Augmentation of Age-0 Colorado pikeminnow and Age-1+ razorback sucker in the San Juan River Fiscal Year 2018 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 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 (SJRIP 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 (SJRIP 2014).

Fish community monitoring during the SJRIP'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 ≥ 300,000 age-0 and ≥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 written to direct the continuation of stockings through 2020. Phase II augmentation reflects changes requested by the SJRIP 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≥ 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 SJRIP 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 SJRIP-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 (2009-2016) calls for the stocking of 91,200 Razorback Suckers over an 8-year period, or ≥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. A revised *Augmentation Plan for Razorback Sucker in the San Juan River Basin* (Furr 2016, *draft*) was submitted to the Program's Biology Committee in February 2016 for review and is being finalized. It has been recommended that the Program continue to stock all available Razorback Sucker into the San Juan River and its tributaries with a goal of stocking ≥6,500 fish (≥300mm TL) annually.

The augmentation programs for the Colorado Pikeminnow and Razorback Sucker populations in the San Juan River are related to the 2016 SJRIP 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 2018

1. Annually stock ≥400,000 age-0 Colorado Pikeminnow, and investigate methods for batch-marking hatchery released fish for verifiable in-field identification.
2. Stock all available RBS (> 300 mm TL), with the intent to stock ≥6,500 fish per year until the population becomes self-sustaining.* No RBS <300 mm TL will be stocked.
3. Analyze collected data, begin drafting a new Colorado Pikeminnow augmentation plan, and modify/update plans for both Razorback Sucker and Colorado Pikeminnow as needed.

*the target number of Razorback Sucker and Colorado Pikeminnow to be stocked in subsequent years will be able to 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.) determined to have occurred in any given year.

Methods and Approach

- Objective 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).
    - 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 reduce 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.) within an *in* situ enclosure for up to 72 hours prior to release into the San Juan River. A study is being conducted to determine the feasibility and efficacy of batch-marking all hatchery produced Colorado Pikeminnow with Calcein. If a reliable batch-marking method is identified, Calcein or another method, then future stockings should incorporate this technology to assist in detecting, and verifying, wild produced and recruiting fish.

- Objective 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 Augmentation Plan for Razorback Sucker in the San Juan River Basin (Furr 2016, draft).

- 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. Currently, 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 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). Once data has been analyzed, location of stockings may be adjusted to maximize apparent survival (e.g., retention) or to more equally distribute the population longitudinally. Only fish ≥300 mm TL will be stocked into the San Juan River beginning in 2017. Fish ≤299 mm TL will be held until they reach ≥300 mm TL before being stocked, or used for other purposes. This will help distinguish wild recruiting Razorback Sucker from stocked fish.

Objective 3. New Mexico FWCO, in conjunction with the Program Office, will analyze all pertinent stocking information including, but not limited to: timing, location, environmental conditions, size of fish, numbers stocked, and subsequent apparent survival from various stockings; and population estimates, age-class structure, longitudinal distribution, and reach specific densities resulting from stocked fish. These data will then be incorporated into the augmentation efforts and written plans for both Colorado Pikeminnow and Razorback Sucker.

In support of these Objectives the New Mexico FWCO will continue to conduct field excursions to identify suitable stocking sites throughout the basin (e.g., tributaries, secondary channels, etc.). [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) and stocking locations and protocols for Razorback Sucker will be outlined in *Augmentation Plan for Razorback Sucker in the San Juan River Basin* (Furr 2016, *draft*). Modifications to protocols and plans will be made to reflect new data as it becomes available.]

Products/Schedule

An electronic data file will be provided for inclusion in the centralized database by 31 December 2018. A draft summary report detailing findings will be submitted to the San Juan River Implementation Program, Biology Committee, by 31 March 2019. Revisions will be completed and a final annual report will be submitted by 1 June 2019.

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.

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FY 2018							
Razorback Sucker and Colorado Pikeminnow Augmentation							
Labor Cost							
Position	**Grade/Step**	**Hourly Rate**	**Fringe**	**Salary w/ Benefits**	**Hours/Day**	**Total Days**	**Sub-total**
Fish Biologist	GS 9/7	$29.41	26.41%	$37.17	9	40	$13,382.53
Fish Biologist	GS 11/7	$35.58	25.54%	$44.66	9	10	$4,019.79
Supervisory Fish Biologist	GS 13/6	$49.30	28.28%	$63.24	9	5	$2,845.89
Supervisory Fish Biologist	GS 14/9	$63.25	26.93%	$80.29	9	4	$2,890.32
Adminstrative Officer	GS 9/8	$30.23	26.12%	$38.13	9	5	$1,715.67
					Total Labor		**$24,854.21**
Travel and Per Diem	**Days**	**Rate**					**Sub-total**
Hotel Costs	20	$91.00					$1,820.00
Per Diem (Travel Day)	18	$38.25					$688.50
Per Diem (Full Day)	16	$51.00					$816.00
					Total Travel/Per Diem		**$3,324.50**
Equipment	**Miles/Qty**	**Total Miles**	**Rate**				**Sub-total**
Vehicle Fuel							
1 truck x 6 trips - ABQ to Farmington, NM - 366mi RT + 150mi/trip local commute	516	3,096	$0.54				$1,671.84
					Equipment		$1,671.84
		Sub-total for Augmentation - NMFWCO only					**$29,850.55**
		Administrative Overhead (3%)					**$895.52**
		Total - USFWS - NMFWCO					**$30,746.07**