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

Program Highlights

2006-2007

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

Balancing Species Recovery with Water Resource Development and Management

Program Highlights 2006-2007

The Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program are based on a balanced approach. Multiple state and federal agencies work cooperatively with public and private interests to recover the endangered Colorado River fishes. Water development and management continue in compliance with interstate compacts and all applicable federal and state laws. The recovery programs provide Endangered Species Act compliance for fulfillment of federal trust responsibilities to American Indian Tribes and continued operation of federal water and power projects in accordance with project purposes.

Program Highlights *is produced annually to document the recovery programs' progress toward recovery of the endangered fishes. This document is not a publication of the U.S. Department of the Interior or its agencies.*

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Colorado Pikeminnow

Humpback Chub

Bonytail

Razorback Sucker

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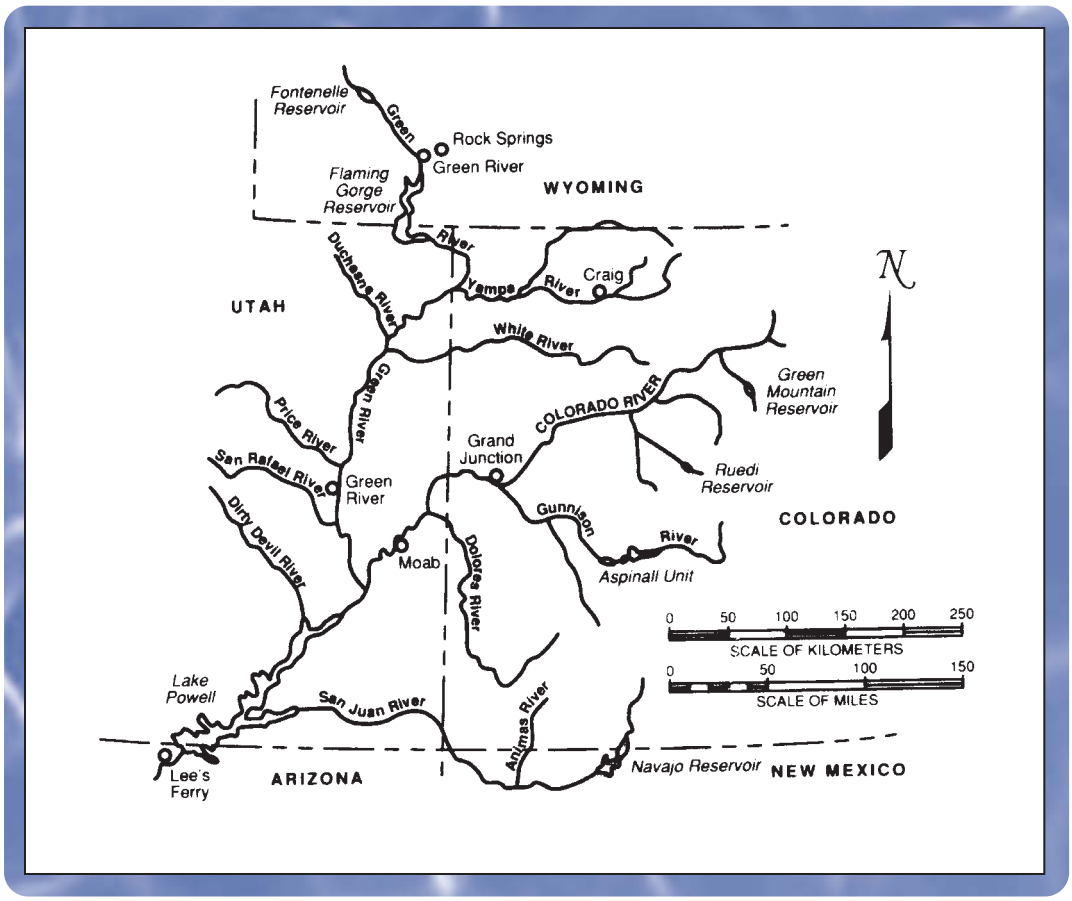
Recovering Endangered Fishes in the Upper Colorado and San Juan River Basins

The Intermountain West is the nation's fastest-growing region and a critically important energy-producing area of the country. Recovery Program partners recognize that their collaborative conservation partnership provides the most workable approach to recover endangered species while meeting growth-induced energy and water demands. The recovery programs are working to recover endangered fishes that live in the Colorado River Basin and nowhere else in the world.



Geographic Scope:

The Upper Colorado River Endangered Fish Recovery Program is recovering 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 agreed to extend the cooperative agreement through September 30, 2013.

The San Juan River Basin Recovery Implementation Program is recovering 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 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 parties extended the cooperative agreement through 2023.

Partners' Active Commitment and Participation Key to Recovery Programs' Success

Given the Colorado River's complex habitat changes and demands on water resources, Recovery Program partners recognize that collaboration is necessary to accomplish the dual objectives of recovering endangered fish species while providing water for human needs. Each partner fully participates in developing and implementing management actions leading toward delisting of the endangered Colorado River fishes. The recovery programs have earned accolades for their management approach, their proven track record of accomplishments, and their partners' long-term commitments of staff, time, and money.

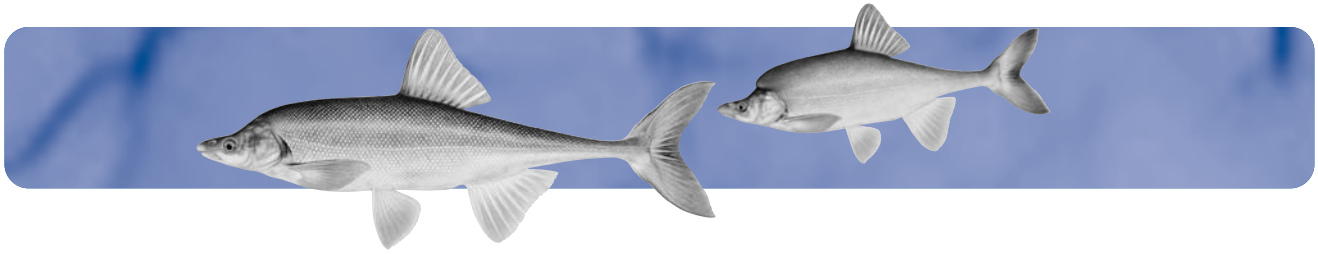
Congressional support and continued funding of agency involvement and program construction projects demonstrate the effectiveness of these public/private conservation partnerships. The recovery programs' success is a direct result of the active commitment and participation of their partners:

Upper Colorado River Endangered Fish Recovery Program

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

San Juan River Basin Recovery Implementation Program

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



Demonstrated Achievements Draw Bipartisan Support for Endangered Fish Recovery Programs

The recovery programs have become national models, demonstrating that public/private partnerships can effectively recover endangered species and resolve Endangered Species Act-related conflicts. State and federal leaders (including the Congress) continue to provide bipartisan and critically important support and funding for these programs in recognition of their proven effectiveness.

DEPARTMENT OF THE INTERIOR

"Faced with the need to manage the [Colorado] river for threatened and endangered fish and other wildlife, the Fish and Wildlife Service, the Bureau of Reclamation and many other partners developed the Upper Colorado River Endangered Fish Recovery Program, the Lower Colorado Basin Multi-species Conservation Program, and the San Juan River Basin Recovery Implementation Program.

As a result we are making progress toward recovery of endangered fish, while addressing the demand for water development to support growing western communities.

For example, in the Upper Colorado River Basin, the Fish and Wildlife Service has now consulted on nearly 1,400 water projects, using the Recovery Program as a reasonable and prudent alternative under the Endangered Species Act. This allows these projects to go forward while ensuring the conservation of the fish."

Secretary of the Interior Dirk Kempthorne, Dec. 15, 2006
Colorado River Water Users Association Annual Meeting
Las Vegas, Nevada

"Although the Fish and Wildlife Service is legally mandated to conserve species protected under the Endangered Species Act, we can't do it alone. We know that success requires the power of effective partnerships -- from state and federal personnel to non-governmental organizations. The Upper Colorado River and San Juan River Basin recovery programs have succeeded in bringing stakeholders together, uniting conservation efforts, and striking the necessary balance between species conservation and human needs."

U.S. Fish and Wildlife Service Director Dale Hall

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 recovery programs have become national models for collaboratively working to recover endangered species while meeting water use and water development demands in compliance with the Endangered Species Act, state law, and interstate compacts in the Upper Colorado River Basin region of the Intermountain West."

Dave Freudenthal, Governor, State of Wyoming

Federal Laws Authorize Cost-Sharing and Show Congressional Commitment to Species Recovery

While Congressional authorization to fund capital construction projects and operation and maintenance has been enacted in federal law, the Upper Colorado River and San Juan River Basin recovery programs' continued success depends on obtaining sufficient funding to implement recovery actions. Current federal laws authorize funding for capital construction projects and operation and maintenance.

CAPITAL FUNDING

Public Law 106-392, signed into law on October 30, 2000, authorizes the Bureau of Reclamation to provide cost-sharing for capital construction projects for both recovery programs. P.L. 107-375 (2002) extended the authorization period to complete capital construction projects to 2008. P.L. 109-183 (2006) authorized an additional $15 million for capital construction for the Upper Colorado River program and extended the capital construction period to 2010 for both programs.

Construction funding is capped at $126 million:
$108 million for the Upper Colorado River program and
$18 million for the San Juan River Basin program.

Capital Construction Cost-Sharing for Upper Colorado and San Juan Programs

Upper Colo. Rec. Program	$108 million
San Juan Recovery Program	$18 million
Total	**$126 million**

Sources of Revenue

Federal	Non-Federal	
Congress: $61 million	Power Revenues:	$17 million
	States:	$17 million
	Water and Power:	$31 million
	Total:	**$65 million**

Colorado River Storage Project (CRSP) power customers, water users, and the States of Colorado, New Mexico, Utah, and Wyoming provide non-federal cost-sharing funds.

Power Revenues

The Secretary of Energy, acting through the Western Area Power Administration, is authorized to expend up to $17 million of CRSP power revenues for capital projects construction. 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.

States Demonstrate their Commitment by Cost-Sharing Capital Projects

The four participating states are collectively contributing $17 million.

Capital Project Cost-Sharing by the States

		Upper Colorado River Rec. Program	San Juan Rec. Program
Colorado	$9.146 M	$8.065 M	$1.081 M
New Mexico	2.744 M	0.000 M	2.744 M
Utah	3.422 M	3.422 M	0.000 M
Wyoming	1.688 M	1.688 M	0.000 M
Total	**$17.000 M**	**$13.175 M**	**$3.825 M**

The states' contributions are funded through several unique and creative means:

- **Colorado's** legislature created a Native Species Conservation Trust Fund in 2000 through which an annual "Species Conservation Eligibility List," submitted by the Department of Natural Resources, is funded by a joint resolution of the State's General Assembly.
- **New Mexico's** legislature appropriated funds to meet the state's cost-share contributions to capital recovery projects in the San Juan River Basin.
- **Utah's** legislature created a Species Protection Account within the General Fund in 1997 which receives Brine Shrimp Royalty Act-created revenue. In 2000, Utah dedicated 1/16th of one cent of its general sales tax to water development projects and directed funding to the Upper Colorado River program.
- **Wyoming's** legislature appropriated its funding share during its 1998 and 1999 sessions.

BASE (O&M) FUNDING

P.L. 106-392 also provides up to $6 million per year (adjusted annually for inflation) of CRSP power revenues for base (non-capital) funding for the two programs. This provides up to $4 million for the Upper Colorado River program and up to $2 million for the San Juan River Basin program. After 2011, power revenues may be used only for monitoring and to operate and maintain capital projects. The states also contribute about $350,000 per year to base funding through in-kind services or agency cash contributions.

Recovery Programs Rely on Recovery Goals to Manage Actions and Measure Success

The recovery programs rely on recovery goals as the foundation documents to develop and implement management actions and measure success as they work to recover the endangered humpback chub, bonytail, Colorado pikeminnow, and razorback sucker. The recovery goals provide objective, measurable criteria for downlisting to "threatened" and delisting (removal from Endangered Species Act [ESA] protection).

Recovery is based on reduction of threats and improvement of a species status during the time it is listed under the ESA. Recovery goals identify the number and age of fish that comprise a specified number of self-sustaining wild populations. They also identify site-specific management actions that reduce threats to the species associated with the ESA's five listing factors.

Endangered Species Act Listing Factors

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

The U.S. Fish and Wildlife Service will consider downlisting or delisting the endangered fishes once the required demographic and genetic standards for self-sustaining populations are reached and the necessary management actions are achieved to reduce the threats that caused them to be listed.

The Service approved the initial recovery goals on August 1, 2002, with the requirement that they be reviewed and updated at least once every 5 years to include any new information. This review is underway with completion slated for early 2008. Results will be available for public review and comment in the *Federal Register*.

Actions to Recover the Fishes

The recovery programs implement management actions within five major program elements. They primarily address threats associated with present or threatened destruction, modification, or curtailment of habitat or range *(ESA listing factor A)* disease or predation *(ESA listing factor C)*.

The five program elements are:

◆ **Habitat Management** – Identify and provide adequate instream flows.

The Recovery Program worked with the Audubon Society to restore a 26-acre floodplain wetland at the Lucy Ferril Ela Wildlife Sanctuary in western Colorado.

◆ **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.

Highlights of recent accomplishments to recover the fishes are described on the following pages for each program element.

Implementing Innovative Solutions to Manage Water and Improve River Habitat

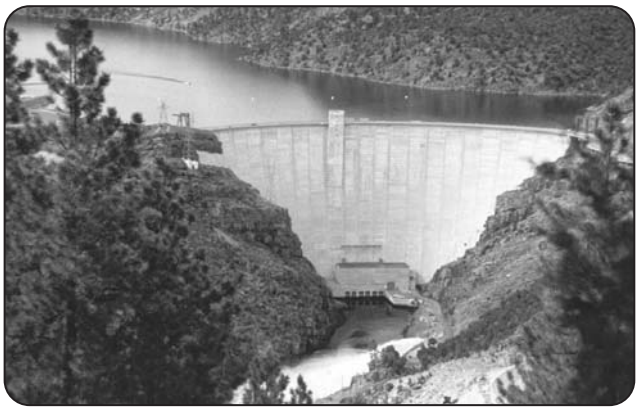
The recovery programs implement innovative solutions to meet the water needs of growing western communities while providing adequate instream flows to restore river and floodplain habitat to benefit endangered fishes. The recovery programs' partners cooperatively manage water resources in accordance with state water law, individual water rights, and interstate compacts. This is accomplished through a variety of means including: leases and contracts for water supplies; coordinated water releases from upstream reservoirs; efficiency improvements to irrigation systems to reduce water diversions; and re-operation of federal dams and reservoirs. These water-management actions benefit recreational, municipal, and agricultural water users, as well as the endangered fishes.

The Bureau of Reclamation's administrative actions in 2006 to change operations at Flaming Gorge and Navajo Dams to help meet flow recommendations for the endangered fishes were landmark events for both recovery programs.

"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."

Dan Luecke, Western Resource Advocates

Upper Colorado River Endangered Fish Recovery Program



Flaming Gorge Dam on the Green River is operated to help meet flow and temperature recommendations to benefit endangered fish.

◆ Coordinated reservoir operations in the Colorado River allow upstream reservoir owners to voluntarily release water to enhance river spring peak flows and improve fish habitat without affecting those reservoirs' yields. In 2006, a total of 28,460 acre-feet of water was released, which added an average of 1,800 cubic-feet-per-second to the annual peak flows. This was the first year since 1999 that runoff conditions enabled coordinated reservoir operations to occur.

◆ Releases from upstream Colorado River reservoirs to enhance summer base flows and improve endangered fish habitat began in 1990. From 1990 through 1999, about 19,000 acre-feet of water per year was released. With the completion of a programmatic biological opinion in December 1999, releases increased to about 48,000 acre-feet on average per year. Contributing to this increase is water conserved by improvements to the Grand Valley Project canal system in western Colorado which has reduced water diversions by 10 to 16 percent while meeting irrigation demands.

San Juan River Basin Recovery Implementation Program

Navajo Dam is operated to help meet flow recommendations for the San Juan River.

◆ Water shortage-sharing agreements among local water users, American Indian Tribes, and state and federal agencies help ensure that water is shared in times of shortage among human uses and endangered fish needs. Navajo Reservoir releases have been reduced to conserve water during winter and provide more water in the spring and summer.

◆ Hydrology modeling is a tool used to assess the effects of changing water storage and releases to benefit fish habitat while not impacting water contractors' uses. Testing of the Third Generation San Juan Recovery Implementation Program Hydrology Model is scheduled for completion in 2007.

Cooperative Effort to Enlarge Colorado's Elkhead Reservoir Benefits People and Endangered Fish

The Upper Colorado River Endangered Fish Recovery Program saw an important milestone in 2006 with the completion of the Elkhead Dam and Reservoir Enlargement Project in northwest Colorado. The project provides additional storage capacity both to augment flows in the Yampa River and for human use in the Yampa River Basin.

The Recovery Program partnered with the Colorado River Water Conservation District (River District) and other state and local agencies on a 13,000 acre-foot enlargement of Elkhead Reservoir. The Recovery Program funded $13.2 million of the $31 million project. The River District funded the remaining $17.8 million.

After the reservoir fills in early 2007, up to 5,000 acre-feet of permanent water and 2,000 acre-feet of leased water will be available each year to augment flows for endangered fish in the Yampa River during middle and late summer.

The dam enlargement is a unique example of water development and environmental interests working together to achieve common goals. This type of proactive action avoids conflicts between water users and fish recovery actions and ensures that the Recovery Program is conducted in accordance with state water law and interstate compacts.

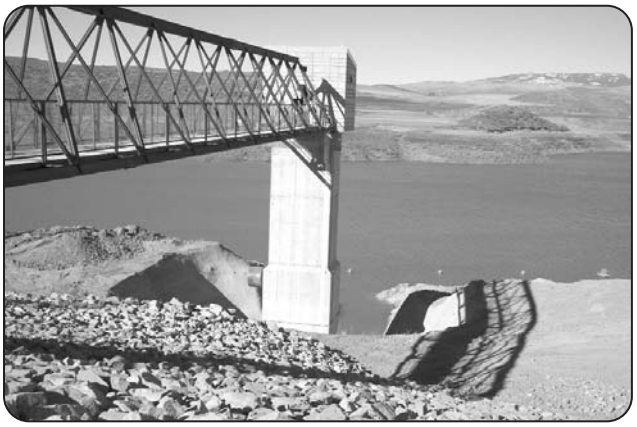
Razorback suckers and Colorado pikeminnows spawn in the lower reaches of Yampa Canyon, which also harbors one of five remaining populations of humpback chub in the Upper Colorado River Basin.

"The Yampa River plays a critical role in the lifecycle of the endangered fishes," said Recovery Program Director Bob Muth. ***"The cooperation that led to completion of the Elkhead Reservoir enlargement reflects the spirit of the Recovery Program. The enlargement ensures that water is available to release into the Yampa River to augment late-summer flows and benefit the endangered fishes."***

On the human side of the equation, some 5,000 acre-feet of water is newly available for future growth in Moffat County. The project also creates an improved recreational amenity for the people of Routt and Moffat counties. Colorado State Parks and the City of Craig will build improved camping, day-use and boating facilities this spring alongside the reservoir.

The reservoir also serves as a repository for nonnative sportfish removed from the Yampa River and a revitalized attraction for anglers.

"At the risk of overusing the word, the cooperation behind this project cannot be overemphasized," said River District Project Engineer Ray Tenney. ***"Cooperation got us to the construction phase at which point the contractor, the on-site engineer, local governments, and the Recovery Program all worked together and cooperated at very high levels. Now that the dam is completed, it will take new cooperative efforts to operate the reservoir and protect flows for the endangered fish and to manage the nonnative fish species to achieve Recovery Program goals."***



A new tower contains four levels of outlets to regulate dam releases. Fish screens will prevent the escapement of nonnative sportfish from the reservoir and into the Yampa River.

Construction Projects to Improve River Habitat Nearly Complete

The recovery programs are working cooperatively with American Indian Tribes, water and power customers, and local landowners to improve fish habitat. Congress authorized capital construction to be completed by September 30, 2010. The programs are working to meet that schedule.

Upper Colorado River Endangered Fish Recovery Program

◆ **Fish passages and screens are in place at major diversion dams and canals in western Colorado**. The Redlands Diversion Dam on the Gunnison River, the Grand Valley Irrigation Company and the Grand Valley Project Diversion Dams on the Colorado River no longer impede fish migration or present the risk of entrapment in canals.

◆ **Price-Stubb Diversion Dam fish passage** construction on the Colorado River near Grand Junction is slated to begin in March 2007 and become operational in April 2008. Once this last barrier to fish migration is removed, endangered fish will have access to an additional 50 miles of critical habitat that has been blocked for nearly 100 years.

◆ **Grand Valley Project fish passage** trial operations in 2005 and 2006, allowed 1 razorback sucker, 3 humpback chubs, and about 14,000 other native fish to move upstream. Full-time operation of this fish passage will begin when the Price-Stubb fish passage is completed.

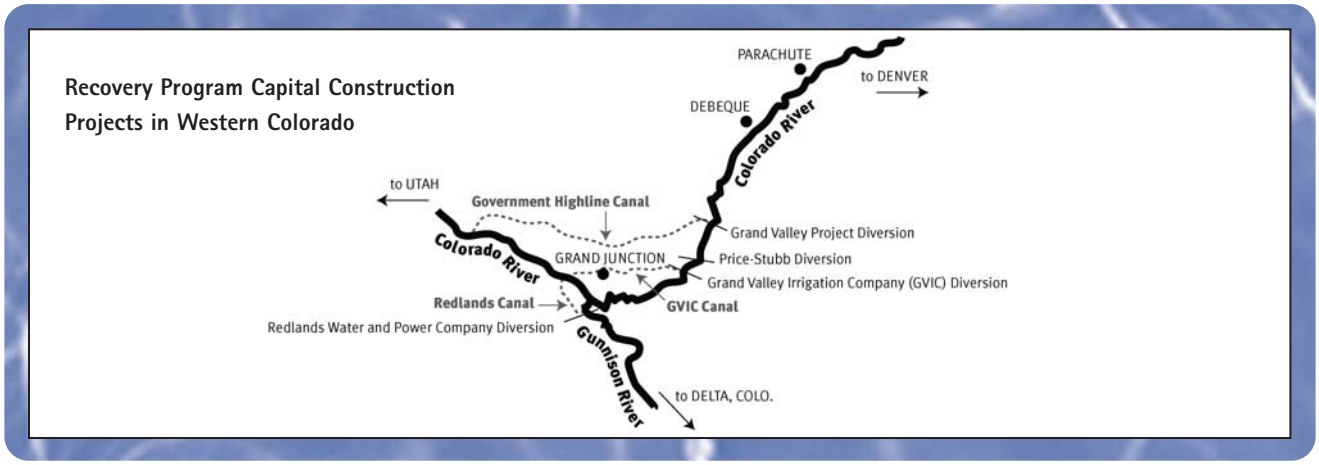
◆ **Redlands Diversion Dam fish passage restored access to 50 miles of Gunnison River critical habitat** for endangered fishes when completed in 1996. To date, 81 Colorado pikeminnows, 20 razorback suckers, 1 bonytail, and over 80,000 other native fish have used the passage. Colorado pikeminnow and razorback sucker reproduction has been recently documented in reaches upstream of the fish passage.

◆ **Tusher Wash Diversion Dam canal fish screen** on the Green River in eastern Utah is scheduled to be constructed in 2009. Once this structure is completed, all major diversion canals identified in the recovery goals for the upper Colorado River system will be screened.

◆ **Floodplain habitats are being made accessible** to all life stages of endangered fish by breaching or removing natural or man-made levees. Green River research studies in 2004-2006 documented transport of razorback sucker larvae into floodplain wetlands that serve as nursery habitat. Research continues to identify other floodplain site modifications and to evaluate flow and temperature recommendations for the Green River.

Biologists released 3 million beads into the Green River to simulate drifting larvae and learn how they move from the river into floodplain wetlands.

These research studies clearly demonstrate the cooperation of Recovery Program partners, including the Bureau of Reclamation, Utah Division of Wildlife Resources, Ouray National Fish Hatchery, Colorado State University's Larval Fish Laboratory, Argonne National Laboratory, and the U.S. Geological Survey.



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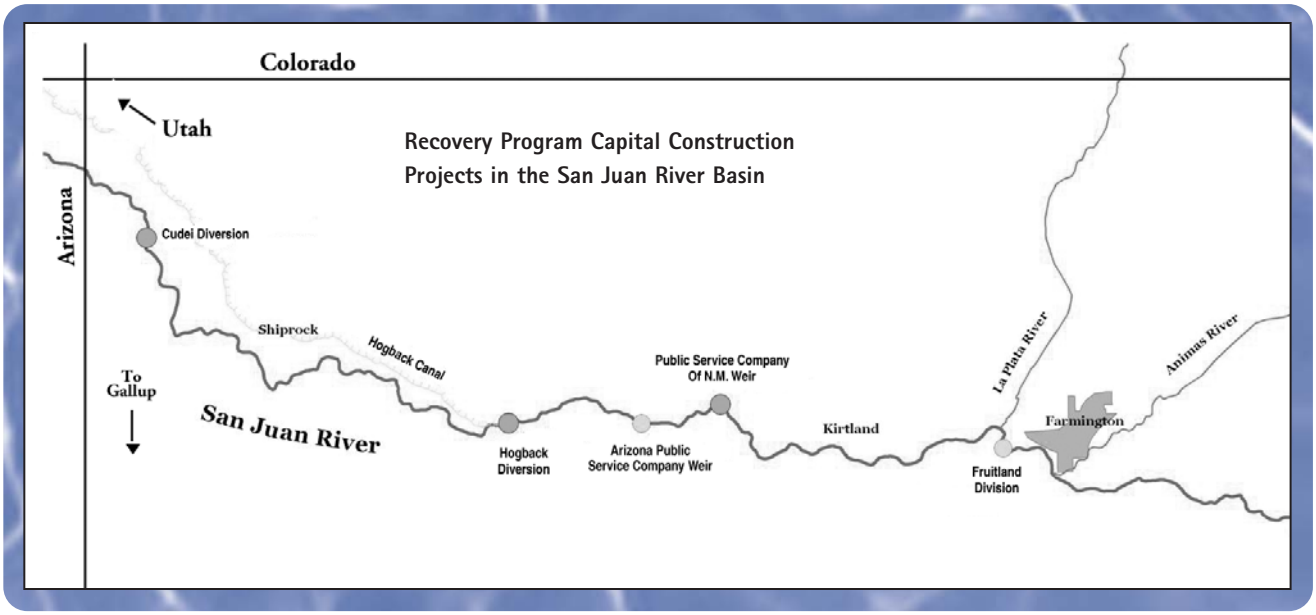


San Juan River Basin Recovery Implementation Program

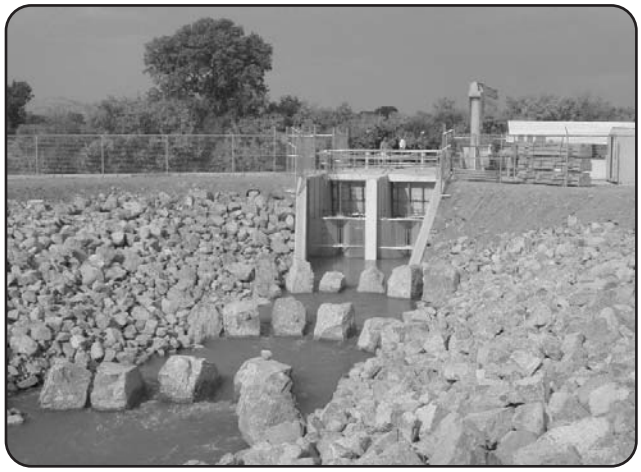
◆ **Fish access has been restored to an additional 36 miles of critical habitat on the San Juan River** with the construction of passages at the Public Service Company of New Mexico (PNM) weir and the Hogback Diversion Dam, and removal of the Cudei Diversion Dam.

◆ **PNM fish passage operated by the Navajo Nation** has allowed 18 razorback suckers, 26 Colorado pikeminnows, and nearly 65,000 other native fish to use the passage since 2003.

◆ **Hogback Diversion Dam canal fish screen** construction is scheduled for completion in 2008.

◆ **Arizona Public Service Company weir fish passage** designs are being developed and evaluated with construction scheduled to begin in October 2008.

◆ **Fruitland Diversion Dam's rock weir** may be replaced by a more permanent structure pending the outcome of a Bureau of Reclamation feasibility study. A new structure would eliminate the need for annual instream work to rebuild the rock weir after high flows, benefiting fish habitat and water-user operations.



The Navajo Nation operates the fish passage at the Public Service Company of New Mexico weir.

The Recovery Program has restored endangered fish access to critical habitat on the San Juan River upstream of the Cudei Diversion Dam.

Reestablishing Fish Populations through Propagation and Stocking

Hatchery-produced, stocked fish form the foundation to reestablish naturally self-sustaining populations of razorback sucker and bonytail in the upper Colorado River system and razorback sucker and Colorado pikeminnow in the San Juan River. The recovery programs' maximize the genetic diversity of wild broodstocks used to produce fish in hatcheries to increase the likelihood that stocked fish can cope with local habitats. Both recovery programs implemented new stocking plans in 2003 to expedite reestablishment of wild populations. The recovery programs fund six hatchery facilities to produce the fish necessary to meet the stocking targets. The Grand Valley Endangered Fish Facility, Dexter National Fish Hatchery and Technology Center, Uvalde National Fish Hatchery, and Ouray National Fish Hatchery produce razorback suckers. Dexter, the State of Colorado's J.W. Mumma Native Aquatic Species Restoration Facility, and the State of Utah's Wahweap Fish Hatchery produce bonytails. Dexter also produces Colorado pikeminnows.

Ouray National Fish Hatchery, Vernal, UT

Wahweap State Fish Hatchery, Big Water, UT

Grand Valley Endangered Fish Facility, Grand Junction, CO

J.W. Mumma Native Aquatic Species Restoration Facility, Alamosa, CO

Dexter National Fish Hatchery & Technology Center, Dexter, NM

Uvalde National Fish Hatchery, Uvalde, TX

Fish Stocked in 2005 and 2006 to Meet Annual River Stocking Targets

Species	River	Annual River Target	Fish Stocked 2005	Fish Stocked 2006
Colorado pikeminnow	San Juan	303,000	306,800	326,547
Razorback sucker	San Juan	11,400	1,996[a]	18,793
	Colorado and Gunnison	9,930	11,633	11,559
	Middle Green	9,930	4,878[a]	10,091
	Lower Green	9,930	4,243[a]	10,313
Bonytail	Colorado	5,330	6,067	5,554
	Middle Green	5,330	5,980	5,045
	Lower Green	5,330	3,100[b]	3,270[b]

[a] *Problems with predation and other factors affecting survival of fish in grow-out ponds in 2005 were corrected in 2006.*
[b] *Distribution of stocked fish to meet the annual river targets will change beginning in 2007.*

Stocking Efforts Show Encouraging Results

Results of stocking efforts are successful in reestablishing endangered fish populations throughout the Upper Colorado River and San Juan River basins. The recovery programs continue to monitor survival and reproduction of stocked fish to evaluate and improve stocking strategies.

RAZORBACK SUCKER

◆ **About 2,550 recaptures of stocked razorback suckers** were reported from the Green, Colorado, and Gunnison rivers in 2000-2005. Some fish were recaptured 4 years after stocking.

◆ **Stocked razorback suckers are moving between the Green, Colorado, and Gunnison rivers.** This exchange of individuals between rivers suggests that razorback suckers may eventually form a network of populations or subpopulations.

About 1,900 recaptures of stocked razorback suckers were reported from the San Juan River since 2000. Numbers of recaptures in 2005 and 2006 were higher than in previous years. Some fish were recaptured 13 years after stocking in the San Juan River.

◆ **Stocked razorback suckers are behaving as wild fish.** They have been recaptured or observed in reproductive condition at spawning sites in the Green and San Juan rivers.

◆ **Stocked razorback suckers are reproducing** in the Green, Gunnison, Colorado, and San Juan rivers based on captures of larval fish.

◆ **Razorback sucker larvae are surviving through the first year** in the Green, Gunnison, and San Juan rivers based on captures of juveniles.

COLORADO PIKEMINNOW

Biologists tag Colorado pikeminnows before stocking them in the San Juan River. More than 1 million juvenile or subadult fish have been stocked since 2002.

◆ **About 8,400 recaptures of stocked Colorado pikeminnows** were reported from the San Juan River in 2004-2006. Numbers of recaptures in 2005 and 2006 were higher than in previous years.

◆ **Recaptures indicate that stocked fish are surviving**, with many fish approaching adulthood. Biologists anticipate documenting natural reproduction through the collection of larvae in future years.

BONYTAIL

◆ **Over 44,000 subadult or adult bonytails have been stocked** since implementing the new stocking plan in 2003.

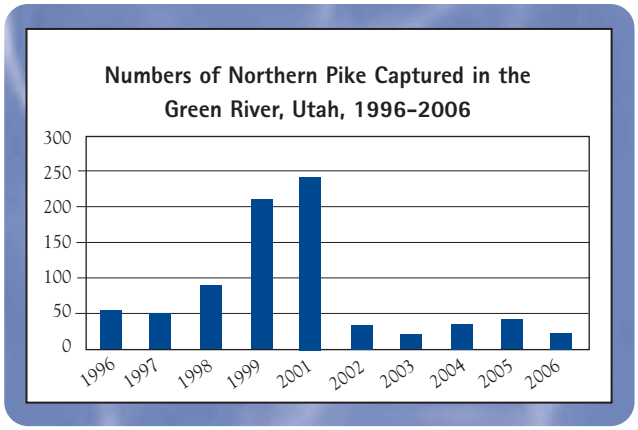
◆ **About 200 stocked bonytails were recaptured in 2004-2005**, all within 1 year after stocking. The Upper Colorado River program is investigating ways to modify the stocking plan to improve bonytail survival.

Developing Solutions to Manage Nonnative Fishes and Provide Sportfishing Opportunities

Predation or competition by nonnative fish species is a serious threat to the endangered fishes and perhaps the most challenging to manage. The recovery programs are proactively working hard to meet the challenge of nonnative fish management by removing the most problematic nonnative fishes from rivers, and preventing nonnative fish from entering the river system in areas inhabited by endangered fish. The actions recognize the dual responsibilities of state and federal wildlife agencies to conserve native fish species while providing sportfishing opportunities.

Upper Colorado River Endangered Fish Recovery Program

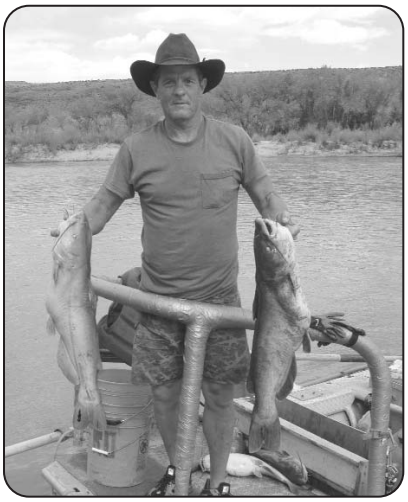
◆ **Active removal beginning in 2002 has reduced the abundance of nonnative northern pike** in the Green River, Utah, to a consistently low level.



◆ **An innovative study is underway to identify the source of nonnative smallmouth bass** in rivers of western Colorado through analysis of fish otoliths (ear bones). Otoliths have growth layers (like tree rings) whose chemistry reveals clues about where a fish lived during specific times of its life. This information will help determine the most cost-effective and efficient management methods.

This children's fishing pond in Craig, Colorado, is one of several locations where biologists are placing smallmouth bass that are removed during nonnative fish management efforts on the Yampa River.

San Juan River Basin Recovery Implementation Program

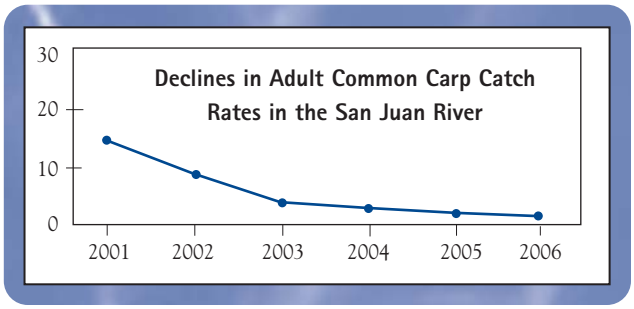


Biologists are encouraged that they are seeing fewer channel catfish of this size during nonnative fish management efforts.

◆ **Active removal since 2001 has reduced the abundance of nonnative channel catfish.** Today, the population appears to be dominated by juvenile fish, thereby reducing the potential for both channel catfish reproduction and predation on large native fish.

◆ **Recreational fishing opportunities are enhanced at area lakes** through relocation of channel catfish coordinated with the Navajo Nation and the State of New Mexico.

◆ **Active removal beginning in 2001 has reduced the abundance of nonnative common carp** to a level where, in 2006, collections of Colorado pikeminnows outnumbered common carp.



Involving Communities through Education and Outreach

The recovery programs work proactively to increase public awareness of, and support for, endangered fish recovery. The recovery programs invite full public participation and understanding of program activities through the conduct of public meetings and the distribution of a wide range of educational materials, including newsletters, fact sheets and reports such as *Program Highlights*.

Key outreach efforts, previously conducted separately by the two recovery programs, have been integrated to ensure delivery of accurate and consistent messages and achieve cost savings. Local communities help promote awareness of the endangered fishes and their recovery in a variety of ways.

◆ **A new interpretive exhibit opened in 2006** featuring an aquarium with endangered fish at Glen Canyon Dam's Carl Hayden Visitor Center in Page, Arizona. The recovery programs jointly partnered with state, federal, and Colorado River Storage Project power customers.

The Center's 360,000 annual visitors learn about endangered fish.

◆ **The recovery programs provide information at major water conferences** in Colorado, Nevada, Utah, and Wyoming.

◆ **Fifth-grade classrooms established aquariums with endangered fish** at a dozen schools in western Colorado. Students care for the fish during the school year and help tag and release them into the river.

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 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.

◆ **The Grand Valley Audubon Society installed interpretive signs at a restored floodplain wetland** at the Audubon's Lucy Ferril Ela Wildlife Sanctuary in Grand Junction, Colorado.

This Grand Valley Audubon Society wetland historically provided important nursery habitat for razorback suckers.

Recovery Program Web Sites
Upper Colorado River:
ColoradoRiverRecovery.fws.gov
San Juan River: **southwest.fws.gov/sjrip**

Research and Monitoring Track Endangered Fish Status and Support Adaptive Management

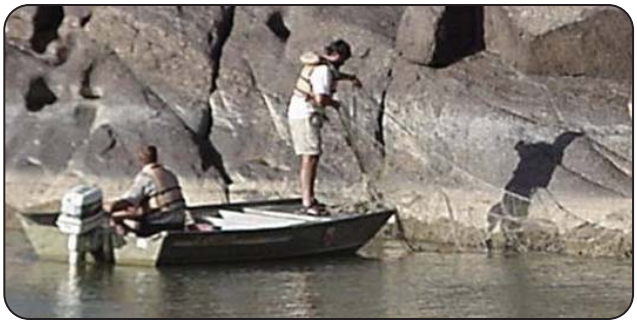
The recovery programs monitor reproduction, growth, survival, and abundance of endangered fish in the wild. Results are used to track progress toward achieving the recovery goals, assess the effectiveness of management actions, and adjust recovery efforts through adaptive management.

Downward trends in some humpback chub and Colorado pikeminnow populations and increased abundance of problematic non-native fishes have been observed during dry weather and low river runoff conditions since 1999. The recovery programs are actively implementing management actions to reduce these impacts.

HUMPBACK CHUB

◆ **Five humpback chub populations inhabit canyon-bound river reaches** of the Upper Colorado River Basin.

- About 3,000 adults occur in Black Rocks and Westwater canyons, and the population in Desolation/Gray canyons is about 1,000 adults.
- Populations in Yampa and Cataract canyons are small, each consisting of a few hundred adults.



Researchers sample for humpback chubs in Black Rocks, a canyon in western Colorado, to estimate the abundance of this population.

The largest humpback chub population in the upper basin lives in Westwater Canyon in Utah where this fish was captured.

BONYTAIL

◆ **Stocking continues to reestablish bonytail populations** in the upper basin. Stocking expanded into floodplain wetlands to enhance growth and survival of the species (*see pages 12-13*).

◆ **Stocked bonytails being recaptured in several locations** throughout the Green and Colorado rivers, provide additional information about life-history and habitat requirements.

Bonytails raised in hatchery ponds at Utah's Wahweap Fish Hatchery are prepared for transport to the river.

Utah's Wahweap Fish Hatchery produces and stocks bonytails to establish populations. Stocked bonytails are being recaptured in the Green and Colorado rivers.

Continued on page 17

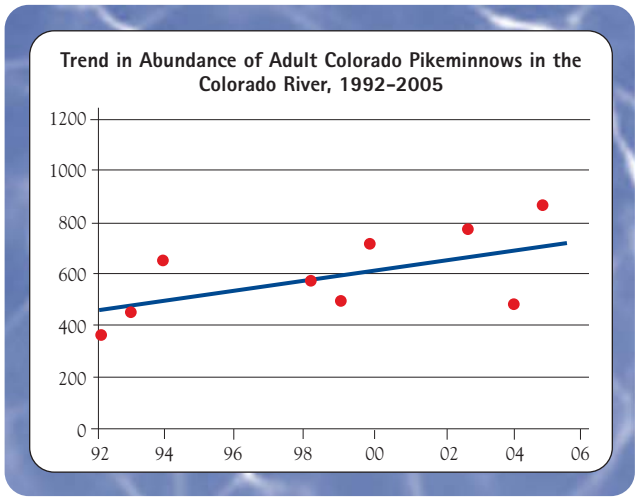
COLORADO PIKEMINNOW

◆ **Wild Colorado pikeminnow populations occur in the Colorado and Green river systems** of the Upper Colorado River Basin:

- Abundance of adults in the Colorado River system has generally increased since 1992 (*see chart at right*).

This female Colorado pikeminnow (37 in., 16.8 lbs) used the Redlands Diversion Dam fish passage on the Gunnison River in 2002.

- Abundance of adults in the Green River system declined from 3,100 to 2,300 in 2001-2003. Collections of larvae in 2006 indicate a strong reproductive year. Monitoring of year-classes provides insight on reasons for the downward population trends and guides actions to reverse these trends.



◆ **Stocking efforts continue in the San Juan River to achieve recovery goals** (*see pages 12-13*).

- Before stocking began, an estimated 19 wild adult fish remained in the San Juan River.
- The U.S. Fish and Wildlife Service concluded in 2005 that Colorado pikeminnow and razorback sucker populations in the San Juan River are more secure today than during the 1980s and 1990s, and the threat of extinction has been reduced.

RAZORBACK SUCKER

This razorback sucker used the Public Service Company of New Mexico weir fish passage on the San Juan River.

◆ **Razorback sucker populations show success** as stocked fish survive and reproduce (*see pages 12-13*).

- 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 reproducing.

Photo courtesy of Tom Ross, Steamboat Pilot & Today

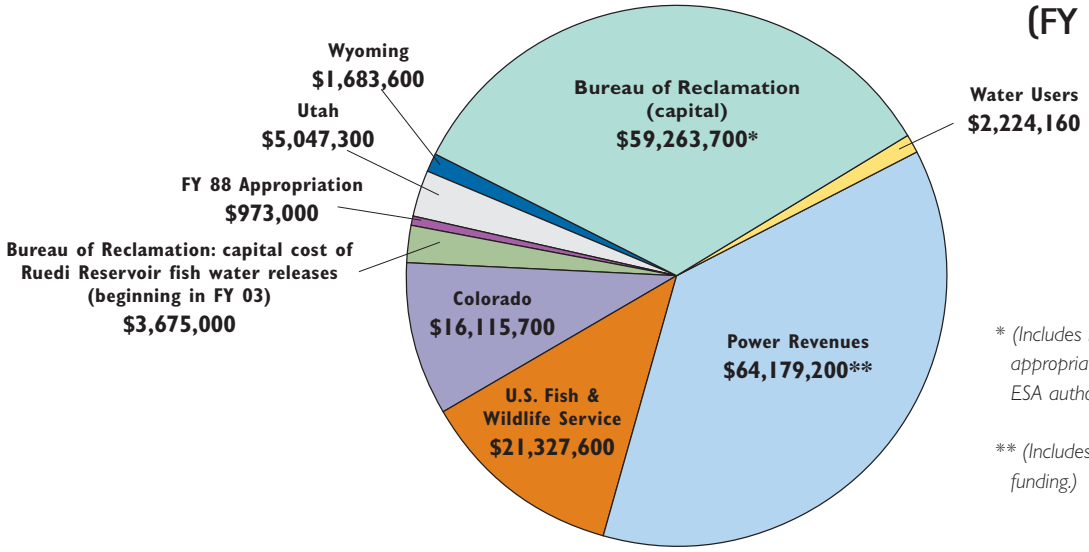
Stocking razorback suckers to reestablish a population in the Green River system.

Expenditures

Upper Colorado River Endangered Fish Recovery Program

Total Partner Contributions = $174,509,300 (FY 1989-2007)

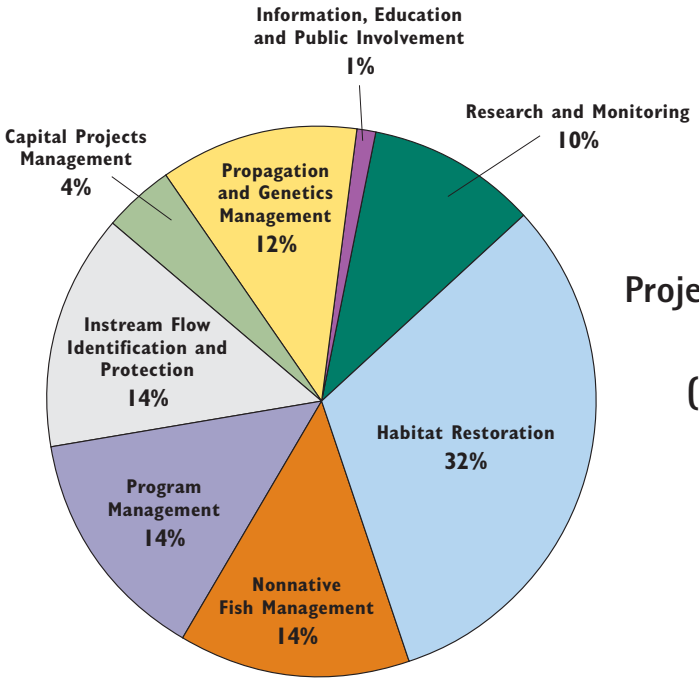
Partners Contributions (FY 1989-2007)



* *(Includes Reclamation capital appropriation of $20,979,700 under ESA authorization prior to FY 1999.*

** *(Includes both annual and capital project funding.)*

Projected Expenditures by Category (FY 2007 only)

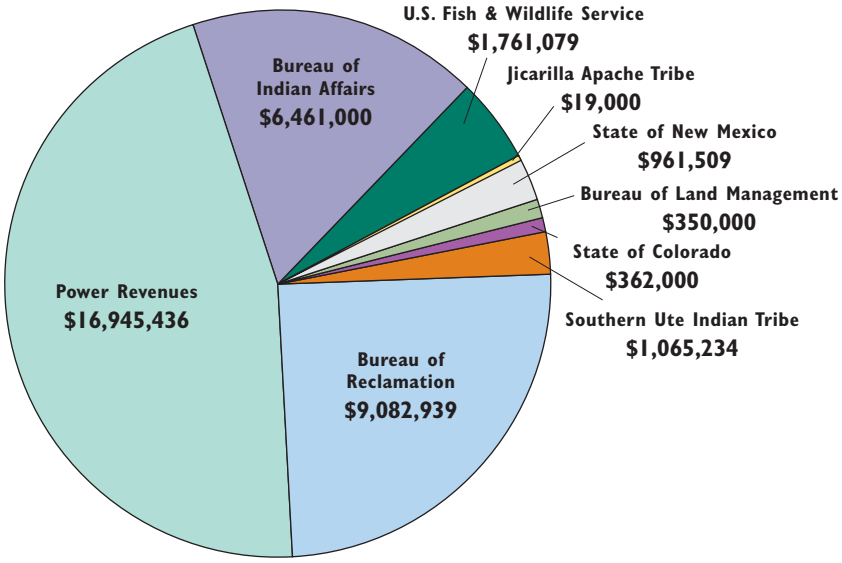


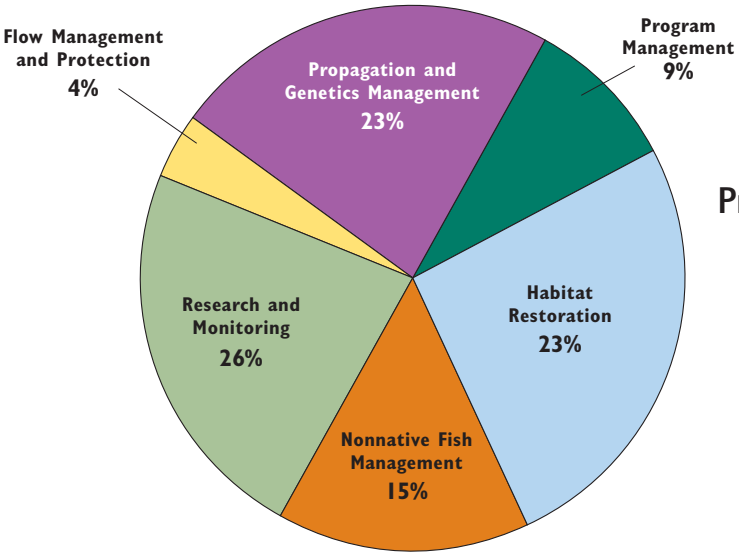
Expenditures

San Juan River Basin Recovery Implementation Program

Total Partner Contributions = $37,008,197 (FY 1992-2007)
(Not including in-kind contributions)

Partner Contributions (FY 1992-2007)





Projected Expenditures by Category (FY 2007 only)

Providing Endangered Species Act Compliance for Water Projects

The Upper Colorado River and San Juan River Basin recovery programs respond to the challenge of water management by working cooperatively with 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 management 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 1,600 water projects depleting more than 3 million acre-feet per year. This is accomplished through cooperative efforts. No lawsuits have been filed on ESA compliance for any of these water projects.

Upper Colorado River Endangered Fish Recovery Program
Summary of Endangered Species Act Section 7 Consultations
(1/1998 through 12/31/2006)

		Historic Depletions	New Depletions	Totals
State	Number of Consultations	Acre-feet/yr	Acre-feet.yr	Acre feet/yr
Colorado	1053	1,466,375	172,825	1,639,200
Utah	65	421,868	70,248	492,116
Wyoming	127	83,498	32,264	115,762
Regional*	238	(regional)	(regional)	0
Total	1,483	1,971,741	275,337	2,247,078

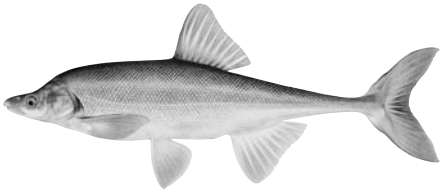
*Depletions included in historic projects.

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

		Depletions
State	Number of Consultations	Acre-feet/yr
New Mexico	18	617,216
Colorado	94	217,456
Utah	12	9,140
Total	124	843,812

ESA Compliance Granted for Ditch Bill Easements

The Upper Colorado River and San Juan River Basin recovery programs provide ESA compliance for 704 agricultural irrigation or livestock ditches and reservoirs depleting nearly 440,000 acre-feet of water on national forest lands in Colorado. The recovery programs greatly simplified the consultations and reduced the cost of ESA compliance for water users, the U.S. Forest Service, and the U.S. Fish and Wildlife Service.



Upper Colorado River Endangered Fish Recovery Program

Program Partners:
State of Colorado
State of Utah
State of Wyoming
Bureau of Reclamation
Colorado River Energy Distributors Association
Colorado Water Congress
National Park Service
The Nature Conservancy
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
P.O. Box 25486, DFC
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
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Jicarilla Apache Nation
Navajo Nation
Southern Ute Indian Tribe
Ute Mountain Ute Tribe
U.S. Fish and Wildlife Service
Water Development Interests

San Juan River Basin Recovery Implementation Program
2105 Osuna Rd. NE
Albuquerque, NM 87113
505-761-4745
505-346-2542 Fax
http://southwest.fws.gov/sjrip