

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022 ANNUAL REPORT

PROJECT: 129

Project Title

Humpback chub monitoring and broodstock collections in Desolation/Gray Canyons, Green River, Utah

Bureau of Reclamation Agreement Number:

R19AP00059

Project/Grant Period:

Start date: 10/01/2019

End date: 09/30/2024

Reporting period end date: 09/30/2022

Is this the final report? Yes _____ No X

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Abstract:

Recent plans to conserve Desolation-Gray humpback chub *Gila cypha* (HBC) genetics and re-introduce the species into Dinosaur National Monument require collection of wild individuals to establish captive broodstock. In 2022, Utah Division of Wildlife Resources (UDWR) conducted three collections trips to collect wild HBC from the Desolation-Gray population. A total of 25 adult HBC were transferred to the Ouray National Fish Hatchery at Randlett, Utah. Three mortalities occurred during the project, one in the field prior to transport and two in the hatchery after transport, for a final survival rate of 88%.

Study Schedule:

2019-Ongoing

Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

IV.A.4.c.5 Secure and manage humpback chub in hatcheries according to the Genetic Management Plan: Desolation & Gray Canyons population

Accomplishment of FY 2022 Tasks and Deliverables, Discussion of Initial Findings, and Shortcomings:

Task 2: Collect wild humpback chub for hatchery broodstock.

Methods

Three 6-day float trips were conducted for the purpose of HBC broodstock collection in Desolation and Gray Canyons on September 14-29, September 28-October 3, and October 12-17, 2022. In the interest of minimizing duration of fish captivity in a field setting, individuals collected from Desolation Canyon

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(RMI 216-157) were transported directly to Ouray NFH by helicopter, while fish collected in Gray Canyon (RMI 137-132) were transported downstream via motorized raft to a waiting hatchery truck at Swasey's boat ramp near Green River, UT (RMI 132). Thus, only two collection sites were chosen for each trip—one each in Desolation and Gray Canyons, and each site was sampled for two days.

Sites chosen for collection during each trip were determined by a combination of 1) logistical constraints related to transport (e.g., proximity to helicopter landing zones or takeout), and 2) likelihood of capture success based on catch rates observed during past monitoring. The first and third trips collected fish at long-term monitoring sites “Cow Swim” (RMI 160.3-159.6) and “Coal Creek” (146-145.5), while the second trip collected at long-term sites “Wild Horse” (178.8-178.5) and “Curry” (148-147.5).

Similar to sampling for population abundance estimation in this reach, a combination of trammel nets and baited hoop nets were deployed at each site. However, due to higher than optimal water temperatures for entanglement gear and the anticipation of greater cumulative stress imposed on fish by extended captivity and transport, use of trammel nets was limited. Specifically, nets were only deployed when water temps fell below 20 degrees Celsius, and the duration of sets was kept under the typical 2-hour rotation—generally 90 minutes or less. Handling of HBC was also kept to a minimum in the interest of minimizing stress—HBC were neither measured, weighed, nor tagged after visual identification, except when the decision was made to release them (see “Additional noteworthy observations” for an example).

Fish awaiting transport were kept in-river via hoop nets converted to live wells. Just before transit to the landing zone or boat ramp, fish were transferred into 7-gallon live wells fitted with aerators and filled with fresh river water treated to a 0.3% NaCl concentration. A small quantity (small handful) of chunk ice was added to slowly lower the water temperature during transport to mitigate stress. No fish mortalities occurred during transit.

Results

- A total of 25 HBC were transferred to Ouray NFH. Details of trip and capture locations are contained in Table 1. As of reporting, 23 of 25 remain alive at the hatchery.
- One adult HBC mortality was observed among captive fish in the field. The fish died while in a hoop net livewell in the river during the first trip when water temperatures warmest.
- Two additional mortalities were recorded in a hatchery setting. One of these showed clear signs of trammel net damage and was collected during the first sampling trip.

Additional noteworthy observations:

- Baited hoop nets have proven an effective method for capturing juvenile *Gila* in previous years (e.g. 2018) and other Upper Basin populations. Despite extensive use of hoop nets, no juvenile *Gila* were captured in this effort.
- The final helicopter flight was cancelled due to only one HBC being captured at Cow Swim during the third trip. The fish was measured, weighed, tagged and released before the crew proceeded to the Gray Canyon site at Coal Creek.

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Recommendations:

- In retrospect, trip itineraries were somewhat ambitious, and transit between sampling sites was difficult to accomplish on schedule. At minimum, future trips should add a day or two if hoping to accomplish the same duration of sampling.
- Consider adapting sampling regime to avoid trammel netting when water temperatures are near or above 20 degrees Celsius. Based on recent sampling, water temperatures seem likely to remain unsuitably high for use of trammel nets during September and early October. These high water temperatures increase the likelihood of post-capture mortality for fish captured in trammel nets. To avoid loss of potential broodstock and unnecessary mortalities during monitoring, changes to timing and/or sampling methods should be developed prior to FY2023 work.
- Consider whether collection goals can be met in a reasonable time-frame at the pace achieved during the 2022 effort. High logistical complexity, and cost-per-individual characterized this year's collection effort, yet numbers of HBC collected fell well short of the 100-fish annual target identified in Valdez et al. (2021). Moreover, these individuals were all mature fish and therefore less likely than juveniles or subadults to survive in captivity until broodstock goals are met. Targeting younger fish may reduce impacts to the wild population, and offer novel opportunities for collection (e.g. 43 juvenile *Gila spp.* captured during Project C29a/130 during 2016), but with perhaps "hit-or-miss" results based on variation in annual recruitment success.
- Also worthy of further consideration are the potential negative impacts of broodstock collection goals. Humpback chub in Desolation and Gray Canyons occur in disjunct aggregations and individuals exhibit high site fidelity. The extent to which spawning occurs among individuals from different aggregations is unknown. However, the population viability analysis (PVA) used in developing broodstock collection goals lacks explicit spatial structure. If, contrary to the PVA, these aggregations function as individual populations in a reach-wide metapopulation, the goals under-emphasize the potential risk of extirpating these aggregations via over-exploitation. Such extirpations could put the greater wild population at greater risk, and development of future collection strategies should consider this possible outcome.

Project Status: Ongoing

FY2022 Budget Status

Funds Provided: \$110,000

Funds Expended: \$110,000

Difference: -X-

Percent of the FY 2022 work completed, and projected costs to complete: 100%

Recovery Program funds spent for publication charges: -X-

Status of Data Submission

Data will be uploaded into STReAMS by the end of December 2022.

Signed:

Zach Ahrens

Principal Investigator

18 November 2022

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Table 1.

Humpback chub broodstock collection totals by trip dates and site, 2022.

Trip Dates	# HBC collected by site			
	Cow Swim	Wildhorse	Curry	Coal Creek
September 11-17	7	-	-	7
September 28-October 3	-	3	2	-
October 13-18	0	-	-	6