

**COLORADO RIVER RECOVERY PROGRAM
FY 2014-15 PROPOSED SCOPE OF WORK for:**

Project No.: 129

Humpback chub population estimates for Desolation/Gray Canyons

Reclamation Agreement number: R09AP40908
Reclamation Agreement term: 10/1/2010-4/30/2015

Lead Agency: Utah Division of Wildlife Resources

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<u>Category:</u>	<u>Expected Funding Sources:</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 (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) and 2006-07 (Badame 2012). Population estimates during 2001-2003 ranged between 970 and 2,612 adults and over each year the related coefficient of variation (CV) declined from 36% to 21%. With some changes in site locations and sampling methods estimates in 2006 and 2007 achieved CV values of 16-17%. Due to 100% site fidelity during sampling, population estimates were calculated for each site and extrapolated to cover the entire reach. Those estimates ranged between 1,108 and 2,578 during 2006-2007 (Badame 2011). The estimate in 2010, following methods used in 2006-2007, showed that there were approximately 1,625 individuals throughout the study reach. In 2011 estimates were not calculated due to a lack of recaptures (Badame 2011). Catch rates in historical monitoring sites over the last sixteen years show a declining trend in population, however, continued monitoring and population estimation is necessary to document the continued decline as well as the rate of decline.

An important factor in determination of how past estimates relate to the actual population size is the nearly 100% site fidelity observed during fall sampling. High site fidelity results in no mixing between sites within a sampling period and results in an estimate that is only related to sample sites and not the entire reach, suggesting significant underestimation of the total Desolation population size when estimated from fall samples. Individual sample site estimates can be made from mark recapture data and then translated into a density estimate based on sample area size.

The current monitoring schedule for humpback chub in the upper Colorado River Basin is two years on, two years off; 2014 will mark the start of another two year round of population estimates in Desolation/Gray Canyons.

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

Goal: To estimate the population size of humpback chub in four long-term sampling sites within Desolation/ Gray Canyon with coefficient of variation of less than 20%.

Objectives:

1. Obtain site specific population estimates of late juvenile/adult humpback chub in long-term sample sites within Desolation/Gray Canyon.
2. Determine mean estimated recruitment of naturally produced subadult humpback chub (150-199 mm) in Desolation/Gray Canyon.

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.

V. Study Area:

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 field season five sites were sampled including the four long-term sites: Cedar Ridge (RM 185), Log Cabin (RM 174.4), Cow Swim (RM 160.4), Coal Creek (RM 145.7), and Chandler Falls (RM 167). During the 2011 field season six sites were sampled including three long term sites: Cedar Ridge (RM 185), Log Cabin (RM 174.4), Cow Swim (RM 160.4), Range Creek (RM 151), Chandler Falls (RM 167), and Curry Rapid (RM 148). The long-term site not sampled, Coal Creek (RM 145.7) was purposefully avoided because humpback chub were removed in late September of 2010 and transported to Ouray National Fish Hatchery for the preservation of genetic material.

For the 2014 and 2015 field seasons, the four long-term sites will be sampled as well as two sites randomly selected. The long-term trend sites are as follows: Cedar Ridge (RM 185), Log Cabin (RM 174.4), Cow Swim (RM 160.4), and Coal Creek (RM 145.7). The other sites (RM 189, 182, 178.5, 166.8, 157.4, 154.4, 150.8, 148) will be selected at random.

VI. Study Methods/Approach:

Study methods will be similar to those used in previous Desolation population estimates (Chart and Lentsch 1999, Jackson and Hudson 2005, Badame 2010) and in the Westwater Canyon population estimates.

Three sampling trips will be made in the last week of August and through the beginning of October, with intervals of 5-8 days between sampling. The six sites will be sampled for one night each. Trammel nets and electrofishing will be used to collect chubs; hoop nets may be used to supplement captures. Each site will be electrofished before nets are set in the afternoon. Six to eight nets will be set in the evening beginning at approximately 1630 hrs and checked every 1.5 to 2 hours to approximately 2230 hrs. Nets will be set again before sunrise and checked through mid-morning. Suitable portions of the river in between sites will also be electrofished when possible. 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 using the criteria described in Douglas et al. (1989,1998). 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:

Task 1. Complete 3 sampling trips in Desolation/Gray Canyon from August-October 2014-2015.

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 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.

Schedule: FY 2014-2015

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

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

<p>FY 2014 Costs for UDWR- Moab (2% increase from FY10 minus <i>Gila</i> collection)</p> <p>Task 1. Sampling in Desolation/Gray Canyons (3 passes)</p>
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Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$29.71	100	\$2,971

Biologist	\$26.83	480	\$12,877
Technician	\$16.97	1800	\$30,542
		subtotal	\$46,390

Food and Transport (current expense)

	Rate	Quantity	Cost
Fleet Costs ^a (3 trucks for 15% of total fleet costs)	\$40,800.00	0.15	\$6,120
Food (6 people, 8 days, 3 trips)	\$30.00	144	\$4,320
Shuttle (3 trucks, 3 trips)	\$175.00	9	\$1,575
		subtotal	\$10,440

Equipment (current expense)

	Rate	Quantity	Cost
Camping gear repair/replacement ^b :			\$437
Sampling gear repair/replacement ^c :			\$932
Boating gear repair/replacement ^d :			\$1,300
Fuel for motors (30 gallons/trip)	\$4.00	90	\$360
		subtotal	\$3,029

Task 1 subtotal **\$59,859**

Task 2. Data Entry, Analysis, and Reporting

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$29.71	60	\$1,783
Biologist	\$26.83	180	\$4,829
Technician	\$16.97	0	\$0
		subtotal	\$6,611

Task 2 subtotal **\$6,611**

Grand Total FY 2014	\$66,470
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^a The State of Utah uses Automotive Resources Inc. for motor pool operations. 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.

^b Includes, but is not limited to, tents, sleeping pads, toilet system, cookware, stoves, propane, charcoal, satellite phone and service, drybags, coolers, first aid supplies.

^c Includes, but is not limited to, trammel nets, PIT tag readers, scales, spot lights, GPS units, data loggers.

^d Includes, but is not limited to, raft repair/replacement, outboard motor parts and maintenance, propellers, oars, raft frame repair, dry boxes.

^{b,c,d} Estimated costs are based on actual costs from previous years plus an estimated 2% cost of living increase each year following.

FY 2015 Costs for UDWR- Moab (same as FY14)
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Task 1. Sampling in Desolation/Gray Canyons (3 passes)

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$29.71	100	\$2,971
Biologist	\$26.83	480	\$12,877
Technician	\$16.97	1800	\$30,542
		subtotal	\$46,390

Food and Transport (current expense)

	Rate	Quantity	Cost
Fleet Costs (3 trucks for 15% of total fleet costs)	\$40,800.00	0.15	\$6,120
Food (6 people, 8 days, 3 trips)	\$30.00	144	\$4,320
Shuttle (3 trucks, 3 trips)	\$175.00	9	\$1,575
		subtotal	\$10,440

Equipment (current expense)

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$437
Sampling gear repair/replacement:			\$932
Boating gear repair/replacement:			\$1,300
Fuel for motors (30 gallons/trip)	\$4.00	90	\$360
		subtotal	\$3,029

Task 1 subtotal **\$59,859**

Task 2. Data Entry, Analysis, and Reporting

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$29.71	60	\$1,783
Biologist	\$26.83	180	\$4,829
Technician	\$16.97	0	\$0
		subtotal	\$6,611

Task 2 subtotal **\$6,611**

Grand Total FY 2015	\$66,470
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FY 2018 Costs for UDWR- Moab (2% increase from FY14)

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

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$30.30	100	\$3,030
Biologist	\$27.36	480	\$13,135
Technician	\$17.31	1800	\$31,153
		subtotal	\$47,318

Food and Transport (current expense)

	Rate	Quantity	Cost
Fleet Costs (3 trucks for 15% of total fleet costs)	\$41,616.00	0.15	\$6,242
Food (6 people, 8 days, 3 trips)	\$30.60	144	\$4,406
Shuttle (3 trucks, 3 trips)	\$178.50	9	\$1,607
		subtotal	\$10,649

Equipment (current expense)

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$445
Sampling gear repair/replacement:			\$951
Boating gear repair/replacement:			\$1,326
Fuel for motors (30 gallons/trip)	\$4.08	90	\$367
		subtotal	\$3,089

Task 1 subtotal **\$61,056**

Task 2. Data Entry, Analysis, and Reporting

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$30.30	60	\$1,818
Biologist	\$27.36	180	\$4,925
Technician	\$17.31	0	\$0
		subtotal	\$6,744

Task 2 subtotal **\$6,744**

IX. Program Budget Summary

	UDWR- Moab
FY2014	\$66,470
FY2015	\$66,470
FY2016	\$0
FY2017	\$0
FY2018	\$67,800
total:	\$200,740

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. Recovery Implementation Project #22k

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. Recovery Implementation Program Project #39.

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. Recovery Implementation Project #22k.

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.

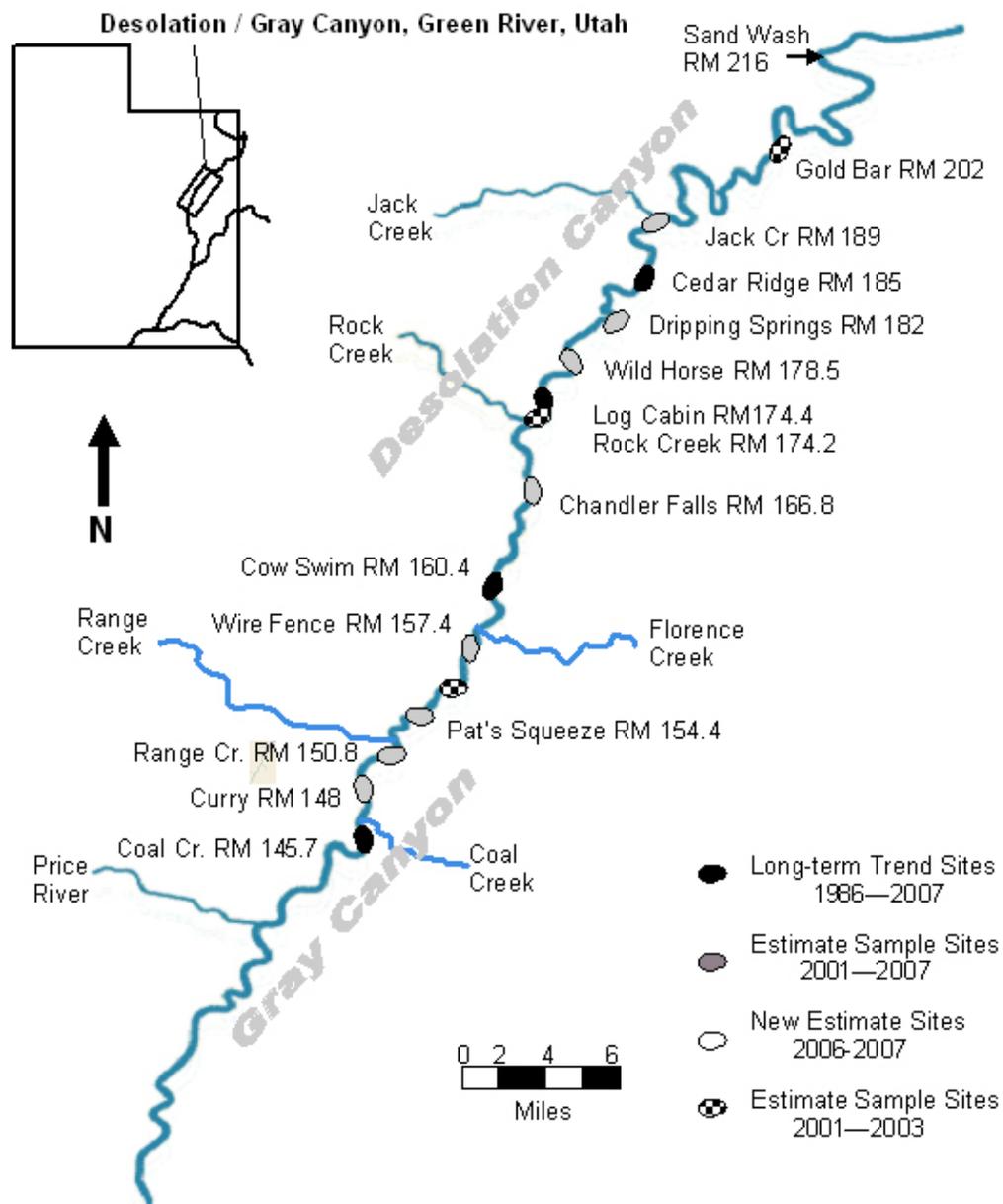


Figure 1. Sites sampled between 1986 and 2007, located within Desolation/Gray Canyons of the Green River.