

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2023 ANNUAL REPORT

PROJECT: 29B

Project Title

Operation and Maintenance of Ouray National Fish Hatchery - Randlett Unit

Bureau of Reclamation Agreement Number:

N/A

Project/Grant Period:

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Reporting period end date: 09/30/2023

Is this the final report? Yes No

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Abstract:

Ouray National Fish Hatchery (Randlett Unit; ONFH-R) is located on the Ouray National Wildlife Refuge (ONWR) 35 miles southwest of Vernal, Utah. ONFH-R is a warm/cool water hatchery established in 1996 as a fish production, refugia and technology development facility to assist the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) in the recovery of razorback sucker (RZ), Colorado pikeminnow (CPM), bonytail (BT), and humpback chub (HB). Hatchery infrastructure includes both a large indoor recirculating aquaculture system and an extensive outdoor pond system supplied with water from a nearby well system. Stocking goals established by the Recovery Program include the annual production and distribution of 6,000 RZ averaging 350 mm total length (TL) and 10,000 BT averaging 250 mm TL into the middle and lower Green River in Utah. In FY 2023, ONFH-R met stocking goals with 7,920 RZ and 10,280 BT released into the Upper Green River Basin. ONFH-R assisted with the collection of CPM for broodstock development. The hatchery will continue to maintain HB as a source of future broodstock.

Study Schedule:

1996-Ongoing

Relationship to RIPRAP:

General Recovery Program Support Action Plan

- IV. Manage genetic integrity and augment or restore populations.
- IV.A. Genetic CPM management.
- IV.A.4 Secure and manage genetic stocks in refugia.
- IV.A.4.a. Razorback sucker
- IV.A.4.b. Bonytail
- IV.A.4.c. Humpback chub
- IV.A.4.d. Colorado pikeminnow

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- IV.B Conduct annual fish propagation activities.
- IV.B.2. Implement revised integrated stocking plan (Integrated Stocking Plan Revision Committee 2015); supersedes all earlier stocking plans, including species-specific and individual basin plans.
- IV.C Operate and maintain facilities.
- IV.C.1. ONFH-R Unit

Green River Action Plan: Main Stem.

- IV.A. Augment or restore populations as needed.
- IV.A.1. Implement plan.

Accomplishment of FY 2023 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Razorback Sucker

Ouray National Fish Hatchery (ONFH-R) met stocking goals during 2023 for razorback (RZ; *Xyrauchen texanus*) stocking 8,938. RZ averaged 337 mm, weighed 392 g, and had a K Condition Factor (KCF) of 1.024. A KCF above 1.0 usually indicates a better conditioned fish (more mass per length), however, the relationship has not been validated for RZ. Fish distribution during 2023 resulted in 1,496 RZ stocked in the Green River at the Ouray National Wildlife Refuge, 1,455 RZ stocked in the Green River at Rainbow Park, 1,995 RZ stocked in the Green River at Red Wash, 1,527 RZ stocked in the Green River at Green River State Park, 1,447 RZ stocked in the White River at the Bonanza Bridge, and 1,018 RZ stocked in the Green River, Utah at the Tusher Diversion as part of the Colorado State University Green River Canal Study (Table 1). Health Condition Profiles (HCP) were conducted on 20 fish revealing a sex ratio of 5% females and 95% unknown sex. HCP also revealed a mesentery fat of 3.75 (mesentery fat is scored on a 0-4 scale, 0 representing no mesentery fat, and > 3 being optimal to assist in increased survival post stocking) and 100% PIT-tag retention post 12 days. No Asian Tapeworms (*Taenis asiatica*) were found during the HCP process.

RZ were not spawned in 2023 due to high fish numbers on station in the spring of 2023.

RZ daily monitoring in ponds or in the hatchery building consist of water temperatures and dissolved oxygen checks, feeding, cleaning, and water adjustments as needed.

Bonytail

Ouray National Fish Hatchery (ONFH-R) met stocking goals during 2023 for bonytail (BT; *Gila elegans*) stocking 10,280. BT averaged 298 mm, weighed 312 g, and had a K Condition Factor (KCF) of 1.179. A KCF above 1.0 usually indicates a better conditioned fish (more mass per length), however, the relationship has not been validated for BT. Fish distribution during 2023 resulted in 2,497 BT stocked in the Green River at the Steward Lake outlet, 2,488 stocked in the Green River at Walker Hollow, 1,874 stocked into Johnson Bottom Wetland, 2,477 stocked in the Green River at the Pariette Wetland outlet, 625 stocked into Stirrup Wetland, and 319 stocked into Stewart Lake (Table 1). HCP were conducted on 20 fish revealing a sex ratio of 50% males to 50% females. HCP also revealed a mesentery fat of 3.4 (mesentery fat is scored on a 0-4 scale, > 3 being optimal to assist in increased survival post stocking) and 100% PIT-tag retention post 70 days. No Asian Tapeworms (*Taenis asiatica*) were found during the HCP process.

ONFH-R did not request BT swim-up fry from the Southwestern Native Aquatic Resources and Recovery Center (SNARRC; Dexter, NM) in 2023 due to high fish numbers on station in the spring of 2023.

BT daily monitoring in ponds or in the hatchery building consist of temperatures and dissolved oxygen checks, feeding, cleaning, and water adjustments as needed.

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Colorado Pikeminnow

During the fall of 2022 and the fall of 2023, hatchery staff at the ONFH-R cooperated with the Green River Basin FWCO, Recovery Program Director's Office, and SNARRC to assist in collection of YOY Colorado pikeminnow (CPM; *Ptychocheilus lucius*) for development of broodstock. On January 24th, 2023, ONFH-R transferred 82 wild caught CPM collected during the fall of 2022 to SNARRC. In addition to the fall of 2022 efforts, the Green River Basin FWCO collected one CPM and transferred it to the ONFH-R for interim holding during the fall of 2023. The one CPM was transferred to SNARRC on October 3rd, 2023 (Table 1).

In addition to the wild CPM, ONFH-R has been holding CPM propagated and transferred from SNARRC in 2021. Approximately 5,000 were sent to ONFH-R for chemical exposure studies conducted under Matt Fry's supervision, though current staff cannot find background information or results for that work. On April 25th, 2023, ONFH-R transferred the remaining 850 fingerlings to the Lower Colorado River Basin, Willow Beach National Fish Hatchery located at 25808 North Willow Beach Road, Willow Beach, AZ 86445. Mean size of the transferred CPM was 217 mm TL and 72.90 g (Table 1).

As of Summer 2023, ONFH-R has no CPM on station.

Humpback Chub

Nine adult humpback chubs (HB; *Gila cypha*) collected from Desolation Canyon in 2009 remain in our indoor facility. In addition, the Utah Division of Wildlife Resources collected wild HB in the fall of 2022 from Desolation Canyon and transferred them to ONFH-R to increase genetic diversity for a potential future brood lot source. A total of 32 HB remain on station as of fall 2023. These HB averaged 300 mm TL and 234 g and are being held in an 8' culture tank inside the hatchery building. HB are being held on well water and fed every other day.

HB daily monitoring in the hatchery building consists of temperature and dissolved oxygen checks, feeding, cleaning, and water adjustments as needed.

Education and Public Outreach Activities

ONFH-R continues to provide tours to the public and local schools. ONFH-R also provides fish for school aquariums throughout the Uintah Basin.

ONFH-R Hatchery Manager assisted the Recovery Program at the Colorado River Water Users Conference in Las Vegas, Nevada and the Utah Water Users Conference in St. George, Utah during the FY2023 period. ONFH-R Manager provided live fish for the displays and considerable educational outreach opportunities to visit with attendees at the conferences on the Recovery Program.

Facility Maintenance and Construction

ONFH-R, the Recovery Program, and FWS regional leadership formed a workgroup in FY23 to holistically improve functioning of the Randlett unit by leveraging expertise from other hatcheries. The group focuses on both facility upgrades and updated rearing procedures. The workgroup, as well as in-person visits to ONFH-R and other facilities, have enabled greater progress, and broadened the vision of what's possible at ONFH-R.

- LED lighting continues to reduce electrical consumption as well as reducing stress on the fish.
- One set of BIRM filter pods were cleaned and repaired. The second set of BIRM filter pods will be cleaned and repaired during the summer of 2024.
- All wells were jetted and cleaned in FY2022 by the U.S. Bureau of Reclamation (BOR) and increasing flow by 200 gpm. These will need to be cleaned again in the spring of 2024. The well field was cleaned, mowed, and evaluated for upcoming needs.

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- All water lines running in filtration building were jetted and cleaned of iron and manganese buildup. Along with the lines being jetted, the main sump was cleaned and one of the main turbine sump pumps/motors was rebuilt. ONFH-R also cleaned and rebuilt the degassing tower in the filtration building. The filtration building was thoroughly cleaned and is in good working order.
- ONFH-R had two B Ponds down for many years with torn pond liners. These two ponds have been repaired and will be used for production in 2024.
- ONFH-R staff removed over 30' of "Dead End Pipes" in the hatchery building aquaculture recirculation system, along with creating access holes in all drain lines that allow for line jetting and cleaning on a regular basis.
- ONFH-R is currently working on equipment that is outdated in many aspects and needs to be repaired or replaced (pumps, pond electrical, several pond liners, pond concrete structures, BIRM filler media, alarm system, lighting, flow meters, hatchery building heaters, heavy equipment, etc). Hatchery staff has made some great progress and will continue to spend many hours repairing and updating equipment.
- ONFH-R is working with FWS leadership and using BIL funding to design a new water supply source. The preferred option is surface river water to create a flow-through system in both the ponds and hatchery building. Wells and/or an infiltration gallery may be pursued later as an additional source. The surface water option would replace the existing well source that is laden with heavy metals and energy-consumptive.
- ONFH-R has been working with BOR and using BIL funding to install a new raceway system to support hatchery operations. The BOR is doing the engineering and will have the final plans available by spring 2024. The dual-raceway system will be used as an intermittent holding location between the ponds and hatchery building. The raceway would be used for treatments, sorting, and sampling before fish entering the hatchery building. This would decrease the risk of infecting the building with parasites/diseases and adding organic load to the filters.
- ONFH-R has been working with BOR and using BIL funding to install a new effluent settling basin. The BOR is doing the engineering and will have final plans available by spring 2024. The current ditch system is inadequate to handle the flow from the hatchery and ponds, increasing the risk of AIS and nuisance animal species from entering the facility. The current system does not allow the refuge to direct water for their needs.
- ONFH-R received BIL funding for temperature control and options are being investigated. Temperatures are driven by well water at about 12°C year-round and is significantly below what is needed for optimal growth of warm or even some cool-water species. Currently, the only means to adjust water temperature for Ouray NFH's indoor aquaculture facility is to adjust ambient air temperature. This is inefficient, energy costly, and limited in its ability to adjust water temperature, thus reducing culture options.
- ONFH-R is working with FWS engineering and using BIL funding to construct fencing for biosecurity around the ponds. FWS has completed the design and we are working on sending it out for bid. The current fencing is inadequate to exclude predatory animals and the AIS they transport.
- ONFH-R received funding for the Isolation Room Rebuild from the Deferred Maintenance Account and is in the beginning stages of assignment and signatures. FWS is provided design expertise and engineering should begin by the end of 2023.

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- Additional Project Needs:
 - The current UV system is outdated and undersized, leaving holdings vulnerable to disease. Staff have been working on evaluation of designs and assessing cost for a replacement. Replace UV system as soon as is feasible. The UV system was cleaned, UV bulbs were replaced, and put back into operation until funding is available for replacement.
 - New Backup Alarm System: The current alarm system is outdated and inadequate to monitor hatchery operations and fish health after normal working hours. The old alarm system needs to be replaced.
 - New Pond Screens: Our outdoor ponds are designed to have three screens on the outflow kettle structure. The current screens available on site at the ONFH-R are inadequate and current available screens are in poor condition. New pond screens are needed to support production in the outdoor ponds.
 - New Oxygen Generator: Our current Oxygen Generator is old and inadequate for the needs of the facility. A new one to support the facility is needed.
 - Collapsed Pond Drain Junction: The current pond system has a junction box between A rows and B rows of ponds. All the ponds drain through this junction and over time, it has started collapsing. We are working with Kristopher Johnson on the repairs.
 - Bird protection netting over the 0.2 ac ponds should be replaced in the next few years. Ouray has obtained a Federal Migratory Bird Permit to assist with predation.

Challenges

Spring of 2023, ONFH-R lost 4,796 RZ fingerlings to winter kill, and bird predation. ONFH-R has acquired a Federal Migratory Bird Permit to decrease bird predation.

Spring of 2023, ONFH-R lost 13,755 BT fingerlings to winter kill, bird predation, and a Saprolegnia fungi outbreak. ONFH-R has acquired a Federal Migratory Bird Permit to decrease bird predation.

In April 2023, ONFH-R had a system wide Ichthyobodosis (*Ichthyobdo necator*) outbreak inside the hatchery building. Fish were treated with salt at .4% solution for two weeks. Hatchery staff worked closely with the USFWS, Bozeman Fish Health Center located in Bozeman, Montana. Quick action resulted in less than 75 mortalities.

In August 2023, ONFH-R had a system wide Branchiomyces (*Branchiomyces sanguinis*) infection in the outdoor ponds. Branchiomyces is also known as Gill Rot. Badly infected ponds were harvested and moved inside the hatchery building to administer salt treatments. Fish were treated with salt at .4% solution for three weeks. Hatchery staff worked closely with the USFWS, Bozeman Fish Health Center located in Bozeman, Montana. Quick action resulted in less than 500 mortalities.

In September 2023, ONFH-R had a system wide Columnaris (*Flexibacter columnaris*) infection in the hatchery building. Fish were treated with a bacteriostatic antibiotic known as Florfenicol. Hatchery staff worked closely with the USFWS, Bozeman Fish Health Center located in Bozeman, Montana. Quick action resulted in less than 150 mortalities.

Additional Information

Avian, salamander, and mammal control at ONFH-R did occur during FY 2023 to help decrease predation and disease transfer to fish species in ponds and in the hatchery building. With the reduced depredation, more

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efficient production strategies can be employed. ONFH-R works with the Utah Division of Wildlife Resources in relocating any live trapped animals.

Also, during the spring of 2023, ONFH-R staff noticed many fathead minnows (*Pimephales promelas*) in the BIRM filters backwash settling pond. These fish moved up the drain lines, from the refuge wetlands, and established a thriving population in the settling pond. Hatchery staff worked quickly and in conjunction with USGS employee David Ward and euthanized the entire pond. As of fall 2023, no fathead minnows were observed in the settling pond. ONFH-R staff will keep a close eye on the settling pond in case of reestablishment. This settling pond drain is directly connected to the filtration building, hatchery building, and hatchery ponds.

Recommendations (order is not by priority):

Primary recommendations for ONFH-R include the following:

Administration

- Maintain the current staffing level of four full time employees that assist in facilitating safe conditions for employees and fish holdings.
 - Current permanent staffing level is in place to meet workload. Borrowing of staff from other stations on occasion is still needed to safely accomplish certain tasks (PIT-tagging, pond harvesting, and big construction projects). In addition, any plans to increase production of native fishes (more species and/or fish) for the Recovery Program would require an adequate amount of staffing. Recent support from the Recovery Program for a temporary position is making a positive impact on staffing levels. The future direction of this support is unknown currently.
- Provide Modicum Housing for ONFH-R Employees
 - Ouray is one of a minority of remote hatcheries that does not offer some manner of temporary or permanent housing. This lack of housing makes it more difficult to recruit and retain permanent and temporary employees. In addition, the lack of nearby employees reduces response times to alarms/emergencies at the hatchery and facility oversight.

Propagation

- ONFH-F has been asked by the Recovery Program to “Take a New Look” at BT production, evaluating new production methods to improve fitness and survivability. We will be evaluating both species propagation and stocking schedules as we continue to improve rearing methodologies.
- Monitor and evaluate fecundity and egg viability of aging broodfish at ONFH-R.
- ONFH-R manager will participate in the newly developed Recovery Program Propagation Workgroup to discuss production methods, stocking, and coordinate between other hatcheries participating in the recovery of Colorado Fishes.

Stocking

- Continue coordinating, revising, and evaluating stocking efforts with the Recovery Program and the Propagation Workgroup.
- Continue the practice of blending receiving water into hauling water for pre-stocking acclimation.
- Discuss stocking schedules that consider current data analyses on survival, release strategies and techniques.

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- Consider stocking various life stages of BT and RZ in nearby floodplain wetlands to continue evaluation of wetland areas for rearing of native species. Space and resources for rearing of entrained wild native fishes should be given priority.

Project Status: Ongoing

FY 2023 Budget Status

Funds Provided: \$590,718

Funds Expended: \$590,718

Difference: \$0

Percent of the FY 2023 work completed, and projected costs to complete: 100%

Recovery Program funds spent for publication charges: \$0

Status of Data Submission

Passive integrated transponder (PIT) tag data has been submitted to Program Directors Office.

Signed:

Zane C. Olsen, Principal Investigator

11/20/2023

Tables:

Table 1. Stocking and Transfer events for RZ, BT, and CPM from ONFH-R Unit, Spring/Fall 2023.

Stocking Date	Species	Stocking/Transfer Location	# of Fish Stocked	Avg. Length (mm)
01/24/2023	CPM	SNARRC	82	77
04/25/2023	CPM	Willow Beach NFH	850	217
10/03/2023	CPM	SNARRC	1	65
04/26/2023	BT	Stewart Lake	319	298
05/11/2023	BT	Johnson Bottom	1,874	298
05/15/2023	BT	Green River, Stewart Lake Outlet	2,497	298
05/16/2023	BT	Green River, Walker Hollow	2,488	298
05/17/2023	BT	Stirrup	625	298
05/19/2023	BT	Green River, Pariette Wetland Outlet	2,477	298
10/25/2022 to 04/26/2023	RZ	Green River, Tusher Diversion	1,018	344
09/18/2023	RZ	Green River, Green River State Park	1,527	337
09/19/2023	RZ	Green River, Red Wash	1,995	337
09/19/2023	RZ	White River, Bonanza Bridge	1,447	337
09/20/2023	RZ	Green River, Rainbow Park	1,455	337
09/21/2023	RZ	Green River, Ouray NWR	1,496	337

Table 2. ONFH-Randlett Unit fish holdings as of November 2023.

Lot I.D.	Species	Number of Fish	Mean TL (mm)	Mean Weight (g)
210515CBBT-Dexter-01	BT	2,532	285	232
220511CBBT-Dexter-01	BT	7,593	246	136
220513RZBS-ONFHR-01	RZ	6,479	293	279
Brood-RZBS (11, 13, 17)	RZ	763	499	1,419

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RZBS Brood - 2010 & Older	RZ	189	558	1,962
Brood-RZBS (18, 19)	RZ	279	429	800
Brood-RZBS-22	RZ	123	184	77
CBHB-Refuge Brood	HB	32	300	234