

**COLORADO RIVER RECOVERY PROGRAM
FY 2012-13 PROPOSED SCOPE-OF-WORK for:**

Project No.: 132

Lead Agency: Utah Division of Wildlife Resources
Submitted by (Principal Investigators): Darek Elverud (lead), Paul Badame

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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 estimate of humpback chub in Westwater Canyon, Colorado River,
Utah

II. Relationship to RIPRAP:

Colorado River Action Plan: Mainstem
V.C. Estimate humpback chub populations
V.C.2. Westwater

III. Study Background/Rationale and Hypotheses:

The Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin is currently involved in establishing recovery goals for the endangered humpback chub. Recovery goals will be based in part on maintaining populations of humpback chub in several locations, among which is the Westwater Canyon population on the Colorado River. Establishing and measuring progress toward recovery goals necessitates monitoring to obtain accurate and precise population estimates.

Three-year population estimates were conducted for the Westwater Canyon humpback chub population during 1998-2000 and 2003-2005. Capture M_0 model (null model) population estimates were: 4,744 in 1998, 2,215 in 1999, and 2,201 in 2000 with respective profile likelihood intervals (1998: 3,760-14,665; 1999: 1,608-7,508; 2000: 1,335-4,124; Jackson, 2010). From 1998 through 2000, the probability of capture (p -hat) and coefficient of variation (CV) increased slightly (1998: p -hat=0.035, CV= 0.23; 1999: p -hat=0.041, CV= 0.28; 2000: p -hat=0.041, CV= 0.28; Jackson, 2010). The population model estimates from Capture M_t model were: 2,973 in 2003, 1,729 in 2004, and 1,210 in 2005 with respective profile likelihood intervals (2003: 1,710-6,042, 2004: 1,121-2,967, 2005: 880-1,769; Jackson, 2010).

Two-year population estimates were conducted for Westwater Canyon in 2007 and 2008. The population model estimates from Capture M_t model were: 1,757 in 2007 and 1,315 in 2008 with respective profile likelihood intervals (2007: 1,097-3,173, 2008: 969 - 1,896; Elverud 2008). The probability of capture (p -hat) and coefficient of variation (CV) from 2007 and 2008 were: (2007: p -hat = 0.05, CV = 0.27; 2008: p -hat = 0.08, CV = 0.17; Elverud 2008).

The recovery goals require that population estimates for Westwater Canyon humpback chub be conducted on a two years on and then two years off schedule. Information collected previously by the Utah Division of Wildlife Resources- Moab Field Station and recommendations from the USFWS population estimate workshops held in Winter 2002 are incorporated into the approach to provide the best opportunity of determining the most accurate and precise estimate for the Westwater Canyon humpback chub population.

IV. Goals, Objectives, End Product:

Goal: To estimate the population size of humpback chub in Westwater Canyon with the most precise confidence intervals possible.

Objectives:

1. Obtain a population estimate of adult humpback chub (≥ 200 mm) in Westwater Canyon
2. Determine mean estimated recruitment of naturally produced subadult humpback chub (150-199 mm) in Westwater Canyon

End Product:

An in-depth annual progress report detailing these data (including population estimates, 95% confidence intervals, coefficients of variation, and probabilities of capture) will be completed before the winter Colorado River Researchers Meeting and provided to the Recovery Program and the USFWS for evaluation. At the completion of this project, the annual progress report will incorporate in-depth analyses (including population estimates, 95% confidence intervals, coefficients of variation, and probabilities of capture) for both years of the study.

V. Study area:

Westwater Canyon, Colorado River (RM 124.5-112.5), Utah.

Sampling will occur at four locations:

1. RM 124.5-123.7 - Above and Below Miners Cabin
2. RM 123.2-121.7 - Between Miners Cabin and Cougar Bar¹
3. RM 121.7-120.8 - Cougar Bar to Little Hole
4. RM 120.0-119.5 - Hades Bar

¹ *This location will be investigated to determine to what extent it can be sampled based on ability to access the area from a camp.*

VI. Study Methods/Approach:

Study methods will be similar to those used in the previous humpback chub population estimates in Desolation/Gray and Westwater canyons (Hudson and Jackson, 2003) and incorporate recommendations that resulted from the USFWS population estimate workshops held in winter 2002.

Three sampling trips will be made in September and October approximately one to two weeks apart. Each of the four sampling locations will be sampled for one night around the crepuscular hours (i.e., late afternoon to midnight, and pre-dawn to mid-morning). Three of these sites will be sampled for an additional night to maximize captures of humpback chub in Westwater Canyon (Above and Below Miners Cabin, RM 124.5-123.7; between Miners Cabin and Cougar Bar, RM 123.2-121.7; Cougar Bar to Little Hole, RM 121.7-120.8).

Humpback chub will be captured using trammel nets and electrofishing at each sampling location. The number of trammel nets set at each sampling location will be maximized according to available sampling habitat (7-14 nets per sampling location). Trammel nets will be fished in 1.5 to 2 hour sets from late afternoon through approximately 2300 hrs. At that time, the nets will be pulled for the remainder of the night. Trammel nets will again be fished in 1.5 to 2 hour nets sets from pre-dawn through mid-morning. All chubs will be scanned for a PIT tag, tagged (if necessary), measured (mm; total length, depth of nuchal depression, length of origin of pectoral fin to origin of pelvic fin, length of dorsal fin base, length of anal fin base; Douglas et al. 1998, Smith et al. 1979), weighed (g), principal dorsal and anal fin rays counted, and released. Other endangered fish captured will be scanned for a PIT tag, tagged (if necessary), measured for total length (mm), weighed (g), and released. All other fish captured will be measured for total length (mm), weighed (g), and released or disposed of accordingly. This information will be collected immediately after capture to reduce handling stress.

Electrofishing will be conducted at each sampling location prior to nets being set and after nets are pulled. In addition, electrofishing will be conducted in intervening reaches between sampling locations. All chubs will be scanned for a PIT tag, tagged (if necessary), measured (mm; total length, depth of nuchal depression, length of origin of pectoral fin to origin of pelvic fin, length of dorsal fin base, length of anal fin base), weighed (g), principal dorsal and anal fin rays counted, and released. Other endangered fish captured will be scanned for a PIT tag, tagged (if necessary), measured for total length (mm), weighed (g), and released. All other fish captured will be measured for total length (mm), weighed (g), and released or disposed of accordingly. This information will be collected immediately after capture to reduce handling stress.

VII. Task Description and Schedule:

- Task 1) Complete 3 sampling trips in Westwater Canyon from September-October 2011-2012.
FY11 – two trips will be completed in September 2011.
FY12 – one trip will be completed during October 2012 and two will be completed during September 2013.
FY13 – one trip will be completed during October 2013.
- Task 2) Data will be entered into a database on the computer and transferred to the UCRRP database manager by January 15 each year.
FY12 – data entered and submitted Jan 2013.
FY13 – data entered and submitted Jan 2014.
- Task 3) An annual progress report including: 1) number of passes made; 2) estimator model used (and why) and point estimate (N-hat); 3)

confidence interval; 4) probability of capture (p-hat) and coefficient of variation (C.V.); 5) length frequency charts with demarcation of subadults and adults; and 6) percentage of subadult to adult fish, which will be submitted by Nov. 15 each year.

FY12 – Annual report submitted Nov 2012.

FY13 – Annual report submitted Nov 2013.

Task 4) Prepare final report (FY13)

VIII. Deliverables/Due Dates - See above

FY 2011 Budget: Funded at \$53,876 for annual work completed in FY 11, which represents approximately 2/3 of the work completed in calendar year 2011.

FY 2012 Budget: 1/3 of annual work completed in calendar year 2011 (October '11) and 2/3 of work completed in calendar year 2012 (September '12).

Task 1.

Personnel (*Personal Services*)

-Biologists (\$340/day x 60 total work days)	\$20,400
-Technicians (\$195/day x 176 total work days)	\$34,320
-Project Leader (\$438/day x 30 total work days)	<u>\$13,140</u>
Subtotal	<u>\$67,860</u>

Food and Transport (*Current Expense*)

-Food (6 people @ \$25/day for 24 days)	\$ 3,600
- Vehicles - 4 trucks and 6% of fleet costs	\$ 2,000
-Gasoline (boats and generators) 3 trips	<u>\$ 2,200</u>
Subtotal	<u>\$ 7,800</u>

Equipment (*Current Expense*)

-Misc. gear and camping equipment tents, dry bags, stoves, cookware, chairs, tables, toilets, trammel nets, oars, oar blades, life jackets, dip nets, GPS units, digital camera, scales)	\$ 2,500
-Equipment repair and maintenance (outboards, generators, trailers, rafts, oars)	<u>\$ 2,300</u>
Subtotal	<u>\$ 4,800</u>
Task 1 Total	<u>\$ 80,460</u>

Task 2.

Personnel (*Personal Services*)

Biologists (\$340/day x 10 total work days)	<u>\$ 3,400</u>
Task 2 Total	<u>\$ 3,400</u>

Task 3.

Personnel (*Personal Services*)

Biologists (\$340/day x 10 total work days)	\$ 3,400
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Project Leader (\$438/day x 1 work day)	\$ 438
Task 3 Total	<u>\$ 3,838</u>

FY 2012 Total **\$87,698**

FY 2013 Budget: 1/3 of annual work completed in calendar year 2012 (October '12), plus annual and final reporting for the project.

Task 1.

Personnel (*Personal Services*)

-Biologists (\$340/day x 20 total work days)	\$ 6,800
-Technicians (\$195/day x 58 total work days)	\$11,310
-Project Leader (\$438/day x 10 total work days)	<u>\$ 4,380</u>
Subtotal	<u>\$22,490</u>

Food and Transport

-Food (6 people @ \$25/day for 24 days)	\$ 1,200
-Vehicles - 4 trucks and 6% of fleet costs	\$ 583
-Gasoline (boats and generators) 2 trips	<u>\$ 726</u>
Subtotal	<u>\$ 2,509</u>

Equipment

-Misc. gear and camping equipment (tents, dry bags, stoves, cookware, chairs, tables, toilets, trammel nets, oars, oar blades, life jackets, dip nets, GPS units, digital camera, scales)	\$ 825
-Equipment repair and maintenance (outboards, generators, trailers, rafts, oars)	<u>\$ 759</u>
Subtotal	<u>\$ 1,584</u>

Task 1 Total **\$ 26,583**

Task 2.

Personnel (*Personal Services*)

-Biologists (\$340/day x 10 total work days)	<u>\$ 3,400</u>
Task 2 Total	<u>\$ 3,400</u>

Task 3.

Personnel (*Personal Services*)

-Biologists (\$340/day x 10 total work days)	\$ 3,400
-Project Leader (\$438/day x 1 work day)	<u>\$ 438</u>
Task 3 Total	<u>\$ 3,838</u>

Task 4.

Personnel (*Personal Services*)

-Biologist (\$340/day x 20 total work days)	\$ 6,800
-Project Leader (\$438/day x 2 total work days)	<u>\$ 876</u>
Task 4 Total	<u>\$ 7,676</u>

FY 2013 Total **\$41,497**

IX. Budget Summary

FY2011 \$ 53,876 *previously funded.*

FY2012 \$ 87,698

FY2013 \$ 41,497

X. Reviewers

XI. References

Douglas, M.E., R.R. Miller, and W.L. Minckley. 1998. Multivariate discrimination of Colorado Plateau *Gila* spp.: The “art of seeing well” revisited. *Transactions of the American Fisheries Society* 127:163–173.

Elverud, D.S. 2008. Population Estimate of Humpback Chub in Westwater Canyon, Colorado River, Utah. Draft Annual Progress Report. Utah Division of Wildlife Resources.

Hudson, J.M. and J.A. Jackson. 2003. Population Estimates for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Colorado River, Utah. 1998-2000. Utah Division of Wildlife Resources.

Jackson, J.A. 2010. Population Estimate for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Colorado River, Utah 2003-2005. Draft Final Report for the Upper Colorado River Basin Endangered Fish Recovery Program, Denver Colorado

Smith, G.R., R.R. Miller, and W.D. Sable. 1979. Species relationships among fishes of the genus *Gila* in the upper Colorado River drainage. *U.S. Nat. Park Serv. Trans. Proc.*, Ser. 5:613-623.