

**Rearing Endangered Fish at the
Horsethief Canyon Native Fish Facility Ponds
for Stocking into the San Juan River
Draft Fiscal Year FY 2020 Project Proposal
Updated: 27 March 2019**

Principal Investigators:

Dale Ryden, Thad Bingham and Brian Scheer
U. S. Fish and Wildlife Service
Ouray National Fish Hatchery – Grand Valley Unit
445 West Gunnison Avenue, Suite 140
Grand Junction, Colorado 81501
(970) 628-7200
dale_ryden@fws.gov

Current Contract or Agreement number(s):
R17PG00084 for USFWS – Grand Junction, CO

Reporting Dates: 10/1/2019 through 9/30/2020

**Rearing Endangered Fish at the Horsethief Canyon Native
Fish Facility Ponds for Stocking into the San Juan River
Fiscal Year 2020 Project Proposal
27 March 2019**

Principal Investigator: Dale Ryden, Thad Bingham & Brian Scheer
U. S. Fish and Wildlife Service
Ouray National Fish Hatchery – Grand Valley Unit
445 West Gunnison Avenue, Suite 140
Grand Junction, Colorado 81501
(970) 628-7200
dale_ryden@fws.gov

Introduction

Along with the workplan entitled, “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 (usually in late January or early February). 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 at least 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 and scanned for a PIT tag (a subset are also weighed). 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 knuckle 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 (O&M) 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 (AIS) 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 transport and stocking. Following QA/QC of the data, this file is submitted to the SJRBRIP and the NMFWCO by December 31, 2019. The SJRBRIP has eliminated stocking any Razorback Sucker that are < 300 mm TL. However, the SJRBRIP is actually getting age-1 fish (i.e., after 2 full growing seasons) from HCNFF that are meeting the Upper Colorado River Basin's minimum size requirements of ≥ 350 mm TL. The stocking size of most Razorback Sucker sent to the San Juan River from HCNFF is considerably larger than the minimum 300 mm TL target.

It is anticipated that 2,000-4,000 Razorback Sucker (all ≥ 300 mm TL) can be reared annually 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. In addition, stocking numbers will be provide to the NMFWCO for inclusion of augmentation annual report.

In fall 2018, a total of 4,812 Razorback Sucker from the HCNFF were stocked into the San Juan River. Their mean total length at stocking was 337 mm. There have now been six years (representing the fall 2013-2018 stockings) during which Razorback Sucker stocked from the HCNFF have been available for recapture during the annual fall Sub-Adult and Adult Large-Bodied Fish Community Monitoring ("Adult Monitoring") study. During the fall 2017 Adult Monitoring study, Razorback Sucker from HCNFF accounted for 47% of all Razorback Sucker collected (the Adult Monitoring study was not performed in fall 2018).

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 obtaining 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 ½ year that the HCNFF ponds operate) = \$50
- \$50 (the ½ 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-2020 Budget:

(Based on an anticipated FY-2020 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 @ \$53.84/hr X 2 people (approx. 130 total hours covered by SJRBRIP or approx. 65 hr/person)	211,053	7,049
Biological Technician (GS-7) – 1,960 hours @ \$32.46/hr (approx. 65 total hours covered by SJRBRIP)	63,622	2,125
Biological Technicians (GS-5) – 1,960 hours @ \$23.40/hr (approx. 65 total hours covered by SJRBRIP)	45,864	1,531
Overtime:		
Biological Technician (GS-7) – 120 hours overtime @ \$48.69/hr (approx. 4 total hours of overtime hours covered by SJRBRIP)	5,843	195
Biological Technician (GS-5) – 120 hours @ \$35.10/hr (approx. 4 total hours of overtime covered by SJRBRIP)	4,212	140
Subtotal	330,594	11,040

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

Project Leader (GS-14) – 320 hours @ \$82.57/hr (approx. 10.7 total hours covered by SJRBRIP)	26,422	882
Administrative Officer (GS-9) – 320 hours @ \$42.98/hr (approx. 10.7 total hours covered by SJRBRIP)	13,754	459
Subtotal	40,176	1,341

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

Fish Food (based on a quote from Rangen, Inc., dated 8 March 2018)

Actual costs = 4 orders of fish food per year (1 order per fiscal quarter) at \$19,620 each = \$78,480. The line items below represent four total orders to be placed in 2020. 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.

Rangen # 0 Starter:	1,000 lbs @ \$1.28 per lb = \$ 1,280	
Rangen # 1 Starter:	2,000 lbs @ \$1.28 per lb = \$ 2,560	
Rangen # 2 Starter:	3,000 lbs @ \$1.28 per lb = \$ 3,840	
Razorback Diet (1.2 mm):	8,000 lbs @ \$1.11 per lb = \$ 8,880	
Razorback Diet (2.0 mm):	16,000 lbs @ \$1.02 per lb = \$16,320	
Razorback Diet (3.0 mm):	48,000 lbs @ \$0.95 per lb = <u>\$45,600</u>	
Fish Food Subtotal	\$78,480	2,621

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 = \$425

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 31,735 1,060

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 (based on FY-2018 4X4 category
56R @ \$365/month lease = \$12.17 per day based on 30
days in an "average" month + \$0.42/mile)

Hatchery pickup truck = \$11,279

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 12,429 415

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 159,749 5,335

Subtotal for All Shared Costs 530,519 17,716

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 @ \$53.84/hr 4,307

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

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

Biological Technician (GS-7) – 136 hours @ \$32.46/hr 4,415

(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 @ \$23.40/hr 7,488

(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 16,210

Lodging and Per Diem (Based on Published FY-2019 GSA Per Diem Rates)

Lodging
 5 nights lodging in Cortez, CO X 2 people at
 \$115.00/night = 1,150

Per Diem
 10 days hotel rate (Cortez, CO X 2 people at
 \$59/day = 1,180

Subtotal 2,330

Fuel

Stocking truck (gets ~8 miles per gallon) from
 Grand Junction, CO to Farmington, NM (660
 miles round trip X 5 trips = 3,300 total miles)
 = 413 gallons of gas at \$4.00/gallon 1,652

Water pump for tempering fish (4 gallons X 5 trips)
 = 20 gallons gas at \$4.00/gallon 80

Subtotal 1,732

Subtotal for Costs Unique to SJRBRIP 20,272

Total of All Costs Incurred by SJRBRIP:

USFWS-CRFP (Grand Junction, CO) Total 37,988

USFWS Region 6 Administrative Overhead (3.00%) 1,140

USFWS Region 6 Total 39,128

Cost/Fish Comparison:

Workplan total cost in FY-2020 = \$39,128

Estimated production in FY-2020 = 2,000-4,000 fish

For 2,000 Razorback Sucker produced, the cost/fish = \$19.56

For 3,000 Razorback Sucker produced, the cost/fish = \$13.04

For 4,000 Razorback Sucker produced, the cost/fish = \$ 9.78