

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

Program Highlights

2005-2006

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

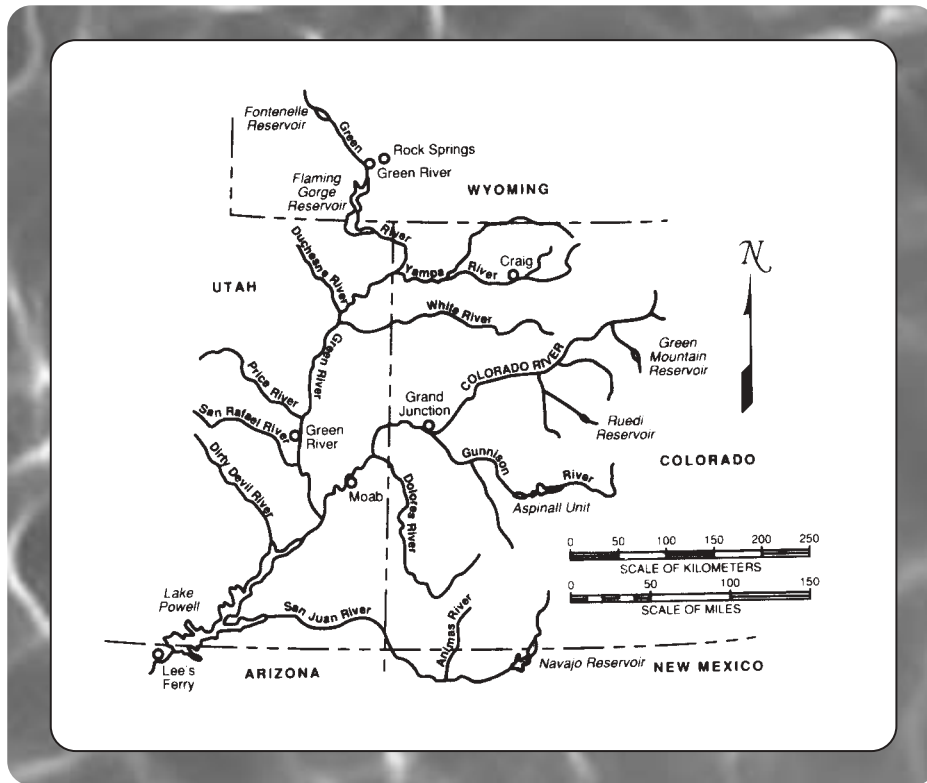
National Models of Effective Conservation Partnerships Program Highlights 2005–2006

The Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program are national models of cost-effective, public and private partnerships. These programs are working to recover endangered species while water development continues in accordance with Federal and State laws and interstate compacts, including fulfillment of Federal trust responsibilities to American Indian tribes.

Program Highlights is produced annually to provide current information on the progress these programs are making toward recovery of the endangered fishes. This document is not a publication of the U.S. Department of the Interior or its agencies.



Endangered Fish Recovery in the Upper Colorado River Basin



Upper Colorado River Endangered Fish Recovery Program

Program Partners:

State of Colorado	U.S. Bureau of Reclamation
State of Utah	U.S. Fish and Wildlife Service
State of Wyoming	Utah Water Users Association
Colorado River Energy Distributors Association	Western Area Power Administration
Colorado Water Congress	Western Resource Advocates
National Park Service	Wyoming Water Association
The Nature Conservancy	

San Juan River Basin Recovery Implementation Program

Program Partners:

State of Colorado	U.S. Bureau of Land Management
State of New Mexico	U.S. Bureau of Reclamation
Jicarilla Apache Nation	U.S. Fish and Wildlife Service
Navajo Nation	Water Development Interests
Southern Ute Indian Tribe	
Ute Mountain Ute Tribe	
U.S. Bureau of Indian Affairs	

The Upper Colorado River Endangered Fish Recovery Program is recovering the endangered humpback chub, bonytail, Colorado pikeminnow, and razorback sucker in the Colorado River and its tributaries in Colorado, Utah, and Wyoming. The Recovery Program was initiated in 1988 with the signing of a cooperative agreement by the Governors of Colorado, Utah, and Wyoming; the Secretary of the Interior; and the Administrator of Western Area Power Administration. In 2001, these parties extended the cooperative agreement through September 30, 2013.

The San Juan River Basin Recovery Implementation Program is recovering the Colorado pikeminnow and razorback sucker in the San Juan River and its tributaries in Colorado, New Mexico, and Utah. The Recovery Program was established in 1992 with the signing of a cooperative agreement by the Governors of Colorado and New Mexico, the Secretary of the Interior, the U.S. Bureau of Indian Affairs, the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Nation. The Bureau of Land Management and the Navajo Nation joined the program in 1992 and 1996, respectively. The Recovery Program is working to extend the cooperative agreement through 2013.

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Endangered Fish Recovery Programs Continue to Garner Bipartisan Support

State and Federal leaders continue to recognize the ongoing success and accomplishments of the Upper Colorado River and San Juan River Basin recovery programs.

DEPARTMENT OF THE INTERIOR

“The programs [San Juan River Basin and Upper Colorado River] are engaged in the hard, day to day work of recovering endangered species. They provide Endangered Species Act compliance for more than 800 water projects. Amazingly, no lawsuits have been filed on ESA compliance on any of those water projects. The Upper Colorado program has become a national model for recovering endangered species while addressing the demand for water development to support growing western communities.”

Secretary of the Interior Gale Norton, January 28, 2005
Colorado Water Congress 47th Annual Convention
Denver, Colorado

“Through my work, the most important lesson I have learned is that longstanding solutions to natural resource problems are not found in the exercise of governmental power alone. Rather, long-term solutions must always have a foundation built on collaboration with all interested constituents...I believe in the old adage that says ‘real power can only be realized when it is shared and allowed to grow.’ By sharing power with our citizens, the future success of our nation’s fish and wildlife resources is without limit.”

U.S. Fish and Wildlife Service Director Dale Hall, September 22, 2005
Senate Energy and Natural Resources Committee Confirmation Hearing
Washington, D.C.

COLORADO

“These recovery programs work through the strong partnership established between the States of Colorado, New Mexico, Utah and Wyoming, Indian tribes, water and power developers, environmental interests and federal agencies....Endangered fish recovery efforts have been able to proceed while municipal and agricultural water users have put to beneficial use 2.9 million acre-feet of water constituting 1,000 projects. These projects have relied on the recovery programs as regulatory compliance for the Endangered Species Act, and all of this activity has been accomplished without a single lawsuit.”

Bill Owens
Governor, State of Colorado

NEW MEXICO

“Congress enacted Public Law 106-392 with strong bipartisan support. Public Law 106-392 authorizes the federal government to provide up to \$46 million of cost sharing for the implementation of capital projects... The four participating states of New Mexico, Colorado, Utah and Wyoming and their water users will contribute up to an aggregate of \$17 million to the programs, and \$17 million will be contributed from revenues derived from the sale of Colorado River Storage Project hydroelectric power....The substantial non-federal cost sharing funds demonstrate the strong commitment and effective partnerships that are present in both the San Juan and Upper Basin programs.”

Bill Richardson
Governor, State of New Mexico

UTAH

“The Recovery Program is a mutually supported partnership involving the states of Utah, Colorado, New Mexico and Wyoming, as well as environmental organizations, power users, water users and development interests. It is important to note that, because of the cooperation between the partners, water development along the river has continued to proceed without a single lawsuit.”

Jon M. Huntsman, Jr.
Governor, State of Utah

WYOMING

“These ongoing, highly successful, cooperative programs ... reflect the proper approach to providing endangered species conservation and recovery within the framework of the existing Federal Endangered Species Act, while concurrently resolving critical conflicts between endangered species recovery and the development and use of Compact-allocated water resources in the Upper Colorado River Basin region of the Intermountain West.”

Dave Freudenthal
Governor, State of Wyoming

Accomplishments Toward Achieving Recovery

Recovery Goals Provide Measures of Success

The U.S. Fish and Wildlife Service (Service) approved recovery goals for the endangered humpback chub, bonytail, Colorado pikeminnow, and razorback sucker on August 1, 2002. The recovery goals provide objective, measurable criteria for downlisting to “threatened” and delisting (removal from Endangered Species Act [ESA] protection). The recovery goals also state that the Service and its partners will review and revise the goals at least once every five years, or as necessary, when new information warrants a change in the recovery criteria.

The recovery goals can be viewed and downloaded at:
<http://mountain-prairie.fws.gov/crrip/rg.htm>.

Recovery is based on reduction of threats and improvement of a species status during the time it is listed under the ESA. The 2002 recovery goals identify the number and age of fish that comprise a specified number of self-sustaining wild populations (see “Fish Status” on pages 14-15). They also identify site-specific management actions that reduce threats to the species associated with the ESA’s five listing factors. Because recovery is the reverse of listing, the five listing factors and threats associated with each factor must be resolved before reclassification (i.e., downlisting or delisting) of a listed species can be considered.

Five ESA Listing Factors

- Present or threatened destruction, modification, or curtailment of habitat or range.
- Overutilization for commercial, recreational, scientific, or educational purposes.
- Disease or predation.
- Inadequacy of existing regulatory mechanisms.
- Other natural or manmade factors affecting continued existence.

Downlisting or delisting of the endangered fishes will be considered by the Service once the fish populations reach the required demographic and genetic standards for self-sustaining, and the necessary management actions are achieved that reduce the threats that caused them to be listed.

U.S. Fish and Wildlife Service Biologist
Brian Scheer holds a razorback sucker
produced at the Grand Valley Endangered
Fish Facility in Grand Junction, Colorado.

Management, research, and monitoring actions of the two recovery programs are consistent with the recovery goals. The recovery programs implement actions within five major program elements, and primarily address threats associated with two ESA listing factors: “present or threatened destruction, modification, or curtailment of habitat or range;” and “disease or predation.” The five program elements are:

- **Habitat management** - Identify and provide adequate instream flows.
- **Habitat development** - Restore habitat to develop spawning and nursery sites, provide fish passage at dams, maintain water quality, and prevent fish from being trapped in diversion canals.
- **Nonnative species and sportfishing** - Reduce the threat of certain nonnative fish species while maintaining sportfishing opportunities.
- **Endangered fish propagation and stocking** - Produce genetically diverse fish in hatcheries and stock them in the river system.
- **Research, monitoring, and data management** - Provide data on life-history requirements of the endangered fishes and monitor populations to measure progress toward achieving the recovery goals.

Selected accomplishments of the two recovery programs toward achieving recovery of the endangered fishes are described on the following pages for each program element.



Cooperative Water Management Improves Habitat

Streamflow regulation is a primary threat to the endangered fishes because of associated modification or loss of river and floodplain habitat. Actions the recovery programs accomplish within this recovery element focus on identification and provision of adequate instream flows. Research, monitoring, and adaptive management identify, implement, evaluate, and refine flow and temperature recommendations to meet life-history requirements and flow-habit relationships of the endangered fishes.

The recovery programs' partners manage water resources to benefit the endangered fishes and their habitat in accordance with State water law, individual water rights, and interstate compacts. Water for the endangered fishes is managed through a variety of means, including water leases and contracts, coordinated releases from upstream reservoirs, improvements to irrigation, and reoperation of Federal facilities.

Upper Colorado River Endangered Fish Recovery Program

- Flow recommendations help guide efforts to provide and protect instream flows to benefit the endangered fishes in the Colorado, Gunnison, Green, Yampa, Duchesne, and White rivers.
- Coordinated reservoir operations in the Colorado River allow upstream reservoir owners and operators to release water to enhance spring peak flows and improve fish habitat. During 1998 and 1999, a total of 65,500 acre-feet of water was released to support spring peak flows which, on average, added 2,000 cubic-feet-per-second to the annual peak flows.
- From 2002 through 2005, improvements to the Grand Valley Project canal system in western Colorado reduced water diversions by 10 to 16 percent (29,000 to 45,000 acre-feet) while meeting irrigation demands. On average, about 33,000 acre-feet of water will be available each year to augment base flows in the Colorado River.
- Water (acre-feet) is released from upstream reservoirs to augment late-summer and fall base flows in the Colorado River to improve endangered fish habitat (see table below).

Year	2000	2001	2002	2003	2004	2005
Water (acre-feet)	45,567	68,305	19,613	72,108	17,640	53,177



Improvements to the Grand Valley Project canal system reduced water diversions by 10 to 16 percent.

- A final environmental impact statement and biological opinion on the operation of Utah's Flaming Gorge Dam were completed to help meet flow and temperature recommendations for the Green River. The U.S. Bureau of Reclamation's record of decision was executed in February 2006.
- *The Management Plan for Endangered Fishes in the Yampa River Basin* was initiated in 2005 to help ensure that current and future water needs are met for people and endangered fish in the Yampa River Basin in Colorado and Wyoming.



A 12,000 acre-foot enlargement of Elkhead Reservoir in northwest Colorado is underway. When completed in 2007, 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.

- Local water users and State and Federal agencies work together to implement flow recommendations for the Duchesne River in northeast Utah according to an updated biological opinion.

(Continued on page 7)

Cooperative Water Management Improves Habitat (continued from page 6)

San Juan River Basin Recovery Implementation Program

■ Flow recommendations for the San Juan River help guide efforts to provide and protect instream flows to benefit the endangered fishes.



San Juan River.

■ Navajo Dam has been reoperated on a trial basis since 1999 to provide flows in accordance with flow recommendations.

■ A final environmental impact statement and biological opinion were completed on the operation of New Mexico's Navajo Dam to help meet flow recommendations for the San Juan River. The U.S. Bureau of Reclamation's record of decision will be executed in early 2006.



San Juan River below Navajo Dam.

■ Local water users, Indian tribes, and State and Federal agencies work together to implement an agreement to share water shortages in Navajo Reservoir and the San Juan River Basin. Reservoir releases have been reduced to conserve as much as water as possible during winter.



Navajo Reservoir.



Navajo Dam and Reservoir.

Construction Projects Key to Habitat Development

The recovery programs improve fish habitat by providing fish passage at diversion dams for endangered and other native fish, screening diversion canals to keep fish from entering and becoming trapped, and acquiring and restoring floodplain habitat to serve primarily as fish nursery areas. The recovery programs fund construction and operation costs of fish screens and passages. All actions to improve habitat are monitored to evaluate their effectiveness.

Upper Colorado River Endangered Fish Recovery Program

Fish passages and screens are in place at three diversion dams and canals in western Colorado - Redlands diversion dam on the Gunnison River, and Grand Valley Irrigation Company and Grand Valley Project diversion dams on the Colorado River.

The Price-Stubb diversion dam is the last barrier to fish movement on the Colorado River in critical habitat and the last barrier identified for fish passage in the recovery goals for the upper Colorado River system. This fourth and final passage is scheduled for completion in 2007. At that time, endangered fish will have uninterrupted access to an additional 110 miles of critical habitat in the Colorado and Gunnison rivers, blocked for nearly a century.

To date, 71 Colorado pikeminnows, 15 razorback suckers, 1 bonytail, and 70,814 other native fish have used the Redlands fish passage. During initial trial operation of the Grand Valley Project fish passage in 2005, 1 razorback sucker, 3 humpback chubs, and 2,861 other native fish moved upstream. Use of the fish passage by humpback chubs suggests a sixth population of this species may occur in this area.

Construction of a fish screen in the Tusher Wash diversion dam canal on the Green River in eastern Utah is scheduled for completion in 2008. Once completed, all major diversion canals identified in the recovery goals for the upper Colorado River system will be screened.

Floodplains are being made accessible to all life stages of endangered fish by breaching or removing natural or man-made levees. Since 1992, the Recovery Program has acquired 19 properties totaling 1,600 acres and restored floodplain habitat at 16 sites, totaling 2,656 acres in Colorado and Utah.

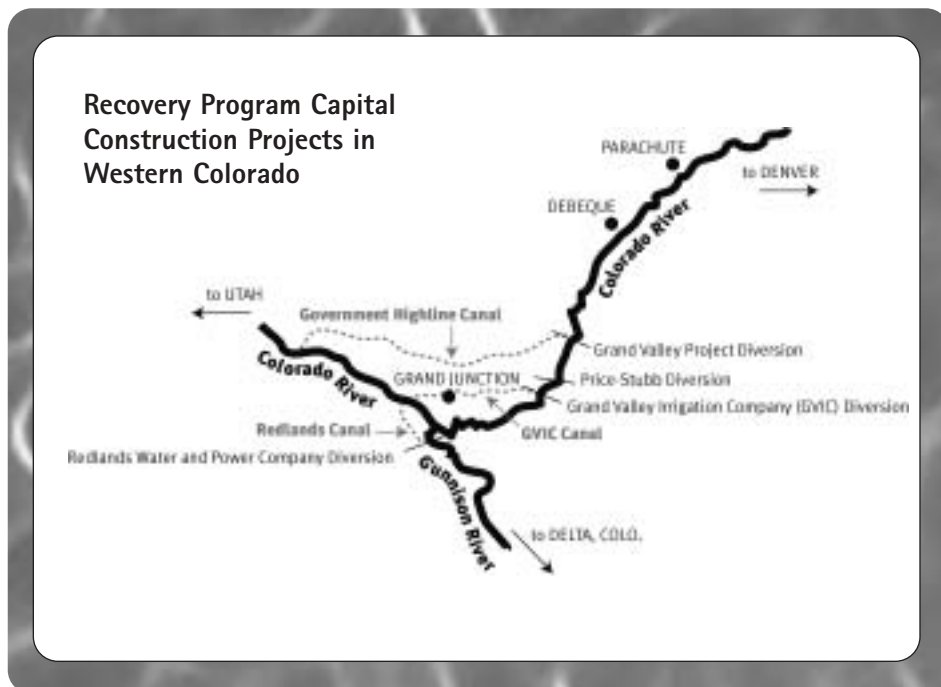
Fish screen under construction at the Grand Valley Project diversion dam and canal.



Fish screen at the Redlands Water and Power Company diversion dam and canal.



Fish passage at Grand Valley Project diversion dam.

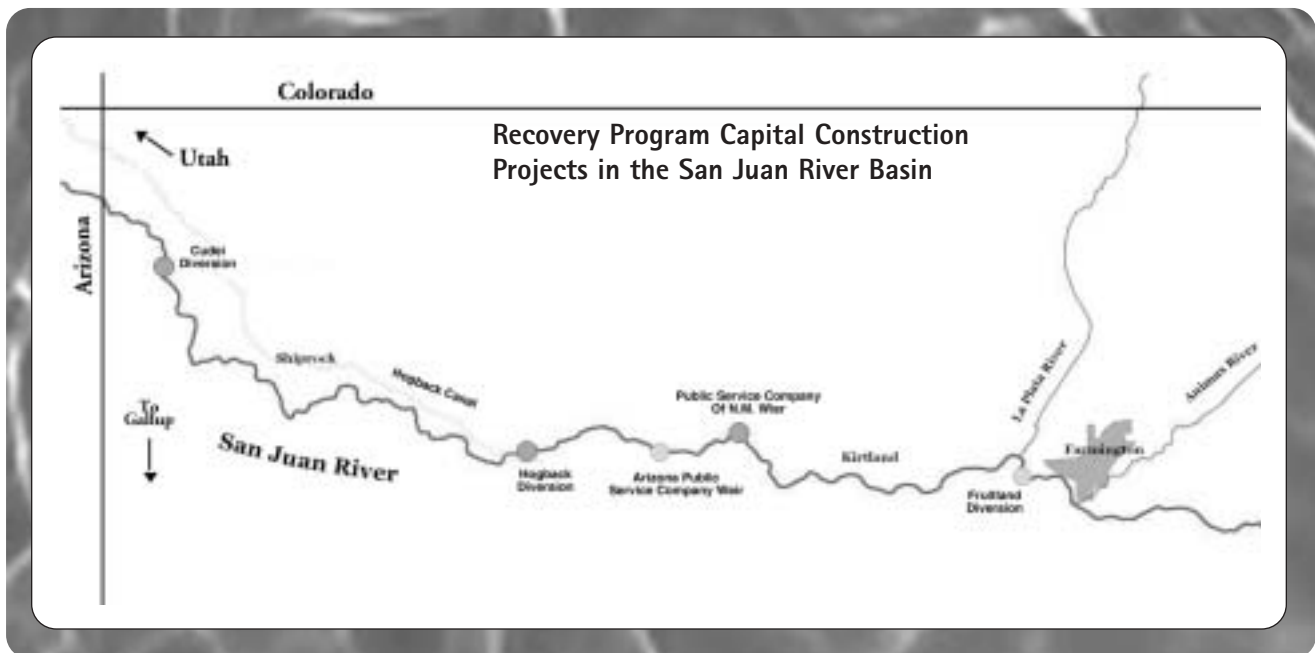


(Continued on page 9)

Construction Projects Key to Habitat Development (continued from page 8)

San Juan River Basin Recovery Implementation Program

- Fish access has been restored to an additional 36 miles of critical habitat on the San Juan River with the construction of passages at the Public Service Company of New Mexico (PNM) weir and the Hogback diversion dam, and removal of the Cudei diversion dam.
- The Navajo Nation operates the PNM passage. Through 2005, 15 razorback suckers, 24 Colorado pikeminnows, and nearly 50,000 other native fish used the passage.
- Construction of a fish screen in the Hogback diversion dam canal is scheduled for completion in 2008.
- Other potential barriers to fish movement include the Arizona Public Service Company weir and the Fruitland diversion dam. A technical evaluation completed in 2005 will help determine if fish passages are needed at these structures.



Fish passage at Hogback diversion dam.



Arizona Public Service Company weir.



Fish passage at Public Service Company of New Mexico weir.

Programs Address Nonnative Fish Management Challenges

Predation or competition by nonnative fish species is a serious threat to the endangered fishes and perhaps the most challenging to manage. Biologists have identified problematic nonnative fish species. The recovery programs implement, evaluate, and improve management actions to reduce their impacts to the endangered fishes. The actions recognize the dual responsibilities of State and Federal wildlife agencies to conserve native fish species while providing sport-fishing opportunities.

The recovery programs meet the challenge of nonnative fish management through a variety of means. Actions to prevent nonnative fish from entering the river system include: restriction of nonnative fish stocking, screening of off-river ponds and reservoirs, and chemical removal of nonnative fish in small off-river ponds. In addition to these measures, the recovery programs remove the most problematic nonnative fish from the rivers.

Upper Colorado River Endangered Fish Recovery Program

■ Northern pike, smallmouth bass, and channel catfish pose the greatest threats to the endangered fishes in the upper Colorado River system. Removal efforts significantly increased in 2005 to remove northern pike and smallmouth bass in 565 miles of the Colorado, Green, and Yampa rivers in Colorado and Utah. Effective channel catfish removal continued in Yampa Canyon.

■ Northern pike management removal in the Yampa and Green rivers shows signs of success. In critical habitat on the middle Yampa River in Colorado, biologists reported a 60 to 68 percent within-year decrease in the abundance of northern pike in 2004 and 2005. Northern pike declined 28 percent from 2004 to 2005. In the Green River, northern pike abundance has been reduced by 87 percent since 2001.



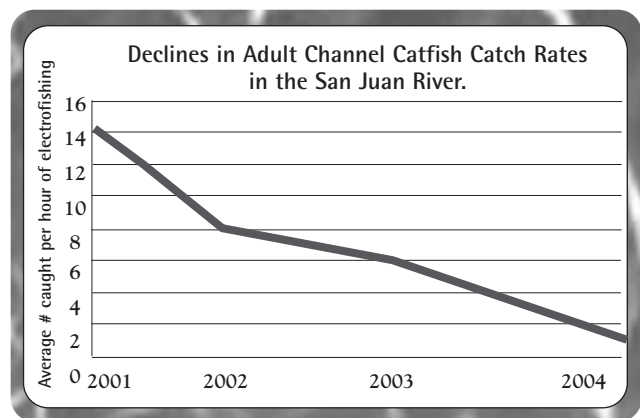
Aaron Rice, of the Colorado Division of Wildlife, holds a northern pike removed from the Yampa River.

■ Efforts to manage smallmouth bass also show signs of success. In sections of critical habitat on the Green River in Utah, catch rates of smallmouth bass declined 60 to 70 percent from 2004 to 2005.

■ A barrier net at Highline Lake in western Colorado prevents escapement of nonnative sportfish and allows the lake to be managed for sportfishing.

San Juan River Basin Recovery Implementation Program

■ Channel catfish pose the greatest threat to endangered fishes in the San Juan River. Intensive efforts to remove this species have been underway since 2001 in 124 miles of river. Today, the abundance of channel catfish has been reduced to the lowest level ever observed. The channel catfish population appears to be dominated by juvenile fish, thereby reducing the potential for both channel catfish reproduction and predation on large native fish.



■ The Recovery Program coordinates with the Navajo Nation and the State of New Mexico to relocate channel catfish from the river to area lakes to enhance recreational fishing opportunities.



Although channel catfish pose the greatest threat to endangered fish in the San Juan River, there is evidence that their population numbers and sizes have declined.

Reestablishing Fish Populations Through Propagation and Stocking

The recovery programs produce genetically diverse bonytail, razorback sucker, and Colorado pikeminnow in hatcheries and then stock them in rivers. Both recovery programs finalized stocking plans in 2003 to expedite reestablishment or enhancement of self-sustaining wild populations.

Fish production numbers and sizes and schedules of the stocking plans are tied to the population criteria of the recovery goals for each endangered fish species (see “Fish Status” on pages 14-15). Stocked fish are surviving and reproducing (see story on page 16).

Upper Colorado River Endangered Fish Recovery Program

- Since 1996, about 100,700 subadult razorback suckers, 265,000 subadult bonytails, and 8,000 subadult Colorado pikeminnows have been stocked in the upper Colorado River system.
- The Recovery Program funds operations of four hatchery facilities in Colorado and Utah:
 - The Recovery Program’s Grand Valley Endangered Fish Facility (Grand Junction, Colorado) produces razorback suckers for stocking in the Colorado, Gunnison, and Green rivers.
 - The Ouray National Fish Hatchery (Ouray, Utah) produces razorback suckers for stocking in the Green River.
 - The State of Utah’s Wahweap Fish Hatchery (Big Water, Utah) produces bonytails for stocking in the Colorado and Green rivers.

- The State of Colorado’s J.W. Mumma Native Aquatic Species Restoration Facility (Alamosa, Colorado) produces bonytails for stocking in the Colorado and Green rivers, and Colorado pikeminnows for stocking in the Colorado and Gunnison rivers.

San Juan River Basin Recovery Implementation Program



Dexter National Fish Hatchery and Technology Center.

- Dexter National Fish Hatchery and Technology Center (Dexter, New Mexico) produces the Colorado pikeminnow and razorback sucker larvae required to meet the stocking plan for the San Juan River.
 - Since 2002, about 975,000 juvenile Colorado pikeminnows have been stocked.
 - Since 1994, 12,650 subadult or adult razorback suckers have been stocked.

Hatchery Production of Subadult Fish Under the Recovery Programs’ Stocking Plans.

Hatchery	Species	Annual Production Target	Fish Stocked		Total
			2004	2005	
Ouray	Razorback sucker	14,895	14,508	4,878 ¹	19,386
Grand Valley	Razorback sucker	14,895	7,827 ²	15,876	23,703
Wahweap	Bonytail	10,660	9,700	10,574	20,274
Mumma	Bonytail	5,330	13,400	5,147	18,547
Mumma	Colorado pikeminnow	2,250	4,578	1,493 ³	6,071
Dexter	Razorback sucker	11,400	2,988	1,996	4,984 ⁴
Dexter	Colorado pikeminnow	303,000	281,219	306,800	588,019

1. High mortality in hatchery ponds due to cormorant predation. Ponds were covered with netting to prevent future predation. 2. Survival in leased grow-out ponds was extremely variable. Changes in hatchery operations in 2005 increased production. 3. These fish were stocked in the San Juan River. 4. Predation and other problems with grow-out ponds. Pursuing other sources to provide fish to meet the stocking target.

Adaptive Management Approach Requires Research and Monitoring

The recovery programs conduct research and monitoring to generate critically important information on reproduction, growth, and survival of the endangered fishes in the wild. The recovery programs use this information to adjust management actions. Estimates of the abundance and age of endangered fish populations are used to monitor progress toward achieving the recovery goals.

Upper Colorado River Endangered Fish Recovery Program

■ Research studies conducted in the Green River in 2005 provided important information about transport of razorback sucker larvae out of the river and into floodplain wetlands that serve as nursery habitat. Data will identify modifications needed at floodplain sites that provide nursery habitat.



The U.S. Bureau of Reclamation released additional water from Flaming Gorge Dam for 2 days before and after the peak flow. Ouray National Fish Hatchery produced 1.3 million razorback sucker larvae to mark and stock in the river. Utah Division of Wildlife Resources biologists performed the field work, and Colorado State University Larval Fish Laboratory researchers analyzed fish samples.

■ In 2005, the U.S. Geological Survey initiated monitoring of sediment movement in the Gunnison and Green rivers to evaluate the level of spring peak flows needed to create and maintain endangered fish habitat. These data will be used to help refine flow recommendations.

■ Population estimates have been obtained for all five humpback chub populations and the two Colorado pikeminnow populations. These estimates are used to track progress toward achieving the recovery criteria for self-sustaining populations. These estimates and sampling methods were reviewed by researchers from State and Federal agencies and universities at two workshops sponsored by the Recovery Program. The U.S. Fish and Wildlife Service is working with the Recovery Program to evaluate the estimates' reliability.

San Juan River Basin Recovery Implementation Program

■ Based on multi-year research and monitoring, the U.S. Fish and Wildlife Service concluded in 2005 that razorback sucker and Colorado pikeminnow populations in the San Juan River are more secure today than they were during the 1980s and 1990s, and that the threat of extinction has been reduced. Captures of razorback sucker larvae are increasing, and the collection of two juvenile razorback suckers in the lower San Juan River provides the first evidence of successful recruitment (*see story on page 16*).



Researchers are recapturing stocked razorback suckers in the San Juan River.

■ The U.S. Bureau of Reclamation, in coordination with the Hydrology Committee, completed development of the Third Generation San Juan River Recovery Implementation Program Hydrology Model in 2004. Testing of the model is underway and scheduled to be completed in 2006. The model allows better evaluation of flows in the San Juan River to benefit the endangered fishes.

Public Information and Involvement Supports Recovery Efforts

The recovery programs conduct public information and involvement to increase awareness of, and support for, the recovery of the endangered fish species. In 2005, the recovery programs integrated certain outreach efforts to ensure consistent messages about the endangered fish recovery efforts. Cost savings through sharing of production expenses will result from joint exhibits at State and regional water user conferences and co-production of publications including newsletters and brochures.

Upper Colorado River Endangered Fish Recovery Program

- Local communities are helping to establish interpretive exhibits and host public events that offer opportunities to observe and learn about the endangered fishes.
- In 2005, the City of Grand Junction, Colorado, helped develop and install six interpretive signs and a custom-shaped Colorado pikeminnow bench along a riverfront trail.
- Colorado River State Park in Fruita, Colorado, established an aquarium with endangered fish at its visitor center in 2005. The aquarium is similar to one at a conference center in Montrose, Colorado.



Aquarium with endangered fish at Colorado River State Park.



Congressional staffers tour recovery program facilities, such as the Grand Valley Endangered Fish Facility.

- Public meetings are held, and a wide range of educational materials are produced, including newsletters, fact sheets, and a web site. Considerable favorable press concerning the Recovery Program was observed in 2005 in local and regional newspapers in Colorado, Utah, and Wyoming.

San Juan River Basin Recovery Implementation Program

- The fish passage at the Public Service Company of New Mexico weir continues to provide educational opportunities to students from local schools, the Shiprock Boys and Girls Club, and the local Headstart Program.



Local students learn to identify native and nonnative fishes by helping biologists sort the day's catch at the fish passage at the Public Service Company of New Mexico weir on the San Juan River.

- The Recovery Program invites full public participation through public meetings and maintains an updated website.

Recovery Program Web Sites

Upper Colorado River:

ColoradoRiverRecovery.fws.gov

San Juan River: southwest.fws.gov/sjrip



Endangered Fish Status

The recovery programs conduct monitoring and research to track and better understand the status of endangered fish populations. The U.S. Fish and Wildlife Service and other stakeholders assess the reliability of population estimates and sampling methods through adaptive management. Recently reported downward trends in some humpback chub and Colorado pikeminnow populations may

be attributed to sustained drought conditions during 2000 through 2004 (water-year 2002 was the driest in more than 100 years) and increases in the abundance and distribution of certain predatory nonnative fishes. The recovery programs are taking research and management actions to reduce these impacts.

Humpback Chub

■ Five self-sustaining humpback chub populations inhabit canyon-bound river reaches in the Green and Colorado river systems of the Upper Colorado River Basin:

- A total of about 3,000 adult humpback chubs are estimated to occur in the Black Rocks and Westwater Canyon populations.
- The humpback chub population in Desolation/Gray canyons is estimated at about 1,000 adults.

Population Criteria for Humpback Chub Recovery in the Upper Colorado River Basin

Downlisting

Over a 5-year monitoring period:

- Maintain the five populations with no net loss of fish
- One core population > 2,100 adults

Delisting

For 3 years beyond downlisting:

- Maintain the five populations with no net loss of fish
- Two core populations, each > 2,100 adults

- The Yampa Canyon and Cataract Canyon humpback chub populations are small, each consisting of a few hundred adults.



Researchers sample for humpback chubs in Black Rocks.

Fish Illustrations © Joseph R. Tomelleri

Bonytail

■ The bonytail is the rarest of the four endangered Colorado River fish species. Before stocking began, the species had essentially disappeared in the Upper Colorado River Basin.

Population Criteria for Bonytail Recovery in the Upper Colorado River Basin

Downlisting

Over a 5-year monitoring period:

- Maintain two reestablished populations, one in the Green River system and one in the Colorado River system, each > 4,400 adults

Delisting

For 3 years beyond downlisting:

- Maintain two reestablished populations, one in the Green River system and one in the Colorado River system, each > 4,400 adults

- Stocking efforts continue to reestablish two self-sustaining bonytail populations in the upper basin. Stocking has been expanded to place fish into floodplain wetlands to enhance growth and survival.
- Stocked bonytails are being recaptured in several locations throughout the Green and Colorado rivers. This information will be used to help determine the life-history and habitat requirements of the species.



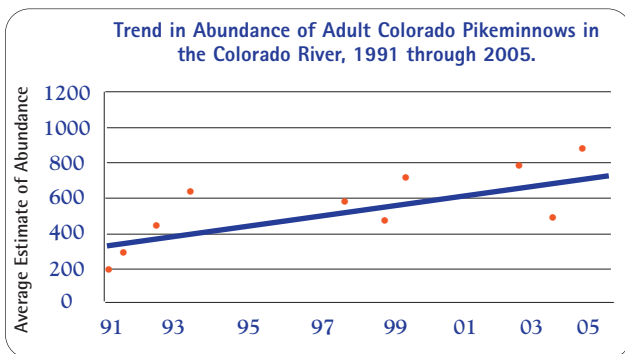
Stocked bonytails are being recaptured in the Green and Colorado rivers.

- Stocking efforts continue in the San Juan River to achieve requirements of the recovery goals.

Colorado Pikeminnow

■ Self-sustaining Colorado pikeminnow populations occur in the Colorado and Green river systems of the Upper Colorado River Basin:

- Since 1991, abundance of Colorado pikeminnow adults in the Colorado River has generally increased.
- Adult Colorado pikeminnow abundance in the Green River system during 2001 through 2003 declined from 3,100 to 2,300. Catch rates for young Colorado pikeminnows in 2004 were the highest since 1996 in the Green River. It is anticipated that this stronger year-class will show up as subadult or adult fish in future estimates.



Population Criteria for Colorado Pikeminnow Recovery in the Upper Colorado River Basin	
Downlisting	Delisting
Over a 5-year monitoring period: <ul style="list-style-type: none"> • Maintain the exchange of fish among populations • Maintain populations in the Green and Colorado river systems with no net loss of fish • Green River system population > 2,600 adults • Colorado River system population > 700 adults • Establish 1,000 age 5+ subadults in the San Juan River 	For 7 years beyond downlisting: <ul style="list-style-type: none"> • Maintain the exchange of fish among populations • Maintain populations in the Green and Colorado river systems with no net loss of fish • Green River system population > 2,600 adults • Colorado River system population > 1,000 adults OR Colorado River system population > 700 adults and the San Juan River population > 800 adults



U.S. Fish and Wildlife Service Biologist Rick Smaniotta holds a Colorado pikeminnow that used the fish passage at the Redlands diversion dam on the Gunnison River.

Razorback Sucker

■ Genetic stocks of wild razorback suckers are secured in hatcheries, and their offspring are being stocked to reestablish or enhance wild populations.

■ Stocked razorback suckers in the Green and San Juan rivers have been captured at spawning sites in reproductive condition, and captures of young fish in the Green, Gunnison, Colorado, and San Juan rivers demonstrate that these fish are successfully reproducing (see story on page 16).

Population Criteria for Razorback Sucker Recovery in the Upper Colorado River Basin	
Downlisting	Delisting
For 5-year monitoring period: <ul style="list-style-type: none"> • Maintain two reestablished populations, one in the Green River system and one in EITHER the Colorado River system or in the San Juan River, each > 5,800 adults 	For 3 years beyond downlisting: <ul style="list-style-type: none"> • Maintain two reestablished populations, one in the Green River system and one in EITHER the Colorado River system or in the San Juan River, each > 5,800 adults



Stocked razorback suckers are being recaptured in reproductive condition.

Razorback Sucker Stocking Shows Success

Bringing the Species Back from the Brink of Extinction

The razorback sucker was historically common to abundant in most warmwater rivers of the Colorado River Basin, but declined in abundance and distribution throughout the 20th century. Today, the species exists naturally in only a few locations.

Numbers of wild razorback suckers captured in the Upper Colorado River Basin have decreased dramatically since the mid 1970s. Less 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.

Hatchery-produced, stocked fish form the foundation for the reestablishment of naturally self-sustaining populations of razorback sucker in the upper Colorado and San Juan river systems. The recovery programs' genetic management plans maximize the genetic diversity of razorback suckers produced in hatcheries from wild brood stocks to increase the likelihood that stocked fish can cope with local habitats. The recovery programs' stocking plans identify the annual number and size of stocked subadult razorback suckers to expedite reestablishment of populations and achieve the demographic criteria of the recovery goals.

Stocking efforts are showing success as stocked fish are surviving and reproducing:

- During 2000 through 2004, 1,283 stocked razorback suckers were recaptured in the Green River and over 500 were recaptured in the Colorado and Gunnison rivers. Some fish have been recaptured 4 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 of individuals between rivers suggests that razorback suckers may eventually form a network of populations or subpopulations.

- During 2000 through 2004, 893 stocked razorback suckers were recaptured in the San Juan River. Some fish have been recaptured 9 years after stocking.

- 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 successfully reproducing.

- Survival of razorback sucker larvae through the first year is evidenced by captures of juveniles in the Green, Gunnison, and San Juan rivers.

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



Some razorback suckers have been recaptured 9 years after stocking.



Utah Division of Wildlife Resources Biologist Ron Brunson samples for razorback sucker larvae in the Green River.

Programs' Accomplishments for Water Project Consultations

The Upper Colorado River and San Juan River recovery programs respond to the challenge of water management by working cooperatively with and among local, State, Federal, and tribal agencies to meet the needs of people and endangered fish. The programs' goal is to achieve full recovery (delisting) of the endangered fishes, not just to avoid jeopardy (offset impacts of water project depletions) under the Endangered Species Act (ESA). The recovery programs serve as a vehicle for ESA compliance (reasonable and prudent alternatives) for water development and manage-

ment activities by all parties, including the Federal government. Responsibilities to offset water project depletion impacts do not fall on individual projects or their proponents.

The recovery programs provide ESA compliance for more than 1,000 water projects depleting more than 2.9 million acre-feet per year. This is accomplished through cooperative efforts and, to date, no lawsuits have been filed on ESA compliance for any of these water projects.

Upper Colorado River Endangered Fish Recovery Program Summary of Section 7 Endangered Species Act Consultations (1/1988 through 12/31/2005)

State	Number of Consultations	Historic Depletions	New Depletions	Totals
		Acre-feet/yr	Acre-feet/yr	Acre-feet/yr
Colorado	461	1,293,154	169,558	1,462,712
Utah	44	433,605	63,049	496,654
Wyoming	119	83,760	39,187	122,947
Regional*	238	(regional)	(regional)	0
Totals	862	1,810,519	271,794	2,082,313

* Depletions included in historic projects.

San Juan River Basin Recovery Implementation Program Summary of Section 7 Endangered Species Act Consultations

State	Depletions
	Acre-feet/yr
New Mexico	617,216
Colorado	217,456
Utah	9,140
Arizona	10,010
Total	853,822

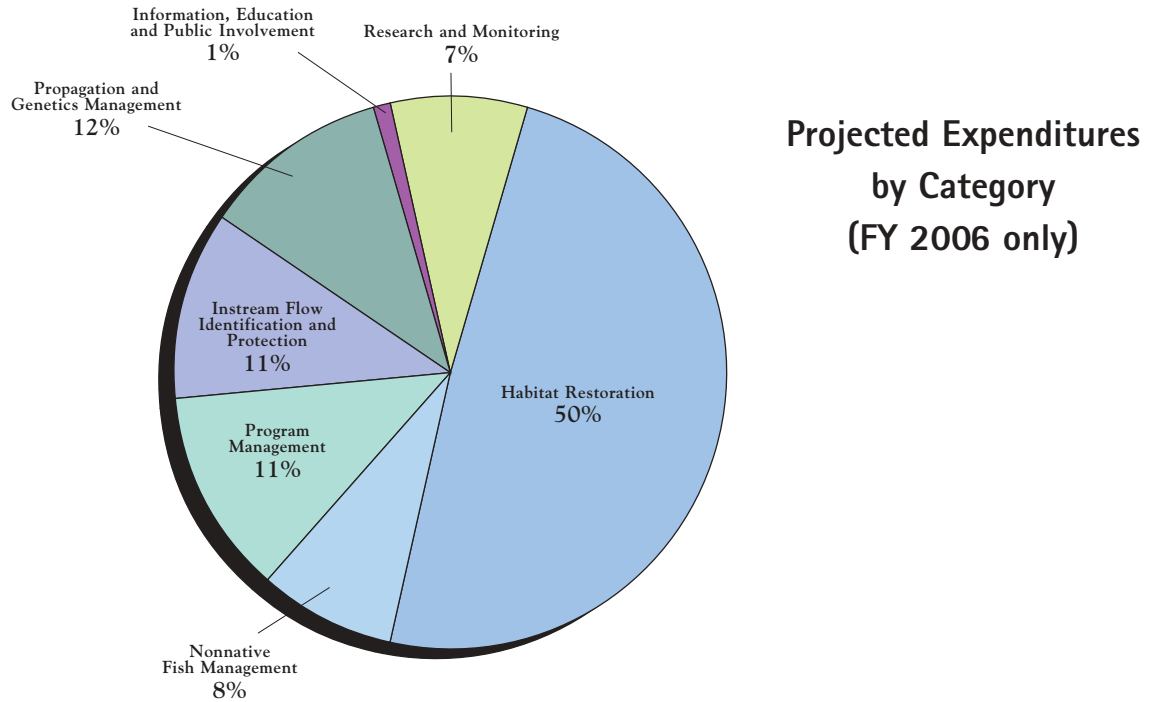
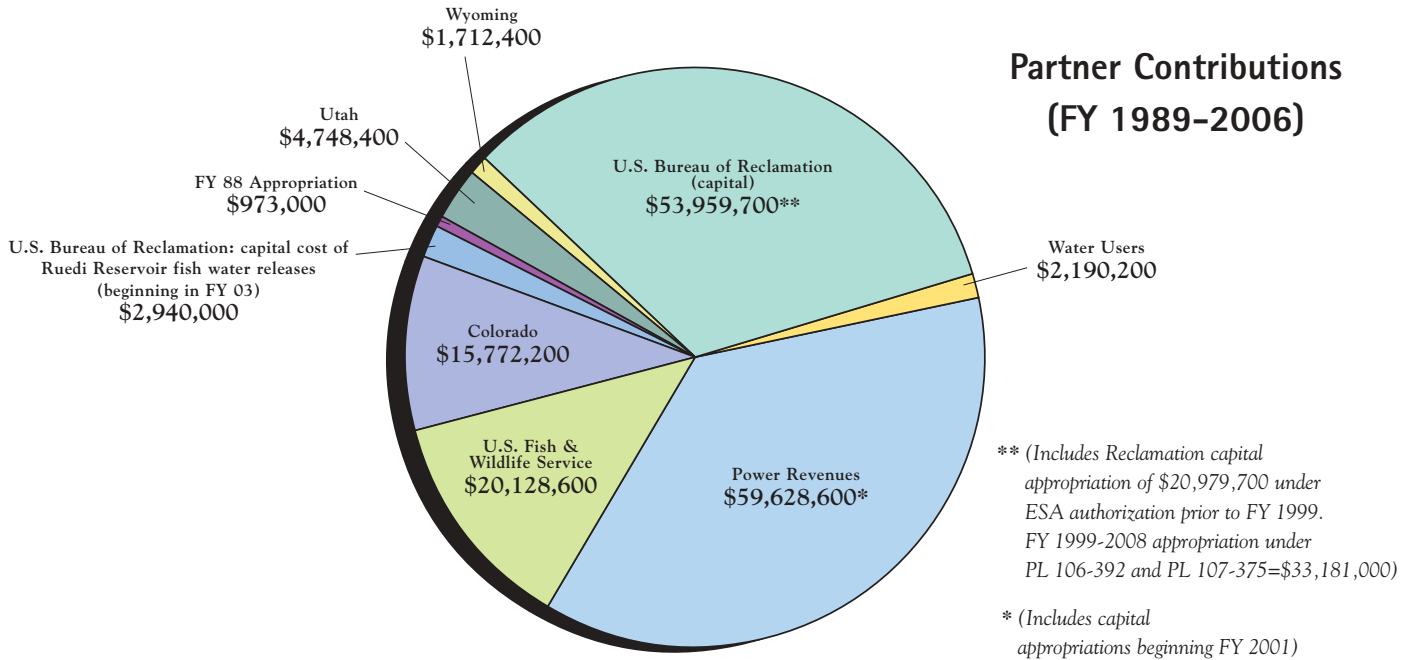
People and endangered fish benefit in various ways from a cooperative approach to water management.



Expenditures

Upper Colorado River Endangered Fish Recovery Program

Total Partner Contributions = \$161,080,100 (FY 1989-2006)



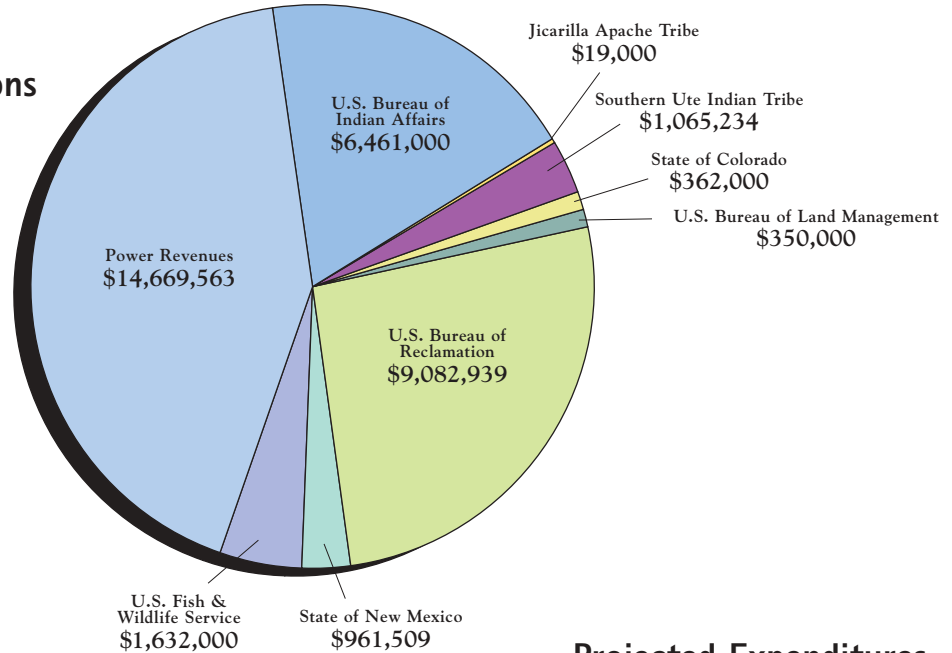
Expenditures

San Juan River Basin Recovery Implementation Program

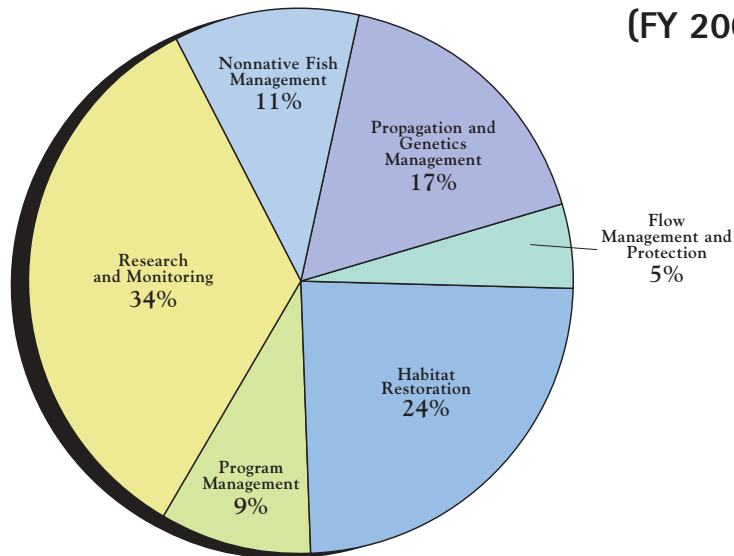
Total Partner Contributions = \$34,603,245 (FY 1992-2006)

(Not including in-kind contributions)

**Partner Contributions
(FY 1992-2006)**



**Projected Expenditures
by Category
(FY 2006 only)**



Additional Appropriations Authority Nearing Enactment

Enactment of S. 1578 and H.R. 3153 into Law Will Provide Additional Capital Construction Appropriation Authority for the Upper Colorado River Recovery Program

Continuing success for both recovery programs and accomplishment of the ultimate goal of delisting the four endangered fish species requires sufficient funding to implement identified and agreed-upon recovery actions. Authorization for Federal spending was provided by Public Law 106-392, which authorized \$46 million of Federal appropriations and authorized the Secretary of the Interior, acting through the Bureau of Reclamation, to accept and expend \$17 million of contributed funds from the States of Colorado, New Mexico, Utah, and Wyoming and \$17 million from Colorado River Storage Project (CRSP) power revenues as non-Federal cost sharing. This law also recognized \$20 million in non-Federal cost sharing. Public Law 107-375 (2002) extended the capital construction authorization period to 2008 for both recovery programs.

Capital Funding Shortfall Identified and Solution Proposed

Under current law, the recovery programs' capital construction costs are not to exceed \$100 million: \$82 million for the Upper Colorado Program and \$18 million for the San Juan Program. P.L. 106-392 used recovery programs' cost estimates developed in the late 1990s. Since then, costs have risen due to increased demand for steel and concrete, higher energy and construction costs, and identification of additional fish passage and screen features specific to Colorado River conditions. With indexing for inflation, the authorized Federal construction amount is now \$64.5 million, while the current total estimated costs are \$77 million. The Upper Colorado Program participants have identified an appropriations authorization (ceiling) shortfall of \$12.5 million to complete authorized capital construction projects. No funding shortfall has been identified for the San Juan Program.

Completion of the Upper Colorado Program's capital construction program is a necessary step for the program to reach its ultimate goal of delisting the four endangered fish species. In early 2005, Recovery Program participants initiated an effort with Congress to increase the construction authorization by \$15 million. Congress was also asked to recognize additional non-Federal cost sharing of \$7.1 million from the power users as a result of additional losses in energy generation at CRSP hydroelectric projects, and a \$3.9 million contribution by the Colorado River Water Conservation District resulting from a 20-year lease of 2,000 acre-feet of water per year to the program at below cost rates. As a means to avoid requesting larger annual appropriation amounts in the Bureau of Reclamation's budget, Recovery Program participants also requested the authorization period for expending those funds be extended from 2008 to 2010.

Legislation to solve the capital projects funding shortfall was introduced in mid-2005. Thirteen of the 14 members of the House from the four States co-sponsored the House version of the bill. S. 1578 was introduced with substantial support of the Senate delegations from Colorado, New Mexico, and Utah, and was passed by the U.S. Senate on December 16, 2005. The engrossed bill increases the appropriations authorization for the Upper Colorado Program by \$15 million and extends the construction period for both the Upper Colorado and San Juan programs from 2008 to 2010. H.R. 3153 has passed the House Resources Committee and is awaiting passage. The following table describes cost sharing and revenue sources for the programs under current law and after House passage and signature of this necessary legislation into law by the President:

Current and Proposed Capital Construction Cost-sharing for Upper Colorado and San Juan Programs

Upper Colorado Recovery Program	\$82 million
San Juan Recovery Program	\$18 million
	<u>Total: \$100 million</u>

Proposed (After Enactment of H.R. 3153)

Upper Colorado Recovery Program (per S. 1578)	\$108 million
San Juan Recovery Program	\$18 million
	<u>Total: \$126 million</u>

Current and Proposed Sources of Revenue

Federal	Non-Federal
Congress: \$46 million	Power Revenues: \$17 million
	States (CO, NM, UT, WY): \$17 million
	Water and Power: \$20 million
	<u>Total: \$54 million</u>

Proposed (After Enactment of H.R. 3153)

Federal	Non-Federal
Congress: \$61 million	Power Revenues: \$17 million
	States (CO, NM, UT, WY): \$17 million
	Water and Power: \$31 million
	<u>Total: \$65 million</u>

Base (O&M) Funding for Programs Assured

P.L. 106-392 also provided up to \$6 million per year (adjusted annually for inflation) of CRSP hydropower revenues for base (non-capital) funding for the two programs. The law provides annual "base" funding of up to \$4 million for the Upper Colorado Program and up to \$2 million for the San Juan Program through 2011. After 2011, power revenues may be used only for monitoring and to operate and maintain capital projects unless Congress authorizes additional funding.

Non-Federal Funding Being Provided

The four participating States and power revenues each are contributing \$17 million for these projects. The Secretary of Energy, acting through the Western Area Power Administration, is authorized to use up to \$17 million of CRSP power revenues for capital projects. These revenues are treated as a non-Federal contribution, but are reimbursable costs assigned to power for repayment under Section 5 of the CRSP Act. Colorado created a Native Species Conservation Trust Fund and through joint resolution of the General Assembly an annual "Species Conservation Eligibility List" submitted by the Department of Natural Resources is funded. The New Mexico Legislature appropriated funds into the State's "operating reserve" (making monies available at any time) subject to approval by the New Mexico Interstate Stream Commission. Wyoming's State Legislature appropriated its funding share during its 1998 and 1999 sessions. In 1997 the Utah State Legislature created a Species Protection Account within the General Fund which receives Brine Shrimp Royalty Act-created revenue; in 2000 Utah dedicated 1/16th of one cent of Utah's general sales tax to water development projects, and directed funding to the Upper Colorado Program.



*Upper Colorado River Endangered
Fish Recovery Program*

Program Partners:

State of Colorado
State of Utah
State of Wyoming
Colorado River Energy Distributors
Association
Colorado Water Congress
National Park Service
The Nature Conservancy
U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
Utah Water Users Association
Western Area Power Administration
Western Resource Advocates
Wyoming Water Association

**Upper Colorado River Endangered
Fish Recovery Program**

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Denver, CO 80225
303-969-7322
303-969-7327 Fax
coloradoriverrecovery.fws.gov



*San Juan River Basin Recovery
Implementation Program*

Program Partners:

State of Colorado
State of New Mexico
Jicarilla Apache Nation
Navajo Nation
Southern Ute Indian Tribe
Ute Mountain Ute Tribe
U.S. Bureau of Indian Affairs
U.S. Bureau of Land Management
U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
Water Development Interests

**San Juan River Basin Recovery
Implementation Program**

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505-346-2542 Fax
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