

**Rearing Endangered Fish at the
Horsethief Canyon Native Fish Facility Ponds
for Stocking into the San Juan River
Draft Fiscal Year FY-2018 Project Proposal
Updated: 4 May 2017**

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Introduction

Along with workplan 11, “Razorback Sucker Augmentation/NAPI Pond Management,” this workplan is intended to supply the San Juan River Basin Recovery Implementation Program (SJRBRIP) with a reliable source of endangered Razorback Sucker (*Xyrauchen texanus*) with which to help restore a self-sustaining population via annual fall stocking events.

The Ouray National Fish Hatchery – Grand Valley Unit (NFH-GVU) consists of several distinct facilities located in and around Grand Junction, CO. One of these facilities is the Horsethief Canyon Native Fish Facility (HCNFF) pond complex (about 7½ miles west of the main hatchery building) near Fruita, CO. The other facility used for this workplan is the 24-Road Hatchery, an intensive water reuse hatchery building, utilizing a municipal water source, thus insuring good water quality, clarity, and freedom from parasites.

The HCNFF consists of 22 ponds, ranging in size from 0.1 to 0.5 surface acres, with a total surface acreage for the entire facility of 6.2 acres. Each pond is 5-6 feet deep and is equipped with a fabric liner to prevent seepage. Each pond also has a concrete kettle and drain structure to facilitate draining and concentrating of fish for ease of harvest. This facility is a multi-species broodstock, production, and rearing facility dedicated to rearing the three endangered Colorado River fishes: Razorback Sucker, Humpback Chub (*Gila cypha*), and Bonytail (*Gila elegans*).

Until 2012, the operation and maintenance (O&M) of the entire Ouray NFH-GVU complex (Project 29a: Operation and Maintenance of Ouray National Fish Hatchery – Grand Valley Unit) was funded by Upper Colorado River Endangered Fish Recovery Program (UCREFRP). On 25 March 2010, the Coordination Committee of the SJRBRIP voted to cost-share 1/6 of the operation and maintenance costs for the HCNFF pond complex. This equates to a total of one surface acre of pond rearing and production space (either two 0.5 acre ponds, or four 0.25 acre ponds).

Methods

Currently, the one surface acre of grow-out ponds allotted to the SJRBRIP is being used to rear Razorback Sucker that are progeny of 15-20 paired matings of appropriate genetic lineage, produced annually from Razorback Sucker broodstock being held at HCNFF. Spawning takes place at the HCNFF each spring around mid-April, depending upon ambient water temperatures. After spawning, fertilized eggs are transported to the 24-Road Hatchery building where they are reared in flow-through egg jars until they hatch into larvae. Several weeks after spawning, larval Razorback Sucker are then stocked back out into grow-out ponds at HCNFF for the remainder of their age-0 growing season. At the end of their age-0 growing season, the Razorback Sucker grow-out ponds are drained and the young fish are transported back into the 24-Road hatchery building where they continue to be fed and reared in a warm,

climate-controlled, indoor environment overwinter, thus allowing fish to continue grow even during the coldest months of the year.

Several months after they have been brought back into the hatchery, young Razorback Sucker are implanted with PIT tags. This usually happens at 100-200 mm TL. PIT-tagging young Razorback Sucker several months after they are transferred to the hatchery building (i.e., after they have settled down from being moved into the hatchery building from the HCNFF grow-out ponds) helps reduce stress on these animals and allows them to have abundant time to heal in the hatchery building after being PIT-tagged, but prior to being stocked back into the HCNFF grow-out ponds for their age-1 growing season (which usually happens in late March). Prior to being PIT-tagged, fish are taken off of feed for 48 hours and aren't fed again for at least 24 hours after PIT-tagging. This helps reduce stress as well as allowing the fish's intestinal tract to empty and retract, thus reducing the possibility of accidentally puncturing an intestine during implantation of a PIT tag. After PIT-tagging, fish are monitored in circular hatchery tanks for both PIT tag loss and delayed mortality (both tag loss and mortality due to PIT-tagging are very low; < 0.5% annually).

During the spring of their age-1 year these Razorback Sucker, now about 200 mm TL, are released back into the grow-out ponds. They are not handled again until the fall of that same year. When ponds are harvested, every individual Razorback Sucker is measured (a subset are also weighed) and scanned for a PIT tag. This happens at the end of the age-1 growing season (October/November), just prior to stocking. Harvest operations consist of taking fish off of feed 48 hours before harvest, draining grow-out ponds and passively gathering fish into the concrete kettles as the pond drains, anesthetizing fish (using MS-222), measuring fish (all fish), weigh fish (a subset of fish from each pond; minimum of 50 fish per pond), and checking fish for PIT tags. If a PIT tag is found to be missing at this point (which is very rare), then a new PIT tag is implanted prior to the fish being loaded for transport and stocking into the San Juan River. Fish are lifted from grow-out ponds to the stocking truck using a Palfinger brand boom crane with an attached fish basket. They are then transported to the appropriate stocking site, tempered following appropriate USFWS protocols, and stocked as either a hard- or soft-release, as per directions from the SJRBRIP and the U. S. Fish and Wildlife Service's New Mexico Fish and Wildlife Conservation Office (NMFWCO).

Daily operation and maintenance of the HCNFF ponds and the 24-Road hatchery includes regularly checking and making appropriate adjustments to water quality (dissolved oxygen, pH, nitrates/nitrites, etc.), maintenance, cleaning, and replacement of air distribution systems (air stones, air pads, oxygen cylinders), calculating proper feed ratios and distributing proper types and sizes of feed based on fish life stage, size, and pond/tank densities, cleaning of fish ponds/tanks, checking fish for diseases and applying appropriate treatments for sick/infected fish when necessary, maintenance of pumps, filters (e.g., fluidized sand, drum, UV), and air distribution systems, maintenance of vehicles, equipment and grounds, scheduling and performing USFWS and state-mandated annual fish health inspections and Aquatic Invasive Species inspections, applying for and obtaining state fish importation permits, collection and QA/QC of PIT tag database files, submission of data files to the SJRBRIP, preparation of annual reports, etc.

Products/Deliverables

PIT tag files will include all Razorback Sucker handled and scanned at time of pond harvest (including all fish that were re-tagged), immediately prior to stocking. Following QA/QC of the data, this file is submitted the SJRBRIP and the NMFWCO. While the SJRBRIP has requested Razorback Sucker that are ≥ 300 mm TL, they are actually getting age-1 fish that are meeting the Upper Colorado River Basin's minimum size requirements of ≥ 350 mm TL. The mean stocking size for most lots of Razorback Sucker sent to the San Juan River is closer to 365-375 mm TL.

It is anticipated that 2,000-4,000 Razorback Sucker (≥ 300 mm TL) can be reared in the one surface acre of ponds allotted to the SJRBRIP. Razorback Sucker of the appropriate target stocking size will be made available to the SJRBRIP in October/November of each calendar year for stocking (after the annual fall fish community monitoring studies are completed). All stockings of Razorback Sucker will be coordinated with personnel from the SJRBRIP office and the NMFWCO.

Changes in Future Management Strategies for HCNFF

The SJRBRIP will have the option to change the management approach and species being reared in their one surface acre of pond space as they see fit, but will need to coordinate such changes with Ouray NFH-GVU hatchery staff, allowing enough lead time to prepare for changes in importation/exportation permitting, purchasing of feed proper for the sizes and species of fish being reared, etc. Changes in numbers or sizes of fish desired, species being reared, etc. may lead to adjustments in future years' budgets. For instance, if the SJRBRIP decides to rear Colorado Pikeminnow (a species not currently being held on station at Ouray NFH-GVU), appropriate lead time will be needed to arrange attaining young fish from another facility.

Cost Share with Upper Colorado River Endangered Fish Recovery Program

The SJRBRIP's Coordination Committee voted to cost-share 1/6 of the O&M costs for the HCNFF pond complex. However, the O&M of the HCNFF ponds is in reality part of a much larger picture of the overall O&M of the Ouray NFH-GVU itself. So, the following staffing breakdowns were used to determine the overall O&M of the entire Ouray NFH-GVU:

- 1) 24-Road Hatchery building will require 100% staffing for 6 months of the year
- 2) 24-Road Hatchery building will require 50% staffing for the other 6 months of the year
- 3) Peter's ponds complex, Horsethief SWA ponds & lease-free grow-out ponds will require 10 % staffing for 6 months of the year
- 4) The HCNFF ponds will require 40% staffing for 6 months of the year
 - a. One-sixth of the O&M of the HCNFF ponds will be paid for by the SJRBRIP

So, for areas where there are shared costs at the HCNFF ponds, an example of a \$100 cost/year to the UCREFRP, would cost the SJRBRIP:

- \$100 (full year cost) X .50 (the 1/2 year that the HCNFF ponds operate) = \$50
- \$50 (the 1/2 year that the HCNFF ponds operate) X .40 (40% staffing) = \$20
- \$20 (1/2 year at 40% staffing) X 0.167 (1/6 cost to SJRBRIP) = \$3.34

So, the dollar cost to SJRBRIP is \$3.34 per \$100 (3.34%) of UCREFRP Project 29a. In other words, take the actual dollar cost to UCREFRP of Project 29a X 0.0334 for all shared costs.

NOTE: There are also costs included in the budget that are unique to the SJRBRIP alone. These costs will not be prorated, but charged at 100% rate to the SJRBRIP (see budget for details).

Possible Outyear Cost Adjustments

If the SJRBRIP decides to change stocking strategies (species, sizes, times of year at which fish are being stocked, etc.) outyear budgets may need to be adjusted to account for this. The costs presented in this workplan represent the best estimates we can develop, based on the species, numbers, and timing of fish to be stocked from our facility to the San Juan River.

FY-2018 Budget:

(Based on an anticipated FY-2018 costs)

Costs Shared by UCREFRP and SJRBRIP (i.e. O&M Costs)**Personnel/Labor Costs (Federal Salary + Benefits)**

	UCREFRP Project 29a	SJRBRIP Cost
Principal Biologists (GS-11) – 1,960 hours @ \$56.27/hr X 2 people (130 total hours covered by SJRBRIP or 65 hr/person)	220,578	7,367
Biological Technician (GS-7) – 1,960 hours @ \$35.75/hr (65 total hours covered by SJRBRIP)	70,070	2,340
Biological Technicians (GS-5) – 600 hours @ \$26.48/hr X 2 people (40 total hours covered by SJRBRIP or 20 hr/person)	31,776	1,061
Overtime:		
Biological Technician (GS-7) – 120 hours overtime @ \$53.63/hr (4 total hours of overtime hours covered by SJRBRIP)	6,436	215
Biological Technician (GS-5) – 40 hours @ \$39.72/hr X 2 people (2.7 total hours covered by SJRBRIP or 1.35 hr/person)	3,178	106
Subtotal	332,038	11,090

**Permitting; Coordination; Data Input, Analysis, Management & Presentation;
Report Writing; Office & Administrative Support (Federal Salary + Benefits)**

Project Leader (GS-14) – 320 hours @ \$88.50/hr (10.7 total hours covered by SJRBRIP)	28,320	946
Administrative Officer (GS-9) – 320 hours @ \$47.44/hr (10.7 total hours covered by SJRBRIP)	15,181	507
Subtotal	43,501	1,453

In-Kind Services

Bozeman Fish Technology Center		
Grind and sift fish food for larval Razorback Sucker	<\$2,898>	<97>

**Operations (Fish Food, Chemicals and Fertilizer, Hatchery
Supplies, Vehicles and Fuel, Electricity)****Operations (Fish Food, Chemicals and Fertilizer, Hatchery
Supplies, Vehicles and Fuel, Electricity)**

Fish Food (from Skretting USA)

Actual costs = 4 orders of fish food per year (1 order per fiscal quarter) at \$18,350 each = \$73,400. The line items below represent one of our four orders (placed April 2016). This fish food order will last us 90 days. We have several different sizes of fish on station, thus the different sizes of food in each order.

Trout # 1 Crumble: 1,000 lbs @ \$1.18 per lb = \$1,180
 Trout # 2 Crumble: 1,000 lbs @ \$1.17 per lb = \$1,170
 1.0 mm RZ Grower 2,000 lbs @ \$1.00 per lb = \$2,000
 2.0 mm RZ Grower 4,000 lbs @ \$1.00 per lb = \$4,000

3.0 mm RZ Grower 8,000 lbs @ \$1.00 per lb = \$8,000
 4.0 mm RZ Grower 2,000 lbs @ \$1.00 per lb = \$2,000
Fish Food Subtotal 73,400 2,452

Chemicals and Fertilizer

Exact use of the money in this line item will vary from year to year depending on specific chemical/fertilizer/herbicide needs in a particular year. It will also depend on if there are outbreaks of pathogens that need to be treated (e.g., "Ich") in a given year. Funds for a "typical" field season for one study would likely include the following:

Sodium Bicarbonate (pH increaser) = \$5,600

Eighty 50-lb bags @ \$70 per bag annually

Copper Sulfate = \$4,825

Ten 50-lb bags (pellets) @ \$95 each = \$950

50 gallons 10% solution @ \$77.50/gallon
 = \$3,875

Spartan Sparquat 256 Germicidal Cleaner = \$300

10 gallons @ \$30 per gallon

Chloram-X (dechloriator) = \$1,440

Sixteen 10 lb buckets (4/case, 4 cases/year)
 @ \$90/bucket

Finquel brand MS-222 anesthetic = \$900

Two 1 kg bottles @ \$450/bottle

Chloramine-T = \$880

Two 55-lb containers @ \$440 per container

Formalin (10% fixative) = \$2,100

Four 55-gallon drums @ \$275 each

Specialized Haz-Mat shipping @ \$1,000

Denatured ethyl alcohol = \$760

Eight 5-gallon jugs @ \$95 per jug

Distilled water = \$300

Ten 2-gallon jugs @ \$30 per jug

Stress Coat (slime coat replacement) = \$290

Two 5-gallon containers @ \$145 each

No-Foam De-Foamer = \$210

6 gallons @ \$35/gallon

Weed killer (2,4-D and Roundup) = \$3,200

2,4-D 40 quarts of concentrate @ \$35 each

Roundup 10 gallons concentrate @ \$180 each

Aquashade (water colorant) = \$3,000

50 gallons @ \$60 per gallon

Dimilin 25W (for anchor worm control) = \$5,000

Twenty 5 lb boxes @ \$250 per 5 lb box

Chemicals and Fertilizer Subtotal 28,805 962

Hatchery Supplies and Equipment Repair and Replacement

Exact use of the money in this line item will vary from year to year depending on specific equipment repair, replacement, or upgrade needs in a particular year. Funds for a "typical" field season for one study would likely include the following:

Egg hatching jars – Model J30 = \$455		
5 @ \$85/each		
24-hr belt feeder = \$2,700		
Repair/replace 10 annually @ \$270 each		
Waders = \$225		
Replace 3 pair annually @ \$75 each		
Duraframe dip nets = \$1,500		
Replace 5 annually @ \$300 each		
Digital scale repair, replace battery, recalibration = \$1,500		
(3 scales per year @ \$500 per service per scale)		
YSI brand water chemistry meters = \$2,000		
(dissolved oxygen, pH, salinity) – repair, replace, recalibrate annually		
HVAC service = \$1,200		
Done annually		
Service fish food cooler refrigeration unit = \$750		
Done annually		
Service the backup generator = \$700		
Done annually		
Pump & motor maintenance/service = \$5,700		
Labor & parts to rebuild:		
One portable water pump/year = \$1,700		
One hatchery motor/pump set/year = \$4,000		
Fluorescent hatchery lights = \$2,200		
Replace ½ of all hatchery lights annually		
Tank Cleaning Supplies = \$235		
Scotch-Brite pads, scrubbing handles		
Maintenance tool replacement = \$400		
Screwdrivers, crescent wrenches, monkey wrenches, vise grips, hammers, rubber mallets, ratchets & sockets, drills & drill bits, chop saw blades		
Plumbing supplies = \$2,000		
PVC pipe, couplers, primer & glue		
Refill compressed oxygen bottles = \$2,500		
50 per year @ \$50 each		
Air stones, tubing couplers, hose clamps = \$1,500		
0.4” air stones – 20 @ \$50 each = \$1,000		
Tubing, couplers, hose clamps = \$500		
Screens and pond boards = \$3,700		
10 screens @ \$300/screen		
PVC lumber for making screen frames		
Metal mesh for making screens		
Redwood pond boards		
100 boards (2” X 8” X 6’) @ \$7 each = \$700		
Koch rings = \$500		
For aerating water in packed columns		
Sand = \$2,000		
For sand filters - 1 pallet = twenty 80 lb bags		
	Hatchery Supplies Subtotal	
		31,765
		1,061

Office Supplies

Staples, copier paper, pencils/pens, paperclips,
note pads, cleaning supplies, toilet paper, paper
towels, etc.

Office Supplies Subtotal 1,500 50

Vehicles (maintenance & repair) and fuel

Vehicles: GSA-lease rate (@ \$365/month lease = \$12.17 per
day based on 30 days in an "average" month + \$0.33/mile)

Hatchery pickup truck = \$9,803

24-Road Hatchery Building to Horsethief Canyon Native
Fish Facility ponds (45 mile round trip X 1 vehicle X
365 days per year = 16,425 total miles per year)

Fuel

Diesel fuel = \$350

For Kubota tractor – one 55-gallon drum of diesel @
\$250 (includes fuel, barrel & delivery)

For back-up generator at hatchery – 25 gallons @
\$4.00/gallon

Repair/replace shocks, struts, brakes = \$800

Vehicles and Fuel Subtotal 10,953 366

Electricity = \$6,800

For pump and spawning shed at the Horsethief State
Wildlife Area brood ponds

8 months operation at \$850/month

Electricity Subtotal 6,800 227

Operations Subtotal 153,223 5,118

Subtotal for All Shared Costs 528,762 17,661

Costs Unique to SJRBRIP (Harvest, PIT-Tagging & Stocking Costs)**Personnel/Labor Costs (Federal Salary + Benefits)****SJRBRIP
Cost****Pond Harvest, PIT-Tagging, Stocking and Database Management**

Principal Biologist (GS-11) – 80 hours @ \$56.27/hr 4,502

(2 days X 2 people/day for fish harvest)

(6 days X 1 person/day for PIT-tagging)

Biological Technician (GS-7) – 136 hours @ \$35.75/hr 4,862

(2 days for fish harvest)

(6 days for PIT-tagging)

(5 days for database and records management)

(2 stocking trips X 2 days each X 1 person)

Biological Technician (GS-5) – 320 hours @ \$26.48/hr 8,474

(2 days X 3 people/day for fish harvest)

(6 days X 5 people/day for PIT-tagging)

(2 stocking trips X 2 days each X 1 person)

Subtotal 17,838

Lodging and Per Diem (Based on Published FY-2017 GSA Per Diem Rates)

Lodging		
2 nights lodging in Farmington, NM X 2 people at \$91.00/night =		364
Per Diem		
4 days hotel rate (Farmington, NM) X 2 people at \$51/day =		<u>408</u>
	Subtotal	772

Fuel

Stocking truck (gets 8 miles per gallon) X 2 trips from Grand Junction, CO to Farmington, NM (660 miles round trip) X 2 trips (= 1,320 total miles) = 170 gallons of gas at \$4.00/gallon		678
Water pump for tempering fish = 20 gallons gas at \$4.00/gallon		<u>80</u>
	Subtotal	758

Subtotal for Costs Unique to SJRBRIP 19,368

Total of All Costs Incurred by SJRBRIP:

USFWS-CRFP (Grand Junction, CO) Total	37,029
USFWS Region 6 Administrative Overhead (3.00%)	<u>1,111</u>
USFWS Region 6 Total	38,140

Cost/Fish Comparison:

Workplan total cost in FY-2018 = \$38,140

Estimated production in FY-2018 = 2,000-4,000 fish

For 2,000 Razorback Sucker produced, the cost/fish = \$19.07

For 3,000 Razorback Sucker produced, the cost/fish = \$12.71

For 4,000 Razorback Sucker produced, the cost/fish = \$ 9.54