

REPORT TO CONGRESS ON THE UPPER COLORADO AND SAN JUAN RIVER BASINS ENDANGERED FISH RECOVERY PROGRAMS

As directed by Public Law 106-392, amended by Public Law 116-9 Section 8102
and Public Law 117-328, Division CC
March 2023

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Executive Summary

The Upper Colorado Endangered Fish Recovery Program (Upper Colorado Program) was established through a cooperative agreement in 1988 to balance water resource development and recovery of the listed fishes. The San Juan River Basin Recovery Implementation Program (San Juan Program) was implemented as a reasonable and prudent alternative for the Animas-La Plata Project and established through a cooperative agreement in 1992. The Upper Colorado Program and the San Juan Program are hereafter referred together as “the recovery programs”. The goal of the recovery programs is to recover the federally listed Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) by 2023, while water use and development continue to meet human needs. The recovery programs’ actions provide Endangered Species Act (ESA) compliance for more than 2,500 federal, tribal, and non-federal water projects depleting more than 3.8 million acre-feet of water per year in the Colorado and San Juan rivers, and their tributaries in Colorado, Utah, Wyoming, and New Mexico.

Section 3 of Public Law 106-392, as amended by Section 8102 of Public Law 116-9 and Public Law 117-328, Division CC, required the Secretary of the Interior to submit to the appropriate committees a Report to Congress that includes a description of the costs and accomplishments of the recovery programs to date as well as anticipated cost and activities needed to continue during the reauthorization period. This report provides that information in seven sections:

- I. Purpose
- II. Description of the Recovery Programs
- III. Accomplishments of the Recovery Programs
- IV. Listing Status of the Colorado River Fishes
- V. Program Expenditures and Funding Sources to Date
- VI. Post-2023 Management Actions to Recover and Protect Species
- VII. Conclusions and Recommendations

For more than 30 years, the recovery programs have been a model of ESA implementation (further details in Section II). One of the species, humpback chub, was downlisted to threatened in 2021. A second species, razorback sucker, has been recommended for downlisting based on reestablishment of adult populations across the Colorado River basin and increasing signs of natural recruitment after extirpation from the upper Colorado River basin in the 1990’s (further details in Section IV). While this progress was being made, the recovery programs also provided certainty for water users, allowing water development to continue to support cities, towns, agriculture, recreation and more.

This recovery success has occurred thanks to the dedicated efforts of all program partners, who contribute time, expertise, natural resources (like water and wetlands), in addition to their monetary contributions (further details in Section V). Dedication and voluntary contributions are what make the recovery programs work so well. As a few examples of these contributions, water users have redirected flow to support the recovery programs while making water deliveries, state governments have implemented policies to disadvantage nonnative predators, and non-profits

have purchased and rebuilt wetlands to support wild razorback sucker (further details in Appendix A).

Many of the actions described in this report have been developed over the years by multiple cooperating partners (further details in Section III). These actions are now integrated into the management of the upper Colorado River basin, allowing for management responses to changing environmental conditions, such as drought. Recovery program partners are becoming increasingly aware of the need to continue these actions in perpetuity, as part of the fabric of a highly managed ecosystem that produces benefits to stakeholders across the basin. The progress towards recovery relies on ongoing conservation actions that include, 1) nonnative fish removal, 2) operation, repair, and upgrade of fish screens and passages, 3) management of instream flow and 4) educational efforts which all provide direct benefit to the species in the wild. The recovery programs conduct additional actions, including propagation of some species and research to further support recovery, which may become less important over time as the species become more successful with natural reproduction on the landscape

After 30 years of intentional actions, two of the species have shown documented progress towards recovery, but progress is slower than originally anticipated and is compounded by increasing stresses in the system, including the millennium drought, the most severe drought in 1200 years. The funding amounts presented in this report represent about a 15% increase in annual funding for the programs (further details in Section VI). The values were derived by surveying biological experts in all areas of the recovery programs to estimate what is needed to achieve and sustain recovery over the next 10-15 years. Continuation of the recovery programs is recommended at the levels presented here for the next 15 years.

Recommendation:

In conclusion, because of the effective nature of the actions completed by the recovery programs and the certainty they provide; re-authorization of P.L. 106-392 is recommended for an additional 15 years to continue the progress made to date in recovering these species. The continuation of funding through shared contributions from a combination of sources such as federal appropriations, Colorado River Storage Project (CRSP) power revenues, non-federal contributions of both cash and in-kind services for the Upper Colorado Program and San Juan Program are essential to support ongoing and remaining actions necessary to achieve species recovery.

I. Purpose

The Upper Colorado Endangered Fish Recovery Program (Upper Colorado Program) and the San Juan River Basin Recovery Implementation Program (San Juan Program) (hereafter referred together as “the recovery programs”) protect and recover federally listed fishes found only in the Colorado River basin: the Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). The recovery programs provide compliance with the Endangered Species Act (ESA) while water development proceeds according to federal and state laws, interstate compacts, Supreme Court decrees, and federal trust responsibility to the tribes.

This report from the Secretary of Interior to the United States Congress satisfies the requirement in Public Law 106-392 Section 3 as amended by Public Law 116-9, Section 8102 and Public Law 117-328, Division CC as outlined below. The report has been reviewed and is approved by all partners of the recovery programs.

- (1) IN GENERAL.—Not later than September 30, 2022, the Secretary shall submit to the appropriate committees of Congress a report that—
 - (A) describes the accomplishments of the Recovery Implementation Programs;
 - (B) identifies—
 - (i) as of the date of the report, the listing status under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) of the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail; and
 - (ii) as of September 30, 2024, the projected listing status under that Act of each of the species referred to in clause (i);
 - (C) (i) identifies—
 - (I) the total expenditures and the expenditures by categories of activities by the Recovery Implementation Programs during the period beginning on the date on which the applicable Recovery Implementation Program was established and ending on September 30, 2021; and
 - (II) projected expenditures by the Recovery Implementation Programs during the period beginning on October 1, 2021, and ending on September 30, 2024; and
 - (D) for purposes of the expenditures identified under clause (i), includes a description of—
 - (I) any expenditures of appropriated funds;
 - (II) any power revenues;
 - (III) any contributions by the States, power customers, Tribes, water users, and environmental organizations; and
 - (IV) any other sources of funds for the Recovery Implementation Programs; and
 - (E) describes—
 - (i) any activities to be carried out under the Recovery Implementation Program after September 30, 2024; and

(ii) the projected cost of the activities described under clause (i).

(2) CONSULTATION REQUIRED.—The Secretary shall consult with the partners in the Recovery Implementation Programs in preparing the report under paragraph (1).”

II. Consultation with the partners in the Recovery Implementation Programs

This report was drafted by staff of the Upper Colorado and San Juan programs and was developed in consultation with partners from both recovery programs. The first draft of the document was shared with a small team of partners including water users, power users, and state representatives. That small team provided guidance on scope and length of the document in March 2021. The subsequent draft was broadly distributed to all partners in December 2021. Comments were received from the Bureau of Reclamation, the states of Utah, and New Mexico, The Nature Conservancy, Western Resource Advocates, water users, and power users. Comments were incorporated into the document when possible. When conflicts between comments arose, additional discussions occurred with the affected partners. The report was approved by the governing committees of both programs before submission.

III. Description of the Recovery Programs

The Upper Colorado Program was established through a cooperative agreement in 1988 to balance water resource development and recovery of the listed fishes (**Figure 1 - Box 1**). The San Juan Program was implemented as a reasonable and prudent alternative for the Animas-La Plata Project and established through a cooperative agreement in 1992 (**Figure 1 - Box 2**).

The recovery programs conduct actions across the upper Colorado River basin (that includes Colorado, Green, and San Juan River sub-basins) in the states of Colorado, New Mexico, Utah, and Wyoming (**Figure 2**), to benefit the listed species and provide ESA compliance for 2,500 water development and management projects. In addition, the recovery programs provide a streamlined ESA consultation process for water projects that minimize the time and cost to comply with sections 7 and 10 of the ESA for the U.S. Fish and Wildlife Service (USFWS) and federal action agencies.

Box 1. – Partners of the Upper Colorado 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*
Fish and Wildlife Service
Utah Water Users Association*
Western Area Power Administration
Western Resources Advocates*
Wyoming Water Association*

Box 2. – Partners of the San Juan Program

State of Colorado
State of New Mexico
Bureau of Reclamation
Bureau of Indian Affairs
Bureau of Land Management
Fish and Wildlife Service
Navajo Nation
Jicarilla Apache Nation
Southern Ute Indian Tribe
Ute Mountain Ute Indian Tribe
The Nature Conservancy*
Water Development Interest*

Figure 1. Boxes 1 and 2 represent all partners in the Upper Colorado and San Juan programs. Those with an asterisk (*) are not signatories to the cooperative agreements.



Figure 2. Major rivers and tributaries of the upper Colorado River basin including the San Juan River sub-basin (outlined in red). The Colorado and Green river sub-basins are outlined in black.

IV. Accomplishments of the Recovery Programs

The recovery programs have achieved two important goals:

- **Consistently provided ESA compliance** for thousands of water projects, including the Bureau of Reclamation’s reservoir operations and;
- **Implementing recovery actions** that have helped to prevent extinction of all four listed species and advanced the recovery of two species to the extent that USFWS has

reclassified one species and has proposed reclassifying another from ‘Endangered’ to ‘Threatened’ status (explained further in Section IV of this report).

A. Providing ESA Compliance

As of December 31, 2021, the recovery programs provide ESA compliance for more than 2,500 water projects in Colorado, Utah, New Mexico, and Wyoming (**Tables 1 and 2**), including projects constructed prior to the existence of the recovery programs (historical projects), and new projects constructed since the recovery programs were established. These projects provide more than 3.69 million acre-feet of water for agricultural, industrial, tribal, and municipal uses.² Projects range in size from the Bureau of Reclamation’s Flaming Gorge, Navajo, and Aspinall Unit reservoirs that collectively have more than 6.6 million acre-feet of storage capacity to depletions of a few acre-feet or less by small individual projects in the four states. The recovery programs streamline ESA compliance and provide efficiencies for water users, the USFWS, and other federal agencies. Importantly, since the initiation of the recovery programs, no water project in the upper Colorado River basin has been halted because of ESA compliance regarding the impact of its depletions on listed fish, nor have any lawsuits been filed challenging the ESA compliance facilitated by the recovery programs.

Table 1 – Projects provided with ESA compliance by the Upper Colorado Program from 1988 through 2021.

State	Number of Projects	Historical Depletions Acre-Foot/Year	New Depletions Acre-Foot/Year	Total Depletions Acre-Foot/Year
Colorado	1,259	1,915,682	207,233	2,122,915
Utah	266	517,898	101,541	619,439
Wyoming	434	83,498	40,946	124,463
CO/UT/WY	238 ³	(Regional)	(Regional)	Total
Total	2,197	2,517,078	349,738	2,866,816

² An acre-foot (ac-ft) is the volume of water equivalent to covering one acre one foot deep, or about 326,000 gallons; it is roughly the amount of water supplied to two average households over the course of a year.

³ Small depletion projects (<100 acre-feet per year) consulted on between July 3, 1994, and October 1, 1997, when the Upper Colorado Program did not track the number of these projects by state. Depletion totals associated with these 238 projects are captured by state under new depletions.

Table 2 – Projects provided with ESA compliance by the San Juan Program from 1992 through 2021.

State	Number of Projects	Total Depletions Acre-Feet/Year
New Mexico	27	605,690
Colorado	321	218,098
Utah	16	9,140
Total	363	832,928

B. Implementing Recovery Actions

The recovery programs provide considerable flexibility for ESA compliance for water development and management through the implementation of recovery actions that benefit the species and promote progress toward recovery within the upper Colorado River basin. Recovery actions are implemented across six broad recovery elements:

- Identifying and protecting instream flows;
- Restoring and protecting habitat;
- Managing nonnative fish;
- Propagating, stocking, and maintaining genetic integrity of listed fishes;
- Research and monitoring;
- Public education and involvement.

When the recovery programs were initiated in 1988 and 1992, the trajectory of all four listed species was toward extinction. The implementation of these recovery elements not only prevented extinctions, but substantially improved the prospect for recovering the listed fishes. Collaboration among stakeholders in developing and implementing management actions that will achieve recovery goals and result in delisting the listed fishes is key to the recovery programs' success.

The recovery programs apply a science-based adaptive management approach to develop and implement management actions. The recovery programs use adaptive management actions to address changing environmental conditions such as the recent prolonged drought and anticipated impacts of climate change in the West. As new research and monitoring information becomes available, the recovery programs evaluate, modify, and prioritize activities based on species' status and response. Prioritization of activities is based on both site-specific and species-specific needs for each basin. For example, the Upper Colorado Program places priority on identifying and protecting instream flows, building and managing habitat, and managing nonnative fish; whereas the San Juan Program is focused on using a research-based approach to develop and assess management actions needed to increase species recruitment and managing nonnative fish.

1. Identifying and Protecting Instream Flows

Recovery of the listed fishes requires identifying, protecting, and managing river flows to maximize the habitat available for all life-stages to support self-sustaining populations. The

recovery programs manage water to benefit the listed fishes and their habitats, including leases and contracts for water supplies, coordinated water releases from reservoirs, efficiency improvements to irrigation systems to reduce diversions leaving more water in the rivers, and modified operations of federal dams and reservoirs. Water for listed fishes is provided in accordance with State water law, individual and tribal water rights, interstate compacts, and federal laws.

2. Restoring and Protecting Habitat

Recovery of the listed fishes requires restoration and protection of habitat vital to all fish life stages. Habitat for listed fishes is restored and maintained by constructing and operating fish passages at diversion dams allowing access to important river reaches, constructing and operating fish screens to minimize fish entrainment in water diversions, and acquiring and restoring or creating floodplain habitat for fish nursery areas. Due to the recovery programs, these migratory fish now have access to over 900 miles of river across the upper basin. In addition, over 2,700 acres of floodplains and side channels provide warm, food-rich environments to support young life stages of razorback sucker and bonytail.

3. Managing Nonnative Fish

Predation and competition from nonnative fish species is a serious threat to the listed fishes and poses an obstacle to recovery, particularly in the Green and Colorado river subbasins. Among the most problematic introduced species are large-bodied predators including smallmouth bass (*Micropterus dolomieu*), northern pike (*Esox lucius*), and walleye (*Sander vitreus*) in the Colorado and Green river sub-basins and channel catfish (*Ictalurus punctatus*) and common carp (*Cyprinus carpio*) in the San Juan River sub-basin. Nonnative fish management includes mechanical removal, flow management to disrupt spawning, elimination of in-river spawning habitat, screening of off-river ponds and reservoirs to prevent escapement while allowing sport fishing opportunities, development of sterile sportfishing alternatives, and identifying and eliminating sources of nonnative fish. Coordination and consultation with state and tribal partners occur on all nonnative fish management actions. Regulatory strategies include fishing contests to increase angler harvest, removal of take limits and must kill orders for problematic species, and nonnative fish stocking prohibitions when introductions would interfere with recovery of listed species.

4. Propagating, Stocking, and Maintaining Genetic Integrity of Fish

Hatchery operations support stocking plans to increase population sizes and re-establish self-sustaining populations in several major tributaries of the upper Colorado River basin. Broodstocks and propagation are managed to maintain the genetic diversity of stocked fish and increase the likelihood of survival in the wild. Six hatchery facilities in Colorado, Utah, and New Mexico produce bonytail, razorback sucker, and Colorado pikeminnow necessary to meet the recovery programs' annual and long-range stocking targets. Razorback sucker and bonytail are stocked in the upper Colorado River and Green River sub-basins. Colorado pikeminnow and razorback sucker are stocked in the San Juan River sub-basin.

5. Research and Monitoring

Research and monitoring by the recovery programs provide a scientific basis for implementing and adaptively revising recovery actions and ensuring efficient use of the recovery programs'

resources. Research and monitoring provide information on the abundance, reproduction, growth, and survival of listed fishes in the wild, and on the efficacy of the recovery programs' management actions. Additionally, research fills gaps in life-history information, habitat use, and improves field sampling techniques. Research and monitoring provide the basis for the recovery programs' adaptive management to evaluate and prioritize recovery actions. In 2016, the recovery programs launched a centralized, web-based database that currently houses more than 2.9 million records tracking more than 1.3 million fish collections over 40 years.

6. Public Involvement and Education

Public support is crucial to the long-term success of the programs' recovery efforts. Actions to increase public awareness and foster public support for the listed fishes are implemented through a strategic and multi-faceted communication program. This includes participation in relevant community events, water user meetings, and river-related conferences. The recovery programs distribute a wide range of printed educational materials, including [newsletters](#), [brochures](#), and [briefing documents](#). The recovery programs have also developed a joint comprehensive website for the public www.coloradoriverrecovery.org. Print and broadcast news media are also key avenues for disseminating information to the general public, and the recovery programs regularly seek news media coverage for a variety of their activities.

7. Capital Improvements

While implementing the actions described above, the recovery programs have made major capital investments in a host of water-related infrastructure projects that provide substantial longterm benefits to listed fishes, while also frequently benefiting local water users. Major capital investments including federal appropriations, state contributions and CRSP hydropower revenues, and in-kind projects (denoted by †) made by the recovery programs since their inception include:

Irrigation System Efficiency Improvements

- Grand Valley Water Users Association (Mesa County, CO)
- Orchard Mesa Irrigation District Canal Modernization (Mesa County, CO)
- Orchard Mesa Irrigation District Powerplant Improvements (Mesa County, CO)

Reservoir Enlargement for Conservation Benefits

- Elkhead Reservoir (Moffat County, Colorado)

Fish Ladders and Passages around River Barriers

- Tusher Wash Diversion Dam, Green River (Emery County, UT)
- Myton Diversion, Duchesne River (Uintah County, UT)†
- Grand Valley Project Roller Dam, Colorado River (Mesa County, CO)
- Price-Stubbs Diversion Dam, Colorado River (Mesa County, CO)
- Grand Valley Irrigation Company Diversion, Colorado River (Mesa County, CO)
- Redlands Water and Power Diversion Dam, Gunnison River (Mesa County, CO)
- Hogback Diversion Dam, San Juan River (San Juan County, NM)
- Cudei Diversion replacement, San Juan River (San Juan County, NM)
- PNM Diversion Dam, San Juan River (San Juan County, NM)
- Facilitated passage at Piute Farms Waterfall, San Juan River (San Juan County, UT)
- Ranchmans-Terrell Ditch Improvement, Animas River (San Juan County, NM)

- Planning and design for Arizona Public Service, San Juan River (San Juan County, NM)

Fish Screens and Weir Walls at Diversions to Prevent Entrainment of Listed Species

- Green River Canal, Green River (Emery County, UT)
- Grand Valley Project Roller Dam, Colorado River (Mesa County, CO)
- Grand Valley Irrigation Company Diversion, Colorado River (Mesa County, CO)
- Redlands Water and Power Diversion Dam, Gunnison River (Mesa County, CO)
- Hogback Diversion Dam, San Juan River (San Juan County, NM)
- Planning and design for Fruitland Irrigation Project, San Juan River (San Juan County, NM)

Fish Screens at Reservoir Outlets to Reduce/Eliminate Non-native Fish Escapement and to Provide Sport Fishing Venues

- Red Fleet Reservoir (Uintah County, UT)
- Starvation Reservoir (Uintah County, UT)
- Elkhead Reservoir (Moffat County, CO)
- Rifle Gap Reservoir (Garfield County, CO)†
- Highline Lake (Mesa County, CO)
- Ridgway Reservoir (Montrose County, CO)
- Lake Nighthorse (La Plata County, CO)
- Morgan Lake (San Juan County, NM)†

Habitat Improvements

- Managed floodplain wetland at Stewart Lake (Uintah County, UT)
- Managed floodplain wetland at Stirrup Lake (Uintah County, UT)
- Managed floodplain wetland at Johnson Bottom (Uintah County, UT)
- Managed floodplain wetland at Old Charley Wash (Uintah County, UT)
- Managed floodplain wetland at Sheppard Bottom (Uintah County, UT)†
- Managed floodplain wetland at the Hot Spot Complex (Mesa County, CO)
- Managed floodplain wetland at Walter Walker State Wildlife Refuge (Mesa County, CO)
- Managed floodplain wetland at Adobe Creek (Mesa County, CO)
- Managed floodplain wetland at Butch Craig Pond (Mesa County, CO)
- Managed floodplain wetland at Matheson Wetland (Grand County, UT)†
- Restoration of channel complexity and improving habitat conditions for native fish in the San Juan River at six sites between river miles 132.2-127.2 (San Juan County, NM)†
- San Juan River habitat restoration between river miles 136.5-134.5 (San Juan County, NM) †
- Constructed floodplain wetland refugium at river mile 107 (San Juan County, UT)
- Shiprock mitigation channel at river mile 147.6 (San Juan County, NM)†

Fish Hatchery Development and Improvements

- Ouray National Fish Hatchery ponds (Grand Valley Unit in Mesa County, CO, and Randlett Unit in Uintah County, UT)
- Wahweap State Fish Hatchery ponds (Garfield County, UT)
- Colorado Native Aquatic Species Restoration Facility (Alamosa County, CO)†
- Southwestern Native Aquatic Resources and Recovery Center (Chaves County, NM)

- Navajo Agricultural Products Industry razorback sucker rearing ponds (San Juan County, NM)

V. Listing Status of Colorado River Fish Species

When the recovery programs were initiated in 1988 and 1992, the trajectory of all four listed species was toward extinction. The implementation of the previously detailed recovery actions not only prevented their extinction, but substantially improved the prospect for recovering the listed fishes. **Table 3** summarizes the 2022 status of the four listed species targeted by the recovery programs and their projected status post-2023. The table is followed by additional information about the status each of the species and the outlook for recovery.

Table 3 – Current and projected listing status of the four listed species within the recovery programs.

Species	Current Status	Projected Status Post-2023
Humpback chub (<i>Gila cypha</i>)	Threatened ⁴ . In 2021, USFWS reclassified humpback chub from endangered to threatened. ⁵	The humpback chub will remain in threatened status through 2023. USFWS will review the status of humpback chub again in 2026 and assess future viability of the species and on-going conservation actions.
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	Endangered ⁶ .	Colorado pikeminnow will remain endangered through 2023. The species status will be reviewed by USFWS in 2025.
Bonytail (<i>Gila elegans</i>)	Endangered.	Bonytail will remain endangered through 2023. The species status will be reviewed by USFWS in 2024.
Razorback sucker (<i>Xyrauchen texanus</i>)	Endangered.	The razorback sucker was proposed to be reclassified to threatened status in July 2021. ⁷ A final decision is expected before the end of 2023. The USFWS will review the species status again in 2027.

⁴ The term “threatened species” means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

⁵ Fish and Wildlife Service; Endangered and Threatened Wildlife and Plants; Reclassification of the Humpback Chub from Endangered to Threatened with a Section 4(d) Rule, 86 Fed. Reg. § 57588 (final rule October 18, 2021)

⁶ The term “endangered species” means any species which is in danger of extinction throughout all or a significant portion of its range.

⁷ Fish and Wildlife Service; Endangered and Threatened Wildlife and Plants; Reclassification of the Razorback Sucker from Endangered to Threatened with a Section 4(d) Rule, 86 Fed. Reg. § 35708 (proposed rule July 7, 2021)

Humpback chub – Threatened



Fish drawings © Joseph Tomelleri

Humpback chub was listed as endangered in the original 1967 Endangered Species List primarily due to construction of mainstem dams in canyon areas and accompanying alterations to habitat and flow regimes that occurred throughout the Colorado River basin. The species prefers deep, swift, canyon habitat, and its pronounced muscular hump behind its head stabilize it in high flows. Humpback chub are members of the minnow family that grow to approximately 20 inches and live for more than 30 years.

Humpback chub currently reside in five stable populations: four in the upper Colorado River basin in Colorado and Utah, and one large complex in the lower basin in the Grand Canyon. The populations exhibit resiliency by naturally completing all life stages in stable populations, cover a broad geographic extent with redundant populations, and are genetically diverse. For these reasons, in October 2021, USFWS reclassified humpback chub from endangered to threatened.

Colorado pikeminnow – Endangered



Colorado pikeminnow was listed as endangered in the original 1967 Endangered Species List. Colorado pikeminnow were historically the apex predator of the Colorado River basin and are the largest members of the minnow family in North America, growing to as much as five feet or more in length. The species is highly migratory and was distributed across the entire Colorado River basin.

Colorado pikeminnow are currently limited to a small portion of their historic range in the upper Colorado River basin due to dam construction and changed flow conditions. The two remaining naturally recruiting populations in the Green and Colorado river subbasins have been declining for approximately two decades, primarily because of poor survival of young life stages. A third population in the San Juan River, maintained with stocking, is successfully spawning and more

recently, is recruiting to later life stages. Young-of-year Colorado pikeminnow are currently being collected by the recovery programs for broodstock to enhance the genetic integrity of the captive population and support potential future stocking efforts in the Green and Colorado rivers.

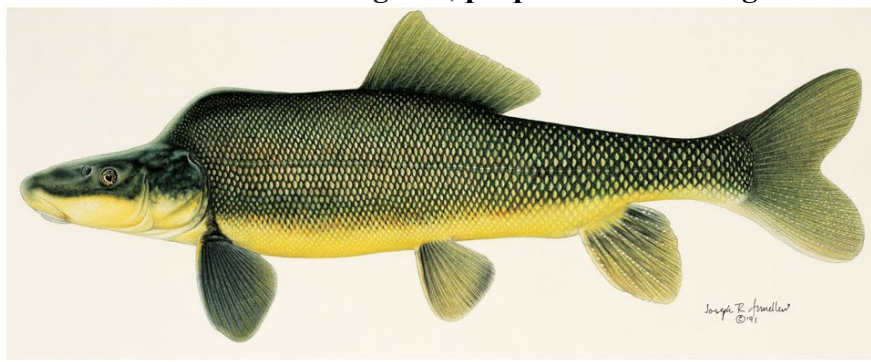
Bonytail – Endangered



Bonytail was listed as endangered in 1980 under the ESA. The bonytail is a streamlined fish with a small head, slender body, and pencil-thin tail connection point. Bonytail is the rarest fish species in the Colorado River Basin. Historically, the species were commonly confused with both humpback chub and roundtail chub (*Gila robusta*).

The last large concentration of wild bonytail was observed in 1954 in Lake Mohave in the lower Colorado River basin. Thirty-four were collected in Lake Mohave between 1976 and 1988, 11 of which were used as the original broodstock for the species. The last wild bonytail captured in the upper Colorado River basin was in the Black Rocks area of Colorado River in western Colorado in 1984. Stocking is occurring across the species range, but less than 1% of all stocked bonytail have been re-captured in the wild.

Razorback sucker – Endangered, proposed downlisting to threatened



Razorback sucker was listed as endangered in 1991 under the ESA. Razorback suckers are found throughout the Colorado River basin in a variety of habitats but are most common in low velocity river habitats such as backwaters, floodplains, flatwater river reaches, and in reservoirs. These low-velocity environments are essential for successful grow out of young. Unlike the other three species, populations of razorback sucker dramatically increased in the lower Colorado River basin downstream of Lake Powell after large reservoirs were constructed, and

only subsequently decreased when nonnative fish populations were introduced. In the upper Colorado River basin, populations decreased dramatically after 1974, prompting the collection of the last remaining wild razorback sucker to create an upper Colorado River basin broodstock in the late 1980's and early 1990's.

Stocking of razorback sucker occurs across the upper Colorado River basin. Survival of stocked razorback sucker is high, with sufficient adults to meet the numeric recovery goals in the Green and Colorado river subbasins. Adults migrate long distances, expand into new areas, and reliably spawn in multiple locations. Recruitment remains rare, but juvenile presence has been increasing in recent years. Wild adult razorback suckers were documented in the Green River in 2020, a first since the species was extirpated from the upper Colorado River basin in the 1990s. This indicates that the recovery programs' actions can re-establish conditions capable of supporting the entire life cycle of a species that was previously close to extinction in the upper Colorado River basin.

VI. Program Expenditures and Funding Sources through Fiscal Year 2024

Recovery activities are implemented through a combination of annual funding and capital project expenditures. Annual funding supports recurring expenses for staff time, facility operations and maintenance, field activities, monitoring and data collection, data analysis and management, public outreach, committee meetings, and general administrative support. Capital funding supports major infrastructure improvements implemented at reservoirs, canals, diversion dams, and floodplains across the basin to enhance fish habitat, provide fish passage, and reduce threats to the listed species associated with nonnative fish and water diversions. Annual funding for the Upper Colorado Program and San Juan Program is approximately \$8,000,000 and \$3,460,000, respectively in fiscal year 2022. The recovery programs collectively spend on average, \$5,000,000 annually on capital projects. Both annual funding and capital funding levels have increased with inflation since the beginning of the recovery programs. The remainder of the funds presented below has been provided as in-kind donations where monetization was possible.

Figure 3 depicts cumulative total partner contributions to the recovery programs from their inception through fiscal year 2022, including appropriated funds, CRSP power revenues, and contributions by the states, power customers, tribes, water users, environmental organizations, and other sources. Values include cash, in-kind donations where monetization is difficult, and credits for costs incurred because of the programs. Tribal contributions are greatly undervalued in these figures because it is difficult to monetize access, permission, and usage of both land and water in the San Juan River basin. Essential in-kind contributions are described in Appendix A. **Figure 4** depicts how these cumulative contributed funds were expended by each recovery element of the recovery programs from their inception to fiscal year 2022. As mentioned earlier, prioritization of recovery elements is based on both site-specific and species needs in each basin where the listed species and habitats are managed.

TOTAL PARTNER CONTRIBUTIONS FY1988 - 2022
\$ 564,352,000

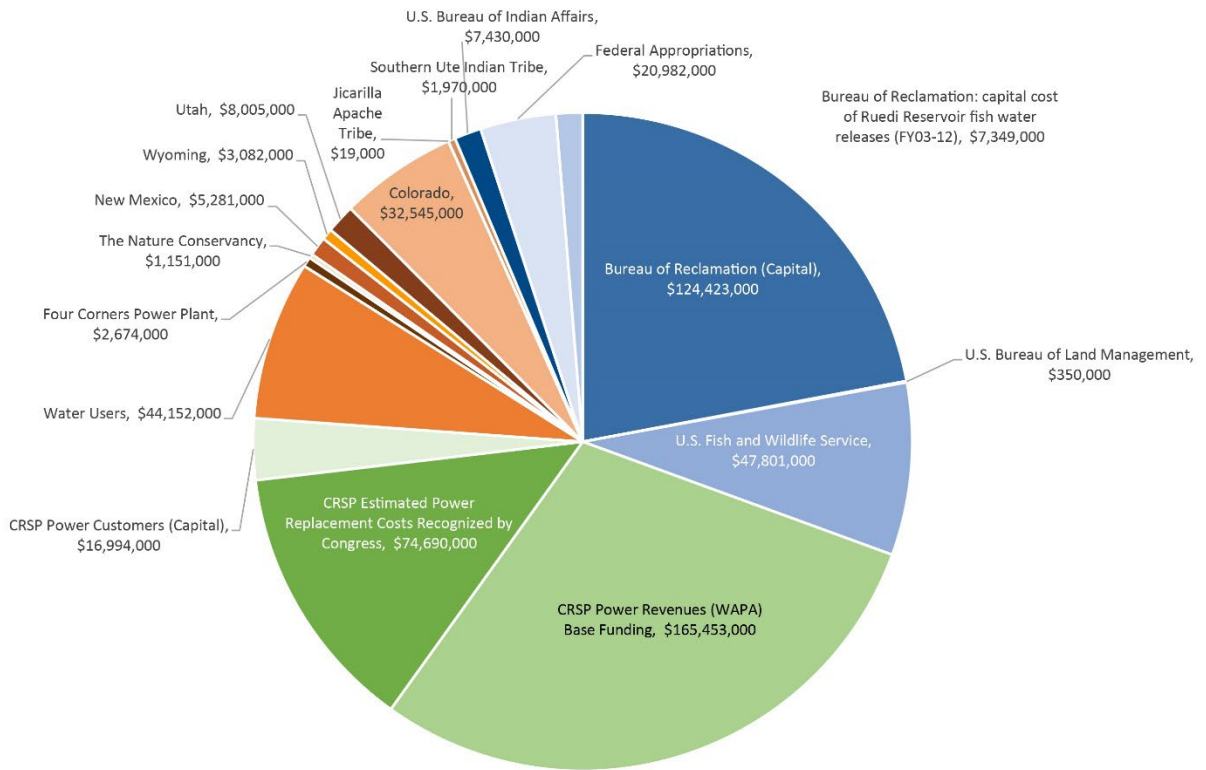


Figure 3. Cumulative total partner contributions to recovery programs from 1988 through 2022.

HISTORICAL SPENDING BY PROGRAM ELEMENT - 1988 - 2022

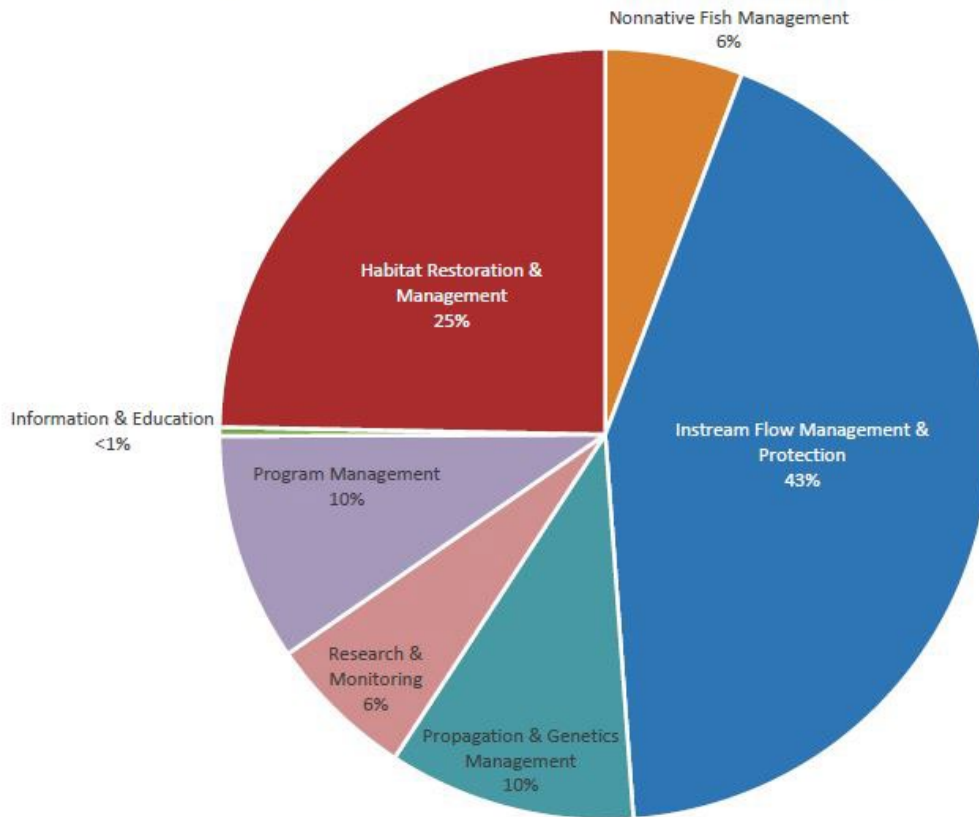


Figure 4. Historical spending by program elements for the recovery programs from 1988 through 2022.

Figure 5 depicts estimated total partner contributions for the recovery programs in fiscal years 2023-2024, including appropriated funds, power revenues, and contributions by the states, power customers, tribes, water users, environmental organizations, federal agencies, and other sources. Values include both cash and in-kind donations where monetization of the in-kind contributions is possible. **Figure 6** depicts how these estimated partner contributions are anticipated to be expended by program element in fiscal years 2023-2024.

TOTAL ESTIMATED PARTNER CONTRIBUTIONS 2023-2024
\$ 42,454,000

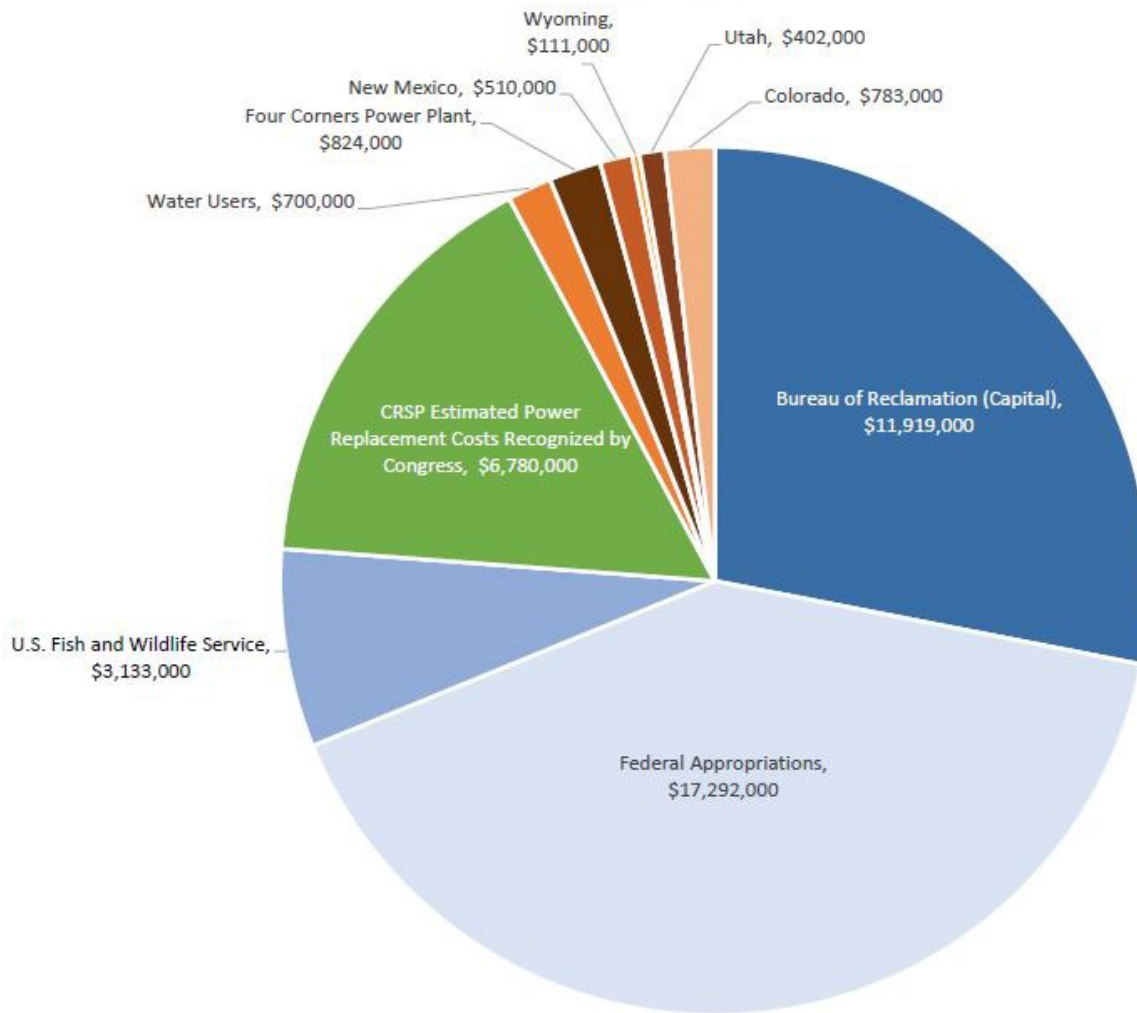


Figure 5. Total estimated contributions for the recovery programs in fiscal years 2023-2024 based on current information. All in-kind contributions are difficult to quantify in advance.

EXPECTED SPENDING BY PROGRAM ELEMENT - 2023-2024

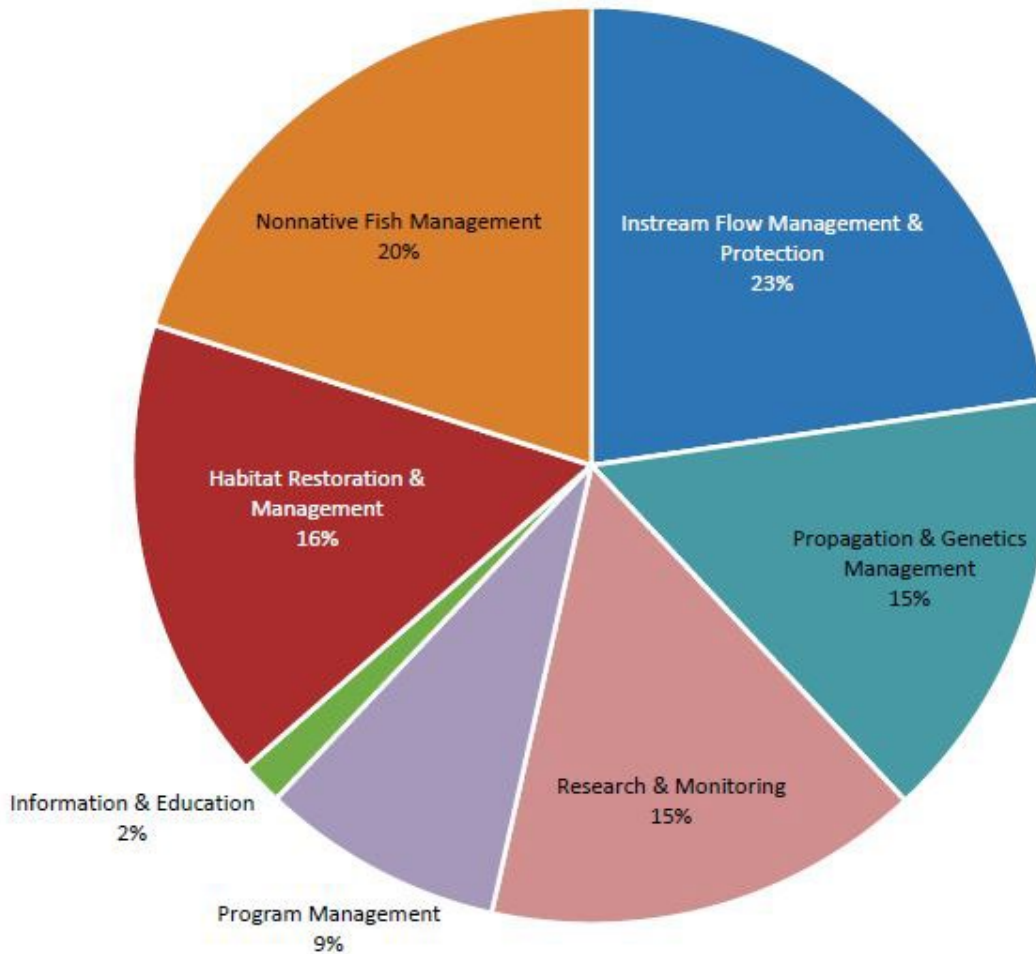


Figure 6. Expected spending by program elements for the recovery programs in fiscal years 2023-2024.

A. Annual Funding and Expenditures

Since the inception of the Upper Colorado Program in 1988 and the San Juan Program in 1992, the recovery programs were funded from a variety of sources pursuant to initial agreements among the recovery programs' partners. Sources included cash and in-kind contributions by states and water users and power customers and federal appropriations. In the mid-1990s, the partners entered discussions to develop formal cost sharing arrangements. These arrangements were codified in Public Law 106-392, the recovery programs' federal authorizing legislation passed in 2000. The legislation identified federal and nonfederal capital and annual funding and cost sharing arrangements for each of the programs. These cost sharing arrangements were unique to each program and reflected prior agreements among their partners.

Since 2001, power revenues generated from sales of hydropower from operations of the CRSP have provided the largest component of annual funding for the recovery programs. Annual funding was authorized for facility operation and maintenance expenses, listed fishes populations and habitat monitoring, propagation, research, critically important nonnative fish management, public involvement, and program administration.

Subsequent to passage of P.L. 106-392, \$131,328,144 in CRSP power revenue base funds have been expended or obligated by the Upper Colorado Program, and \$50,387,142 by the San Juan Recovery Program. Legislation passed by Congress [John D. Dingell, Jr. Conservation, Management, and Recreation Act, P.L. 116-9, Section 8101] amended P.L. 106-392 to authorize up to \$10 million in non-reimbursable Bureau of Reclamation appropriated funds through fiscal year 2023. In recent years, Western Area Power Administration (WAPA) and the Bureau of Reclamation have worked together to provide funding through a combination of CRSP power revenues and federal appropriations for most of the annual funding. Other important cost-share and in-kind partners contributions include the USFWS through annual appropriations; the states of Colorado, Utah, Wyoming, and New Mexico; the U.S. Bureau of Indian Affairs; the Southern Ute Indian Tribe and Jicarilla Apache Nation; and water users through Section 7 consultation fees on larger projects.

B. Capital Funding and Expenditures

Planning, design, and construction of capital projects were funded through federal appropriations from Bureau Reclamation and contributions provided by the four states, power customers, and other entities. Between 1998 and 2022, the Bureau of Reclamation provided \$124,423,000 in capital construction funding. The four states provided \$17,000,000 that was divided in proportion to their compact water allotments in the upper Colorado River basin. Power customers (through WAPA) provided an additional \$17,000,000 in capital project funding.

C. In-Kind Contributions

In-kind contributions by non-federal parties are defined for the purpose of this report as voluntary actions, paid for by recovery program partners that are not required by program documents (refer to Appendix A). These voluntary contributions are essential to achieving the goals of preserving gains made toward recovery of the listed species. Without these voluntary contributions, the recovery programs could not make progress towards recovery and, therefore, could not provide ESA compliance for some 2,500 water projects, including every Bureau of Reclamation project upstream of Lake Powell.

These actions include delivery of more than 2 million acre-feet of water into critical habitat over the past 34 years, protection and coordination of instream flows, infrastructure improvements to reduce water needs, operation of water efficiency projects to provide water for listed fishes, modeling and monitoring to support adaptive management, nonnative fish management, development of sterile sportfishing alternatives, habitat management, implementation of regulation and policy, and public outreach. Many of these actions are difficult to quantify monetarily over the life of the recovery programs.

Many of these actions have been ongoing since the inception of the recovery programs and several will need to be continued after the recovery programs achieve the goal of recovery of the four fish species. These activities will be necessary and will continue following delisting to ensure that the species are conserved and do not need the protection of the ESA in the future.

VII. Post-2023 Management Actions to Recover and Protect Species

Over the past 30 years, the recovery programs have implemented actions to reduce threats to the listed species. The recovery programs have built passage structures and screens on diversions to restore access to historic habitat, created and managed floodplain wetlands to support young life stages, developed and implemented flow recommendations to support fish life-cycles, targeted nonnative predators for removal, and installed screens on reservoirs to prevent escapement of problematic nonnative fish species while providing sport fishing opportunities for anglers. The recovery programs have made great progress in supporting the species, as illustrated by the 2021 downlisting of humpback chub and proposed downlisting of razorback sucker. Continued management actions are needed to sustain the progress towards recovery for these two species and to support both Colorado pikeminnow and bonytail recovery efforts across the upper Colorado River basin. Continuation of these management actions also helps keep other at-risk species from becoming federally listed.

The subsequent sections outline the annual and capital cost estimates for management actions that need to be conducted over the next 15 years and post-recovery management actions to keep species from being relisted. The actions are presented in fiscal year 2024 dollars and are assumed to increase with inflation annually.

A. Recovery actions for 15 years post-2023.

In 2019, the recovery programs began determining what the future should look like for the recovery programs, both in cost and scope. Subject-matter experts were convened from across the basin and asked to identify actions they thought were needed over the next 15 years to make additional progress towards recovery. Each identified action was categorized based on subject matter experts' confidence that the action would support increased progress towards recovery. The information was then provided to management experts for both recovery programs, who each selected the optimal level of activity for each action. Those results were compiled and formed the basis for the projected estimates presented in **Table 4**.

The projected estimates for annual cost were derived from previously developed annual work plans and capital costs were estimated from surrogate project examples from the Bureau of Reclamation. Estimated post-2023 annual funding for the Upper Colorado Program and San Juan Program is approximately \$9,700,000 and \$4,200,000, respectively starting in fiscal year 2024. Estimated total capital cost post-2023 for the Upper Colorado Program and San Juan Program is approximately \$65,700,000 and \$57,600,000, respectively, for the next 15 years. Annual funding estimates represent an increase in recovery program cost of approximately 15-18%.

Table 4 – Estimated annual cost and total capital expenditures starting in 2024 by management activity for the Recovery Programs to continue progress toward recovery of the listed species.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 dollars)
Identifying and Protecting Instream Flows		
Upper Colorado Program	\$1,255,000	\$500,000
San Juan Program	\$383,500	\$15,500,000
Restoring and Protecting Habitat		
Upper Colorado Program	\$792,000	\$35,000,000
San Juan Program	\$838,000	\$41,545,000
Managing Nonnative Fish		
Upper Colorado Program	\$2,357,000	\$8,500,000
San Juan Program	\$94,000	--
Propagating, Stocking, and Maintaining Genetic Integrity of Fish		
Upper Colorado Program	\$2,106,000	\$18,000,000
San Juan Program	\$379,000	--
Research and Monitoring		
Upper Colorado Program	\$2,004,000	\$3,000,000
San Juan Program	\$1,523,500	\$525,000
Public Involvement and Education		
Upper Colorado Program	\$216,000	--
San Juan Program	\$48,000	--
Program Management		
Upper Colorado Program	\$970,000	--
San Juan Program	\$943,000	--

1. Identifying and Protecting Instream Flows

The recovery programs will continue to coordinate flow management with water partners to benefit listed fishes in the Green, Yampa, Duchesne, Gunnison, San Juan, and Colorado rivers. Flow coordination activities are expected to expand as new opportunities emerge to work with partners in the White, San Rafael, and Price rivers. The San Juan Program will coordinate with water partners to determine irrigation efficiency improvements (piping, gaging, automating, etc.) and water acquisition opportunities. **Table 5** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for identifying and protecting instream flows. The recovery programs will continue to evaluate flow recommendations through the adaptive-management process. Information collected for adaptive management includes data on stream flows, sediment transport, and the effects of variable flows on backwater and flooded bottomland habitats in high-priority areas.

Table 5 – Estimated annual cost and total capital expenditures starting in 2024 for identifying and protecting instream flows for the recovery programs.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 Dollars)
Instream flow studies and flow recommendations		
Upper Colorado Program	\$230,000	--
San Juan Program	\$45,000	--
Coordinated water acquisition and delivery		
Upper Colorado Program	\$688,000	--
San Juan Program	--	--
Water operation efficiency improvements		
Upper Colorado Program	--	\$500,000
San Juan Program	\$85,000	\$15,300,000
Flow, sediment, temperature, and river channel monitoring		
Upper Colorado Program	\$337,000	--
San Juan Program	\$253,500	\$200,000

2. Restoring and Protecting Habitat

Habitat restoration and maintenance for both recovery programs includes continued operation and management of flooded bottomlands for fish habitat by the Upper Colorado Program; development of additional managed wetland sites along the Green and Colorado rivers; development of additional low-velocity nursery and rearing habitats in the San Juan River; establishment of new and upgraded fish screening facilities at major irrigation diversions; and continued operation and maintenance of the fish passages improvements and fish screens that have been established since inception of these programs. **Table 6** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for restoring and protecting habitat.

Table 6 – Estimated annual cost and total capital expenditures starting in 2024 for restoring and protecting habitat.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 Dollars)
Flooded Bottomlands and Other Habitat Improvements		
Upper Colorado Program	\$365,000	\$15,000,000
San Juan Program	\$190,000	\$6,090,000
Fish Passages Improvements		
Upper Colorado Program	\$181,000	\$10,000,000
San Juan Program	\$343,000	\$20,480,000
Fish Screens		
Upper Colorado Program	\$246,000	\$10,000,000
San Juan Program	\$305,000	\$15,375,000

3. Managing Nonnative Fish

The recovery programs will continue widespread mechanical removal of predatory nonnative fish species, specifically northern pike, smallmouth bass, and walleye, with a particular focus on disrupting nonnative spawning to reduce adult densities and prevent reproduction. More efficient landscape-scale methods to reduce nonnative fish spawning will continue to be tested through modified water operations, and more widely implemented where proven effective. New tools will be investigated to control nonnative fish, such as genetic modifications, sport-reward fisheries, and novel piscicides. The recovery programs will also continue to prevent nonnative fish from escaping from upstream reservoirs into downstream endangered fish habitats by using screens and nets at dam outlets and reducing reservoir populations through various methods.

Table 7 summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for managing nonnative fish.

Table 7 – Estimated annual cost and total capital expenditures starting in 2024 for managing nonnative fish.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 Dollars)
In-River Nonnative Fish Removal		
Upper Colorado Program	\$2,194,000	--
San Juan Program	\$90,000	--
Preventing Fish Escapement		
Upper Colorado Program	\$163,000	\$8,500,000
San Juan Program	\$4,000	--

4. Propagating, Stocking, and Maintaining Genetic Integrity of Fish

The recovery programs will continue stocking efforts to maintain, augment or restore populations of bonytail, razorback sucker, and Colorado pikeminnow to meet goals set forth in the recovery plans. The Upper Colorado Program will expand its stocking efforts to include Colorado pikeminnow and humpback chub to further augment or restore these populations. The recovery programs should continue maintaining and operating hatcheries for as long as those facilities are needed to assist in recovery. Maintenance of broodstock and refuge populations will continue, including maintaining bonytail and razorback sucker broodstock and enhancing the Colorado pikeminnow broodstock with wild individuals collected from the Colorado and Green rivers. Propagation of listed fishes will be managed to maximize their genetic diversity and increase the likelihood that stocked fish can survive in the wild. **Table 8** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for propagating, stocking, and maintaining genetic integrity of fish.

Table 8 – Estimated annual cost and total capital expenditures starting in 2024 for propagating, stocking, and maintaining genetic integrity of fish.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 Dollars)
Supporting Propagation Facilities		
Upper Colorado Program	--	\$18,000,000
San Juan Program	--	--
Maintaining, Augmenting, Restoring Species Populations		
Upper Colorado Program	\$1,872,000	--
San Juan Program	\$379,000	--
Maintaining Genetic Diversity		
Upper Colorado Program	\$234,000	--
San Juan Program	--	--

5. Research and Monitoring

The recovery programs will continue to collect, manage, and assess long-term datasets on habitat conditions and listed fishes encounters, and continue supporting the management of all field monitoring data in a centralized, web-based database (STReAMS). Constructing, installing, and maintaining passive integrated antennas (PIAs) technology is vital to increase the amount of data collected remotely for listed fishes with passive integrated transponder (PIT) tags. Analyses will be conducted to improve the recovery programs’ understanding of fish behavior, movement, and improve the estimation of demographic parameters and vital species metrics like rates of growth, recruitment, and mortality. The recovery programs will continue evaluating and adapting their management actions with lessons learned through species monitoring, including monitoring of both listed fishes and other native and nonnative species. Monitoring information is particularly valuable in designing and assessing effective water control structures for floodplain wetland management; better controlling nonnative fish populations; and improving hatchery techniques

for raising listed fishes. **Table 9** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for research and monitoring.

Table 9 – Estimated annual cost and total capital expenditures starting in 2024 for research and monitoring.

Management Activity	Estimated Average Annual Cost (2024 Dollars)	Estimated Total Capital Expenditures (2024 Dollars)
Data Management and Analysis		
Upper Colorado Program	\$601,000	--
San Juan Program	\$634,500	--
Support for Adaptive Management		
Upper Colorado Program	\$1,403,000	\$3,000,000
San Juan Program	\$889,000	\$525,000

6. Public Involvement and Education

The recovery programs will continue reaching out to local communities, river enthusiasts, and resource management decisionmakers, providing information about the recovery programs and their role in recovery and providing ESA compliance for water development. Maintaining a strong presence at community events and water user conferences, continuing outreach to children and students, including support for K-12 programs developed or supported by partners. The recovery programs will continue to disseminate press releases and coordinate communications between the recovery programs and the media. Educational giveaway items will continue to be distributed at partner fishing tournaments where problematic nonnative species are being removed by anglers. The recovery programs will continue to publish annual updates on program activities and achievements for distribution at public events and for posting on-line. **Table 10** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for public involvement and education.

Table 10 – Estimated annual cost starting in 2024 for public involvement and education.

Management Activity	Estimated Average Annual Cost (2024 Dollars)
Outreach to Local Communities, Students, News Media and Decisionmakers	
Upper Colorado Program	\$137,000
San Juan Program	\$24,500
Publications, Media, and Other Educational Materials	
Upper Colorado Program	\$80,000
San Juan Program	\$24,000

7. Program Management

Program management will continue to direct both day-to-day activities and longer-term recovery action development and implementation. This element includes funding for the recovery program directors and their staffs of qualified fishery and administrative professionals, who will continue to provide knowledgeable budgetary oversight for recovery program actions carried out by program partners and contractors. Recovery program staff will continue to assist in managing projects, reviewing results and data, implementing, and refining recovery activities, and supporting recovery program partners and researchers in their ongoing contributions to recovery efforts. Recovery program staff will continue to coordinate meetings with their technical and management committees; and conduct independent annual assessments of recovery program activities to determine whether actions are satisfactorily meeting expectations for achieving recovery goals, recommending modifications as needed. **Table 11** summarizes the estimated annual cost and estimated total capital expenditures starting in 2024 for program management. The Bureau of Reclamation manages distribution and expenditures of all annual base and capital funds expended to the recovery programs.

Table 11 – Estimated annual cost starting in 2024 for program management.

Activities	Estimated Average Annual Cost (2024 Dollars)
Program Management	
Upper Colorado Program	\$970,000
San Juan Program	\$943,000

B. Post-Recovery Management Actions

The USFWS recognizes that storage, diversion, delivery and use of water to meet a wide range of needs and purposes will remain an ongoing aspect of water management in the upper Colorado River basin and the basin is facing new challenges associated with drought, population growth, and a warming climate. After 30 years of developing management actions to support these species, program partners believe that actions will need to continue to occur even after the species are recovered to maintain viable populations. The recovery programs anticipate that actions may be re-prioritized as populations show increasing resilience on the landscape or experience other population-level changes. Among the long-term conservation needs will be a sustained commitment to continue many of the same threat-management activities that the programs conduct today, but perhaps at a reduced level of effort.

The recovery programs recognize that once the species are delisted, a post-delisting monitoring plan will need to be developed. The post-delisting monitoring is a requirement of the ESA, as amended (ESA; 16 U.S.C. 1531 et seq.). Section 4(g)(1) requires the USFWS to: “implement a system in cooperation with the States to monitor effectively, for not less than five years, the status of all species which have recovered to the point at which the measures provided pursuant to this ESA are no longer necessary.” The purpose of this post-delisting monitoring is to verify that any delisted species remains secure from the risk of extinction after it has been removed from the protections of the ESA.

The recovery programs recognize that there is a need for continued partnership and long-term commitment in addressing threats to these listed species, whereby both federal and non-federal partners could have regulatory mechanisms or other conservation plans or programs in place to reduce and ameliorate threats associated with habitat loss and degradation in all populations, such that these species can remain secure from the risk of extinction.

VIII. Conclusions and Recommendations

The Upper Colorado Program and the San Juan Program have demonstrated progress towards recovery of the four listed Colorado River fishes, while providing certainty for water users across the upper Colorado River basin. The recovery programs are an effective mechanism to implement on-the-ground conservation efforts, but progress towards recovery is increasingly hampered by challenges like new nonnative fish establishment and by stressors like drought in the basin. Long term actions will be necessary to support the species into the future, even post-delisting.

The recovery programs are successful because of the dedication and cooperation of all partners contributing time, expertise, monetary and natural resources. Some of these are mandated by legislation, ESA compliance, cooperative agreements, and other foundational documents, but many others are provided in-kind from willing and dedicated program partners. Without these resources the recovery programs would not be successful.

Continuation of the recovery programs for an additional 15 years at the funding levels proposed in this document would support recovery actions necessary to achieve species recovery. The cost estimates are based on what the partners thought was needed to achieve and support recovery in the basin. Program partners are developing cost-sharing agreements that reflect these new estimates.

IX. Appendix A

Non-federal Partners Historical In-Kind Contributions to the Recovery Programs

In-kind funding is defined as funds or activities that are not included in annual work plans of the recovery programs that provide substantial and essential services that make the programs effective in accomplishing conservation actions. In many cases, water, wetlands, and other essential resources are donated or leased that substantially expands the scope of recovery actions funded by the recovery programs. The recovery programs cannot achieve the goal of recovery of the listed species without these in-kind contributions. The following information describes the contributions provided by the states and water users for the recovery program that directly benefit the Recovery Program. The states of Colorado, Utah and Wyoming and water users provide specific examples of their in-kind contributions, whereas New Mexico and tribes within the San Juan Program are more broadly described.

For many of the following management actions, the states and water users are not reimbursed and actions are considered annual in-kind cash-equivalent partner contributions. Not all in-kind management actions are tracked formally by the recovery program as these types of contributions are difficult to value monetarily. However, in-kind management actions are considered invaluable for the recovery of the endangered fish. These activities are identified in the Recovery Program's Recovery Action Plan (RIPRAP) or Long Range Plan (LRP) as conservation measures in annual sufficient progress reports by the USFWS; recovery would not be likely without the following non-federal contributions.

The following list of management actions is not all-inclusive and is intended to provide a good representation of ongoing and annual activities provided by the states and water users. The list includes recovery actions to fulfill the goals of the recovery program. It does not include management actions that indirectly benefit the endangered species (e.g. opportunistic non-native fish removal by biologists in the field; funding for projects that provide ancillary benefits to endangered species recovery). Also, the following list does not include all activities provided and funded by the States and Water Users partners since 1988, as that list would be too extensive.

UPPER COLORADO PROGRAM

IDENTIFY AND PROTECT INSTREAM FLOWS

Colorado

- Delivery of water to endangered fish habitat
 - Since 1997, more than 2 million acre feet of water have been provided by water users from Green Mountain, Ruedi, Wolford Mountain, Williams Fork, Granby, Windy Gap, Dillon, Homestake, Upper Blue, and Willow Creek reservoirs and the Palisade Pipeline. These flows have enhanced spring and summer flows to improve habitat for the endangered fish in the 15-Mile Reach. Spring flow augmentation involves coordinated, voluntary retiming of excess reservoir inflow to enhance peak flows in the 15-Mile Reach. Summer flow augmentation entails reservoir releases as described below.
 - Green Mountain Reservoir

- In 1996, an agreement between multiple parties, including water users in the Grand Valley and the U.S. Bureau of Reclamation, made available up to 66,000 acre feet of water annually from the Green Mountain Reservoir “Historic Users Pool” (HUP) to augment flows in the 15-Mile Reach. On average, since 1996, more than 33,000 acre feet per year of HUP surplus water have been released to benefit the endangered fish.
- Ruedi Reservoir
 - A total of 5,412.5 acre feet of water is available annually from Ruedi Reservoir to augment flows in the 15-Mile Reach to benefit the endangered fish. The Colorado Water Conservation Board and Colorado water users also provided funds to conduct the “Alternative Studies” and to conduct environmental compliance, which amounted to more than \$1.3 million.
 - The Colorado Water Conservation Board has provided funding for temporary water leases from Ruedi Reservoir to benefit the endangered species. For example, 6,000-12,000 acre feet of water is currently leased from the Ute Water Conservancy District and 350 acre feet from Garfield County on an annual basis for delivery to the 15-Mile Reach.
- Granby Reservoir
 - A total of 5,412.5 acre feet of water is available annually from Granby Reservoir to augment flows in the 15-Mile Reach to benefit the endangered fish.
- Elkhead Reservoir
 - The Colorado River Water Conservation District operates and maintains Elkhead Reservoir to make releases to augment flows in the Yampa River.
 - Water users and power customer contributions for the enlargement of Elkhead Reservoir are recognized and credited as cost sharing towards recovery in Section 3(c)(4) of [P.L. 106-392](#). These contributions exceeded [\\$11 million](#).
 - The Colorado Water Conservation Board acquired 5,000 acre feet of storage in Elkhead Reservoir to be used to benefit the endangered fish and to support the maintenance of base flow through critical habitat. (The expansion was paid for with federal appropriations for capital funding and other capital funds from the states and power customers.)
- Wolford Mountain Reservoir
 - The Colorado River Water Conservation District provides 6,000 acre feet of water annually from Wolford Mountain Reservoir to augment flows in the 15-Mile Reach to benefit the endangered fish.
 - Water users and power customers contribute \$20 million for the cost of replacement power purchased due to modifying the operations of the CRSP facilities and the capital cost of water from Wolford Mountain Reservoir are recognized and credited as cost sharing towards recovery in Section 3(c)(4) of [P.L. 106-392](#).

- Palisade Pipeline
 - The Palisade Pipeline is a Grand Valley Water Management feature that was added to the Grand Valley Project diversion canal just downstream of the entrance to the canal. The Palisade Pipeline returns unneeded diverted water directly back to the river above the 15-Mile Reach. From 2002 to 2019, the Palisade Pipeline returned an average of 14,332 acre-feet water per year back to the river.
 - Reclamation/Grand Valley Districts Contract
 - On November 7, 2018 the Bureau of Reclamation entered into a contract that authorizes Grand Valley Water Users Association and Orchard Mesa Irrigation District to use federal Grand Valley Project (Project) facilities to deliver up to 10,000 acre-feet annually of non-Project water from upstream sources to the 15-Mile Reach of the Colorado River for the ongoing recovery of endangered fishes. This contract duration is five years (Bureau of Reclamation, 2018). Execution of this contract has the potential to benefit endangered fish. This additional water, after being routed through the Grand Valley hydroelectric power plant, will be returned the top of the 15-Mile Reach of the Colorado River (near Palisade, Colorado), typically at times when the flows would otherwise fall short of Upper Colorado Program instream flow targets.
 - Water from other sources
 - Water has been periodically made available for one time or short-term delivery to the 15-Mile Reach. Deliveries that occurred during the 2016 to 2020 period were provided by various non-federal partners.
- Protection and administration of instream flows
 - The Colorado Water Conservation Board holds instream flow water rights on two reaches of the Colorado River (Case Nos. 5-92CW286 and 5-94CW330) within the 15-Mile Reach. These decreed water rights include 881 cubic feet per second of water between July 1 and September 30 of each year.
 - The Colorado Water Conservation Board has historically reevaluated the need for instream-flow filings or other protective mechanisms every five years.
 - The Colorado Division of Water Resources protects and administers water and provides important data to support flow augmentation efforts to benefit the endangered fish.
 - The Colorado Division of Water Resources and the Colorado Water Conservation Board also routinely provide data, modeling and analyses for studies including using the Colorado Decision Support System and the 2019 Yampa River transit loss study.
 - The Colorado Division of Water Resources and Colorado water users implement the “[Shoshone Outage Protocol](#)” which provides for flows to the 15-Mile Reach when the Shoshone Power Plant is not operable due to a shutdown for repair, maintenance, or other reasons. Agreements and exchanges have been implemented to facilitate flexible late summer flow augmentation efforts during periods of extreme drought and during periods of maintenance and repair at various reservoirs.

- Coordination of flows
 - The Colorado Water Conservation Board coordinates the “Coordinated Reservoir Operations” to provide for the augmentation of peak flows through voluntary operational coordination of selected reservoirs and transmountain diversion projects in the Colorado River Basin upstream from the confluence of the Colorado and Gunnison Rivers. The Colorado Water Conservation Board also evaluates the hydrology and assesses these efforts and provides annual reports and assists with press releases. Coordinated Reservoir Operations has provided over 386,193 acre feet of water to the 15-Mile Reach.
 - The Colorado Water Conservation Board, Colorado Division of Water Resources and water users participate in weekly flow and reservoir operation coordination calls (Green Mountain Reservoir Historic Users Pool and Yampa River flow calls) to directly benefit the endangered fish.
 - Colorado Parks and Wildlife and the Colorado Water Conservation Board participate in the “Dolores River Dialog” for the purposes of identifying water storage and spill management opportunities to benefit the endangered fish and suppress non-native fish in critical habitat.
- Development of Programmatic Biological Opinions
 - The Colorado Water Conservation Board is providing 100% of the funding for consultants support to model hydrology and develop the White River Management Plan to characterize current and reasonably foreseeable future water use within the basin and its possible impacts to endangered fish. These efforts will exceed \$250,000, excluding staff time and resources. Nonfederal parties to the Upper Colorado Program are donating substantial time participating in development of the Programmatic Biological Opinion.
- Development, maintenance, and operation of Colorado’s Decision Support System
 - The Colorado Water Conservation Board and the Colorado Division of Water Resources assess legal and physical availability of water and compact considerations associated with the protection of instream flow water rights for endangered fish and their critical habitat.
 - The Colorado Water Conservation Board and the Colorado Division of Water Resources provide hydrology support to develop and evaluate flow augmentation to critical habitat.
 - The Colorado Water Conservation Board estimates current and projected future depletions in the Colorado River mainstem above the 15-Mile Reach and Yampa Rivers in Colorado as required by their respective Programmatic Biological Opinions. Funds provided for these efforts currently amount to more than [\\$115,000 per year](#).
- Rehabilitation and protection of power plant infrastructure
 - Grand Valley Power Plant Rehabilitation
 - The Orchard Mesa Irrigation District and Grand Valley Water User Association are providing more than \$8.5 million to improve the efficiency and reliability of the power plant, not including staff time.
 - The Colorado Water Conservation Board has provided Species Conservation Trust Funds for the repair and rehabilitation of the Grand Valley Power Plant to increase reliability of delivery of water to the 15-Mile Reach.

- Improvement of irrigation infrastructure and operations and maintenance
 - The Colorado Water Conservation Board has provided significant funding for multiple irrigation infrastructure improvement projects to benefit the endangered fish, including the Orchard Mesa and Maybell Irrigation Ditch Improvements.
 - Colorado water users have implemented irrigation efficiency improvements to Grand Valley water project operations, which has provided supplemental water augmentation to the 15-Mile Reach to benefit the endangered fish.
 - Orchard Mesa Irrigation District operates and maintains the [canal automation system](#), which reduces the volume of water diverted from the Colorado River for irrigation use by more closely matching the volume of water diverted with actual irrigation demand.
 - The Colorado River Water Conservation District and the Colorado Water Conservation Board provided funding for the Orchard Mesa Irrigation District's re-regulation reservoir. Contributions amounted to more than \$2.7 million.
 - The Colorado Water Conservation Board provided funds to establish the Grand Valley and Orchard Mesa Irrigation District Water Management Project Trust Fund for operations and maintenance by the Orchard Mesa Irrigation District. Principal funds amounted to more than \$1.5 million.
 - Grand Valley Water Management: Grand Valley Water Management is a collaborative efficiency action among the irrigation water providers served by the Grand Valley Project and the Upper Colorado Program, physically consisting of check structures and a SCADA system installed in the Grand Valley Project canal system. The average reduced diversion by the Highline Canal is 48,755 acre-feet per year. The water is retained in Green Mountain reservoir for subsequent release to augment base flows in the 15-Mile Reach.
 - Orchard Mesa Irrigation District Canal Automation: Project construction was initiated in fiscal year 2013. Construction of all 33 canal check structures was completed during the winter of 2013-2014. These facilities were operated throughout the 2014 through 2020 irrigation seasons. A construction contract for the regulating reservoir was awarded in fiscal year 2016. Construction of this facility was completed in June of 2017 and placed into operation in July, 2017. Completion of the entire canal automation project is currently on hold pending evaluation of current operations. The estimated water saving by reduction in diversions with improvements to date is 3,000 acre feet per year. Savings are likely to increase as project operations become more routine.
- Policy and Integrated Planning
 - The Colorado Water Conservation Board developed the Governor's Water Plan that includes initiatives for the endangered species and the Upper Colorado Program.
 - The Colorado Water Conservation Board and Colorado Parks and Wildlife participate with various Basin Roundtables and Integrated Stream Management Planning processes to ensure processes include initiatives for protection and conservation measures for the endangered species.

Utah

- Delivery of water to endangered fish habitat

- Non-federal contributions to the Upper Colorado Program from the Central Utah Water Conservancy District have centered on various aspects of fishery flow delivery to the lower Duchesne River. The following summary includes information as of and through Water Year 2020.
- Annually-available, project-water sources managed for fishery-flow deliveries to the lower Duchesne River include: 1) 2,900 acre-feet (A-F) of water, delivered from Starvation Reservoir, that was developed from the Daniels Replacement Project, a project of the Central Utah Project Completion Act; 2) approximately 5,000 A-F of water (“44,400 Water”) diverted into Starvation Reservoir that was originally released for fishery flow purposes along the four, main-stem, water courses of the Strawberry Aqueduct and Collection System; 3) 10,830 A-F of 44,400 Water delivered during the non-irrigation season from Starvation Reservoir and Knight Diversion Dam; 4) 65 A-F of permanent water made available by contract holders and delivered from Starvation Reservoir; and 5) 1,865 A-F of temporary water made available by contract holders and delivered from Starvation and Big Sand Wash reservoirs. It should also be noted that the 44,400 Water was/is subject to payment, via a complicated cost allocation process, of operation, maintenance, replacement, and reserves costs by the United States with funds budgeted outside the Upper Colorado Program budget.
- In addition, there are multiple aspects of administration and in-kind services associated with these water deliveries. These include: 1) weekly operational and accounting activities developing and recording release regimens; 2) weekly coordination with the Duchesne/Strawberry River Commissioner for release timing during the irrigation season; 3) participation in semi-annual Duchesne River Working Group meetings to summarize the preceding items; 4) contract administration and monitoring of the lower Duchesne River suite of U.S. Geological Survey stream gaging stations for target flow compliance; 5) contract monitoring and administration of the Uinta Mountain Range - South Flank Cloud Seeding Program to increase snow pack over the subject area; 6) assisting with the development and implementation of a Candidate Conservation Agreement with Assurances and a Safe Harbor Agreement granted to water users in exchange for allowing fishery flows to bypass their diversions; and 7) authoring two, major, summary reports in 2013 and 2019.

Wyoming

- Instream flows
 - Provides funding for a U.S. Geological Survey Joint Funding Agreement for stream gages.

REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH

Colorado

- Removal of non-native fish
 - Colorado Parks and Wildlife conducts annual non-native fish removal on more than 105 total river miles on the Yampa, Colorado, Gunnison, and White Rivers. This effort takes approximately 66 days to complete and includes multiple passes on most reaches. It is not fully compensated by the Upper Colorado Program. For example, full-time biologists' salaries are not compensated.
 - Colorado Parks and Wildlife conducts annual non-native fish removal in Catamount, Stagecoach, and Green Mountain Reservoirs and opportunistic or less-than-annual removal at a number of other reservoirs including but not limited to Crawford, Wolford Mountain, and Rifle Gap Reservoirs. These efforts take approximately 50 days to complete, although effort varies by year.
 - Colorado Parks and Wildlife conducted chemical reclamations at Paonia, Miramonte, and Chapman reservoirs to eradicate non-native fish, eliminating threat of escapement to critical habitat. Colorado Parks and Wildlife provided all preparation, labor, and execution to implement this project. The Upper Colorado Program provided 50% of the cost of the rotenone for the chemical treatments.
- Construction, operation, and maintenance of reservoir nets and screens to prevent non-native fish escapement; evaluation of net and screen effectiveness.
 - Colorado Parks and Wildlife, the Colorado Water Conservation Board, and Colorado water users provided funding for the construction and installation of nets and screens at five reservoirs to prevent the escapement of non-native fish. Nets or screens are installed and operating as intended at Rifle Gap Reservoir, Juniata and Purdy Mesa reservoirs, Highline Lake, and Elkhead Reservoir, and a screen is soon to be constructed at Ridgway Reservoir (\$1 million of State contributions). Colorado Parks and Wildlife maintains all of these nets and screens, including daily maintenance at Rifle Gap reservoir.
 - When feasible, Colorado water users have operated reservoirs to avoid spilling prior to the construction of nets and screens (e.g. Tri-County Water Conservation District has avoided spilling since 2014 at Ridgway Reservoir) to prevent the escapement of non-native fish.
 - Colorado Parks and Wildlife completes annual and, in some cases, biannual fish survey work downstream of the spillway nets in Highline Lake and Elkhead Reservoir, and upstream and downstream of the fish screen in Rifle Creek downstream of Rifle Gap Reservoir. The objective of these fish surveys is to evaluate the effectiveness of these fish anti-escapement devices.
- Implementation of annual targeted harvest incentive programs
 - Colorado Parks and Wildlife, the Colorado Water Conservation Board, and Colorado water users have implemented non-native fishing tournaments at Elkhead and Ridgway reservoirs to reduce non-native fish populations, raise public awareness, and increase public support through tournament prizes and outreach. These labor-intensive tournaments are implemented for 7 to 10 days at each reservoir, requiring multiple staff for planning and execution of these events.
 - Colorado Parks and Wildlife, the Colorado Water Conservation Board, and Colorado water users provide cash prizes annually to incentivize non-native fish harvest.

- Colorado Parks and Wildlife collaborates with several partners to implement angler harvest incentives of \$20/northern pike legally harvested at Kenney and Green Mountain reservoirs. Funds for these harvest incentives are provided by the Colorado Water Conservation Board.
- The Colorado River Water Conservation District funds a harvest incentive on Northern pike at Wolford Mountain Reservoir.
- Implementation of regulation, policy, and public outreach actions
 - Colorado Parks and Wildlife changed its regulations to allow unlimited bag and possession for northern pike (except for Williams Fork Reservoir), and smallmouth bass on the West Slope.
 - Colorado Parks and Wildlife allows the use of underwater spearfishing, archery, slingbows and gigs for the legal take of northern pike.
 - Colorado Parks and Wildlife amended its Master Angler award program to eliminate the “released fish” award for northern pike and smallmouth bass on the West Slope, with messaging in the award brochure explaining this is due to native fish impacts and illegal stocking.
 - Colorado Parks and Wildlife prominently promotes anti-illegal stocking messages in fishing brochures and other continual agency communications.
 - Colorado Parks and Wildlife annually evaluates applications for private pond stocking permits to ensure no potential escapement threats of non-native fish.
 - Colorado Parks and Wildlife implements the “Nonnative Fish Management Workgroup”, which convenes semi-annually. Recent efforts include angler research and outreach.
 - Colorado Parks and Wildlife develops lake management plans for the management of non-native fish.

Utah

- Development, production, and/or purchase of sterile sportfish alternatives (approved hybrids or induced triploids) for use in upper Colorado River basin reservoirs.
 - Sterile Walleye (ongoing) – In-state egg collection, pressure induced triploidy, rearing and stocking for Red Fleet and Scofield Reservoirs.
 - Hybrid wiper bass (ongoing) – purchase/production for Red Fleet, Scofield, Cottonwood, and Bullock reservoirs.
 - Hybrid tiger muskie (ongoing) – production for Red Fleet, Scofield, and Joe’s Valley.
- Develop and implement lake management plan revisions and renovations to align with nonnative stocking agreements and RIPRAP goals.
 - Reservoir treatment and development of new sport fisheries using “white listed” species or revision of existing plan and fishery.
 - Scofield Reservoir
 - Red Fleet Reservoir
 - Pelican Lake
 - Construction, operation, and maintenance of reservoir fish escapement structures.
 - Red Fleet screen – construction complete 2020 (Upper Colorado Program/DWR funded), operation/maintenance ongoing (DWR funded).

- Starvation Screen – temporary construction completed 2015 (DWR funded), operation/maintenance ongoing (DWR funded). Permanent structure construction planned for 2021 (Upper Colorado Program/DWR funding)
- Pelican Screen – constructed 2019 (DWR funded). Operation and maintenance ongoing (DWR funded).

Wyoming

- Classified burbot, northern pike, walleye, and yellow perch as nongame species in the Green River, Bear, and Great Divide drainages, and implemented a must kill regulation with unlimited harvest on those species in those areas.
- Increased penalties for illegal stocking (now may include lifetime revocation of hunting and fishing privileges, a fine of up to \$10,000, up to one year in jail, and civil penalties to cover the cost of removing the illegally introduced species).
- Frequently provides messages to the public regarding the impact of illegally introduced fish, including in our annual fishing regulation booklet.
- Reviews all private fish stocking requests to make sure introduced species are compatible with existing species.
- Uses Basin Management Plans to guide fisheries management decisions that are consistent with the nonnative stocking agreement.
- Promotes fishing derbies that target illegally introduced burbot.
- Did extensive surveys in the Little Snake River drainage to determine if this habitat provides a source population for northern pike found in the Yampa River.

RESTORE AND PROTECT HABITAT

Colorado

- Restoration and protection of habitat
 - Colorado Parks and Wildlife implemented and constructed major stream rebuild and habitat restoration projects in the upper Yampa River that improved habitat and eliminated major northern pike spawning areas.
 - The Colorado Water Conservation Board has allocated funds for the Walton Creek Rehabilitation project in the Yampa River to eliminate northern pike spawning habitat. This is one of the most productive northern pike spawning and rearing areas remaining in the Yampa River.
 - The Colorado Water Conservation Board has provided funding for the monitoring and evaluation programs to manage selenium in the Gunnison River basin. Activities include research, monitoring, and evaluation to reduce selenium loading for the protection of the endangered fish. Since 1988, more than \$2 million has been provided for these efforts.
 - The Colorado Water Conservation Board has provided funds for multiple habitat restoration and protection projects. Some of the more recent projects include habitat improvement in the Morgan Bottom area and the Elk Creek stream restoration project in the Yampa River basin.

- Colorado Parks and Wildlife (then the Colorado Division of Wildlife) collaborated with the Colorado Department of Public Health and Environment through the Water Quality Control Commission to implement water quality standards protecting aquatic life in tributary streams to the lower Colorado River. Colorado Parks and Wildlife and the USFWS have documented use of these tributaries by threatened and endangered fishes.
- Colorado Parks and Wildlife partners with the U.S. Bureau of Land Management and others to construct fish passage structures over and around what would otherwise be barriers to fish movement. These efforts target the three species, but may also provide benefit to threatened and endangered fishes present in the area, especially those in tributary systems.

Utah

- Restoration and Protection of Habitat
 - All combined, the Green and Colorado rivers in Utah contain 285.5 river miles of state sovereign lands. The Uintah Basin section of the Green River contains 99.3 miles. The lower section of the Green River (Green River Town and Labyrinth Canyon) contains 83.8 miles. The Colorado River from Stateline to Canyonlands contains 102.3 river miles of state sovereign lands.
 - Through an ongoing project entitled the ‘Colorado River Interagency Restoration’ the Department of Natural Resources’ Division of Forestry, Fire and State Lands, working through Utah’s Watershed Restoration initiative, to date has restored 735 acres of riparian habitat along the Colorado River mainstem since 2017.
 - In partnership with The Nature Conservancy and others working to establish and protect Price River base flow by acquiring and increasing the storage capacity of Olsen Reservoir to allow for strategic augmentation of base flows.
 - Increase recruitment of wild-spawned endangered razorback sucker by reconnecting the Matheson Scott M. Matheson Wetland Preserve, an 895-acre seasonally flooded Colorado River bottomland located near Moab, with the Colorado River and managing as a wetland nursery to optimize larval growth and survival. The aim is to increase survival of wild-spawned larvae in the Colorado River and facilitate recovery of the species by addressing the recruitment bottleneck caused by modified flow regimes, habitat alteration and loss, and competition and predation threats from non-native fishes.

CONSERVE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS

Colorado

- Propagation of endangered fish
 - All relevant Colorado Parks and Wildlife Murre Native Aquatic Species Restoration Facility activities credited by the Upper Colorado Program.
- Restoration and protection of endangered fish populations
 - Colorado Parks and Wildlife partners with the USFWS and others to salvage native fishes (both non-listed and listed species) from the Grand Valley Irrigation Company and Grand Valley Water Users canal systems once the

irrigation season has concluded. These fishes would otherwise perish as the canals are nearly dry throughout the winter (non-irrigation season).

Utah

- All relevant Utah activities funded with Upper Colorado Program dollars.

MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH

Colorado

- Monitoring of endangered fish populations
 - Colorado Parks and Wildlife in coordination with the USFWS collects fish tissue samples from the threatened and endangered fishes for mercury, selenium, and other contaminants during fish monitoring.
 - Colorado Parks and Wildlife completes monitoring and research of the three species (roundtail chub, bluehead sucker, and flannelmouth sucker) in mainstem rivers and their tributaries during which threatened and endangered fishes are also encountered and captured. Individual fish are handled, data recorded and submitted to the STReAMS database, a centralized location for data within the Upper Colorado Program.

Utah

- Utah Division of Wildlife Resources and Utah State University monitor “Three Species” as well as endangered fish use of major Colorado Basin tributaries that are outside of critical habitat using PIT antenna and physical captures. These activities are ongoing in the Price, San Rafael, Dolores and Duchesne Rivers and funding is shared by Utah Division of Wildlife Resources, the Bureau of Land Management, and the U.S. Bureau of Reclamation (separate from the Upper Colorado Program funds).
- Utah State University is conducting an ongoing study looking at stocked bonytail use of new floodplain habitats within the middle San Rafael River (Bureau of Land Management, Utah Division of Wildlife Resources).

INCREASE PUBLIC AWARENESS AND SUPPORT

Colorado

- Implementation of public awareness and outreach
 - The Colorado Water Conservation Board, Babbitt Center for Land and Water Policy, and the Chesapeake Conservancy have developed a data dashboard to track and monitor water released for endangered fish. This effort has also produced other outreach materials including a geographic information system StoryMap.
 - The Nature Conservancy, the Colorado Water Conservation Board, and Colorado water users helped to create the “Yampa River Fund”, which provides funds to projects that directly benefit the endangered fish.

- Colorado Parks and Wildlife partners with the Upper Colorado Program, USFWS and others to teach and train students and teachers in various western Colorado classrooms about the importance of threatened and endangered fishes through the “rearing fish in the classroom” program.
- Colorado Parks and Wildlife annually teaches a Colorado Mesa University Fish Biology class in the Colorado River about fish sampling techniques, fish identification, and data collection, reporting, and evaluation. Often, threatened and endangered fishes are encountered during this “mini” fish survey, and students have a rare opportunity to handle and learn about these unique fish.
- Colorado Parks and Wildlife partners with the USFWS and others at multiple, public educational events to showcase live threatened and endangered fishes in a mobile aquarium setting. Many of these events provide a “hands-on” opportunity in which people are able to handle/touch threatened and endangered fishes.

Utah

- 3rd and 4th Grade classroom presentations are conducted about native fishes and conservation.
- Statewide and regional social media posts and stories released monthly and press releases are put out as new benchmarks are reached.
- In-state development of video and storyboard products produced through Utah’s “Wildlife Migration Initiative” (DWR funded). Example - [Razorback Migration Animation](#).
- Support Utah Aquarium and Zoo native fish displays with cooperative collections and permitting.

PROVIDE PROGRAM PLANNING AND SUPPORT

Colorado

- Management of the Upper Colorado Program on an annual basis
 - The Colorado Water Conservation Board, Colorado Parks and Wildlife, and the Colorado Department of Natural Resources currently provide [staff to manage the Upper Colorado Program](#). Funding for management typically exceeds the requirements in the “Blue Book”. Staffing includes representation on the Implementation Committee, Management Committee, Biology Committee, Water Acquisition Committee, Information and Education Committee, White River Planning Team, Non-native Fish subcommittee and other adhoc subcommittees. Management also includes the annual congressional briefing trip to Washington, D.C.

Utah

- Management of the Upper Colorado Program on an annual basis
 - Biology Committee representation, workshops and technical committee participation is funded by the Utah Department of Natural Resources, Division of Water Resources (UDNR) and the Upper Colorado Program and that portion has

been tracked in program documents. The UDNR, and Division of Water Rights (DWR) representation on the Implementation Committee, Management Committee, and Water Acquisition Committee are provided as “in-kind” contributions and are not currently tracked by the program. Management also includes the annual congressional briefing trip to Washington, D.C.

Wyoming

- Management of the Upper Colorado Program on an annual basis
 - The Wyoming State Engineer’s Office and the Wyoming Game & Fish Department provide support to the Upper Colorado Program through participation in program committees and related activities, as well as the annual congressional briefing trip to Washington, D.C.

SAN JUAN PROGRAM

- All non-federal partners provide funding for program planning and support typically includes staffing representation on the Coordination Committee, Biology Committee, Information and Education Committee, and other adhoc subcommittees, as appropriate. The non-federal partners are crucial in relaying information regarding the recovery programs at the annual congressional briefing trip to Washington, D.C. While fully quantifying those voluntary in-kind contributions has been somewhat challenging, Section V of this report estimates that the non-federal funds have notably assisted the implementation of the program since 1992. Some of the in-kind contributions by certain non-federal partners are mentioned below.

New Mexico

- New Mexico Interstate Stream Commission and New Mexico Department of Fish and Game provide valuable technical and scientific expertise, ensuring the actions of the programs support state residents and natural resources. New Mexico contributes by providing feedback and recommendations on Navajo Reservoir Operations and annual review and assessment of the San Juan Program Hydrology Model. The cost of water forgone to New Mexico water users from re-operation of the Navajo Reservoir to provide water for fish species protected under the Endangered Species Act and ESA Sufficient Progress for many uses in both Colorado and New Mexico has not been monetized.
- New Mexico Interstate Stream Commission (NMISC) provides funding for state-wide maintenance of U.S. Geological Survey stream gages across New Mexico, which includes the gages on the San Juan, Animas, and La Plata rivers. The information obtained from these gages is used to make management decisions.
- In 2020, the New Mexico Interstate Stream Commission designated the San Juan River as a Priority Reach for the Strategic Water Reserve (Reserve). The Strategic Water Reserve statute was enacted in 2005 as a management tool for the NMISC to purchase and lease water, water rights and storage rights. Pursuant to the 2005 Strategic Water Reserve Act, the Reserve is to be used for two purposes: to assist the state in complying with interstate stream compacts and court decrees, and to assist the state and water users in water

management efforts to benefit threatened or endangered species. In 2022, NMISC is partnering with The Nature Conservancy by entering into a lease agreement with the Jicarilla Apache Nation to place in the Reserve a portion of the Nation's water supply stored in Navajo Reservoir. This lease agreement, which is currently pending the permit approval by the Office of the State Engineer, could provide up to 20,000 acre-feet of water per year, depending on available funding and other factors. The leased water would be released from Navajo Reservoir to the San Juan River in New Mexico to help achieve the statutory purposes of the Reserve.

Tribes

- Tribal partners (Jicarilla Apache Nation, Navajo Nation, Southern Ute Indian Tribe and Ute Mountain Ute Tribe) are vital to the ongoing San Juan Program efforts. Tribes contribute personnel and facilities, permit access to their lands, participate on various committees to provide professional and scientific expertise, and serve as liaisons to facilitate agreements and permits. Additionally, tribes actively seek alternate funding opportunities to enhance conservation efforts and sustain natural resources beneficial to threatened and endangered species.

The Nature Conservancy

- The Nature Conservancy has provided significant time and resources programs in habitat restoration, water acquisitions investigations, and irrigation improvements.