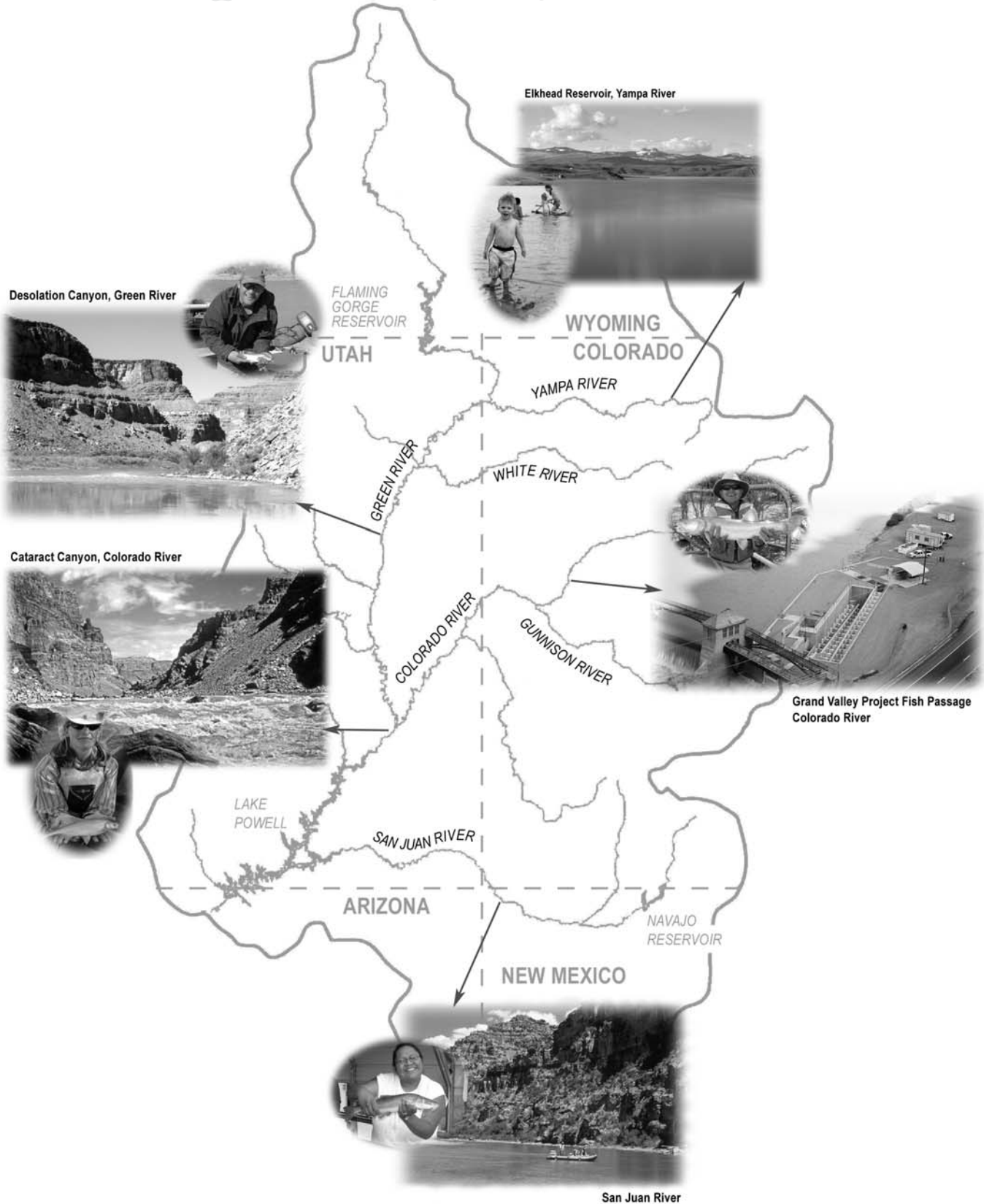


# Upper Colorado River Endangered Fish Recovery Program San Juan River Basin Recovery Implementation Program



2009 - 2010

## Highlights





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

## Innovative Approach Helps Achieve Species Recovery While Water and Hydroelectric Power Use and Development Continues

### *Highlights 2009-2010*

Partners in the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program use an innovative, collaborative approach to recover endangered Colorado River fishes while meeting human needs for water and hydroelectric power.

These programs have proven track records of success that demonstrate that diverse groups are effectively working together to conserve species while managing water and hydroelectric power resources.

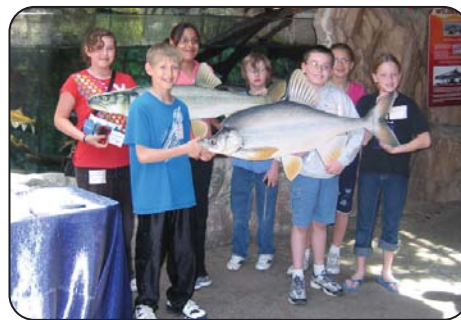
This approach is especially crucial to millions of people in the states of Colorado, New Mexico, Utah, and Wyoming,

as well as numerous species of plants, fish, and wildlife, that rely on water from the Upper Colorado River Basin.

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 hydroelectric power projects. The programs use adaptive management to continually evaluate and revise management actions as new information becomes available.

*Highlights 2009-2010* provides current information about the recovery programs' accomplishments.

*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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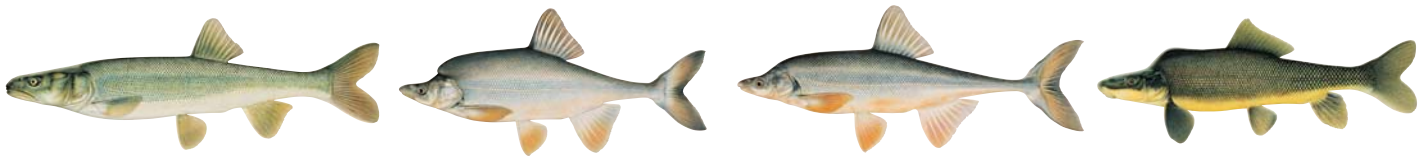
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*Colorado Pikeminnow*

*Humpback Chub*

*Bonytail*

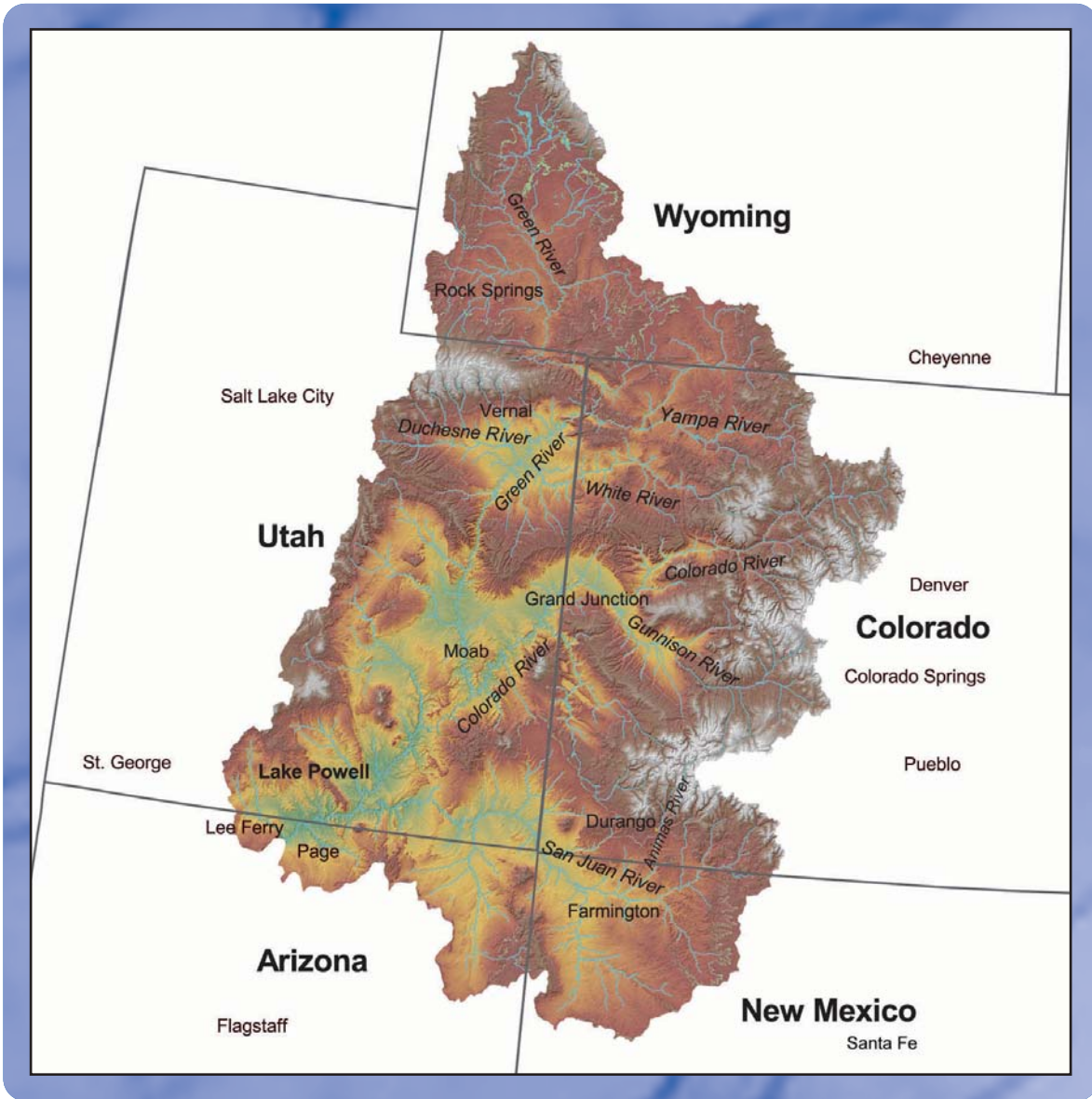
*Razorback Sucker*

Illustrations® by Joseph R. Tomelleri

**Cover photos (clockwise from top)**

- Elkhead Reservoir in northwest Colorado was enlarged to provide water for people and endangered fish in the Yampa River Basin
- The Elkhead Reservoir expansion provides increased recreational opportunities for people of all ages
- Colorado pikeminnow populations are increasing in the Upper Colorado River Basin
- The Grand Valley Project Fish Passage on the Colorado River near Grand Junction, Colorado, restores access to 41 miles of critical habitat
- A canyon-bound reach of the San Juan River in southern Utah is home to razorback sucker and Colorado pikeminnow
- Razorback sucker are reproducing in the San Juan, Colorado, Green, and Gunnison rivers
- Stocked bonytail are being recaptured in reaches of the Green and upper Colorado rivers
- Biologists monitor humpback chub and bonytail in Cataract Canyon on the Colorado River in Utah
- Researchers remove nonnative fish from the Green River in Desolation Canyon, Utah
- Humpback chub prefer habitat in canyon reaches of the Upper Colorado River Basin

# State and Federal Leaders Extend Commitment to Recovery Programs Through 2023



## 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 2009, the cooperative agreement was extended through September 30, 2023.

*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 Southern Ute Indian Tribe; the Ute Mountain Ute Tribe; and the Jicarilla Apache Nation. In 2006, the cooperative agreement was extended through September 30, 2023.

# Partners' Long-Term Commitment, Collaboration, and Active Participation Key to Recovery Programs' Success

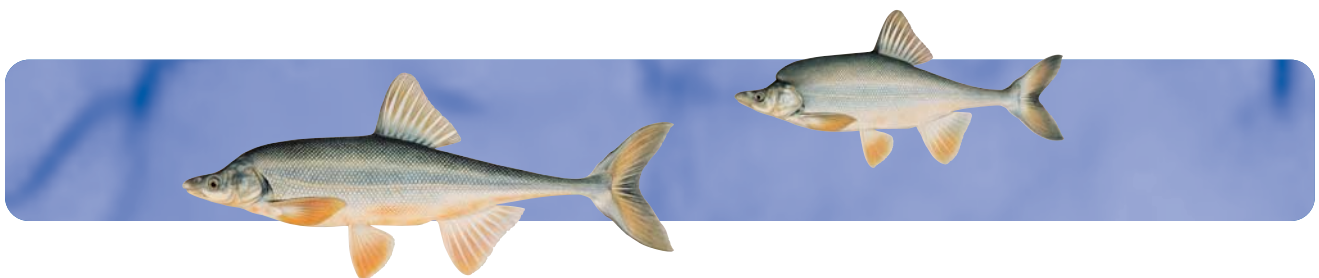
**T**he *Upper Colorado River Endangered Fish Recovery and San Juan River Basin Recovery Implementation Programs* have a broad range of partners that include state and federal agencies, water development interests, power customers, American Indian tribes, and environmental organizations. Partners have made long-term commitments to set aside individual interests and work collaboratively to create innovative solutions that are helping achieve the recovery programs' goals of species recovery while water development occurs. Each partner takes an active interest in the programs and fully participates in developing and implementing management actions that will recover the endangered Colorado River fishes.

## 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
- ◆ Jicarilla Apache Nation
- ◆ Navajo Nation
- ◆ Southern Ute Indian Tribe
- ◆ Ute Mountain Ute Tribe
- ◆ Bureau of Indian Affairs
- ◆ Bureau of Land Management
- ◆ Bureau of Reclamation
- ◆ The Nature Conservancy
- ◆ U.S. Fish and Wildlife Service
- ◆ Water Development Interests



# State and Federal Leaders Acknowledge Recovery Programs for On-the-Ground Species Conservation Achievements

**S**tate and federal leaders continue to acknowledge and support the recovery programs for their cost-effective and collaborative on-the-ground achievements.

The programs have become models for other endangered species recovery efforts across the West. The Department of the Interior presented the recovery programs with a Cooperative Conservation Award in 2008, citing their excellence in implementing on-the-ground conservation measures through collaboration and partnerships.



## Department of Interior Officials Commend the Recovery Programs

*"This extension [in 2009] of the [Upper Colorado] Recovery Program's cooperative agreement shows how far we've come in the last two decades. When this program began 21 years ago, it was the first conservation initiative of its kind. Never before had such a broad group of state and federal agencies come together formally to work side-by-side with water users, power customers, and environmental organizations. I commend all of the program's partners for developing creative and effective ways to meet the dual goals of endangered species recovery and water development."*

**Secretary of the Interior**  
**Ken Salazar, 2009**

*"Two of our current recovery efforts are poster children for the successes that result when all parties join together in good faith – the Upper Colorado River and San Juan Recovery Implementation Programs. These Programs have become national models demonstrating that endangered species conservation and water development can be compatible."*

**Assistant Secretary of the Interior for Water and Science**  
**Anne Castle, 2009**

*"These Programs have been nationally recognized for their cooperative approach to recovering aquatic native fish species, avoiding litigation, and providing Endangered Species Act compliance to federal and non-federal water users."*

**Bureau of Reclamation Commissioner**  
**Michael Connor, 2009**

*"These outstanding partnerships and cooperative efforts represent a fundamental way in which our Department provides stewardship for America with integrity and excellence."*

**Secretary of the Interior**  
**Dirk Kempthorne, 2008**

## Participating States' Governors Value Recovery Program Accomplishments

*"Balancing the needs of the environment with the beneficial use of our state's water continues to be a challenge ... On the Colorado River we are working to recover endangered fish, while protecting water users and ensuring the state can develop its entitlements under interstate compacts."*

**Bill Ritter, Jr., Governor, State of Colorado**

*"These highly successful and widely supported programs [Upper Colorado and San Juan fish recovery programs] are recovering endangered fish species in the Upper Colorado River and San Juan River basins while providing compliance with the Endangered Species Act for more than 1,800 federal, tribal, and non-federal water projects."*

**Bill Richardson, Governor, State of New Mexico**

*"The success of the Upper Colorado River and San Juan River Endangered Species Recovery Programs is vital for Utah's continued use and development of Utah's Colorado River apportionment as part of our state's continued progress in providing for the needs of the citizens of Utah."*

**Gary Herbert, Governor, State of Utah**

*"These ongoing, highly successful, cooperative programs ... reflect the proper approach to providing endangered species conservation and recovery ... while concurrently resolving critical conflicts between endangered species recovery and the development and use of Compact-apportioned water resources in ... the Intermountain West."*

**Dave Freudenthal, Governor, State of Wyoming**

# Federal Laws Authorizing Cost-Sharing Show Congressional Commitment to Species Recovery

Although 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.**

## CAPITAL FUNDS

Public Law (P.L.) 106-392 (2000) authorizes the Bureau of Reclamation (Reclamation) to cost-share capital construction projects for both recovery programs. 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.

P.L. 107-375 (2002) extended the period to complete capital construction 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. P.L. 111-11 (2009) authorized \$15 million for future rehabilitation, repair, and replacement that may be required for facilities (passages, screens, hatcheries, reservoirs, and habitat) now benefitting the endangered fish. An additional \$12 million is authorized for the San Juan Program – \$7 million to repair unstable rock formations at Farmers Mutual Ditch near Farmington, New Mexico, that threaten critical habitat for the endangered fish when repairs require heavy equipment in the San Juan River, and \$5 million for rehabilitation and repair of Program capital projects, as needed. The law extended the programs' authorization period to 2023.

Capital Construction Cost-Sharing for Upper Colorado and San Juan Programs		
Upper Colorado Recovery Program	.....	\$179 million
San Juan Recovery Program	.....	\$.30 million
<b>Total</b>	.....	<b>\$209 million*</b>
<b>*Sources of Revenue</b>		
<b>Federal</b>	<b>Non-Federal</b>	
Congress: <b>\$88 million</b>	Power Revenues:	\$17 million
	States:	\$17 million
	Water and Power:	\$87 million
		<b>\$121 million</b>

## Power Revenues

CRSP power revenues, totaling \$17 million, have been expended for capital construction projects consistent with

authorization provided in these public laws. These revenues are treated as a non-federal contribution and are reimbursable costs assigned to power for repayment under Section 5 of the CRSP Act.

## States Cost-Share Capital Projects

*The states fund contributions in a variety of ways:*

- ◆ **Colorado's** legislature created a Native Species Conservation Trust Fund in 2000. Its "Species Conservation Eligibility List" is annually 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.
- ◆ **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 general sales tax to water development projects and directed funding to the Upper Colorado Program.
- ◆ **Wyoming's** legislature appropriated its funding share during its 1998 and 1999 sessions.

Capital Project Cost-Sharing by the States			
	<b>Total Amount</b>	<b>Upper Colorado Rec. Program</b>	<b>San Juan Rec. Program</b>
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
<b>Total</b>	<b>\$17.000 M</b>	<b>\$13.175 M</b>	<b>\$3.825 M</b>

## BASE FUNDS

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. Legislation is now before the Congress to reauthorize the non-operation and maintenance and monitoring uses of annual base funding through 2023, which include crucially important nonnative fish management, public involvement, and program administration activities. **The states, U.S. Fish and Wildlife Service, and water users also contribute substantial base funding each year.** (See also budget summaries on pages 18 and 19 for each program.)

# Recovery Programs Rely on Recovery Goals to Guide Recovery Actions and Measure Success

**T**he 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 fishes. 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.

The U.S. Fish and Wildlife Service (Service) approved the initial recovery goals on August 1, 2002, with the requirement that they be reviewed and updated every five years to include any new information. This review is underway with completion slated for 2010.

Recovery goals can be found under Foundational Documents at: [ColoradoRiverRecovery.org](http://ColoradoRiverRecovery.org)



The 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 the fish to be listed.

Current Estimated Year to Downlist and Delist the Endangered Fishes		
Species	Downlist	Delist
Humpback chub	2013	2016
Colorado pikeminnow	2013	2021
Razorback sucker	2020	2023
Bonytail	2020	2023

## Actions to Recover the Fishes

The recovery programs implement management actions within five program elements:

- ◆ **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.
- ◆ **Endangered Fish Propagation and Stocking** – Produce genetically diverse fish in hatcheries and stock them in the river system.
- ◆ **Habitat Management** – Identify and provide adequate instream flows.
- ◆ **Habitat Development** – Construct and operate fish passages and screens at diversion dams, and acquire and restore floodplain habitat.
- ◆ **Nonnative Species and Sportfishing** – Reduce the threat of certain nonnative fish species while maintaining sportfishing opportunities.

Public information and outreach are integrated into each program element. The recovery programs proactively work to increase public support for endangered fish recovery and invite full public participation and understanding of program activities.

Highlights of recent accomplishments to recover the fishes are described on the following pages.



Operated by the Navajo Nation, the fish passage at the Public Service Company of New Mexico Weir provides educational opportunities for local students.



# Research and Monitoring Track

## Endangered Species Status

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

### COLORADO PIKEMINNOW (*Ptychocheilus lucius*)

#### Upper Colorado River Program

◆ Wild Colorado pikeminnow populations occur in the Green and Colorado river sub-basins of the Upper Colorado River.

- The population in the Green River is the largest with a recovery goal of 2,600 adults to downlist (*Figure 1*). Downlisting criteria requires 700 adults for the smaller Colorado River population (*Figure 2*) and 1,000, 5-year or older fish in the San Juan River sub-basin.

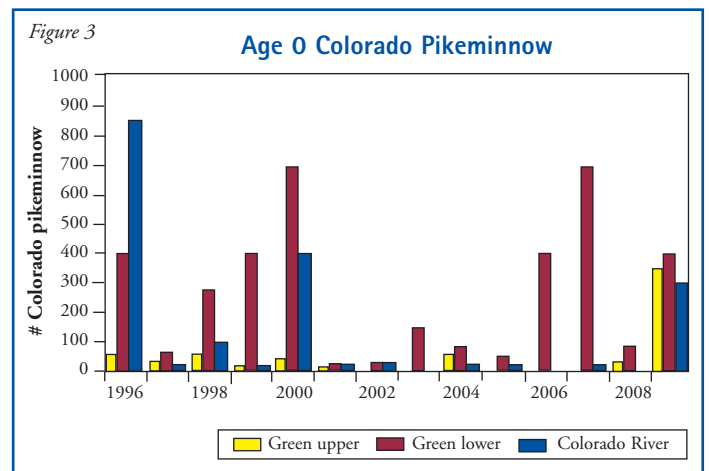
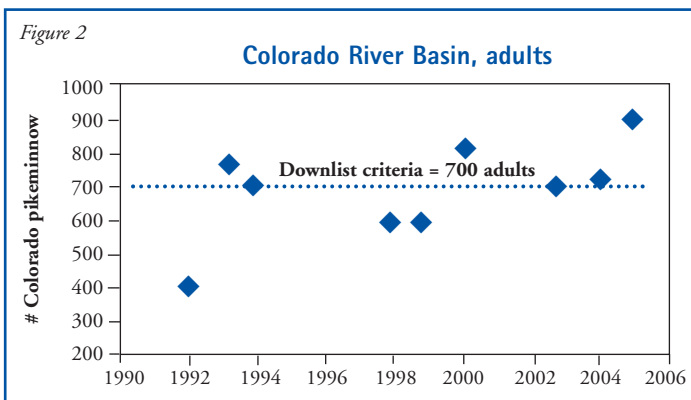
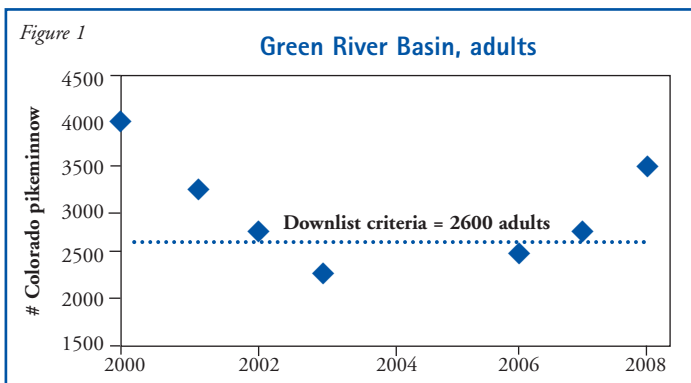
- Researchers caution that despite recent increases in adult numbers in both populations, fluctuations should be expected in the future due to natural population dynamics.

◆ Young of the year (age-0) Colorado pikeminnow are monitored every fall in two reaches of the Green River and one reach of the Colorado River.



New Mexico Fisheries Resources Office Biologist Bobby Duran holds a Colorado pikeminnow from the San Juan River. Catch rates have steadily increased over the past decade.

- Catch of age-0 Colorado pikeminnow in the upper reach of the Green River has been very low and of particular concern to researchers since the mid-1990s. Catches in that reach increased in 2009, presumably due to higher flows in 2008 and 2009 as well as other recovery actions like nonnative fish management (*Figure 3*).



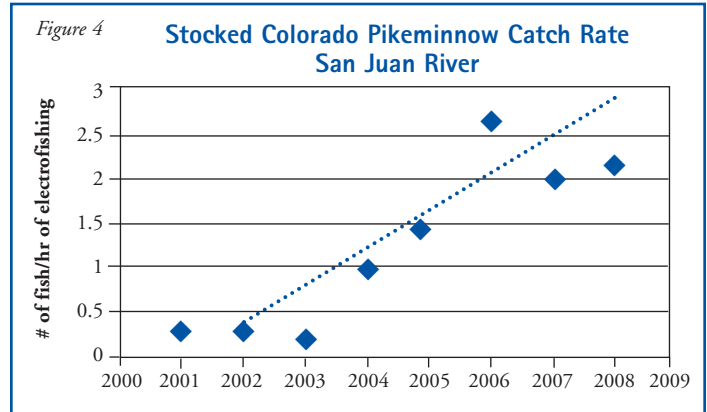
Continued on page 9

## COLORADO PIKEMINNOW (*Ptychocheilus lucius*)

### San Juan River Program

◆ Catch rates of juvenile and adult Colorado pikeminnow have steadily increased over the past decade, demonstrative of a successful stocking program (Figure 4).

- The stocking target for age-0 Colorado pikeminnow was achieved in four out of the past five years. The target for juvenile fish has been met since its inception in 2006.
- Colorado pikeminnow larvae have been detected in the San Juan River in very low numbers since 1993. Larval fish caught in 2004, 2007, and 2009 indicate hatchery-produced fish are reproducing in the wild.



Catch rates of stocked Colorado pikeminnow collected during nonnative fish removal in the upper San Juan River have increased since 2001.

## BONYTAIL (*Gila elegans*)

### Upper Colorado River Program

◆ Stocking continues to reestablish populations in the Upper Colorado River Basin. When the Upper Colorado Recovery Program was established, the bonytail had essentially disappeared and little was known of its habitat requirements. Key to bonytail recovery is research and monitoring of stocked fish to determine life history needs and ways to improve their survival.

- To date, stocked bonytail do not appear to be surviving as well as razorback sucker. Researchers continue to experiment with pre-release conditioning as well as exploring alternative release sites to improve their survival.
- In 2009, biologists working on the Green River in the Uintah Basin, Utah, captured in excess of 40 bonytail stocked more than a year earlier.



Colorado Division of Wildlife Technician Joe Marrinan raises bonytail at the State of Colorado's J.W. Mumma Native Aquatic Species Restoration Facility in Alamosa, Colorado.

### Program's Performance to Meet Annual Bonytail Stocking Goals (%)

	Green River		Colorado/Gunnison Rivers
	Middle	Lower	
2005	112	58 <sup>1</sup>	114
2006	95	61	104
2007	101	101	105
2008	143	100	111
2009	101	100	95

Shaded cells indicate years when stocking goal was not met (i.e., <100%)

<sup>1</sup> Fish were stocked in other locations.



Bonytail are stocked in the Colorado and Green rivers in Colorado and Utah.

## RAZORBACK SUCKER (*Xyrauchen texanus*)

◆ When the Upper Colorado Recovery Program was founded in 1988, numbers of wild razorback sucker had diminished to a few hundred adults in the Green River system and were considered lost from the Upper Colorado and San Juan rivers. Clearly, hatchery-produced fish would be needed to reestablish the species in the wild and preferred habitat would need to be restored via flow management and floodplain protection.

- Fish stocked in the Green, Colorado, and San Juan rivers are recaptured in reproductive condition and often in spawning groups. Captures of larvae in the Green (*Figure 5*), Gunnison, Colorado, and San Juan rivers document reproduction.

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

- A recent analysis of long-term razorback sucker recapture information indicates that autumn is the best time of year to stock and that larger (12 inches or greater) hatchery-produced fish appear to survive better.

- In spring 2009, researchers captured the first adult razorback sucker seen for nearly 30 years in the Yampa River near Dinosaur National Monument in northwest Colorado. This was a hatchery-raised fish stocked in the Green River in 2004. The fish traveled 280 miles upstream during the next five years.

**Programs' Performance to Meet Annual Razorback Sucker Stocking Goals (%)**

	Green River		Colorado/Gunnison Rivers	San Juan River
	Middle	Lower		
2005	49 <sup>1</sup>	43 <sup>1</sup>	117	18 <sup>2</sup>
2006	102	104	116	164
2007	111	86	102	203
2008	118	102	130	39 <sup>3</sup>
2009	151	51 <sup>1</sup>	181 <sup>4</sup>	135

Shaded cells indicate years when stocking goal was not met (i.e., <100%)

<sup>1</sup> Bird predation at ponds reduced production.

<sup>2</sup> Inclement weather impeded pond harvest.

<sup>3</sup> The additional fish to meet the annual river target were held over at Uvalde National Fish Hatchery. These fish will be stocked in the San Juan River in 2009 and 2010 to study survival rates of larger stocked fish.

<sup>4</sup> Permit not in place for Grand Valley to stock at Green River, Utah; therefore fish were stocked into Colorado and Gunnison rivers.



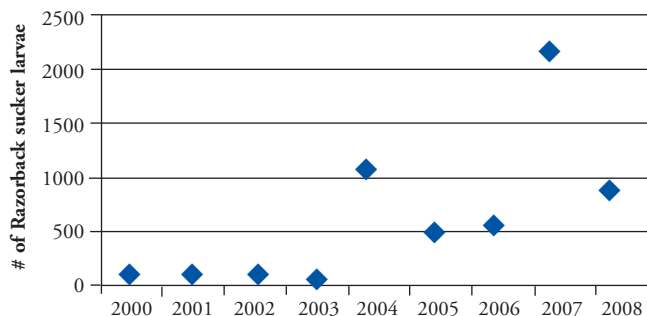
Biologist Cameron Walford captured this razorback sucker from the Yampa River in 2009. It was the first of its species seen in the Yampa River near Dinosaur National Monument for nearly 30 years.



Biologists Yvette Paroz (left) and Nik Zymonas, New Mexico Department of Game and Fish, seine for young-of-year razorback sucker and other native fish during fall sampling on the San Juan River.

Figure 5

**Razorback Sucker Larvae Captured in the Middle Green River**



## HUMPBAC CHUB (*Gila cypha*)

◆ Five wild populations inhabit canyon-bound sections of the Colorado, Green, and Yampa rivers. Downward trends in some populations (particularly Yampa Canyon and Desolation Canyon in the Green River) have been attributed to increased abundance of nonnative fish and habitat changes associated with dry weather and low river flows.

- A return to average hydrologic conditions throughout the basin in 2008 and 2009, coupled with ongoing nonnative fish management, may explain recent observations of successful native chub reproduction.



Researchers collect humpback chub from Gray Canyon, a reach of the Green River in eastern Utah, to secure genetic diversity of this population.



Utah Division of Wildlife Resources Biologist Katrina Lund with a humpback chub captured while conducting a population estimate during fall 2009 in Cataract Canyon on the Colorado River.



Locations of the five humpback chub populations in the Upper Basin.

- The largest population in the Upper Colorado River Basin is comprised of two groups in Black Rocks and Westwater Canyon. Most recent estimates indicate the combined population size exceeds 3,000 adults. (Note: recovery goals identify a downlist demographic of 2,100 adults for this combined “core” population.)

- Downward trends in the Yampa and Desolation populations led the Upper Colorado Program to collect more than 20 individuals from each population to secure genetic diversity maintained in the hatchery system in 2009.

Trends in Humpback Chub Populations

Population	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
Black Rocks	↓	NS	NS	↔	↑	NS	NS	↓	↔	NS
Westwater Canyon	↓	↔	NS	↔	↔	↔	NS	↔	↔	NS
Cataract Canyon	NS	NS	NS	↔	↓	↑	NS	NS	NS	↑
Desolation Canyon	NS	↔	↑	↓	NS	NS	↓	↓	NS	*
Yampa Canyon	↔	NS	NS	↓	↓	NS	NS	*	NS	NS

↓ = decline from previous abundance estimate; ↑ = increase from previous abundance estimate; ↔ = little or no change from previous abundance estimate; \* = chubs from this population were brought into captivity; NS = not sampled

# State, Federal, and Tribal Facilities Help Reestablish Endangered Fish Populations

**G**enetically diverse, hatchery-produced, stocked fish are used 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 to achieve the demographic criteria of the recovery goals. The recovery programs monitor survival and reproduction of stocked fish to evaluate and improve stocking strategies. In most cases, the facilities are exceeding their annual production targets (see pages 9 and 10).

## Wahweap State Fish Hatchery

Big Water, Utah



Wahweap raises bonytail and stocks them when they reach 8-inches in size (about two years old).

**Species:** Bonytail  
**Target:** 10,660, 8-inch  
**Stocked:** Colorado, Middle, and Lower Green rivers

## Ouray National Fish Hatchery

Vernal, Utah



Biologists obtain data and tag razorback sucker before stocking.

**Species:** Razorback sucker  
**Target:** 14,895, 12-inch  
**Stocked:** Middle and Lower Green rivers  
**Species:** Humpback chub  
**Goal:** Maintain individual fish from two populations to preserve genetic diversity.

## Navajo Agricultural Products Industry

(NAPI) Ponds/ near Farmington, New Mexico



The Navajo Nation raises fish in ponds to stock in the San Juan River.

**Species:** Razorback sucker  
**Target:** 6,000, 12-inch  
**Stocked:** San Juan River

## J.W. Mumma Native Aquatic Species

Restoration Facility / Alamosa, Colorado



Mumma raises a broad variety of species that are endangered, threatened, and of concern.

**Species:** Bonytail  
**Target:** 5,330, 8-inch  
**Stocked:** Middle Green, Colorado, and Gunnison rivers

## Dexter National Fish Hatchery &

Technology Center / Dexter, New Mexico



Dexter NFH&TC produces the largest annual number of endangered fish for the recovery programs.

**Species:** Colorado pikeminnow, razorback sucker, bonytail  
**Target:** Varies by species  
**Stocked:** All Upper Basin rivers

## Uvalde National Fish Hatchery

Uvalde, Texas



A biologist holds a tagged razorback sucker before transporting and stocking in the San Juan River.

**Species:** Razorback sucker  
**Target:** 11,400, 12-inch  
**Stocked:** San Juan River

## Grand Valley Endangered Fish Facility

Grand Junction, Colorado



The Grand Valley and other facilities provide education through tours, aquarium exhibits, and school programs.

**Species:** Razorback sucker  
**Target:** 14,895, 12-inch  
**Stocked:** Gunnison, Colorado, and Lower Green rivers

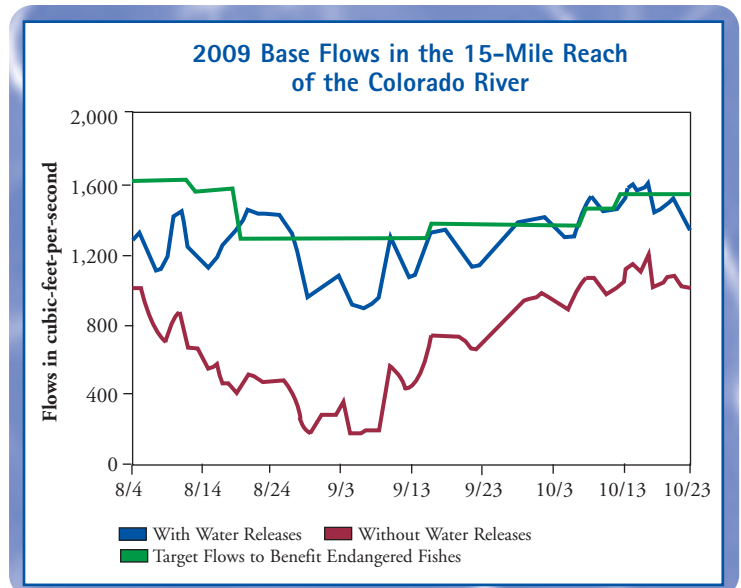
# Innovative Solutions Provide Water for Endangered Fish

**A**ctions within this recovery element focus on identifying and providing instream flows needed to recover the endangered fishes. The recovery programs use research, monitoring, and adaptive management to identify, evaluate, and revise flow recommendations to meet the flow-related life-history and habitat requirements of the endangered fishes.

Innovative solutions are implemented to provide adequate instream flows for the endangered fishes while meeting water needs of growing western communities. Program partners cooperatively manage water in accordance with state law, individual water rights, and interstate compacts. This is accomplished through water leases and contracts, coordinated releases from upstream reservoirs, efficiency improvements to irrigation systems, and re-operation of federal dams and reservoirs.



The San Juan River Basin Hydrology Model is being updated to ensure proposed water projects do not negatively affect Navajo Dam releases for endangered fish. The updated model will be used to evaluate and revise the San Juan River flow recommendations.



Water released from upstream Colorado reservoirs, averaging 64,444 acre-feet per year since 1998, enhances late-summer and fall base flows in the Colorado River for endangered fishes. Water released in 2009 totaled 106,022 acre-feet.



Coordinated releases from Ruedi and other Colorado reservoirs enhance spring peak flows in the Colorado River for the endangered fishes. Combined releases in 2009 of 42,783 acre-feet were the highest since the Coordinated Reservoir Operations Program began in 1995.



An environmental impact statement is being prepared on reoperation of Aspinall Unit dams on the Gunnison River in western Colorado to help recover the endangered fishes. The Aspinall Unit is comprised of three federal reservoirs – Blue Mesa (pictured), Morrow Point, and Crystal.



The Upper Colorado River Program provided matching funds for a Water 2025 Challenge Grant to the Uintah Indian Irrigation Project O&M Company for improvements to the Myton Diversion Dam and Canal on the Duchesne River in Utah to ensure delivery of full water rights while helping to implement flow recommendations for endangered fishes.

# Construction Projects Key to Restoring Endangered Fish Populations

The recovery programs work cooperatively with American Indian Tribes, water and power customers, and local landowners to improve endangered fish habitat. Habitat restoration and maintenance includes “undoing” habitat fragmentation through construction and operation of fish passages at irrigation diversion dams; preventing fish from entering and becoming trapped in irrigation diversion canals through construction and operation of fish screens; and acquisition, restoration, and management of floodplain habitat to serve primarily as fish nursery areas.

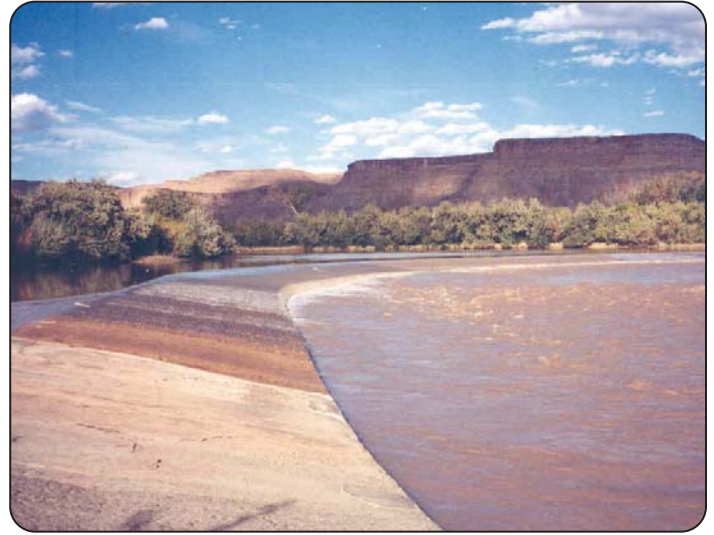
The central map shows the Colorado River flowing from the top right towards the bottom left, where it meets the Gunnison River. Key locations marked include GRAND JUNCTION, GRAND VALLEY PROJECT DIVERSION, Price-Stubb Diversion, and GVIC Canal. A dashed line indicates the Government Highline Canal. Other locations shown are PARACHUTE, DEBEQUE, and Redlands Canal. Arrows from the map point to the following project photos:

- Price-Stubb Fish Passage, 2008**: Aerial view of a concrete structure in a river channel.
- Grand Valley Project Fish Passage, 2004**: Aerial view of a large dam structure with a fish passage.
- Redlands Fish Screen, 2005**: Aerial view of a large metal screen structure in a river.
- Grand Valley Project Fish Screen, 2007**: Aerial view of a large metal screen structure in a river.
- Redlands Fish Passage, 1996**: Aerial view of a concrete structure in a river channel.
- GVIC Fish Screen, 2002**: Ground-level view of a large metal screen structure.
- GVIC Fish Passage, 1998**: Ground-level view of a concrete structure in a river channel.

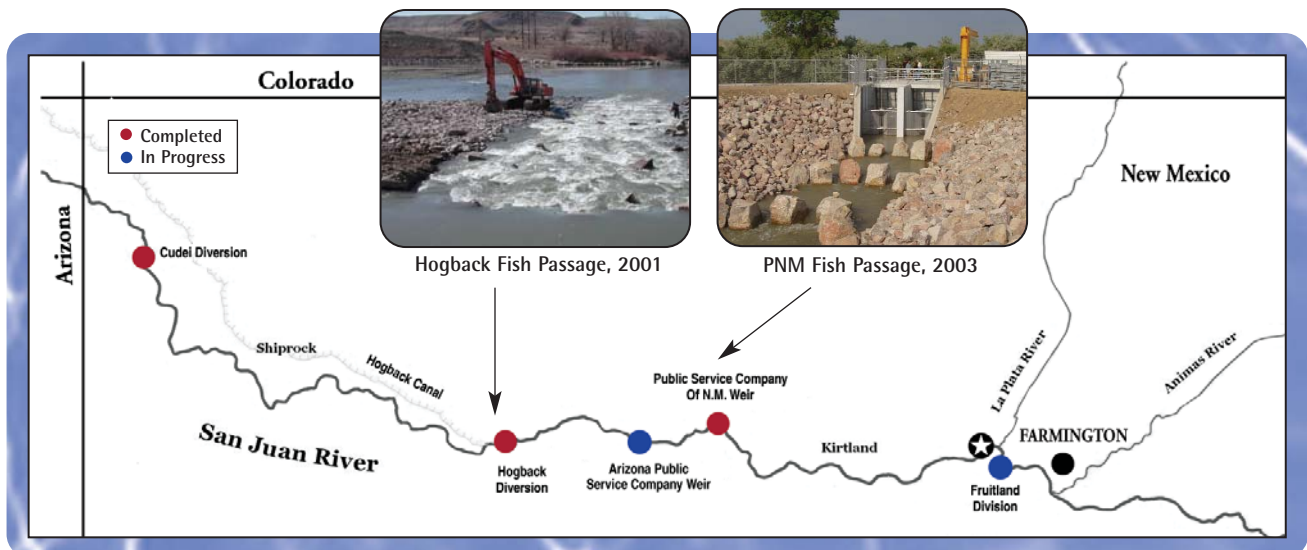
Ninety percent of the Upper Colorado River Program’s construction projects needed to recover the endangered fishes are complete. These include fish passages and screens at the Redlands Water and Power Company, Grand Valley Irrigation Company, Grand Valley Project, and Price-Stubb irrigation diversions in western Colorado. These fish passages provide endangered fish with unimpeded access to about 340 miles of designated critical habitat in the Colorado and Gunnison rivers.



About 2,700 acres of restored floodplain habitat in the Upper Colorado River Basin are managed for all life stages of endangered fish.



Once a fish screen is constructed at the Tusher Wash Diversion Canal on the Green River in eastern Utah, all major diversion canals identified in the recovery goals for the upper Colorado River system will be screened.



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.

⊗ Capital funds will be used to repair unstable rock formations (see photo and caption below).



Construction of a weir wall to prevent fish from entering the Hogback Irrigation Canal will begin in 2010. Fish passages are being considered at the Arizona Public Service Company Weir and the Fruitland Diversion Dam.



Passed in 2009, Public Law 111-11 authorized \$7 million to repair unstable rock formations near Farmington, New Mexico. Heavy equipment in the San Juan River needed to repair the slides threatens critical habitat.



The San Juan River Program received a River Ecosystem Restoration Initiative grant from the New Mexico Environment Department to restore backwater and side channel habitat along the San Juan River. Work began in 2009 to identify restoration sites.



# 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.** Currently, nonnative smallmouth bass and northern pike are the principal target species for management in the Green and upper Colorado River systems; whereas, nonnative channel catfish and common carp are targeted in the San Juan River.



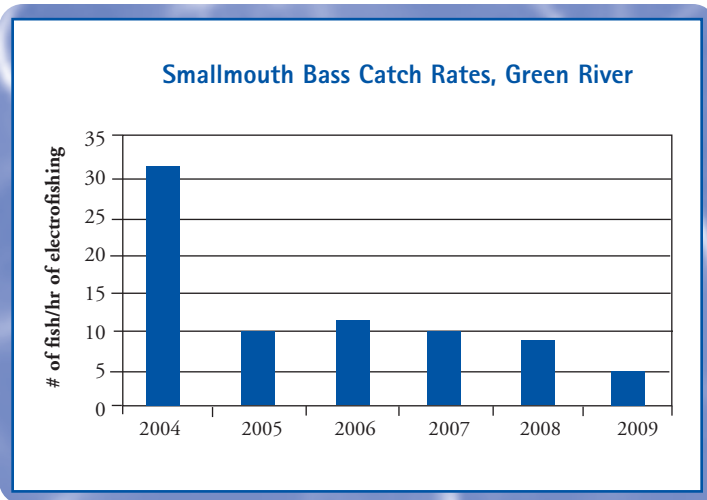
Large adult northern pike (nonnative species) like the one shown above have been reduced throughout portions of the Upper Colorado River Basin since intensive removal efforts began in 1999.



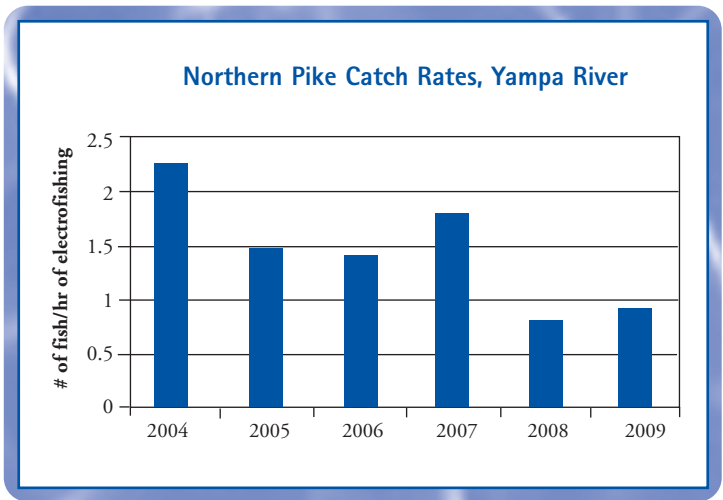
Nonnative removal efforts have reduced the abundance of adult channel catfish in high-priority upper and lower sections of the San Juan River where channel catfish numbers were highest.

Progress to reduce the abundance of the target nonnative fish species over the past 10 years is summarized below.

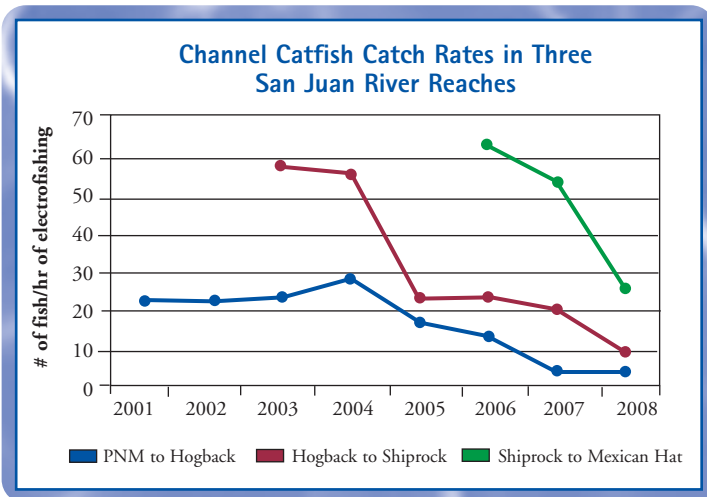
River	Species	History and Current Status
Colorado (112 miles)	Smallmouth bass	<ul style="list-style-type: none"> <li>Increases in abundance first observed in 2003; removal began in 2004 and increased significantly in 2007.</li> <li>Abundance has steadily declined from 2004-2009.</li> <li>Largemouth bass are an emerging problem; catch of young fish has steadily increased since 2004.</li> </ul>
Green (198 miles)	Smallmouth bass	<ul style="list-style-type: none"> <li>Increases in abundance first observed in 2003; removal began in 2004.</li> <li>Adult abundance was highest in 2004 but has declined by ~50% in recent years.</li> <li>Increased removal efforts since 2007 have removed as much as 90% of the estimated adult population in certain areas, in some years.</li> </ul>
	Northern pike	<ul style="list-style-type: none"> <li>Since removal began in 2001, abundance has been greatly reduced and remains low.</li> </ul>
Yampa (134 miles)	Smallmouth bass	<ul style="list-style-type: none"> <li>Increases in abundance first observed in 2003; removal began in 2004.</li> <li>Results through 2007 indicated the adult population was declining; however, substantial reproduction occurred in 2007.</li> <li>Average flows in 2008 and 2009 in the Yampa, Green, and Colorado rivers appear to have negatively affected reproduction.</li> </ul>
	Northern pike	<ul style="list-style-type: none"> <li>Abundance steadily increased during the 1980's and 1990's; removal began in 1999.</li> <li>Removal through 2007 shifted the size to smaller individuals; in 2008 and 2009 the overall abundance in critical habitat was near its lowest level (<i>see northern pike graph on next page</i>).</li> </ul>
San Juan (164 miles)	Channel catfish	<ul style="list-style-type: none"> <li>Removal since 2001 reduced abundance to a level where the population is now dominated by juveniles, reducing reproduction and predation on larger native fish.</li> </ul>
	Common carp	<ul style="list-style-type: none"> <li>Removal since 2001 reduced abundance to a level where collections of Colorado pikeminnow and razorback sucker now outnumber common carp.</li> </ul>



A declining catch rate for nonnative smallmouth bass (larger than 4 inches) from an intensively sampled, 24-mile reach of the Green River in Utah, 2004–2009.



A declining catch rate for adult, nonnative northern pike (larger than 12 inches) in a 70-mile reach of the Yampa River, Colorado.



Removal efforts in three San Juan River reaches resulted in significant declines in channel catfish abundance.

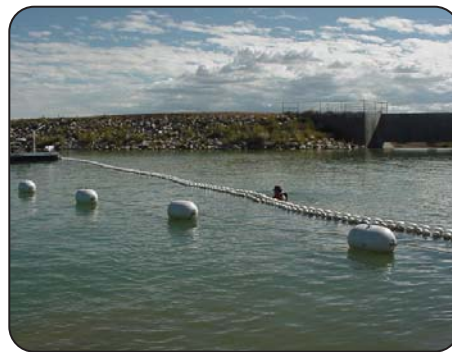


A waterfall formed at the mouth of the San Juan River and Lake Powell in 2003 when lake levels started dropping. While beneficial because it prevents nonnative fish from moving upstream, there is concern that native fish are being lost from the system. Monitoring will determine the level of native fish loss and any associated management actions.

***Nonnative fish management actions of the recovery programs recognize the dual responsibilities of state and federal wildlife agencies to conserve native fish species while providing sportfishing opportunities.*** Where feasible, sportfish removed from rivers are translocated to local off-channel ponds and reservoirs accessible to local anglers.



Channel catfish removed from the San Juan River are stocked in Navajo Nation ponds to enhance sportfishing.



A barrier net installed at Highline Lake in western Colorado prevents escapement of nonnative fish while a sportfishery is maintained.

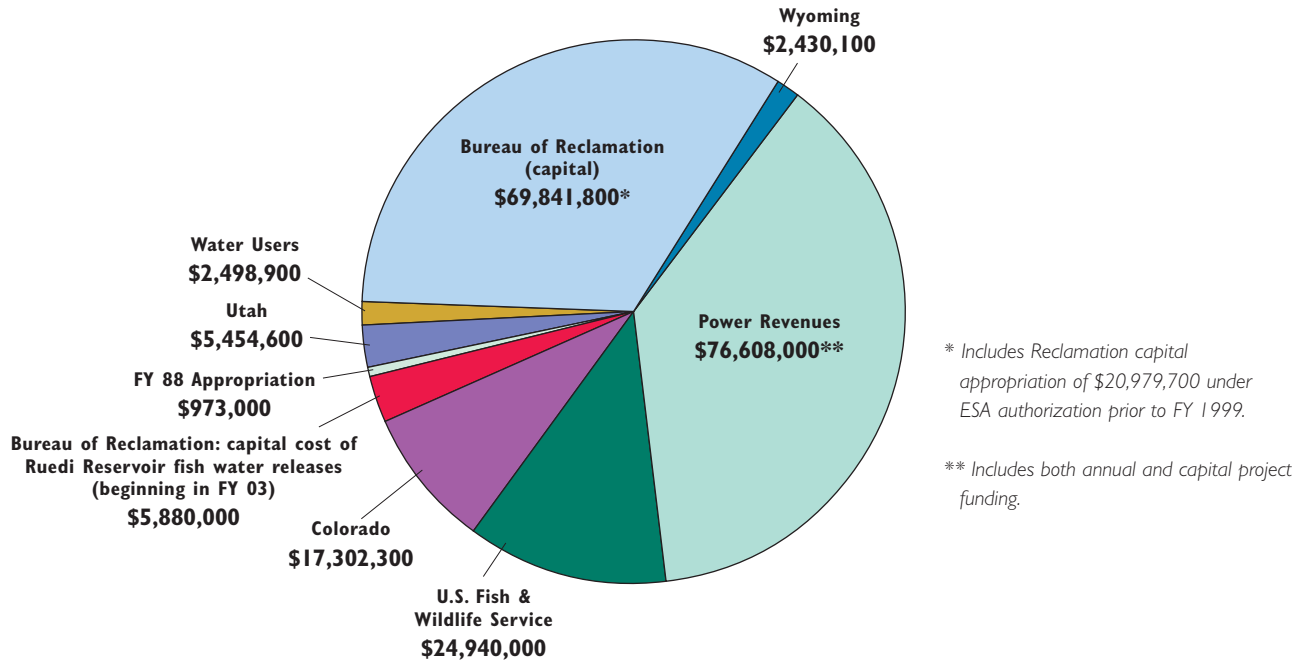


The San Juan River Program helped educate children about endangered species at the Jemez Springs Hatchery "Kids Fishing Day" sponsored by the New Mexico Game and Fish Department.

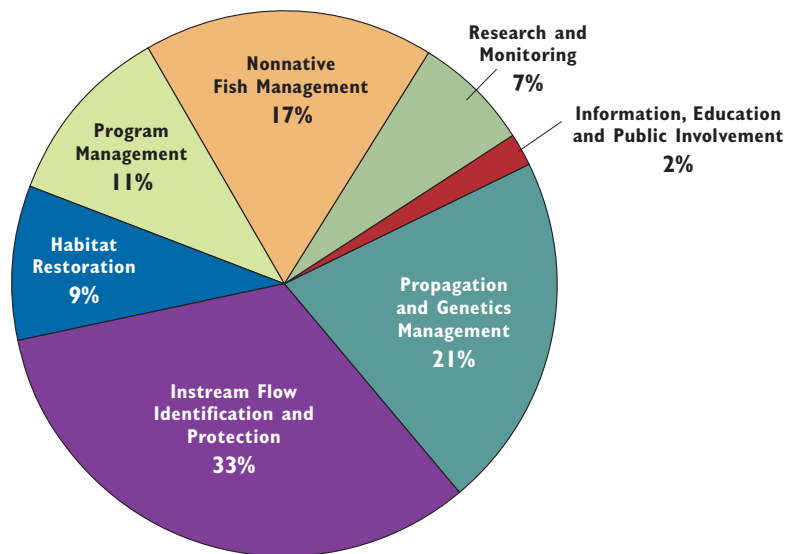
# Expenditures

## Upper Colorado River Endangered Fish Recovery Program

Total Partner Contributions = \$207,928,700 (FY 1989-2010)



## Projected Expenditures by Category (FY 2010 only)

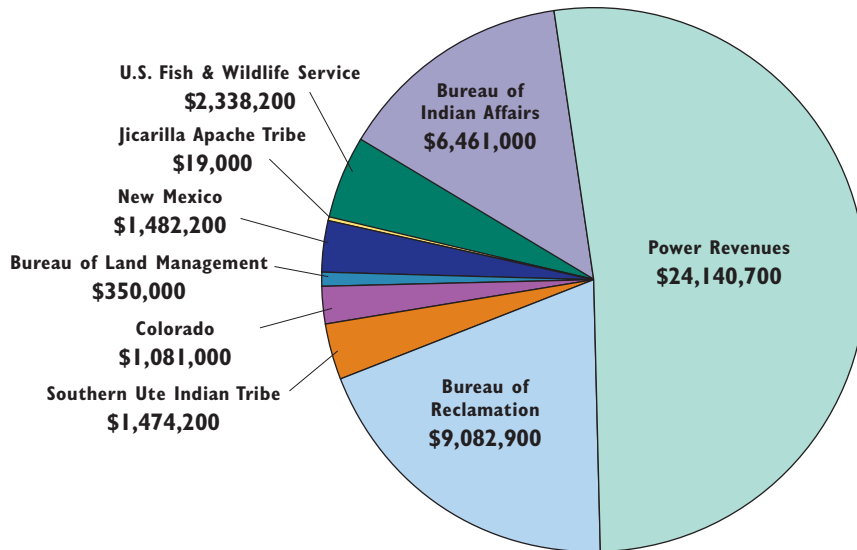


# Expenditures

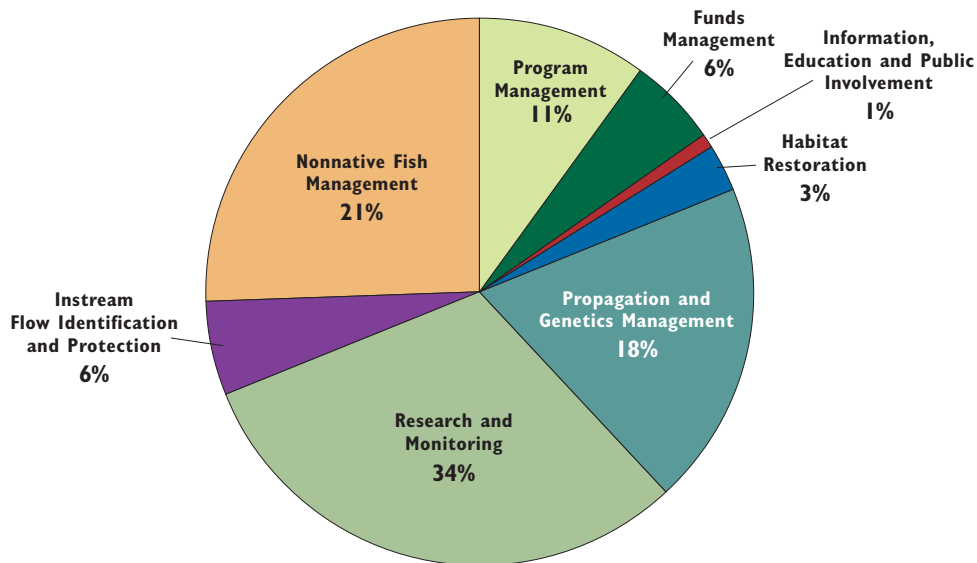
## San Juan River Basin Recovery Implementation Program

Total Partner Contributions = \$46,429,200 (FY 1992-2010)

(Not including in-kind contributions)



## Projected Expenditures by Category (FY 2010 only)



# Providing Endangered Species Act Compliance for Water and Hydroelectric Power Projects

The Upper Colorado River and San Juan River Basin recovery programs respond to the challenge of water management by working 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 provide ESA compliance for water development and management activities by all parties, together with all

federal agencies. This includes Bureau of Reclamation-operated reservoirs and projects in the Upper Colorado River Basin. Responsibilities to offset water project depletion impacts do not fall on individual projects or their proponents.

**The recovery programs provide ESA compliance for 1,857 water projects depleting more than 3.7 million acre-feet per year.** 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**  
(1/1988 through 12/31/2009)

State	Number of Consultations	Historic Depletions	New Depletions	Totals
		Acre-feet/yr	Acre-feet/yr	Acre-feet/yr
<b>Colorado</b>	1,111	1,915,322	205,917	2,121,239
<b>Utah</b>	198	517,670	75,616	593,286
<b>Wyoming</b>	164	83,498	33,428	116,926
<b>Regional*</b>	238	(regional)	(regional)	0
<b>Total</b>	<b>1,711</b>	<b>2,516,490</b>	<b>314,961</b>	<b>2,831,451</b>

\*Amount included in individual states' new depletions.

**San Juan River Basin Recovery Implementation Program  
Summary of Endangered Species Act Section 7 Consultations**  
(1/1992 through 12/31/2009)

State	Number of Consultations	Depletions
		Acre-feet/yr
<b>New Mexico</b>	19	653,109
<b>Colorado</b>	114	217,746
<b>Utah</b>	13	9,144
<b>Total</b>	<b>146</b>	<b>879,999</b>



*Bonytail*



*Humpback Chub*



*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.org



*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  
Bureau of Indian Affairs  
Bureau of Land Management  
Bureau of Reclamation  
The Nature Conservancy  
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  
southwest.fws.gov/sjrip



*Colorado Pikeminnow*



*Razorback Sucker*