biological aspects related to recovery of endangered Colorado pikeminnows and razorback suckers in the San Juan River. Scott has been working with endangered species in Southwestern riparian systems since 2001. Most recently he worked for the U.S. Geological Survey-Southwest Biological Science Center in Flagstaff, Ariz., where he studied the ecology of endangered Southwestern Willow Flycatchers in central Arizona and the abundance, distribution and habitat use of candidate species Western Yellow-billed Cuckoos along the lower Colorado River.

In addition to his experience conducting field research, Scott has contributed to numerous professional publications as both a lead- and co-author. His work on the Southwestern Willow Flycatcher range-wide database breeding site and territory summary has been the cornerstone of the U.S. Fish and Wildlife Service’s efforts to track the progress of recovery and conservation for this endangered bird. Scott earned a master’s degree in biology from Northern Arizona University. He was a Peace Corps volunteer in Ghana, West Africa, where he taught biology, chemistry and math. Scott can be reached at 505-761-4719 or scott_durst@fws.gov.

Upper Colorado River Endangered Fish Recovery Program

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