

**COLORADO RIVER RECOVERY PROGRAM
FY-12-13 PROPOSED SCOPE OF WORK**

Project No.: 131 (22a-3)

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

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<u>Category</u>	<u>Expected Funding Source</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 project	<input type="checkbox"/> Other
<input type="checkbox"/> Unsolicited proposal	

I. Title of Proposal: **Population Estimate of Humpback Chub in Black Rocks.**

II. Relationship to RIPRAP: General Recovery Program Support. V. Monitor Populations.
A.1. Conduct standardized monitoring program.

III. Study Background/Rationale and Hypotheses: Robust population estimates are now critical to monitor recovery of the humpback chub population (USFWS 2001). Recovery goals require estimates of population size at regular intervals to measure population response to management activities under the Recovery Program. A population estimate was made for the 1998B2000 time period (McAda 2002) a second estimate was made for 2003 B 2004 (McAda 2007) and a third estimate was conducted 2007-2008 (Francis and McAda 2011). This scope of work identifies the work necessary to complete a fourth estimate of population size for humpback chub in Black Rocks.

IV. Study Goals, Objectives, End Product:

A. Goal:

Estimate size and recruitment of the humpback chub population in Black Rocks

B. Objectives:

1. Use mark-recapture to estimate the population size (including adults, 200 mm TL) and recruitment (i.e., juveniles 150B199 mm TL) of humpback chub in Black Rocks.
2. Describe population structure of humpback chub in Black Rocks by analyzing length-frequency distributions.
3. Monitor and describe relative condition of the chub populations.

V. Study area: Upper Colorado River Basin C Black Rocks area (RM 135.5B136.5) and one test sample at Mee Canyon (False Black Rocks RM 138.2).

VI. Study Methods/Approach:

Recovery Program (2002) summarized population estimates conducted through 2001 and made recommendations for sampling methodologies for future work. The study methodology outlined here corresponds to those recommendations.

Conduct four intensive 4-day (3 nights) sampling efforts in Black Rocks between mid September and late October in 2003 and 2004, with intervals of 1B2 weeks between samples. Capture as many adult-size chubs as possible using the most efficient gear for handling as many fish as possible for the effort expended. Sampling will encompass the entire length of Black Rocks occupied by humpback chub to ensure that all fish have an equal chance of being captured. During the first sample effort spend an additional night at False Black Rocks (Mee Canyon RM 138.2) to determine whether sample protocol should include sampling this location.

Based on previous field efforts the most effective gear is 1-in inner mesh trammel nets (McAda 2002; Chart and Lentsch 1999). However, there is some concern that trammel nets can produce injuries that might lead to delayed mortality if not used carefully (McAda 2002). To reduce stress to humpback chub, sampling will be done in fall as temperatures are falling in the river (mid September through October). Trammel nets will be run every hour to the extent possible, with 1.5 hr as the absolute maximum length of set. Fewer nets may be set than during the previous study to ensure that maximum length of set is not exceeded.

Extensive sampling will also be done with electrofishing, seining and hoop nets. The extra sampling will especially target chubs < 200 mm TL to estimate population size of fish about to recruit into the adult population. Recapture rates for fish this size are currently unknown, so catch per effort may have to be relied on to estimate recruitment rates. The extra sampling will also be used to evaluate techniques that might supplement or replace (if deemed necessary) trammel netting and reduce potential stress to the fish.

All specimens captured will be identified to species using criteria described by Douglas et al. (1989, 1998). Careful examination and use of specific criteria will be especially important for fish < 200 mm which can be difficult to distinguish to species. After handling, all chubs will be treated in a salt dip (1.5%, ~1 min) before release. In addition, treatment with a commercial fungicide (200 ppm, ~1 hr) will be explored. However, use of the fungicide will require holding the fish in a tank with aeration for about one hour before release.

A longer-term evaluation of delayed mortality will be attempted after further evaluation. Twenty roundtail chub captured by trammel nets will be held in live cages until the week of sampling is completed. Fish will be monitored daily to assess their health. At the end of one week the fish will be released.

Measure to total length.(1 mm) and weigh.(20 g) all Colorado pikeminnow, humpback chub, and roundtail chub captured. PIT tag all Colorado pikeminnow, humpback chub and roundtail chub greater than 160 mm total length. Identify and count all sympatric fishes collected during all sampling efforts.

Capture-recapture data for humpback chub will be placed into a matrix and run through program MARK. A population estimate will be calculated using the model most suitable for the sampling methods used. Survival rates may also be estimated. Population trends and population size structure will be determined using standard techniques described in Recovery Program (2002). Analysis of similar data collected during 1998 B 2008 indicated that capture probabilities (P^{\wedge}) ranged from 0.04B0.14 and coefficient of variation (CV) ranged from 0.13B0.98 (Francis and McAda 2011). These parameters varied with catch rates and number of sampling trips, but the current study will attempt to produce P^{\wedge} 's > 0.07 and CV \leq 0.25.

VII. Task Description and Schedule

1. Sample humpback chubs in Black Rocks; fall 2011 (FY 2011 and FY 2012); and fall 2012 (FY 2012 and FY 2013).
2. Compile data annually, prepare preliminary population estimate to be made available before the winter Colorado River researchers meeting and provided to the Recovery Program and USFWS for evaluation. Estimates will include numbers of adults (200 mm TL) in the population, as well as recruitment by juveniles (150B199 mm TL); winter 2011 B 2012 and 2012 B 2013. Larval Fish Lab will assist with a joint analysis of tag recapture data gathered from Black Rocks and Westwater canyons, 1998-2008, to assess populations abundance and potentially survival and transition rates among reaches. They will also provide a description of Methods and assist with interpretation. Addition of 2011-2012 data to such a combined analysis may also be possible but will be contingent upon success of this first-phase analysis.
3. Complete final report describing population size and structure of humpback chub in Black Rocks; winter, spring, summer 2013. Draft report August 1, 2013. Final Report, November 1, 2013.

VIII. FY-2012 - 2013

FY 12; Tasks 1 and 2
 FY 13, Tasks, 1,2, and 3

IX. Budget Summary

FY-2012

Tasks 1 and 2

Labor

Assistant P.L. (58 hrs @ 61.38)	\$ 3,560
Administrative Officer (91 hrs @ 39.63)	\$ 3,605
Fishery Biologist (300 hrs @ 42.91)	\$ 12,875
Crew Leader Tech (248 hrs @ 24.70)	\$ 6,125
Biological Technicians (2, 240 hrs @ 17.45)	\$ 8,375
Labor subtotal	\$ 34,540

Equipment and Supplies

Office Supplies (phones, paper, computer supplies, Postage, copying, etc)	\$ 820
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Field Equipment

Vehicle rental (2 @ 334 mon x 2 mon)	\$ 1,340
Boat gasoline 91 oct. (300 Gallons @ \$4.00)	\$ 1,200
Trammel Nets (6 @ 210)	\$ 1,260
Motor, generator and boat repair	\$ 2,000
Misc. Field supplies	\$ 800
Hoop nets and supplies	\$ 1,500
Equipment subtotal	\$ 8,920

Travel/Per Diem	
Field Work (4 people, 17 days @ 40 day)	\$ 2,720
Meeting (2 people, 3 days @ 150 day)	<u>\$ 900</u>
	\$ 3,620
Larval Fish Laboratory, Statistical Assistance	\$ 20,000
Total U.S. Fish and Wildlife Service	\$ 47,080
Total Larval Fish Laboratory	<u>\$ 20,000</u>
FY-2012 Grand Total	\$ 67,080

FY-2013

Tasks 1, 2, and 3

Labor	
Project Leader (40 hrs @ 76.34)	\$ 3,054
Assistant P.L. (80 hrs @ 65.05)	\$ 5,204
Administrative Officer (100 hrs @ 40.78)	\$ 4,078
Fishery Biologist (280 hrs @ 45.53)	\$ 12,749
Crew Leader Tech (160 hrs @ 26.17)	\$ 4,187
Biological Technicians (2, 120 hrs @ 17.95)	<u>\$ 4,308</u>
Labor subtotal	\$ 33,580
Equipment and Supplies	
Office Supplies (phones, paper, computer supplies, Postage, copying, etc)	\$ 600
Field Equipment	
Vehicle rental (2 @ 334 mon x 2 mon)	\$ 1,336
Boat gasoline 91 oct (200 Gallons @ \$4.00)	<u>\$ 800</u>
Motor and boat repair	<u>\$ 1,200</u>
Equipment subtotal	\$ 3,936
Travel/Per Diem	
Field Work (4 people, 9 days @ 40 day)	\$ 1,440
Meeting (2 people, 3 days @ 150 day)	<u>\$ 900</u>
	\$ 2,340
Larval Fish Laboratory, Statistical Assistance	\$ 5,000
Total U.S. Fish and Wildlife Service	\$ 39,856
Total Larval Fish Laboratory	<u>\$ 5,000</u>
FY-2013 Grand Total	\$ 44,856

X. Reviewers:

Program Staff and Biology Committee

XI. References

Chart, T.E., and L.D. Lentsch. 1999. Flow effects on humpback chub (*Gila cypha*) in Westwater Canyon. Final Report to Upper Colorado River Endangered Fish Recovery Program, Project Number 39. Utah Wildlife Resources, Moab and Salt Lake City, Utah.

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.

Douglas, M.E., W.L. Minckley, and H.M. Tyus. 1989. Qualitative characters, identification of Colorado River chubs (Cyprinidae: genus *Gila*) and the “art of seeing well.” Copeia 1989:653–662.

Francis, T.A., and C.W. McAda, 2011. Population size and structure of humpback and roundtail chub in Black Rocks, Colorado River, Colorado, 2007-2008. Final report to Upper Colorado River Endangered Fish Recovery Program, Project Number 131 (22-a-3). U.S. Fish and Wildlife Service, Grand Junction, Colorado.

McAda, C. W. 2007. Population size and structure of humpback chub in Black Rocks, Colorado River, Colorado, 2003-2004. Final report to Upper Colorado River Endangered Fish Recovery Program, Project Number 131 (22-a-3). U.S. Fish and Wildlife Service, Grand Junction, Colorado.

McAda, C. W. 2002. Population size and structure of humpback chub in Black Rocks, Colorado River, Colorado, 1998-2000. Final report to Upper Colorado River Endangered Fish Recovery Program, Project Number 22-a-3. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Recovery Program (Program Director’s Office, Upper Colorado River Endangered Fish Recovery Program). 2002. Protocols for Colorado pikeminnow and humpback chub population estimates. Draft Final Report to Upper Colorado River Endangered Fish Recovery Program. U. S. Fish and Wildlife Service, Denver, Colorado.

USFWS (U. S. Fish and Wildlife Service). 2002. Recovery goals for the endangered fishes of the upper Colorado River Basin. Draft Report, U. S. Fish and Wildlife Service, Denver, Colorado.

Larval Fish Laboratory cost breakdown to assist with data analysis and Methods write up; includes time for Dr. Gary White and Kevin Bestgen to participate.

FY 2012

salary (525/day, 32 days, includes 26.3% fringe rate)	17021
overhead (17.5%)	2979
total	20000

FY2013

salary (525/day, 8 days, includes 26.6% fringe rate)	4255
overhead (17.5%)	745
total	5000