

Environmental Assessment

Upper Colorado and San Juan River Basin Endangered Fish Recovery Programs

DRAFT

December 1, 2023

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Acronyms and Abbreviations

Full Phrase

15-MR	15-mile reach
af	acre-feet
afy	acre-feet per year
BIA	Bureau of Indian Affairs
BO	biological opinion
CA	cooperative agreement
CBRFC	Colorado Basin River Forecast Center
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Colorado
CRSP	Colorado River Storage Project
CUP	Central Utah Project
CWCB	Colorado Water Conservation Board
DBO	Duchesne Biological Opinion
DOI	United States Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	foot
GSP	gross state product
HUP	historic user pool
km ²	square kilometers
LRP	Long Range Plan
mm	millimeter
mi	miles
mi ²	square miles
maf	million acre-feet

Acronyms and Abbreviations	Full Phrase
mg/L	milligrams per liter
NEPA	National Environmental Policy Act of 1969
NIIP	Navajo Indian Irrigation Project
NM	New Mexico
NPS	National Park Service
PBO	Programmatic Biological Opinion
PNM	Public Service Company of New Mexico
Reclamation	Bureau of Reclamation
RIPRAP	Recovery Implementation Program Recovery Action Plan
RM	river mile
ROD	Record of Decision
RPA	reasonable and prudent alternative
RPM	reasonable and prudent measure
San Juan Program	San Juan River Basin Recovery Implementation Program
Secretary	Secretary of the Interior
Service	United States Fish and Wildlife Service
SGCN	Species of Greatest Conservation Need
TL	total length
UCRB	upper Colorado River basin
Upper Colorado Program	Upper Colorado River Endangered Fish Recovery Program
USC	United States Code
US	United States
USGS	United States Geological Survey
YRMP	Yampa River Management Plan

Chapter 1 Purpose and Need of Action

1.1 Introduction

The U.S. Department of Interior (DOI), U.S. Fish and Wildlife Service (Service) prepared this environmental assessment (EA) to analyze the environmental effects of extending both the Upper Colorado River Endangered Fish Recovery Program (Upper Colorado Program) and the San Juan River Basin Recovery Implementation Program (San Juan Program), hereafter referred to collectively as the “recovery programs” beyond 2024. If the recovery programs were extended, this would occur through one or more new cooperative agreements (CAs). The CAs are executed under the statutory authority of the Endangered Species Act (ESA) and other federal, state, and Tribal laws. After the CAs are signed, the recovery programs would be implemented by the Service, Reclamation, Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), National Park Service (NPS), Western Area Power Administration (WAPA), four states, and four tribes who are each signatories on one or both of the recovery programs. The recovery programs include other parties necessary for implementation, such as water users, Colorado River Storage Project (CRSP) power customers, and conservation organizations. In this EA, entities that have signed the CA are referred to as "signatories" while non-signatories are referred to as “Parties.” Together, all entities are referred to as “participants.”

The Upper Colorado Program was established in 1988 to allow water resource development to proceed under state, federal, and Tribal law, and for recovery of ESA listed fish species. The San Juan Program was implemented as a reasonable and prudent alternative (RPA) for the Animas-La Plata Project and established via cooperative agreement in 1992. The goals of the recovery programs are to recover the federally listed Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*), while continuing water development and use. The recovery programs’ actions provide ESA compliance for more than 2,500 multiple purpose federal, Tribal, and non-federal water projects, which have a combined utilization of more than 3.8 million acre-feet (maf) of water per year in the Green, Colorado, and San Juan rivers and their tributaries in Colorado, New Mexico, Utah, and Wyoming (Map 1).

This EA analyzes the potential effects of extending the recovery programs beyond 2024 through one or more CAs. This EA analyzes the environmental impacts of the coordination provided by the recovery programs, which would begin with the signing of the new CAs by the Secretary of Interior (Secretary) and signatories. It is likely that some specific recovery program implementation activities (e.g., habitat restoration) may require project-specific National Environmental Policy Act (NEPA) analysis. Those activities will be considered and analyzed in future NEPA documents. Additionally, if there are significant changes to the scope of the action described herein or the impacts of the action, including changes resulting from new or revised environmental laws, regulations or policies, this environmental assessment may require additional analysis.

1.2 Background of Prior Cooperative Agreements

In 1988, the governors of Colorado, Wyoming, and Utah, the Administrator for WAPA, and the Secretary signed the Upper Colorado Program CA (U.S. Department of the Interior 1988). The CA described a coordinated effort among signatories to recover four ESA listed fish species in the upper Colorado River basin (UCRB) upstream of Glen Canyon Dam, excluding the San Juan River (U.S. Department of the Interior 1987; Wydoski and Hamill 1991; Evans 1993).

Similarly, in 1992, the Secretary, on behalf of the Service (Regions 2 and 6), Reclamation, and BIA; the governors of Colorado and New Mexico; the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Nation executed a CA to carry out the San Juan Program (U.S. Department of the Interior 1992). Navajo Nation, BLM, and the State of Utah became signatories in 1993, 1996, and 2022 respectively. The San Juan Program is a coordinated effort among program participants to support recovery of two ESA listed fish species specifically within the San Juan River Basin. Copies of all CAs are provided in Appendix B.

Each CA incorporates the terms, objectives, and undertakings of the relevant recovery program and commits each signatory to its timely implementation. Both CAs expire on September 30, 2024. In addition to CAs to implement the recovery program, funding reliability is critical to ensure that recovery actions are implemented on a yearly basis, thus contributing to the success of the recovery programs. Prior to 2001, funding for annual operations of the San Juan Program was provided by Reclamation, BIA, and the Service. Funding for the annual operations of the Upper Colorado Program was provided by the Service, Reclamation, the states of Colorado, Utah, and Wyoming, and water users in those three states (in the form of depletion fees). The states, CRSP power customers through WAPA, and Reclamation provided funding for capital projects.

On January 24, 2000, Congress enacted Public Law (P.L.) 106-392, which authorized the Secretary to use CRSP power revenues to fund annual base costs of both recovery programs. These revenues replaced the Reclamation and BIA annual contributions. P.L. 106-392 also authorized use of federal funds appropriated by Congress, and a cost-share from CRSP hydropower users and the four upper basin states for funding capital projects under the recovery programs. P.L. 106-392 has been amended several times, including by P.L. 116-9, which authorized Reclamation to provide funding for the recovery programs from 2020 through 2023. More recently, P.L. 117-328 extended Reclamation's funding authorization through 2024. Recovery program participants are committed to actively support program activities. Recovery program signatories have extended the existing CAs to match the P.L. 117-328 funding authorization.

Continued implementation of the recovery programs would be necessary to provide further conservation and recovery of the four ESA listed fish species in the UCRB and to maintain ESA compliance provided by the recovery programs on water development projects.

1.3 Proposed Federal Action

The Service, working with Reclamation, BIA, BLM, NPS, four states, four tribes, WAPA and other program parties, proposes to extend the duration of the recovery programs through CAs beyond 2024. The recovery programs provide effective recovery actions targeting four ESA listed fish species and certainty to water users through ESA compliance for water development projects. An extension of the CAs would include federal action through participation and funding of the recovery programs to continue the progress made to date to achieve additional milestones in recovering the species (U.S. Department of Interior 1987, 1988, 1992, 2022a and U.S. Fish and Wildlife Service 2002a-d).

If the recovery programs were to be extended, one or more CAs would be signed by the Secretary, implemented by all signatories, and further supported by program participants. The proposed recovery program extension activities are further described in the Report to Congress, submitted by the recovery programs and DOI on March 7, 2023 (Upper Colorado River Endangered Fish Recovery Program and San Juan River Basin Recovery Implementation Program 2023). This EA analyzes and discloses the effects of the proposed extension.

1.4 Purpose and Need for the Action

The purpose of this federal action is to further the recovery of four ESA listed fish species in the Green, upper Colorado, and San Juan rivers' subbasins so that water development and federal power production projects continue to have ESA compliance. This would also provide continued ESA compliance for existing and future water-related projects and uses in the UCRB. In addition, continued adaptive management, as outlined in the program guiding documents (U.S. Department of the Interior 1987; San Juan River Basin Recovery Implementation Program 2022a), would further increase understanding of fish requirements and effectively inform recovery measures to make further progress toward delisting goals. Federal action is needed to recover the four ESA listed fish species as identified in previous CAs and guiding documents (U.S. Department of Interior 1987, 1988, 1992, 2022a and U.S. Fish and Wildlife Service 2002a-d) which are scheduled to expire in September 2024.

1.5 Description of the Analysis Area

The analysis area for this EA includes all of the UCRB. See map of the basin (Map 1). Operations of Navajo Dam, the Aspinall Unit dams, and Flaming Gorge Dam would continue under the existing Record of Decisions (RODs) for each facility (U.S. Bureau of Reclamation 2006a, 2006b, 2012), with Reclamation assuming responsibility for ESA compliance as outlined in each ROD, which reference participation in the recovery programs. This EA does not analyze or replace existing RODs for the federal facilities mentioned above.

Chapter 2 Description of Proposed Action and Alternatives

2.1 Introduction

The Proposed Action and No Action Alternative are analyzed in depth in this document. Under the No Action Alternative, the recovery programs would not be extended beyond 2024. Federal involvement would not be continued, nor associated funding and implementation, which would result in the dissolution of the recovery programs. The Proposed Action would extend the recovery programs beyond 2024, which would include federal action in participation and funding of the recovery programs to the extent Congress appropriates funds to the Secretary for this purpose. The recovery programs would continue to work as cooperative partnerships with federal, state, Tribal, and private partners that work within state and Tribal water rights systems, Reclamation project authorizations, and interstate water compacts to:

- continue the implementation of Section 7 compliance for water-related projects and uses under the ESA,
- continue research efforts to identify the needs of the fishes and devise effective recovery measures, and
- continue and expand current recovery and management efforts to recover the ESA listed fish species.

2.2 Proposed Action

Under the Proposed Action, the recovery programs would be extended beyond 2024 through one or more CAs. The recovery programs would continue to provide ESA compliance for existing and new water development and water management activities throughout the upper Colorado, Green, and San Juan river subbasins. The Proposed Action incorporates the extension of recovery activities as described in the CAs for the recovery programs (U.S. Department of Interior 1988, 1992, 2001, 2006, and 2009). In addition, continued adaptive management, as outlined in the program guiding documents (U.S. Department of the Interior 1987; San Juan River Basin Recovery Implementation Program 2022a), would increase the understanding of fish requirements and effectively inform recovery measures to make further progress toward down- and delisting goals. The Proposed Action would not change the recovery programs, goals, objectives, milestones, or implementation framework (U.S. Department of the Interior 1987; San Juan River Basin Recovery Implementation Program 2022a). Extending the recovery programs beyond 2024 would continue coordination in the following six principal recovery elements:

1. Identifying and protecting instream flows
2. Restoring and protecting habitat
3. Managing nonnative fish
4. Propagating, stocking, and maintaining genetic integrity of fish
5. Research and monitoring
6. Public involvement, education, and outreach

Program management is considered a seventh element that ensures implementation of the six primary elements. Activities within each element would be implemented and adapted to incorporate new scientific and governing committee decisions as outlined in program guidance documents. Implementing the extension would depend on what is practicably achievable, given available funding and resources. CAs establishing the recovery programs would be dependent upon federal funding to carry out the recovery activities defined in the program guiding documents. Elimination of federal funding would risk implementation of the cooperative agreements.

The Proposed Action would continue the existing coordinated system-wide approach: (1) allowing comprehensive consideration of information gained through various research efforts; (2) prioritize funds for the actions deemed most essential to support species recovery across the basins, and; (3) continuation of streamlined ESA compliance for water development projects. In addition, the Proposed Action allows for recovery actions that could only be implemented with state coordination, such as instream flow protection, nonnative species control, and voluntary augmentation of flows by water users to benefit ESA listed fish.

The recovery programs are not legal entities that could buy, own, or hold property rights or assets. The actions considered below consist only of providing ESA compliance for water projects, facilitating research, and monitoring for endangered species needs, and enhancing recovery efforts through coordination. Any tangible, on-the-ground projects, such as construction or habitat modification, would undergo a separate NEPA analysis conducted by the appropriate action agency. The recovery programs would continue to support these projects financially.

2.2.1 Identifying and protecting instream flows

The recovery programs would continue to coordinate flow management with water partners to benefit listed fishes in the Green, Yampa, Duchesne, Gunnison, San Juan, and Colorado rivers and their tributaries. Flow coordination activities are expected to expand as new opportunities emerge to work with partners in the White, San Rafael, Price, and San Juan rivers. The recovery programs would coordinate with water partners to determine potential irrigation efficiency improvements (piping, gaging, automating, etc.) and water acquisition opportunities. The recovery programs would continue to evaluate flow recommendations through the adaptive-management process and revise those as necessary. Information collected for adaptive management includes data on stream flows, sediment transport, and the effects of variable flows on federal project purposes and backwater and flooded bottomland habitats in high-priority areas.

2.2.2 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

establishment of new and continued operation and maintenance of the fish passage improvements and fish screens that have been established since inception of these programs.

2.2.3 Managing nonnative fish

The recovery programs would continue widespread mechanical removal of predatory nonnative fish species and focus on disrupting nonnative spawning to reduce adult densities and prevent reproduction. More efficient landscape-scale methods to reduce nonnative fish spawning would continue to be tested through modified water operations, and more widely implemented where they have proven effective. New tools would be investigated to control nonnative fish, such as genetic modifications, sport-reward fisheries, and novel piscicides. The recovery programs would also continue to prevent nonnative fish from escaping from reservoirs into threatened and ESA listed fish habitats using screens and nets at dam outlets and reducing reservoir populations through various methods.

2.2.4 Propagating, stocking, and maintaining genetic integrity of fish

The recovery programs would 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 may expand its stocking efforts to include Colorado pikeminnow and humpback chub to further augment or restore these populations which are currently naturally reproducing. The recovery programs would continue to support maintenance and operation of hatcheries for as long as those facilities are needed to assist in recovery. Maintenance of broodstock and refuge populations would continue, including maintaining bonytail and razorback sucker broodstock and developing or enhancing the Colorado pikeminnow and humpback chub broodstock with wild individuals as needed. Propagation of listed fishes would be managed to maximize their genetic diversity and increase the likelihood that stocked fish can survive in the wild.

2.2.5 Research and monitoring

The recovery programs would continue to collect, manage, use, and assess long-term datasets on habitat conditions and listed fish encounters, and would continue supporting the management of all field monitoring data in a centralized, web-based database (STReAMS). Constructing, installing, and maintaining passive integrated antennas technology is vital to increase the amount of data collected remotely for listed fishes with passive integrated transponder tags. Analyses would 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 would continue to evaluate and adapt management actions with lessons learned through species monitoring, including monitoring of both listed fishes and other native and nonnative species. Biological effects of flow recommendations would be evaluated and adjusted as new information becomes available. Monitoring information is particularly valuable in designing and assessing effective water

control structures for floodplain wetland management; controlling nonnative fish populations; and improving hatchery techniques for raising listed fishes.

2.2.6 Public involvement, education, and outreach

Building and maintaining public awareness and support are essential to recover the threatened and ESA listed fishes. The recovery programs work together to identify and engage diverse audiences throughout the UCRB to achieve recovery goals while providing ESA compliance for water development. A strategic, comprehensive, and inclusive outreach program increases awareness and support among individuals, local communities, partners, and other stakeholders including Tribes, anglers, boaters, water uses, hydropower customers, landowners, environmental organizations, and natural resource decision makers. Special focus will continue to support the removal of problematic nonnative species by anglers and ensure that all anglers understand the impacts of moving species illegally. The recovery programs plan and implement a wide variety of activities including visiting schools, expanding unique educational opportunities, attending community events, presenting at professional conferences, developing educational materials, and working with the media. The recovery programs would continue to coordinate communications, publish annual updates on program activities and accomplishments, foster broad public support and involvement, and ensure that information about the ESA listed fishes is accurate and accessible to all.

2.3 No Action Alternative

Under the No Action Alternative, the recovery programs would not be extended beyond 2024. Federal involvement would not be continued, nor associated funding requests or implementation, which would result in the dissolution of the recovery programs. The non-federal program participants could respond to the dissolution in several ways, none of which are predictable enough to evaluate as alternatives in this EA. The non-federal participants could theoretically reorganize the recovery programs to operate without federal participation or funding, either by absorbing the current funding and administration responsibilities or by operating smaller programs to seek ESA compliance under a new framework.

Obligations for ESA compliance would revert to the action agencies and project proponents for each individual project or would need to be addressed using an alternative mechanism. Each water project or activity in the basin that secured ESA compliance based on implementation of either program would require reinitiation of the existing ESA Section 7 consultation. Over 2,500 current water development projects would require reinitiation. Absent a new programmatic mechanism, mitigation measures for ESA compliance would need to be identified individually for each project and implemented by the project sponsor. Furthermore, new projects that require future federal approval, permitting, or funding would need to implement project specific measures to avoid jeopardizing the ESA listed fish species.

Funding for recovery actions would be severely curtailed, competing with other needs of state and federal agencies. If funding for recovery actions were significantly reduced, it would delay and likely could prevent, attainment of recovery goals, undermine the recovery programs'

achievements in restoring populations of the ESA listed fishes, and cause the species to revert to their population status prior to recovery program development.

Operations of Navajo Dam, the Aspinall Unit dams, and Flaming Gorge Dam would continue under the RODs that have been established for each facility (U.S. Bureau of Reclamation 2006a, 2006b, 2012), with Reclamation assuming responsibility for ESA compliance as outlined in each ROD to the extent Reclamation has authority to do so. Some activities, such as protection and/or delivery of instream flow released from Reclamation projects, would be governed by state law.

In addition to ESA Section 7 compliance issues, under the No Action Alternative the coordinated system-wide approach to species recovery would be lost. Losing the cooperative efforts of the non-federal participants in the recovery program would negatively impact current and future progress toward recovery for the ESA listed fishes.

Under this No Action alternative, federal, state, and Tribal agencies would be assumed to return to managing and conserving the fishes independently and without the recovery programs' ESA compliance:

1. Conduct Section 7 consultation on individual existing and proposed water projects.

Section 7 consultation would need to be reinitiated for each project currently using the recovery programs as a conservation measure or RPA. In that event, reinitiation of ESA Section 7 consultation would consider what is known at the time of consultation of the ESA listed species and critical habitat requirements in the area affected; assess the effects expected from project construction and operation (including effects of depletions and cumulative impacts); and identify an RPA that considers project purpose, planned operation, and economic and technologic feasibility. In seeking RPAs, the Service could suggest measures to avoid or compensate for adverse impacts. A variety of measures could be investigated including, but not limited to, changing the timing, amount, or location of diversions; providing offsetting flows from reservoir reoperation or storage; building fish passage structures; conducting research studies to collect critical information on habitat requirements of ESA listed fish in affected reaches; and/or improving habitat.

In addition, the Service anticipates that monetary contributions for research and recovery measures would be used as an RPA for small-volume depletions, but only when other RPAs cannot be developed for those projects. However, even with this array of options, there may be future proposed projects likely to jeopardize the fish for which the Service would be unable to develop RPAs in the absence of the recovery programs.

The operation of water storage projects by Reclamation constitutes a federal action which may affect threatened and endangered fishes. Therefore, Reclamation is involved in Section 7 consultation to ensure its project operations do not jeopardize ESA listed fish species. Federal reservoir projects include, but are not limited to: Flaming Gorge, Navajo, Morrow Point, Crystal and Blue Mesa Reservoirs (U.S. Bureau of Reclamation 2006b, 2006c, 2012). If the RODs are dependent on actions currently carried out by the recovery programs that no longer exist, consultations and potential amendments to the RODs would be required.

2. Conduct basic and applied research on fish and their needs, as funds allow.

Research would be severely curtailed due to lack of funding. Research and monitoring are critical to the preservation of species as these activities identify the status of the species, positive and negative impacts to the species, and adaptive management needed to address adverse impacts. The Service and Reclamation would continue efforts to identify essential habitats and delineate their physical characteristics as funds allow, or as required by current RODs. Researchers would continue to examine ecosystem relationships (e.g., interspecific competition, primary and secondary productivity), develop computer models that simulate river conditions under alternative flow management scenarios, and analyze the feasibility and effectiveness of various recovery techniques (e.g., using “grow-out ponds” [artificial rearing areas] to produce fish) as funds allow. The state and Tribal resource agencies would still work to protect the resources under their respective jurisdictions and authorities as funds allow.

3. Monitor the status of the fish, as funds permit.

Monitoring of fish populations, habitat, and other species affecting the ESA listed fish would be severely curtailed. Information needed for management of the species and habitat would no longer be available. The Service, Reclamation, and the states of Colorado, New Mexico, and Utah would continue to monitor for ESA listed fish populations in essential habitats of the UCRB as funds permit¹.

4. Conduct recovery actions, as funds allow.

The recovery program partners commitment to recover the ESA listed fish would be severely undermined because Section 7 consultation does not require that project sponsors or federal agencies recover the species. Federal agencies are required to use their authorities to carry out programs for the conservation of ESA listed species under Section 7(a)(1) of the ESA.

All activities described above would be reviewed and conducted in accordance with federal and state law, including the NEPA, ESA, Fish and Wildlife Coordination Act, and National Historic Preservation Act.

2.4 Alternatives Considered but Eliminated but Not Analyzed in Detail

The following alternatives were considered, but not analyzed in detail because they would not carry out the recovery programs’ stated goal, i.e., to recover the federally listed fish species while providing ESA compliance to continue water and hydropower development and use to meet human needs. The following are alternatives were considered but not analyzed in detail because they would not accomplish the recovery programs’ goals:

- a. Federal action only. Under this alternative, the federal government would try to recover the ESA listed fishes using federal authorities and resources only. It was assumed that agreements for instream flows between federal, state, Tribal and water users would be

¹ Populations of the species have been extirpated from the State of Wyoming, with no chance of recolonization because of the presence of Flaming Gorge Dam.

voided. In addition, it is also assumed that the federal government would handle all on-the-ground recovery activities which would be limited by available funding and staffing. The loss of instream flows would result in the removal, reduction, and degradation of habitat necessary for the ESA listed fish species. Essential actions currently conducted by state agencies, water users, and environmental organizations could be discontinued at any time.

- b. Upper Colorado Program. Under this alternative, only the Upper Colorado Program would be extended beyond 2024. Recovery actions would be reliant on the Upper Colorado Program's ability to make progress toward recovery in its current geographic extent. The dissolution of the San Juan Program would cause actions in that basin to move towards implementing minimization measures as Section 7 consultations are newly initiated or reinitiated. In addition, this alternative would drastically affect Tribal relationships, as a portion of the federal government's trust responsibilities towards Tribes would no longer be fulfilled through the close working relationships that the San Juan Program has provided. In turn, Tribal coordination would occur on a case-by-case basis when appropriate. The process for water development within the San Juan basin would likely be slowed, as there would be no streamlined or uniform process in place. In summary, an Upper Colorado Program would not fulfill the goals of the recovery programs, nor does it currently have the Tribal relationships that are currently thriving in the San Juan River basin.
- c. San Juan Program. Under this alternative, only the San Juan Program would be extended beyond 2024. The dissolution of the Upper Colorado Program would remove coverage from the majority of water development in the basin, including over 2200 projects covering almost 2.9 maf of water all of which would require re-consultation. Ongoing conservation actions in the Green and Colorado subbasins would occur only as funding allows. A loss of instream flow coordination in the Yampa and Colorado rivers may result in the removal, reduction, and degradation of habitat necessary for the ESA listed fishes.

The above-mentioned alternatives were considered but eliminated from detailed analysis because they 1) would not fully meet the purpose and need (see Section 1.4); and/or 2) are inconsistent with recovering ESA listed fishes.

Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

This section describes the affected environment in the area and its resources (e.g., biological, physical) potentially impacted by the Proposed Action and No Action Alternative. In addition, significant and the degree of the effects of the action, including connecting actions (40 Code of Federal Regulations (CFR) 1501.3(b) and 40 CFR 1501.9(e)(1)). NEPA requires that in considering effects to the potentially affected environment, agencies should consider the affected area (national, regional, or local) and its resources (40 CFR 1501.3(b)(1)). To determine the degree of the effects of the action, federal agencies “should consider the following, as appropriate to the specific action: (i) Both short- and long-term effects, (ii) Both beneficial and adverse effects, (iii) Effects on public health and safety, (iv) Effects that would violate federal, state, Tribal, or local law protecting the environment” ((40 CFR 1501.3(b)(2)).

This section is organized by affected resource categories and discusses: (1) the existing environmental and socioeconomic baseline in the action area for each affected resource; and (2) the effects and impacts of the Proposed Action and any alternatives on each affected resource. The effects and impacts of the Proposed Action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the Proposed Action or No Action Alternative. This EA includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore the resource would be considered an “affected resource.” Any resources that would not be more than negligibly impacted by the action have been dismissed from further analyses. The following resources either (1) do not exist within the project area, (2) would either not be affected or only negligibly affected by the Proposed Action, or (3) would only be affected by potential future projects that would undergo separate NEPA analysis on a project-by-project basis and would therefore not be covered in this EA.

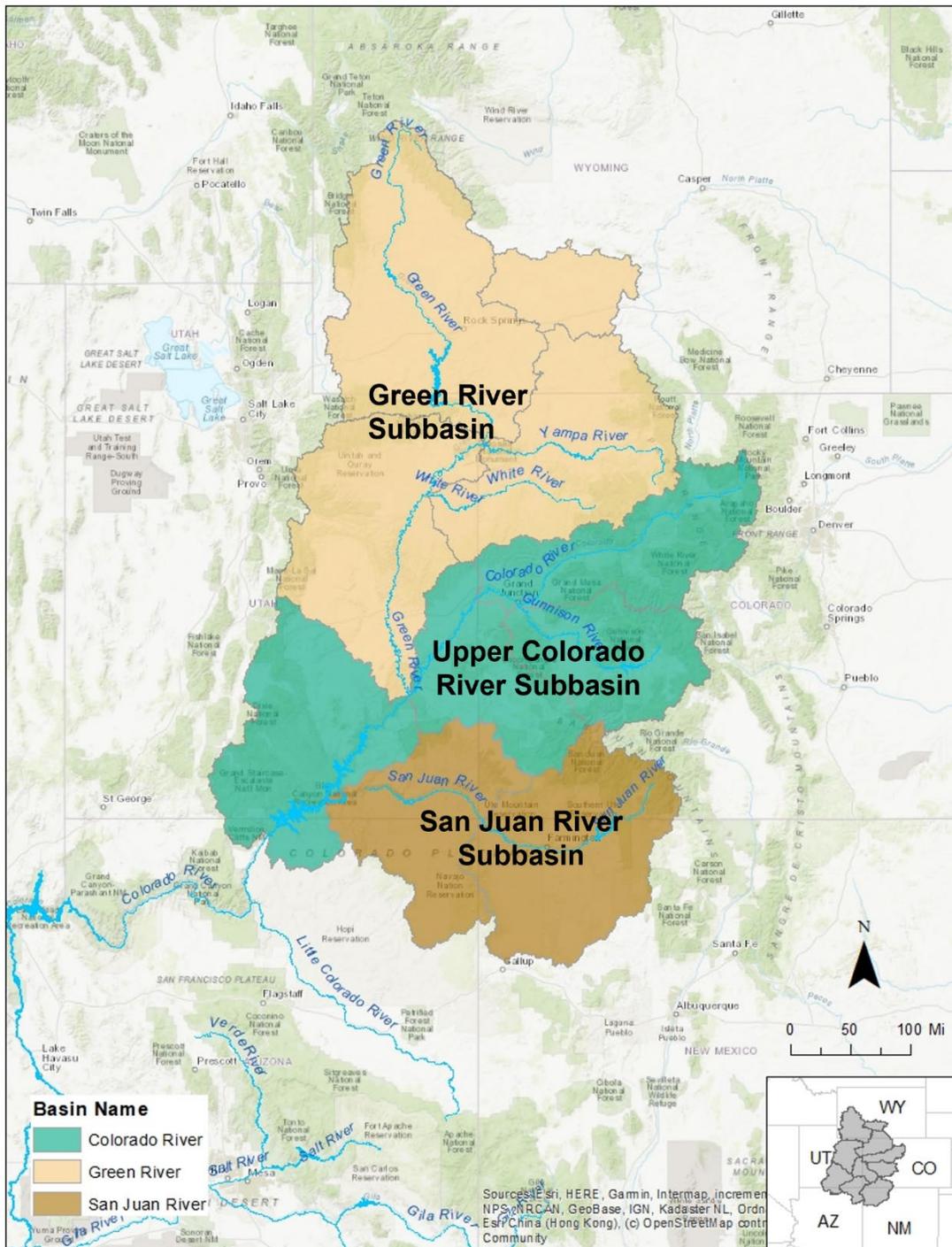
Table 1. Resources Eliminated from further analysis.

Resource	Rationale for Elimination from Further Analysis
Archeological/Cultural Resources	Any actions that may affect the integrity of historic properties would need to undergo a separate NEPA analysis. Operations at federal reservoirs undergo separate NEPA analyses that address all the possible impacts from flow management decisions which may affect archeological or cultural resources.
Public Health and Safety	The recovery programs’ actions of enhancing research and monitoring, providing ESA compliance, and enhancing recovery actions through coordination have no impact on public health and safety. NEPA analyses related to flow augmentation are discussed within Reclamation’s project-specific RODs.
Environmental Justice	The recovery programs provide compliance for ongoing water development. How that water is developed or for whom is not impacted by the existence of the recovery programs and therefore no

Resource	Rationale for Elimination from Further Analysis
	disproportionate impacts on low-income or minority populations are expected.
Hydropower generation	Although considered in the original EA, all hydropower generation is now governed by RODs throughout the UCRB. The analyses of effects are documented in the EIS for each facility.
Land Use / Realty	The recovery programs' actions of enhancing research and monitoring, providing ESA compliance, and enhancing recovery actions through coordination have no impact on landscapes of any kind. The recovery programs cannot purchase property or affect land use. Implementation of some flow recommendations to support the ESA listed fish species can impact their surrounding environments. Operations at federal reservoirs undergo separate NEPA analyses that address the possible impacts from flow management decisions.
Water Quality	Any actions that may affect water quality would need to undergo a separate NEPA analysis. The recovery program's actions in enhancing recovery actions through protecting and enhancing instream flows and habitat have already gone through separate NEPA analysis or would require separate NEPA analysis for site-specific projects.
Air Quality	The actions of the recovery programs have no discernable impact on air quality.
Wilderness or Other Special Designation	The recovery programs' actions of enhancing research and monitoring, providing ESA compliance, and enhancing recovery actions through coordination have no impact on landscapes of any kind, including wilderness or other areas with special designation. The recovery programs do conduct work within National Park boundaries and all actions are coordinated with NPS staff. Work is also conducted along Wild and Scenic Rivers, where all actions are coordinated with the surrounding landowners, primarily BLM.
Indian Trust Assets	Any actions that may affect the protection and preservation of Indian Trust Assets from loss, damage, unlawful alienation, waste, and or depletion would need to undergo a separate NEPA analysis. The recovery programs' actions of enhancing research and monitoring, providing ESA compliance, and enhancing recovery actions through coordination have no impact on landscapes of any kind. Implementation of flow recommendations or habitat restoration that support the ESA listed fish species can impact Tribal land uses and would undergo separate NEPA analysis. Operations at federal facilities would undergo separate NEPA analyses that address all the possible impacts to Indian Trust Assets.
Terrestrial Biological Resources	Any actions that may affect terrestrial biological resources would need to undergo a separate NEPA analysis. The recovery programs' actions of enhancing research and monitoring, providing ESA compliance, and enhancing recovery actions through coordination have no impact on

Resource	Rationale for Elimination from Further Analysis
	landscapes of any kind. Implementation of some flow recommendations to support the ESA listed fish species can impact their surrounding environments. Operations at federal reservoirs undergo separate NEPA analyses that address all the possible impacts from flow management decisions.

The area covered by the recovery programs includes the entire UCRB, as depletions from any waterway within the basin is provided with ESA compliance under one of the two recovery programs. Much of the landscape of the UCRB would remain unaffected by the existence of the recovery programs because actions associated with the recovery programs mainly occur in critical or occupied habitat of the listed fish species which is primarily limited to the mainstems of the Yampa, Green, White, Colorado, Gunnison, and San Juan rivers. Seasonal occupation also occurs in the San Rafael, Duchesne, Price, and Dolores rivers, Vermillion Creek, and other tributaries.



Map 1. Major rivers and tributaries of the UCRB with the Green River, Upper Colorado River, and San Juan River subbasin shaded, tan, green and brown, respectively.

The UCRB is described below in three discrete subbasins, operating under somewhat different flow scenarios. The Green and upper Colorado river subbasins are considered within the Upper Colorado Program coordination activities while the San Juan River operating procedures occur entirely within the San Juan Program.

3.1.1 Green River Subbasin

The Green River subbasin occupies a total area of 45,000 square miles (mi²) in Wyoming, Colorado, and Utah. The Green River originates in the Wind River Range of Wyoming and continues through eastern Utah, with a loop into northwestern Colorado, on through the Canyon of Lodore in Dinosaur National Monument and back into Utah. It then flows generally southwest through Desolation and Gray canyons, past Green River city, Utah, and southeast to join the Colorado River south of Moab, in Canyonlands National Park. It is navigable only by special shallow-draft riverboats—and then only at high water. Its chief tributaries are the Yampa River, in Colorado, and the Duchesne, Price, White, and San Rafael rivers in Utah. The Green River is the largest tributary of the Colorado River. Nearly half of the flow of the Colorado River at its confluence with the Green River is from the Green River subbasin.

3.1.2 Upper Colorado Subbasin

The Colorado River begins at La Poudre Pass in the Never Summer Mountains in Rocky Mountain National Park, 10,184 feet (ft) above sea level. After a short run south, the river turns west below Grand Lake, the largest natural lake in the state. For the first 250 miles of its course, the Colorado River carves its way through the mountainous Western Slope, a sparsely populated region defined by the portion of the state west of the Continental Divide. As it flows southwest, it gains strength from many small tributaries and larger ones including the Blue, Eagle, and Roaring Fork rivers. After passing through De Beque Canyon, the Colorado river emerges from the Rocky Mountains into the Grand Valley, a major farming and ranching region where it meets one of its largest tributaries, the Gunnison River, at Grand Junction. From Grand Junction, the Colorado River cuts southwest across the Colorado Plateau. Here, the climate becomes significantly drier than that in the Rocky Mountains, and the river becomes entrenched in progressively deeper gorges of bare rock, beginning with Ruby and Westwater canyons as it enters Utah. Farther downstream it receives the Dolores River and defines the southern border of Arches National Park, before passing Moab and flowing through "The Portal," where it exits the Moab Valley between a pair of 1,000-ft sandstone cliffs. The Colorado River continues downstream, meeting the Green River in Canyonlands National Park. The Upper Colorado subbasin continues through to the Lake Powell inflows.

3.1.3 San Juan River Subbasin

The San Juan River subbasin is the second largest of the three subbasins which comprise the UCRB. The San Juan River subbasin has a drainage area approximately 38,000 square miles of southwestern Colorado, northeastern Arizona, northwestern New Mexico, and southeastern Utah. From its origins in the San Juan Mountains of Colorado, the San Juan River flows 31 miles to the New Mexico border, 190 miles westward through New Mexico to the Four Corners area, and then another 136 miles to Lake Powell. In its upper reaches, the river traverses rugged terrain and has a relatively high gradient. The river emerges from canyon-bound reaches shortly after entering New Mexico and flows through a broad floodplain for much of its course in New Mexico and Utah. About 70 miles upstream of Lake Powell, the river again enters canyon reaches for the remainder of its course. The river is generally restricted to a single channel in canyon portions but is often divided into several channels in floodplain reaches.

The San Juan River has comparatively few perennial tributaries, most of which are in upper reaches. The Pines, Piedra, Navajo, Animas, La Plata, and Mancos rivers, Rio Blanco, and McElmo Creek are the only perennially flowing tributaries. Other streams such as Montezuma and Chinle creeks seasonally contribute flows. Numerous washes and arroyos also enter the river, but none provide regular flow. Among tributaries, the Animas River contributed the greatest flow.

3.2 Water Resources and Management

3.2.1 Affected Environment

Information about the water resources of the affected area of the UCRB is presented in this section, including the upper mainstem of the Colorado, the Green, and the San Juan rivers and portions of their associated tributaries. Overall, the UCRB is a highly regulated and managed water system. Water is stored in reservoirs and released at certain times to meet specific needs and to fulfill contractual requirements (U.S. Bureau of Reclamation 2006a-c, 2012).

Average annual precipitation ranges from over 60 inches in the high elevation headwaters to less than 4 inches in desert areas. Large variations in annual discharge occur due to variations in precipitation and long-term climatic trends. The average natural flow (undepleted) of the Colorado River at Lee's Ferry was 14 maf for the period 1906 to 2017, with extremes of 24 af in 1984 and 5 af in 1977. Water storage facilities (which includes federal multi-purpose projects) conserve limited precipitation, abate flood conditions, and release water when needed for agricultural, municipal, and industrial uses. In addition, water storage facilities are managed to provide flood control, hydropower, recreation, and fish and wildlife benefits. Many federal projects have been built throughout the UCRB, which are outlined below in the individual subbasins.

Water projects have been and continue to be developed by states, tribes, and other water users to use UCRB water in accordance with state water laws, the 1922 Compact, the 1948 UCRB Compact, the 1956 CRSP Act and the 1968 Colorado River Basin Project Act. The capacity of these water projects rarely exceeds 50,000 af and average annual depletions range between 25,000 and 35,000 af. Private water management includes both reservoir construction and direct flow diversions that may impact the bed and banks of a stream. These water projects involve the construction of intake structures which divert directly out of the river at a constant or varied rate according to state water administration (i.e., 'priority administration'). Currently, there are over 2,500 water projects that receive ESA compliance coverage by the recovery programs. A few key agreements are described below, but many more directly tie recovery program actions to projects that are actively diverting and depleting water from the UCRB. In each of these cases, one of the recovery programs is used as a conservation action called out in the pertinent BO or ROD.

The Section 7 Agreement, which established a framework for conducting Section 7 consultations on depletion impacts related to new projects and impacts associated with existing projects in the UCRB (Upper Colorado River Endangered Fish Recovery Program 1993, outlined in sections 4.1.5, 4.1.6, and 5.3.4). Procedures outlined in the Section 7 Agreement are used to determine if

sufficient progress is accomplished in the recovery of ESA listed fishes to enable the Upper Colorado Program to serve as an RPA to avoid the likelihood of jeopardy and/or adverse modification of critical habitat (or serve as applicant-committed conservation measures) to provide ESA compliance for new and existing projects. These actions take much of the burden of compliance off individual project proponents and coordinate the subsequent recovery actions.

Similarly, the San Juan Program document describes the process for conducting Section 7 consultations under the ESA and for reviewing the progress of the program in providing RPAs and reasonable and prudent measures (RPM) for water development and water management activities in the San Juan River basin. The Section 7 document for the San Juan Program is called “Principles for Conducting Endangered Species Act Section 7 Consultations on Water Development and Water Management Activities Affecting Endangered Fish in the San Juan River Basin” (Principles). The San Juan Program also describes recovery implementation through the San Juan Program Long Range Plan (LRP) (San Juan River Basin Recovery Implementation Program 2022b, 2022c).

With the recovery programs in place, the Section 7 consultation process for individual water users depleting water out of the UCRB is streamlined. In the Upper Colorado Program, Section 7 consultations under the Section 7 Agreement require monetary contributions to offset depletions above certain amounts. No similar contribution is required in the San Juan Program. Contributions help fund recovery measures to offset depletion impacts where needed. The permitting process is facilitated by the collaborative nature of the recovery programs since it is no longer necessary to develop case-by-case mitigation or RPAs for each proposed project to offset depletion impacts.

The ecological benefits associated with the coordination of recovery actions to offset these depletions is discussed in the relevant sections below.

3.2.1.1 Green River Subbasin

Flaming Gorge Record of Decision (ROD)

Flaming Gorge Reservoir is part of the CRSP. Flaming Gorge Dam is located on the Green River in northeastern Utah about 32 miles from the Utah-Wyoming border. The primary purpose of reservoirs constructed under CRSP is to store water for beneficial consumptive use and make it possible for the upper basin states to utilize that water consistent with the provisions of the Colorado River Compact and the UCRB Compact. Releases from Flaming Gorge reservoir are made in response to hydropower generation, recreation, and fish and wildlife needs as outlined in the authorized purposes of the reservoir.

Reclamation operates Flaming Gorge in accordance with the ROD with assistance from the Upper Colorado Program. Revised flow recommendations include experimentation with three releases designed specifically to benefit the ESA listed fish species downstream in the Green River:

- Spring peak flows are delivered during the period when razorback sucker larval fish drift to promote larval entrainment into suitable floodplain wetland nursery habitats consistent with recent operations under the Larval Trigger Study Plan (LaGory et al. 2012).
- Base flows are modified experimentally through September in specific reaches to benefit Colorado pikeminnow recruitment. Implementation of the modified base flows as suggested in Bestgen and Hill (2016) allow for summer base flows of lower magnitude than those recommended in Muth et al. (2000) in wet and moderately wet years.
- In average or drier years, experimental short duration (e.g., 3 days), high magnitude cooler release(s) (referred to here as smallmouth bass [*Micropterus dolomieu*] flow spikes) to disrupt smallmouth bass spawning and early life stage habitats are implemented. The smallmouth bass flow spikes are based on the hypothesis that reducing survival and abundance of smallmouth bass over a period of years could limit recruitment and reduce negative effects on native fishes (Bestgen 2018).

Each year, the Upper Colorado Program requests that Reclamation implement appropriate experiments based on expected flow conditions and evaluates the outcomes of those that are implemented. Results of the experiments are used to further the knowledge about the needs of the species, particularly Colorado pikeminnow and razorback sucker, in the Green River system.

Central Utah Project – Duchesne River

The Central Utah Project (CUP) was first authorized in 1956 under the CRSP Act (P.L. 84-485) as a participating project of the CRSP. Completed in the late 1980s, the Strawberry Aqueduct and Collection System enables trans-basin diversion of ~101,900 af per year (afy) to the Wasatch front of Utah. The 1998 Duchesne Biological Opinion integrated CUP operations with Upper Colorado Program management activities, specifically detailing nonnative fish abatement activities, flow need investigations, and a more detailed assessment of listed fishes use of the lower Duchesne River (U.S. Fish and Wildlife Service 1998). The Duchesne BO was amended in May of 2005 to include new findings for listed species occupation and utilization of Duchesne River habitat, and articulate flow targets for baseflow, flushing flow, and channel maintenance priorities (U.S. Fish and Wildlife Service 2005).

Yampa River Management Plan

The Yampa River Management Plan and subsequent programmatic biological opinion (PBO) were designed to promote recovery of the ESA listed fish species through the year 2045 as water depletions continue to serve existing and projected human needs in the Yampa River basin (Roehm 2004). The area of influence is the Yampa River Basin, including the Little Snake River, in Colorado and Wyoming. The implementation of the Yampa River Management Plan provides a federal nexus for all water depletions in the area of influence, so all state and private water development projects are included in the plan. Total depletions from the Yampa River above the Deerlodge gage are 169,293 af as provided in the 2016 – 2020 depletion accounting reports from Colorado (130,670 af) and Wyoming (Little Snake subbasin - 38,623 af).

In 2005, the Upper Colorado Program partners signed an agreement to add and fund an additional 5,000 af of storage to the Elkhead Reservoir enlargement project, proposed by the Colorado River District, to be used for baseflow augmentation purposes. The Upper Colorado

Program convenes weekly coordination calls with Yampa basin stakeholders during the latter part of the irrigation season, generally mid-July through early October, to coordinate releases from the long-term and lease pools in Elkhead Reservoir to more frequently achieve flow targets.

3.2.1.2 Upper Colorado River Subbasin

Three major federal water projects represent most of the federal water management activity in the Upper Colorado River subbasin: the Colorado-Big Thompson Project, the Fryingpan-Arkansas Project, and the CRSP. In addition, Reclamation's Grand Valley Project (1912) included development of a major irrigation and hydropower project near the head of the 15-Mile Reach (15-MR) east of Grand Junction and includes the Collbran, Grand Valley, and Silt projects. These federal projects have changed riverine conditions, affecting ESA listed fish. Reclamation has consulted on all existing Reclamation projects in the subbasin. Significant seasonal diversions and operations at the combined "Cameo" diversion structure (to meet irrigation and hydropower purposes) play a significant role in affecting 15-MR flows.

15-MR Programmatic Biological Opinion

The 15-MR Programmatic Biological Opinion (15-MR PBO) provides ESA compliance for continuation of Reclamation operations in the Colorado River upstream of the Gunnison River confluence, including existing and authorized depletions. Specifically, this includes Reclamation's portion of 120,000 af of new depletions upstream of the 15-MR, pre-PBO depletions by non-federal water users, and actions undertaken by the Service, Reclamation, and WAPA in the funding and carrying out of recovery actions of the Upper Colorado Program. The 15-MR PBO provides ESA compliance for approximately 1 million af of pre-15-MR PBO depletions. The consultation considered an action area within the Colorado River beginning at the Gunnison River confluence (located at Colorado River Mile [RM] 171) and extending approximately 15 miles upstream to the Grand Valley Irrigation Company diversion structure (RM 185.5).

Reclamation projects provided with ESA compliance by the 15-MR PBO include the Colorado-Big Thompson Project, the Fryingpan-Arkansas Project, the Collbran Project, Grand Valley Project, and Silt Project.

Colorado-Big Thompson Project

The Colorado-Big Thompson Project consists of over 100 structures integrated into a transmountain water diversion system that stores, regulates, and diverts water from the Colorado River on the western slope of the Continental Divide to the eastern slope of the Rocky Mountains (U.S. Fish and Wildlife Service 1999). The project annually diverts a maximum of 310,000 af of water from the Colorado River headwaters to the Big Thompson River in the South Platte River basin. Primary storage facilities on the west slope include Lake Granby (aka Granby Reservoir) and Green Mountain Reservoir.

Fryingpan-Arkansas Project

The Fryingpan-Arkansas Project supports an annual diversion of up to 69,200 af from the Fryingpan River and other tributaries of the Roaring Fork River on Colorado's western slope to

the Arkansas River on the eastern slope (U.S. Fish and Wildlife Service 1999). The project exports trans-basin water for beneficial use to Colorado water users in the Arkansas River basin in southeastern Colorado and re-regulates in-basin water for multiple western Colorado water users.

Ruedi Dam and Reservoir are the key infrastructure components of the Fryingpan-Arkansas Project and are located on the Fryingpan River.

Collbran Project

The Collbran Project developed water in Plateau Creek and its principal tributaries in west-central Colorado (U.S. Fish and Wildlife Service 1999). The project includes electrical energy generation and water for 22,210 irrigated acres, along with supplemental irrigation water. The Project includes Vega Dam and Reservoir, two powerplants, and two major diversion dams on Plateau Creek.

Grand Valley Project

The Grand Valley Project provides both municipal and irrigation water to about 42,000 acres of land along the Colorado River between Palisade and Fruita, Colorado (U.S. Fish and Wildlife Service 1999). The project works include a diversion dam, a powerplant, two pumping plants and canals, and lateral and drain systems that are hundreds of miles long. Unlike the other listed projects, the Grand Valley Diversion Dam (which provides water to the Government Highline Canal System, Palisade Irrigation District, Mesa County Irrigation District, the Orchard Mesa/Vinelands Hydropower facility, and the Orchard Mesa Canal System) is located within critical habitat for the four ESA listed fish species.

Silt Project

The Silt Project provides water from Rifle Creek and the Colorado River to irrigate 6,591 acres of land near Silt and Rifle, Colorado (U.S. Fish and Wildlife Service 1999). The project includes Rifle Gap Dam and Reservoir, a pumping plant, and a lateral system.

Implementation of the 15-MR PBO

Diversions and depletions affect base flows within the 15-MR more than in any other area of the Colorado River because, in addition to the diversions and depletions occurring throughout the contributing drainage basin, several large diversions occur immediately upstream of this reach. Extremely low water conditions can occur during the late summer and early fall months.

The Upper Colorado Program provides conservation measures outlined in the 15-MR PBO, including provision of supplemental flows to benefit ESA listed fish. Flow augmentation and protection actions for the 15-MR are guided by flow recommendations (Osmundson et al. 1995), which include both spring peaks, summer and fall baseflow targets, and winter flows. The Upper Colorado Program manages specified quantities of storage water in several different reservoirs (Table 2) to provide this water to the 15-MR for the benefit of ESA listed fish, with most of that water directed toward improving baseflow conditions during the late summer and early fall irrigation season.

Table 2. Water supplies available for release to the 15-MR; note the variable nature of some supplies based on availability and administrative circumstances in Water Division 5 in Colorado. Water Year 2013 was used for average releases because flow quantities and sources were clearly defined in Reclamation’s ‘Green Mountain Reservoir Administrative Protocol Agreement’ (February 22,2013).

Reservoir Source	Water Supply (af)	Notes
Ruedi Reservoir	5,412.5	River District agreement #139D6C0024 - West Slope water users provide 50% share of 10,825 af committed for Upper Colorado Program perpetual use
Ruedi Reservoir	5,000	Colorado Water Conservation Board (CWCB) agreement #0-07-60-W0540 committed for Upper Colorado Program use, expires in 2030.
Ruedi Reservoir	0 - 5,000	Colorado Water Conservation Board agreement #0-07-60-W0540 committed for Upper Colorado Program use, expires in 2030. '4-in 5'year pool (estimated to be available in 80% of years)
Wolford Mountain Reservoir	0 - 6,000	Wolford Biological Opinion (1998), Colorado River District: pro-rata availability based on Wolford Fill
Granby Reservoir	5,412.5	Northern Water agreement #4310J - East Slope water users provide 50% share of 10,825 af committed for Upper Colorado Program perpetual use
Total Supply Available	15,412.5 - 26,825	Average Base Pool Use since 2013: 33,021 AF
Ruedi Reservoir	0 - 6,000	Colorado Water Trust: Lease / Donation Pools
	0 - 12,000	Colorado Water Conservation Board Lease Options
HUP Surplus - Green Mountain Reservoir	0 - 66,000	66,000 AF ‘Historic User Pool’ – Compensatory storage for ‘West Slope Beneficiaries’ becomes available when ‘HUP Surplus’ declared in a given water year Average release since 2013: 32,080 AF

In addition, because of the collaborative nature of the Upper Colorado Program, voluntary agreements provide additional flows into the 15-MR. The first is a 66,000 af pool called the Historic User Pool (HUP) in Green Mountain Reservoir (Grand County, Colorado), a portion of which may be available for 15-MR instream flow purposes when the HUP's managing entities make a "surplus declaration." The "HUP Surplus" has been used for both flow augmentation during the late irrigation season and to fill 15-MR flow gaps in early spring when Grand Valley canals are operational, but snowmelt runoff has not yet materialized to meet early season irrigation demands. The second is a coordinated bypass of spring snowmelt that augments spring peak flows termed Coordinated Reservoir Operations. Under Coordinated Reservoir Operations, UCRB reservoir operators voluntarily coordinate and bypass inflows that could otherwise be legally stored to enhance the Colorado River's natural spring peak flow in the 15-MR. Reservoir operators participate when they are certain that enough water will be available to fill reservoirs and meet water right obligations.

When conditions in the 15-MR warrant additional water, leased water can be and has been made available to support flows. Multiple water leases have occurred in especially low flow years from organizations like the CWCB, Colorado Water Trust, Ute Water, and the Colorado River District.

Gunnison River Programmatic Biological Opinion and Aspinall Unit Record of Decision

The Aspinall Unit, formerly known as the Curecanti Unit, is also part of the CRSP and is located on the Gunnison River about 30 miles below Gunnison, Colorado. The Aspinall Unit includes Blue Mesa, Morrow Point, and Crystal Reservoirs (upstream to downstream, respectively) (U.S. Bureau of Reclamation 2012).

The Gunnison River PBO provides flow management for the Gunnison River Basin and the operation of the Aspinall Unit to meet its congressionally authorized purposes while addressing flow needs for the ESA listed fish in the Gunnison River and the Colorado River downstream of its confluence with the Gunnison River. In addition, the Gunnison PBO includes all existing water depletions in the Gunnison River basin as of 2009 (averaging 503,500 afy), new depletions up to 3,500 afy, and new depletions associated with the Upper Gunnison Subordination Agreement up to 22,200 afy. The Gunnison River PBO also addresses impacts from continued operation of other Reclamation projects in the Gunnison Basin; other federal, private, local, and state water projects and water uses in the Gunnison Basin; the Dallas Project (17,200 afy in the Gunnison Basin); and the Dolores Project on the Dolores River that depletes no more than 99,200 afy in the Colorado River basin downstream of the Gunnison River confluence. The Gunnison River PBO incorporates information from flow recommendations produced in 2003. The flow recommendations (McAda 2003) outline spring peak targets, minimum durations, and baseflow targets at Whitewater and below the Redlands Diversion where a fish ladder and fish screen minimize entrainment of listed fish into the Redlands Diversion canal.

Operations of the Aspinall Unit were further codified by the 2012 Aspinall ROD, which references the Gunnison River flow targets and operations to meet specific downstream spring

peak flow, duration flow, and base flow targets. The spring peak target is assessed at the Whitewater gage and is determined by the May 1 forecast of total inflow from April through July to Blue Mesa Reservoir.

3.2.1.3 San Juan River Subbasin

The Navajo Unit of the CRSP, situated in northwestern New Mexico, consists of Navajo Dam and Reservoir. The Navajo Unit serves a variety of purposes, furnishing municipal and industrial water to the surrounding area, providing irrigation water to the Navajo Indian Irrigation Project, providing flood control, and regulating water for power generation at Navajo Dam. Navajo Reservoir has a maximum content of 1,701,300 af as measured at the spillway crest (at elevation 6,085 feet) with a corresponding water surface area of 15,610 acres. The San Juan River is partially regulated by Navajo Dam. There is significant tributary inflow between Navajo Dam and Lake Powell. Substantial diversions occur from these tributaries. Since its operation began in 1962, management of Navajo Dam has tended to reduce peak spring flows in the San Juan River and to supplement flows in other seasons. The flow recommendations, as described in the Navajo Reservoir Operations EIS, were designed to create a more “natural” hydrograph with higher spring flows and lower base flows (Holden 1999; U.S. Bureau of Reclamation 2006a; San Juan River Basin Recovery Implementation Program 2018).

Operations at Navajo Dam are conducted following a decision tree that was developed in the 1999 Flow Recommendations (Holden 1999). In 2018, the San Juan Program modified the decision tree to increase the probability of reaching the higher flow targets while minimizing the risk of shortage sharing.

3.2.2 Impacts from the Proposed Action

One of the primary benefits of the recovery programs is the certainty provided to water users throughout the UCRB that they can continue to deplete water as described above without causing negative impacts to the ESA listed species. Under the Proposed Action, extending the recovery programs would continue all the water use, flow augmentation, and resource coordination described above, including investing resources needed to operate all the agreements outlined above in coordination with each other. In addition, the recovery programs would continue to provide streamlined ESA compliance for over 2,500 projects. The coordination and voluntary participation by water users, and use of state water law involved in managing water resources to assist in meeting flow recommendations, is a long-term beneficial action that is another benefit of the recovery programs. Many of the individual flow augmentation efforts might occur as mitigation measures in individual biological opinions. However, if flows to benefit the endangered species resulted in reductions of water availability for human uses, it would devolve into legal conflicts. In addition, lack of coordination among water users, the states, and Reclamation to benefit ESA listed species would mean that those groups would miss opportunities to maximize benefits in implementation. Under the Proposed Action, the existing conditions and continued water management would have beneficial effects to the ESA listed species.

3.2.2.1 Cumulative Effects

Other projects involving water management in the UCRB would continue to alter flows. For example, much of the Tribal water in the San Juan basin is not yet developed and could be utilized to meet water demands for municipal use with minimal return to the river. New water management projects might adversely affect important reaches in the San Juan, Yampa, Green, Gunnison and Colorado rivers and their tributaries. Under the Proposed Action, water management projects that cause potentially adverse depletion impacts which require federal authorization can offset these impacts through the recovery programs. The goal of the Proposed Action is to recover the listed species while providing for new and existing water development in the UCRB. All participants agreed to cooperatively work toward implementation of a recovery program that would provide for recovery of the ESA listed fish species, consistent with federal, state, and Tribal laws and systems for water resource development and use. Each signatory to the CA assumed certain responsibilities in implementing the recovery programs. The impacts of the Proposed Action are expected to be long-term and beneficial to both project proponents (through reduced regulatory hurdles and increased certainty) and federal, state, and Tribal agencies. As such, extending the recovery programs for the recovery programs would not adversely affect water resources.

3.2.3 Impacts from the No Action Alternative

Under the No Action Alternative, the recovery programs would no longer exist, which would have varying impacts depending on how the remaining partners react. For areas where a ROD has been issued for Reclamation projects, the water resources and management described in the affected area would remain very similar. Many of the actions that occur outside of the existing RODs could be incorporated into an alternative compliance mechanism with the remaining partners, could cease altogether, or could be included in individual biological opinions through the ESA Section 7 consultation process. If the Service were to require release of water from nonfederal or Tribal projects on a non-voluntary basis to comply with the ESA, reducing water availability for human uses, significant legal conflicts among state water laws and authorities under the ESA would arise, with an uncertain outcome. The coordination involved in the timing, duration and magnitude of flow would cease or become less effective and compromise efforts to meet flow targets. In addition, without dedicated funding for recovery actions, acquiring water and ensuring protecting flows would cease, or be greatly reduced, producing a patchwork of water management actions and further increasing the variability in meeting flow targets. Therefore, under the No Action Alternative, not extending the recovery programs is expected to result in a long-term significant negative effect on water management through lack of certainty.

3.2.3.1 Cumulative Effects

Projects involving water management would continue to alter flows. Under the No Action Alternative current actions that are implemented through the recovery programs and included in the Proposed Action would be discontinued. The funding authorities for annual recovery activities and capital projects in federal legislation (P. L. 106-392, as amended) would no longer provide for implementation of the recovery programs. More than 2,500 projects that are currently

covered by ESA compliance through the recovery programs would require reinitiation of Section 7 consultation. Any new or existing projects needing consultation in the future would have RPMs directly related to each project rather than through the recovery programs. Project proponents are only required to take actions that offset the impacts of their projects rather than actions that would result in recovery of the species.

The ESA compliance process for individual water users with depletion projects would require case-by-case mitigation to offset depletions impacts or an alternative compliance mechanism. If RPAs and/or RPMs to offset the depletion impact require release of water intended for human use, significant legal conflicts would result involving the states, water users, Tribes, and the Service. Permitting of new water projects could take longer and could become more challenging because the process established through the recovery programs would not be applicable. Requiring depletion offsets by individual project proponents could render new projects infeasible. The extent of this effect is highly dependent on what actions might be taken by non-federal partners if the recovery programs do not continue. With loss of ESA compliance for more than 2,500 water projects, the Service would be faced with the enormous task of consulting on those projects, a process that could take years. During that period, water uses could be subject to legal action by the United States or other parties due to lack of compliance with the ESA.

3.3 ESA Listed Fishes

3.3.1 Affected Environment

3.3.1.1 *Bonytail*

Bonytail is a fish species endemic to warmwater habitats of the Colorado River and its tributaries. It has large fins and a streamlined body that is pencil-thin near its tail. The fish is an elegant swimmer and member of the “chub” group of minnows. The bonytail has a gray or olive-colored back, silver sides, and a white belly. The species was historically widespread and common from Mexico to Wyoming, but by the 1970s had declined to less than 50 known individuals. The Service originally listed bonytail as an endangered species in 1980, citing extirpation from most of its range in the Colorado River Basin due to habitat alteration (45 FR 27710; April 23, 1980).

Bonytail are managed by the Upper Colorado Program and the Lower Colorado River Multi-Species Conservation Program. Despite management efforts, signs of bonytail survival in the wild remain rare and the ecology of the species remains poorly understood (Bestgen et al. 2008).

Without viable, wild bonytail populations, the species continues to rely on hatchery propagation to persist in the wild and advance recovery efforts. The founder population of 10 individuals used for hatchery broodstock was captured from Lake Mohave between 1976 and 1978 (U.S. Fish and Wildlife Service 2002a). Hatcheries in the UCRB produce and stock over 35,000 adult bonytail per year into UCRB rivers, including the Green, White, Yampa, Dolores, Gunnison, San Rafael, Price, and Colorado rivers (Integrated Stocking Plan Revision Committee 2015). The hatcheries include Utah’s Wahweap Hatchery (Big Water, Utah), Service’s Ouray Hatcheries

(Grand Junction, Colorado and Randlett, Utah), and Colorado's Native Aquatic Species Recovery Facility (Alamosa, Colorado).

3.3.1.2 Colorado pikeminnow

The Colorado pikeminnow is the largest member of the family Cyprinidae native to North America and is endemic to warmwater reaches of large rivers in the Colorado River basin. Historically, it was the apex predator within these reaches and is believed to be almost entirely piscivorous as an adult.

Colorado pikeminnow occurred throughout the warmwater reaches of the Colorado River basin, including the Green, Colorado, and San Juan river subbasins of Wyoming, Colorado, Utah, and New Mexico; downstream through the Colorado River mainstem in Arizona, Nevada, California, and Mexico; and the Gila River subbasin in Arizona and New Mexico. As a result of extensive water development, modified hydrology and resultant habitats, Colorado pikeminnow were extirpated from the lower basin by the 1960s. In the UCRB, including Lake Powell and its tributaries, the construction of large dams and diversions was more diffuse, leaving longer reaches of river available in downstream areas. In the UCRB, Colorado pikeminnow populations exhibit contracted ranges and reduced abundances in the Green and upper Colorado river subbasins and were functionally extirpated from the San Juan River subbasin.

The Green River subbasin had the largest population of adult Colorado pikeminnow in the 1990s and early 2000s; consisting of wild fish that have not been supplemented by stocking except in isolated instances for experimental purposes. Estimated abundance of Colorado pikeminnow adults declined from about 4000 fish in year 2000 to about 850 in 2018 (Bestgen et al. 2018). Based on low adult numbers in the most recent abundance estimates (2016-2018), efforts to collect and develop a broodstock for possible future augmentation have been initiated.

In the Green River subbasin, Colorado pikeminnow larvae are commonly produced at two primary spawning sites in the Green and Yampa rivers (Bestgen and Hill 2016). Larvae then drift downstream into nursery reaches close to Jensen, Utah where backwaters provide warm, food rich water for first summer. Adults are present throughout the Green River subbasin, including in the Yampa River from Craig, Colorado to the confluence with the Green River, in the White River from Taylor Draw Dam to the confluence, and in the mainstem Green River from Vermillion Creek to the confluence with the Colorado River.

In the upper Colorado River subbasin, the wild adult population consists of several hundred individuals, which also declined in the early 21st century. Captures of age-0 fish indicate spawning occurs annually, but recruitment is generally low with an infrequent "spawning spike" documented. In addition, populations of Colorado pikeminnow extend through the Colorado River from Rifle, Colorado to Lake Powell. The 15-MR is a critical reach that appears to provide the optimum balance between temperature and food abundance for adult Colorado pikeminnow (Osmundson et al. 1998; Osmundson 1999a). While broodstock development is underway for this species, the need for augmentation is not clear.

The San Juan River subbasin consists of adult fish that were stocked after the wild population of Colorado pikeminnow was nearly extirpated in the late 1990s. Population estimates from the 1990s suggest that there were fewer than 50 adult Colorado pikeminnow in the San Juan River (Ryden 2000a). Since 2002, nearly six million hatchery-produced Colorado pikeminnow of various life stages have been stocked in the San Juan River (Furr 2020). Adult abundance estimates indicate a relatively small adult population comprised of stocked individuals, which appears to be increasing in the last few years. Reproduction has been documented annually since 2013, with increasing catch rates of larval fish, but recruitment of wild fish beyond their first year appears to be limited. Currently, the available data suggest persistence of Colorado pikeminnow in the San Juan River is reliant on stocking.

3.3.1.3 Humpback chub

The humpback chub is a fish endemic to the warmwater portions of the Colorado River system. Humpback chub inhabit rocky canyon areas often with swift, turbulent water and are able to tolerate a wide variety of physical and chemical habitat conditions. The pronounced hump behind its head gives this fish a striking, unusual appearance. It has an olive-colored back, silver sides, a white belly, small eyes, and a long snout that overhangs its jaw. Like the Colorado pikeminnow and bonytail, the humpback chub is a member of the minnow family.

The historical range of the species includes portions of the Colorado, Green, and Yampa rivers, but this range has been reduced through the construction of mainstem dams in canyon areas. Two of eight documented populations of humpback chub are extirpated because of the construction of Flaming Gorge (Hideout Canyon) and Hoover dams (Black Canyon). A third population in Dinosaur National Monument is considered functionally extirpated because individuals have not been collected since 2004. The species is now found as five extant populations, including four upstream of Lake Powell (Black Rocks, Westwater Canyon, Desolation/Gray canyons, and Cataract Canyon) and one downstream of Lake Powell (Grand Canyon). Humpback chub are now managed as two units, the “UCRB” and “lower Colorado River basin,” separated by Glen Canyon Dam. Humpback chub do not exist in the San Juan River.

Currently, four populations of humpback chub occur in the UCRB. The Westwater Canyon population has increased substantially over the past 5 years (Hines et al. 2020), and the Black Rocks populations has remained stable (Francis 2021). The best available information indicates that the Desolation, Gray, and Cataract Canyons populations are also stable (Ahrens 2019; Caldwell 2019). Currently, management actions in the upper basin have modified river flows to make habitats suitable to support humpback chub populations. Although nonnative predatory fish species that prey on humpback chub, such as northern pike (*Esox lucius*), walleye (*Sander vitreus*), and smallmouth bass, have been documented near multiple humpback chub populations, the upper basin populations are largely free of these predators.

In 2021, the Service reclassified humpback chub from endangered to threatened because of the persistence of the four UCRB populations and the size of the wild Grand Canyon population. The Upper Colorado Program's conservation and management actions have maintained and

improved resource conditions for humpback chub populations in the UCRB, supporting the reclassification for humpback chub.

3.3.1.4 Razorback sucker

The razorback sucker is a freshwater fish species endemic to warmwater portions of the Colorado River basin in the southwestern United States, uniquely identified by a bony, dorsal keel (ridge) located behind its head. The species tolerates wide-ranging temperatures, high turbidity and salinity, low dissolved oxygen, and wide-ranging flow conditions. Razorback sucker are found throughout the Colorado River basin and are most common in low-velocity habitats such as backwaters, floodplains, flatwater river reaches, and reservoirs. The species' historical range includes most of the Colorado River basin, from Wyoming to the delta in Mexico, including the states of Colorado, Utah, New Mexico, Arizona, Nevada, and California, and Mexican states of Baja and Sonora. Dam construction across the basin dramatically altered flow-regimes and habitat, disconnecting floodplain habitats, and converting long reaches of river to reservoirs. Mainstem reservoirs initially supported some of the largest populations of razorback sucker (greater than 70,000 individuals) until nonnative sportfish were introduced and became abundant, at which time the recruitment of young razorback sucker to adults became rare and populations declined.

In the UCRB, the last wild razorback sucker was captured from the Colorado River in 1995 (McAda 2003). The Upper Colorado Program began hatchery augmentation soon after and continues to stock razorback sucker produced from established brood stocks managed by two facilities (Czapla 1999; Ryden 2006; Integrated Stocking Plan Revision Committee 2015). The hatcheries each annually spawn, produce, and distribute 6,000 razorback sucker. Estimated survival after the first year in the river exceeds the rate assumed for wild fish (Zelasko et al. 2022). The high survival of large numbers of fish stocked into the Upper Colorado Basin (over 400,000 from 1995 through 2022) have resulted in population estimates of approximately 30,000 fish in the Green River subbasin (Zelasko et al. 2018) and 5,000-8,000 for the Colorado River subbasin (Elverud et al. 2020). Those fish spawn in both subbasins (Bestgen et al. 2012).

Wild-produced razorback sucker larvae from mainstem rivers drift downstream into several managed floodplain wetlands, to allow them to grow in warm, food-rich environments. The fish are being harvested, and tagged from these managed wetlands, and returned to the main channel as juveniles, which represents the first documented recruitment of wild individuals to that life stage in decades for the UCRB.

Wild razorback sucker were extirpated from the San Juan River by the 1990s and the current population was established through stocking of hatchery-reared fish (Holden 1999). Since then, over 200,000 razorback suckers have been stocked into the San Juan River subbasin. Razorback sucker are typically stocked at sub-adult sizes (>300 mm; (Furr 2022)) and increased catch rates have indicated survival of these stocked individuals to the adult life stage (≥ 400 mm TL)(Schleicher 2018). The adult population appears to have stabilized around 3,000 individuals since 2011 (Saltzgeber and Mussmann 2020; Schleicher et al. 2022). Razorback sucker spawning has occurred consistently in the San Juan River since 1998 over a larger spatial extent with generally increased density of larval fish captured through time (Farrington et al. 2022). However, the percentage of adults participating in spawning in any given year is low, although it

is slowly increasing through time (Diver et al. 2021). Given the lack of wild recruitment, the San Juan River subbasin population of razorback sucker, like most other populations, remains reliant on hatchery augmentation for their persistence.

3.3.2 Impacts from the Proposed Action

Under the Proposed Action, all four ESA listed fish species would continue to benefit from the recovery activities undertaken by the recovery programs.

Instream flow management has restored much of the important intra- and inter-annual variability of river flow to provide valuable habitat for each of the species. Changes to the operations of the federal dams and provision of water dedicated to experimental flows have benefitted all four ESA listed fish species. For example, Flaming Gorge Dam (the Green River), the Aspinall Unit (the Colorado River), and Navajo Dam (the San Juan River) changed operational release patterns in 2006, 2012 and 1999 (revised in 2018), respectively, to reduce adverse effects of altered flow regimes and to provide downstream flows to benefit fish species ((U.S. Bureau of Reclamation 2006a, 2006b, 2012, San Juan River Basin Recovery Implementation Program 1999 and 2018). Flow management at Flaming Gorge has recently been implemented in an experimental manner that allows the Upper Colorado Program to investigate the success of a Larval-Triggered Study Plan which uses off channel wetlands to complete early life cycles of razorback sucker (LaGory et al. 2012, 2019). Similarly, the Navajo Dam operations were revised to increase high flow releases (San Juan River Basin Recovery Implementation Program 2018). Under the Proposed Action, these experimental efforts would continue when water supplies are sufficient to support implementation. Implementing, evaluating, and revising flow recommendations demonstrates a commitment by stakeholders to provide flow regimes that benefit the fish.

To maintain flows, the recovery programs have acquired water stored in reservoirs in the Yampa, Colorado, and San Juan rivers and release this water to support all ESA listed fish species when needed, such as during low-flow periods during the summer. Stakeholders in the Upper Colorado Program implement various other actions to improve flow conditions for the ESA listed fish, such as voluntary releases of water to augment the spring peak on the Colorado River mainstem (Coordinated Reservoir Operations), which has occurred 12 times since 1997 (U.S. Fish and Wildlife Service 2018). Furthermore, CWCB holds instream flow water rights on two reaches of the Colorado River to maintain minimum flows in the river, which may benefit downstream habitats and designated critical habitat. In 2023, the New Mexico Interstate Streams Commission, Jicarilla Apache Nation and The Nature Conservancy collaborated to release water to augment the spring peak on the San Juan River. This lease is in place for another 9 years, with one of its two goals being benefit to threatened and endangered species. Under the Proposed Action, all flow coordination would continue to support the species.

Habitat management includes installation and management of fish passage facilities over diversion dams and fish screens to prevent entrainment of fish in canal systems in the Green, Colorado, and San Juan rivers. Currently, passages have been installed at all major impediments within critical habitat in the Green or Colorado subbasins, and their associated canals are screened, allowing for improved movement between populations. Improved movement between

all UCRB populations provided by the fish passage structures allows for genetic exchange and maintenance of genetic diversity of populations. One additional canal, Maybell, in the Yampa River, is currently planned to undergo renovation. A screen is not included for that facility as because remote monitoring equipment has indicated that entrainment of ESA listed fish is rare. In the San Juan River, access to 36 miles of critical habitat was restored in 2002 when a nonselective fish passage was constructed at Hogback Diversion, and the Cudei Diversion was replaced with a subsurface siphon. In 2003, a selective fish passage operated by the Navajo Nation Department of Fish and Wildlife was built around the Public Service Company of New Mexico (PNM) Weir to allow native fish access to upstream habitat. Additionally, modifications to improve fish passage at the Arizona Public Service Weir and Fruitland Diversion Weir were included in recent BOs and are planned to be constructed soon. Most diversion structures in the San Juan River are not screened, but in 2013 a weir wall was installed in the Hogback Canal to reduce entrainment into the irrigation canal, and efforts are ongoing to install similar structures at the Fruitland and PNM diversions. Under the Proposed Action, extending the recovery programs would result in consistent funding for the operation, repair and replacement of these facilities as needed. Any construction activities required would undergo a separate site-specific NEPA analysis.

Habitat management for razorback sucker is focused on the development and management of suitable nursery habitat, either in off-channel wetlands (Green and Colorado river subbasins) or in-river habitat installations (San Juan River subbasin). Most important for razorback sucker in the Green River are spring peaks timed to transport wild-produced larvae into warm, food-rich floodplain wetlands that are then managed to exclude nonnative fish (Bestgen et al. 2011). Successful floodplain management for razorback sucker nursery habitat requires: (a) Flow management that provides floodplain connection when larval razorback sucker are present in the system; (b) floodplains that are retrofitted with water control structures that restrict entry of large-bodied fish and allow managers to fill and drain the habitat at the beginning and end of the growing season, respectively; and (c) a supplemental water source to freshen floodplain water quality through the summer. The Upper Colorado Program has developed multiple wetlands that can connect under various flow regimes in the Green River downstream of Flaming Gorge Dam. One wetland, Stewart Lake, has provided the largest naturally produced cohort of wild razorback sucker surviving through their first summer of life to date in the UCRB (Partlow et al. 2022). In total, seven such wetlands under varying degrees of management have produced and returned to the mainstem Green and Colorado rivers over 8,000 wild-spawned juvenile razorback sucker since 2013, with documented survival and recruitment to age-6 for at least two of those fish (Ahrens 2022; Goodell and Breen 2022; Partlow et al. 2022; Smith and Beers 2022). This potential completion of the species life cycle has contributed to the proposed downlisting rule for razorback sucker (86 FR 35708).

Nonnative fish management is conducted to reduce the negative impacts of nonnative fish species on ESA listed fishes. The Upper Colorado Program implements a comprehensive suite of nonnative fish management actions to limit these effects. The two core actions to reduce predation are removing predatory fish from approximately 966 km of river and screening reservoirs to prevent predators from escaping into the downstream habitats. Additionally, state

partners in the Upper Colorado Program no longer stock the most predatory nonnative fishes, and instead stock alternatives that tend not to contribute to large populations in river habitats. State partners have implemented harvest regulations that promote removal of nonnative predatory fish throughout the UCRB, including sponsoring incentivized harvest in some locations.

Bonytail stocking occurs in both the Green and Colorado river subbasins. Razorback sucker is stocked in all three subbasins. Stocking of Colorado pikeminnow currently occurs in the San Juan River, and stocking is under consideration based on status of the species in the Green and Colorado rivers.

Robust monitoring programs have been developed for Colorado pikeminnow, razorback sucker, and humpback chub in areas managed by the recovery programs, including adult population estimates where possible. Larval and young-of-year monitoring occurs for both Colorado pikeminnow and razorback sucker.

Educational efforts throughout the basin are enhancing the public's recognition of these four ESA listed fish species, promoting additional conservation and protection of individuals that may be seen in the wild. Dedicated funding provides stable resources for these conservation actions.

Under the Proposed Action, the recovery programs would continue to provide long-term benefits to maintain and improve Colorado pikeminnow, razorback sucker, humpback chub and bonytail populations and the ecosystems upon which they rely, continuing progress to recovery.

Implementation of the recovery elements under the Proposed Action would result in both short-term and long-term beneficial impacts to the four ESA listed species within the UCRB. However, some short-term negative impacts of the recovery actions may include injury, mortality, disturbance, or displacement of individuals, but are considered discountable given the long-term benefits of the success of the recovery programs which have supported the recent downlisting of humpback chub from endangered to threatened (86 FR 57588) and the proposed downlisting for razorback sucker (86 FR 35708). Therefore, under the Proposed Action, extending the recovery programs would benefit the four ESA listed species through continued coordination of recovery actions.

3.3.2.1 Cumulative Effects

The recovery programs have been in place, as early as 1988, aiding the recovery of the ESA listed species, as evidenced by the downlisting of humpback chub and proposal to downlist razorback sucker. However, current and future projects outside the scope of the recovery programs may impact the ESA listed species in the UCRB. These projects could include grazing, transportation, land management plans, and renewable resources as a few examples. If there is a federal nexus, these types of activities may need ESA Section 7 compliance and if there is no federal nexus then there may need to be ESA Section 10 compliance. Under those activity scenarios impacts would be minimized through the ESA Section 7 or Section 10 compliance mechanism. Past and planned restoration and recovery activities as mentioned in the species section above in the UCRB are contributing to mitigation for historical landscape alteration effects of the four ESA listed species and habitats. Restoration effort, water management,

nonnative fish management and stocking have proven effective and Under the Proposed Action would continue to be an effective and efficient mechanism toward collaborate conservation and recovery. Therefore, Under the Proposed Action, in particular over time and with future collaboration would result in incremental increases in water quantity, water quality, habitat development and enhanced survivability of the ESA listed fishes.

3.3.3 Impacts from the No Action Alternative

Under the No Action Alternative, not extending the recovery programs would hamper recovery of all four ESA listed species. Because bonytail exists only through stocking, functional extirpation would be likely in the UCRB. Dissolution would also likely result in the functional extirpation of wild Colorado pikeminnow in the Green River. The Colorado River population of Colorado pikeminnow may persist if the current pattern of periodic recruitment spikes continues in that subbasin. Colorado pikeminnow in the San Juan would not persist without active stocking efforts. Humpback chub would likely decline in all UCRB populations, but more slowly than other species due to their utilization of deep water in rocky canyons which isolate them from large nonnative fish populations. Without continued stocking and recovery efforts and the absence of recruitment, the estimated 30,000 razorback sucker in the Green River subbasin would decline to fewer than 500 in twenty years (Zelasko et al. 2022). Similar declines would be anticipated in the Upper Colorado and San Juan River subbasins.

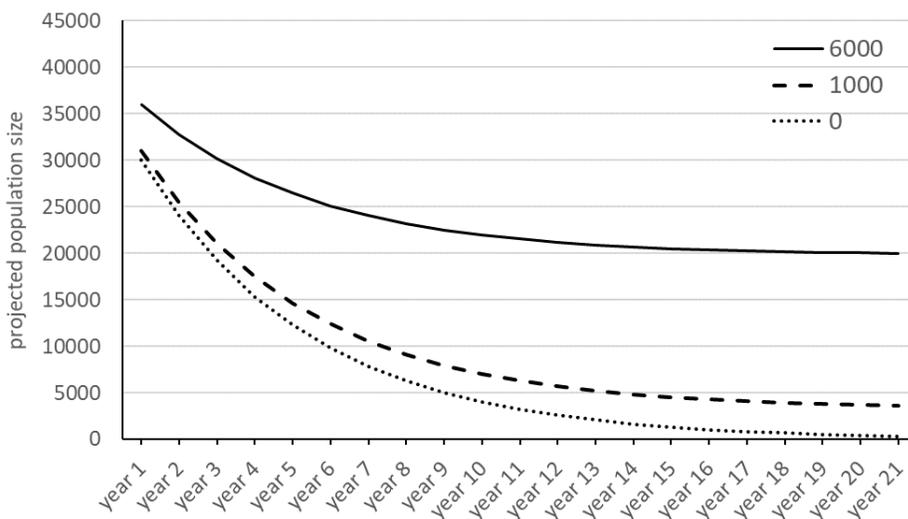


Figure 1. Predicted population size through time of an initial 30,000 hatchery-reared razorback sucker (Zelasko et al. 2018) in the Green River subbasin under various stocking scenarios: annual autumn stocking of 6,000 or 1,000 350 mm TL razorback sucker with mean first-year and subsequent-year survival rates of 0.46 and 0.80, respectively; or cessation of annual stocking, with subsequent-year survival of 0.80 for the existing fish. Adapted from Zelasko et al. (2022).

Instream flow management would continue downstream of Reclamation reservoirs based on existing RODs but would not occur in other critical reaches like the Yampa and Colorado rivers

unless determined to be part of the consultation process in specific BOs. Coordination efforts to implement experimental releases from Flaming Gorge Reservoir to transport wild razorback sucker larvae into floodplain wetlands, disadvantage smallmouth bass, and support Colorado pikeminnow would cease. Habitat management in floodplain wetlands might continue at some sites, specifically at Stewart Lake and on the Ouray National Wildlife Refuge, but not at levels that would support bonytail or razorback sucker recovery. Some nonnative fish management, stocking, and educational efforts would continue through the Service and the states of New Mexico, Colorado, and Utah, but without dedicated funding provided by the recovery programs, the efforts would be a small fraction of their current extent. Therefore, under the No Action Alternative, not extending the recovery programs is expected to result in long-term adverse effects on the four ESA listed fish species in the UCRB.

3.4 Other Federally Listed Species and Species of Special Status

3.4.1 Affected Environment

Because of the large area of influence of the recovery programs, many federally listed species and other species of special status have populations or established critical habitat within the geographic scope of the recovery programs. Many of these species are not expected to be impacted by recovery program actions which primarily occur in or around critical habitat of the four ESA listed fish species. The species not likely to be impacted are found in Appendix A.

Aquatic species with state special status and ranges that overlap with, or are close to, critical habitat are affected by the presence of the recovery programs. These include: bluehead sucker (*Catostomus discobolus*) – New Mexico Endangered, Utah Species of Greatest Conservation Need (SGCN), Wyoming SGCN; flannelmouth sucker (*Catostomus latipinnis*) – Utah SGCN, Wyoming SGCN; and roundtail chub (*Gila robusta*) – Colorado Species of Concern, New Mexico Endangered, Utah SGCN, Wyoming SGCN. They are commonly referred to as the “Three Species” because they are managed together. The Three Species are a substantial component of the historical prey base for Colorado pikeminnow.

Bluehead sucker are members of the sucker genus *Catostomus*, with skin that can vary from entirely silver, to tan or dark brown dorsally, with a white to yellowish white belly. Larger fish tend to have a bluish tint on the head, more prevalent in adults. Bluehead sucker tend to utilize swifter velocity, higher gradient streams than those occupied by either flannelmouth sucker or roundtail chub.

Flannelmouth sucker, also members of the sucker genus *Catostomus*, have long bodies with short thick heads. They have thick, fleshy lobes on their bulky lower lips. Flannelmouth sucker reside in mainstem and tributary streams. Obstructions to movements such as dams may also be an important consideration in the conservation of flannelmouth sucker because of their presence in mainstem habitats.

Roundtail chub are members of the minnow family with an olive or gray-colored back, and a white belly. Roundtail chub utilize slow-moving, deep pools for cover and feeding. These fish

are found in the mainstem of major rivers and smaller tributary streams. Roundtail chub are carnivorous, opportunistic feeders.

3.4.2 Impacts from the Proposed Action

Under the Proposed Action, instream flow management, habitat actions, and nonnative fish removal conducted by the recovery programs would have a positive effect on the Three Species. Flow management across the basin enhances flows for fish in both mainstem and tributary environments. The water managed throughout the UCRB provides additional habitat for the Three Species, both in critical habitat and non-designated habitat. In addition, the Three Species have populations below many of the federal dams that are managed with the listed fish species in mind, including Flaming Gorge, the Aspinall Unit, and Navajo Dam.

Both recovery programs have installed screens on irrigation canal intakes to keep most fish species out and return them to the riverine environment. As a supplementary measure, the Upper Colorado Program conducts salvage efforts in the canals each fall as irrigation canals are closed. Very few ESA listed fish are found during these efforts, but substantial numbers of Three Species are recovered and returned to the river. Between 2004-2018, over 200,000 Three Species individuals were recovered from the Grand Valley Irrigation Company and Grand Valley Water Users canals (Crowley and Ryden 2019).

The primary predators of the ESA listed fish species also prey on the Three Species because of their overlapping ranges. In areas where nonnative fish have invaded, native species are very rare, such as in the middle Yampa River which has substantial northern pike and smallmouth bass populations. Contrastingly, areas with robust native fish populations such as the Gunnison River have low densities of nonnative fish. Removal of smallmouth bass, walleye, and northern pike which are all very predatory fish reduces predation impacts on all native fish.

Should the actions of the recovery program restore populations of Colorado pikeminnow to sustainable levels, healthy populations would likely be an additional predation pressure on the Three Species. This increase in predation from a native predator would likely depend on the removal or suppression of nonnative predators. Predation effects from a native predator would likely be much smaller than the predation effect of the current persistence of nonnative predators. Overall, the continuation of the recovery programs would benefit other listed species, particularly the Three Species.

3.4.2.1 Cumulative Effects

Current and future projects outside the scope of the recovery programs may impact the Three Species populations in the UCRB. These projects could include grazing, transportation, land management plans, and renewable resources as a few examples. Past and planned restoration and recovery activities as mentioned in the species section above are contributing to improving historical landscape alteration effects of the four ESA listed species and habitats, as well as native populations of the Three Species. Restoration efforts, water management, nonnative fish management and stocking have proven effective and would continue to be an effective and efficient mechanism toward collaborate conservation and recovery under the Proposed Action.

Therefore, under the Proposed Action, in particular over time and with future collaboration, would result in incremental increases in water quantity, water quality, habitat development and enhanced survivability of the Three Species.

3.4.3 Impacts from the No Action Alternative

Under the No Action Alternative, the recovery programs would not be extended and both flow management and nonnative removal efforts would be discontinued to substantially decreased, potentially resulting in a further decrease in the Three Species populations. The canal screens would continue to be used periodically because of existing federal contracts with the canal companies, and canal salvage would likely continue, assuming continued funding and implementation by Colorado Parks and Wildlife. Discontinuation of the recovery programs would likely cause adverse impacts to Three Species populations.

3.5 River Geomorphology and Aquatic Habitat

3.5.1 Affected Environment

Formation and maintenance of aquatic habitat necessary for the native fish community are controlled by the physical (geomorphological and hydrological) characteristics of the river. The endangered fishes adapted to a riverbed with areas of silt, sand, gravel, and cobble. Gravel and cobble bed parts of the channel, especially riffles, are essential for spawning. Sand and silt bed parts of the channel, especially backwaters, are utilized extensively by larval and juvenile fishes. Aggradation that results in an all-sand bed channel or degradation that results in an all-gravel bed channel would eliminate essential habitat for specific life stages of the ESA listed fish and would disrupt the sustainability of ESA listed fish communities.

Scouring or flushing flows prepare riverbeds for spawning by removing sand and silt and may be required to maintain the present character of the streambed in areas of concern. For example, in the San Juan River the planform channel has changed drastically since the 1930s with a large decrease in channel area, island count, and island area (Bassett 2015).

Habitat response occurs in two ways: as a direct response to the flow in the river and as a secondary response to changes in channel morphology induced by hydrologic events. For example, cobble transport necessary for the formation of fish spawning bars is related to the stream gradient, cobble size, channel cross-section, and river flow. Tributary inflows from extreme monsoonal events may introduce both coarse and fine materials into the mainstem habitats, where more regulated flows below major reservoirs (e.g., Navajo, Flaming Gorge) are limited in their ability to re-sort these sediments in a manner conducive to ESA listed fish spawning, so periodic flushing flows may be coordinated to maintain high-value spawning sites. Prescribed flows may also be necessary to sustain historic channel complexity where it exists, or to improve habitats where certain life stage needs are not being met.

Reduced peak flows and flow stabilization have contributed to channel narrowing and simplification. Reduced peak flows and flow stabilization are exacerbated by drought conditions,

climate change and hydrologic management. Flow stabilization has led to proliferation of vegetation including the invasive and nonnative tamarisk along the channel and associated sediment deposition, channel narrowing and channel simplification (Friedman 2018).

Cottonwoods can compete with tamarisk when flows closely mimic a natural hydrograph. Under native flow conditions, both cottonwood and tamarisk seedlings are scoured away in the active channel area (generally, below floodplain elevations). In a regulated, stabilized flow regime, tamarisk have greater opportunity to germinate new seedlings on the wetted below-floodplain surface due to their longer seed production period, which regulated base flows may allow to persist even in dry years (Friedman 2018). Reductions in peak flow can reduce the power of the river to re-sort coarse sediment, flush fines from spawning sites, and scour newly established vegetation, leading to channel narrowing and simplification. These processes threaten persistence and quality of the different habitat components (e.g., spawning sites, backwater and side channel features) that are needed for self-sustaining ESA listed fish populations.

Definition of the flow conditions necessary to develop and maintain fish spawning habitat requires an understanding of these physical relationships in the river. River geomorphology descriptions have been developed in various documents highlighting river conditions of the UCRB that describe flow, sediment transport, topography and river plan form and are incorporated by reference into flow guidance used by the San Juan and Upper Colorado River Programs (Muth et al. 2000, McAda 2003, Holden et al. 1999, Bassett 2015, Lamarra and Lamarra 2021). Program instream flow management is largely incorporated into RODs for federal projects that govern releases by recognizing how different year-type hydrology dictates the opportunities or limitations that affect aquatic habitat (e.g., Green River below Flaming Gorge Reservoir; Gunnison River below Blue Mesa Reservoir). Flow operations for the 15-MR require a coordinated approach with both non-federal and federal partners that enables real-time adjustments throughout a given water year to account for habitat needs for spring, peak runoff, and baseflow conditions during the irrigation season.

3.5.2 Impacts from the Proposed Action

Under the Proposed Action, a similar level of flow management activities that would affect river geomorphology and aquatic habitat is expected to continue to be managed beyond 2024 within the UCRB. As such, effects to geomorphology and aquatic habitat due to recovery activities would be similar to what is described in Section 3.5.1, which are entirely intended to improve or sustain aquatic habitats for endangered and other native fish. Non-flow projects that could affect aquatic habitat or local geomorphology, such as incorporation of wood into in-channel structures, re-connection of side-channel or floodplain habitats, or construction or re-construction of diversions for off-channel habitat purposes, would require additional site-specific NEPA compliance where implemented. These site-specific projects would implement best management practices during construction and operation to avoid and/or minimize adverse impacts to geomorphology and aquatic habitats where required by federal, state, Tribal and local regulations. Under the Proposed Action, there would be no additional adverse impacts to geomorphology and aquatic habitat.

3.5.2.1 Cumulative Effects

Water development in the UCRB can and does restrict the amount of water available for channel altering flows. Implementation of the recovery programs provides a venue for coordinated releases that support larger spring peaks that would otherwise be reduced by water removed from the river. These effects are expected to be beneficial and long-term, in the 15-MR in particular, because coordinated flows can scour established vegetation, move sediments, create backwaters and side channels, which are all parts of healthy riparian habitat. No cumulative effects are expected in systems dominated by CRSP reservoirs.

3.5.3 Impacts from the No Action Alternative

Because most large reservoir releases are governed by RODs that tier off flow recommendations that include considerations around river geomorphology, most river geomorphology would not be affected by the dissolution of the recovery programs. However, it is anticipated that voluntary efforts in the UCRB that enhance flows could cease, reducing the effectiveness in maintaining favorable geomorphology and aquatic habitat is beneficial for these four federally listed species, particularly in the 15-MR of the Colorado River. Under the No Action Alternative, an adverse effect on geomorphology and aquatic habitats is anticipated.

3.6 Riparian Habitat and Wetlands

3.6.1 Affected Environment

Waterfowl habitat, wetlands, riparian (streamside), and bottomland vegetation are all closely interrelated components of the terrestrial ecosystem occurring along major rivers of the affected area. Therefore, they are discussed collectively rather than as separate topics.

The riparian-wetland vegetation complex is one of the most limited and valuable wildlife habitat types in the UCRB. As a narrow belt of relatively lush habitat within an otherwise arid terrain, it is vital to many wildlife species. Cottonwoods provide nesting, roosting, and perching habitat for raptors, herons, and passerine birds. Numerous mammals use the understory.

Waterfowl nesting habitat occurs naturally on the banks, islands, and floodplains of the major streams and tributaries. In addition, multiple wetlands managed for razorback sucker also serve as areas supportive of or managed for waterfowl.

The recovery programs have been working to manage various floodplain wetland habitats in the Green and upper Colorado rivers. Starting in the 1990s, the Upper Colorado Program breached levees that prevented wetlands from connecting to the rivers to increase floodplain habitat availability for razorback sucker. Spring peak flow recommendations are also partially based on achieving bankfull flows that can connect the rivers to floodplain wetland habitats. More recently, the recovery programs have been constructing water control structures with screens to manage water inflow and outflow from select wetland sites. The goal of these modifications is to time the flow of water into wetlands when razorback sucker larvae are present in the river, while also preventing larger nonnative fish species from colonizing the same habitats. These wetlands

are then managed via pumping or supplemental water deliveries throughout the summer and autumn to maintain water quality and depth for fish that are entrained.

The Upper Colorado Program has worked in recent years to expand wetlands habitats where possible and is in fact one of the few creators of expanded wetland environments in the UCRB. When wetlands are constructed or physically altered, a separate environmental assessment is completed addressing any possible effects of construction. The actions considered here include the management of the developed wetland habitats to support razorback sucker and/or bonytail, especially in younger life stages. Currently, management for these ESA listed fish species occurs in conjunction with other management priorities and provides additional benefits, such as maintenance of water quality or habitat for waterfowl. Management of wetland habitat often results in retaining water in wetland environments longer than would occur naturally, either through additional pumping or through operation of gates installed to hold water entrained during spring peak flows. In addition, the recovery programs work to maintain open water in wetlands environments, which otherwise would be overtaken by invasive vegetation, such as cattails.

The recovery programs monitor riparian habitats (i.e., secondary and backwater habitats) and river channel morphology to determine whether channel narrowing or habitat loss is occurring. In some cases, flow management (i.e. Flaming Gorge and Navajo Dam) or mechanical restoration (i.e. in the San Juan River) can be directed towards areas where riparian degradation has been observed. While high flows in the San Juan River create and maintain habitats that promote recovery for the Colorado pikeminnow and razorback sucker, these flows have not occurred at the desired frequency due to the ongoing drought. To counteract habitat degradation in the absence of high flows, numerous secondary channels have been restored and reconnected to the mainstem San Juan River. Additionally, given the success of off-channel wetland construction in the Colorado and Green rivers, an off-channel wetland was created in the San Juan River, but it unfortunately failed following subsequent high flows. Efforts are ongoing to create new off-channel wetlands in the San Juan River.

3.6.2 Impacts from the Proposed Action

Under the Proposed Action, there would be no change to the nature and types of impacts to riparian habitat and wetlands as those described in Section 3.6.1. In general, the acres of wetlands, secondary channel, and backwaters developed or maintained through the recovery programs would continue to increase to support recovery. This would result from implementing instream flow management, mechanical restoration to secondary and backwater channels, as well as maintaining and developing new wetlands targeting habitat improvements. Wetland and riparian habitat improvements would remove nonnative invasive vegetation (i.e., Russian olive or tamarisk) and allow for revegetation of native plants. Habitat improvements would involve temporary vegetation removal and ground disturbance and may increase the potential for noxious nonnative vegetation through construction activities, the effects of which would be assessed in independent NEPA assessments. However, the recovery programs would continue to implement best management practices to minimize this effect as part of their coordinated efforts. Under the

Proposed Action, extending the recovery programs would positively affect riparian habitat and/or wetlands.

3.6.2.1 Cumulative Effects

The Service, state wildlife agencies, and nonprofit organizations actively manage wetland environments to support migratory birds, waterfowl, and other wildlife. Under the Proposed Action, extending the recovery programs would produce more productive wetlands and aquatic environments in the long-term. No change in cumulative effects is expected from continuing the recovery programs.

3.6.3 Impacts from the No Action Alternative

Without operation of these wetlands or mechanical aquatic habitat improvements by the recovery programs operations would return to previous priorities, including support of waterfowl or water quality. Most of the entrained water in many of the wetlands would drain or evaporate much earlier in each season because the water would not be specifically held throughout the entire summer to support juvenile fish. Wetlands with gates could be managed by other entities, but funding for these activities would be uncertain. The gates of these created wetland habitats would be left open or would degrade, allowing for natural inflow and draining to occur as river levels fluctuate. The No Action alternative is expected to have a long-term adverse impact to riparian areas/wetlands in the action area.

3.7 Recreation Activities

Recreation resources of concern include recreational fishing and boating within the UCRB.

3.7.1 Recreational Fishing Affected Environment

Rivers and reservoirs serve as habitat for both native and nonnative fish species, some of which are attractive for angling opportunities. The reservoirs serve an important role in water supply management and are also used for recreation, including sportfishing.

Sportfishing is an important recreational activity in the UCRB. According to the U.S. Bureau of Economic Analysis, the economic value of fishing in some Western states is approximately \$500 million annually. In 2019 in Colorado alone, over 300,000 people spent over 2.2 million days fishing in the Colorado River basin, accounting for \$181.8 million in spending (Southwick Associates 2020)².

The Upper Colorado Program has developed agreements for stocking nonnative fish (U.S. Fish and Wildlife Service 2009) between the Service and the states of Colorado, Utah, and Wyoming. The Upper Colorado Program stocking agreement outlines locations, species, and procedures for stocking nonnative sportfish in a manner consistent with endangered species recovery. This includes a list of compatible sportfish, and associated escapement prevention requirements, that can be stocked in reservoirs throughout the basin without endangering the native fish species in

² These figures include fishing targeting both coldwater and warmwater species present in the Colorado River basin.

downstream river habitats, and a list of noncompatible sportfish that cannot be stocked or propagated in any manner. All salmonid species targeted by anglers in the UCRB are listed as compatible species and are not impacted by the continuation of the recovery programs, along with largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*) yellow perch (*Perca flavescens*), tiger muskie (*Esox masquinongy X Esox lucius*), wiper (white/striped bass hybrid [*Morone chrysops x Morone saxatilis*]), and sterile walleye if nets are used to prevent escapement into the rivers. The relevant states and the Service have signed the Upper Colorado Program's stocking agreement; therefore, the agreement would continue to be implemented whether the recovery programs continue or not. The San Juan Program is in the process of developing similar agreements.

3.7.1.1 Coldwater sportfishing

Salmonid species are not considered a threat to the recovery of the four ESA listed fish species because their habitats do not commonly overlap in the UCRB. Therefore, the recovery programs do not actively manage against salmonids. In fact, nonnative removal performed by the recovery programs can benefit salmonids.

Four reservoirs actively managed by the recovery programs and their tailwaters provide angling opportunities for various species of trout (*Oncorhynchus spp.*) and kokanee salmon (*Oncorhynchus nerka*). All water management efforts and flow recommendations consider angling opportunities downstream of these reservoirs as flows are released.

Flaming Gorge Reservoir supports a quality fishery for lake trout (*Salvelinus namaycush*) and provides fishing opportunities for rainbow (*Oncorhynchus mykiss*), brown (*Salmo trutta*), cutthroat (*Oncorhynchus clarkii*), and brook trout (*Salvelinus fontinalis*) as well as kokanee salmon. The reservoir is classified as a Class 1 Fishery Water by the Utah Division of Wildlife Resources, indicating a high-quality angling opportunity. Anglers also enjoy the opportunities in the tailwaters of Flaming Gorge. A 2018 study documented 756 angler hours per acre in the tailwaters, which was almost 100 times the angling pressure in the reservoir itself (8 angler hours per acre) (Mosley et al. 2020).

Ruedi Reservoir provides sportfishing opportunities for rainbow, brown, and lake trout and kokanee salmon. There are over 26 miles of Gold Medal Waters downstream of the reservoir in both the Fryingpan River and the Roaring Fork River.

The Aspinall Unit consists of three dams (Crystal, Blue Mesa and Morrow Point Dams) on the Gunnison River in Colorado. The reservoirs and tailwater of the Aspinall Unit provide fishing opportunities for rainbow, brown, and lake trout as well as kokanee salmon. The Gunnison River downstream of the Aspinall Unit is considered Gold Medal Waters with the catch dominated by brown and rainbow trout.

The Navajo Reservoir and tailwaters provide fishing opportunities for rainbow and brown trout, largemouth and smallmouth bass, crappie, bluegill, channel catfish (*Ictalurus punctatus*), northern pike, and kokanee salmon. The first 3.75 miles of Navajo Reservoir tailwaters are designated as Quality Waters for trout fishing by New Mexico Department of Game and Fish.

A variety of other coldwater sportfishing opportunities are available in the basin and are not impacted by flow management for the recovery programs.

3.7.1.2 Warmwater sportfishing

The Yampa, Green, White, Colorado, San Juan rivers and tributaries provide several miles of warmwater fishing opportunity for New Mexico, Colorado, and Utah residents and visitors. Warmwater reservoir fishing opportunities are plentiful across the basin, including opportunities to catch walleye, largemouth and smallmouth bass, northern pike, and catfish. Colorado and Utah are currently working to develop compatible sportfisheries across the upper Colorado and Green river subbasins. Current state regulations allow for unlimited harvest of northern pike, smallmouth bass, channel catfish, striped bass, and walleye, demonstrating the states' support for removal of these species. In Colorado, nets or screens preventing downstream escapement from Elkhead and Ridgway reservoirs funded by the Upper Colorado Program support fishing tournaments that provide angling opportunities and target species removal. In Utah, in Starvation and Red Fleet reservoirs, stocking of desirable species is supported by recovery program screens at both Starvation and Red Fleet reservoirs. In both states, lake management plans currently support stocking of species that are desirable for fishing and supportive of endangered species recovery. Maintaining opportunities with species compatible with recovery is likely to continue regardless of the Proposed Action.

3.7.2 Impacts from the Proposed Action

Under the Proposed Action, efforts to remove northern pike in coldwater habitats, especially in the Yampa and Colorado rivers, would continue to decrease the opportunity for northern pike fishing and enhance populations of salmonid species. As salmonids are the preferred sportfish for most anglers, removal of northern pike benefits the majority of the angling community in the affected area. The effect on coldwater fisheries would be beneficial because of the recovery program actions that support salmonid species. In-river removal efforts of smallmouth bass and walleye in warmwater systems would continue, which would decrease the number of large individuals of these species available for capture in rivers. The effect on warmwater fisheries would be adverse as the goal of the recovery programs is to remove fishable nonnative species from riverine environments. The recovery programs' work to create compatible fisheries where possible would reduce the effect to a non-significant level.

3.7.2.1 Cumulative Impacts

No cumulative impacts are anticipated for recreational fishing. All recreational fishing is managed by the state agencies acting in conjunction with the recovery programs.

3.7.3 Impacts from the No Action Alternative

Colorado Parks and Wildlife spends substantial time removing northern pike from Catamount Reservoir to support and expand a population of whirling-disease resistant rainbow trout. Those efforts in the reservoir would continue, but northern pike removal efforts in the Yampa River would decline, leaving trout populations vulnerable to predation from northern pike in coldwater habitats.

If the recovery programs were not extended, the resources available to manage nonnative species would likely substantially decrease, resulting in expansion of populations of smallmouth bass, walleye, and northern pike throughout the Yampa, White, Green, and Colorado rivers both in and outside of critical habitat. This halt of nonnative species removal may enhance in-river fishing opportunities for the smallmouth bass, walleye, and northern pike, but it could result in a decrease in trout. Current states' regulations supporting unlimited in-river fishing for these species would remain in effect.

Overall, the effect of discontinuing the recovery program would be beneficial to nonnative fish species actively targeted for removal, which in turn would have a positive effect in in-river fishing conditions for warm-water anglers. In addition, the halt of nonnative fish removal would have a significantly adverse effect on native and salmonid species highly desirable to anglers.

3.7.4 Recreational Boating Affected Environment

The distinctive and diverse geography of the area, with high mountain streams and meadows, steep canyon walls, placid river reaches and reservoirs, turbulent rapids, and desert scenery make the UCRB a popular boating area. Water sports in the Colorado River basin in Colorado alone account for almost 4 million outdoor recreation days annually for a total economic impact of \$569 million to local communities (Southwick Associates 2020).

Whitewater rafting areas are present on the Green River below Flaming Gorge Dam, in Lodore through Split Mountain, the Green River through Desolation and Gray canyons, the Yampa River from Deerlodge Park to the confluence with the Green River, the Colorado River through Ruby-Horsethief, Westwater, and Cataract canyons, and the Gunnison River from Crystal Dam to its confluence with the North Fork of the Gunnison. Recreational river runners typically prefer steady, moderate to high flows, especially through whitewater areas, to achieve the most rewarding river running experience.

Flatwater rafting has become increasingly popular through the Green and Colorado rivers in Canyonlands National Park as well as in the Colorado River upstream of Moab, the Yampa River upstream of Deerlodge, and along the lower Green River.

Commercial and private rafting are present on the San Juan River. BLM regulates float trips through a permit system, with most trips occurring from March through September, though river use is open year-round. Launch sites include Sand Island and the Mexican Hat Boat Ramp; other sites are also used occasionally. Take-out locations are the Sand Island Boat Ramp, the Mexican Hat Boat Ramp, and Clay Hills. Most trips originate at Sand Island, and camping occurs along the north side of the San Juan River in unreserved sites between Sand Island and Government Rapids. Below Government Rapids, camping sites are designated and reserved through a permit system. Some trips start at Montezuma Creek or Navajo Reservoir.

Reservoir boating, canoeing, kayaking, and jet boating are also popular throughout the basin, including on reservoirs used by the recovery programs: Flaming Gorge, Blue Mesa, Morrow Point, Crystal, Ruedi, Green Mountain, and Navajo reservoirs, among others. Reservoir boaters can be affected by changes in reservoir operations as low reservoir levels can make access to boat ramps difficult.

3.7.5 Impacts from the Proposed Action

Under the Proposed Action, extending the recovery programs would maintain or improve recreational boating conditions because coordinated flow management generally increases water available in rivers for boating purposes.

The recovery programs and the agencies responsible for implementing the applicable RODs coordinate flow management throughout the current range of the ESA listed species to support recovery. Because much of the habitat of these species overlaps with areas commonly used for boating, those actions tend to also benefit recreational boaters. Instream flow coordination for the Yampa and Colorado rivers can have positive impacts for recreational river runners by adding flow to those river systems during summer months, potentially increasing the number of boatable days. The effects in the Colorado River are less impactful than in the Yampa because most of the flow in these reaches of the Colorado River is provided by Gunnison River flows guided by the Aspinnall ROD. Overall, the effect of the Proposed Action, under Upper Colorado Program flow management, is expected to be small, but positive, relative to recreational boating resources.

Reservoir elevations are managed by Reclamation in accordance with the RODs for each reservoir and are not impacted by the presence or absence of the recovery programs.

3.7.5.1 Cumulative Impacts

Under the Proposed Action, extending the recovery program would continue a focus on maintaining instream flow to support ESA listed fish species which would also benefit recreational boating. No change in cumulative impacts is expected, regardless of the presence of the recovery programs.

3.7.6 Impacts from the No Action Alternative

Under the No Action Alternative, not extending the recovery programs would reduce instream flow management efforts and voluntary instream flow enhancements would be eliminated. The amount of flow available may decrease because ESA listed species would no longer support flow augmentation in the Yampa, Colorado and San Juan rivers meaning the number of boatable days may be reduced, particularly in reaches of river not primarily driven by reservoir operations governed by RODs.

3.8 Socioeconomics - Local and Regional Economies

3.8.1 Affected Environment

The affected area includes substantial portions of the states of Wyoming, Utah, Colorado, and New Mexico where Colorado River water is used for municipal, industrial, agricultural, energy and recreational purposes. Much of the water developed from the Colorado River basin extends far beyond the borders of the basin itself. Multiple trans-basin water diversions provide water to the metropolitan areas of Denver, Fort Collins, Pueblo, and Colorado Springs in Colorado, Cheyenne in Wyoming, Provo, and Salt Lake City in Utah, and Santa Fe, Albuquerque, and Native American Pueblos in New Mexico. Trans-basin diversions also provide substantial

quantities of irrigation water in Colorado and New Mexico. The recovery programs provide for continued use of water for human purposes consistent with state water rights, Reclamation project authorizations, and interstate compacts.

In 2021, Colorado had a Gross State Product (GSP) of \$439 billion, which has grown from \$267 billion in 2011 (Bureau of Economic Analysis 2022a). The largest industries included finance (including insurance, real estate, rentals, and leasing), professional and business services, government, educational services and health care, and information services.

In 2021, Wyoming had a GSP of \$42 billion, which has grown from \$40 billion in 2011 (Bureau of Economic Analysis 2022b). The largest industries included government, mining (including quarrying and oil and gas extraction), finance (including insurance, real estate, rentals, and leasing), transportation and warehousing, and the retail trade. Major sources of growth in GSP included arts, entertainment, recreation, accommodation, and food services.

In 2021, New Mexico had a GSP of \$110 billion, which has grown from \$87 billion in 2011 (Bureau of Economic Analysis 2022c) The largest industries included government, finance (including insurance, real estate, rentals, and leasing), professional and business services, mining (including quarrying and oil and gas extraction), and education services and health care. The largest source of growth in GSP was arts, entertainment, recreation, accommodation, and food services.

In 2021, Utah had a GSP of \$225 billion, which has grown from \$126 billion in 2011 (Bureau of Economic Analysis 2022d). The largest industries included finance (including insurance, real estate, rentals, and leasing), professional and business services, government, retail trade, and construction.

An analysis calculated the effects of the Colorado River on the economies of each of the four states for a given year (James et al. 2014). The report provides the foundation for the remainder of this section and makes two assumptions: 1) that the loss includes the entirety of Colorado River water in any given year, and 2) that there are no substitutions available for the Colorado River water. The report provides information on the economic impacts of Colorado River water that is currently covered for ESA compliance by the recovery programs. The purpose of this section is to exemplify the importance of the water in the Colorado River as a resource used to support economies throughout the basin, not to assume the losses would directly result from the dissolution of the recovery programs. This report is somewhat dated but was the most recent analysis to specifically consider the impacts of the river on each state economy. All monetary losses are noted in 2014 dollars, which would be 14% higher in 2023 dollars.

In Colorado, 31% of all agricultural water and 41% of all municipal and industrial water is provided by the Colorado River. Water from the Colorado River is tied to \$189 billion in economic activity annually, over 2.1 million jobs, and \$116 billion in labor income.

In Wyoming, 20% of all agricultural water, and 70% of municipal and industrial water usage is supplied by the Colorado River. Water from the Colorado River is tied to \$22 billion in economic activity annually, over 284,000 jobs, and around \$13 billion in labor income.

In New Mexico, 15% of all agricultural water, and 60% of municipal and industrial water usage is supplied by the Colorado River. Colorado River water is tied to \$60 billion in economic activity annually, over 771,000 jobs, and around \$34 billion in labor income.

In Utah, 22% of all agricultural water, and 34% of municipal and industrial water usage is supplied by the Colorado River. Colorado River water is tied to \$70 billion in economic activity annually, over 969,000 jobs, and around \$43 billion in labor income.

The economies in each of these states are highly dependent on the availability of water. In the absence, or reduced availability, of Colorado River water, the historical economic development of each of these states could have followed different trajectories (James et al. 2014).

3.8.2 Impacts from the Proposed Action

Under the Proposed Action, the economies of the four affected states and tribes would continue to develop with ESA protection because the recovery programs are structured to allow water development to continue in accordance with state, federal, and Tribal law. Other external factors, such as drought, climate change, or aridification, may change the amounts of water available to the states to use in any given year, but that would occur with or without the continuation of the recovery programs. The regulatory certainty and streamlined permitting processes provided by the recovery programs are some of the most positive, long-term, substantial benefits to local economies for water development projects.

3.8.3 Impacts from the No Action Alternative

Under the No Action Alternative, if the recovery programs did not continue, approximately 2,500 current consultations dependent on the recovery programs would need to be reinitiated, and other new water development with a federal nexus would need new stand-alone Section 7 consultations (absent development of some other programmatic ESA coverage mechanism). The specific impacts of the federal agencies not continuing to participate in the recovery programs on state and local economies would be variable. The continuation of some activities to benefit the ESA listed fish, with no recovery programs and no federal funding, would be insufficient to provide programmatic ESA compliance for water project impacts throughout the basin. RPAs and RPMs requiring release of water from projects being consulted on would result in significant legal actions to protect existing supplies.

The dissolution of the recovery programs would create uncertainty and administrative hurdles for water users throughout the four states.

3.8.3.1 Cumulative Effects

Implementation of the recovery programs streamlines the process to use and develop water in the UCRB in compliance with the ESA. The water development process currently has other

regulatory steps that would be further drawn out by a traditional Section 7 process that would occur without the recovery programs. The cumulative effect would be an additional administrative burden which would impair the development of water resources and could have significant socioeconomic costs in the short-term.

Chapter 4 Environmental Commitments

4.1 Introduction

The section includes a list of environmental commitments that are undertaken by the recovery programs, as appropriate, when carrying out program activities. All program activities undertaken with federal funds or that require federal permits or involve federal facilities, will be considered federal actions and subject to federal environmental laws, such as NEPA, ESA, and the Clean Water Act of 1972 (CWA).

These environmental commitments generally are intended to avoid, minimize, or compensate for adverse environmental impacts that would otherwise occur due to the recovery programs' implementation activities. In some cases, these commitments help ensure that such activities are conducted in accordance with applicable laws and guidelines. Some actions may require compliance with other federal laws and regulations not listed here.

4.2 Federal Laws

4.2.1 National Environmental Policy Act

This EA covers the regional- and system-wide impacts of the Proposed Action, as far as they can be foreseen. Under the Proposed Action, feasibility studies may be undertaken for individual projects managed by the recovery programs. These actions may require evaluation and appropriate documentation under NEPA, tiered off this EA.

The following is a list of future program activities that will require further site-specific NEPA analysis: construction, rehabilitation, or improvement of capital projects, including, but not limited to, fish passages, screens and escapement prevention devices, wetland or habitat modification, water conveyance structure alterations, or permanently installed monitoring devices.

4.2.2 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 reads as follows:

Whenever the waters or channel of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the Service and with the head of the agency exercising administration over the wildlife resources of the state where construction would occur, with a view to the conservation of wildlife resources. The Act provides that land, water, and interests may be acquired by federal construction agencies for wildlife conservation and development. In addition, real property under jurisdiction or control of a federal agency and no longer required by that agency, can be utilized for wildlife conservation by the state agency exercising administration over wildlife resources upon that property.

The specific reports and recommendations of the Secretary and the state agency on the wildlife aspects of such projects must be made part of the responsible federal agency's report. It is intended that the reports and recommendations be based on surveys and investigations to determine possible damage to wildlife resources and measures that should be adopted to prevent their loss or damage.

4.2.3 Clean Water Act

Wetland and habitat development to support one or more of the ESA listed fish species can alter river channels and wetlands in the UCRB. Specific plans for wetland and habitat would be developed after the recovery programs have identified and obtained support from interested landowners and recovery program participants.

Specific proposals would be developed and would be subject to analysis and permitting under Section 404 of the CWA to the extent their implementation would involve the discharge of dredged or fill material into CWA jurisdictional waters. The development and analysis of these proposals would be coordinated with appropriate offices of the Corps and the EPA.

The Proposed Action includes options for alteration or construction of in-stream habitat projects or off-channel wetlands or floodplains. Feasibility investigations or assessments of each project must occur before approval to proceed with construction from the recovery programs. If the recovery programs choose to proceed with any of these elements, site-specific NEPA analysis would be undertaken.

4.2.4 Endangered Species Act

All site-specific recovery program actions outside of water development that could affect listed species or their habitat would be assessed under the ESA before implementation. The recovery programs would evaluate the potential impact of site-specific activities on other listed species when activities are proposed and before they are implemented. In the event adverse impacts on other listed species or designated critical habitats are identified, the recovery programs would take appropriate actions. Any adverse impacts would be avoided or offset based on consultation with the Service.

4.2.5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits the take of migratory birds. Executive Order 13186 requires federal agencies to avoid impacts on migratory birds. Under the recovery programs, clearing wood and shrubs from riparian areas to restore river channel habitat and wet meadows would reduce migratory bird habitat and could result in unintentional take of these species. In compliance with Executive Order 13186, such activities would be restricted to those periods of the year when nesting activities do not occur, to minimize the chances of unintentional take. Each site-specific NEPA analysis tiered to this EA would examine potential methods to reduce impacts on migratory birds and implement those methods found to be reasonable.

4.2.6 National Historic Preservation Act

According to the National Historic Preservation Act of 1966, where site-specific recovery program actions may adversely affect cultural resources or sites and structures listed on or eligible for listing on the National Register of Historic Places, consultation would be undertaken by the recovery programs with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. Appropriate surveys would be undertaken and incorporated into site-specific planning and evaluation. Programmatic agreements would be implemented with each state and interested tribes, providing a process for consultation and mitigation. This would take place when the recovery programs' actions are found to affect cultural or historic resources.

4.2.7 Farmland Protection Policy Act

According to the Farmland Protection Policy Act of 1981, for each site-specific NEPA compliance analysis for recovery programs actions, the recovery programs would coordinate with the USDA's Natural Resources Conservation Service. The purpose of this coordination would be to identify prime farmlands that might, through recovery program actions, be permanently converted to nonagricultural uses and to consider conversion of these lands when deciding where to pursue construction and habitat restoration actions. The recovery programs would strive to minimize unnecessary and irreversible conversion of prime farmlands.

4.3 Monitoring

The Proposed Action incorporates an extensive strategy of resource monitoring and research that adapts regularly through the recovery programs. Each program evaluates its actions on an annual or biannual basis to ensure the efforts are productive and making sufficient progress towards the recovery of the species. The recovery programs would continue to monitor key resource features throughout the reauthorization period. The recovery programs would also provide ongoing feedback to program decisionmakers about trends in environmental and species conditions and the impact of program actions on those resources.

Chapter 5 Consultation and Coordination

5.1 Introduction

This chapter describes the Service's public involvement program and coordination with specific federal, state, and local agencies, along with Tribal consultation.

5.2 General Public Involvement Activities

This EA will be distributed for a 30-day public comment period prior to finalization.

5.3 Cooperating Agency Involvement

For the purposes of this EA, all recovery program participants are considered cooperating agencies. All recovery program participants were given multiple opportunities to review and provide input for incorporation into the document.

5.4 Tribal Consultation and Coordination

Four tribes are members of the San Juan Program and have had the opportunity to provide comments through the participant review process.

5.5 Endangered Species Act Section 7 Consultation

ESA Section 7 consultation has not been assessed as part of the development of this EA because providing Section 7 compliance is an inherent component of program implementation. Additional assessment or consultation is not needed.

Chapter 6 List of Sources, Agencies and Persons Consulted

Jason Davis, U.S. Fish and Wildlife Service
Lisa Yellow Eagle, Southern Ute Indian Tribe
Jenny Dumas, Jicarilla Apache Nation
Rudy Keedah, Bureau of Indian Affairs
Dale Ryden, U.S. Fish and Wildlife Service
Tom Pitts, Water Consult
Crystal L. Tulley-Cordova, Navajo Nation
Michelle Garrison, Colorado Water Conservation Board
Kara Scheel, Colorado Water Conservation Board
Chris Briedenbach, Colorado Attorney General's Office
Lee Traynham, U.S. Bureau of Reclamation
Jennifer Ward, U.S. Bureau of Reclamation
Bill Stewart, U.S. Bureau of Reclamation
Sarah Bucklin, U.S. Bureau of Reclamation
David Speas, U.S. Bureau of Reclamation
Ali Effati, New Mexico Interstate Stream Commission
Colleen Cunningham, New Mexico Interstate Stream Commission
Joseph Trungale, The Nature Conservancy
Todd Adams, Utah Department of Natural Resources
Jeff Tafoya, U.S. Bureau of Land Management
Shane Capron, Western Area Power Administration
Leslie James, Colorado River Energy Distributors Association
Marj Nelson, U.S. Fish and Wildlife Service
Jed Rockweiler, Wyoming State Engineers Office
Melissa Trammell, National Park Service
Darren LeBlanc, U.S. Fish and Wildlife Service
Michelle Durflinger, U.S. Fish and Wildlife Service

Chapter 7 References

- Ahrens, Z. 2019. Population monitoring of humpback chub and bonytail in Cataract Canyon. 2019 annual report. Project Number 130. Page 12 Upper Colorado River Endangered Fish Recovery Program. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Bassett, S. 2015. San Juan River historical ecology assessment: changes in channel characteristics and riparian vegetation. Page The Nature Conservancy. U.S. Bureau of Reclamation, Sante Fe, NM.
- Bestgen, K. R. 2018. Evaluate effects of flow spikes to disrupt reproduction of smallmouth bass in the Green River downstream of Flaming Gorge Dam. Page 43. Upper Colorado River Endangered Fish Recovery Program, Denver, CO.
- Bestgen, K. R., and A. A. Hill. 2016. Reproduction, abundance, and recruitment dynamics of young Colorado pikeminnow in the Green and Yampa rivers, Utah and Colorado, 1979-2012. Page 115. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Bestgen, K. R., C. D. Walford, G. C. White, J. A. Hawkins, M. T. Jones, P. A. Webber, M. J. Breen, J. A. Skorupski, J. Howard, K. Creighton, J. Logan, K. Battige, and F. B. Wright. 2018. Population status and trends of Colorado pikeminnow in the Green River sub-basin, Utah and Colorado, 2000-2013. Page 152 Larval Fish Laboratory. Upper Colorado River Endangered Fish Recovery Program, Denver, CO.
- Bestgen, K. R., K. A. Zelasko, R. I. Compton, and T. E. Chart. 2008. Survival, condition, habitat use, and predation on stocked bonytail (*Gila elegans*) in the Green River, Colorado and Utah. *The Southwestern Naturalist* 53(4):488–494.
- Bestgen, K. R., K. A. Zelasko, and G. C. White. 2012. Monitoring reproduction, recruitment, and population status of razorback suckers in the upper Colorado River basin. Page Larval Fish Laboratory, Colorado State University. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Bureau of Economic Analysis. 2022a. BEARFacts Report: Economic Profile for Colorado. U.S. Department of Commerce, Washington, D. C.
- Bureau of Economic Analysis. 2022b. BEARFacts Report: Economic Profile for Wyoming. U.S. Department of Commerce, Washington, D. C.
- Bureau of Economic Analysis. 2022c. BEARFacts Report: Economic Profile for New Mexico. U.S. Department of Commerce, Washington, D. C.
- Bureau of Economic Analysis. 2022d. BEARFacts Report: Economic Profile for Utah. U.S. Department of Commerce, Washington, D. C.
- Caldwell, J. 2019. Humpback chub population estimate in Desolation/Gray Canyon, Green River, Utah. 2019 Annual Report. Project Number 129. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Crowley, B., and D. W. Ryden. 2019. Retrieval of fish from the Grand Valley Irrigation Company and Grand Valley Water Users canal. 2019 Annual Report. Project number 29a. Page U.S. Fish and Wildlife Service. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Czapla, T. E. 1999. Final Revised Genetics Management Plan. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Diver, T. A., S. M. Mussmann, S. L. Durst, and N. R. Franssen. 2021. Effective number of breeders and reconstructed sibships reveal low reproductive output by a reintroduced

- population of endangered fish. *Aquatic Conservation: Marine and Freshwater Ecosystems* 31(12):3416–3428.
- Elverud, D. S., D. B. Osmundson, and G. C. White. 2020. Population structure, abundance and recruitment of Colorado pikeminnow of the upper Colorado River, 1991–2015. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.
- Evans, P. 1993. A “recovery” partnership for the upper Colorado River to meet ESA § 7 needs. *Natural Resources & Environment* 8(1):24–72.
- Farrington, M. A., R. K. Dudley, G. C. White, and S. L. Clark Barkalow. 2022. Colorado Pikeminnow and Razorback Sucker larval fish survey in the San Juan River during 2021. Final Report to the U.S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Francis, T. A. 2021. Population estimate of humpback chub in Black Rocks. 2021 Annual Project Report, Project Number 131. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Friedman, J. M. 2018. Potential effects of elevated base flow and midsummer spike flow experiments on riparian vegetation along the Green River. Page National Park Service. Fort Collins, Colorado.
- Furr, D. W. 2020. San Juan River razorback sucker (*Xyrauchen texanus*) and Colorado pikeminnow (*Ptychocheilus lucius*) population augmentation: 2019. Page 16. San Juan River Basin Recovery Implementation Program, Albuquerque, NM.
- Furr, D. W. 2022. San Juan River Razorback Sucker *Xyrauchen texanus* and Colorado Pikeminnow *Ptychocheilus lucius* population augmentation: 2021. Final Report to the U.S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Hines, B. A., K. R. Bestgen, and G. C. White. 2020. Abundance estimates for humpback chub (*Gila cypha*) and roundtail chub (*Gila robusta*) in Westwater Canyon, Colorado River, Utah 2016–2017. Final Report to the U.S. Fish and Wildlife Service, Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado State University, Larval Fish Laboratory, Contribution 219, Fort Collins, Colorado.
- Holden, P. B. 1999. Flow recommendations for the San Juan River. San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Integrated Stocking Plan Revision Committee. 2015. Revised integrated stocking plan for Razorback Sucker and Bonytail. Final Report to the U.S. Fish and Wildlife Service, Upper Colorado River Endangered Fish Recovery Program, Denver.
- James, T., A. Evans, E. Madly, and C. Kelly. 2014. The economic importance of the Colorado River in the basin region. L William Seidman Research Institute, W.P. Carey School of Business, Arizona State University.
- LaGory, K., T. E. Chart, K. R. Bestgen, J. Wilhite, S. Capron, D. W. Speas, H. Hermansen, K. T. McAbee, and J. Mohrman. 2012. Study plan to examine the effects of using larval razorback sucker occurrence in the Green River as a trigger for Flaming Gorge Dam Peak Releases. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- LaGory, K. E., K. R. Bestgen, H. Patno, J. Wilhite, David Speas, and M. Trammell. 2019. Evaluation and suggested revisions of flow and temperature regulations for endangered fish in the Green River downstream of Flaming Gorge Dam. Final Report to the U.S. Fish and Wildlife Service, Upper Colorado River Endangered Fish Recovery Program, Denver.

- McAda, C. W. 2003. Flow recommendations to benefit endangered fishes in the Colorado and Gunnison Rivers. Page U.S. Fish and Wildlife Service. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Mosley, R., L. Marthe, and T. N. Hedrick. 2020. Summary of recreation and angling use, success, and satisfaction on the Green River in 2018. Utah Department of Natural Resources, Division of Wildlife Resources, Publication Number 20-19, Salt Lake City, Utah.
- Osmundson, D. B. 1999. Longitudinal variation in fish community structure and water temperature in the upper Colorado River. Page 70 U.S. Fish and Wildlife Service. Upper Colorado River Endangered Fish Recovery Program, Denver, CO.
- Osmundson, D. B., P. Nelson, K. Fenton, and D. W. Ryden. 1995. Relationships between flow and rare fish habitat in the “15-Mile Reach” of the upper Colorado River. Page 237. Upper Colorado River Endangered Fish Recovery Program, Denver, CO.
- Osmundson, D. B., R. J. Ryel, M. E. Tucker, B. D. Burdick, W. R. Elmlblad, and T. E. Chart. 1998. Dispersal Patterns of Subadult and Adult Colorado Squawfish in the Upper Colorado River. Transactions of the American Fisheries Society 127(6):943–956.
- Roehm, G. W. 2004. Management plan for endangered fishes in the Yampa River basin and environmental assessment. U.S. Fish and Wildlife Service, Denver, CO.
- Ryden, D. W. 2000. Adult fish community monitoring on the San Juan River, 1991-1997. Page 269. U.S. Fish and Wildlife Service, Grand Junction, CO.
- Ryden, D. W. 2006. Augmentation and monitoring of the San Juan River razorback sucker population, 2005 interim progress report. Page U.S. Fish and Wildlife Service, Colorado River Fishery Project. San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Saltzgeber, M. J., and S. M. Mussmann. 2020. Using molecular techniques to quantify the effective number of breeders (N_b) razorback sucker and Colorado pikeminnow in the San Juan River. 2020 annual report to the San Juan River Basin Recovery Implementation Program. U.S. Fish and Wildlife Service, Southwestern Native Aquatic Resources and Recovery Center.
- San Juan River Basin Recovery Implementation Program. 2022a. Program Document.
- San Juan River Basin Recovery Implementation Program. 2022b. Long-range plan. Page San Juan River Basin Recovery Implementation Program. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- San Juan River Basin Recovery Implementation Program. 2022c. Section 7 Principles. Page San Juan River Basin Recovery Implementation Program. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Schleicher, B. J. 2018. Long term monitoring of sub-adult and adult large-bodied fishes in the San Juan River: 2017. Page U.S. Fish and Wildlife Service. San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Schleicher, B. J., B. A. Hines, and T. A. Diver. 2022. San Juan River Demographic Monitoring 2021. Page U.S. Fish and Wildlife Service, Colorado River Fishery Project. San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- SJRIP. 2016. Long-range plan. Page U.S. Fish and Wildlife Service. San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico.
- Southwick Associates. 2020. The economic contributions of water-related outdoor recreation in Colorado. Business for Water Stewardship.

- Upper Colorado River Endangered Fish Recovery Program, and San Juan River Basin Recovery Implementation Program. 2023. Report to Congress on the Upper Colorado and San Juan River Basins Endangered Fish Recovery Programs. Page 46.
- U.S. Bureau of Reclamation. 2006a. Final Environmental Impact Statement - Navajo Reservoir Operations Volume 1.
- U.S. Bureau of Reclamation. 2006b. Record of Decision: Operation of Flaming Gorge Dam Final Environmental Impact Statement.
- U.S. Bureau of Reclamation. 2006c. Record of Decision for the Navajo Reservoir Operations, Navajo Unit - San Juan River, New Mexico, Colorado, Utah Final Environmental Impact Statement.
- U.S. Bureau of Reclamation. 2012. Record of decision for the Aspinall Unit operations final environmental impact statement. U.S. Bureau of Reclamation.
- U.S. Department of the Interior. 1987. Recovery implementation program for endangered fish species in the upper Colorado River basin, “Blue Book.” U.S. Fish and Wildlife Service, Region 6, Denver, Colorado.
- U.S. Department of the Interior. 1988. Cooperative Agreement for the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin.
- U.S. Department of the Interior. 1992. Cooperative Agreement for the San Juan River Basin Recovery Implementation Program.
- U.S. Fish and Wildlife Service. 1998. Final biological opinion, Duchesne River Basin. U.S. Fish and Wildlife Service Mountain-Prairie Region (6), Denver, Colorado.
- U.S. Fish and Wildlife Service. 1999. Final programmatic biological opinion for Bureau of Reclamation’s operations and depletions, other depletions, and funding and implementation of Recovery Program actions in the Upper Colorado River above the confluence with the Gunnison River. U.S. Fish and Wildlife Service, Region 6, Denver, Colorado.
- U.S. Fish and Wildlife Service. 2002. Bonytail recovery goals: amendment and supplement to the Bonytail recovery plan.
- U.S. Fish and Wildlife Service. 2005. Update of the Reasonable and Prudent Alternative in the July 1998 Biological Opinion for the Duchesne River Basin. U.S. Fish and Wildlife Service, Region 6, Denver, Colorado.
- U.S. Fish and Wildlife Service. 2009. Procedures for stocking nonnative fish species in the upper Colorado River basin. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- U.S. Fish and Wildlife Service. 2018. Species status assessment for the humpback chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region, Denver, Colorado.
- Wydoski, R. S., and J. Hamill. 1991. Evolution of a cooperative recovery program for endangered fishes in the upper Colorado River basin. Page *in* W. L. Minckley and J. E. Deacon, editors. *Battle Against Extinction: Native Fish Management in the American West*. University of Arizona Press, Flagstaff, Arizona.
- Zelasko, K. A., K. R. Bestgen, and G. C. White. 2018. Abundance and survival rates of razorback suckers *Xyrauchen texanus* in the Green River, Utah, 2011–2013. Page Colorado State University, Larval Fish Laboratory. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Zelasko, K. A., K. R. Bestgen, and G. C. White. 2022. Incorporating passive antenna detections with physical recaptures in the Barker model increases razorback sucker survival rate estimates and their precision. Final Report to the U.S. Fish and Wildlife Service, Upper

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Appendix A. Other Federally Listed Species and Species of Special Status

The large extent of the recovery programs area of influence, many federally listed species and other species of special status have populations or established critical habitat within the scope of the recovery programs. Many of these species are not expected to be impacted by recovery program actions which primarily occur in, or around critical habitat of the four ESA listed fish species. The species not likely to be impacted are listed here.

Type	Common Name	Scientific Name	Special Status
Amphibian	Western Tiger Salamander	<i>Ambystoma mavortium</i>	Wyoming SGCN
Amphibian	Western Toad	<i>Anaxyrus boreas</i>	Utah SGCN, Wyoming SGCN
Amphibian	Boreal Toad	<i>Bufo boreas</i>	New Mexico Endangered, Colorado Endangered
Amphibian	Great Basin Skink	<i>Plestiodon skiltonianus utahensis</i>	Wyoming SGCN
Amphibian	Jemez Mountains salamander	<i>Plethodon neomexicanus</i>	Federally Endangered, New Mexico Endangered
Amphibian	Northern Leopard Frog	<i>Rana pipiens</i>	Colorado Species of Special Concern, Utah SGCN, Wyoming SGCN
Amphibian	Wood Frog	<i>Rana sylvatica</i>	Colorado Species of Special Concern
Amphibian	Plains Spadefoot	<i>Spea bombifrons</i>	Wyoming SGCN
Amphibian	Great Basin Spadefoot	<i>Spea intermontane</i>	Wyoming SGCN
Arthropod	Colorado Fairy Shrimp	<i>Branchinecta coloradensis</i>	Wyoming SGCN
Arthropod	Constricted Fairy Shrimp	<i>Branchinecta constricta</i>	Wyoming SGCN
Arthropod	Pocket Pouch Fairy Shrimp	<i>Branchinecta lateralis</i>	Wyoming SGCN
Arthropod	Versatile Fairy Shrimp	<i>Branchinecta lindahli</i>	Wyoming SGCN
Arthropod	Rock Pool Fairy Shrimp	<i>Branchinecta packardi</i>	Wyoming SGCN
Arthropod	Circumpolar Fairy Shrimp	<i>Branchinecta paludosa</i>	Wyoming SGCN
Arthropod	Eastern Alkali Fairy Shrimp	<i>Branchinecta reading</i>	Wyoming SGCN
Arthropod	a fairy shrimp	<i>Branchinecta serrata</i>	Wyoming SGCN
Arthropod	Great Basin Tadpole Shrimp	<i>Lepidurus bilobatus</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Arthropod	Couse Tadpole Shrimp	<i>Lepidurus couesii</i>	Wyoming SGCN
Arthropod	Lynch Tadpole Shrimp	<i>Lepidurus lemmoni</i>	Wyoming SGCN
Arthropod	Swamp Lymnaea	<i>Lymnaea stagnalis</i>	Wyoming SGCN
Arthropod	Holarctic Clam Shrimp	<i>Lynceus brachyurus</i>	Wyoming SGCN
Arthropod	Greater Plains Fairy Shrimp	<i>Streptocephalus texanus</i>	Wyoming SGCN
Bird	Northern Goshawk	<i>Accipiter gentilis</i>	Wyoming SGCN
Bird	Clark's Grebe	<i>Aechmophorus clarkii</i>	Wyoming SGCN
Bird	Western Grebe	<i>Aechmophorus occidentalis</i>	Wyoming SGCN
Bird	Boreal Owl	<i>Aegolius funereus</i>	New Mexico Threatened, Utah Imperiled, Wyoming SGCN
Bird	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	New Mexico Endangered, Wyoming SGCN
Bird	American Pipit	<i>Anthus rubescens</i>	Wyoming SGCN
Bird	Woodhouse's Scrub-Jay	<i>Aphelocoma woodhouseii</i>	Wyoming SGCN
Bird	Golden Eagle	<i>Aquila chrysaetos</i>	Utah Apparently Secure, Wyoming SGCN
Bird	Black-chinned Hummingbird	<i>Archilochus alexandri</i>	Wyoming SGCN
Bird	Great Blue Heron	<i>Ardea Herodias</i>	Wyoming SGCN
Bird	Sagebrush Sparrow	<i>Artemisiospiza nevadensis</i>	Wyoming SGCN
Bird	Short-eared Owl	<i>Asio flammeus</i>	Wyoming SGCN
Bird	Burrowing Owl	<i>Athene cunicularia</i>	Colorado Threatened, Wyoming SGCN, Utah Vulnerable
Bird	Juniper Titmouse	<i>Baeolophus ridgwayi</i>	Wyoming SGCN
Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	Wyoming SGCN
Bird	American Bittern	<i>Botaurus lentiginosus</i>	Utah SGCN, Wyoming SGCN
Bird	Cattle Egret	<i>Bubulcus ibis</i>	Wyoming SGCN
Bird	Ferruginous Hawk	<i>Buteo regalis</i>	Colorado Species of Special Concern, Utah SGCN, Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Bird	Swainson's Hawk	<i>Buteo swainsoni</i>	Wyoming SGCN
Bird	Canyon Wren	<i>Catherpes mexicanus</i>	Wyoming SGCN
Bird	Gunnison Sage-Grouse	<i>Centrocercus minimus</i>	Federally Threatened, Colorado Species of Special Concern, Utah Imperiled
Bird	Greater Sage Grouse	<i>Centrocercus urophasianus</i>	Colorado Species of Special Concern, Utah SGCN, Wyoming SGCN
Bird	Western Snowy Plover	<i>Charadrius alexandrinus</i>	Colorado Species of Special Concern
Bird	Mountain Plover	<i>Charadrius montanus</i>	Colorado Species of Special Concern, Wyoming SGCN
Bird	Snowy Plover	<i>Charadrius nivosus</i>	Utah Vulnerable, Wyoming SGCN
Bird	Black Tern	<i>Chlidonias niger</i>	Wyoming SGCN
Bird	Common Nighthawk	<i>Chordeiles minor</i>	Wyoming SGCN
Bird	Western Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	Federally Threatened, Colorado Species of Special Concern, Utah Imperiled, Wyoming SGCN
Bird	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Wyoming SGCN
Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>	Utah Vulnerable
Bird	Trumpeter Swan	<i>Cygnus buccinator</i>	Wyoming SGCN
Bird	Black Swift	<i>Cypseloides niger</i>	Utah Imperiled
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	Wyoming SGCN
Bird	Snowy Egret	<i>Egretta thula</i>	Wyoming SGCN
Bird	Southwestern Woodrow Flycatcher	<i>Empidonax traillii extimus</i>	Federally Endangered, Colorado Endangered, New Mexico Endangered, Utah Critically Imperiled, Wyoming SGCN
Bird	Merlin	<i>Falco columbarius</i>	Wyoming SGCN
Bird	Peregrine Falcon	<i>Falco peregrinus</i>	New Mexico Threatened, Utah SGCN, Wyoming SGCN
Bird	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Colorado Species of Special Concern
Bird	American Kestrel	<i>Falco sparverius</i>	Wyoming SGCN
Bird	Common Loon	<i>Gavia immer</i>	Wyoming SGCN
Bird	MacGillivray's Warbler	<i>Geothlypis tolmiei</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Bird	Common Yellowthroat	<i>Geothlypis trichas</i>	Wyoming SGCN
Bird	Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	Utah SGCN, Wyoming SGCN
Bird	Whooping Crane	<i>Grus americana</i>	Federally Endangered, Colorado Endangered, New Mexico Endangered
Bird	Greater Sandhill Crane	<i>Grus canadensis tabida</i>	Colorado Species of Special Concern
Bird	California Condor	<i>Gymnogyps californianus</i>	Federally Endangered, Utah Critically Imperiled
Bird	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	Utah Apparently Secure
Bird	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Colorado Species of Special Concern, Wyoming SGCN, Utah Imperiled
Bird	Harlequin Duck	<i>Histrionicus histrionicus</i>	Wyoming SGCN
Bird	Caspian Tern	<i>Hydroprogne caspia</i>	Utah SGCN, Wyoming SGCN
Bird	Scott's Oriole	<i>Icterus parisorum</i>	Wyoming SGCN
Bird	Loggerhead Shrike	<i>Lanius ludovicianus</i>	Wyoming SGCN
Bird	Eastern Black Rail	<i>Laterallus jamaicensis ssp. Jamaicensis</i>	Federally Threatened
Bird	Virginia's Warbler	<i>Leiosthlypis virginiae</i>	Wyoming SGCN
Bird	Franklin's Gull	<i>Leucophaeus pipixcan</i>	Wyoming SGCN
Bird	Black Rosy-finch	<i>Leucosticte atrata</i>	Utah Critically Imperiled, Wyoming SGCN
Bird	Red Crossbill	<i>Loxia curvirostra</i>	Wyoming SGCN
Bird	Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Wyoming SGCN
Bird	Lewis's Woodpecker	<i>Melanerpes lewis</i>	Utah SGCN, Wyoming SGCN
Bird	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Wyoming SGCN
Bird	Clark's Nutcracker	<i>Nucifraga columbiana</i>	Wyoming SGCN
Bird	Long-Billed Curlew	<i>Numenius americanus</i>	Colorado Species of Special Concern, Wyoming SGCN
Bird	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Wyoming SGCN
Bird	Sage Thrasher	<i>Oreoscoptes montanus</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Bird	Blue Grosbeak	<i>Passerina caerulea</i>	Wyoming SGCN
Bird	Band-tailed Pigeon	<i>Patagioenas fasciata</i>	Utah SGCN
Bird	American White Pelican	<i>Pelecanus erythrorhynchos</i>	Utah SGCN, Wyoming SGCN
Bird	Black-backed Woodpecker	<i>Picoides arcticus</i>	Wyoming SGCN
Bird	White-faced Ibis	<i>Plegadis chihi</i>	Utah Imperiled
Bird	White-faced Ibis	<i>Plegadis chihi</i>	Wyoming SGCN
Bird	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	Wyoming SGCN
Bird	Purple Martin	<i>Progne subis</i>	Wyoming SGCN
Bird	Bushtit	<i>Psaltriparus minimus</i>	Wyoming SGCN
Bird	Flammulated Owl	<i>Psilosops flammeolus</i>	Utah SGCN, Wyoming SGCN
Bird	Virginia Rail	<i>Rallus limicola</i>	Wyoming SGCN
Bird	Thick-billed Longspur	<i>Rhynchophanes mccownii</i>	Wyoming SGCN
Bird	Calliope Hummingbird	<i>Selasphorus calliope</i>	Wyoming SGCN
Bird	Rufous Hummingbird	<i>Selasphorus rufus</i>	Wyoming SGCN
Bird	Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	Wyoming SGCN
Bird	Pygmy Nuthatch	<i>Sitta pygmaea</i>	Wyoming SGCN
Bird	Wouldiamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Wyoming SGCN
Bird	Dickcissel	<i>Spiza americana</i>	Wyoming SGCN
Bird	Brewer's Sparrow	<i>Spizella breweri</i>	Wyoming SGCN
Bird	Least Tern	<i>Sterna antillarum</i>	Colorado Endangered
Bird	Forster's Tern	<i>Sterna forsteri</i>	Wyoming SGCN
Bird	Great Gray Owl	<i>Strix nebulosa</i>	Wyoming SGCN
Bird	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Federally Threatened, Colorado Threatened, Utah Imperiled
Bird	Bewick's Wren	<i>Thryomanes bewickii</i>	Wyoming SGCN
Bird	Columbian Sharp-tailed Grouse	<i>Tympanuchus phasianellus columbianus</i>	Colorado Species of Special Concern, Utah Imperiled, Wyoming SGCN
Bird	Plains Sharp-Tailed Grouse	<i>Tympanuchus phasianellus jamesii</i>	Colorado Endangered

Type	Common Name	Scientific Name	Special Status
Bird	Mitered Vertigo	<i>Vertigo modesta concinnula</i>	Wyoming SGCN
Bird	Red-eyed Vireo	<i>Vireo olivaceus</i>	Wyoming SGCN
Bird	Gray Vireo	<i>Vireo vicinior</i>	Wyoming SGCN
Fish	Mountain Sucker	<i>Catostomus playtrhynchus</i>	Colorado Species of Special Concern
Fish	Lake Chub	<i>Couesius plumbeus</i>	Colorado Endangered
Fish	Colorado River Cutthroat Trout	<i>Oncorhynchus clarkii pleuriticus</i>	Colorado Species of Special Concern, Utah SGCN, Wyoming SGCN
Fish	Kendall Warm Springs Dace	<i>Rhinichthys osculus thermalis</i>	Federally Endangered, Wyoming SGCN
Insect	Uncompahgre fritillary butterfly	<i>Boloria acrocneuma</i>	Federally Endangered
Insect	Monarch Butterfly	<i>Danaus plexippus</i>	Federal Candidate
Insect	western glacier stonefly	<i>Zapada glacier</i>	Federally Threatened
Mammal	Moose	<i>Alces alces</i>	Wyoming SGCN
Mammal	Pallid Bat	<i>Antrozous pallidus</i>	Wyoming SGCN
Mammal	Ringtail	<i>Bassariscus astutus</i>	Wyoming SGCN
Mammal	Gray Wolf	<i>Canis lupus</i>	Federally Endangered, Colorado Endangered, New Mexico Endangered
Mammal	Townsend's Big-eared Bat	<i>Corynorhinus townsendii pallescens</i>	Colorado Species of Special Concern, Utah Apparently Secure, Wyoming SGCN
Mammal	Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	Utah SGCN
Mammal	White-tailed Prairie Dog	<i>Cynomys leucurus</i>	Utah SGCN, Wyoming SGCN
Mammal	Utah prairie dog	<i>Cynomys parvidens</i>	Federally Threatened
Mammal	Chisel-toothed Kangaroo Rat	<i>Dipodomys microps celsus</i>	Utah Critically Imperiled
Mammal	Spotted Bat	<i>Euderma maculatum</i>	New Mexico Threatened, Utah SGCN, Wyoming SGCN
Mammal	Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	Wyoming SGCN
Mammal	North American wolverine	<i>Gulo luscus</i>	Proposed Federally Threatened, Colorado Endangered, Utah Imperiled, Wyoming SGCN
Mammal	Allen's Big-eared Bat	<i>Idionycteris phyllotis</i>	Utah SGCN
Mammal	Sagebrush Vole	<i>Lemmiscus curtatus</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Mammal	Northern River Otter	<i>Lontra canadensis</i>	Colorado Threatened, Wyoming SGCN
Mammal	Canada Lynx	<i>Lynx canadensis</i>	Federally Threatened, Colorado Endangered, Utah Imperiled, Wyoming SGCN
Mammal	Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>	Utah SGCN
Mammal	Water Vole	<i>Microtus richardsoni</i>	Wyoming SGCN
Mammal	Black-Footed Ferret	<i>Mustela nigripes</i>	Federally Endangered, Colorado Endangered, Utah Critically Imperiled, Wyoming SGCN
Mammal	Western Little Brown Myotis	<i>Myotis carissima</i>	Wyoming SGCN
Mammal	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Wyoming SGCN
Mammal	Long-eared Myotis	<i>Myotis evotis</i>	Wyoming SGCN
Mammal	Little Brown Myotis	<i>Myotis lucifugus</i>	Utah Apparently Secure
Mammal	Fringed Myotis	<i>Myotis thysanodes</i>	Utah Imperiled, Wyoming SGCN
Mammal	Long-legged Myotis	<i>Myotis Volans</i>	Wyoming SGCN
Mammal	Yuma Myotis	<i>Myotis yumanensis</i>	Wyoming SGCN
Mammal	Yellow-pine Chipmunk	<i>Neotamias amoenus</i>	Wyoming SGCN
Mammal	Cliff Chipmunk	<i>Neotamias dorsalis</i>	Wyoming SGCN
Mammal	Utah Cliff Chipmunk	<i>Neotamias dorsalis utahensis</i>	Wyoming SGCN
Mammal	Uinta Chipmunk	<i>Neotamias umbrinus</i>	Wyoming SGCN
Mammal	Fremont's Uinta Chipmunk	<i>Neotamias umbrinus fremonti</i>	Wyoming SGCN
Mammal	Southern Rocky Mountain Uinta Chipmunk	<i>Neotamias umbrinus montanus</i>	Wyoming SGCN
Mammal	Utah Uinta Chipmunk	<i>Neotamias umbrinus</i>	Wyoming SGCN
Mammal	American Pika	<i>Ochotona princeps</i>	Utah Apparently Secure, Wyoming SGCN
Mammal	Northern Rocky Mountain Pika	<i>Ochotona princeps</i>	Wyoming SGCN
Mammal	Uinta Pika	<i>Ochotona princeps uinta</i>	Wyoming SGCN
Mammal	Bighorn Sheep	<i>Ovis canadensis</i>	Wyoming SGCN
Mammal	Olive-backed Pocket Mouse	<i>Perognathus fasciatus</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Mammal	Great Basin Pocket Mouse	<i>Perognathus mollipilosus</i>	Wyoming SGCN
Mammal	Canyon Deermouse	<i>Peromyscus crinitus</i>	Wyoming SGCN
Mammal	Pinon Deermouse	<i>Peromyscus truei</i>	Wyoming SGCN
Mammal	Dwarf Shrew	<i>Sorex nanus</i>	Utah SGCN, Wyoming SGCN
Mammal	Preble's Shrew	<i>Sorex preblei</i>	Utah Imperiled, Wyoming SGCN
Mammal	Western Spotted Skunk	<i>Spilogale gracilis</i>	Wyoming SGCN
Mammal	Pygmy Rabbit	<i>Sylvilagus idahoensis</i>	Utah SGCN, Wyoming SGCN
Mammal	Botta's Pocket Gopher	<i>Thomomys bottae rubidus</i>	Colorado Species of Special Concern
Mammal	[a Race of the] Botta's Pocket Gopher	<i>Thomomys bottae robustus</i>	Utah Imperiled
Mammal	Wyoming Pocket Gopher	<i>Thomomys clusius</i>	Wyoming SGCN
Mammal	Idaho Pocket Gopher	<i>Thomomys idahoensis</i>	Wyoming SGCN
Mammal	Northern Pocket Gopher	<i>Thomomys talpoides macrotis</i>	Colorado Species of Special Concern
Mammal	Grizzly Bear	<i>Ursus arctos</i>	Federally Threatened, Colorado Endangered
Mammal	Kit Fox	<i>Vulpes macrotis</i>	Colorado Threatened, Utah SGCN
Mammal	Swift fox	<i>Vulpes velox</i>	Colorado Species of Special Concern, Wyoming SGCN
Mammal	New Mexico meadow jumping mouse	<i>Zapus hudsonius</i>	Federally Endangered, New Mexico Endangered
Mollusk	Mud Amnicola	<i>Amnicola limosa</i>	Wyoming SGCN
Mollusk	California Floater	<i>Anodonta californiensis</i>	Wyoming SGCN
Mollusk	Eastern Spiny Softshell	<i>Apalone spinifera</i>	Wyoming SGCN
Mollusk	Rocky Mountain Dusksnail	<i>Colligyrus greggi</i>	Wyoming SGCN
Mollusk	Mellow Column Snail	<i>Columella</i>	Wyoming SGCN
Mollusk	Jones Cycladenia	<i>Cycladenia humilis</i> var. <i>jonesii</i>	Federally Threatened, Utah Imperiled
Mollusk	Meadow Slug	<i>Deroceras leave</i>	Wyoming SGCN
Mollusk	Striate Disc Snail	<i>Discus shimekii</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Mollusk	Forest Disc Snail	<i>Discus whitneyi</i>	Wyoming SGCN
Mollusk	Brown Hive Snail	<i>Euconulus fulvus</i>	Wyoming SGCN
Mollusk	Creeping Ancyloid	<i>Ferrissia rivularis</i>	Wyoming SGCN
Mollusk	Green River Pebblesnail	<i>Fluminicola coloradoensis</i>	Utah Imperiled, Wyoming SGCN
Mollusk	Prairie Fossaria	<i>Galba bulimoides</i>	Wyoming SGCN
Mollusk	Dusky Fossaria	<i>Galba dalli</i>	Wyoming SGCN
Mollusk	Rock Fossaria	<i>Galba modicella</i>	Wyoming SGCN
Mollusk	Golden Fossaria	<i>Galba obrussa</i>	Wyoming SGCN
Mollusk	Pygmy Fossaria	<i>Galba parva</i>	Wyoming SGCN
Mollusk	Disc Gyro	<i>Gyraulus circumstriatus</i>	Wyoming SGCN
Mollusk	Star Gyro	<i>Gyraulus crista</i>	Wyoming SGCN
Mollusk	Ash Gyro	<i>Gyraulus parvus</i>	Wyoming SGCN
Mollusk	Two-ridged Ramshorn	<i>Helisoma anceps</i>	Wyoming SGCN
Mollusk	Great Basin Ramshorn	<i>Helisoma newberryi</i>	Wyoming SGCN
Mollusk	Plain Pocketbook	<i>Lampsilis cardium</i>	Wyoming SGCN
Mollusk	Chrome Ambersnail	<i>Mediappendix rehderi</i>	Wyoming SGCN
Mollusk	No Common Name Available	<i>Mediappendix vermeta</i>	Wyoming SGCN
Mollusk	Cooper's Rocky Mountainsnail	<i>Oreohelix cooperi</i>	Wyoming SGCN
Mollusk	Deseret Mountainsnail	<i>Oreohelix peripherica</i>	Wyoming SGCN
Mollusk	Pygmy Mountainsnail	<i>Oreohelix pygmaea</i>	Wyoming SGCN
Mollusk	Rocky Mountainsnail	<i>Oreohelix strigose</i>	Wyoming SGCN
Mollusk	Subalpine Mountainsnail	<i>Oreohelix subrudis</i>	Wyoming SGCN
Mollusk	[a Race of the] Yavapai Mountainsnail	<i>Oreohelix yavapai cummings</i>	Utah Critically Imperiled
Mollusk	Blunt Ambersnail	<i>Oxyloma retusum</i>	Wyoming SGCN
Mollusk	clay phacelia	<i>Phacelia argillacae</i>	Federally Endangered

Type	Common Name	Scientific Name	Special Status
Mollusk	Debeque phacelia	<i>Phacelia submutica</i>	Federally Threatened
Mollusk	Obtuse Physa	<i>Physa jennessi</i>	Wyoming SGCN
Mollusk	Cloaked Physa	<i>Physa megalochlamys</i>	Wyoming SGCN
Mollusk	Glass Physa	<i>Physa skinneri</i>	Wyoming SGCN
Mollusk	Pewter Physa	<i>Physella acuta</i>	Wyoming SGCN
Mollusk	Rotund Physa	<i>Physella columbiana</i>	Wyoming SGCN
Mollusk	Olive Physa	<i>Physella cooperi</i>	Wyoming SGCN
Mollusk	Tadpole Physa	<i>Physella gyrina</i>	Wyoming SGCN
Mollusk	No Common Name Available	<i>Physella utahensis</i>	Wyoming SGCN
Mollusk	Ubiquitous Peaclam	<i>Pisidium casertanum</i>	Wyoming SGCN
Mollusk	Ridgedbeak Peaclam	<i>Pisidium compressum</i>	Wyoming SGCN
Mollusk	Fat Peaclam	<i>Pisidium rotundatum</i>	Wyoming SGCN
Mollusk	Triangular Peaclam	<i>Pisidium variabile</i>	Wyoming SGCN
Mollusk	Rough Ramshorn	<i>Planorbella subcrenata</i>	Wyoming SGCN
Mollusk	Marsh Ramshorn	<i>Planorbella trivolvis</i>	Wyoming SGCN
Mollusk	Umbilicate Sprite	<i>Promenetus umbilicatellus</i>	Wyoming SGCN
Mollusk	Rocky Mountain Column	<i>Pupilla blandii</i>	Wyoming SGCN
Mollusk	Crestless Column Snail	<i>Pupilla hebes</i>	Wyoming SGCN
Mollusk	Bear Lake Springsnail	<i>Pyrgulopsis pilsbryana</i>	Wyoming SGCN
Mollusk	Jackson Lake Springsnail	<i>Pyrgulopsis robusta</i>	Wyoming SGCN
Mollusk	Grooved Fingernailclam	<i>Sphaerium simile</i>	Wyoming SGCN
Mollusk	Abbreviate Pondsnaill	<i>Stagnicola apicina</i>	Wyoming SGCN
Mollusk	Woodland Pondsnaill	<i>Stagnicola catascopium</i>	Wyoming SGCN
Mollusk	Marsh Pondsnaill	<i>Stagnicola elodes</i>	Wyoming SGCN
Mollusk	Rustic Pondsnaill	<i>Stagnicola hinkleyi</i>	Wyoming SGCN
Mollusk	Mountain Marshsnail	<i>Stagnicola montanensis</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Mollusk	Santa Rita Ambersnail	<i>Succinea grosvenori</i>	Wyoming SGCN
Mollusk	Last Chance Townsendia	<i>Townsendia aprica</i>	Federally Threatened, Utah Imperiled
Mollusk	Silky Vallonia Snail	<i>Vallonia cyclophorella</i>	Wyoming SGCN
Mollusk	Glossy Valvata	<i>Valvata humeralis</i>	Wyoming SGCN
Mollusk	Mossy Valvata	<i>Valvata sincera</i>	Wyoming SGCN
Mollusk	Threeridge Valvata	<i>Valvata tricarinata</i>	Wyoming SGCN
Mollusk	Cross Vertigo Snail	<i>Vertigo modesta</i>	Wyoming SGCN
Mollusk	Western Glass-snail	<i>Vitrina pellucida</i>	Wyoming SGCN
Mollusk	Quick Gloss Snail	<i>Zonitoides arboreus</i>	Wyoming SGCN
Mollusk	Rocky Mountain Capshell	<i>Acroloxus coloradensis</i>	Colorado Species of Special Concern
Mollusk	Cylindrical Papershell	<i>Anodontoides ferussacianus</i>	Colorado Species of Special Concern
Plant	Welsh's milkweed	<i>Asclepias welshii</i>	Federally Threatened
Plant	Paradox Milkvetch	<i>Astragalus holmgreniorum</i>	Utah Critically Imperiled
Plant	Mancos milk-vetch	<i>Astragalus humillimus</i>	Federally Endangered
Plant	Heliotrope Milk-Vetch	<i>Astragalus montii</i>	Federally Threatened
Plant	Osterhout milkvetch	<i>Astragalus osterhoutii</i>	Federally Endangered
Plant	Cisco Milkvetch	<i>Astragalus sabulosus</i>	Utah Critically Imperiled
Plant	Navajo Sedge	<i>Carex specuicola</i>	Federally Threatened, Utah Critically Imperiled
Plant	Zuni fleabane	<i>Erigeron rhizomatus</i>	Federally Threatened
Plant	Clay-Loving Wild Buckwheat	<i>Eriogonum pelinophilum</i>	Federally Endangered
Plant	Penland alpine fen mustard	<i>Eutrema penlandii</i>	Federally Threatened
Plant	Barneby's Reed Mustard	<i>Hesperidanthus barnebyi</i>	Utah Critically Imperiled
Plant	Pagosa skyrocket	<i>Ipomopsis polyantha</i>	Federally Endangered

Type	Common Name	Scientific Name	Special Status
Plant	Barneby ridge-cress	<i>Lepidium barnebyanum</i>	Federally Endangered, Utah Critically Imperiled
Plant	Dudley Bluffs bladderpod	<i>Lesquerella congesta</i>	Federally Threatened
Plant	Brady pincushion cactus	<i>Pediocactus bradyi</i>	Federally Endangered
Plant	Despain Pincushion Cactus	<i>Pediocactus despainii</i>	Utah Imperiled
Plant	San Rafael cactus	<i>Pediocactus despinii</i>	Federally Endangered
Plant	Knowlton's cactus	<i>Pediocactus knowltonii</i>	Federally Endangered
Plant	Fickeisen plains cactus	<i>Pediocactus peeblesianus ssp. fickeiseniae</i>	Federally Endangered
Plant	Siler pincushion cactus	<i>Pediocactus sileri</i>	Federally Threatened
Plant	Winkler's Pincushion Cactus	<i>Pediocactus winkleri</i>	Utah Imperiled
Plant	Winkler cactus	<i>Pediocactus winkleri</i>	Federally Threatened
Plant	White River Beardtongue	<i>Penstemon albifluvis</i>	Utah Imperiled
Plant	Parachute beardtongue	<i>Penstemon debilis</i>	Federally Threatened
Plant	Graham's Beardtongue	<i>Penstemon grahamii</i>	Utah Imperiled
Plant	blowout penstemon	<i>Penstemon haydenii</i>	Federally Endangered
Plant	Penland beardtongue	<i>Penstemon penlandii</i>	Federally Endangered
Plant	Dudley Bluffs twinpod	<i>Physaria obcordate</i>	Federally Threatened
Plant	Kodachrome Bladderpod	<i>Physaria tumulosa</i>	Utah SGCN, Federally Endangered
Plant	western prairie fringed orchid	<i>Platanthera praeclara</i>	Federally Threatened
Plant	Clay Reed-mustard	<i>Schoenocrambe argillacae</i>	Federally Threatened, Utah Critically Imperiled

Type	Common Name	Scientific Name	Special Status
Plant	Barneby reed-mustard	<i>Schoenocrambe barnebyi</i>	Federally Endangered
Plant	Shrubby Reed-mustard	<i>Schoenocrambe suffrutescens</i>	Federally Endangered, Utah Critically Imperiled
Plant	Pariette cactus	<i>Sclerocactus brevispinus</i>	Federally Threatened
Plant	Colorado hookless cactus	<i>Sclerocactus glaucus</i>	Federally Threatened
Plant	Mesa Verde cactus	<i>Sclerocactus mesae-verdae</i>	Federally Threatened
Plant	Uinta Basin hookless cactus	<i>Sclerocactus wetlandicus</i>	Federally Threatened, Utah SGCN
Plant	Wright fishhook cactus	<i>Sclerocactus wrightiae</i>	Federally Endangered
Plant	Gierisch's Globemallow	<i>Sphaeralcea gierischii</i>	Utah Critically Imperiled
Plant	Ute Ladies' Tresses	<i>Spiranthes diluvialis</i>	Federally Threatened, Utah Critically Imperiled
Reptile	Western Painted Turtle	<i>Chrysemys picta bellii</i>	Wyoming SGCN
Reptile	Triploid Checkered Whiptail	<i>Cnemidophorus neotesselatus</i>	Colorado Species of Special Concern
Reptile	Striped Whipsnake	<i>Coluber taeniatus</i>	Wyoming SGCN
Reptile	Desert Striped Whipsnake	<i>Coluber taeniatus</i>	Wyoming SGCN
Reptile	Prairie Rattlesnake	<i>Crotalus viridis</i>	Wyoming SGCN
Reptile	Midget Faded Rattlesnake	<i>Crotalus viridis concolor</i>	Colorado Species of Special Concern, Wyoming SGCN
Reptile	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>	Colorado Species of Special Concern
Reptile	Yellow Mud Turtle	<i>Kinosternon flavescens</i>	Colorado Species of Special Concern
Reptile	Western Milksnake	<i>Lampropeltis gentilis</i>	Wyoming SGCN
Reptile	Common King Snake	<i>Lampropeltis getula</i>	Colorado Species of Special Concern
Reptile	Greater Short-horned Lizard	<i>Phrynosoma hernandesi</i>	Wyoming SGCN

Type	Common Name	Scientific Name	Special Status
Reptile	Plains Short-horned Lizard	<i>Phrynosoma hernandesi brevirostris</i>	Wyoming SGCN
Reptile	Roundtail Horned Lizard	<i>Phrynosoma modestum</i>	Colorado Species of Special Concern
Reptile	Great Basin Gophersnake	<i>Pituophis catenifer deserticola</i>	Wyoming SGCN
Reptile	Plateau Fence Lizard	<i>Sceloporus tristichus</i>	Wyoming SGCN
Reptile	Massasauga	<i>Sistrurus catenatus</i>	Colorado Species of Special Concern
Reptile	Plains Black-headed Snake	<i>Tantilla nigriceps</i>	Wyoming SGCN
Reptile	Northern Mexican gartersnake	<i>Thamnophis eques</i>	Federally Threatened
Reptile	Valley Gartersnake	<i>Thamnophis sirtalis fitchi</i>	Wyoming SGCN

Appendix B. Previously Signed Cooperative Agreements

COOPERATIVE AGREEMENT

for

RECOVERY IMPLEMENTATION PROGRAM FOR
ENDANGERED SPECIES IN
THE UPPER COLORADO RIVER BASIN

1. Purpose. The parties hereto agree to participate in and implement the recovery program as provided for in the document “Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin” (Program), dated September 29, 1987. The parties also agree to participate in the Recovery Implementation Committee which will be established to oversee the implementation of the Program. The Program provides for a broad range of measures to manage and recover three endangered fishes and to manage the razorback sucker, while providing for new water development to proceed in the Upper Colorado River Basin. The Program has five principal elements: (a) habitat management through the provision of instream flows; (b) nonflow habitat development and maintenance; (c) native fish stockings; (d) management of nonnative species and sportfishing; and (e) research, data management, and monitoring. The Program depends on the effective implementation of all of these elements and on their successful coordination. It is agreed that the Program may be modified from time to time by the Committee as experience is gained in implementing the Program.
2. Geographic Scope. The Program and this Cooperative Agreement apply only to the Upper Colorado River Basin above Glen Canyon Dam, excluding the San Juan River Subbasin.
3. Term. This Cooperative Agreement shall remain in effect for a period of 15 years from the date of its execution.
4. Amendment. This Cooperative Agreement may be extended, amended, or terminated by agreement of the parties, or any party may withdraw from this Cooperative Agreement upon written notice to the other parties.
5. Authorities and Responsibilities.
 - A. Federal Cooperation with States. Section 2(c) (2) of the Endangered Species Act, states that “the policy of Congress is that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species.” Under Section 6 of the Act, the Secretary of the Interior is directed to cooperate to the maximum extent practicable with the States in carrying out the program authorized by the Act and to consult with affected States before acquiring any land and water, or interest therein, for the purpose of conserving endangered species. Under Section 6 of 41 USC 505, an executive agency should enter a cooperative agreement when anything of value will be transferred to a State or local government to carry out a public purpose authorized by Federal statute.

- B. Recovery Plans and Teams. Under Section 4(f) of the Endangered Species Act, the Secretary is directed to develop and implement plans for the conservation of endangered species and may procure the services of public and private agencies and institutions in developing and implementing such recovery plans.
 - C. Consultation and Coordination Among Federal Agencies. Under Section 7 of the Endangered Species Act, Federal agencies shall utilize their programs and authorities in furtherance of the purposes of the Act and ensure that their actions are not likely to jeopardize listed species. Under Section 2 of the Fish and Wildlife Coordination Act, Federal agencies must consult with the Fish and Wildlife Service and with State wildlife agencies on the fish and wildlife impacts of Federal or federally licensed or permitted water projects.
 - D. Operation of Federal Water Projects. The Bureau of Reclamation is charged with the operation of the Flaming Gorge and Curecanti storage units under the 1956 Colorado River Storage Project Act and with the operation of Ruedi Reservoir under P. L. 87-590 and other applicable Federal laws.
 - E. Applicable State Law. Pursuant to applicable State laws and interstate compacts, Colorado, Utah, and Wyoming administer water rights, including water rights for instream flows, and oversee development of water resources, allocated and apportioned to them in perpetuity by interstate compacts. Each of these States also has certain statutory authority and responsibility to protect and manage its fish and wildlife resources.
6. No Delegation or Abrogation. All parties to this Cooperative Agreement recognize that they each have statutory responsibilities that cannot be delegated, and that each have statutory responsibilities that cannot be delegated, and that this Cooperative Agreement does not and is not intended to abrogate any of their statutory responsibilities.
7. Consistency with Applicable Law. This Cooperative Agreement is subject to and is intended to be consistent with all applicable Federal and State laws and interstate compacts.
8. Legislative Approval. All funding commitments made under the Program and this Cooperative Agreement are subject to approval by the appropriate State and Federal legislative bodies.


Donald Paul Hodel
Secretary of the Interior

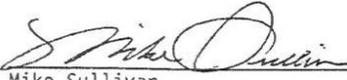
Jan 21, 1988
Date


Roy Romer
Governor of Colorado

1/21/88
Date


Norman H. Bangert
Governor of Utah

1/22/88
Date


Mike Sullivan
Governor of Wyoming

1/21/88
Date


William H. Clagett
Administrator, Western Area Power
Administration, Department of Energy

21 Jun 88
Date

COOPERATIVE AGREEMENT
for the
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM

COOPERATIVE AGREEMENT

This Cooperative Agreement is entered into by the United States of America, represented by the Department of the Interior (Department); the State of Colorado; the State of Utah; the State of New Mexico; the Navajo Nation; the Southern Ute Indian Tribe; the Ute Mountain Ute Indian Tribe; and the Jicarilla Apache Indian Tribe.

I. PURPOSE

On October 24, 1991, a Memorandum of Understanding was executed by the Department, the States of Colorado, Utah, and New Mexico, the Ute Mountain Ute Indian Tribe, the Southern Ute Indian Tribe, and the Jicarilla Apache Indian Tribe, to set forth certain agreements and to establish the foundation for a long-term program to recover the endangered fish species of the San Juan River Basin. This Cooperative Agreement adopts the attached San Juan River Basin Recovery Implementation Program (Implementation Program). The signatories to this Cooperative Agreement agree to participate in and support the Implementation Program including the committees established by the Implementation Program.

II. AUTHORITIES AND RESPONSIBILITIES

- A. Federal Cooperation with States. Section 2(c)(2) of the Endangered Species Act, states that "the policy of Congress is that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species." Under section 6 of the Act, the Secretary of the Interior is directed to cooperate to the maximum extent practicable with the States in carrying out the program authorized by the Act and to consult with affected States before acquiring any land and water, or interest therein, for the purpose of conserving endangered species. Under section 6 of the Act, an executive agency should enter a cooperative agreement when anything of value will be transferred to a State or local government to carry out a public purpose authorized by Federal statute.
- B. Recovery Plans and Teams. Under section 4(f) of the Endangered Species Act, the Secretary is directed to develop and implement plans for the conservation of endangered species and may procure the services of public and private agencies and institutions in developing and implementing such recovery plans.
- C. Consultation and Coordination Among Federal Agencies. Under section 7 of the Endangered Species Act, Federal agencies shall utilize their programs and authorities in furtherance of the purposes of the Act and ensure that their actions are not likely to jeopardize listed species. The Department has the authority to enter into this Cooperative Agreement under section 1 of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). Under

section 2 of the Fish and Wildlife Coordination Act, Federal agencies must consult with the Fish and Wildlife Service and with State wildlife agencies on the fish and wildlife impacts of Federal or federally licensed or permitted water projects.

- D. Applicable State Law. Pursuant to the applicable State laws and interstate compacts, Colorado, Utah, and New Mexico administer water rights, including water for instream uses, and oversee development of water resources, allocated and apportioned to them in perpetuity by interstate compacts. Each of these States also has certain statutory authority and responsibility to protect and manage its fish and wildlife resources.
- E. Applicable Tribal Law. Pursuant to the applicable Tribal laws, and inherent Tribal sovereignty, the Navajo Nation, the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Indian Tribe have the authority to administer water rights, to oversee the development of water resources, and to protect and manage fish and wildlife resources within the boundaries of their reservations.
- F. Statement of Authorities. The signatories hereby state that they have legal authority to enter into this Cooperative Agreement, and have legal authority to carry out all the provisions of the Implementation Program.

III. TERMS AND CONDITIONS

- A. Effective Date and Duration. This Cooperative Agreement shall be effective as of November 1, 1992, and shall remain in effect for a period of 15 years, however, the protection of the reservoir releases as per the Biological Opinion for the Animas-LaPlata Project (Project) shall survive the termination of this agreement and last for the life of the Project.
- B. Amendment. This Cooperative Agreement may be extended, amended, or terminated by agreement of the signatories, or any signatory may withdraw from this Cooperative Agreement upon written notice to the other signatories.
- C. No Delegation or Abrogation. All signatories to this Cooperative Agreement recognize that they each have statutory responsibilities that cannot be delegated, and that this Cooperative Agreement does not and is not intended to abrogate any of their statutory responsibilities.
- D. Consistency with Applicable Law. This Cooperative Agreement is subject to and is intended to be consistent with all applicable Federal, State, and Tribal laws and interstate compacts.

- E. Legislative Approval. All funding commitments made under the Implementation Program and this Cooperative Agreement are subject to approval by the appropriate State, Tribal, and Federal legislative bodies.
- F. Implementation Program Modifications. Modifications to the Implementation Program may be made pursuant to section 5.4 of the attached Implementation Program without requiring modification to this Cooperative Agreement or the additional written consent of the signatories to this agreement.

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by Manuel Lujan Jr. Date October 28, 1992
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by *Roy Romer* Date 10-30-92
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by Bruce King _____ Date 11/6/92
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

This is the signature page from the Governor of Colorado for the cooperative agreement for the San Juan River Basin Recovery Implementation Program in 1992.

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by Leonard Burch Date Nov. 3, 1992
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by *Manuel Lujan Jr.* Date October 28, 1992
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Ray Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangertter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by *Judy Knight-Frank* Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonato Alois, President

TOTAL P. 08

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

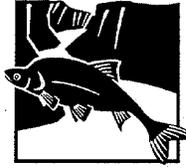
by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

HICARILLA APACHE INDIAN TRIBE

by Leonard Atole Date 11-13-92
Leonard Atole, President



Upper Colorado River Endangered Fish Recovery Program

EXTENSION
OF THE
COOPERATIVE AGREEMENT
FOR THE RECOVERY IMPLEMENTATION PROGRAM FOR
ENDANGERED FISH SPECIES IN THE UPPER COLORADO RIVER BASIN

The parties hereto agree to extend the Cooperative Agreement dated January 21, 1988, which provided for their participation and implementation of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Program), through September 30, 2013.

Gale Norton 12/6/01 *Jim Geringer* 12/6/01
 Gale Norton Date Jim Geringer Date
 Secretary of the Interior Governor of Wyoming

Bill Owens 12/6/01 *Michael S. Hacskeylo* 12/06/01
 Bill Owens Date Michael S. Hacskeylo Date
 Governor of Colorado Administrator, Western Area
 Power Administration,
 U.S. Department of Energy

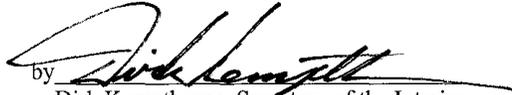
Michael Leavitt 12/11/01
 Michael Leavitt Date
 Governor of Utah

EXTENSION
OF THE
COOPERATIVE AGREEMENT
FOR THE SAN JUAN RIVER RECOVERY IMPLEMENTATION
PROGRAM

The parties hereto agree to extend the 1992 Cooperative Agreement, which provided for their participation in and implementation of the San Juan River Basin Recovery Implementation Program through September 30, 2023.

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by  Date 10-26-06
Dirk Kempthorne, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Bill Owens, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bill Richardson, Governor

STATE OF UTAH

by _____ Date _____
Jon Huntsman, Jr., Governor

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By Bill Owens. Date 11/6/06
Governor

STATE OF NEW MEXICO

By _____ Date _____
Governor

STATE OF UTAH

By _____ Date _____
Governor

NAVAJO NATION

By _____ Date _____
President

SOUTHERN UTE INDIAN TRIBE

By _____ Date _____
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

By _____ Date _____
President

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By _____ Date _____
Governor

STATE OF NEW MEXICO

By *Bess Richman* Date *Oct 30, '06*
Governor

STATE OF UTAH

By _____ Date _____
Governor

NAVAJO NATION

By _____ Date _____
President

SOUTHERN UTE INDIAN TRIBE

By _____ Date _____
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

By _____ Date _____
President

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By _____ Date _____
Governor

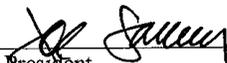
STATE OF NEW MEXICO

By _____ Date _____
Governor

STATE OF UTAH

By _____ Date _____
Governor

NAVAJO NATION

By  Date NOV 01 2006
President

SOUTHERN UTE INDIAN TRIBE

By _____ Date _____
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

By _____ Date _____
President

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By _____ Date _____
Governor

STATE OF NEW MEXICO

By _____ Date _____
Governor

STATE OF UTAH

By _____ Date _____
Governor

NAVAJO NATION

By _____ Date _____
President

SOUTHERN UTE INDIAN TRIBE

By Clement J. Frost Date 10-18-06
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

By _____ Date _____
President

Attachment 2

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By _____ Date _____
Governor

STATE OF NEW MEXICO

By _____ Date _____
Governor

STATE OF UTAH

By _____ Date _____
Governor

NAVAJO NATION

By _____ Date _____
President

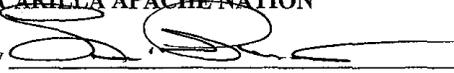
SOUTHERN UTE INDIAN TRIBE

By _____ Date _____
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

By  _____ Date 10/26/06
President

**EXTENSION OF THE COOPERATIVE AGREEMENT
FOR THE
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM**

The parties hereto agree to extend the 1992 Cooperative Agreement for the San Juan River Basin Recovery Implementation Program through September 30, 2023.

In witness whereof, each party has caused this Extension to the Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

By _____ Date _____
Secretary of the Interior

STATE OF COLORADO

By _____ Date _____
Governor

STATE OF NEW MEXICO

By _____ Date _____
Governor

STATE OF UTAH

By  _____ Date 08/15/2022
Governor

NAVAJO NATION

By _____ Date _____
President

SOUTHERN UTE INDIAN TRIBE

By _____ Date _____
Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

By _____ Date _____
Chairman

JICARILLA APACHE NATION

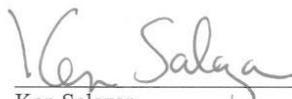
By _____ Date _____
President



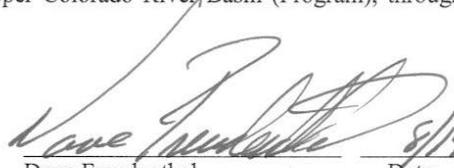
Upper Colorado River Endangered Fish Recovery Program

**EXTENSION
OF THE
COOPERATIVE AGREEMENT
FOR THE RECOVERY IMPLEMENTATION PROGRAM FOR
ENDANGERED FISH SPECIES IN THE UPPER COLORADO RIVER BASIN**

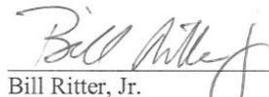
The parties hereto agree to extend the Cooperative Agreement dated January 21, 1988, which provided for their participation and implementation of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Program), through September 30, 2023.


 Ken Salazar
 Secretary of the Interior

AUG 26 2009
 Date


 Dave Freudenthal
 Governor of Wyoming

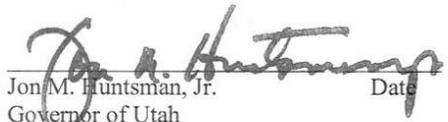
8/14/09
 Date


 Bill Ritter, Jr.
 Governor of Colorado

8/26/09
 Date


 Timothy J. Meeks
 Administrator, Western Area
 Power Administration
 U.S. Department of Energy

8/3/09
 Date


 Jon M. Huntsman, Jr.
 Governor of Utah

7/30/09
 Date