

## Appendices

### APPENDIX A. Tasks, priorities, responsibilities, dates, and descriptions for elements of the Long-Range Plan

The following Recovery Element Tables 1-6 are included:

1. Management and Augmentation of Populations and Protection of Genetic Integrity
2. Protection, Management, and Augmentation of Habitat
3. Management of Nonnative Species
4. Monitoring and Evaluation of Fish and Habitat in Support of Recovery Actions
5. Program Coordination and Assessment of Progress toward Recovery
6. Information and Education

The following are criteria used as guidance for “Recovery Goals Priority” in the *P* column of the following tables:

Low ( <i>L</i> )	The task is not linked to site-specific management actions of recovery goals and is not necessary for species recovery.
Medium ( <i>M</i> )	The task is indirectly linked to site-specific management actions and may be supportive of species recovery.
High ( <i>H</i> )	The task is linked or related to a site-specific management action cited in recovery goals and may be necessary to achieve species recovery goals.
Critical/Compliance ( <i>C</i> )	The task reflects a site-specific management action cited in recovery goals or biological opinions as a compliance measure and is considered necessary to achieve species recovery (formerly Highest).

Status Categories: Ongoing, Annually, Pending, To Be Determined (TBD), As Needed, As Requested, On Hold, Completed

The following are abbreviations used in the following Tables:

ASIR	American Southwest Ichthyological Researchers
BC	Biology Committee
BIA	Bureau of Indian Affairs
BHS	Bluehead Sucker
BOR	Bureau of Reclamation
CC	Coordination Committee
CPM	Colorado Pikeminnow
ERI	Ecosystems Research Incorporated
FMS	Flannelmouth Sucker
FWS	U.S. Fish and Wildlife Service
GJ	Grand Junction
HCNFF	Horsethief Canyon Native Fish Facility

MEC	Miller Ecological Consultants
NFWF	National Fish and Wildlife Foundation
NMDGF	New Mexico Game and Fish Department
NN	Navajo Nation
PO	Program Office
RBS	Razorback Sucker
RERI	New Mexico River Ecosystem Restoration Initiative
Program	San Juan River Basin Recovery Implementation Program
SOW	Scopes of Work
SNARRC	Southwestern Native Aquatic Resources & Recovery Center
TNC	The Nature Conservancy
UNFH	Uvalde National Fish Hatchery

Table A1. Element 1— Management and Augmentation of Populations of Colorado Pikeminnow and Razorback Sucker.

P	Tasks	Start Date	End Date	Who	Status	Status of Activity												
<b>Goal 1.1 Establish Genetically and Demographically Viable, Self-Sustaining CPM and RBS Populations.</b>																		
<b>Action 1.1.1 Develop plans for rearing and stocking CPM and RBS.</b>																		
H	1.1.1.1 Review and update augmentation plan for CPM and adjust stocking goals as needed.	2010	2020	FWS, BC, PO	Ongoing	Time frame for current CPM stocking plan is 2010-2020. Review and update of 10-year stocking goals needs to occur before 2020.												
H	1.1.1.2 Review and update augmentation plan for RBS and adjust stocking goals as needed.	2016	2023 (?)	FWS, BC, PO	Ongoing	Time frame for current 8-year stocking plan is 2009-2016. A draft Augmentation Plan has been created and will be completed in 2017 to guide stocking beginning in 2018.												
<b>Action 1.1.2 Produce, rear, and stock sufficient numbers of CPM to meet stocking goals of augmentation plan.</b>																		
C	Task 1.1.2.1 Annually produce and rear at least 400,000 age-0 CPM (50–55 mm TL) at SNARRC.	2010	2020	SNARRC	Annually	Under the current CPM stocking plan for the San Juan River, augmentation efforts focus on culturing and stocking ≥400,000 age-0 Colorado pikeminnow annually from 2011-2020 or as directed by the SJRRIP. SNARRC currently maintains a broodstock of 725 adult fish. (SOW 15-8)												
C	Task 1.1.2.2 Stock at least 400,000 age-0 CPM annually into the San Juan River Basin	2010	2020	NMFWCO, SNARRC	Annually	In 2016, a total of 432,443 age-0 fish (2016 year class) were stocked at three locations (2 on the San Juan River, 1 on the Animas River) in the San Juan River Basin as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>11/2</td> <td>135,757</td> <td>50-55mm</td> <td>Verde del Rio Park- RM 196</td> </tr> <tr> <td>11/2</td> <td>207,131</td> <td>45-55mm</td> <td>PNM Sluiceway- RM 166.6</td> </tr> <tr> <td>11/3</td> <td>89,555</td> <td>45-55mm</td> <td>Boyd Park- Animas RM 1</td> </tr> </table>	11/2	135,757	50-55mm	Verde del Rio Park- RM 196	11/2	207,131	45-55mm	PNM Sluiceway- RM 166.6	11/3	89,555	45-55mm	Boyd Park- Animas RM 1
11/2	135,757	50-55mm	Verde del Rio Park- RM 196															
11/2	207,131	45-55mm	PNM Sluiceway- RM 166.6															
11/3	89,555	45-55mm	Boyd Park- Animas RM 1															
M	Task 1.1.2.3 Opportunistically stock available CPM in excess of those described above.	2010	2020	NMFWCO, BC, PO	Annually	In 2016, 1,520 age-1 or older PIT tagged CPM were stocked in the San Juan River Basin These PIT tagged fish were stocked to support various studies conducted by the SJRRIP. Evaluation on a case-by-case basis will occur when opportunistically acquired fish become available to the Program in the future.												
<b>Action 1.1.3 Produce, rear, and stock sufficient numbers of RBS to meet stocking goals of augmentation plan.</b>																		
C	Task 1.1.3.1 Produce and rear RBS at SNARRC for stocking to grow-out facilities.	2009	2016	SNARRC	Annually	The RBS stocking plan for the San River is for SNARRC to maintain a captive broodstock population large enough to produce RBS for annual stocking. A broodstock of 1,189 adult fish of Lake Mohave origin is currently being maintained and managed as identified in SNARRC’s Razorback Sucker Genetics Management and Captive Propagation Plan (2004). In 2016, a total of 7,000 age-2 RBS (2014 year class) were stocked into two NAPI ponds on April 27, 2016: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>4/27</td> <td>3,500</td> <td>194-220mm</td> <td>604 lbs</td> <td>W. Avocet</td> </tr> <tr> <td>4/27</td> <td>3,500</td> <td>194-220mm</td> <td>604 lbs</td> <td>Hidden Pond</td> </tr> </table> All fish are PIT tagged prior to hauling and stocking into the NAPI	4/27	3,500	194-220mm	604 lbs	W. Avocet	4/27	3,500	194-220mm	604 lbs	Hidden Pond		
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						ponds. (SOW 15-9).
C	Task 1.1.3.2 Rear RBS in three NAPI grow-out ponds (3,000-3,500 fish per pond, > 200 mm TL) and stock into the San Juan River.	2009	2016	NN, NMFWCO	Annually	7,000 Razorback Suckers, 194-220mm TL, were stocked into two NAPI Ponds in April 2016. E. Avocet pond was unused to allow for maintenance and re-grading. Passive harvest occurred in September 14-29 and active harvest was conducted on October 18 & 19, 2016. Overall, 2,501 Razorback Suckers averaging 334 mm were stocked into the San Juan River at various locations under two independent studies' protocols. (SOW 16-10)
C	Task 1.1.3.3 Produce > 2,000 RBS per year (>300 mm TL) at Horsethief Canyon Native Fish Facility (HCNFF), which is part of the larger Ouray National Fish Hatchery – Grand Valley Unit (ONFH-GVU) in Grand Junction, CO.	2013	2016	FWS ONFH- GVU	Annually	Ponds became operational in summer 2012. The fourth year stockings of RBS from HCNFF occurred in the fall of 2016. A total of 4,102 RBS were stocked as follows: 1) 10/11/2016 - 873 RZ stocked into the San Juan River at Shiprock, NM (mean TL = 381 mm) 2) 10/13/2016 - 762 RZ stocked into the San Juan River at Bloomfield, NM (mean TL = 393 mm) 3) 10/17/2016 - 818 RZ stocked into the Animas River at Berg Park, NM (mean TL = 393 mm) 4) 10/19/2016 - 816 RZ stocked into the San Juan River at Mont. Creek, UT (mean TL = 389 mm) 5) 10/25/2016 - 833 RZ stocked into the San Juan River at PNM Weir, NM (mean TL = 385 mm) The SJRBRIP was charged this year for harvesting, PIT-tagging, or transport/stocking in FY-16 (SOW 16-6). The next cohort -- to produce > 2,000 RZ of target size (> 300 mm TL) -- to be stocked in 2017 (SOW 17-6). (See Task 1.3.1.4)
C	Task 1.1.3.4 Stock at least 91,200 RBS (> 300 mm TL) during eight year stocking period or 11,400 per year.	2009	2016	NN, CRFP, NMFWCO	Annually	In 2016, 7,666 RZB were stocked at various locations in the San Juan and Animas rivers in NM & 1 site in UT (Montezuma Creek): 4,102 RZB were delivered from Ouray/Horse Thief Canyon-GVU (2015 YC), 2,501 from NAPI ponds (2014 YC), and 1,063 from SNARRC (2014 YC). Overall, 103,938 fish were stocked under the eight year stocking effort: a surplus of 12,738 fish. A new Augmentation Plan has been drafted and is being finalized to guide stocking efforts beginning in 2018
M	Task 1.1.3.5 Opportunistically stock available RBS in excess of the 11,400 described above.	2009	2016	NMFWCO, BC, PO	Annually	No excess RBS were stocked in 2016. Stocking target of 11,400 RZB/year was not fulfilled in 2016, but the goal of 91,200 RZB stocked over 8 years had already been exceeded. Evaluation on a case by case basis will occur if opportunistically acquirable fish become available to the SJRRIP in the future.
<b>Goal 1.2—Identify and Implement Strategies for Improving the CPM and RBS Augmentation Program and Genetic Integrity.</b>						
<b>Action 1.2.1 Implement methods to evaluate status and success of stocked CPM and RBS.</b>						
H	Task 1.2.1.1 Maintain a standardized database for all stocked	2009	2023	PO	Ongoing	The CPM and RBS PIT tag databases have been updated to reflect

	and recaptured CPM and RBS in order to determine the fate of stocked fish.					2016 stocking, capture, and recapture efforts conducted by various Program projects. The database currently contains 59,473 CPM and 176,669 RBS records (SOW16-37). Efforts are on-going to integrate Program data into the online database STReAMS.
H	Task 1.2.1.2 Identify, describe, and implement strategies for improving survival and retention of stocked CPM and RBS, including acclimation prior to stocking, size of fish stocked, time and location of stocking, physiological conditioning, and predator avoidance.	2009	2023	FWS, NMFWCO	Ongoing	Developed and implemented an experimental stocking design for RBS to better understand the effects soft vs. hard release and stocking site has on retention/survival. Recapture data will be used to evaluate those effects.  Stocking locations at PNM Weir (Fruitland, NM) and upstream at Verde del Rio Park (Bloomfield, NM) on the San Juan River, plus Boyd and Berg Parks on the Animas River in Farmington, NM were used to reduce densities at stocking sites and to expand stocking range for YOY CPM. (SOW 16-7)
L	Task 1.2.1.3 Identify and implement a method for tracking genetics of CPM and RBS in the San Juan River to determine if and to what extent wild-produced individuals depart from genetic structure of parental stock (hatchery derived).	2003	2023	FWS	As needed	No action taken yet as wild-produced individuals remain rare.
<b>Goal 1.3— Support Operations and Maintenance of Facilities to Support CPM and RBS Stocking Programs.</b>						
<b>Action 1.3.1. Support production and grow-out facilities.</b>						
H	Task 1.3.1.1 Support operation and maintenance of hatchery facilities at SNARRC for CPM and RBS production.	1994	2016/2020	PO, FWS	Annually	Program provided funding for these projects via SOW 16-8 & 9)
H	Task 1.3.1.3 Support operation and maintenance of NAPI grow-out ponds.	1994	2023	NN, FWS	Annually	Program provided funding for this project via SOW 16-10
H	Task 1.3.1.4 Support operation, and maintenance of Horsethief Canyon Native Fish Facility (HCNFF), part of the larger Ouray National Fish Hatchery – Grand Valley Unit (ONFH-GVU) in Grand Junction, CO.	2013	2023	FWS ONFH-GVU	Annually	Program provided funding for this project via SOW 16-6.
<b>Action 1.3.2 Implement a PIT tag marking program to insure all stocked and/or encountered endangered fish are fitted with PIT tags to track individual CPM and RBS in support of evaluation and assessment activities.</b>						
H	Task 1.3.2.1 Procure adequate numbers of PIT tags for marking endangered fish.	1998	2023	BOR	Ongoing	Reclamation is currently developing a DOI-wide contract for the procurement of PIT tags and related equipment.
H	Task 1.3.2.2 Install and maintain remote PIT tag detectors in the river to passively track fish presence/absence and movement.	2012	2023	BOR	Ongoing	Permanent passive PIT tag detectors were installed at TNC Phase II restoration sites west of Shiprock, NM, Hogback Fish Weir (RM 159), and PNM fish passage (RM 167) in 2014. A permanent detector was installed across half of the river at PNM Diversion. Coverage across the entire river will potentially be done after a year to see if the partial structure stays in place. Mobile detectors were also deployed at several locations in the river.

Table A2. Element 2 — Protection, Management, and Augmentation of Habitat

<i>P</i>	Tasks	Start Date	End Date	Who	Category	Status of Activity ( focus on previous year)
<b>Goal 2.1 Provide Suitable Habitat to Support Recovery of CPM and RBS Populations</b>						
<b>Action 2.1.1 Implement habitat restoration strategies to augment the function of river flow to create and maintain suitable habitat.</b>						
<i>H</i>	Task 2.1.1.1 Develop and implement a plan for feasible habitat restoration strategies and implement such plan as funding becomes available.	2011	2023	BOR, BC, FWS, NN	Pending	This will likely be a topic for a workshop in the future once additional information is collected on the persistence of restored aquatic habitats and use by larval and small-bodied fish from prior to spring runoff to late fall, the retrospective analysis is completed, and the flow revision workshop is completed.
<b>Action 2.1.2 Create and maintain habitat complexity to minimize loss and degradation of habitat for the endangered fish in the SJR</b>						
<i>C</i>	Task 2.1.2.1 Support implementation of TNC’s Conservation/Habitat Planning Project.	2015	2023	TNC, PO	Ongoing	In 2014, the Phase II channel restoration was completed at a complex site located between RM 134 and RM 137 using private mitigation funds. Restoration methods included: 1) re-establishing the secondary channel inlet (i.e. connection with the river) and cleaning out secondary and tertiary channels; 2) mechanical clearing and chemical treatment of Russian olive and saltcedar along banks; and 3) replacement-planting of willow poles. A total of 4.7 miles of channel restoration and 17 acres of exotic vegetation removal were completed.
<b>Action 2.1.3 Procure products, equipment, and materials in support of Goal 2.1 – 2.6</b>						
<i>H</i>	Task 2.1.3.1.Obtain river videography	1999	2023	P.I.s	Annually	River videography is now obtained through a purchase agreement with an independent provider and paid for using NFWF funds authorized by the USFWS.
<i>H</i>	Task 2.1.3.2 Support operation and maintenance of San Juan River stream gages as necessary to monitor flows in the river.	1999	2023	BOR, PO	Annually	The Program funded USGS to provide 12 additional flow measurements at four SJR gages in NM (Archuleta, Farmington, Shiprock, and Four Corners (SOW 16-13).
<b>Goal 2.2—Provide Suitable Flows to Support Recovery of CPM and RBS Populations.</b>						
<b>Action 2.2.1 Develop flow regimes to provide adequate flow and function to maintain habitat for CPM and RBS.</b>						
<i>C</i>	Task 2.2.1.1 Implement flows that provide suitable habitat for endangered fishes and other native fishes in the San Juan River.	1999	2023	BOR, FWS, BC	Ongoing	Reclamation operates Navajo Dam according to the Recovery Program’s Flow Recommendations using operations decision criteria developed in 2006. Modifications were made to the criteria during an environmental flow workshop in April 2016.
<i>H</i>	Task 2.2.1.2 Develop and implement a process for evaluating and revising flow recommendations.	2016	2017	BOR, FWS, BC	Pending	The process for revising flow recommendations will be based on monitoring data, the new San Juan River Basin hydrologic model, updated climate change projections for stream flow, and expanded scientific knowledge of flow-ecology relationships. To initiate the process, the Program held an environmental flow workshop in April 2016 to make modifications to the existing process for implementing the flow recommendations to partially address

						apparent weaknesses in the decision criteria as a result of the drier hydrologic conditions that have occurred in the basin in the last decade. During the workshop a process was also developed for conducting a flexible end of water year storage target (EWYST) decision tree releasing maximum days at 5,000 cfs..
<b>Action 2.2.2 Develop and maintain a hydrology model to evaluate flow recommendations in the context of water supply and demand in the Basin.</b>						
C	Task 2.2.2.1 Develop, evaluate, and refine a San Juan Basin hydrology model that provides a scientifically sound and biologically relevant representation of the San Juan River.	1995	2023	BOR, FWS	Ongoing	Completion of San Juan Basin Hydrology Model (SJRHM) Generation IV was completed in 2016 (SOW 16-12).
M	Task 2.2.2.2 Conduct peer review of the hydrology model by qualified specialists not affiliated with the Program.	2015	2023	PO	Pending	A validation report was provide by BOR to the PO that was open for comments for the Generation IV hydrology model.
H	Task 2.2.2.3 Provide model analysis for the evaluation of flow recommendations.	1999	2023	BOR, FWS	As requested	Model runs were requested in 2016 to evaluate the flexible EWYST decision tree for releasing maximum days at 5,000 cfs..
<b>Action 2.2.3 Coordinate with BOR on Navajo Dam operations.</b>						
H	Task 2.2.3.1 Provide input and recommendations to Fish and Wildlife Service and Reclamation on alternate dam operations when extreme hydrologic conditions prevent flow recommendations from being met.	2016	2023	BC, PO	Ongoing	The 2014 water year was the sixth straight year with below-average (30-year) hydrology in the San Juan River Basin. The April-July inflow to the reservoir was only 58% of average. Additionally, the reservoir went into the year with much below average storage. However, the Flow Recommendation Decision Tree did recommend that a 1-week spring peak release occur in late May. After discussion with the Program, it was agreed that the spring peak release be forgone for 2014 in favor of recovering the reservoir and sustaining the ability to meet target baseflows. Operations at Navajo continued to be run very tightly, releasing the minimum required to meet the target baseflow while attempting to recover storage in the reservoir.
H	Task 2.2.3.2 Make determination of perturbation for Navajo Dam operations.	2000	2023	BOR, BC	Annually	Reclamation provided a determination of perturbation to the BC for their review on Feb. 19, 2015. 2013 was not a perturbation year (not enough qualifying storm events in calendar year 2012); 2014 through 2016 were all a perturbation year (due to the monsoons or storm events occurring in the prior calendar year).
<b>Action 2.2.4 Provide and protect flows in the San Juan River consistent with flow recommendations.</b>						
C	Task 2.2.4.1 Develop and implement mechanisms for protecting water required to meet flow recommendations.	1999	2023	BOR	Ongoing	BOR actively coordinates with the appropriate parties to achieve the Program’s second goal of “proceeding with water development in the Basin in compliance with federal and state laws, interstate compacts, Supreme Court decrees, and federal trust responsibilities to the tribes.”
C	Task 2.2.4.2 Develop contingency strategies to meet the functions provided by flow recommendations during extended periods of droughts.	2014	2023	BOR, FWS, BC	Pending	In 2014, Reclamation proposed modifying the existing process for implementing the flow recommendations to partially address apparent weaknesses in the decision criteria as a result of the drier hydrologic conditions that have occurred in the basin during 1999

						to 2013 period as compared to the longer term period since 1971. To reduce the risk of shortages and improve implementation of the flow recommendations, the BC recommended a “standard target elevation” of 6,063 with a flexibility range to reduce to 6,050 for biological flexibility and to forego a one week peak release in 2015.
M	Task 2.2.4.3 Collaborate with agricultural, municipal, and industrial water users in the San Juan Basin to promote water use efficiency savings and water market transactions that support environmental flows.	2015	2023	FWS, BOR, BC, TNC	Ongoing	A 2014 TNC review of the current scientific literature and case studies indicated that both water market transactions and irrigation system improvements that integrate infrastructure modernization with operational changes can successfully reduce agricultural river diversions for the benefit of endangered fish. The study identified multiple opportunities to collaborate with agricultural, municipal, and industrial water users in the San Juan Basin to reduce river diversions through water use efficiency improvements, thereby supporting environmental flows.
<b>Goal 2.3—Provide Increased Range to Support Recovery of CPM and RBS Populations.</b>						
<b>Action 2.3.1 Identify blockages to fish passage at diversion structures in the San Juan River and provide and maintain fish passage where needed.</b>						
C	Task 2.3.1.5 Investigate the need for fish passage at the Arizona Public Service Company (APS) Weir and provide and maintain fish passage, if deemed necessary.	2016	2018	BOR, FWS	Pending	The need for fish passage at the APS Irrigation Diversion structure was identified in 2005 by Stamp et al. A fish passage at APS Weir will be constructed as part of the mitigation requirements for the Four Corner Power Plant and Navajo Mine Energy Project. Implementation of the mitigation measure (RPM #4 of the 2015 BO) began in 2016. The FCCP and NMEP Project will cost-share with the Program to complete the project. 2017 capital funds are budgeted for planning, engineering, and constructing of the fish passage.
C	Task 2.3.1.6 Investigate the need for fish passage at the Fruitland Diversion and provide and maintain fish passage, if deemed necessary.	2016	2018	BOR, FWS, NN	Ongoing	Planning and engineering work on the Fruitland Diversion Dam renovation project got underway at the end of 2015. The Program is coordinating with project planners to construct a fish passage and screens as part of the renovation project. 2017 capital funds are budgeted for the fish passage and screens. Completion of construction is expected in April 2018.
H	Task 2.3.1.7 Investigate the need for passage of native and endangered fish from Lake Powell around the waterfall into the San Juan River and provide and maintain fish passage, if deemed necessary.	2016	TBD	FWS, BOR, BC	Pending	The Program has funded preliminary work by UDWR to translocate RBS and CPM upstream of the waterfall and further effort to move and track translocated fish has been under-taken by KSU.
<b>Action 2.3.2 Identify impediments to fish passage in San Juan River tributaries to increase range.</b>						
H	Task 2.3.2.1 Investigate the need for fish passage at the Animas Pump Station #2 and provide and maintain fish passage, if deemed necessary.	2007	TBD	BOR, FWS, BC	Ongoing	Francis (2007) investigated fish passage and canal entrainment of native sucker populations in the Animas River. He found the Animas Pump Station #2 was a seasonal barrier to fish passage and Farmer’s Ditch Diversion on the Animas was a significant



						barrier to native sucker movement.
H	Task 2.3.2.2 Investigate the need for fish passage at the Farmer's Ditch Diversion and provide and maintain fish passage, if deemed necessary.	2007	TBD	BOR, FWS, BC	Ongoing	See above.
H	Task 2.3.2.3 Investigate the need for fish passage at other diversion structures in the Animas River and provide and maintain fish passage, if deemed necessary.	2007	TBD	BOR, FWS, BC	Ongoing	See above
<b>Action 2.3.3 Operate and maintain fish passages at diversion structures in the San Juan River.</b>						
C	Task 2.3.3.1 Operate and maintain fish passage at the Public Service Company of New Mexico (PNM) Weir.	2003	2023	FWS, NN	Ongoing	Program provides long-term funding for operation of a selective fish passage at PNM weir. Repairs and/or upgrades are being made to inflow gates and screens to alleviate upstream sediment deposition problem. PIT tag antennas were also installed in 2014 to evaluate fish passage efficiency. (SOW16-14)
<b>Goal 2.4— Minimize fish entrainment at diversion structures in the San Juan Basin.</b>						
<b>Action 2.4.1 Identify diversions that could potentially entrain endangered fish in the San Juan River and remediate where necessary.</b>						
C	Task 2.4.1.2 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at the Arizona Public Service Company (APS) Weir.	2016	2018	BOR, BC, PO, FWS	Ongoing	APS Weir entrainment will be addressed in conjunction with Four Corner Power Plant and Navajo Mine Energy Project implementation of mitigation measure RPM #4 of the 2015 BO.
C	Task 2.4.1.3 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at the Fruitland Canal.	2015	2018	BOR, BC, PO, FWS	Ongoing	Planning and engineering work on the Fruitland Diversion Dam renovation project got underway at the end of 2015. The Program is coordinating with project planners to construct a fish passage and screens as part of the renovation project. 2017 capital funds are budgeted for the fish passage and screens. Completion of construction is expected in April 2018.
H	Task 2.4.1.4 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at the Jewett Valley Ditch.	2015	2016	BOR, FWS, BC, PO	Pending	The 2016 San Juan and Animas river diversion study identified 5.25 CPM/hr, and 4.32 RBS/hr There is no fish passage to allow escape from the diversion ditch upstream of the newer headgate, except back upstream.
H	Task 2.4.1.5 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at the San Juan Generating Station.	2015	2016	BOR, BC, PO, FWS	Pending	San Juan Generating Station was not visited in the 2016 San Juan and Animas river diversion study. While there is a substantial concrete head-grade control structure that extends across the river channel adjacent to the intake structure, another feature of this diversion is a fish passage on the opposite side of the river from the headgate. The intake structure directs flow to a stilling basin, from which water is pumped to the San Juan Generating Station. There is a trash rack across the intake structure, and a rotating mesh fish screen at the pump-house, with openings approximately 10.6 cm x 15.2 cm.
H	Task 2.4.1.6 Investigate the need for and construct, if	2015	2016	BOR, BC,	Pending	Farmer's Mutual Ditch was not visited in the 2016 San Juan and

	appropriate, a fish screen or deflection weir at the Farmer's Mutual Ditch.			PO, FWS		Animas river diversion study. Based on the aerial photograph, a substantial head-grade control structure extends across the entire river channel adjacent to the headgate structure. Again, based on the aerial photograph, the head-grade control structure appears to be comprised of large boulders. It is unknown if there is a fish screen in front of the headgate.
<b>Action 2.4.2 Identify diversions that could potentially entrain endangered fish in San Juan River tributaries and remediate where necessary.</b>						
H	Task 2.4.2.1 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at Animas Pump Station #2.	2015	2016	BOR, BC, PO, FWS	Pending	Animas Pump Station #2 was not visited in the 2016 San Juan and Animas river diversion study.
H	Task 2.4.2.2 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at the Farmer's Ditch Diversion.	2015	2016	BOR, BC, PO, FWS	Pending	Farmers Ditch Diversion on the Animas (RM 21.9) will be included in the diversion assessment in 2016 (see Task 2.4.1.2).
H	Task 2.4.2.3 Investigate the need for and construct, if appropriate, a fish screen or deflection weir at diversion structures in the Animas River.	2015	2016	BOR, BC, PO, FWS	Pending	Francis (2007) investigated entrainment of native suckers in diversion canals in the Animas River. Although a specific study to estimate entrainment losses was not conducted, he concluded YOY suckers may be entrained in canals and pump stations. Animas River diversions and ditches will be included in the diversion assessment in 2016 (see Task 2.4.1.2).
<b>Action 2.4.3 Operate and maintain fish entrainment prevention structures at diversions in the San Juan River.</b>						
C	Task 2.4.3.1 Operate and maintain a fish deflection weir at the Hogback Diversion.	2013	2023	BOR, BC, PO, FWS, NN	Ongoing	A fish deflection weir at Hogback Diversion was completed in FY2013. PIT tag antennas were installed on the structure in 2014 and tests conducted to test for effectiveness. Additional tests are planned. See Tasks 4.5.2.2 for test results.
<b>Goal 2.5—Provide Suitable Water Quality to Support Recovery of CPM and RBS Populations.</b>						
<b>Action 2.5.1 Describe water quality and identify potential problems to native and endangered fish.</b>						
C	Task 2.5.1.1 Coordinate with other agencies to evaluate water quality of the San Juan River Basin and identify potential effects to native and endangered fish.	1999	2023	FWS, BOR, BC	Ongoing	FWS is coordinating with other agencies; strategies for research and monitoring are being developed.
C	Task 2.5.1.2 Compile and synthesize historic water quality information on the San Juan River to identify water quality parameters that may be detrimental to native and endangered fish species (e.g., mercury, selenium, polycyclic aromatic hydrocarbons [PAHs]).	1994	2023	FWS, BOR, BC	Ongoing	See above
C	Task 2.5.1.3 Conduct an evaluation of water quality as potential limiting factors to recovery.	1994	2023	FWS	Ongoing	See above.
<b>Action 2.5.2 Remediate Water Quality Problems</b>						

C	Task 2.5.2.1 Develop and implement a comprehensive contaminants monitoring plan to identify water quality threats to the endangered species.	2010	TBD	FWS	Pending	The FWS is working with other agencies to develop a basin-wide strategy to accomplish this task.
C	Task 2.5.2.2 Identify effects of contaminants on recovery of endangered fish.	2010	2023	FWS, BC	Ongoing	See above.
C	Task 2.5.2.3 Provide assistance in developing recommended water quality criteria for problematic contaminants for consideration by state and federal water quality regulatory agencies when those agencies adopt enforceable water quality standards.	2010	TBD	FWS	Ongoing	See above.
<b>Action 2.5.3 Minimize the risk of hazardous-materials spills in critical habitat.</b>						
C	Task 2.5.3.1 Identify and remediate potential sources of hazardous materials in areas of designated critical habitat (e.g., petroleum-product pipelines within the 100-year floodplain, riverside retention ponds).	2012	TBD	FWS, TNC	Pending	First step: TNC will complete its identification of potential hazardous material threats in 2015 (SOW 09-16). Second step: Develop plan for remediating potential hazardous materials spills (includes Tasks 2.5.3.2-2.5.3.4).
C	Task 2.5.3.2 Review and recommend modifications to state and federal hazardous-materials spills emergency-response plans to ensure adequate protection for CPM and RBS populations from hazardous-materials spills.	TBD	TBD	FWS, PO	Ongoing	See above
C	Task 2.5.3.3 Assess the need for and install emergency shut-off valves on problematic petroleum-product pipelines within the 100-year floodplain of critical habitat to minimize the potential of spills.	TBD	TBD	FWS, PO	Ongoing	Same as above.
C	Task 2.5.3.4 Develop Best Management Practices for heavy equipment use within the 100 year floodplain.	TBD	TBD	FWS, PO	Ongoing	Same as above.
<b>Goal 2.6— Manage the Native Fish Community to Assist in Recovery of the Endangered Species.</b>						
<b>Action 2.6.1. Develop, implement, and evaluate the most effective strategies for maintaining the native fish community upon which the endangered species depend.</b>						
H	Task 2.6.1.1. Use active capture techniques to assess native fish abundance.	1999	2023	P.I.'s	Annually	Refer to Element 4 for monitoring and evaluation of fish and habitat activities.
H	Task 2.6.1.2. Conduct annual review of native fish abundance and potential implications to recovery of the endangered fish.	1999	2023	P.I.'s	Annually	Refer to Element 4 for monitoring and evaluation of fish and habitat activities.
H	Task 2.6.1.3 Develop a comprehensive management plan in conjunction with the non-native fish management plan and the endangered species augmentation plans and recovery goals.	2000	2023	PO, BC, FWS, NMDGF, UDWR	Ongoing	The Program's Monitoring Plan And Protocols (Feb 2012) are being used to implement standardized fish monitoring to assess the presence, status, and trends of CPM, RBS, and fish community.

Table A3. Element 3 — Management of Nonnative Aquatic Species.

P	Tasks	Start Date	End Date	Who	Category	Status of Activity (focus on previous year)
<b>Goal 3.1—Control Problematic Nonnative Fishes.</b>						
<b>Action 3.1.1 Develop, implement, and evaluate the most effective strategies for reducing problematic nonnative fish.</b>						
C	Task 3.1.1.1 Mechanically remove nonnative fish to achieve objectives.	2002	2023	NMFWCO, UDWR	Annually	<p><u>Upper San Juan River</u> - In 2016, the SJRIP implemented a revised study design to better quantify the effects of nonnative removal on native and nonnative fishes. The new study conducted in the upper section of the San Juan River focused on a smaller reach of river from Shiprock Bridge (RM 147.9) to Montezuma Creek, Utah (RM 93.6). The 54 river mile reach was delineated in to control (no electrofishing) and treatment (intensive removal) reaches for each respective geomorphic reach. The section sampled by SOW 13-17 Upper, encompasses geomorphic reaches 5-3 resulting in three treatments equaling 28 total river miles sampled. An initial marking pass was completed throughout the entire reach through both control and treatment reaches one week prior to the first removal trips starting in late March. This marking pass resulted in the marking of 641 Channel Catfish that would allow for generating exploitation rates and population estimates for different size classes of Channel Catfish, and to be able to quantify movement between reaches. Crews completed six consecutive removal trips during the spring, resulting in 12 intensive removal passes in the treatment reaches from March – May. Four consecutive removal trips were completed in the treatment reaches during August – September, resulting in a total of 20 removal passes for the year in each treatment reach and removed 6,316 Channel Catfish and 246 Common Carp in 545.4 hours of electrofishing.</p> <p>Exploitation rate in 2016 for all three treatment reaches combined, 10 trips (2 passes per trip), was 57.1% for juvenile Channel Catfish and 48.6% for adult Channel Catfish. Exploitation rate for all life stages combined was 48.8%. Majority of recaptures occurred during trips 1-6, prior to spring runoff, with only eight fish being recaptured after the spring flow release, trips 7-10. Exploitation rates for adults, by size class, were 41.3% (300-399mm TL), 51.1% (400-499mm TL), 54.8% (500-599mm TL), and 100% (600mm+ TL).</p> <p>Since intensive nonnative removal began in this section, catch rates for Common Carp have significantly decreased. Common Carp are infrequently collected during nonnative removal trips in this section. Although we did collect 246 Common Carp in 2016, the majority (N=226) were juveniles. This increase in juvenile Common Carp is likely a result of the extended spring flow release that took place in 2016. (SOW 13-17 Upper)</p> <p><u>Lower San Juan River</u> - Nonnative fish removal activities have been ongoing in the lower San Juan River since 2002. This year we shifted our effort to the middle section of the San Juan River from Montezuma Creek to Mexican Hat.</p>

						<p>This effort this year was also more of an experimental design with control (RM 77-58.9) and treatment reaches (RM 93.5-76.9 and RM 59-53.3). One marking trip and eight removal trips were conducted in 2016. During removal trips, 41 black bullhead, 2,955 channel catfish, one brown trout, two largemouth bass, four white suckers, and 27 common carp were removed. Catch rates for common carp have remained relatively low since 2004. Catch rates for channel catfish have remained steady over the past few years, but the size structure has changed with a majority of the fish being adults (&lt;300 mm). More adults are being captured because we have shifted our effort to an area that has higher concentrations of adult channel catfish. Lincoln Peterson population estimates were conducted on channel catfish in this section of river and estimated to be 2,188 from RM 93.5-76.9 and 917 from RM 59-53.3.</p>
C	Task 3.1.1.2 Remove nonnative fish at selective fish passage structures.	2003	2023	NN, FWS	Annually	<p>Nonnative fish were removed at PNM selective fish passage structure (see Task 2.3.1.4). The passage operated 230 days between March 15 and October 30, 2015 (passage was closed for 77 days of the 230 days, due to automatic screen cleaner installation, Gold King Mine Spill, and two severe rain events that caused debris buildup at the inlet). 11,272 total fish were captured. 10,393 native fish were transported upstream of the weir including 32 CPM and 38 RBS. 879 non-native fish were captured and removed from the river at the PNM fish passage facility (SOW 16-14).</p>
H	Task 3.1.1.3 Remove nonnative fish during all Program research and monitoring activities.	1999	2023	P.I.s	Ongoing	<p>This is a SOP for the Program but no specific reporting requirements are in place. “Adult Monitoring” reports numbers of nonnative removed annually by that study. It provides a yearly snapshot of the relative number of nonnative fish in the SJR in relation to both T&amp;E and common, sympatric large-bodied natives. It also reports the location (by age-class &amp; 10-RM section) of Channel Catfish in the SJR to help inform the best locations for performing nonnative fish removal in the subsequent year. A total of 722 Channel Catfish were removed during Adult Monitoring in 2016. This made up 9.7% of the total catch (third most abundant species) in the common sampled area RM 180-77, however catfish were only found from RM 166.6 to 77. The highest concentration regardless of age class was found between RM 90 and 77. Adult (&gt;300 mm TL) and juvenile (200-299 mm TL) had their highest concentrations between RM 150 and 140 whereas sub-adult (61-199 mm TL) and young of year (0-60 mm TL) had their highest concentrations between RM 90 and 77.</p>
C	Task 3.1.1.4 Conduct annual review of success of nonnative fish control strategy.	1999	2023	FWS, UDWR, BC	Annually	<p>Success of riverwide nonnative fish removal is reviewed annually by P.I.’s and BC (SOW 16-17 Upper and 16-18 Lower). See above.</p>
C	Task 3.1.1.5 Organize and conduct workshops, as necessary, to develop a comprehensive non-native species management plan, including measurable river wide objective to determine effects of removal effort on native and nonnative fishes.	2010	2014	NMFWCO, BC, PO	In progress	<p>The BC held a meeting in conjunction with its December 2016 meeting to evaluate the results of the experimental non-native fish control implemented in 2016. The BC recommended minor changes that resulted in a second year of the control-treatment experimental removal design.</p>

H	Task 3.1.1.6 Establish target criteria for reduction of problematic nonnative fish species to estimate time, effort, and cost for controlling nonnative fishes.	2012	2023	BC, FWS	Ongoing	See Task 3.1.1.5.
H	Task 3.1.1.7 Evaluate and implement effective alternative nonnative fish reduction methods.	2012	2023	FWS, BC	Ongoing	See Task 3.1.1.5.
<b>Goal 3.2—Prevent introduction and establishment of other nonnative invasive species.</b>						
<b>Action 3.2.1 Ensure that sport fishing regulations and enforcement are consistent with endangered fish recovery.</b>						
M	Task 3.2.1.1 Review sport fishing regulations and revise, as necessary, to ensure consistency with endangered fish recovery.	1999	2023	States, NN, PO,BC	Ongoing	See Tasks 3.2.2.1 and 3.2.2.2.
M	Task 3.2.1.2 Collaborate with state and tribal agencies to enforce fishing regulations.	1999	2023	States, NN, PO,BC	Ongoing	See Tasks 3.2.2.1 and 3.2.2.2.
<b>Action 3.2.2 Develop and implement policies and agreements among stakeholders on nonnative game fish management to prevent introduction of invasive species</b>						
C	Task 3.2.2.1 Develop and implement a sport fish stocking policy among the states and tribes.	2009	2015	States, NN, PO,BC	In Progress	A final draft version of the sport fish stocking procedures document is being completed by New Mexico Department of Game and Fish after receiving comments from Colorado Parks and Wildlife. After completion of the final draft version, the stocking procedures document will be reviewed by Colorado Parks and Wildlife with eventual distribution to other signatories for review.
H	Task 3.2.2.2 Execute agreements among the states and tribes to prevent the spread of nonnative invasive species.	2009	2015	States, NN, PO,BC	In Progress	This will occur after the stocking procedures document is finalized and reviewed by the document’s signatories.
<b>Action 3.2.3 Identify potential invasive nonnative species and control their introduction and escapement into the main river, floodplain, and tributaries.</b>						
L	Task 3.2.3.1 Consolidate all information for a comprehensive report and risk assessment of waterfall inundation and associated immigration of nonnative fish from Lake Powell including options and recommendations for potential management actions.	TBD	TBD	PO, BC	On Hold	Information is being collected. No management actions are being proposed at this time. See Task 2.3.1.7
C	Task 3.2.3.2 Develop a plan to control non-native fish entering the SJR from Lake Powell and be prepared to implement when the lake refills.	TBD	TBD	PO, BC	As needed	If a barrier/passage is determined to be necessary, a plan will be developed. See Task 2.3.1.7
H	Task 3.2.3.3 Identify major sources of nonnative fish from tributaries and off-channel features to minimize reinvasion of riverine habitats by problematic species.	TBD	2023	BC	Ongoing	This will be part of a comprehensive non-native species management plan.
C	Task 3.2.3.4 Implement measures to reduce escapement of nonnative fish from tributaries and off-	2009	2023	PO, BOR, FWS	As needed	Measures are being implemented at the recently constructed Lake Nighthorse on the Animas River. Nonnative fishes occur in the reservoir and they could

	channel features, as necessary.					potentially be released into San Juan River Basin. Tests have shown the sleeve valve on the outlet structure does not prevent 100% escapement as originally anticipated, especially for early life history stages. The management plan for the reservoir will only allow the stocking of trout and salmon species and include additional monitoring of releases. No other measures are being implemented, at this time, to reduce escapement of nonnative fish from tributaries and off-channel features.
H	Task 3.2.3.5 Coordinate with other programs, agencies, and activities to track occurrences of nonnative species in the San Juan River Basin and, if a potential invasive species problem is identified, develop and implement preventive actions as appropriate.	1999	2023	PO, BC, States	Ongoing	Channel Catfish is currently the primary nonnative species of concern in the San Juan River. All nonnative fishes encountered during the Program's nonnative fish removal efforts are removed. No other invasive species problem has been identified in the San Juan River at this time.

Table A4. Element 4 — Monitoring and Evaluation of Fish and Habitat in Support of Recovery Actions.

P	Tasks	Start Date	End Date	Who	Category	Status of Activity (focus on previous year)
<b>Goal 4.1—Monitor Fish Populations of the San Juan River.</b>						
<b>Action 4.1.1 Develop a Standardized Monitoring Plan for fish.</b>						
M	Task 4.1.1.1 Develop and revise, as needed, a Standardized Fish Monitoring Plan to assess the presence, status, and trends of CPM, RBS, and fish community.	2000	2023	PO, BC, FWS, NMDGF, UDWR	Ongoing	The Program’s Monitoring Plan and Protocols (Feb 2012) are being used to implement standardized fish monitoring. In 2016, the PO was tasked with developing a concept paper for conducting pop estimates in both the river and the lake. This will include consideration of how we can use PIT tag data for pop estimates and how to deal with differences observed between tag and electrofishing results.
H	Task 4.1.1.2 Analyze and evaluate monitoring data and produce Annual Fish Monitoring Reports to ensure that the best sampling design and strategies are employed.	2000	2023	PO, BC, P.I.’s	Annually	Annual reports are posted on the Program website each year: <a href="http://www.fws.gov/southwest/sjrip/index.cfm">http://www.fws.gov/southwest/sjrip/index.cfm</a>
H	Task 4.1.1.3 Organize and conduct Monitoring Plan Workshops, as necessary, to coordinate sampling design, data collection, and desired precision and detection levels for detecting responses.	2000	2023	PO, BC	As needed	Monitoring workshops were last held in 2009.
<b>Action 4.1.2 Implement a Standardized Monitoring Plan to track the presence, status and trends of endangered fish populations.</b>						
H	Task 4.1.2.1 Conduct larval fish sampling to determine if reproduction is occurring, locate spawning and nursery areas, and to gauge the extent of annual reproduction.	1998	2023	P.I.s	Annually	<p>During 2016, 266 larval fish collections were made encompassing 10,493.6 m<sup>2</sup> of low velocity habitat. The 266 collections contained 12,620 age-0 and 363 age-1+ fish representing six families and 16 species.</p> <p>There were 548 age-0 Colorado Pikeminnow collected in 2016 between river miles 147.1 and 5.0. Back-calculated spawning dates encompassed a 14-day period between 29 June and 12 July 2016. The collection of larval Colorado Pikeminnow at river mile 147.1 represents a 30.2 mile increase in upstream distribution for this species. Between 2003 and 2016, the estimated densities of Colorado Pikeminnow in 2016 were significantly higher than all preceding years except 2011 and 2014. Spawning by Colorado Pikeminnow in the San Juan River has been documented in nine of the last 14 years, and seven of the last eight.</p> <p>For the nineteenth consecutive year, spawning by Razorback Sucker was documented in the San Juan River. Age-0 Razorback Sucker were collected during each of the five larval fish survey trips (April through late July). Between 1999 and 2016, Razorback Sucker estimated densities in 2016 were similar to 2002, 2003, and 2010–2015, and</p>



						<p>significantly higher than all other preceding years. Despite a wide range of environmental conditions, estimated densities for Razorback Sucker have remained relatively stable between 2010 and 2016. Back-calculated spawning dates for Razorback Sucker were from 20 March to 1 July 2016. This is the broadest spawning period ever observed for Razorback Sucker.</p> <p>During 2016, through a separate Bureau of Reclamation funded project, personnel from ASIR were tasked with evaluating larval fish entrainment at the Hogback diversion canal. Drift-net collections made for this study collected larval Colorado Pikeminnow and Razorback Sucker. These collections provide documentation of spawning by both of these species upstream of the Hogback diversion canal.</p>
H	Task 4.1.2.2 Conduct juvenile and small-bodied fish sampling to determine if young fish are surviving and recruiting into the population and locate the areas and habitat used for rearing.	1998	2023	P.I.s	Annually	<p>In 2016, New Mexico Department of Game and Fish conducted small-bodied fishes monitoring during two trips which took place September 12 – 15 and 20 – 28. Monitoring took place from the Animas River confluence (RM 180.5, Reach 6) in New Mexico downstream to Mexican Hat, Utah (RM 52.7, Reach 2). For the fifth consecutive year, an additional 16 river miles (beginning at RM 196.1) above the Animas River confluence were also sampled. All secondary channels restored by TNC in 2011 and nearby reference channels were visited during the September 20 - 28 trip, but only 2 restored channels and 2 reference channels were sampled because most were not flowing. A total of 6,513 fishes were captured during monitoring, 80% of which were native. Forty-three Colorado Pikeminnows were captured, including 23 wild age-0 fish, 19 age-1 fish, and 1 age-2+ fish. The wild age-0 Colorado Pikeminnows were the first wild post-larval age-0 fish ever captured during small-bodied fishes monitoring. One wild age-0 Razorback Sucker was captured in 2016, as well as two larger Razorback Suckers (both &gt; 350 mm total length). This is the first wild age-0 Razorback Sucker ever captured during small-bodied fishes monitoring and one of the few ever captured in the San Juan River since the program began. Three age-0 Roundtail Chub were also captured in 2016. Analyses of these data will be reported to the Recovery Program in 2017 (SOW16-20).</p>
H	Task 4.1.2.3 Conduct adult fish sampling to estimate densities of fish (CPUE) and estimates of population size (mark-recapture estimates).	1998	2023	P.I.s	Annually	<p>Adult Monitoring was conducted RM 195-77 in the fall of 2016. CPUE for RBS and the SJR 1+ overwinter periods showed a significantly increase over time (2003-2016) with 390 individual RBS captured during Adult monitoring in 2016. CPUE for CPM has not significantly increased since 2003, 145 individuals were captured during Adult Monitoring in 2016, five of which were adults, this marked the seventh consecutive year that adult and recruiting sub-adult CPM were collected, showing that Adult Monitoring is able to detect their presence if CPM are in the river. It is important to note that these fish are all (or almost all) the result of stocking efforts and widespread</p>

						recruitment of wild-produced CPM and RBS is still relatively rare. Common Carp have been very rare in our collections in the intensive removal reaches since 2010 (likely due to nonnative fish removal efforts). Channel Catfish remain widespread (RM 166.6-77.0) in 2016 with the overall CPUE for Channel Catfish not significantly decreasing or increasing in the last 17 years. In the common sampled area (RM 180-77) there has been a long term decrease in juvenile BHS and adult FMS, this could be due to the introduction of 143,672 RBS since 2002. Other size classes of these native suckers appear to stable and widespread. (SOW 16-19)
H	Task 4.1.2.4 Conduct fish studies in the SJR Arm of Lake Powell as needed to assess presence/absence of SJR endangered fish populations	2011	2015	P.I.s, FWS, PO, BC	Ongoing	Two years of RBS surveys (2011-2012; SOWs 11-28 and 12-28) on the SJ Arm of Lake Powell showed the importance of 33 Lake Miles below the waterfall to the species and Spencer's Camp and Neskahi Canyon areas for spawning. A total of 147 RBS captured, 36% of which were without PIT tags suggesting potential recruitment, however this could also be a reflection of cumulative tag loss. A detectable native fish community was present with CPM (n=25), FMS (n=173), and BHS (n=2) making up 2.1% of the trammel net total catch. Of 69 larval samples collected, one native fish was collected in 2011, a RBS metalarvae (20.7 mm TL).  The Colorado arm of Lake Powell is currently being surveyed by the UCR Program (2014-2018) with funding from outside the recovery programs.
H	Task 4.1.2.5 Deposit, process, and secure SJR fish specimens, field notes, and associated data at an organized permanent repository.	1987	2023	P.I.s	Annually	Since 1987, the Museum of Southwestern Biology (MSB), Division of Fishes at the University of New Mexico (UNM), in Albuquerque has served as the primary repository for collections of fishes (eggs, larvae, and adults) and field notes taken for the Program. In addition to curation and deposition, species identification and data are verified, entered into an electronic catalog, and geo-referenced in ArcView. (SOW 16-22).
H	Task 4.1.2.6 Collect scales, otoliths, and/or fin rays from fish captured during monitoring and nonnative fish removal activities for future analyses.	2012	2023	P.I.s	Annually	During 2016, 29 fin rays were collected from untagged Razorback Suckers in the San Juan Arm of Lake Powell below the waterfall during March and April and delivered to ASIR for microchemical analysis. These Razorback Suckers ranged in size from 400 to 570 mm TL. An additional 46 fin rays were collected from untagged Razorback Suckers in the SJR between RM 169 and RM 78.9.  Note: Fin rays are collected from unmarked fish rather than scales because scales were determined to be non-viable for microchemical analysis.
<b>Action 4.1.3 Collect data on the endangered fish and native and nonnative fish communities during other Program management activities, when possible</b>						
H	Task 4.1.3.1 Collect data on the endangered fish and native fish community during nonnative fish control activities to aid	1998	2023	FWS, BC, UDWR	Annually	<u>Upper San Juan River</u> - In addition to collecting nonnative fishes, work conducted under SOW 13-17 Upper, collects data on any rare fish

	in tracking the presence, status and trends of endangered fish populations.					<p>encountered during removal efforts. In 2016, nonnative fish removal crews sampling in the three upper removal (treatment) reaches from RM's 147.9 to 93.6, collected a total of 320 (287 unique) Colorado Pikeminnow and 1,423 (1,047 unique) Razorback Sucker. Of these fish, 31 individual adult Colorado Pikeminnow &gt;450 mm total length (TL) were collected. This signifies a high number of adult Colorado Pikeminnow collected in the San Juan River in only 28 river miles sampled. The majority of Razorback Sucker collected in 2016 had been in the river &lt; 5 years; however, 13 fish were collected that have been in the river for &gt;10 years. All rare fish data are summarized in an Excel database and submitted to the Program Office for inclusion into the comprehensive rare fish database. (SOW 13-17 Upper)</p> <p><u>Lower San Juan River</u> - A total of 218 Colorado pikeminnow (CPM) and 264 razorback sucker (RBS) were captured during nonnative removal efforts in 2016. The CPM collected consisted primarily of fish that had been stocked in the last two years with sizes ranging from 75 mm to 561 mm. The RBS collected ranged in size from 255 mm to 536 mm. All data collected on endangered fish was summarized in Excel spreadsheets and submitted to the Program Office for inclusion into the database.</p>
H	Task 4.1.3.2 Collect data on the endangered fish and native fish community during PNM selective fish passage operations to aid in tracking the presence, status and trends of endangered fish populations.	2003	2023	FWS, NN	Ongoing	The Navajo Nation operated the PNM fish passage for 250 days in 2015 (see Task 2.3.1.4). A total of 10,393 native fish were passed through the passage facility in 2015. The most dominate species were FMS and BHS, 38 RBS and 32 CPM were passed through the facility. (SOW 16-14)
<b>Action 4.1.4 Obtain reliable population estimates of CPM and RBS.</b>						
H	Task 4.1.4.2 Use mark-recapture population estimators, when available, in conjunction with catch rate estimators, to provide reliable estimates of adults, subadults, survival, and recruitment consistent with recovery goals criteria to gauge recovery of CPM and RBS.	1998	TBD	FWS, BC, P.I.s	Ongoing	The Program is using catch rate estimators to do population estimates at this time. While not mark-recapture population estimators, the BC determined that population estimates developed with data from Adult Monitoring (which is a single-pass effort) and other Program data collection efforts will be used until the Program transitions from catch rate indices to mark-recapture population estimators for subadult and adult CPM and RBS. See 4.1.2.3.
H	Task 4.1.4.3 Analyze mark-recapture data with methods used by Bestgen et al. (2009) to estimate survival rates of RBS.	2009	TBD	PO, BC	Ongoing	These analyses are repeated every 3-5 years; the most recent being in 2014.
H	Task 4.1.4.4 Conduct Population Estimation Workshops, as necessary, to evaluate population estimators used in other systems to identify the most reliable and suitable estimator(s) for CPM and RBS.	1999	2023	PO, BC	As needed	No workshops are planned at this time.

<b>Action 4.1.5 Evaluate status and success of stocked CPM and RBS.</b>						
H	Task 4.1.5.1 Determine survival and recruitment of stocked CPM and RBS to assess stocking success and to determine when to implement mark-recapture population estimates.	2009	2023	FWS, BC	Ongoing	2015 results from analysis done on “Adult Monitoring” data indicate that we are getting close with the number of adult RBS (we are actually probably there for adult RBS numbers-wise) and CPM between 300-399 mm TL are being seen in the river. However, almost (or almost all) of the fish captured in the river are the result of stocking efforts and we are still lacking widespread recruitment of wild-produce CPM and RBS.
<b>Action 4.1.6 Evaluate the risk of hybridization among sucker species.</b>						
M	Task 4.1.6.1 Quantify the extent of hybridization <b>among native suckers</b> to determine if stocking large numbers of hatchery RBSs into the San Juan River will reduce genetic diversity and viability of RBS and/or FMS.	2002	2023	BC, P.I.s	Ongoing	Observational surveys are conducted in conjunction with annual monitoring. Hybridization between native Suckers appears to be low at present. P.I.’s include a brief description of any fish anomalies observed in their annual reports to track the occurrence of hybrids. If, and when, the frequency of occurrence appears to increase, a focused reassessment will be conducted.
M	Task 4.1.6.2 Quantify the extent of hybridization <b>between native suckers with nonnative White Suckers</b> to determine if hybridization is reducing genetic diversity and viability of native suckers (i.e., RBS, FMS, BHS).	2002	2023	BC, P.I.s	Ongoing	Observational surveys are conducted in conjunction with annual monitoring. Hybridization between native suckers and nonnative White Suckers is present but the rate of hybridization is relatively low and appears to be mostly limited to the upper sections of the river around Farmington, NM. P.I.’s include a brief description of any fish anomalies observed in their annual reports to track the occurrence of hybrids. If, and when, the frequency of occurrence appears to increase, a focused reassessment will be conducted.
M	Task 4.1.6.3 Identify and implement necessary actions to minimize hybridization among native suckers and nonnative suckers.	TBD	TBD	BC, P.I.s	As needed	At present, the risk appears to be minimal and no specific management actions are warranted. See Tasks 4.1.6.1 and 4.1.6.2.
<b>Action 4.1.7. Monitor health of fish in the San Juan River to ensure adequate protection from diseases and parasites.</b>						
C	Task 4.1.7.1 Track health of fish in the San Juan River to ensure adequate protection from diseases and parasites.	1998	2023	PO, P.I.s	Ongoing	Ocular inspections of general fish health and condition are conducted during fish handling and capture activities on the San Juan River. Indications of poor health of endangered fishes are logged and reported.
C	Task 4.1.7.2 Investigate potential health problems, identify causes, and recommend corrective actions if any indications of poor health are of concern.	1998	2023	P.O., BC, P.I.s	As needed	No specific health problems have been identified that require action at this time. The Program will continue to identify and, when appropriate, actively investigate potential health problems.
<b>Goal 4.2—Monitor Habitat Availability and Use.</b>						
<b>Action 4.2.1 Develop a standardized monitoring program for habitat.</b>						
M	Task 4.2.1.1 Develop and revise Standardized Habitat Monitoring Plan.	1999	2023	BC	Ongoing	A revised Monitoring Plan And Protocols was completed February 2012.

M	Task 4.2.1.2 Organize and conduct Habitat Monitoring and Mapping Workshops, as necessary, to refine and improve habitat evaluation methods.	1999	2023	PO, BC	As needed	A focused habitat monitoring workshop was held in January 2012.
<b>Action 4.2.2 Implement a standardized monitoring program for habitat.</b>						
	Task 4.2.2.1 Map habitat at different flows as described in the Standardized Habitat Monitoring Plan	1999	2023	P.I.s	Ongoing	Standardized Habitat protocols are being implemented (SOW 15-28).
H	Task 4.2.2.2 Monitor long-term habitat response of the river channel to flow recommendations.	1999	2023	BC	Ongoing	Standardized Habitat protocols are being implemented (SOW 15-28).
C	Task 4.2.2.3 Monitor water quality in the San Juan River (see Action 2.4.1.).	1999	2023	FWS, BIA, BOR	Ongoing	The Program monitors water temperature continually at 8 locations (SOW 15-28), but no longer routinely conducts water quality sampling. The BIA has been sampling water quality at 10 sites in the San Juan Basin since 1991. Parameters analyzed annually include: Al, Cl, Ni, nitrates, nitrites, orthophosphates, and sulfates. Parameters analyzed quarterly include: As, Cu, Pb, Mg, Hg, Na, Se, Zn, alkalinity, hardness, TDS, TSS, and turbidity. All data is available upon request.
H	Task 4.2.2.4 Monitor stream flows	1999	2023	USGS, P.I.s	Annually	USGS streamflow gaging stations on the SJR are providing flow data (SOW 15-13).
C	Task 4.2.2.5 Monitor water temperature	1999	2023	MEC, ERI, USGS	Annually	In 2015, the USGS added real time water temperature monitoring in the San Juan River at Archuleta, Farmington, Four Corners, and the Animas at Farmington. The USGS currently has real-time water temperature monitoring at the Bluff (Mexican Hat) gage (SOW 16-16). The database will be updated and maintained as in past years. Temperature is also monitored at three locations during larval fish sampling (SOW 16-21).
<b>Action 4.2.3 Identify, characterize, and quantify suitable habitat.</b>						
H	Task 4.2.3.1 Assess data collected to identify and describe flow-habitat relationships.	2012	2023	PO, BC	Ongoing	Program is monitoring various aspects of habitat and flow ( <i>SOW 15-28 Habitat Temperature Monitoring</i> ). BC held a Habitat Monitoring Workshop in 2012. A retrospective habitat analysis of geomorphology and floodplain vegetation using existing data was conducted in 2013 with report due in 2014 (Task 4 of <i>Habitat Temperature Monitoring SOW</i> ).  In 2015, monitoring of the TNC's Habitat Restoration Project Phase II sites and a nearby control site began and will continue in 2016 and 2017 (SOW 15-31).
C	Task 4.2.3.3 Determine the extent various flow releases from Navajo Dam have on the seasonal and longitudinal distributions of endangered fishes and other native and nonnative fish.	2013	TBD	PO, BC	Ongoing	See Task 4.2.3.1 above.

M	Task 4.2.3.4 Characterize channel geomorphology and river channel dynamics to better understand flow-habitat relationships.	2013	TBD	PO, BC	Ongoing	See Task 4.2.3.1 above.
<b>Action 4.2.4 Identify and refine habitat/fish relationships.</b>						
H	Task 4.2.4.1 Identify and quantify principal river reaches and attributes of habitats important to each life stage of endangered fish.	2010	2023	FWS, BC	Ongoing	The BC reviewed data collected, to date, during annual researchers meetings to gain additional insight into habitat/fish relations.
H	Task 4.2.4.2 Relate geo-referenced fish capture data to habitat data, as needed.	1999	2023	P.I.s, PO	Ongoing	Starting in 2010, monitoring crews started recording GPS coordinates for all captures and recaptures during monitoring and nonnative fish removal activities. Geo-referenced fish capture data and habitat data are used by researchers, as needed, to meet specific information needs.
H	Task 4.2.4.3 Determine, to the extent possible, habitat/fish relationships, the level of data needed to accomplish this, and the cost of collecting the data.	1999	2023	FWS, BC	Ongoing	See Task 4.2.3.1 above.
<b>Goal 4.3— Monitor and Evaluate Habitat Restoration Strategies and Projects</b>						
<b>Action 4.3.1 Evaluate and implement habitat restoration strategies to augment the function of river flow to create and maintain suitable habitat.</b>						
C	Task 4.3.1.1 Use data and information gathered from habitat assessments as the foundation for identifying and evaluating the need to implement other recovery actions, including but not limited to, habitat modification (flow or mechanically induced) and population augmentation.	1999	2023	FWS, BC	Ongoing	Flow recommendations were implemented and evaluated using the standardized methodology that guides the Program’s annual and long-term monitoring activities (Program 2012b). Monitoring of TNC’s Phase I and II habitat restoration sites is ongoing (SOW 15-31).
H	Task 4.3.1.2 Evaluate construction of backwater habitats to serve as low-velocity nursery habitat if lack of backwater habitat is found to be limiting recovery.	2011	2015	BOR, PO, BC NN, TNC	Ongoing	Monitoring for fish presence and functionality to serve as low-velocity nursery habitat is continuing at TNC’s Phase I and II habitat restoration sites (SOW 15-31).
H	Task 4.3.1.3 Evaluate selective nonnative vegetation removal in conjunction with high flow conditions for habitat creation and maintenance.	2013	2015	BOR, BC, FWS, NN	Ongoing	The Program is working on this task through development of SJBHM Gen III, TNC’s Conservation/Habitat Planning Project and associated monitoring, and the retrospective habitat analysis.
M	Task 4.3.1.4 Evaluate large-scale nonnative vegetation control, as feasible and necessary.	2013	2015	BOR, BC, FWS, NN	Ongoing	Same as above.
H	Task 4.3.1.5 Evaluate non-flow alternatives that would work in conjunction with flows to meet the functions provided by flow recommendations.	2011	2015	BOR, FWS, BC	Ongoing	Same as above.
H	Task 4.3.1.6 Monitor TNC’s restoration sites	2011	2023	BC, PI’s	Annually	Phase I sites were monitored during various flows between November 2011 and February 2013. By February 2013 at 500 cfs, two of the six restored channels contained water and maintained an upstream

						<p>connection with the primary channel, and a third channel is expected to flow at 700 cfs. Fish presence in restored sites was monitored in 2012; RBS larvae were collected at two of the six RERI sites and all sites contained suitable nursery habitat between April and August 2012. In 2013, Program monitoring crews collected good numbers of larval and small bodied native fishes at the RERI sites including CPM and RBS.</p> <p>Monitoring of larval and small-bodied native fishes in the original 6 RERI sites continued in 2014 and both larval and small-bodied fishes were captured in good numbers at the restored sites. To provide additional information on the persistence of aquatic habitats and to measure changes in habitat features, larval fish abundance and small-bodied fish abundance from prior to spring runoff to late fall, more intensive monitoring of the Phase II site and a nearby control site will began in 2015 and will be continued in 2016 and 2017. Re-sprouting Russian olive and saltcedar at the 6 RERI sites were treated with herbicide in 2014. (SOW 15-31)</p>
<b>Goal 4.4— Integrate And Synthesize Monitoring Data And Information To Evaluate Fish Community And Ecosystem Responses To Recovery Actions.</b>						
<b>Action 4.4.1 Describe life history parameters of wild CPM and RBS.</b>						
C	Task 4.4.1.1 Document and quantify reproduction, survival, and recruitment.	1992	2023	FWS, BC	Ongoing	This task is addressed by Program scientists and the BC through the annual review of fish monitoring data collected.
<b>Action 4.4.2 Develop fish community and ecosystem response strategies and implement appropriate monitoring and research strategies to evaluate ecosystem response.</b>						
H	Task 4.4.2.1 Develop a centralized database that incorporates all data from standardized monitoring and integrate into the Program database.	2007	2023	PO, BC	Ongoing	Data from the large-bodied, small-bodied, and larval monitoring data is currently being updated to include data through 2016. Temperature data has been integrated through 2015 from ASIR, KB, and MEC. Temperature data beyond 2015 is house by USGS is associate with gage stations. Habitat data has been summarized from 1992-2007. See Tasks 1.2.1.1 and 5.2.1.1.
H	Task 4.4.2.2 Use previous and current data collected during ongoing investigations to characterize dynamics of native fishes and their response to management activities intended to improve status of listed species.	1992	2023	PO, UNM, P.I.s., BC	Ongoing	<p>The “2016 Integrated PIT tag database summary of CPM and RBS in the San Juan River” report has been incorporated in the PO’s “pathways” document.</p> <p>A manuscript detailing a modelling effort is currently being prepared “Predicted response of the San Juan River Channel Catfish population to managed exploitation.” The assessment of the Razorback Sucker augmentation program is on-going “Survival and movement of stocked Razorback Sucker in the San Juan River, NM and UT.” “Razorback Sucker transbasin movement through Lake Powell, Utah.” was published in The Southwestern Naturalist. Analysis to investigate age-specific survival of stocked Colorado Pikeminnow in the San Juan River in on-going.</p>
M	Task 4.4.2.3 Update SJR population model and use with other existing data to evaluate fish community response to recovery actions.	2006	2023	PO, BC	As needed	An update to the San Juan River population model was completed in 2014 (Miller and Lamarra 2014). A Dec. 2014 workshop was held to review the updated model. It is currently in review by the BC and

						Program peer reviewers. The model should be operational in 2015 to assist in evaluating possible responses by fish species to management actions.
H	Task 4.4.3.1 Develop and implement an integrated fish and habitat monitoring plan that includes an annual process for assessing and modifying monitoring activities so that current status of native and endangered fish populations and habitat can be assessed and progress toward recovery can be determined.	1999	2023	PO, BC	Ongoing	See Tasks 4.4.1.1, 4.4.2.2 and 4.4.2.3.
<b>Action 4.4.3 Use data from monitoring and management actions and research information to evaluate and modify recovery activities, as necessary, to ensure progress toward recovery.</b>						
C	Task 4.4.3.1 Identify, describe, and implement strategies for improving long-term survival and recruitment of CPM and RBS including but not limited to nonnative fish removal, enhancing habitat and food resources, enhancing genetic diversity and viability, and mitigating barriers to range fragmentation.	1999	2023	PO, BC	Ongoing	Program is using adaptive management strategies to accomplish this task. See Tasks 4.4.1.1, 4.4.2.2, and 4.4.2.3.
H	Task 4.4.3.2 Use data and information gathered from fish surveys, hatchery augmentation, and survival studies to describe best strategies for establishing wild populations of endangered fish to maintain a healthy native fish community.	1999	2023	PO, BC	Ongoing	Information was assimilated and evaluated to assess stocking success and establishment of wild populations of CPM and RBS. See Tasks 4.4.1.1, 4.4.2.2, and 4.4.2.3.
H	Task 4.4.3.3 Use data and information gathered from nonnative fish efforts to evaluate effects of nonnative fish control on distribution, abundance, and demographics (e.g., fish size, age, sexual maturity) of the endangered fish populations, the native fish community, and nonnative fish populations.	2008	2023	FWS, BC	Ongoing	The BC held a workshop in 2010 to evaluate the nonnative fish control program and made adjustments. Information was assimilated and evaluated to accomplish this task. A nonnative workshop was held in December 2016 to evaluate the revised study design initiated in FY16. See Task 3.1.1.5.
C	Task 4.4.3.4 Use data and information gathered from habitat assessments as the foundation for evaluating the effectiveness of the flow recommendations and operations decision criteria for Navajo Dam in providing suitable habitat for the endangered fish.	1999	2023	FWS, BC	Ongoing	Flow recommendations were implemented in 1999 and continue to present. The Program collects habitat and fish data and information through its annual monitoring program. The Flow Recommendations revision process began in 2015 and was completed in 2016.
<b>Action 4.4.4. Review and evaluate San Juan River stream flow in light of hydrology variability.</b>						
H	Task 4.4.4.1 Conduct a comprehensive analysis of hydrologic variability in the San Juan River.	2014	2017	BOR, FWS	Pending	BOR completed Colorado River Basin Water Supply and Demand Study in 2012. This study includes the SJR Basin. A comprehensive analysis of hydrologic variability occurred during the flow recommendation revision in 2015 and 2016. Gen4 of the San Juan Basin Hydrology Model will be used to evaluate various hydrologic scenarios.



H	Task 4.4.4.2 Evaluate the possible and most probable impacts of hydrologic variability on future water availability.	2014	2017	BOR, FWS	Pending	See above.
H	Task 4.4.4.3 Evaluate ability of the river to meet the functions provided by the flow recommendations during extended periods of drought.	2014	2017	BOR, FWS, BC	Pending	See above.
<b>Goal 4.5— Identify and Conduct Research and Monitoring in Support of Recovery Actions</b>						
<b>Action 4.5.1 Annually identify potential project/activities/questions/information needs (ongoing list).</b>						
H	Task 4.5.1.1 Annually, following review of the previous year’s findings and data integration, identify and prioritize new projects, activities, questions, and information needs to be addressed in future work plans.	2000	2023	BC, FWS, CC, PO	Ongoing	<p>The following information needs were identified:</p> <ul style="list-style-type: none"> <li>• Information needs in support of flow recommendation review</li> <li>• Survey of potential entrainment structures in the San Juan and Animas rivers</li> <li>• Temperature modeling out of Navajo Dam and downstream</li> <li>• 2D modeling of floodplain using Lidar to capture overbank flows</li> <li>• Radiotelemetry Study</li> <li>• Tributary Sampling</li> <li>• Conduct Inventory of all potential problematic reservoirs (i.e., potential sources of nonnative species)</li> <li>• Enhanced/expanded larval studies</li> <li>• Determine negative impacts of the known contaminants (e.g., Hg and Se) effects on the native fishes of the San Juan River</li> <li>• Develop methodologies for integrating recapture data from different sampling methods for making population estimates (e.g., electrofishing, remote PIT tag readers)</li> </ul>
<b>Action 4.5.2 Implement project/activities as necessary to obtain needed information.</b>						
	Task 4.5.2.2 Develop and conduct a study/monitoring plan to assess the effectiveness of the Hogback fish weir in preventing entrainment of endangered and native fish.	2014	2015	BOR	Ongoing	An evaluation of the Hogback Fish Weir has been ongoing since 2014, with all field work completed in 2016. A final report is being developed with recommendations. A recommendation that has risen to the top is to modify the structure using a log-boom type of a device with a curtain to further prevent entrainment.
	Task 4.5.2.3 Determine how to distinguish stocked fish from naturally produced fish.	2013	2023	ASIR	Ongoing	<p>The microchemical reference library for the SJR was previously completed in 2015. Due to the connectivity of Lake Powell with other drainages within the Colorado River Basin, additional potential sources of Razorback Suckers were analyzed to complete the reference library. Fin rays were collected from native catostomids from potential sources (Gunnison River, Green River, Colorado River, Colorado Arm of Lake Powell, San Juan Arm Lake Powell, and Ouray NFH).</p> <p>All fin rays were analyzed isotopically and elementally at Woods Hole Oceanographic Institution in February 2017. Data are currently being processed and analyzed.</p>

Table A5. Element 5 — Program Coordination and Assessment of Progress toward Recovery.

P	Tasks	Start Date	End Date	Who	Category	Status of Activity (focus on previous year)
<b>Goal 5.1—Facilitate Program Planning and Management.</b>						
<b>Action 5.1.1 Provide Ongoing Program Management.</b>						
H	Task 5.1.1.1 Coordinate and schedule meetings and activities of the CC and the technical committees, as necessary.	1992	2023	PO	As Needed	In 2016, the Program Office organized 3 CC meetings/conference calls, 5 BC meetings/conference calls, the Annual Program Meeting, Researchers Meeting, E-Flow Workshop II, and Nonnative Species Control Meeting.
H	Task 5.1.1.2 Annually review and update the LRP to reflect new information, new projects and Program progress.	1995	2023	PO, BC, CC	Annually	The 2016 LRP was finalized by the Program Office in October..
H	Task 5.1.1.3 Convene annual Program coordination meetings to review the preceding year’s monitoring, recovery and research data; assess progress toward recovery; and provide recommendations to modify the LRP.	1995	2023	PO, BOR	Annually	Program’s 2016 Annual Meeting was held on May 12, 2016.
H	Task 5.1.1.4 Develop list of prioritized actions and projects for the AWP that most benefit recovery of the endangered fish populations.	1995	2023	BC, PO	Annually	2016 SOWs were provided to the Program Office by March 31, 2016. A draft AWP with priority projects was provided to the committees in May 2016.
H	Task 5.1.1.5 Develop and issue Requests for Proposals (RFPs) and request SOWs for projects that most benefit recovery of the endangered fish populations.	1995	2023	PO, BOR	Annually	See above.
H	Task 5.1.1.6 Assemble and review annual SOW to identify most suitable projects for funding and implementation.	1995	2023	PO, BOR	Annually	2016 AWP was approved by the CC October 2, 2016.
<b>Action 5.1.2 Oversee and Conduct Endangered Species Act Compliance.</b>						
H	Task 5.1.2.1 Administer Program and review BOs consistent with the Program’s Principles.	1995	2023	PO	Ongoing	Annually conducted by the Program Office.
H	Task 5.1.2.2 Monitor and ensure implementation of Program actions identified as RPAs and RPMs in BOs.	1995	2023	PO	Ongoing	See above.
<b>Goal 5.2— Ensure Integration and Synthesis of Information to Evaluate Program Progress Toward Recovery.</b>						
<b>Action 5.2.1 Synthesize and evaluate information from all studies for Program to evaluate progress toward recovery.</b>						
H	Task 5.2.1.1 Establish and maintain a Program database of information collected under the various Program projects including all rare fish collections.	1995	2023	PO	Annually	Program Office maintained the Program’s database (SOW 15-37). The Program Office database manager is also working with the UCREFRP to develop a centralized common database of Upper Colorado River Basin data. The website, <a href="https://streamsystem.org">https://streamsystem.org</a> , is up and running.
H	Task 5.2.1.2 Conduct annual Program reviews and develop	1995	2023	PO, BC	Annually	2016 Final Reports posted on Programs website:

	annual reports that integrate monitoring and research data and results to track and assess yearly Program progress toward recovery.					<a href="http://www.fws.gov/southwest/sjrip/">http://www.fws.gov/southwest/sjrip/</a>
H	Task 5.2.1.3 Conduct a biennial comprehensive review and assessment of Program progress towards recovery (i.e., Sufficient Progress Report).	2014	2015	PO, CC, FWS	Every two years	The biennial “Sufficient Progress” Report is in draft and being reviewed by the FWS. It will be completed and reviewed by the CC in 2017 and signed by the FWS in 2018.
<b>Action 5.2.2 Ensure new information is identified and developed, as necessary to achieve Program goals and Assess Progress Toward Recovery.</b>						
C	Task 5.2.2.1 Coordinate and oversee development of revisions to the SJRB Hydrology Model and the Program’s flow recommendations.	2008	2015	PO, BOR	In progress	Hydrology Model Generation III will be completed in 2015; flow recommendations revisions will begin in 2015.
C	Task 5.2.2.2 Develop positive population response criteria for the CPM and RBS for 2012-2016 to meet recovery demographic criteria for downlisting and delisting specified in recovery goals/plans adopted by the Service.	2012	2015	FWS, PO, BC	In progress	As of 2011, the Program met only 2 of 5 CPM positive population response criteria (#3 and #5) for 2007-2011. The Service is in the process of evaluating past criteria and developing new criteria for the period 2012 and beyond.
C	Task 5.2.2.3 Identify and evaluate limiting factors and determine necessary research to identify actions that will minimize or remove these limiting factors to recovery.	2002	2015	FWS	Ongoing	See 2002 Recovery Goals for CPM and Razorback Sucker. The species recovery plans are being updated and limiting factors will be re-evaluated through that process.
C	Task 5.2.2.4 Use monitoring and research information to evaluate and use adaptive management strategies to modify recovery activities, as necessary, to ensure progress toward recovery.	2012	2023	FWS	Annually	Program activities are adjusted/modified based on current monitoring and research information.
H	Task 5.2.2.5 Develop interim recovery benchmarks for recovering the CPM and RBS by 2023 that are tied to monitoring data and are consistent with the species recovery plans and goals, Positive Population Criteria, Sufficient Progress Assessment, LRP, and Program Document.	2014	2016	FWS, BC	In progress	The Service will develop recovery benchmarks in coordination with the BC. Interim benchmarks will be developed for (1) implementation of management actions identified in the recovery goals (e.g., minimize threats); (2) recovery demographic criteria in the recovery goals to downlist and delist CPM and RBS; and (3) positive population response criteria developed to document and gauge demographic improvements for both species. Once developed, the benchmarks can be used during the Service’s biennial comprehensive review and assessment of Program progress towards recovery (i.e., Sufficient Progress Report).
<b>Action 5.2.3 Ensure Scientific Integrity of Program Information and Coordination with other Associated Programs, Projects, and Studies.</b>						
H	Task 5.2.3.1 Maintain a standardized process for peer review by qualified specialists in appropriate technical disciplines for significant Program science projects and reports.	1997	2023	PO, BOR	Annually	The Program Office maintains a standardized process for peer review (SOW 16-36).
H	Task 5.2.3.2 Coordinate with activities of the Upper Colorado River Endangered Fish Program and other related programs and promote participation by Program partners.	1992	2023	PO, BC	Annually	The Program Office coordinated closely with the UCR Recovery Program and other related programs in 2016.

<b>Goal 5.3—Facilitate Contract and Funding Management.</b>						
<b>Action 5.3.1 Ensure appropriate and legal contract and funding practices.</b>						
<i>C</i>	Task 5.3.1.1 Maintain and distribute annual base and capital funds allocated under the AWP by each funding source.	1992	2023	BOR, PO	Annually	The Program Office worked closely with the Bureau of Reclamation in 2016 to maintain and distribute all annual base and capital funds allocated under the AWP by each funding source (SOW 15-35)
<i>H</i>	Task 5.3.1.2 Administer Program contracts and provide an accounting of Program funds expended at the end of each federal fiscal year.	1992	2023	BOR, PO	Annually	Reclamation provided an accounting of Program funds (SOW 15-35).
<i>H</i>	Task 5.3.1.3 Manage Capital Improvement Program to maintain records showing the distribution and expenditures of capital funds under the AWP by each funding source, and provide an accounting of funds expended at the end of each federal fiscal year.	1992	2023	BOR, PO	Annually	Reclamation managed the Capital Improvement Program and worked with the Program Office to maintain those.

Table A6. Element 6.—Information and Education.

<i>P</i>	Tasks	Start Date	End Date	Who	Category	Status of Activity (focus on previous year)
<b>Goal 6.1 Increase Public Awareness and Support for the Endangered Fishes and the Recovery Program.</b>						
<b>Action 6.1.1 Provide information to the public on the Recovery Program.</b>						
<i>H</i>	Task 6.1.1.1 Provide information through news articles, press releases, radio and television ads, and other media in Farmington, Durango, Albuquerque, and others in the area to inform the public of Program activities.	1992	2023	PO	Ongoing	SOW 16-37
<i>H</i>	Task 6.1.1.2 Provide notification of meeting times, dates, locations, and draft agendas for committee meetings to interested parties 30 days in advance of the meeting.	1992	2023	PO	Ongoing	SOW 16-37
<i>H</i>	Task 6.1.1.3 Maintain a Recovery Program Website.	2000	2023	PO	Ongoing	<a href="http://www.fws.gov/southwest/sjrip/">http://www.fws.gov/southwest/sjrip/</a>
<i>H</i>	Task 6.1.1.4 Develop Program brochure.	2012	2013	PO	Ongoing	Educational posters and brochures of the Native Fishes of the San Juan River and Progress Towards Recovery were produced in 2014. They convey key scientific information about the biology of all the native fish species, and the extensive efforts to recover CPM and RBS within this drainage. They are being distributed throughout the SJR Basin. Posters and brochures are available from the Program Office.
<b>Action 6.1.2 Coordinate public outreach with Upper Basin Recovery Program.</b>						
<i>H</i>	Task 6.1.2.1 Develop and maintain a formal outreach support agreement between the San Juan River Basin Recovery Implementation Program and the Upper Colorado River Endangered Fish Recovery Program.	1999	2023	PO	Annually	SOW 16-37
<i>H</i>	Task 6.1.2.2 Develop and exchange information and materials to incorporate into PowerPoint presentations, newsletters, Program highlights and Program displays.	1999	2023	PO	Ongoing	SOW 16-37
<i>H</i>	Task 6.1.2.3 Participate in selected outreach efforts at local, state, and regional water development conferences.	1999	2023	PO	Ongoing	SOW 16-37

## Appendix B. Completed Long-Range Plan Tasks (from 2009 LRP Elements 1-7)

Tasks	Recovery Goals Priority	Primary Responsibility	Start Date	Completion Date	Description and Comments
<b>Goal 1.1—Describe Biotic and Abiotic Baseline Conditions.</b>					
<b>Action 1.1.1 Determine the relative abundance and distribution of endangered fishes, as well as other native and nonnative fishes in the San Juan River Basin.</b>					
Task 1.1.1.1 Conduct ichthyofaunal surveys of mainstem, tributary streams, and secondary channels to determine fish species associated with these habitats.	Medium (Completed)	FWS, NMGF, BC	1987	1997	Ichthyofaunal surveys were during 1987-1989 (Platania 1990) to determine the size of the remaining CPM population and to characterize the fish population of the San Juan River. Additional surveys were done during the 7-year research program.
Task 1.1.1.2 Conduct radio telemetry investigations to help define species distributions, movements, spawning sites, and habitat use.	Medium (Completed)	FWS	1991	2000	Although this task was completed (Ryden 2000; Miller and Ptacek 2000), more radiotelemetry work may be necessary to better understand habitat use and movement of newly established populations of CPM and RBS.
Task 1.1.1.3 Monitor the distribution and abundance of wild fish populations in the San Juan River to document status and trends.	High (Completed)	BC	1991	1997	Results of the 7-year research program were assimilated (Holden 2000) and strategies for research and monitoring were developed.
<b>Action 1.1.2 Describe life history parameters of wild CPM and RBS.</b>					
Task 1.1.2.2 Locate and describe areas of reproductive activity and nursery habitats to better understand species spawning needs.	High (Completed)	FWS, BC, NMGF	1991	1997	Reproduction should be documented from capture of ripe and gravid fish, drifting larvae, and age-0 fish. Wild adult CPM were radio-tracked during 1991-1997 (Ryden 2000) and in 1993-1994 to assess habitat use (Miller and Ptacek 2000). Results of the 7-year research program were assimilated (Holden 2000) and strategies for research and monitoring were developed
Task 1.1.2.3 Describe and quantify habitats selected by various life stages of CPM and RBS.	High (Completed)	FWS, NMGF	1991	1997	Capture locations of CPM and RBS should be described and quantified and river flows documented. Results of the 7-year research program were assimilated (Holden 2000) and strategies for research and monitoring were developed
<b>Action 1.1.3 Describe and evaluate flow, habitat, and other abiotic relationships.</b>					
Task 1.1.3.1 Describe, model and evaluate different flow regimes.	High (Completed)	FWS, BOR	1995	1997	Requested releases have been evaluated for response of habitat (Pucherelli and Clark 1990; Pucherelli and Goettlicher 1992; Goettlicher and Pucherelli 1994; Bliesner and Lamarra 2002) and fish (Propst et al. 1999).
Task 1.1.3.2 Determine response of geomorphology	High	FWS, NMGF	1995	1997	Relationships have been developed between channel

and habitat to flow with the use of habitat mapping and river geomorphology.	(Completed)				geomorphology, mesohabitats, and river flow to identify flows that maximize habitat of various life stages of CPM and RBS (Archer and Crowl 2000b; Archer et al. 2000; Bliesner and Lamarra 2000, 2007; Gido and Propst 1999; Lamarra 2004; Miller and Ptacek 2000). River reaches with simple, moderate, and complex channels have been mapped for geomorphic features and mesohabitats.
Task 5.2.3.6 Refine and standardize habitat classification for consistent use with fish sampling and habitat mapping.					A standard habitat classification system is needed that can be used for fisheries, hydrology, and geomorphology.
<b>Action 1.1.4 Identify and evaluate limiting factors and determine necessary research to identify actions that will minimize or remove these limiting factors.</b>					
Task1.1.4.1 Compile, evaluate, and synthesize historic water quality information on the San Juan River to identify water quality parameters that may be detrimental to native and endangered fish species (e.g., mercury, selenium, polycyclic aromatic hydrocarbons [PAHs]).	Highest	BC, BOR	1991	1997	Based on data collection and evaluation during the 7-year research period, the BC concluded that water quality in the San Juan River was not a limiting factor to recovery of the endangered fishes or to restoration and maintenance of the native fish community. Years of monitoring and research have not clearly linked water contaminants and pollutants with adverse effects to the CPM and Razorback Sucker (Abell 1994). In a synoptic study of contaminants data from the 7-year research period, Simpson and Lusk (1999) concluded harm from selenium as a contaminant issue for the Razorback Sucker.
Task 1.1.4.2 Determine and quantify mesohabitat types and channel forms used by native and endangered fish.	High (Completed)	FWS, NMGF	1991	1997	Primary habitats used by wild fish have been documented (Archer and Crowl 2000b; Archer et al. 2000; Bliesner and Lamarra 2000, 2007; Gido and Propst 1999; Lamarra 2004; Miller and Ptacek 2000).
Task 1.1.4.3 Evaluate effects of nonnative fish on native and endangered species and identify the most problematic nonnative species.	Highest (Completed)	FWS, NMGF	1996	1999	Initial evaluation of nonnative fish in the San Juan River has been completed (Brooks et al. 2000; Propst and Hobbes 2000).
Task 1.1.4.4 Estimate numbers of wild CPM and RBS in the San Juan River Basin and evaluate prospects for reestablishment of populations with and without hatchery augmentation.	High (Completed)	FWS, NMGF, BC	1991	1997	Numbers of wild CPM and RBS were found to be low in the San Juan River (Holden 2000).
Task 1.1.4.5 Survey health of fish in the San Juan River to ensure adequate protection from diseases and parasites.	Highest (Completed)	FWS	1998	2000	Fish health surveys were conducted on the San Juan River during 1992-1997 (Landye et al. 2000).
<b>Action 1.1.5 Synthesize and integrate information to describe baseline conditions and to guide future actions.</b>					

Task 1.1.5.1 Synthesize, integrate, and evaluate the 7-year research program.	High (Completed)	FWS, NMGF		2000	A 7-year research program was conducted 1991-1997 (Holden 2000). This effort helped to provide baseline information for the ichthyofauna of the San Juan River. During this program effort, methods were sometimes modified to meet the exigencies of the San Juan River, to incorporate new information and technologies, and to improve efficiency and quality of data collected.
<b>Goal 1.2—Develop New Information as Necessary.</b>					
<b>Action 1.2.3 Assemble information from nonnative fish capture information.</b>					
Task 1.2.3.1 Use data and information gathered from nonnative fish efforts to describe best strategies for minimizing negative impacts to native and endangered fish species.	Highest (Initial phase completed)	FWS, NMGF	2000	2005	A pilot study and ongoing investigations have been conducted to implement and evaluate the best strategies for controlling nonnative fish. Ongoing evaluation is needed, including assessment of new technologies for controlling nonnative fishes.
<b>Goal 2.1—Establish a Genetically and Demographically Viable, Self-Sustaining CPM Population.</b>					
<b>Action 2.1.1 Develop plans for rearing and stocking CPM.</b>					
Task 2.1.1.1 Develop a genetics management plan to guide artificial propagation and ensure genetic diversity and viability of CPM.	Highest (Completed)	FWS, DNFH		2003	A Genetics Management Plan for CPM and RBS was developed in 2003 (Crist and Ryden 2003).
Task 2.1.1.2 Develop an augmentation plan for CPM to provide a strategy for producing, rearing, and stocking fish.	Highest (Completed)	FWS		2003	An Augmentation Plan for CPM was developed in 2003 (Ryden 2003a).
<b>Action 1.1.2 Produce, rear, and stock sufficient numbers of CPM to meet stocking goals of augmentation plan.</b>					
Task 1.1.2.1 Annually produce and rear at least 300,000 age-0 (50–55 mm TL) and 3,000 age-1 CPM at SNARRC.	Highest (Completed)	FWS, DNFH	2000	2009	At least 300,000 age-0 (50–55 mm TL) CPM were produced and reared annually at the SNARRC for an 8-year period, 2002–2009. Analyses showed no survival advantage to stocking age-1 CPM. Goal revised in 2010 to produce, rear, and stock 400,000 age-0 CPM.
Task 1.1.2.2 Annually stock >300,000 age-0 CPM.	Highest (Completed)	FWS, DNFH	2000	2009	At least 300,000 age-0 (50–55 mm TL) CPM were released annually from the SNARRC, into the San Juan River for an 8-year period, 2002–2009. See above.
Task 1.1.2.3 Annually stock 3,000 age-1 CPM.	Highest (Completed)	FWS, DNFH	2000	2009	A total of 3,000 age-1 CPM were stocked and PIT tagged annually in the San Juan River through 2009. Stocking of age-1 CPM ceased in 2011.
<b>Goal 2.2—Establish a Genetically and Demographically Viable, Self-Sustaining RBS</b>					



<b>Population.</b>					
<b>Action 2.2.1 Develop plans for rearing and stocking RBS.</b>					
Task 2.2.1.1 Develop a genetics management plan to guide artificial propagation and ensure genetic diversity and viability of RBS.	Highest (Completed)	FWS, BC		2003	A Genetics Management Plan for CPM and RBS was developed in 2003 (Crist and Ryden 2003).
Task 2.2.1.2 Develop an augmentation plan for RBS to provide a strategy for producing, rearing, and stocking fish.	Highest (Completed)	FWS, BC		2003	An experimental stocking program for RBS was conducted 1994-1997. An Augmentation Plan for RBS was developed in 1997 (Ryden 1997) for a 5-year period, 1997-2001, and recommended stocking 73,482 RBS; only 5,890 were stocked for a lack of hatchery and grow-out facilities. An addendum to the plan was developed in 2003 (Ryden 2003b) to extend the program for 8 years, 2004-2011, and recommended stocking 91,200 age-2 RBS (> 300 mm TL) or 11,400 annually.
<b>Goal 1.2—Evaluate CPM and RBS Augmentation Program and Genetic Integrity.</b>					
<b>Action 1.2.2 Evaluate methods to improve CPM and RBS stocking successes.</b>					
Task 1.2.2.2 Assimilate the genetics information on CPM and RBS to describe best strategies for establishing and maintaining genetically viable wild populations of endangered fish.	Highest (Completed)	FWS, BR		2003	<ul style="list-style-type: none"> <li>Genetics management plan for the endangered fishes of the San Juan River (Crist and Ryden 2003)</li> <li>SNARRC Species Augmentation Plans</li> </ul>
<b>Goal 2.4— Minimize fish entrainment at diversion structures in the San Juan Basin.</b>					
<b>Action 2.4.1 Identify diversions that could potentially entrain endangered fish in the San Juan River and remediate where necessary.</b>					
Task 2.4.1.1 Design, construct, and maintain a fish deflection weir at the Hogback Diversion.	Highest (Completed)	BOR, BC, PO, FWS, NN	2005	2015	A fish deflection weir at Hogback Diversion was completed in FY2013. PIT tag antennas were installed on the structure in 2014 and tests conducted to test for effectiveness. Of the 803 fish stocked for the experiment, 18 fish or 2.2% became entrained in the canal (i.e., lost from the river); however, overall detection was low. Additional tests are planned.
<b>Goal 3.1—Provide Suitable Flows to Support Recovery of CPM and RBS Populations.</b>					
<b>Action 3.1.1 Develop flow regimes to provide adequate base flow and function to maintain habitat for CPM and RBS.</b>					
Task 3.1.1.1 Identify and develop flow recommendations for the San Juan River.	Highest (Completed)	BC		1999	Flow Recommendations for the San Juan River were developed and implemented in 1999 (Holden 1999).

<b>Goal 3.3—Provide Increased Range to Support Recovery of CPM and RBS Populations.</b>					
<b>Action 3.3.1 Provide and maintain fish passage at diversion structures.</b>					
Task 3.3.1.1 Identify and evaluate fish barriers in the San Juan River.	Highest (Completed)	BC		1996	Fish barriers were identified and evaluated in 1996 by Masslich and Holden (1996).
Task 3.3.1.2 Remove Cudei Diversion to provide fish passage.	Highest (Completed)	BIA, NN		2001	The Cudei Diversion was removed in 2001. The Cudei Diversion is owned by the Navajo Nation.
Task 3.3.1.3 Provide and maintain fish passage at the Hogback Diversion.	Highest (Completed)	BIA, NN		2002	Fish passage at Hogback Diversion was completed in 2002. The Hogback Diversion is owned by the Navajo Nation. No maintenance is anticipated.
Task 3.3.1.4 Provide and maintain selective fish passage at the Public Service Company of New Mexico (PNM) Weir.	Highest (Completed)	FWS, NN		2003	Fish passage at Public Service Company of New Mexico (PNM) Weir was completed in 2003.
<b>Action 3.3.2 Evaluate fish passage for native and endangered fish species to and from Lake Powell in light of a natural waterfall at low reservoir elevations.</b>					
Task 3.3.2.1 Identify extent of problem from natural waterfall on passage of native and nonnative fish from Lake Powell into the San Juan River.	High (Completed)	FWS, BOR, BC	2009	2010	The extent that the natural waterfall in the lower San Juan River impedes fish migration should be determined. BOR assessed the risk for predators recolonizing the river when water level in Lake Powell rises to a level that the waterfall is inundated. They concluded that there is a 60 to 75% chance the waterfall will be inundated for a total of 30 months (not necessarily continuously) between 2008 and 2030. Probabilities for longer inundation are available (6-26-07 CC Meeting).
<b>Goal 3.4—Provide Suitable Water Quality to Support Recovery of CPM and RBS Populations.</b>					
<b>Action 3.4.2 Evaluate effects of river temperature on native and endangered fish.</b>					
Task 3.4.2.1 Determine if cold water releases from Navajo Dam into the San Juan River impede endangered fish reproduction or limit endangered fish populations downstream of the Animas River.	High (Completed)	BC		2006	Based on the reports, <i>SJR Fishes Response to Thermal Modification – A White Paper Investigation</i> (Lamarra 2007) and Cutler (2006) <i>Navajo Reservoir and SJR Temperature Study</i> , the BC determined a temperature control device (TCD) was not warranted. Impacts to spawning and rearing from cold releases from Navajo Dam into the SJR appeared to be minimal. Spawning is determined by time-of-year more than temperature cue. A TCD may provide seasonal range expansion above critical habitat but is unknown if range expansion above critical habitat is necessary for recovery. More information is needed (BC Meeting, May

					17-18, 2007).
<b>Goal 4.1—Control Problematic Nonnative Fishes as Needed.</b>					
<b>Action 4.1.1 Develop, implement, and evaluate the most effective strategies for reducing problematic nonnative fish.</b>					
Task 4.1.1.1 Identify and prioritize the most problematic nonnative fish species.	Highest (Completed)	BC	2000	2003	This determination was made through a risk assessment and consensus of biologists. Davis (2003) identified Channel Catfish and Common Carp as the most problematic species.
Task 4.1.1.2 Design and implement a pilot program to evaluate nonnative fish control strategies and gears.	Highest (Completed)	FWS	2000	2003	The Nonnative Fish Monitoring And Control Plan (Davis 2003) served as a pilot program and identified removal reaches and evaluated sampling gears and strategies.
Task 4.1.1.3 Develop a long-term nonnative fish control strategy and specific objectives for nonnative fish control...	Highest (Completed)	FWS	2009	2010	A nonnative fish control strategy will be developed and implemented for the San Juan River. This strategy will identify removal tactics, gear types, personnel, and costs necessary to meet removal criteria established in Task 5.1.1.2.
<b>Action 4.1.4 Obtain reliable population estimates of CPM and RBS.</b>					
Task 4.1.4.1 Implement pilot project to develop mark-recapture population estimates to supplement catch rate estimators for reliable and precise population estimates to help determine if downlist and delist criteria of recovery goals are being achieved	2009	2013	BC	Ongoing	In 2009 and 2010, population estimates for CPM (age 2+) and RBS (if they had been in the river for one over-winter period) were calculated using data collected during nonnative fish removal efforts from Shiprock, NM to Clay Hills, UT. Specific mark/recapture trips were not completed; however, estimates were generated using data collected via standard nonnative fish removal methodologies. To develop point estimates, data were used from a variety of sampling trips that were conducted within one month of each other. Estimates were not generated in 2011 but were generated using data collected during 2012.
<b>Action 3.1.2 Establish and evaluate strategies for handling removed nonnative fish in collaboration with state and tribal agencies.</b>					
Task 3.1.2.1 Evaluate and revise, as necessary, translocation strategy for Channel Catfish removed from the San Juan River.		FWS	FWS		Channel Catfish are no longer translocated, in part, due to several reasons including: (1) cost/benefit of translocation in relation to unpredictability of catch among trips; (2) fish health concerns, specifically the accumulation of mercury in older Channel Catfish; and (3) fish importation concerns between the States of Utah and New Mexico. Channel Catfish have not been translocated since 2006 and, at this point, there are no plans to reinstate this activity. Will not be pursued until the health concerns can be addressed.

Task 3.1.2.2 Implement standardized fish health analysis for translocated Channel Catfish to avoid transfer of harmful pathogens.		FWS	FWS		Standardized fish health testing should be implemented if the translocation of Channel Catfish is reinitiated.
Task 3.1.2.3 Develop, evaluate, and implement standard procedures for disposal of fish that cannot be translocated.		FWS	FWS		Standard procedures have not been developed, to date. Current disposal is to bury, when feasible, all nonnative fishes removed from the San Juan River.
<b>Goal 5.3— Integrate And Synthesize Monitoring Data And Information To Evaluate Fish Community And Ecosystem Responses To Recovery Actions.</b>					
<b>Action 5.3.1 Develop fish community and ecosystem response strategies</b>					
Task 5.3.1.2 Develop an ecosystem model specific to the San Juan River and present it for approval by the BC.	Medium (Completed)	BC, FWS	2000	2005	Completed in 2000-2005. The Program may choose to further develop an ecosystem model specific to the San Juan River to assist in evaluating possible responses by fish species to management actions.
Task 5.3.1.3 Hold workshop on ecosystem model specific to the San Juan River to evaluate model and determine future direction of this effort	Medium (Completed)	FWS, BC	2007	2007	Workshop held in 2007.
<b>Goal 7.1—Facilitate Program Planning and Management.</b>					
<b>Action 7.1.1 Develop and coordinate a Program plan.</b>					
Task 7.1.1.1 Develop and implement a LRP as a framework for ongoing and future Program activities.	Highest (Completed)	PO	1995	1995	A LRP was developed in 1995 (Program 1995).