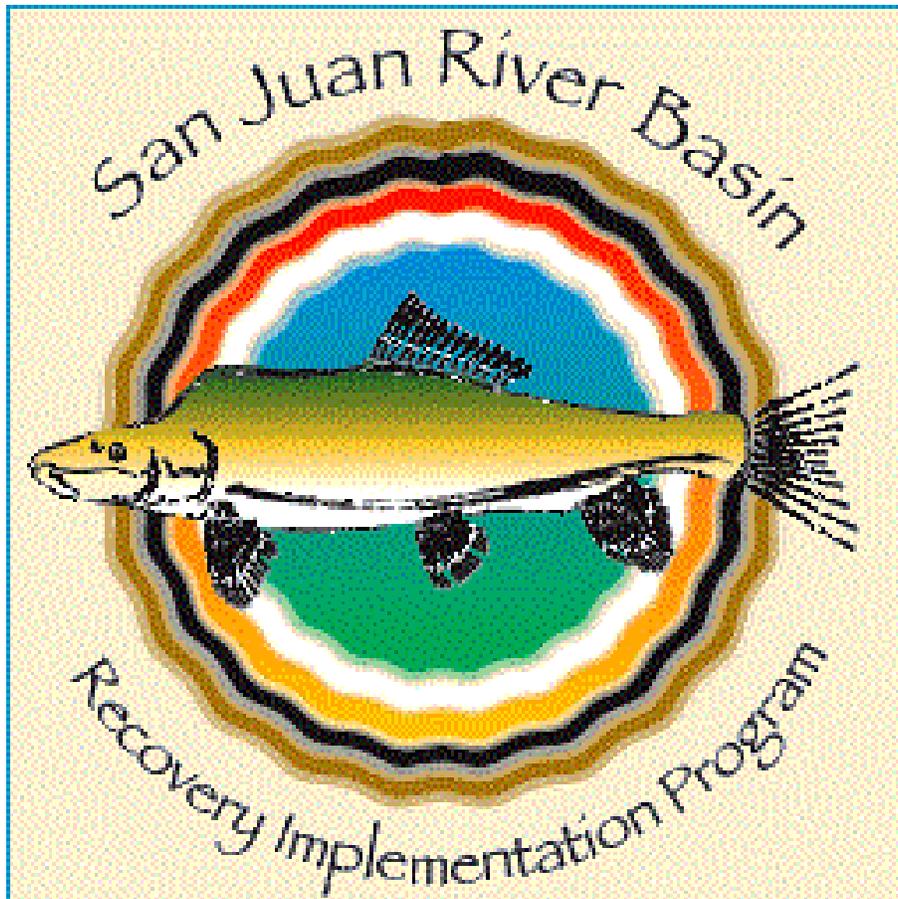


**Colorado Pikeminnow and  
Razorback Sucker Augmentation  
in the San Juan River Basin:  
Fiscal Year 2022 Project Proposal**

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## **Background**

Colorado Pikeminnow (*Ptychocheilus lucius*) and Razorback Sucker (*Xyrauchen texanus*) are federally-listed endangered fishes found in the San Juan River. The San Juan River Recovery Implementation Program (SJRIP) was initiated in 1992 to protect and recover populations of both species in the San Juan River Basin (Basin) while water development proceeds in compliance with all applicable federal, state, and tribal laws (SJRIP 2014). Delisting of Colorado Pikeminnow, as described in the recovery goals, is dependent on the maintenance of a wild population of at least 2,600 adults in the Green River sub-basin and at least 700 adults in the Upper Colorado River sub-basin, as well as a target of 1,000 age 5+ (>300 mm TL) in the San Juan River sub-basin. Delisting criteria include a self-sustaining population that either exceeds 1,000 adults in the Upper Colorado River sub-basin or a self-sustaining population of at least 700 adults in the Upper Colorado River sub-basin and one of at least 800 adults in the San Juan River sub-basin. Razorback Sucker recovery criteria are dependent on the establishment of four self-sustaining populations of 5,800 adult fish each: two populations in the Upper Colorado River Basin (one population in the Green River sub-basin, the other in either the Colorado River or San Juan River sub-basins) and two populations in the Lower Colorado River Basin (SJRIP 2014).

Fish community monitoring during the SJRIP's seven-year research period, 1991-1997, collected few wild Colorado Pikeminnow. This prompted investigations into augmenting the population with hatchery-reared fish. Based on their results, Utah Department of Wildlife Resources experimentally stocked Colorado Pikeminnow in 1996 with the purposes of evaluating dispersal and retention of stocked Colorado Pikeminnow (Ryden 2008). This experimental stocking, along with subsequent stockings of larval, sub-adult, and adult fish, resulted in the recapture of hatchery-reared fish. In 2003, *An Augmentation Plan for Colorado Pikeminnow in the San Juan River* was finalized (Ryden 2003). This plan, and later amendments, called for the annual stocking of  $\geq 300,000$  age-0 and  $\geq 3,000$  age 1+ fish in the San Juan River until 2009. In early 2010 a revised plan, *Augmentation of Colorado Pikeminnow (Ptychocheilus lucius) in the San Juan River: Phase II, 2010-2020* (Furr 2010), was developed to direct the continuation of stockings through 2020. The Phase II augmentation plan reflected changes requested by the SJRIP Biology Committee that discontinued the stocking of Passive Integrated Transponder (PIT) tagged age-1+ Colorado Pikeminnow in exchange for stocking increased numbers of age-0 fish ( $n \geq 400,000$ ). In 2020, the SJRIP Biology Committee recommended changing the Colorado Pikeminnow stocking strategy. Beginning in 2021, the SJRIP will release annually PIT tagged ( $n = 20,000$ ) Colorado Pikeminnow. These fish will allow for researchers to identify wild vs hatchery produced Colorado Pikeminnow, and allow other augmentation related research questions to be addressed.

Similarly, after the failure to collect any wild Razorback Sucker in the San Juan River during three years of intensive studies (1991-1993), the SJRIP Biology Committee initiated an experimental stocking program for Razorback Sucker (Ryden and Pfeifer 1994). Subsequently, Critical Habitat for Razorback Sucker and Colorado Pikeminnow was designated between the Hogback Diversion structure (RM 158.6) downstream to Neskahai Canyon (RM -35.0) in Lake Powell; approximately 35 river miles below the waterfall which demarcates RM 0.0 on the San Juan River (USFWS 1994). In 1996, 942 Razorback Sucker were stocked at four stocking sites. Based on the successes of the experimental stocking study, a full-scale augmentation effort for Razorback Sucker was initiated in 1997 following the *Five-Year augmentation plan for razorback sucker in the San Juan River* (Ryden 1997). In February 2003, the SJRIP Biology Committee extended the augmentation effort for Razorback Sucker with *An augmentation plan for razorback sucker in the San Juan River: An addendum to the five-year augmentation plan for razorback sucker in the San Juan River* (Ryden 2003). However, due to changes in augmentation protocols and difficulties in producing requested numbers of fish, initiation of the eight-year addendum to the original plan was delayed until 2009. That augmentation plan, in effect from 2009-

2016, called for the stocking of 91,200 Razorback Sucker over an eight-year period, or  $\geq 11,400$  fish per year, from a combination of sources including the Ouray National Fish Hatchery – Grand Valley Unit (Ouray NFH-GVU), the Southwestern Native Aquatic Resources and Recovery Center (Southwestern Native ARRC) and grow-out ponds on Navajo Agricultural Products Industry (NAPI) land stocked with fish from Southwestern Native ARRC. A *Final Augmentation Plan for Razorback Sucker in the San Juan River Basin* was submitted to the SJRIP Biology Committee in 2020. This plan recommends that the Program continue to stock all available Razorback Sucker into the San Juan River with a goal of stocking  $\geq 4,800$  fish ( $\geq 300$ mm TL) at all sites previously stocked, both in and outside of critical habitat.

The augmentation programs for the Colorado Pikeminnow and Razorback Sucker populations in the San Juan River are specifically addressed in the following Elements, Goals, Actions, and Tasks of the 2016 SJRIP Long Range Plan (LRP).

### **Element 1. Management and Augmentation of Populations of Colorado Pikeminnow and Razorback Sucker**

- **Goal 1.1 - Establish a Genetically and Demographically Viable, Self-Sustaining CPM and RBS Populations.**
  - **Action 1.1.1** Develop plans for rearing and stocking CPM and RBS.
    - **Task 1.1.1.1** Review and update augmentation plan for CPM and adjust stocking goals as needed.
    - **Task 1.1.1.2** Review and update augmentation plan for RBS and adjust stocking goals as needed.
  - **Action 1.1.2** Produce, rear, and stock sufficient numbers of CPM to meet stocking goals of augmentation plan.
    - **Task 1.1.2.2** Stock at least 400,000 age-0 CPM annually into the San Juan River (*Change in 2021 to 12,000 Age-1 CPM. Task no longer applicable*).
    - **Task 1.1.2.3** Opportunistically stock available CPM in excess of those described above.
  - **Action 1.1.3** Produce, rear, and stock sufficient numbers of RBS to meet stocking goals of augmentation plan.
    - **Task 1.1.3.2** Produce RBS in three Navajo Nation Agricultural Products (NAPI) grow-out ponds (3,000-3,500 fish per pond, > 200 mm TL) and stock into the San Juan River.
    - **Task 1.1.3.4** Stock at least 91,200 RBS (> 300 mm TL) during eight year stocking period or 11,400 per year.
    - **Task 1.1.3.5** Opportunistically stock available RBS in excess of the 11,400 described above.

The USFWS's Fish and Wildlife Conservation Offices is the primary office for satisfaction of policy requirements and to ensure compliance with needs relative to fish health, stocking requests and priorities, deviation from approved stocking requests, pre-stocking treatments (e.g. nonnative fish removal from stocking sites), and applicable environmental regulation. New Mexico Fish and Wildlife Conservation Office is the pertinent field office for processing of SJRIP stocking requests.

The Southwest Regional Policy for Stocking of Fish and Other Aquatic Species specifies regional policy for these actions. Stocking of fish reared at USFWS hatcheries in the Southwest Region are subject to

Regional Policy No. 03-06, “Stocking of fish and other aquatic species”. This policy applies to production, transport, and stocking for USFWS hatchery production and incorporates guidance and requirements from USFWS Fish Health Policy (713 FWM 1-5). Specifically, the policy’s main objectives are to 1) recover fish and other aquatic resources population protected under the Endangered Species Act, 2) restore declining fish and other aquatic resource populations before they require listing under the Endangered Species Act and 3) Maintain healthy, diverse fish and other aquatic resource populations.

### **Objectives for Fiscal Year 2022**

1. Annually stock a minimum of 12,000 PIT tagged age 1 Colorado Pikeminnow. *The time estimate to meet this objective is ten days. We anticipate travel to Southwest Native ARRC and to the San Juan River to meet objective goals.*
2. Annually harvest and stock all available Razorback Sucker ( $\geq 300$  mm TL), with the intent to stock  $\geq 4,800^*$  fish per year until the population reaches the minimum population size of 5,800 adult RBS. (No RBS  $< 300$  mm TL will be stocked to help identify wild recruiting juvenile fish). *The time estimate to meet this objective is 15 days. We anticipate travel to Southwest Native ARRC and to the NAPI Ponds/San Juan River to meet objective goals.*
3. Summarize Razorback Sucker and Colorado Pikeminnow release data into an annual report with an appendix of fish release data by site and date. We will also incorporate survival and population estimates from annual demographic monitoring into our annual report; we will use these estimates to modify or update plans for both species as needed (see methods for details). *Time estimate for this objective is ten days.*
4. Coordinate with the San Juan Program Office to quantify success of augmentation (see methods for details). *Time estimate for this objective is five days.*

\*The target number of Colorado Pikeminnow and Razorback Sucker to be stocked can be adjusted (increased or decreased as appropriate) in response to known population changes (e.g., a known level of recruitment, observed changes to apparent survival, increased retention and distribution, etc.). We will only make changes to augmentation numbers after discussion and agreement with the Biology Committee.

### **Methods and Approach**

- Objective 1. Coordinate with Southwestern Native ARRC to procure and stock Colorado Pikeminnow according to guidelines set forth in *Augmentation of Colorado Pikeminnow (Ptychocheilus lucius) in the San Juan River 2020-2025. (New Mexico FWCO in preparation).*

The SJRIP Biology Committee has recommended that starting in 2021 Southwestern Native ARRC will shift production from 400,000 Age-0 Colorado Pikeminnow to Age-1 PIT tagged Colorado Pikeminnow. The Program has requested a minimum stocking target of 12,000 fish; this target number will likely increase. New Mexico FWCO will assist with PIT tagging all Colorado Pikeminnow at Southwest Native ARRC, and assist with stocking fish into the San Juan River. Fish will be released in the post irrigation season, to reduce the risk of entrainment into irrigation canals. Stocked age-1 Colorado Pikeminnow will be acclimatized to the physical water chemistry

of the river at the time of stocking. We will monitor a small subset of stocked fish for stocking related stress-induced mortality within an *in situ* enclosure (aka, soft release) for up to 48 hours prior to release into the San Juan River Basin.

- Objective 2. Coordinate with Southwestern Native ARRC, Navajo Nation Department of Fish and Wildlife (NNDFW), and Ouray NFH-GVU to procure and stock Razorback Sucker according to guidelines set forth in *Augmentation Plan for Razorback Sucker in the San Juan River Basin* (Furr 2020).
  - Southwestern Native ARRC will continue with a production target of 10,500 Razorback Sucker (150-250 mm TL) into the NAPI ponds (3,500 fish/pond). Navajo Nation DFW will receive, grow out and stock all fish annually. The New Mexico FWCO will assist with fish harvest and stocking from NAPI, and these activities are covered in this SOW. The Ouray NFH-GVU will provide the SJRIP Augmentation Program with ~2,000-4,000 Razorback Sucker ( $\geq 300$  mm TL) annually. We assist Ouray with pre-stocking water quality readings, as well as timing and location of stocking. New Mexico FWCO will assist with stocking Razorback Sucker into the San Juan River. All fish will be stocked into existing sites to eliminate the risk of fish entrainment in irrigation canals. Stocking sites may be adjusted upon request by the Program Office. Furthermore, actively-harvested NAPI fish  $\leq 299$  mm TL will be held until they reach  $\geq 300$  mm TL, and then stocked into the San Juan River, used for other purposes or stocked below the Piute Farms Waterfall. Therefore, only  $\geq 300$  mm TL PIT tagged Razorback Sucker will be stocked into the San Juan River. This will help distinguish wild recruiting Razorback Sucker as any untagged fish captured that is  $< 300$  mm TL will be considered as a wild produced fish. Any opportunistically-acquired Razorback Sucker available to the SJRIP will be tagged and stocked on a case-by-case basis. Finally, New Mexico FWCO maintains a database of all PIT tag numbers from each stocking. This database is supplied to the Program Office.
  - We will continue to work to finalize construction and begin testing a flow conditioning on-site recirculating holding tank at NAPI ponds. Once constructed, the tank will be used to run all passively harvested fish that are  **$< 300$  mm TL** from the NAPI ponds through flow conditioning prior to stocking into the San Juan River. The goals and objectives for this project will be determined through experiment. The test period for running fish through the flow conditioning tanks will begin once the system is complete, and we will be able to determine the number of test runs that can be done annually. *Note: this project was considered non-essential and was postponed in FY 2020, because of travel restrictions and health concerns of COVID-19. We anticipate initiation of this project in FY 2021, and continuation in FY 2022.*
- Objective 3. The New Mexico FWCO will collect and report stocking information such as the timing, location, and physical water chemistry at time of fish releases. We will also report the number and size range of fish released. Once recapture data is available, we will report survival rates and population estimates from each cohort of released fish. These data will then be provided in the annual report and incorporated into long term plans for both Colorado Pikeminnow and Razorback Sucker. The New Mexico FWCO will report survival estimates in annual augmentation reports and reports will be submitted to the Program Office for review by the Biology Committee. We propose evaluating augmentation success through: meeting

augmentation target goals for each species, using demographic monitoring results for adult survival and population estimates when available, using  $N_b$  estimates to track trends in genetic integrity when available and small bodied monitoring to evaluate recruitment. These analyses will be integrated from other reports and studies.

- Objective 4. The New Mexico FWCO will communicate with the Program Office to ensure that augmentation goals and required reporting are understood and are being met. If the Program Office requests specific analysis from New Mexico FWCO we will determine our abilities to do the analysis and respond to the Program Office.

In support of these objectives, the New Mexico FWCO will identify new or alternative suitable stocking sites throughout the basin (e.g., tributaries, secondary channels, etc.) if we lose access to stocking sites or if we are requested to seek additional or alternate release sites. Site selection for Colorado Pikeminnow stockings will follow the *Stocking plan and protocol for the augmentation of Colorado Pikeminnow (Ptychocheilus lucius) in the San Juan River* (Furr and Davis 2009), until it is replaced by other guidance. Stocking locations and protocols for Razorback Sucker will be outlined in *Augmentation Plan for Razorback Sucker in the San Juan River Basin* (Furr 2020). Modifications to protocols and plans will be made to reflect new data as it becomes available.

#### Contribution to Recovery

The recovery program relies on augmentation to both prevent extirpation of both Razorback Sucker and Colorado Pikeminnow populations in the San Juan River and work towards recovery of these species. Augmentation will continue until the wild population can maintain a minimum population size without the need for hatchery production and augmentation.

**Products/Schedule**

An electronic data file will be provided for inclusion in the centralized database by 31 December 2021. A draft summary report detailing findings will be submitted to the SJRIP Biology Committee, by 31 March 2022. Revisions will be completed and a final annual report will be submitted by 1 June 2022. Any inability to meet deadlines will be communicated to the Program Office, and we will negotiate a compromise deadline.

<b>FY 2022</b>						
<b>Razorback Sucker and Colorado Pikeminnow Augmentation</b>						
<b><u>Labor Cost</u></b>						
<u>Position</u>	<u>Grade/Step</u>	<u>ry w/ Benc</u>	<u>Hours/Day</u>	<u>Total Days</u>		<u>Sub-total</u>
Fish Biologist	GS 9/10	\$48.22	8	20		\$7,715.20
Fish Biologist (Remote Bio)	GS 9/4	\$40.60	8	40		\$0.00
Fish Biologist	GS 11/8	\$53.53	8	20		\$8,564.80
Supervisory Fish Biologist	GS 13/4	\$74.78	8	5		\$2,991.20
Administrative Officer	GS 9/10	\$47.35	8	5		\$1,894.00
Supervisory Fish Biologist	GS 14/2	\$82.73	8	5		\$3,309.20
Bio. Science Techs (2 people)	GS 5/1	\$18.69	8	10		\$1,495.20
					<b>Total Labor</b>	<b>\$25,969.60</b>
<b><u>Travel and Per Diem</u></b>						
	<u>Days</u>	<u>Rate</u>				<u>Sub-total</u>
Hotel Costs	36	\$96.00				\$3,456.00
Hotel tax	36	\$12.00				\$432.00
Per Diem (Travel Day)	32	\$41.25				\$1,320.00
Per Diem (Full Day)	32	\$55.00				\$1,760.00
Concur Fee	36	\$14.75				\$531.00
					<b>Total Travel/Per Diem</b>	<b>\$7,499.00</b>
<b><u>Equipment</u></b>						
	<u>Miles/Qty</u>	<u>Total Miles</u>	<u>Rate</u>			<u>Sub-total</u>
Vehicle Fuel						
1 truck x 6 trips - ABQ to Farmington, NM - 366mi RT + 150mi/trip local commute	516	3,096	\$0.56			\$1,733.76
Remote biologist savings	\$ 12,992.00					
					<b>Sub-total for Augmentation - NMFWCO only</b>	<b>\$35,202.36</b>
					Overhead 3%	\$1,056.07
					<b>Grand Total</b>	<b>\$36,258.43</b>
* Travel and per diem costs include NAPI pond harvest, field work and assistance tagging fish at Southwest Native ARRC.						

FIGURE 1. COLORADO PIKEMINNOW AND RAZORBACK SUCKER AUGMENTATION/NAPI POND HARVEST AND STOCKING BUDGET FOR FY 2021.

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<b>8</b>	<b>Colorado Pikeminnow and Razorback Sucker Augmentation in the San Juan River Basin</b>	<b>Furr &amp; Davenport, NMFWCO</b>
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*How can the technical aspects of this SOW be improved?*

**PO:**

Objective 3 from this FY2022 SOW is already included in the FY2021 SOW. If these analyses were to be concluded in 2021 explaining the need to repeat them in 2022 would be helpful. Or simply remove from this SOW.

From the Products/Schedule most dates need to be updated with the accurate year.

The Budget Justification is carryover from last year, no longer needed, recommend removal.

*What is this SOW's contribution to recovery?*

**PO:** Hatchery augmentation will be critical to maintain populations of endangered fish in the San Juan River Basin until wild recruitment becomes widespread.

RESPONSE TO TECHNICAL REVIEW

We modified Objective 3 to only include what we provide annually to the PO in our annual report. This data will include data about releases, water quality and number and size of fish released. We removed all wording about calculating population estimates in FY 2022. We lack the technical skills to navigate Program Mark for FY 2022, but we will work to gain the skills to provide this calculation for FY 2023. We will rely on the PO to calculate this metric.

Updated Products/Schedule dates

Removed budget justification. We also adjusted our budget to a lower amount, because we will not be calculating a population estimate, but relying on the Program Office to analyze the data for this metric.

Added a section on the contribution to recovery.