I. Project Title: **Verification of stocked razorback sucker reproduction in the Gunnison and upper Colorado rivers via annual collections of larvae.**

II. Principal Investigator(s):
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III. Project Summary:

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 1990s (from the Walter Walker Wildlife Area in 1998). 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 is ongoing (Burdick 2003,). About 27,333 juvenile, sub-adult, and adult razorback sucker have been stocked through 2007. Restoration stocking began in the upper Colorado River in 1999 and is ongoing. Through 2007, about 73,202 juvenile, sub-adult, and adult razorback sucker have been stocked in the Colorado River.

To produce a self-sustaining population in a particular river system, some stocked individuals need to 1) survive, 2) remain in the vicinity of release, or if displaced downstream, return upstream to spawn, 3) successfully spawn in either the Gunnison or upper Colorado rivers, and 4) progeny need to survive to adulthood and be retained in or return to the Gunnison and upper Colorado river so as to maintain an adult population there. Razorback sucker stocked in the Gunnison River near Delta, Colorado, have been recaptured upstream from the Redlands Diversion Dam subsequent to their release. Twenty of these, recaptured between 1997–2001, had been at large for more than six months post-stocking (Burdick 2003). Six of these fish were at large at least 18 months (17.9–50.2 months) following release. Five of these six were at least 300 mm when stocked. All six fish were >390 mm long when recaptured, and therefore presumably sexually mature. How many stocked razorback suckers have survived and remained in the Gunnison River is unknown, but those that have will spawn if suitable spawning conditions are present. The capture of razorback sucker larvae provides verification that stocked fish have successfully spawned.

This project was initiated as a means to document the occurrence of razorback sucker larvae in the Gunnison River and thereby verify that successful reproduction occurs. In the first year, 2002, larvae were indeed found. Hence, the initial objective of the study, to determine whether razorback suckers can and will reproduce in the Gunnison River, was achieved. However, this important discovery now leads to new questions and objectives. To restore the Gunnison River as razorback sucker habitat and promote a self-sustaining population there, managers need more information regarding patterns of reproduction, and more importantly, to determine what is needed to promote larval survival and later recruitment to the adult population. Are more larvae produced during years with specific flow conditions? What is the distribution of larvae? Documenting patterns of larval distribution may help identify spawning sites and perhaps areas that could be managed as nursery habitat. The methodology is to search for larvae in backwater and shoreline habitats during and immediately after the suspected spawning

period for a period of about six weeks during May and early June. The study area includes the Gunnison River upstream of the Redlands Diversion Dam near Grand Junction to Confluence Park in Delta, Colorado (rm 3.0-57.0). In 2004, the study area was expanded to include the 57 miles of the upper Colorado River from the Grand Valley Irrigation Company Diversion (rm 185.1) in Palisade, Colorado, downstream to the Westwater Ranger Station, Utah (rm 127.6). A combination of daytime shoreline seining and over-night light-trapping have been used to capture larvae. The Larval Fish Laboratory at Colorado State University performs larvae identification. Year 2004 was initially intended to be the last of a three-year field effort, but sampling was continued through 2007. In 2002, eight razorback sucker larvae were captured, seven with dip-net sampling and one with light-trap sampling, all between May 21 and June 6. In 2003, seven razorback sucker larvae were collected, all from seine samples between May 21 and June 10. In 2004, light trapping was dropped as a capture technique. Two razorback larvae were captured from the Gunnison River with dip nets on June 16. Two were also collected from the Colorado River: one on May 20 and one on May 27. In 2005, six larvae were captured between June 24 and July 7: two from the Gunnison River and four from the Colorado. All four Coloradao River specimens were collected between Loma and Westwater. In 2006, seven larvae were collected from the Colorado River: three on June 8; four on June 16. All were captured between rm 129.0-156.8. No razorback larvae were collected from the Gunnison River in 2006. In 2007, one larva tentatively identified as a razorback sucker was collected from the Gunnison River on May 15; 16 other larva were collected from the Colorado River between May 29 and June 22, including five considered tentative identifications. The following is a list of capture locations from the Gunnison and Colorado rivers during the 2002-2007 sampling period including both positive and tentative identifications:

Date	River	RMI	No. caught	Method
		2002		
May 21	Gunn	6.9-9.1	1	Dip-Net
May 30	Gunn	4.8	3	Dip-Net
May 30	Gunn	5.9-8.4	2	Dip-Net
Jun 6	Gunn	4.8	1	Dip-Net
Jun 6	Gunn	50.2	1	Light-trap
		2003		
May 21	Gunn	15.1	1	Dip-Net
Jun 4	Gunn	37.0	1	Dip-Net
Jun 5	Gunn	17.5	1	Dip-Net
Jun 9	Gunn	54.1	1	Dip-Net
Jun 9	Gunn	52.7	1	Dip-Net
Jun 9	Gunn	47.8	1	Dip-Net
Jun 10	Gunn	30.4	1	Dip-Net
		2004		
Jun 16	Gunn	33.6	1	Dip-Net
Jun 16	Gunn	33.4	1	Dip-Net
May 20	Colo	162.7	1	Dip-Net
May 27	Colo	154.0	1	Dip-Net
		2005		
Jun 24	Gunn	43.2	1	Dip-Net

Jul 7	Gunn	9.6	1	Dip-Net
Jun 27	Colo	144.0	1	Dip-Net
Jun 27	Colo	129.7	1	Dip-Net
Jun 27	Colo	139.9	1	Dip-Net
Jun 27	Colo	144.0	1	Dip-Net
		2006		
Jun 8	Colo	131.5	1	Dip-Net
Jun 8	Colo	130.3	1	Dip-Net
Jun 8	Colo	129.0	1	Dip-Net
Jun 16	Colo	156.8	1	Dip-Net
Jun 16	Colo	155.6	2	Dip-Net
Jun 16	Colo	148.0	1	Dip-Net
		2007		
May 15	Gunn	14.3	1	Dip-Net
May 29	Colo	163.5	1	Dip-Net
May 29	Colo	162.5	1	Dip-Net
May 29	Colo	154.3	1	Dip-Net
Jun 4	Colo	154.3	1	Dip-Net
Jun 5	Colo	138.8	1	Dip-Net
Jun 5	Colo	128.0	1	Dip-Net
Jun 11	Colo	167.2	1	Dip-Net
Jun 14	Colo	142.0	1	Dip-Net
Jun 14	Colo	140.0	1	Dip-Net
Jun 14	Colo	126.6	1	Dip-Net
Jun 14	Colo	124.7	1	Dip-Net
Jun 21	Colo	181.6	1	Dip-Net
Jun 21	Colo	177.8	1	Dip-Net
Jun 21	Colo	154.0	1	Dip-Net
Jun 22	Colo	148.7	1	Dip-Net
Jun 22	Colo	166.8	1	Dip-Net

IV. Study Schedule: 2001-2008

V. Relationship to RIPRAP: Colorado River Action Plan: Gunnison River IV.A.1.b(2)
Monitor and evaluate stocking results; make recommendations regarding further augmentation.

VI. Accomplishment of FY 08 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

1) Prepare annual report
   This annual report fulfills this task.
2) Analyze data and prepare final report.

Data analysis and preparation of final report is not yet complete.

VII. Recommendations: Complete final report in FY2009.

VIII. Project Status: Project is ongoing and not on-track. Field work for 2007 was completed on schedule. Larval samples continue to be analyzed at the Larval Fish Lab. The razorback identifications are, however, complete. Identification of other species will take another couple of months. A draft report will be prepared by March 1, 2009. Final 2007 results will be available from the larval Fish lab by that time.

IX. FY 2008 Budget. $21,429 total

A.	Funds Provided to FWS:	21,429
B.	Funds Expended:	21,429
C.	Difference:	0
D.	Publication costs	(included in cost above)

Deliverables will be provided in FY2009; no funding sought for 2009 work, i.e., funds expended in 2008, but product will be delivered late.

X. Status of Data Submission: Data will be submitted to the database manager upon completion of the study in 2009.

XI. Signed: *Douglas Osmundson*, Fishery Biologist, Lead investigator
11/14/07

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