

swimming upstream

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

Managing water releases from federal dams to benefit endangered fishes — a delicate balancing act

This year, the U.S. Bureau of Reclamation (Reclamation) implemented changes in operations at two federal dams and reservoirs in the Upper Colorado River Basin — Navajo and Flaming Gorge — to assist in the recovery of the endangered fishes. The changes will help meet water flow and temperature conditions that benefit the fishes.

Both facilities are operated to serve multiple authorized purposes that include: regulating river flows in the San Juan and Green rivers, storing and delivering water, and generating hydroelectric power. The facilities also provide significant recreational opportunities and improve conditions for fish and wildlife, both in the reservoirs and downstream.

Based on extensive scientific research, the Upper Colorado River and San Juan River Basin recovery programs worked with the U.S. Fish and Wildlife Service (Service) to develop recommendations for river flows to create and maintain favorable habitat in the Green and San Juan rivers for the various life stages of endangered fishes.

For example, spring peak flows form backwaters, while summer/winter flows help maintain the backwaters that provide important nursery habitat. In addition, spring peak flows clean cobble bars that Colorado pikeminnows and razorback suckers use for spawning.

“Changing the present pattern of river flows at crucial times in the life-cycle of the Colorado River endangered fishes is central to the success of recovery efforts,” said Dan Luecke, Western Resource Advocates representative to the Upper Colorado River Endangered Fish Recovery Program. “The re-operation of Navajo and Flaming Gorge dams to create river conditions more hospitable to native fish, while meeting the projects’ other purposes, is a significant and important step in the process of recovery and, ultimately, the delisting of these endangered species.”

Changing dam operations at Flaming Gorge Reservoir

Releasing water from the dam to change the river flows is a delicate balancing act and is a year-round operation with increased demands in the spring. “We monitor the hydrologic conditions in the basin year-round,” said Reclamation Hydraulic Engineer Rick Clayton, who supervises water operations at Flaming Gorge Dam on the Green River in Utah. “We use that information, plus available storage in the reservoir, to try to



NAVAJO AND FLAMING GORGE RESERVOIRS PROVIDE RECREATIONAL OPPORTUNITIES BOTH IN THE RESERVOIRS AND DOWNSTREAM. FLY FISHING IS EXTREMELY POPULAR ON THE SAN JUAN RIVER BELOW NAVAJO DAM (PICTURED) AND ON THE GREEN RIVER BELOW FLAMING GORGE DAM.

determine the flow patterns we need for the fish. We try to achieve the target range that the scientists have identified in the endangered fish flow recommendations without impacting the purposes of the dam.”

Complicating this effort is the fact that Rick and his staff must predict the volume and timing of flows in the free-flowing Yampa River which enters into the Green River and affects the Green River’s flows below the confluence.

From May to mid-June, Rick monitors river flows in the Yampa and Green rivers hourly, via computer, seven days a week. In addition to determining how much water is available to meet the flow recommendations for the endangered fishes, he tries to time dam releases to coincide with Yampa River flows to reach endangered fish habitat beginning approximately 104 miles downstream.

As if this isn’t enough, Rick has to ensure that water and power users’ needs are met as well. This includes the need for a federal hydroelec-

tric power plant; maintaining reservoir storage; serving the recreational needs of boaters, marina operators and anglers; and delivering water for municipal and irrigation purposes to a variety of water users, including those in downstream states.

“It’s a tremendous challenge to try to determine when and how much water to release to achieve the target flows for the fishes,” Rick said. “We try to operate the dam so that we maximize the volume of water that runs through the power plant to generate energy. At the same time, we have to ensure we release enough water to achieve the targeted flows for the fishes, yet we have to consider what fluctuating releases will mean to the trout fishery below the dam and to lake levels and marina operators. We also have to deliver water to other customers according to

federal and state water rights and interstate compacts.”

While Rick addresses the flow conditions, Reclamation Biologist Dave Speas keeps a close eye on water temperature. Both work closely to calculate the amount of water and the timing of releases to ensure that the water arrives at the intended location at the temperature that scientists have determined that the warm-water endangered fishes need.

This was the first year for Reclamation to implement a Record of Decision which permits re-operation of Flaming Gorge Dam as directed in a final environmental impact statement issued in September 2005. A technical work group was established to propose to Reclamation which flow objectives are most suitable for endangered fishes each year. The group includes representatives of Reclamation, the Service and Western Area Power Administration,

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AT FLAMING GORGE DAM WATER RELEASES THROUGH TUBES THAT BYPASS THE POWER PLANT MAY BE NEEDED TO HELP ACHIEVE FLOW CONDITIONS FOR ENDANGERED FISH AS DESCRIBED IN THE RECORD OF DECISION.



POWER CUSTOMER ORGANIZATIONS PLAY AN IMPORTANT ROLE IN ENDANGERED FISH RECOVERY BY WORKING WITH THE RECOVERY PROGRAMS TO HELP ACHIEVE TARGETED FLOW OBJECTIVES.

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Must be something in the water, p. 6

Local biologists raise baby razorback suckers — and babies of their own.

Nonnative removal efforts on San Juan River show encouraging results

Six years after launching an intensive effort to manage nonnative fish in the San Juan River, biologists see declining trends in the size and numbers of nonnative channel catfish and common carp. Research has shown that nonnative species may threaten the survival of endangered Colorado pikeminnows and razorback suckers because these nonnative fish prey upon other fish and compete for food and space.

In 1999, biologists found significant numbers of these large-bodied nonnative fish in the San Juan River. Today, the river-wide abundance of channel catfish shows a general declining trend in abundance and the current channel catfish population appears to be dominated by juvenile catfish, less than 12 inches in length. Common carp abundance has also significantly declined since 2001 and is at the lowest level ever observed.

"This is good news for the endangered fish," said U.S. Fish and Wildlife Service Biologist Jason Davis. "We're seeing an encouraging trend toward fewer and smaller-sized channel catfish and common carp which may reduce reproductive potential and predation on the native fish."

Biologists from the U.S. Fish and Wildlife Service (Service) and the Utah Division of Wildlife Resources (UDWR) conduct the nonnative fish management work on behalf of the San Juan River Basin Recovery Implementation Program.

"We also collect invaluable information about endangered fish during the course of our nonnative fish management work," said Patrick Goddard, project leader for the UDWR. "The electrofishing method used to capture fish is effective on all species. When we encounter a native fish, we release it immediately. If a Colorado pikeminnow or razorback sucker is netted, the fish is weighed, measured, tagged and returned to the river. This allows us to get important life-history data on these endangered fish and helps us with our estimate of the numbers of each endangered species."

response to nonnative fish reductions, and where and how nonnative fishes are getting into the critical habitat sections of the Upper Colorado River Basin.

Like in the San Juan River, channel catfish also pose a serious threat to the endangered fishes. Because the upper Colorado River system has much wider and deeper waters than the San Juan River does, past capture methods have proved inadequate for effective removal in most areas. As a result, channel catfish research only occurred this year in Yampa Canyon where removal methods have been effective.

Other management actions being taken to reduce the threat of nonnative fishes to the endangered fishes include the review and approval of private fish stocking permits, the screening of reservoir outlets and the construc-



U.S. FISH AND WILDLIFE SERVICE BIOLOGIST JIM BROOKS HOLDS TWO LARGE CHANNEL CATFISH REMOVED FROM THE SAN JUAN RIVER. BIOLOGISTS ARE ENCOURAGED THAT THEY ARE SEEING FEWER CHANNEL CATFISH OF THIS SIZE DURING THEIR NONNATIVE FISH MANAGEMENT EFFORTS.

The Navajo Nation and the U.S. Bureau of Indian Affairs work closely with the San Juan River Recovery Program to support endangered fish recovery efforts.

Biologists with the Navajo Nation Department of Fish and Wildlife transport channel catfish removed from the San Juan River and stock them in ponds and lakes on Tribal lands to enhance sportfishing opportunities.

"The Tribe would like to be even more involved with the Recovery Program because we care about our natural resources — those being water and fish, and especially endangered and threatened species," said Viola Willetto, a fish biologist with the Navajo Nation Department of Fish and Wildlife. "Through education our people are gaining interest in fish. In addition to helping recover the endangered fish, stocking channel catfish into our reservation lakes

has also helped the Tribe increase revenues through the sale of fishing and boating permits."

Next spring, biologists will continue their nonnative fish management efforts to include additional removal passes in a river reach between the upper and lower sections of the San Juan River.



UTAH DIVISION OF WILDLIFE RESOURCES BIOLOGISTS JULIE HOWARD (LEFT) AND RACHEL NELSON WORK TO REMOVE CHANNEL CATFISH FROM THE LOWER SAN JUAN RIVER.

"There appears to be a stronghold of channel catfish and common carp between where the Service's work stopped and the Utah Division of Wildlife's work began," Jason said. "We will put more emphasis on that section to make sure the channel catfish and carp don't move into the reaches where we've seen some success."

"We realize that we will never be able to remove 100 percent of the catfish," he added. "We hope that if we can get the numbers and sizes down at the same time that we are stepping up efforts to increase the endangered fish populations by stocking hatchery-raised fish, we'll give the endangered fish a little head start toward establishing self-sustaining populations."

In addition to active removal of channel catfish and common carp, the New Mexico Department of Game and Fish has removed the bag limit on these species. Work on behalf of the endangered fishes may benefit other native species that live in the San Juan River system, including flannelmouth and bluehead suckers and speckled dace.

For more information, contact Jason Davis, 505-342-9900, ext. 108, jason_davis@fws.gov.

Nonnative fish management efforts continue in upper basin

The Upper Colorado River Endangered Fish Recovery Program expanded its nonnative fish management efforts this year to include additional river sections and removal trips. Biologists worked on 740 miles of the Colorado, White, Yampa, Green and Duschesne rivers in the states of Colorado and Utah. Depending on the river reach, they targeted smallmouth bass and/or northern pike for removal and relocation to appropriate area fishing ponds. Scientific evidence shows that these nonnative fish species are impeding recovery of the endangered Colorado River fishes.

The nonnative fish management research studies are designed to determine if management efforts are effective in reducing the numbers of targeted nonnative fishes, if endangered and other native fishes increase in

tion of berms around ponds to prevent the escape of nonnative fishes into rivers. The states of Colorado and Utah have developed nonnative



PEYTON FRANTZ, 8, OF FORT COLLINS, COLO., CAUGHT THIS SMALLMOUTH BASS IN THE LITTLE RASCALS POND IN CRAIG, COLO. THIS CHILDREN'S FISHING POND IS ONE OF SEVERAL LOCATIONS WHERE BIOLOGISTS ARE PLACING SMALLMOUTH BASS OR NORTHERN PIKE THAT ARE REMOVED DURING NONNATIVE FISH MANAGEMENT EFFORTS ON THE YAMPA RIVER.

fish stocking procedures that prohibit introduction of certain nonnative fish species into river reaches occupied by the endangered fishes. Colorado has

also removed state bag and possession limits for northern pike, smallmouth bass, largemouth bass and other centrarchids in the entire Yampa River and in the designated critical habitat areas of the White, Colorado and Gunnison rivers to increase harvest.

A workshop will be held in December during which researchers will review current data and determine future nonnative fish management actions. For more information, contact Pat Nelson, 303-969-7322, ext. 226, pat_nelson@fws.gov.

Balancing act continued from page 1

all of which are partners in the Upper Colorado River Recovery Program.

Achieving the target flows for the fishes means that during a set period of time, the dam operates to release the maximum amount of water through the power plant (4,500 cubic-feet-per-second). In some years, additional water is also released through the bypass tubes.

The Record of Decision for Flaming Gorge Dam calls for an adaptive management approach. This process allows changes to dam operations to occur as needed based on new scientific information that researchers may obtain about the endangered fishes.

"We understand the need for changes in the dam operations at Flaming Gorge to assist in recovering the fish, but any restrictions on power production are particularly tough in these times of rising demands and drought conditions," said Leslie James, executive director of the Colorado River Energy Distributors Association, a nonprofit organization whose members serve over 4 million electric customers in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. "Now that some levees have been notched at floodplain nursery habitats, we strongly support Reclamation's commitment to determine if lower

peak flows can accomplish the same environmental benefits for the endangered fishes."

The Upper Colorado River Recovery Program's 2000 *Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam* identifies some uncertainties related to flow and temperature needs of the endangered fishes. The Recovery Program is presently developing a Green River Study Plan to identify monitoring and research projects needed to implement and evaluate the recommendations, including examining the uncertainties. The study may result in new scientific information to be considered for future operations at the dam.

Navajo Dam operations

Pat Page, Water Management Group chief for Reclamation's Western Colorado Area Office in Durango, oversees operations at Navajo Dam on the San Juan River in New Mexico. Like Rick, Pat considers base flows and keeps a watchful eye on snowpack and reservoir storage. He also takes into account the multiple purposes of the dam and reservoir, including Native American Tribal use, recreational fishing and boating, water storage and delivery, and flood control. Provision of water for the privately-owned City of Farmington's hydroelectric power plant is considered a secondary purpose and does not control dam operations. Pat's busiest time of year occurs during March through June. That's when he and his staff prepare for and make high releases from the reservoir to mimic more natural spring runoff conditions in the basin.

"We have it a little easier than they do for Flaming Gorge Dam because



RECLAMATION WATER MANAGEMENT GROUP CHIEF PAT PAGE OVERSEES OPERATIONS AT NAVAJO DAM ON THE SAN JUAN RIVER IN NEW MEXICO.

we have a set date of June 4 to try to match the peak flows of the Animas River which enters the San Juan River below Navajo Dam," Pat said. "That date is the historical average peak of the Animas River. We also have some flexibility in dam operations until full water development occurs in the basin, including the completion of the Animas-La Plata and Navajo Indian Irrigation projects."

Navajo Dam has operated according to the San Juan River Recovery Program's flow recommendations to some extent since they were developed in 1999. The recommendations call for releases as low as 250 cubic-feet-per-second to maintain base flows in critical habitat and to conserve water for spring peak releases. In 2005, due to above average snowpack and timing of the high releases from Navajo Reservoir, all of the flow criteria for the spring peak flows were met.

In the spring, Pat assembles a group to track weather and hydrologic conditions and provide input on

dam operations. The group, made up of representatives from Reclamation, the U.S. Army Corps of Engineers and the National Weather Service, participate in conference calls twice a week during high release times. Local emergency agencies are also involved.

The Record of Decision for Navajo Dam formally allows dam operations to help meet the flow recommendations for the endangered fishes in the San Juan River as described in Reclamation's final environmental impact statement issued in April 2006.

Encouraging news

This year's approval to change operations at two major federal dams in the Upper Colorado River Basin to assist in meeting flow recommendations for the endangered fishes is encouraging news for the two recovery programs.

"The adaptability and resiliency of the Colorado River Storage Project has been borne out this year as we have found ways to accommodate the needs of the endangered fishes while protecting the purposes for which Congress created the project 50 years ago," said Reclamation's Upper Colorado Regional Director Rick Gold. "The long history of these two recovery programs of the Upper Colorado River and San Juan River represent amazing success in how government, environmental interests, hydropower customers, Tribal interests and the general public can work together to achieve meaningful and productive change." ◀

QUICK FACTS

Flaming Gorge Dam and Reservoir



Located: Utah on the Green River
Dam Completed: 1962
Dam Height: 455 feet
Live Storage Capacity: 3,749,000 acre-feet *
Maximum Surface Area: 42,020 acres (66 square miles)
ROD Signed: February 16, 2006**

Navajo Dam and Reservoir



Located: New Mexico on the San Juan River
Dam Completed: 1963
Dam Height: 388 feet
Live Storage Capacity: 1,696,000 acre-feet*
Maximum Surface Area: 15,610 acres (24 square miles)
ROD Signed: July 31, 2006**

* Amount of water available for use.

**Record of decision authorizes implementation of approved actions in final environmental impact statement for this facility.

Stocking hatchery-raised fish shows success

Bringing razorback suckers back from the brink of extinction

Historically, the razorback sucker was common to abundant in most warm-water rivers of the Colorado River Basin, but declined throughout its range during the 20th century. Today, the species exists naturally in only a few locations. Fewer than 100 wild adults are estimated to still occur in the middle Green River of Utah and Colorado, and wild populations are considered gone from the Gunnison, Colorado and San Juan rivers.

Because of the dramatic decrease of wild razorback suckers, hatchery-produced, stocked fish form the foundation to reestablish naturally self-sustaining populations of razorback sucker in the Upper Colorado and San Juan river systems. The recovery programs' genetic management plans are designed to maximize the genetic diversity of razorback suckers produced in hatcheries from wild brood stocks to increase the likelihood that stocked fish



UTAH DIVISION OF WILDLIFE RESOURCES BIOLOGIST RON BRUNSON SAMPLES FOR RAZORBACK SUCKER LARVAE IN THE GREEN RIVER.

can cope with local habitats. The recovery programs' stocking plans identify the annual number and size of stocked subadult razorback suckers to expedite the reestablishment of self-sustaining populations and achieve the demographic criteria of the recovery goals.

The recovery programs' stocking efforts are showing success as stocked fish are surviving and reproducing:

- During 2000 through 2005, 1,494 stocked razorback suckers were recaptured in the Green River, and 538 were recaptured in the Colorado and Gunnison rivers. Some fish have been recaptured four years after stocking.
- Razorback suckers stocked in the Green River have been recaptured in the Colorado River, and razorback suckers stocked in the Gunnison River have been recaptured in the Green River. This exchange between rivers suggests that razorback suckers may eventually form a network of populations or subpopulations.
- From 2000 through 2004, 893 stocked razorback suckers were recaptured in the San Juan River. In 2005 alone, there were a total of 399 recaptures. One fish collected in 2005 was recaptured 13 years after being stocked. While eliminating multiple recaptures of fish will reduce this overall number somewhat, the number of razorback suckers recaptured in 2005 remains noticeably higher than in any previous year.
- Razorback suckers stocked in the Green and San Juan rivers have been recaptured or observed in reproductive condition at spawning sites, indicating they are behaving as wild fish.
- Captures of larval razorback suckers in the Green, Gunnison, Colorado and San Juan rivers demonstrate that stocked fish are reproducing.
- Survival of razorback sucker larvae through the first year is evidenced



RAZORBACK SUCKERS HAVE BEEN RECAPTURED FROM FOUR TO 13 YEARS AFTER STOCKING.

Stocking Colorado pikeminnows in the San Juan River

Like the razorback sucker, Colorado pikeminnow were once widespread and abundant in the Colorado River system. The Colorado pikeminnow was considered rare in the San Juan River in the early 1960s. By the mid-1990s, an estimated 19 wild adult fish remained.

Since 2002, hatchery-produced, juvenile Colorado pikeminnows have been stocked in the San Juan River. Stocked fish include age-0, 1-year-old and 2-year-old fish from a variety of sources: Dexter National Fish Hatchery and Technology Center in New Mexico, J.W. Mumma Native Aquatic Species Restoration Facility in Colorado, and Bubbling Ponds Hatchery in Arizona.

Since 2002, more than 1 million juvenile Colorado pikeminnows (most in the 2-inch to 4-inch range) have been stocked in the San Juan River. From 2000 through 2004, 3,233 stocked juvenile Colorado pikeminnows were recaptured in the San Juan River. In 2005 alone, there were a total of 2,476 recaptures. Eliminating multiple recaptures of fish will reduce this overall number somewhat; however, the number of Colorado pikeminnows recaptured in 2005 would still be noticeably higher than in any previous year.

Recaptures indicate that many stocked fish are surviving, with numerous fish approaching adulthood. Biologists anticipate seeing signs of natural reproduction (i.e., the collection of larval fish) in upcoming years as these young fish begin to enter adulthood and are supplemented by further stockings of young fish. ◀

by captures of juveniles in the Green, Gunnison and San Juan rivers.

These results provide encouraging prospects for reestablishing razorback sucker populations throughout the



U.S. FISH AND WILDLIFE SERVICE BIOLOGIST JASON DAVIS STOCKS COLORADO PIKEMINNOWS IN THE SAN JUAN RIVER.

Upper Colorado and San Juan river systems. The recovery programs continue to monitor survival and reproduction of stocked fish to evaluate and improve stocking strategies. ◀

Aquarium exhibits help tell complex story of Colorado River

Hatchery-raised endangered fish in aquarium exhibits help tell the complex story of the Colorado River by attracting visitors to see these unique species and the accompanying interpretive messages. The newest exhibit opened this year at the Carl Hayden Visitor Center at Glen Canyon Dam in Page, Ariz., and features bonytails, razorback suckers and humpback chubs. The facility hosts more than 400,000 visitors each year.

When Utah Division of Wildlife Resources Biologist Quent Bradwisch first raised the idea of establishing this exhibit, enthusiasm quickly grew among the federal, state and private organizations that made it happen. Quent raises bonytails and razorback suckers at the Wahweap Fish Hatchery in nearby Big Water, Utah. Willow Beach National Fish Hatchery in Boulder City, Nev., provided humpback chubs for the exhibit.

"When the thought came up through the visitor center committee, it just seemed like it was the right thing to do," said U.S. Bureau of Reclamation Facility Manager Ken Rice, who oversees the operations of Glen Canyon Dam. "State, federal and private organizations worked together to get the proper permits, design and construct the aquarium, develop and produce the interpretive signs, obtain the fish and educate the interpretive staff." Power production revenues from customers of the Colorado River Storage Project helped fund the project.

The result is an exhibit that Glen Canyon National Recreation Area Interpretive Park Ranger Joan Mayer said is a positive addition to the visitor center.

"The fish provide a pleasant and needed respite from a hectic vacation," she said. "The aquarium is already one of our most popular exhibits, with people of all ages stopping to observe the fish. The new exhibit also explains the cooperative efforts taking place to recover these rare species so that they can remain an important part of the Colorado River ecosystem."

About 350 miles northwest of Glen Canyon Dam, Maintenance Director Bruce Truckey and his colleagues at The Montrose Pavilion are caretakers for their third set of endangered fish. This conference facility in western Colorado was the first public facility to work with the Upper Colorado River Endangered Fish Recovery Program to establish this type of interpretive exhibit. This year, the aquarium received humpback chubs from Dexter National Fish Hatchery and Technology Center in Dexter, N. Mex., making it the only public aquarium with all four species of endangered fish.

"The staff did such a great job taking care of their fish that they outgrew the aquarium," said Colorado



INTERPRETIVE PARK RANGER MATT BOLIN TALKS TO A YOUNG VISITOR ABOUT ENDANGERED FISH AT A NEW AQUARIUM EXHIBIT AT THE CARL HAYDEN VISITOR CENTER AT GLEN CANYON DAM.

Division of Wildlife Education Specialist Stan Johnson who helped establish this exhibit. "We were able to use the large, adult fish as part of our classroom education program and then tag and return them to the river." The adults were replaced with young, hatchery-raised fish.

Colorado State Park in Fruita, on Colorado's western slope, also established an aquarium at its visitor center. A similar exhibit at the Quarry Visitor Center at Dinosaur National Monument in northeast Utah was temporarily removed while repairs are made to that facility. ◀

Education specialist honored for innovative efforts to teach about endangered fish

Local residents and tourists can enjoy a close-up view of endangered Colorado River fishes in western Colorado and Page, Ariz., thanks to the efforts of Colorado Division of Wildlife Education Specialist Stan Johnson. Five years ago, the former high school principal developed a classroom aquarium program for fifth-grade students in Grand Junction, Colo., and nearby communities. Students provide hands-on care for hatchery-raised razorback suckers throughout the school year and then tag and release the fish into the river each spring. This program has reached thousands of students, parents and teachers — and it has raised awareness about the endangered fishes and the importance of maintaining a healthy river ecosystem.



STAN JOHNSON HELPS A STUDENT STERILIZE A PIT TAG THAT WILL BE INSERTED INTO A RAZORBACK SUCKER TO HELP BIOLOGISTS TRACK THE FISH FOR RESEARCH STUDIES.

Recovery Program. "I saw this passage while visiting Washington, D.C., and I believe that it applies to the work that Stan has done which has helped the Recovery Program build its foundation." ◀

Stan also helped the Recovery Program establish an interpretive exhibit featuring an aquarium at The Montrose Pavilion in Montrose, Colo. Similar exhibits modeled after this successful project are now in place at other locations.

The classroom program and interpretive exhibits have received positive news media coverage resulting in further increased awareness about these rare fishes.

"Knowledge is the foundation upon which great endeavors are built," said Recovery Program Director Bob Muth, who presented Stan with a special award in August on behalf of the

Recovery Program news and updates

swimming upstream



Coordinated reservoir operations enhance peak flow

Releases from five Upper Colorado River Basin reservoirs were timed to enhance peak flows in the Colorado River last spring to improve spawning habitat for endangered fish. This effort was a result of voluntary cooperation of major reservoir owners and water management entities who participate on the Upper Colorado River Recovery Program's Coordinated Reservoir Operations Team.

Each year, the team tracks snow pack and predicted runoff to determine if enough water will be available to augment the natural spring peak. Conditions have allowed coordinated reservoir operations to occur three times since the team was established in 1995.

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



Uvalde Hatchery to produce razorback suckers

Uvalde National Fish Hatchery in southwest Texas is expected to produce 6,000, 12-inch razorback suckers next year to help the San Juan River Recovery Program achieve its annual production target of 11,400 fish.

Dexter National Fish Hatchery and Technology Center in southern New Mexico also produces razorback suckers, as well as Colorado pikeminnows, for the San Juan Recovery Program. In 2005, Dexter stocked 1,996 razorback suckers and 306,800 Colorado pikeminnows.

Hatchery-produced razorback suckers and Colorado pikeminnows are stocked in the San Juan River as part of recovery efforts to achieve self-sustaining populations.

For more information, contact Dave Campbell, 505-761-4745, david_campbell@fws.gov. ◀



Elkhead Reservoir enlargement nearly complete

A 12,000 acre-foot enlargement of Elkhead Reservoir in northwest Colorado will be substantially completed this year and ready to capture water next spring. The Upper Colorado River Recovery Program partially funded this project to ensure that 5,000 acre-feet of permanent water and up to 2,000 acre-feet of leased water per year will be available to augment late-summer flows in the Yampa River to protect fish habitat.

The Colorado River Water Conservation District coordinated this project. The reservoir is scheduled to reopen in spring 2007 with improved camping and boat launch facilities.

For more information, contact Dan Birch, 970-945-8522, or dbirch@crwcd.org. ◀



Navajo Nation helps raise razorback suckers

The Navajo Nation is working with the U.S. Fish and Wildlife Service to improve efforts to raise razorback suckers in nine ponds located on Tribal lands southwest of Farmington, N. Mex. Dexter National Fish Hatchery and Technology Center will stock 10,000, 8-inch razorback suckers into the ponds this fall and an additional 10,000 fish late next spring. The Navajo Fish and Wildlife Department will manage the ponds, including monitoring water quality.

The ponds provide additional space to enable the fish to grow to the target size of 10 inches before they are stocked into the San Juan River to help achieve the San Juan River Recovery Program's stocking goals.

For more information, contact Dave Campbell, 505-761-4745, david_campbell@fws.gov. ◀

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 in accordance with federal and state laws and interstate compacts, including fulfillment of federal trust responsibilities to American Indian tribes.

Debra B. Felker
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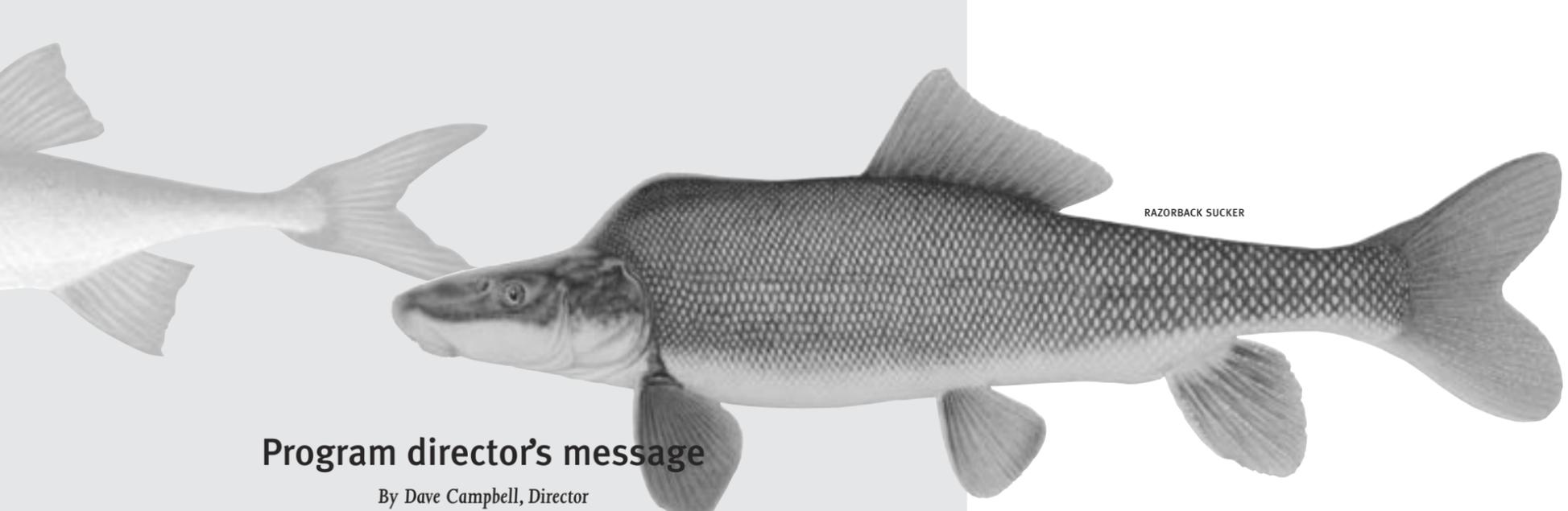
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Water Development Interests



RAZORBACK SUCKER

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Program director's message

By Dave Campbell, Director
San Juan River Basin Recovery Implementation Program

Starting with this issue, *Swimming Upstream* will provide up-to-date information about both the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. Although these programs remain distinct, they share common audiences who we believe will benefit by learning about endangered fish recovery efforts in both river systems.

Both programs are making progress toward recovery of the endangered fishes. Their success is a direct result of the cooperation, hard work and dedication of many people and organizations.

The San Juan River Basin is the second largest of the three sub-basins which comprise the Upper Colorado River Basin. The San Juan River Basin drains about 38,000 square-miles of southwestern Colorado, northwestern New Mexico, northeastern Arizona and southeastern Utah. From its origins high in the San Juan Mountains of Colorado, the San Juan River flows 31 miles south to the New Mexico border, 190 miles west to the Four Corners area, and another 136 miles through a deep canyon before entering Lake Powell.

The San Juan River Recovery Program was initiated in 1992 with a cooperative agreement signed by the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, U.S. Bureau of Indian Affairs, the governors of Colorado and New Mexico, the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe and the Jicarilla Apache Nation. The program's goals are to conserve and recover populations of endangered razorback sucker and Colorado pikeminnow in the San Juan River Basin while water development proceeds in compliance with all applicable federal and state laws. The cooperative agreement is in the process of being amended to extend the San Juan River Recovery Program through 2023.

As in the Upper Colorado River Recovery Program, efforts to recover the endangered fishes include management, research and monitoring actions developed to achieve recovery goals. Some of the San Juan River Recovery Program's accomplishments this year are addressed in more detail in articles in this issue. Some of the highlights include:

- This year's approval to re-operate Navajo Dam should provide the river flows necessary for recovery.
- Evaluation of all diversion structures in the San Juan River that are barriers to fish passage is complete. The Bureau of Reclamation is designing the last passage improvement to be constructed at the Arizona Public Service Company weir. Construction of fish screens should begin at the Hogback diversion dam in 2007.
- This year's nonnative fish management actions extended to the entire San Juan River.
- The Recovery Program is developing protocols to establish population estimates.
- Expanded resources improved the San Juan River Recovery Program's ability to stock hatchery-raised razorback suckers and Colorado pikeminnows. As a result, the number of razorback suckers stocked this year may exceed the total number stocked in all previous years.

The Upper Colorado River Recovery Program also made numerous accomplishments this year that are described in this issue. As we look toward 2007, both programs will continue to share information and strategies about the best methods to recover the endangered fishes in the Upper Colorado and San Juan river basins. ➤

Dave Campbell



Service's new regional directors oversee endangered fish recovery efforts

The U.S. Fish and Wildlife Service (Service) announced the selection earlier this year of new regional directors who are responsible for endangered fish recovery efforts in the Upper Colorado and San Juan river basins. Mitch King is the regional director of the Mountain-Prairie Region, which includes Montana, Wyoming, Colorado, Utah, North Dakota, South Dakota, Nebraska and Kansas. He 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.

Dr. Benjamin Tuggle is the regional director of the Southwest Region, which includes the states of Arizona, New Mexico, Oklahoma and Texas.

Both Mitch and Benjamin have extensive backgrounds with the Service. Most recently, Mitch, a 29-year veteran of the Service, was assistant director for Wildlife and Sport Fish Restoration in Washington, D.C. Previously, he held a number of positions in the Service's Southeast Region headquartered in Atlanta, Ga., including deputy regional director, acting regional chief of the National Wildlife Refuge System, assistant regional director of Migratory Birds and State Programs, geographic assistant regional director for portions of the Southeast, and field supervisor for the Georgia Ecological Services Office in Brunswick, Ga. He holds a degree in Wildlife and Fisheries Science from the University of Tennessee in Knoxville.



SOUTHWEST REGIONAL DIRECTOR BENJAMIN TUGGLE PARTICIPATES IN A DEDICATION CEREMONY FOR THE IOWA TRIBE OF OKLAHOMA'S NEW EAGLE REHABILITATION AND AVIARY CENTER IN PERKINS, OKLA. ON JANUARY 12, 2006.

BY MONETTE R. NATIVE AMERICAN LIAISON

recovery goals for endangered fishes that are based on sound science. As part of this collaborative approach, water development proceeds in accordance with state and federal laws."

Benjamin shares Mitch's longevity with the Service. His leadership positions during the past 25 years include serving as the acting special assistant to the director of the Service and as chief of the Division of Habitat and Resource Conservation. He has a broad range of environmental management skills including water issues, resource development and associated wetland and upland habitat protection and mitigation, habitat conservation and restoration, transportation, energy development, marine mammal protection and other related conservation issues that impact fish and wildlife resources.

"I'm looking forward to continuing the great work already being accomplished throughout this region, including the San Juan River Basin Recovery Implementation Program," Benjamin said. "I believe that our future success rests with collaboration and partnerships with other federal, state and local resource agencies, Tribal members, landowners and the non-governmental environmental groups. The San Juan River Recovery Program continues to enjoy success with these partnerships and can serve as a model for other Service programs. Partnerships will benefit everyone in the Southwest and will secure the conservation of fish, wildlife and their habitats for the future."

Benjamin holds advanced degrees in zoology from The Ohio State University and a bachelor's degree in biology from Fort Valley State College in Georgia. He has written 16 publications in eight scientific journals and three chapters in a Service resource publication. ➤



MOUNTAIN-PRAIRIE REGIONAL DIRECTOR MITCH KING (RIGHT) LEARNS MORE ABOUT ENDANGERED RAZORBACK SUCKERS FROM BIOLOGIST MIKE MONTAGNE WHO OVERSEES OPERATIONS AT THE OURAY NATIONAL FISH HATCHERY IN VERNAL, UTAH.

U.S. FISH AND WILDLIFE SERVICE

"My vision for this region is to balance sound science with responsible and responsive government for resource conservation," Mitch said. "The Upper Colorado River Recovery Program already does this through working with partners to achieve

Christopherson named outstanding researcher of the year

Utah Division of Wildlife Resources (UDWR) Northeastern Regional Supervisor Kevin Christopherson has been named the Upper Colorado River Endangered Fish Recovery Program's Outstanding Researcher of the Year. Kevin's 25-year career includes working with all aspects of fisheries biology including research, fish culture and hatchery operations, conservation of fish and wildlife, and fishery management.



RESEARCHER OF THE YEAR
KEVIN CHRISTOPHERSON

Kevin has made many contributions toward recovery of the endangered fishes.

"From the beginning of his involvement with the Recovery Program, Kevin brought a broad fishery perspective that has benefited program participants and the endangered fishes," said Kevin Bestgen, director of Colorado State University's Larval Fish Laboratory, who presented the award. "Kevin has always presented a reasonable and balanced viewpoint that is based in science, with the overall objective of recovering the endangered fishes."

Kevin Christopherson's lengthy career has taken him to assignments throughout Utah and Washington including work at the fisheries experiment station in Logan, as a research biologist in Cedar City, a fisheries program manager in Price, a reclamation biologist for PacifiCorp in Washington, and a stint as acting southeast regional supervisor in Price.

He spent the last eight years of his career in Vernal as the UDWR project leader for native and endangered aquatic species. During that time, he conducted several studies that address how to enhance habitats to recover endangered fishes. Most recently, Kevin documented larval transport and habitat use during high spring flows. He confirmed that larvae drift into floodplain wetlands, some as far as 54 miles from the spawning site. His research also focused on larval survival in the presence of nonnative fish in floodplain wetlands.

"These studies are right on target with the Recovery Program's mission by helping to identify the minimum amount of water necessary to recover these species," said Recovery Program Director Bob Muth. "This information will help us identify the flows necessary to move larval endangered fish into the appropriate nursery habitats."

Since becoming northeastern regional supervisor earlier this year, Kevin's responsibilities have broadened to include all of the wildlife species in northeastern Utah.

"UDWR is very committed to the conservation of all of the species of Utah, and I feel very fortunate for the opportunity to play a small role in the Endangered Fish Recovery Program," Kevin said. "The work was rewarding, but my fondest memories are of the many dedicated people who worked on this effort."

Kevin holds a bachelor's degree in biology from the University of Utah and a master's degree in biology from Utah State University. ➔

Must be something in the water Biologists raise fish — and babies

—by Sharon Sullivan, Staff Writer
Excerpted from *The Grand Junction Free Press*

Three biologists with the U.S. Fish and Wildlife Service, responsible for raising thousands of baby fish, now have a few more babies to care for.

Each spring Thad Bingham, Travis Francis and Brian Scheer are responsible for the spawning, and then the raising of thousands of baby razorback suckers at the Upper Colorado River Endangered Fish Recovery Program's Grand Valley Endangered Fish Facility located north of Grand Junction, Colo.

All three found out about some added responsibility last fall.

That's when the three men got paged in the middle of the night to attend to an alarm call out at the hatchery. The electricity needed to keep the water flowing and oxygenated had gone out.

Once the problem was fixed, the three started talking and, well, Scheer related what happened next.

"Travis said, 'Looks like my wife and I are going to have a baby.'"

"Then Thad said, 'Well really — I have some news for you, looks like my wife and I are having a baby also.'"

"Then I jumped in," Scheer said, "and I told them my wife and I are due to have a baby also."

Each of the men in charge of raising young fish for a living, were coincidentally making babies of their own — all due in the spring near the time of their busy fish spawning season.

The three biologists, who are also good friends, were surprised at the closeness of their due dates and a little concerned the dates were so close to spawning season.

Spawning takes place once a year in mid-April and the timing is critical. The adult fish are taken from ponds where daylight and water temperatures provide a natural inclination for the fish to spawn.

"Timing was such that the spawning was complete before the babies (humans) started arriving," said supervisor Chuck McAda. And the babies came one at a time so there was always an experienced biologist to attend to the



WHILE THEY WERE BUSY RAISING ENDANGERED RAZORBACK SUCKERS, BIOLOGISTS THAD BINGHAM, TRAVIS FRANCIS AND BRIAN SCHEER WERE MAKING BABIES OF THEIR OWN. THE BABIES, FROM LEFT: BAILEY, TRISTAN AND PEYTON.

half a million baby razorback suckers that were born in April.

Bingham's daughter, Bailey, was born April 26, Francis' son, Tristan, came May 11, and Scheer's daughter, Peyton, was born May 17.

Prehistoric fish in the modern world

While the babies at home are the most important jobs the local biologist trio will ever have, the babies they're raising at work are pretty important, too.

The razorback sucker has been around for nearly a million years and is only found in the Colorado River Basin.

"These fish are an indicator species," Francis said. "They indicate the health of the environment around them. So if they're not doing well, there is obviously something bad with the environment that needs to be corrected."

The Grand Junction hatchery was built in 1996, for the purpose of raising the endangered fish, and to eventually have a self-sustaining population of razorback suckers in the Colorado River Basin again. The Recovery Program requires that 14,500 razorback suckers be stocked annually.

There are 94 tanks at the hatchery where baby razorback suckers are raised for 12 to 14 months.

For the first six weeks, the fish are fed by hand. As the fish get bigger, fish

are separated to reduce the numbers per tank.

The goal of the hatchery is to raise the fish to a length large enough to survive when introduced to the wild. Once they've reached that size, the fish get placed in "grow-out" ponds around the valley where they stay for six months.

Grow-out ponds allow the fish to adapt to the wild slowly, and to learn how to forage on their own in a predator-free environment.

"Essentially it's a stepping stone to the river," Francis said. "We're putting them in the wild without the additional stress of the current."

In the fall, the razorback suckers are captured out of the ponds to be stocked in the Colorado and Green rivers.

"Propagation is an important component of the Recovery Program. We're seeing success," McAda said. "Some stocked fish are surviving to adulthood and spawning on their own."

There are parallels to rearing fish and raising babies.

"They both need to be fed a lot and have to be cleaned up often," Francis said.

"About the only difference is the fish don't cry," Scheer said. ➔

swimming upstream

Upper Colorado River Endangered Fish Recovery Program

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