

**COLORADO RIVER RECOVERY PROGRAM
FY-2006–2007 PROPOSED SCOPE OF WORK for:**

Project No.: 121b

Evaluation of Stocked Razorback Sucker and Colorado Pikeminnow–Gunnison River

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

Submitted by: Bob Burdick, Fishery Biologist (LEAD)
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Category: _____

Expected Funding Source:

- | | |
|--|--|
| <input 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 checked="" type="checkbox"/> Unsolicited proposal | |

I. Title of Proposal: **Evaluation of Stocked Razorback Sucker and Colorado Pikeminnow in the Gunnison River**

II. Relationship to RIPRAP:

IV. Manage Genetic Integrity and Augment or Restore Populations (Stocking Endangered Fishes)

IV.A.3. Razorback sucker

IV.A.3.b. Evaluate stocking success as identified in monitoring plans for stocked fish

IV.A.4. Colorado pikeminnow

IV.A.4.c. Evaluate stocking success as identified in monitoring plans for stocked fish

III. Study Background/Rationale and Hypotheses:

Study Background

Wild razorback suckers were last captured in the Gunnison River in the late 1970s (Holden et al. 1981), and in the Upper Colorado River in the late 1990's (from the Walter

Walker Wildlife Area in 1998; personnel communication, Douglas Osmundson, U. S. Fish and Wildlife Service, Grand Junction). Wild razorback sucker are virtually extirpated in these two river systems. Restoration stocking of razorback sucker began in April 1994 in the Gunnison River and continued annually through 2002 (Burdick 2003a). About 19,270 juvenile, sub-adult, and adult razorback sucker were stocked from 1994 through 2002. No razorback sucker were stocked in the Gunnison River during 2003; 549 razorback sucker were stocked in 2004. The total number of razorback sucker stocked to date (through 2004) in the Gunnison River is 19,819. This does not include the larval and juvenile razorback sucker stocked in 2004 into the Butch Craig property on the lower Gunnison River near Whitewater (river mile [rm] 12.9). Restoration stocking began in the Upper Colorado River in 1999 and has continued through 2004. About 48,060 juvenile, sub-adult, and adult razorback sucker were stocked during those 6 years. Domestic-reared Colorado pikeminnow were stocked in the Gunnison River in 2003 (1,051 fish) and 2004 (1,200 fish) near Delta, Colorado. In the Upper Colorado River, 1,165 domestic-reared Colorado pikeminnow were stocked at the Rifle Bridge (rm 240.4) in July 2004.

Razorback sucker stocked in the Gunnison River near Delta, Colorado, have been recaptured subsequent to their release upstream from the Redlands Diversion Dam. Twenty of these domestic-reared razorback sucker were recaptured from 1997–2001 in the Gunnison River upstream from Redlands Dam that had been at large for more than 6 months post-stocking (Burdick 2003). Six of these fish had been at large an average of 32 months (17.9–50.2 months) following release. Five of these six razorback sucker recaptured in the Gunnison River were at least 300 mm when stocked. All six fish were greater than 390 mm total length when recaptured, and therefore presumably sexually mature. How many stocked razorback suckers have survived and have remained in the Gunnison River is unknown.

Fifty-two domestic-reared razorback suckers stocked in the Upper Colorado and Gunnison rivers from 1996 through 2001 were recaptured in the Upper Colorado River. These fish had been at large for at least 6 months or greater following being stocked in the river. Fifteen of these fish were larger than 350 mm total length and are also presumed to be sexually mature. Thirteen of these fish were recaptured in the 15- and 18 mile reaches near Grand Junction, Colorado (Burdick 2003).

There is evidence that stocked razorback suckers are successfully reproducing in the Gunnison River. Adult razorback sucker successfully reproduced young in both 2002 and 2003. Eight confirmed razorback sucker larvae were identified from preserved seine and light-trap samples collected in the spring and early-summer of 2002 in the Gunnison River (personal communication, Dr. Kevin Bestgen, Larval Fish Laboratory, Colorado State University, Ft. Collins, Colorado). These fish were distributed throughout the river system. These eight larvae were collected over a 46-mile area. One fish was collected at rm 50.3, near the mouth of Roubideau Creek, three were collected between rm 9.6 and

5.9 and four fish at rm 4.8 (Osmundson 2002). However, it is unknown where these larval fish were actually produced. In 2003, seven razorback sucker larvae (two confirmed and five unconfirmed) were collected from the Gunnison River between Delta and the Redlands Diversion Dam during May and June of 2003 with hand seines. These larvae were distributed throughout the Gunnison River with individual larvae captured at the following river miles: 15.1, 17.5, 30.4, 37.0, 47.8, 52.7, and 54.1. Two larval razorback suckers were collected from the Gunnison River in 2004 (Osmundson 2005).

Rationale and Need for Evaluation

Burdick (2003) recommended that stocked fish be monitored following release, and at a frequency necessary to determine a) survival, b) dispersement, c) river-reach retention, d) distribution, and e) abundance. Validation of post-stocking survival in the wild is critical and one of the cornerstones for determining whether demographic recovery targets of fish abundance are being achieved. Determining post-stocking survival rates of domestic-reared razorback sucker in the wild is important because this will provide managers the projected time line to achieve recovery. The rate at which populations become established will depend on the post-stocking survival of domestic-reared razorback sucker in the wild, integration of stocked fish with wild stocks, reproductive success, and recruitment in the wild. Monitoring will also determine if the objectives identified in the recovery goals are being met which are to establish minimum viable populations at the designated abundance levels in the three identified river reaches in the Upper Colorado and Gunnison rivers.

Monitoring the occurrence, distribution, and post-stocking dispersal of stocked razorback sucker in the Gunnison River continued through the late-summer of 2001 (Burdick 2003). Unfortunately, there has been no systematic monitoring of stocked razorback sucker or Colorado pikeminnow in the Gunnison River upstream from the Redlands Diversion Dam (river mile 3) since 2001. Monitoring stocked native, endangered fishes (razorback sucker, Colorado pikeminnow, and bonytail) in the Upper Colorado River is conducted concurrent with other ongoing sampling programs, e.g., Colorado pikeminnow population sampling and nonnative fish removal efforts.

IV. Study Goals, Objectives, End Product:

Study Goals/Objectives

1. Determine stocking success of domestic-reared razorback sucker and domestic-reared Colorado pikeminnow in the Gunnison River, particularly fish stocked in 2002, 2003, and 2004.
2. Determine the post-stocking distribution of domestic-reared razorback sucker and domestic-reared Colorado pikeminnow in the Gunnison River.

3. Determine the current status of wild Colorado pikeminnow in the Gunnison River.

FINAL PRODUCT: Draft Final Report to coordinator: 5/1/2008
Draft Report to peer reviewers/BC: 6/1/2008
Revised Report for BC consideration: 7/15/2008

V. Study area

Gunnison River extending from the Redlands Diversion Dam (river mile 3) upstream to Hartland Diversion Dam (river mile 60) near Delta, Colorado.

VI. Study Methods/Approach

General

This will be a 3-year study with 2 years devoted to field work and 1 year for analyses and writeup of the field data. The study will commence in FY 2006 and end in FY 2008.

Fish Sampling

Electrofishing from aluminum jon boats and rubber rafts will be the method used to sample for stocked razorback sucker and stocked and wild Colorado pikeminnow. Two electrofishing craft will simultaneously proceed sampling downstream. Oar-powered electrofishing rafts will mainly sample shoreline habitats. Motorized electrofishing aluminum jon boats will sample all possible habitats which includes shorelines, backwaters, and eddies. The type of craft used for each sampling outing will be determined by the river stage and water levels. We propose three sampling trips per year. One trip will be prior to runoff in early-May, and the other two trips will be during the post-runoff river stage: one in mid- to late-July, and the third in late-August to early-September. The sampling period that we propose for the two summer sampling trips will be similar to when the two sampling trips were conducted in the Gunnison River between 1996 and 2001. Most of the sampling trips during those 6 years occurred in mid-to late-July and late-August or early-September. One of these sampling trips will be timed to coincide with the estimated spawning period for razorback sucker (mid-May) and one timed to coincide to with the spawning period for Colorado pikeminnow (mid July). Exact scheduling will be determined based on the estimated runoff patterns based on snow pack at the end of the year.

At recapture, all razorback sucker and Colorado pikeminnow will be checked for the presence of a PIT tag, weighed (g), and measured (TL). Other data recorded will be recapture location (river and rm) and date. These data will be compared to the stocked razorback sucker database and the following summary information provided: 1) return rates of recaptured razorback sucker relative to individual size classes of stocked fish, 2)

total return rates of recaptured fish by size class relative to the total number of razorback sucker stocked to date, 3) post-stocking temporal (represented by time-at-large) and spatial (represented by river miles) displacement and movement, 4) the number of recaptured razorback sucker originally stocked from various sources (i.e., hatcheries and various grow-out ponds) by year, and 5) length frequency of stocked and recaptured razorback sucker.

Similar comparisons will be made for stocked Colorado pikeminnow. If sufficient wild Colorado pikeminnow are captured, a population estimate will be conducted.

VII. Task Description and Schedule

Description

- Task 1. Electrofish all possible riverine habitats.
- Task 2. Analyze data; prepare annual RP report.
- Task 3. Prepare draft and final project reports.

Schedule:

- Task 1: May; July; August/September 2006 and 2007
- Task 2: October/November 2006 and 2007
- Task 3: November/December 2007; January–August 2008

VIII. FY-2006 Work (year 1 of multi-year study)

Deliverables/Due Dates Annual Report Due 11/2006

Budget

Task 1. Electrofish all possible riverine habitats (3 separate trips)

Labor (salary and benefits)

Project Leader (1-GS-14 @ 2,035)	3 weeks	\$ 6,105
Project Biologist (1-GS-12 @ 1,846)	10 weeks	\$ 18,460
Bio-Technician (1-GS-7 @ 1,030)	4 weeks	\$ 4,120
Bio-Technician (1-GS-6 @ 658)	4 weeks	\$ 2,632
Bio-Technicians (2-GS-5 @ 591)	4 weeks	\$ 4,728
Admin. Assistant (1-GS-9 @ 1,332)	3 weeks	\$ 3,996
	Subtotal	\$ 40,041

Equipment/Supplies

Vehicles (FWS-owned and GSA-leased: maintenance)	\$ 1,800
Gasoline & outboard motor oil (vehicles and outboard	

motors)		\$ 1,100
Maintenance		
outboard motor repair, Labor (\$72 hour) + parts, e.g., fuel pumps, carburetor overhaul, shifter control cables and adjustments, electrical power pack replacements, new props		\$ 1,500
Outboard Jets Labor (\$72/hr) + parts; e.g. stainless steel impellers, liners, intake assemblies, water pumps, shims re-machine and balance drive shafts		\$ 1,000
Raft supplies: e.g., oar blades and shaft replacements, H-D straps, welding to modify and repair aluminum raft Frame and generator frame		\$ 500
Boat and raft trailer maintenance and repair: e.g., new tires, re pack and replace wheel bearings, replace lights and connectors as needed.		\$ 500
Electrofishing Components (stainless steel cable, spheres, receptacles, plugs, S.O. cable, etc.)		\$ 1,000
Office (misc.–paper, telephones, computer software, office supplies)		\$ 1,500
	Subtotal	\$ 8,900

Travel

Field trips (3) to sample fish (camp out); 5 days/trip \$24/day; 5-person crew; 15 days X \$108 per trip/person		\$ 1,800
	Subtotal	\$ 1,800

Task 1 Total \$ 50,741

Task 2. Analyze data; write annual RP report.

Labor (salary and benefits)

Project Leader (1-GS-14 @ 2,035)	1 week	\$ 2,035
Project Biologist (1-GS-12 @ 1,846)	2 weeks	\$ 3,692
Admin. Assistant (1-GS-9 @ 1,332)	1 week	\$ 1,332
	Subtotal	\$ 7,059

Travel

(RP meetings/workshops/professional meetings)	\$	500
Subtotal	\$	500
Task 2 Total	\$	7,559
FY2006 Total	\$	58,300

FY-2007 Work (year 2 of multi-year study)

Deliverables/Due Dates

Annual Report Due 11/2007

Budget (3% inflation rate applied from 2006)

Task 1. Electrofish all possible riverine habitats (3 separate sampling trips)

Labor (salary and benefits)

Project Leader (1-GS-14 @ 2,096)	3 weeks	\$ 6,288
Project Biologist (1-GS-12 @ 1,902)	10 weeks	\$ 19,020
Bio-Technician (1-GS-7 @ 1,061)	4 weeks	\$ 4,244
Bio-Technician (1-GS-6 @ 678)	4 weeks	\$ 2,712
Bio-Technicians (2-GS-5 @ 609)	4 weeks	\$ 4,872
Admin. Assistant (1-GS-9 @ 1,372)	3 weeks	\$ 4,116
	Subtotal	\$ 41,252

Equipment/Supplies

Vehicles (FWS-owned and GSA-leased: maintenance)	\$ 1,860
Gasoline & outboard motor oil (vehicles and outboard motors)	\$ 1,135

Maintenance

outboard motor repair, Labor (\$72 hour) + parts, e.g., fuel pumps, carburetor overhaul, shifter control cables and adjustments, electrical power pack replacements, new props \$ 1,500

Outboard Jets Labor (\$72/hr) + parts; e.g. stainless steel impellers, liners, intake assemblies, water pumps, shims re-machine and balance drive shafts \$ 1,100

Raft supplies: e.g., oar blades and shaft replacements, H-D straps, welding to modify and repair aluminum raft Frame and generator frame \$ 500

Boat and raft trailer maintenance and repair: e.g., new tires, re pack and replace wheel bearings, replace lights and connectors as needed. \$ 500

Electrofishing Components (stainless steel cable, spheres, receptacles, plugs, S.O. cable, etc.) \$ 1,030
 Office (misc.–paper, telephones, computer software, office supplies) \$ 1,545
 Subtotal \$ 9,170

Travel

Field trips (3) to sample fish (camp out); 5 days/trip
 \$24/day; 5-person crew;
 15 days X \$108 per trip/person \$ 1,860
 Subtotal \$ 1,860

Task 1 Total \$ 52,282

Task 2. Analyze data; write annual RP report

Labor (salary and benefits)

Project Leader (1-GS-14 @ 2,096) 1 week \$ 2,096
 Project Biologist (1-GS-12 @ 1,902) 2 weeks \$ 3,804
 Admin. Assistant (1-GS-9 @ 1,372) 1 week \$ 1,372
 Subtotal \$ 7,272

Travel

(RP meetings/workshops/professional meetings) \$ 515
 Subtotal \$ 515

Task 2 Total \$ 7,787

FY2007 Total \$ 60,070

FY-2008 Work (year 3 of multi-year study)

Deliverables/Due Dates Draft Report to coordinator: 5/1/2008
 Draft Report to peer reviewers: 6/1/2008
 Revised Report for BC consideration: 7/15/2006
 Annual Report due: 11/2008

Budget (3% inflation rate applied from 2007)

Task 2. Analyze data; write annual RP report
 Task 3. Write draft and final report.

Labor (salary and benefits)

Project Leader (1-GS-14 @ 2,159)	3 weeks	\$ 6,477
Project Biologist (1-GS-12 @ 2,018)	12 weeks	\$ 23,508
Admin. Assistant (1-GS-9 @ 1,414)	2 weeks	\$ 2,828
	Subtotal	\$ 32,813

Printing and Distribution (e.g., GPO printing; postage
 & mailing of Final Report)

Subtotal	\$ 1,500
Subtotal	\$ 1,500

Equipment (3 % inflation rate applied from FY-2007)

Office (paper, telephones, postage, office supplies, computer software/support, misc.)	\$ 1,595
Subtotal	\$ 1,595

Travel

(RP meetings/workshops/professional meetings)	\$ 530
Subtotal	\$ 530

Task 2/3 Total\$ 36,438

FY2008 Total \$ 36,438

IX. Budget Summary

FY-2006	\$ 58,300
FY-2007	\$ 60,070
<u>FY-2008</u>	<u>\$ 36,438</u>
Grand	
Total:	\$ 154,812

X. Reviewers

XI. References

Burdick, B. D. 2003. Monitoring and evaluating various sizes of domestic-reared razorback sucker stocked in the Upper Colorado and Gunnison rivers: 1995–2001. Final Report prepared for the Recovery Implementation Program for Endangered

Fishes in the Upper Colorado River Basin. Recovery Program Project Number 50. U. S. Fish and Wildlife Service, Colorado River Fishery Project, Grand Junction, Colorado. 54 pp + appendices.

Holden, P. B., C. Richard, L. W. Crist, and J. R. Campbell. 1981. Aquatic biology studies for proposed Colorado-Ute Electrical Association power plant near Grand Junction, Colorado. Final Report to Burns and McDonnell, Planning and Environmental Analysis Division. Report PR-56-1, BIOWEST, Inc., Logan, Utah.

Osmundson, D. B. 2002. Verification of stocked razorback sucker reproduction in the Gunnison River via annual collections of larvae. Annual report prepared for the Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin. Recovery Program Project Number 121. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

Prepared and compiled by Bob D. Burdick, 25 April 2005
revised 11/7/05 and 2/7/06, cwm
Gunnison River fish survey 0607.wpd