

**RECOVERY PROGRAM  
FY 2016-2017 SCOPE OF WORK for:**

Recovery Program Project Number:   130  

Population monitoring of humpback and bonytail chub in Cataract Canyon

Reclamation Agreement number:   R14AP00007    
Reclamation Agreement term:   05/01/2014-09/30/2018  

Note: Recovery Program FY16-17 scopes of work are drafted in May 2015. 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.

Lead agency: Utah Division of Wildlife Resources

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<u>Category:</u>	<u>Expected Funding Source:</u>
<input checked="" type="checkbox"/> Ongoing project	<input checked="" type="checkbox"/> Annual funds
<input type="checkbox"/> Ongoing-revised project	<input type="checkbox"/> Capital funds
<input type="checkbox"/> Requested new project	<input type="checkbox"/> Other
<input type="checkbox"/> Unsolicited proposal	

I. Title of Proposal: Humpback chub and bonytail monitoring 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:

The Upper Colorado River Endangered Fish Recovery Program (UCRRP) has assisted Region 6 of the U.S. Fish and Wildlife Service (Service) in developing recovery goals for the four Colorado River endangered fishes, including the humpback chub (*Gila cypha*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and bonytail (*Gila elegans*) (USFWS 2001). Achievement of the recovery goals for humpback chub will be determined in part by monitoring the six known self-sustaining populations in the upper and lower Colorado River basins to ensure that each population is stable or increasing. These populations include Black Rocks, Westwater Canyon, Desolation/Gray Canyons, Yampa Canyon, Cataract Canyon, and Grand Canyon. The period of monitoring for downlisting is five years, in which at least three reliable population estimates will be taken for each of the six populations. The period of monitoring for delisting is three years beyond downlisting, in which at least one reliable population estimate will be taken for each of the six populations.

Sampling in Cataract Canyon began in 1979 under the Service's Colorado River Fishery Project (Valdez et al. 1982), and then continued under the U.S. Bureau of Reclamation contracted studies with Bio/West (Valdez 1990). Between 1990 and 2000, sampling was conducted intermittently by the Utah Division of Wildlife Resources (UDWR). Sampling included annual monitoring of the fish community in Cataract Canyon which 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 it was determined that this level of monitoring was not necessary for the Cataract population and that monitoring would return to following annual fall catch rate trends. In 2011 funding restrictions reduced sampling to once every two years. Sampling occurs during odd years; 2017 will be the next year of sampling.

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

Goals: Maintenance of long term catch rate trend data, longitudinal distributions, and population size structures for humpback chub and bonytail within Cataract Canyon.

Objectives:

1. Complete one ten day pass every two years sampling five sites within Cataract Canyon (October 2017).

2. Obtain highest possible rates of capture of humpback and bonytail within concentration habitats and maximize number of individuals marked and captured at each sampling site.
3. Determine annual catch rate trend for chubs and examine population size structure and compare longitudinal distribution to past years.

End Products: Annual reports summarizing humpback and bonytail population trends using catch per unit effort as the trend index.

#### V. Study Area:

Sampling will occur at four long term trend sites: site 1 (RM -4.5 to -5), site 2 (RM -6 to -6.7), site 3 (RM -8.2 to -9.2) and site 4 (RM -9.5 to -11); in addition, we will sample one site between the “Big Drops” (RM -14.5) and Lake Powell (Figure 1).

#### VI. Study Methods/Approach:

During mid-October an annual monitoring trip will be completed within a ten day period. Four primary sites will be sampled, which were identified by previous studies as trend sites for long-term monitoring (Valdez 1990) and one additional site below the full pool level of Lake Powell. Few chubs have been captured outside the trend sites due to Cataract Canyon’s high proportion of large turbulent rapids. Cataract Canyon is 17 miles in length, from the confluence of the Green and Colorado rivers to 40' below the lake full level of Lake Powell (3700' amsl). The first four miles below the confluence, above all rapids, have been sampled by UDWR as part of the bonytail reintroduction monitoring and have not produced humpback chub. Of the remaining 13 miles, six miles are rapids, and cannot be effectively sampled. Of the remaining seven miles between rapids, four miles will be sampled.

The sampling trip will be ten days long, with sites 1-3 being sampled for two consecutive nights and sites 4 and 5 sampled for one night.

Sampling methods will be similar to those used for humpback chub in the Westwater Canyon, Black Rocks, and Desolation/Gray Canyons population estimate sampling. Trammel nets, electrofishing, baited hoop nets and, when available, submersible PIT antennas will be used to capture juvenile and adult chubs. Chart and Lentsch (1999) found that adult chub >200 mm are better sampled with trammel nets, and juvenile chub are better sampled by electrofishing. At each site, six nets will be set in the late afternoon and checked every two hours until 22:00 hours. Nets will be set again in the early morning and checked through late morning. All chub captured will be tagged and processed after each net check.

All endangered species will be scanned for a PIT tag and tagged if one is not detected, measured (mm), and weighed (g). All chub greater than or equal to 150 mm total length (TL) will be PIT-tagged.

#### VII. Task Description and Schedule:

Task 1: Sampling: Complete one sampling trip in Cataract Canyon in fall of 2017. According

to the biennial schedule, no sampling is scheduled for 2016 (October).

Task 2: Data entry, analysis, reporting: Data will be entered into a database and transferred to the UCRRP database manager by January 15 of each year following sampling. An annual progress report summarizing the data and comparing it with past monitoring efforts will 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	

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

**FY2016:** No work will be conducted in FY2016.

**FY2017:** Annual Report by November 2017.

<b>FY 2017 Costs for UDWR- Moab</b>
<b>Task 1. 1 sampling pass in September/October 2017</b>

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$34.38	120	\$4,126
Biologist	\$31.37	270	\$8,471
Technician	\$17.11	510	\$8,724
		<b>subtotal</b>	<b>\$21,321</b>

Food and Travel

	Rate	Quantity	Cost
Fleet Costs (4 trucks for 2% of total fleet costs)	\$41,616.00	0.02	\$832
Food (6 people, 10 days)	\$30.60	80	\$2,448
Shuttle (4 trucks)	\$153.00	4	\$612
		<b>subtotal</b>	<b>\$3,892</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$1,075
Sampling gear repair/replacement:			\$2,155
Boating gear repair/replacement:			\$1,148
Fuel for motors (25 gallons)	\$4.08	25	\$102
		<b>subtotal</b>	<b>\$4,480</b>

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**Task 1 subtotal** **\$29,693**

## Task 2. Data Entry, Analysis, and Reporting

### Personnel Costs (salary + fringe costs)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$35.07	40	\$1,403
Biologist	\$30.76	160	\$4,921
		<b>subtotal</b>	<b>\$6,324</b>
<b>Task 2 subtotal</b>			<b>\$6,324</b>

<b>Grand Total FY 2017</b>	<b>\$36,017</b>
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**FY2018:** No work will be conducted in FY2018.

**FY2019:** Annual Report by November 2019.

### Task 1. 1 sampling pass in September/October 2019

#### Personnel Costs (salary + fringe costs)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$35.77	120	\$4,293
Biologist	\$32.64	270	\$8,813
Technician	\$17.80	510	\$9,076
		<b>subtotal</b>	<b>\$22,182</b>

#### Food and Travel

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
Fleet Costs (4 trucks for 2% of total fleet costs)	\$43,297.29	0.02	\$866
Food (6 people, 10 days)	\$31.84	80	\$2,547
Shuttle (4 trucks)	\$159.18	4	\$637
		<b>subtotal</b>	<b>\$4,050</b>

#### Equipment

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
Camping gear repair/replacement:			\$1,118
Sampling gear repair/replacement:			\$2,242
Boating gear repair/replacement:			\$1,194
Fuel for motors (25 gallons)	\$4.24	25	\$106
		<b>subtotal</b>	<b>\$4,661</b>

<b>Task 1 subtotal</b>	<b>\$30,892</b>
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## Task 2. Data Entry, Analysis, and Reporting

### Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	40	\$1,431
Biologist	\$32.64	160	\$5,223
		<b>subtotal</b>	<b>\$6,654</b>
<b>Task 2 subtotal</b>			<b>\$6,654</b>

<b>Grand Total FY 2019</b>	<b>\$37,546</b>
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**FY2020:** No work will be conducted in FY2020.

IX. Program Budget Summary

	UDWR-Moab
FY2016	\$0
FY2017	\$36,017
FY2018	\$0
FY2019	\$37,546
FY2020	\$0
total:	\$73,563

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.

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.

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.

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.

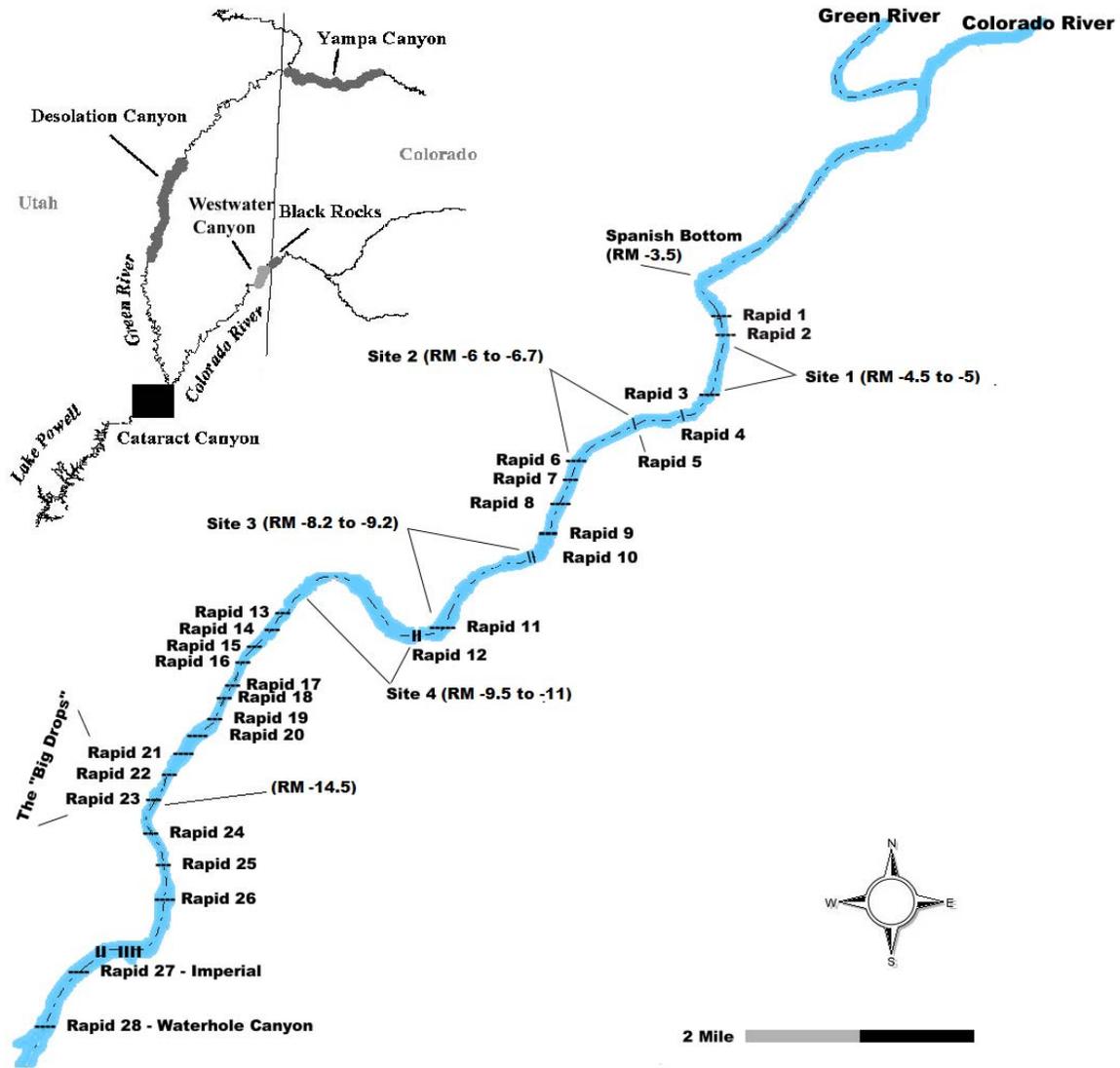


Figure 1. Sampling locations within Cataract Canyon on the Colorado River.