

**COLORADO RIVER RECOVERY PROGRAM
FY-2010-11 PROPOSED SCOPE-OF-WORK:**

No: 129

Lead Agency: Utah Division of Wildlife

Submitted: Paul Badame (Lead)
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Category:

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

Expected Funding Source:

- Annual funds
 Capital funds
 Other (explain)

Revised Date: 25 February 2010

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

II. Relationship to RIPRAP:

Green River Action Plan: Mainstem:

V.B.1 Conduct population estimate for humpback chub within Desolation Gray Canyons.

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. Trend monitoring (ISMP) has been conducted annually since 1991. 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 (Recovery Goals 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 2010, *in progress*). 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%. Population estimates however, have declined significantly to 410 in 2006 and 204 in 2007. Comparisons of catch rates in historical monitoring sites over the last sixteen years support observed declines in population estimates.

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, 2010 will mark the start of another two year round of population estimates.

An additional task has been added to this population monitoring scope due to significant declines in the Desolation humpback chub population. The Utah Division of Wildlife has recommended that humpback chub be captured and removed alive immediately from the canyon and moved to a refuge to preserve genetic material. Similar measures have recently been taken for *Gila* in the Yampa River.

This task will involve a single trip through the canyon to collect young-of-year *Gila* for rearing at the Ouray National Fish Hatchery. These fish will be reared and assessed to species as adult characteristics become apparent. If additional fish are needed they will be collected the following year during scheduled sampling.

IV. Goals, Objectives, End Product:

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

To successfully capture, transport, and rear wild humpback and roundtail chub in a hatchery to preserve population genetics.

Objectives:

- 1) Obtain site specific population estimates of late juvenile/adult humpback chub in long-term ISMP sample sites within Desolation/Gray Canyon.
- 2) Determine mean estimated recruitment of naturally produced subadult humpback chub (150-199 mm) in Desolation/Gray Canyon.
- 3) Collect humpback for placement in captivity at Ouray National Fish Hatchery.

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).

For the 2010 and 2011 field seasons, only four sites will be sampled. The sites will be the long-term trend sites: Cedar Ridge (RM 185), Log Cabin (RM 174.4), Cow Swim (RM 160.4), and Coal Creek (RM 145.7).

VI. Study Methods/Approach:

Population Estimates – 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 September, with intervals of 5-7 days between sampling. The four long-term trend 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 evening. Seven 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.

Salvage and Transport – In FY10, determination will be made as to the number and size class of Gila species available for collection from the river using seines, trammel nets and/or electrofishing equipment. Fish will be captured during a separate trip in October of 2009. Fish health will be maintained during transport by boats equipped with live-wells utilizing an oxygen supply and a re-circulating pump system. Fish will then be transported to a hatchery truck and acclimated to water temperature and conditions and tempered with salt. Trucks will then transport fish to the Ouray National Fish Hatchery. River and hatchery crews will coordinate efforts using satellite phones.

In FY11, YOY, juvenile or adult Gila species will be collected during the second or third pass of estimate sampling in late September of 2010. Because collection will occur concurrent with scheduled sampling, additional man hours from UDWR Moab will not be required. Fish health will be maintained as it was in 2009. Fish will then be transported to a hatchery truck and acclimated to water temperature and conditions and tempered with salt. The truck will then transport fish to the Ouray National Fish Hatchery. River and hatchery crews will coordinate efforts using satellite phones.

VII. Task Description and Schedule:

Task 1) Complete 3 sampling trips in Desolation/Gray Canyon from August-September 2010-2011.

FY10 – Three trips will be completed during August–September 2010.
FY11 – Three trips will be completed during August–September 2011.

Task 2) Data will be entered into a database on the computer and transferred to the UCRRP database manager by January 15 each year.

FY11 – data entered and submitted Jan 2011.
FY12 – data entered and submitted Jan 2012.

Task 3) An annual progress report including: 1) number of passes made; 2) estimator model used (and why) and point estimates ($N\text{-hat}$); 3) confidence interval; 4) probability of capture ($p\text{-hat}$) 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 by Nov. 15 each year.

FY11 – Annual report submitted Nov 2010.
FY12 – Annual report submitted Nov 2011.

Task 4) Complete a collection trip for young-of-year *Gila* and transport fish to Ouray National Fish Hatchery. This task will be complete with assistance from hatchery personnel.

FY10 – 1 trip will be completed during October 2009.

FY11 – Collections will occur during a late September 2010 trip.

VIII. Work Deliverables/Due Dates

FY 2010 Costs:		
Task 1 - Sampling (3-6day trips)	Work Days	UDWR Moab
Labor		
Proj. leader (\$438/day)	24	\$10,512
2 Biologist (\$340/day)	48	\$16,320
4 Technicians (\$195/day)	96	\$18,720
Travel		
Vehicle - 3 trips (3 trucks 15% total fleet cost)		\$5,100
Shuttle Services - 3 trips, 3 vehicles		\$1,800
Per diem - 3 trips (6 days/ 7 people @ \$25 per day)		\$3,150
Equipment		
Trammel net, minnow trap replacement		\$1,500
Boat, Trailer, Sampling gear repair and maintenance		\$500
Boat/generator fuel, propane 3 trips		\$1,000
<i>Task 1 subtotal</i>		<u>\$58,602</u>
^a Calculated as the total percentage of annual fleet costs based on the number of trucks, days used, and total miles driven. Annual fleet costs for the Moab Field Station FY10 is estimated to be \$34,000 for 5 vehicles. Moab fleet vehicles are not assigned to specific projects; instead they are rotated through all projects in the UCRRP & SJRRP.		
Task 2 - Data Entry		UDWR Moab
Labor		
Biologist	5	\$1,700
Technicians	5	\$975
<i>Task 2 subtotal</i>		<u>\$2,675</u>
Task 3 - Data Analysis and Reporting		UDWR Moab

Labor				
Proj. leader	5	\$2,190		
Biologist	5	\$1,700		
<i>Task 3 subtotal</i>		<u>\$3,890</u>		
Task 4 - Gila Collection and Transport		UDWR Moab	USFWS	Ouray
Labor				
Proj. leader (\$438/day)	5	\$2,190		
1 Biologist (\$340/day)	5	\$1,700		
1 Hatchery Technician (\$cost)				\$0
2 Volunteer	10	\$0		
Travel				
Vehicle - 1 trips (2 trucks for 300 mi.and 5 days/trip)		\$340		
Shuttle Services - 1 trip, 2 vehicles		\$400		
Per diem - 1 trip (4 days/ 5 people @ \$25 per day)		\$500		
Hatchery vehicle costs				\$131
Equipment				
Boat/generator fuel, propane 1 trips		\$0		
<i>Task 4 subtotal</i>		<u>\$5,130</u>	<u>\$131</u>	
FY 2010 TOTAL		\$70,297	\$131	

FY 2011 Costs:

Task 1 - Sampling (3 trips)	Work Days	UDWR Moab
Labor		
Proj. leader (\$438/day)	24	\$10,512
2 Biologist (\$340/day)	48	\$16,320
4 Technicians (\$195/day)	96	\$18,720
Travel		
Vehicle - 3 trips (3 trucks 15% total fleet cost)		\$5,100
Shuttle Services - 3 trips, 3 vehicles		\$1,800
Per diem - 3 trips (6 days/ 7 people @ \$25 per day)		\$3,150
Equipment		
Trammel net, minnow trap replacement		\$1,500
Boat, Trailer, Sampling gear repair and maintenance		\$500
Boat/generator fuel, propane 3 trips		\$1,000
<i>Task 1 subtotal</i>		<u>\$58,602</u>

^a Calculated as the total percentage of annual fleet costs based on the number of trucks, days used, and total miles driven. Annual fleet costs for the Moab Field Station FY11 is estimated to be \$34,000 for 5 vehicles. Moab fleet vehicles are not assigned to specific projects; instead they are rotated through all projects in the UCRRP & SJRRP.

Task 2 - Data Entry		UDWR Moab
Labor		
Biologist	5	\$1,700
Technicians	5	\$975
<i>Task 2 subtotal</i>		<u>\$2,675</u>
Task 3 - Data Analysis and Reporting		UDWR Moab
Labor		
Proj. leader	5	\$2,190
Biologist	5	\$1,700
<i>Task 3 subtotal</i>		<u>\$3,890</u>
FY 2011 TOTAL		<u>\$65,167</u>

IX. Program Budget Summary

FY-2010	\$ 70,297
FY-2011	<u>\$ 65,167</u>
Total	\$135,464

X. Reviewers

XI. References

Badame, P.V. 2010. Population Estimate for Humpback Chub (*Gila cypha*) in Desolation and Gray Canyons, Green River, Utah 2006-07. Upper Colorado River Endangered Fish Recovery Program. Draft Report in progress. 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.

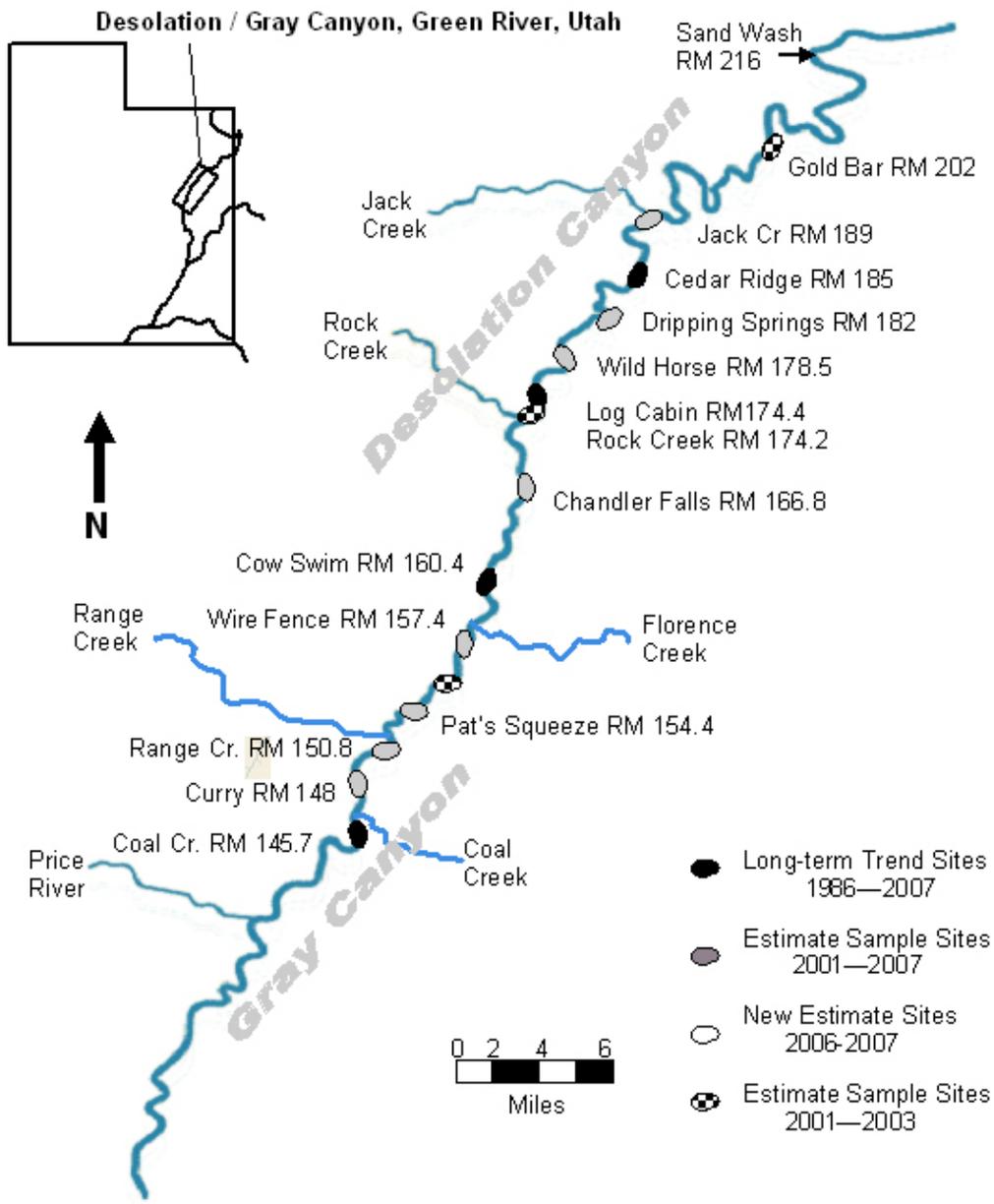


Figure 1. Sites sampled between 1986 and 2007, located within Desolation/Gray Canyons of the Green River.