

**RECOVERY PROGRAM
FY 2020-2021 SCOPE OF WORK for:**

Recovery Program Project Number: 130

Monitoring of humpback chub in Cataract Canyon.

Reclamation Agreement number: R19AP00059
Reclamation Agreement term: Oct. 1, 2019 – Sept. 30, 2024

Note: Recovery Program FY20-21 scopes of work are drafted in May 2019. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other *[explain]*

I. Title of Proposal: Population monitoring of humpback and bonytail chub in Cataract Canyon.

II. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.

COLORADO RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).

- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions
- V.C.3. Cataract Canyon

III. Study Background/Rationale and Hypotheses:

Sampling in Cataract Canyon began in 1979 under the Service’s Colorado River Fishery Project (Valdez et al. 1982), and continued under the U.S. Bureau of Reclamation contracted studies with Bio/West (Valdez 1990). Between 1990 and 2000, sampling conducted intermittently by the Utah Division of Wildlife Resources (UDWR) included annual monitoring of the fish community in Cataract Canyon and was added to the Interagency Standardized Monitoring Program (ISMP) beginning in 1998. The catch rates observed during these studies were highly variable, and the population size could not be determined from these data.

Beginning in 2003, three pass mark/recapture sampling was conducted for three consecutive years. This sampling protocol was used to develop three annual point estimates for adult humpback in the canyon (Badame 2008). The estimates for the Cataract population ranged from 273 - 468 humpbacks within the canyon. Due the small size of the population and probable violations of modeling assumptions, monitoring was reduced to following annual fall catch rate trends. In 2011, funding restrictions reduced sampling to the current biennial monitoring schedule.

Recovery goals for the four upper basin populations of the endangered humpback chub *Gila cypha* include a criterion of “no net loss” in abundance the Cataract Canyon population of the Colorado River in Utah (USFWS 2002). Though few in number relative to other extant humpback chub populations, the Cataract Canyon population exists independent of potentially catastrophic threats to those populations by virtue of its spatial isolation and occurrence in a protected area. Thus, persistence of the Cataract Canyon population is integral to overall species redundancy (USFWS 2017). In the interest of tracking trends in this population to ensure maintenance of this redundancy, we propose continuing biennial monitoring of adult and juvenile humpback chub and other *Gila spp.* in Cataract Canyon.

IV. Study Goals, Objectives, End Product(s):

Goal: Provide measures of humpback chub population dynamics comparable to previous years and other upper basin populations.

Objectives:

1. Complete biennially a single fall sampling pass of four long-term trend sites within Cataract Canyon (2021, 2023).

2. Compare biennial adult and juvenile catch rates, population size structures and longitudinal distributions to past years.

End Products: Annual report summarizing humpback chub and other *Gila spp.* population trends for each year sampling is conducted (2021, 2023).

V. Study Area:

Cataract Canyon is 46 miles in length, spanning from the confluence of the Green and Colorado rivers to the mouth of the Dirty Devil River. Inundation of riverine habitat by Lake Powell is thought to have limited distribution of humpback chub to the uppermost 17 miles of Cataract Canyon. We will continue to sample four long-term trend sites within this 17-mile reach (Figure 1) as identified by previous studies (Valdez 1990):

1. Site 1: “Rapid 2” (RM -4.5 to -5)
2. Site 2: “Rapid 5” (RM -6 to -6.7)
3. Site 3: “Rapid 10” (RM -8.2 to -9.2)
4. Site 4: “Rapid 12” (RM -9.5 to -11)

VI. Study Methods/Approach:

During Fall in odd years (2021, 2023), we will conduct a single sampling trip.

Adult sampling methods

Chart and Lentsch (1999) found that *Gila* 200 mm or greater in total length were better sampled with trammel nets than other methods (e.g., electrofishing) in Westwater Canyon. As a result of their efficacy, trammel nets remain the primary capture method for generating humpback chub population estimates in the upper basin. We will continue to use trammel net catch per unit effort (CPUE) as the primary metric of adult *Gila* abundance in Cataract Canyon. While a single pass cannot provide an estimate of population abundance, we will provide a metric comparable to previous years and other upper basin reaches by deploying identical gear and a similar sampling regime.

At each site, we will deploy multiple trammel nets from approximately 15:00 to 23:00 and 05:00 to 11:00 hours, checking nets every two hours to avoid fish mortality.

Juvenile sampling methods

In contrast to Westwater Canyon, electrofishing in Cataract Canyon has historically yielded relatively few *Gila* captures from any life stage. In 2017 however, concurrent use of scented hoop nets (see Stone 2005) and electrofishing demonstrated a considerable improvement in overall YOY and juvenile *Gila* captures by hoop net relative to

electrofishing (Ahrens 2017). In light of these results, we believe use of scented hoop nets will provide the best metric for tracking reproduction and recruitment.

We will deploy approximately 25 scented hoop nets, checking contents twice daily. To maximize captures, we will include in each net a perforated bait container to broadcast scent and attract fish. We will target low and zero velocity shoreline and eddy habitats frequently used by YOY *Gila*, and also experiment with deeper sets with the goal of increasing adult captures.

Fish processing

We will measure (mm), weigh (g) and scan for a PIT tag all endangered species and roundtail chub *Gila robusta*. We will PIT-tag all individuals greater than or equal to 150 mm in total length (TL) that do not already contain a PIT tag. We will measure, weigh and euthanize black bullhead, walleye, striped bass, and other nonnative piscivores, while enumerating and releasing common and non-piscivorous nonnative fishes (e.g., common carp).

VII. Task Description and Schedule:

Task 1: We will complete one fall sampling trip in Cataract Canyon biennially (2021, 2023). According to the biennial schedule, we will not sample during 2020 or 2022.

Task 2: Data entry, analysis, reporting: we will enter data and transfer to the UCREFRP database manager by January 15 of each year following sampling. We will also provide annual progress report summarizing 1) relative abundances & distributions of endangered species, 2) overall fish community composition and 3) comparisons with past monitoring efforts; to be submitted in November of each year of sampling (November).

Schedule:

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1									X	X		
2										X	X	X

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

	Deliverable(s)	Due Date
FY 2020		
FY 2021	Annual Report	November 2021
FY 2022		
FY 2023	Annual Report	November 2023
FY 2024		

IX. Budget Summary:

	UDWR-Moab
FY 2020	\$ -
FY 2021	\$39,067.92
FY 2022	\$ -
FY 2023	\$40,646.26
FY 2024	\$ -
TOTAL	\$79,714.18

X. Reviewers:

XI. References:

- Badame, P.V. 2008. Population Estimates for Humpback Chub (*Gila cypha*) in Cataract Canyon, Colorado River, Utah, 2003–2005. Final Report to the Colorado River Endangered Fishes Recovery Program. Utah Division of Wildlife Resources, Salt Lake City, UT.
- Bohn, S., and W. Wilson. 2017. Genetic evaluation of Upper Basin Colorado River *Gila cypha* with comparisons to *G. robusta* and *G. elegans*. Southwestern Native Aquatic Resources and Recovery Center, Dexter, New Mexico. Presentation at Upper Colorado River Basin Researchers Meeting, January 11, 2017, Grand Junction, CO.
- Chart, T.E. and L. Lentsch. 1999. Humpback Chub in Westwater Canyon. Final Report to the Colorado River Endangered Fishes Recovery Program. Utah Division of Wildlife Resources, Salt Lake City, UT.
- Hunt TA, Ward DL, Propper CR, Gibb AC. 2012. Effects of capture by trammel net on Colorado River native fishes. *Journal of Fish and Wildlife Management* 3(1):133–141; e1944–687X. doi: 10.3996/122011-JFWM-070
- Stone, Dennis M. 2005. Effect of Baiting on Hoop Net Catch Rates of Endangered Humpback Chub North American *Journal of Fisheries Management* 25:640–645, 2005. doi: 10.1577/M04-091.1
- U.S. Fish and Wildlife Service. 2001. Recovery goals for the humpback chub (*Gila cypha*) of the Colorado River Basin; A supplement and amendment to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Region 6, Denver, CO.
- U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO.

Valdez, R.A., P. Mangan, R. Smith, B. Nilson. 1982. Upper Colorado River investigation (Rifle, Colorado to Lake Powell, Utah). Pages 100–279 in U.S. Fish and Wildlife Service. Colorado River Fishery Project, Final Report, Part 2: Field Investigations. U.S. Fish and Wildlife Service, Salt Lake City, Utah.

Valdez, R.A. 1990. The endangered fish of Cataract Canyon. Bio/West Report No. 134-3 to Bureau of Reclamation, Salt Lake City, UT.

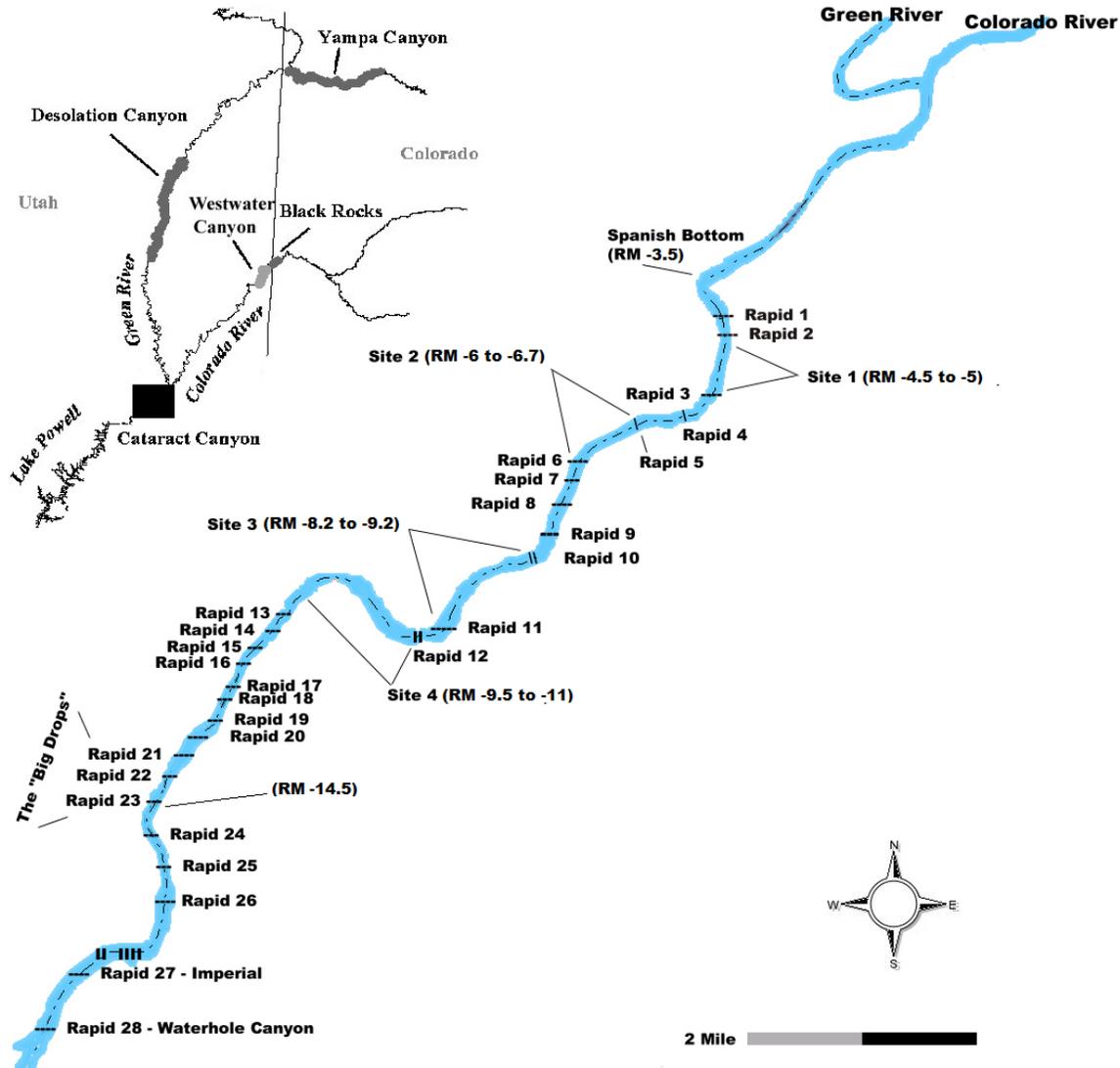


Figure 1. Sampling locations within Cataract Canyon on the Colorado River.