

**Augmentation of
Age-0 Colorado Pikeminnow and Age-1+ Razorback Sucker
in the San Juan River
Fiscal Year 2016 Project Proposal**

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Period of Performance: 2/27/2012 to 9/30/2016

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 (SJ RIP) was initiated in 1992 to protect and recover populations of both Colorado Pikeminnow and Razorback Sucker in the San Juan River Basin (Basin) while water development proceeds in compliance with all applicable federal, state, and tribal laws ([SJ RIP 2014](#)). Recovery of Colorado Pikeminnow, as listed in the recovery goals, is dependent on the maintenance of a wild population of at least 2,600 adults in the Green River subbasin and at least 700 adults in the Upper Colorado River subbasin, as well as a target of 1,000 age 5+ (>300 mm TL) in the San Juan River subbasin. Delisting criteria include a self-sustaining population that exceeds 800 adults maintained in the San Juan River subbasin. 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 subbasin, the other in either the Colorado River or San Juan River subbasins) and two populations in the Lower Colorado River Basin ([SJ RIP 2014](#)).

Fish community monitoring during the SJ RIP's seven year research period, 1991-1997, identified few wild Colorado Pikeminnow inhabiting the San Juan River. This prompted investigation into the feasibility and implementation of augmenting the population with hatchery reared fish. As a result of these findings, an experimental stocking of Colorado Pikeminnow was conducted by Utah Department of Wildlife Resources in 1996 with the purposes of evaluating dispersal and retention of stocked Colorado Pikeminnow and determining the availability, use, and selection of habitats by early life stages of Colorado Pikeminnow ([Ryden 2008](#)). Stockings of larval, sub-adult, and adult fish after this initial stocking resulted in the subsequent recapture of stocked fish suggesting that Colorado Pikeminnow could survive in the San Juan River. 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 drafted that outlines the continuation of stockings through 2020. Phase II augmentation reflects changes requested by the SJ RIP Biology Committee by discontinuing the stocking of Passive Integrated Transponder tagged age-1+ Colorado Pikeminnows in exchange for stocking increased numbers of age-0 fish ($n \geq 400,000$).

Similarly, after the failure to collect any wild Razorback Sucker in the San Juan River during three years of intensive studies (1991-1993) the SJ RIP Biology Committee initiated an experimental stocking program for Razorback Sucker in the San Juan River ([Ryden and Pfeifer 1994](#)). Experimental stocking was implemented to provide needed insight about recovery potential and habitat suitability for the Razorback Sucker in the San Juan River between river mile (RM) 158.6 at the Hogback Diversion structure near Waterflow, NM and Lake Powell near Clay Hills, UT RM 3 ([Maddux et al. 1993](#)). Subsequently, Critical Habitat for Razorback Sucker and Colorado Pikeminnow was designated as 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](#)). Between March 1994 and October 1996, 942 Razorback Suckers were stocked into the San Juan River at four stocking sites (RM 158.6, 136.6, 117.5, and 79.6). Data gathered on these fish identified habitat types being used year-round by Razorback Sucker in the San Juan River, and provided information on movements, survival, and growth rates. Based on the successes of the experimental stocking study, a full-scale augmentation effort for Razorback Sucker in the San Juan River was initiated with the *Five-Year augmentation plan for razorback sucker in the San Juan River* ([Ryden 1997](#)). In February 2003 the SJ RIP-BC 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 the eight-year addendum to the original plan was delayed in initiation until 2009. The current augmentation plan calls for the stocking of 91,200 Razorback Suckers over an 8-year period, or $\geq 11,400$ fish per year, from a combination of fish reared in a hatchery (currently, Ouray National Fish Hatchery – Grand Valley Unit [Ouray NFH-GVU] or the Southwest Native Aquatic Resources and Recovery Center [SNARRC]) and Razorback Suckers that are grown out in ponds on Navajo Agricultural Products Industry (NAPI) land.

The augmentation programs for the Colorado Pikeminnow and Razorback Sucker populations in the San Juan River are related to the 2014 SJRIP Draft Long Range Plan (LRP). These activities are specifically addressed in the following Elements, Goals, Actions, and Tasks:

Element 1. Specific goals, actions, and tasks

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 for CPM and RBS.

Task 1.1.1.1 Review and update augmentation plan for CPM and adjust stocking goals as scheduled.

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 (50–55 mm TL) CPM annually into the San Juan River.

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 1.1.3.4 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 per year described above.

Goal 1.2— Identify and Implement Strategies for Improving the RBS and CPM Augmentation Program and Genetic Integrity.

Action 1.2.1 Implement methods to evaluate status and success of stocked RBS and CPM.

Task 1.2.1.2 Identify, describe, and implement strategies for improving survival and retention of stocked razorback sucker and Colorado pikeminnow, including acclimation prior to stocking, size of fish stocked, time and location of stocking, physiological conditioning, and predator avoidance.

In addition to SJRIP Program priorities, the stocking of fish reared at U.S. Fish and Wildlife Service (Service) hatcheries in the Southwest Region (Region 2; New Mexico, Arizona, Texas and Oklahoma) are subject to Regional Policy No. 03-06, “Stocking of fish and other aquatic species”. This policy applies to production, transport, and stocking for Service hatchery production and incorporates guidance and requirements from FWS Fish Health Policy (713 FWM 1-5), Policy for Controlled Propagation of Species Listed under the Endangered Species Act (Federal Register 65:183), and goals and objectives of the FWS Strategic Plan for the Fisheries Program. The Service’s Fish and Wildlife Conservation Offices are the primary conduit for satisfaction of Policy requirements and ensures 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 compliance. The New Mexico Fish and Wildlife Conservation Office (NMFWCO) is the pertinent field office for the processing of SJRIP stocking requests under this policy directing the change in lead coordination and stocking responsibilities from FWS Region 6 to Region 2.

Objectives for Fiscal Year 2016

1. Coordinate with SNARRC, to procure and stock Colorado Pikeminnows according to guidelines set forth in *Augmentation of Colorado Pikeminnow (Ptychocheilus lucius) in the San Juan River: Phase II, 2010-2020* ([Furr 2010](#))
 - a. Annually stock $\geq 400,000$ age-0 Colorado pikeminnow.
2. Coordinate with SNARRC, Navajo Nation Department of Fish and Wildlife (NNDFW), and Ouray NFH-GVU to procure and stock Razorback Suckers according to guidelines set forth in *An augmentation plan for razorback sucker in the San Juan River* ([Ryden 2003](#))
 - a. Stock at least 91,200 RBS (> 300 mm TL) during eight year stocking period or 11,400 per year.
3. Identify and use multiple stocking locations to expand range and reduce potential for catastrophic loss of an entire year class at a single stocking location ([Furr 2011](#)). Stock Colorado pikeminnow according to guidelines defined in *Stocking plan and protocol for the augmentation of Colorado pikeminnow (Ptychocheilus lucius) in the San Juan River* ([Furr and Davis 2009](#)). Stock Razorback Suckers according to guidelines defined in *Stocking plan and protocol for the augmentation of razorback sucker (Xyrauchen texanus) in the San Juan River* (in preparation)
4. Update the augmentation plans for Razorback Sucker and Colorado Pikeminnow.
5. Provide summarization report on timing and location of individual stockings, numbers, and age classes while relating information to fulfillment of recommended stocking numbers as outlined in the augmentation plan.

Methods and Approach

Objective 1.a. Age-0 Colorado Pikeminnows will be annually reared and harvested by SNARRC and delivered via standard distribution unit to the San Juan River. Fish will be stocked in the fall of each year, post irrigation season, to eliminate the risk of fish entrainment in irrigation canals. When possible, age-0 Colorado Pikeminnow will be acclimatized to a

variety of conditions (i.e. flow, temperature, physical/environmental characteristic, etc.) for up to 72 hours prior to release into the San Juan River.

- Objective 2.a. SNARRC will stock approximately 10,500 Razorback Suckers (≥ 200 mm total length) into three NAPI ponds (3,500 fish/pond). Grow-out, harvesting, and stocking via standard distribution unit into the San Juan River will be conducted by NNDFW annually with assistance from NMFWCO. When possible, fish will be stocked in the fall of each year, post irrigation season, to eliminate the risk of fish entrainment in irrigation canals. Ouray NFH-GVU will provide the SJRIP Augmentation Program with 2,000-4,000 Razorback Suckers (≥ 300 mm TL) annually. All Razorback Suckers from Ouray NFH-GVU will be hard released at four specified locations as part of a stocking Source and Location comparison being conducted by NNDGF, the SJRIP Program Office, and the NMFWCO. By comparing differences in subsequent recapture rates, this stocking study will aid the Program in comparing survival and retention of fish stocked from Ouray NFH-GVU vs. NAPI, and determine if fish from either source had better survival and retention rates at a particular stocking location(s).
- Objective 3. New Mexico FWCO will identify various sites upstream of Animas-RM 5.0 (Berg Park, Farmington, NM) and determine their suitability for use as stocking locations (Furr 2011). Site selection criteria for razorback sucker will be defined in *Stocking plan and protocol for the augmentation of razorback sucker (Xyrauchen texanus) in the San Juan River* (in preparation) and reviewed for approval by the SJRIP Biology Committee. Site selection for Colorado pikeminnow will continue under in *Stocking plan and protocol for the augmentation of Colorado pikeminnow (Ptychocheilus lucius) in the San Juan River* (Furr and Davis 2009).
- Objective 4. New Mexico FWCO will collate all pertinent stocking information including, but not limited to, timing, location, environmental conditions, size of fish, and numbers stocked. These data will be entered into a standardized database that will be provided to the Program Coordinators office for deposition. These data and subsequent recapture data will be used to evaluate stocking effectiveness.

Products/Schedule

An electronic data file will be provided for inclusion in the centralized database by 31 December 2016. A draft summary report detailing findings will be submitted to the San Juan River Implementation Program, Biology Committee, by 31 March 2017. Revisions will be completed and a final annual report will be submitted by 1 June 2017.

Literature Cited

Furr, D. W. and J. E. Davis. 2009. Stocking Plan and Protocol for the Augmentation of Colorado pikeminnow (*Ptychocheilus lucius*) in the San Juan River. U.S. Fish and Wildlife Service, San Juan River Recovery Implementation Program, Albuquerque, NM. 13 pp.

- Furr, D.W. 2010. Augmentation of Colorado Pikeminnow (*Ptychocheilus lucius*) in the San Juan River: Phase II, 2010-2020 (DRAFT). U.S. Fish and Wildlife Service, San Juan River Recovery Implementation Program, Albuquerque, NM. 20 pp + appendices.
- Furr, D.W. 2011. Investigation of Stocking Sites in the San Juan and Animas Rivers Upstream of RM 166.6 (DRAFT). U.S. Fish and Wildlife Service, San Juan River Recovery Implementation Program, Albuquerque, NM. 19 pp + appendices.
- Maddux, R. H., L. A. Fitzpatrick, and W. A. Noonan. 1993. Colorado River endangered fishes Critical Habitat: Draft Biological Support Document and appendices. U.S. Fish and Wildlife Service, Salt Lake City, UT. 222 pp.
- Ryden, D. W., and F. K. Pfeifer. 1994. An experimental stocking plan for razorback sucker in the San Juan River. U.S. Fish and Wildlife Service, Grand Junction, CO. 26 pp. San Juan River Basin Recovery Implementation Program.
- Ryden, D. W. 1997. Five-year augmentation plan for razorback sucker in the San Juan River. U.S. Fish and Wildlife Service, Grand Junction, CO. 27 pp.
- Ryden, D.W. 2003. An Augmentation Plan for Razorback Sucker in the San Juan River: Addendum to the Five-Year Augmentation Plan for Razorback Sucker in the San Juan River (Ryden 1997). U.S. Fish and Wildlife Service, San Juan River Recovery Implementation Program, Albuquerque, NM. 63 pp. + appendices.
- Ryden, D.W. 2008. Augmentation of Colorado pikeminnow in the San Juan River: 2007. Interim Progress Report (Final) submitted to U.S. Fish and Wildlife Service, San Juan River Recovery Implementation Program, Albuquerque, NM. 6 pp. + appendices.
- San Juan River Basin Recovery Implementation Program. 2014. Long-range plan. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service. 1994. Determination of critical habitat for the Colorado River endangered fishes; razorback sucker, Colorado pikeminnow, humpback chub, and bonytail chub. Dept. of the Interior, U.S. Fish and Wildlife Service, Federal Register, 21 March 1994, 59:13374-13400.
- U.S. Fish and Wildlife Service. 2002. Colorado pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO.

FY 2016 Proposed Budget:**Personnel/Labor Costs (Federal Salary + Benefits)**

Fish Biologist (GS-11-5) – 45 days @ \$378/day	\$ 17,010.00
Age-0 Colorado pikeminnow stockings (Objective 1.a):	
(1 person x 2 days/trip x 1 trip)	
Age-1+ razorback sucker stockings (Objective 2.a):	
(1 person x 2 days/trip x 4 trips)	
Age-1+ razorback sucker harvest (Objective 2.a):	
(1 person x 5 days/trip x 1 trips)	
Reporting/Data Management (Objective 2)	
(1 person x 30 days)	
Bio. Science Technician (GS-8) – 15 days @ \$324/day	\$ 4,860.00
Age-0 stockings (Objective 1.a):	
(1 person x 2 days/trip x 1 trip)	
Age-1+ razorback sucker stockings (Objective 2.a):	
(1 person x 2 days/trip x 4 trips)	
Age-1+ razorback sucker harvest (Objective 2.a):	
(1 person x 5 days/trip x 1 trips)	
Supervisory Fish Biologist (GS-13-5) – 5 days @ \$540/day	\$ 2,700.00
(Project oversight and review)	
Project Leader (GS-14-7) - 4 days @ \$674/day	\$ 2,696.00

Sub-total **\$ 27,266.00**

Travel and Per Diem (Based on Published FY-2015 Federal Per Diem Rates)

Hotel Costs – 9 nights	\$ 747.00
(\$83/night – single occupancy)	
Per Diem (Hotel Rate) – 15 days @ \$46/day	\$ 690.00
Sub-total	<u>\$ 1,437.00</u>

Equipment

Vehicle Maintenance & Gasoline 8,000 miles @ \$0.58/mile	
(includes costs associated with gasoline/diesel fuel, vehicle maintenance)	\$ 4,640.00
Sub-total	<u>\$ 4,640.00</u>

USFWS-NMFWCO Total \$ 33,343.00

USFWS Region 2 Regional Office Administrative Overhead (3%) \$ 1,000.00

USFWS Region 2 Total **\$ 34,343.00**

Attachment A. – Out-year budgets for Augmentation of Age-0 Colorado pikeminnow and Age-1+ razorback sucker in the San Juan River

Out-year funding

FY 2017	\$35,405
FY 2018	\$36,484
FY 2019	\$37,588
FY 2020	\$38,748