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):
Douglas Osmundson, Fishery Biologist (lead)
Chuck McAda, Project Leader
U.S. Fish and Wildlife Service
764 Horizon Drive, Building B
Grand Junction, Colorado 81506
(970) 245-9319: Fax 245-6933
Chuck_McAda@FWS.gov
Doug_Osmundson@FWS.gov

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 survive and remain 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. Although the lab has not entirely finished processing samples at this time, it appears that no razorback larvae were collected from the Gunnison River in 2006. No lab work has yet been done on the samples collected in 2007. The following is a list of capture locations from the Gunnison and Colorado rivers during the 2002-2006 sampling.

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

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 07Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

1) Collect samples of larvae. This task was completed on schedule. Because almost all razorback sucker larvae collected in the Gunnison River in 2002 and 2003 were from areas that would not have been accessible for light-trapping, sampling in 2004-2007 relied entirely on dip-net sampling. This provides coverage of the whole study reach allowing distributional information to be collected in addition to just presence/absence results. Sampling was done by a two-person crew boating down the river and sampling habitats with a fine-mesh net set between two hand brailes. In 2007 a total of 292 seining efforts were conducted in the Gunnison River between May 15 and June 27. A total of 289 seining efforts were conducted in the Colorado River between May 9 and June 29. A total of 435 sample bottles containing larvae were collected from the two rivers. A razorback sucker spawning site was discovered at RM 154.1 on the Colorado River in 2007 by an electrofishing crew.

2). Analyze samples in the lab. Samples have been shipped to the Larval Fish Laboratory.

VII. Recommendations: Write final report in 2008.

VIII. Project Status: Project is ongoing and on-track. Field work for 2007 was completed on schedule. Larval samples have been shipped to the Larval Fish Lab for analysis. No sampling is planned for 2008. A summary report will be prepared in 2008. Date of draft will be contingent on receiving 2007 results from the larval Fish lab.

IX. FY 2007 Budget. $79,384 total ($22,000 goes to Larval Fish Lab)

A.	Funds Provided to FWS:	57,384	
B.	Funds Expended:	57,384	
C.	Difference:	0	
D.	Publication costs		0

X. Status of Data Submission: Data will be submitted to the database manager upon completion of the study in 2008.

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

c:\WPwin\Annuals\rzlarvae07wpd