

**COLORADO RIVER RECOVERY PROGRAM
FY 2018-19 PROPOSED SCOPE OF WORK for:**

Project No.: 129

Humpback chub population estimates for Desolation/Gray Canyons

Reclamation Agreement number: R14AP00007
Reclamation Agreement term: 5/1/2014-9/30/2018

Note: Recovery Program FY18-19 scopes of work are drafted in May 2017. 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 to 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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<u>Category:</u>	<u>Expected Funding Sources:</u>
<input type="checkbox"/> Ongoing project	<input checked="" type="checkbox"/> Annual funds
<input checked="" type="checkbox"/> Ongoing-revised project	<input type="checkbox"/> Capital funds
<input type="checkbox"/> Requested new project	<input type="checkbox"/> Other (explain)
<input type="checkbox"/> Unsolicited proposal	

I. Title of Proposal: Humpback chub population estimates for Desolation/Gray Canyons, Green River, Utah.

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.

GREEN 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.B. Conduct population estimate for humpback chub.
- V.B.1. Desolation/Gray

III. Study Background/Rationale and Hypotheses:

In 2002, the RIP set recovery goals for the endangered humpback chub. Recovery goals are based in part on maintaining populations of humpback chub in several locations, among which is the Desolation/Gray Canyon population on the Green River. Setting, maintaining, and monitoring a population necessitates obtaining accurate population estimates. A five-year study on humpback chub reproduction and habitat use 1992-1996 was completed (Chart and Lentsch 1999) as part of the Flaming Gorge studies. However, catch rates were variable and recapture rates low, so a good population estimate could not be produced. An estimate using those data was made by Ron Ryel and Rich Valdez (USFWS 2002).

Annual point population estimates for the Desolation/Gray Canyon humpback chub have been calculated for 2001-03 (Jackson and Hudson 2005). During the next round of estimates in 2006-2007 it was determined that humpback chub site fidelity in fall when sampling occurred was high (90-100%). As very little movement was occurring among humpback chub among sites, population estimates were calculated for each site and extrapolated across a determined number of available sites within Desolation and Gray Canyons (Badame, 2010). The same population estimation technique was followed in the 2010-2011 and 2014-2015 sampling rounds but due to poor site estimates in 2011 and 2015 no reach-wide estimates were calculated for those years.

A 2017 final report (Howard, 2017, pending approval) addressed the complexity and difficulties of estimating this population. A revision of the study design is currently underway and this Scope of Work will be updated upon completion.

The current monitoring schedule for humpback chub in the Upper Colorado River Basin is two years on, two years off; 2018 will mark the start of another two year round of population estimates in Desolation/Gray Canyons.

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

Note: This is a preliminary/placeholder Scope of Work and is expected to change. Based on recommendations from Howard, 2017 (draft report) an increase and/or change in number of sites, effort and/or study design is expected for the 2018-2019 sampling round. Study design and methods will be refined in summer/fall of 2017 and a revised SOW and

budget will be submitted to the Recovery Program at that time.

Goal: To estimate the population size of humpback chub within Desolation/ Gray Canyon with coefficient of variation of less than 20%. *(Pending study design revision)*

Objectives:

1. Obtain site specific population estimates of late juvenile/adult humpback chub in long-term sample sites within Desolation/Gray Canyon and extrapolate to a reach-wide estimate. *(Pending study design revision)*
2. Determine mean estimated recruitment of naturally produced subadult humpback chub (150-199 mm) in Desolation/Gray Canyon. *(Pending study design revision)*

End Products: Data collected during the study will contribute to long term monitoring and population estimation of humpback chub populations in the Desolation/Gray Canyon. Annual Reports will be submitted in November following fall sampling. A final report will be completed the year after the two-year sampling round concludes.

V. Study Area: *(Pending study design revision)*

Desolation and Gray canyons occur south of the Uinta Basin, UT, beginning at Sand Wash (RM 216) and ending at 12 river miles upstream of the town of Green River, UT (RM 120).

In previous years, a total of 12 sites were sampled throughout the canyons located at RM 189, 185, 182, 178.5, 174.4, 166.8, 160.4, 157.4, 154.4, 150.8, 148, and 145.7 (Fig. 1). These include the four long-term trend sites at which have been sampled since 1989. Several sites sampled between 2001 and 2003 were relocated in 2006 and 2007 to provide tighter coverage of the canyon and redistribute effort from sites which were too close together (less than ½ a mile). During the 2010-2011 and 2014-2015 sampling efforts, six sites were sampled including four long-term trend sites (Cedar Ridge (RM 185), Log Cabin (RM 174.4), Cow Swim (RM 160.4), and Coal Creek (RM 145.7)) and two randomly selected sites.

Effort will be doubled in the 2018-2019 sampling round to improve representation of habitat when extrapolating site estimates to a reach-wide estimate. These sites will include all long term trend sites. Other sites will be selected after a thorough inventory of available habitat in the reach.

VI. Study Methods/Approach: *(Pending study design revision)*

Twelve sites will be sampled three times in late summer/early fall. Sampling events will occur approximately two weeks apart. Trammel nets will be the primary method to collect adult fish. Six to eight nets will be set in the evening beginning at approximately 1630 hours and checked every 1.5 to 2 hours to approximately 2230 hrs. Nets will be set again before sunrise and checked through mid-morning. Hoop nets and/or electrofishing may be used to supplement captures and submersible PIT antennas may be used to

augment resights. All chubs will be scanned for a PIT tag, tagged if needed, measured (mm) and weighed (g), and released. All chub captured will be identified to species. When this is not possible, fin clips and photos will be taken for verification. All other endangered species will also be scanned for a PIT tag, tagged if needed, measured (mm) and weighed (g), and released.

VII. Task Description and Schedule: *(Pending study design revision)*

Task 1: Sampling: Complete three sampling trips in Desolation/Gray Canyon (August-October 2018 and 2019).

Task 2: Data entry, analysis, and reporting: Data will be entered into a database on the computer and transferred to the UCRRP database manager by January 15 each year following sampling. An annual progress report including: 1) number of passes made; 2) estimator model used (and why) and point estimates (N-hat); 3) confidence interval; 4) probability of capture (p-hat) and coefficient of variation (C.V.); 5) density estimates; 6) length frequency charts with demarcation of subadults and adults; and 7) percentage of subadult to adult fish, which will be submitted in November of each year of sampling. (October-November)

Task 3: A final report will be prepared following the final year of sampling (2020)

Schedule: FY 2018-2019

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

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

UDWR personnel costs are based on previous year costs plus a 2% increase on hourly rates and fringe costs per year. Vehicle rental is approximately \$6,800/year/vehicle (includes fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program. Vehicle costs for this budget are an estimated percentage of this total based on previous year's usage. Equipment costs are based on previous year costs and rates with a 2% increase on all line items for each year following. Equipment includes but is not limited to trammel nets, scales, outboard repair, rafts, oars, dry boxes, coolers, tents, sleeping pads, PFDs, first aid supplies, satellite phone services, propane, fuel, etc...

FY2018: Annual Report by November 2018.

FY 2018 Costs for UDWR- Moab

Task 1. Sampling in Desolation/Gray Canyons (3 passes, 12 sites)

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.07	300	\$10,520
Biologist	\$32.32	1200	\$38,779
Technician	\$16.96	3300	\$55,968
		subtotal	\$105,267

Food and Travel

	Rate	Quantity	Cost
	\$40,800.0		
Fleet Costs (6 trucks for 15% of total fleet costs)	0	0.30	\$12,240
Food (12 people, 8 days, 3 trips)	\$30.00	288	\$8,640
Shuttle (6 trucks, 3 trips)	\$175.00	18	\$3,150
		subtotal	\$24,030

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$4,914
Sampling gear repair/replacement:			\$3,570
Boating gear repair/replacement:			\$6,200
Fuel for motors (40 gallons per pass)	\$4.00	240	\$960
		subtotal	\$15,644

Task 1 subtotal **\$144,941**

Task 2. Annual Data Entry, Analysis and Reporting

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.07	90	\$3,156
Biologist	\$32.32	270	\$8,725
		subtotal	\$11,881

Task 2 subtotal **\$11,881**

Grand Total FY 2018	\$156,822
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FY2019: Annual Report by November 2019. Final Report by 2020.

FY 2019 Costs for UDWR- Moab

Task 1. Sampling in Desolation/Gray Canyons (3 passes, 12 sites)

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	300	\$10,730
Biologist	\$32.96	1200	\$39,555
Technician	\$17.30	3300	\$57,087
		subtotal	\$107,372

Food and Travel

	Rate	Quantity	Cost
	\$41,616.0		
Fleet Costs (6 trucks for 15% of total fleet costs)	0	0.30	\$12,485
Food (12 people, 8 days, 3 trips)	\$30.60	288	\$8,813
Shuttle (6 trucks, 3 trips)	\$178.50	18	\$3,213
		subtotal	\$21,298

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$5,012
Sampling gear repair/replacement:			\$3,641
Boating gear repair/replacement:			\$6,324
Fuel for motors (40 gallons per pass)	\$4.08	240	\$979
			\$15,956
		subtotal	

Task 1 subtotal **\$144,626**

Task 2. Data Entry, Analysis, and Reporting

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	90	\$3,219
Biologist	\$32.96	270	\$8,900
		subtotal	\$12,119

Task 2 subtotal **\$12,119**

Task 3. Final Report

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	80	\$2,861
Biologist	\$32.96	480	\$15,822

Statistician consultation (Mary Connner)		\$3,000
	subtotal	\$21,683
Task 3 subtotal		\$21,683

Grand Total FY 2019	\$178,429
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FY2020: No work for this SOW will be conducted in FY2020. A final report will be written in 2020 but is included under the FY2019 budget.

FY2021: No work will be conducted in FY2021.

FY2022: Annual Report by November 2022.

FY 2022 Costs for UDWR- Moab

Task 1. Sampling in Desolation/Gray Canyons (3 passes, 12 sites)

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$37.96	300	\$11,387
Biologist	\$34.98	1200	\$41,976
Technician	\$18.36	3300	\$60,582
		subtotal	\$113,944

Food and Travel

	Rate	Quantity	Cost
	\$44,163.2		
Fleet Costs (6 trucks for 15% of total fleet costs)	3	0.30	\$13,249
Food (12 people, 8 days, 3 trips)	\$32.47	288	\$9,352
Shuttle (6 trucks, 3 trips)	\$189.43	18	\$3,410
		subtotal	\$22,601

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$5,319
Sampling gear repair/replacement:			\$3,864
Boating gear repair/replacement:			\$6,711
Fuel for motors (40 gallons per pass)	\$4.33	240	\$1,039
			\$16,933
		subtotal	

Task 1 subtotal	\$153,479
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Task 2. Data Entry, Analysis, and Reporting

Personnel Costs (salary + fringe costs)

Rate	Hours	Cost
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Project Leader	\$37.96	90	\$3,416
Biologist	\$34.98	270	\$9,445
		subtotal	\$12,861
Task 2 subtotal			\$12,861

Grand Total FY 2022	\$166,339
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IX. Program Budget Summary

	UDWR- Moab
FY2018	\$156,822
FY2019	\$178,429
FY2020	\$0
FY2021	\$0
FY2022	\$166,339
total:	\$501,590

X. Reviewers:

XI. References:

- Badame, P.V. 2012. Population Estimate for Humpback Chub (*Gila cypha*) in Desolation and Gray Canyons, Green River, Utah 2006-07. Final Report. Upper Colorado River Endangered Fish Recovery Program.
- Chart, T.E. and L. Lentsch. 1999. Reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River 1992-1996. Report C in Flaming Gorge Studies: Reproduction and Recruitment of *Gila* spp. and Colorado pikeminnow in the middle Green River. Final Report.
- Howard, J.L. 2017. Population Estimate for Humpback Chub (*Gila cypha*) in Desolation and Gray Canyons, Green River, Utah 2001-15. Draft Report. Upper Colorado River Endangered Fish Recovery Program.
- Jackson, J.A. and J. M. Hudson. 2005. Population Estimate for Humpback Chub (*Gila cypha*) in Desolation and Gray Canyons, Green River, Utah 2001-2003. Upper Colorado River Endangered Fish Recovery Program. Draft Report.
- U.S. Fish and Wildlife Service. 2002. Humpback chub (*Gila cypha*) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

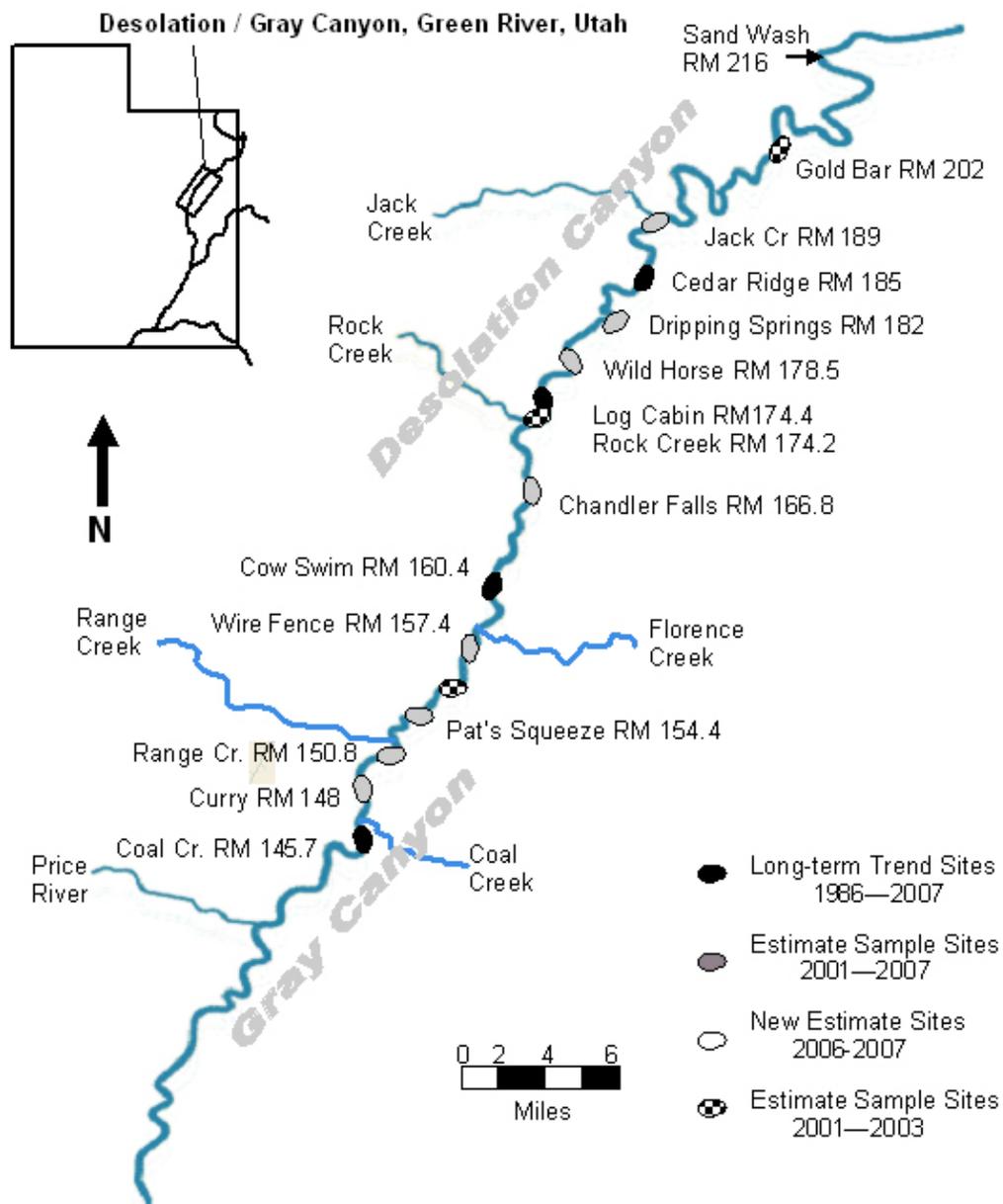


Figure 1. Sites sampled between 1986 and 2007, located within Desolation/Gray Canyons of the Green River.