COLORADO RIVER RECOVERY PROGRAM
FY 2009 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: NA

I. I. Project Title: Demographic estimates and monitoring for razorback sucker in the Colorado and Green River basins, Utah and Colorado

II. Principal Investigator(s):
Lead Agencies: Larval Fish Laboratory, CSU

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III. Project Summary: The goals of this study are twofold. First, we will provide an updated, basin-wide assessment of certain assumptions and demographic parameters for razorback sucker in the Green and Colorado River subbasins based on release of hatchery-reared razorback suckers beginning in 2004 and collection of recapture data through 2008. Results will be useful to managers attempting to restore razorback sucker and may also guide future production and stocking strategies for hatcheries. Second, we will provide an updated monitoring plan for assessing distribution and abundance of razorback suckers in the Upper Colorado River Basin.

IV. Study Schedule: Initial Year 2009
Final year 2010

V. Relationship to RIPRAP:

Green River Action Plan: Mainstem
V. Monitor populations and habitat and conduct research to support recovery actions (Research, monitoring, and data management).
V.D. Conduct abundance estimate for razorback sucker. Develop plan in FY 09 (based, in part, on recommendations from evaluation of stocked razorback report).

Colorado River Action Plan: Mainstem
V. Monitor populations and habitat and conduct research to support recovery actions (Research, monitoring, and data management).

VI. Accomplishment of FY 2009 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Recovery of razorback sucker requires “genetically and demographically viable, self-sustaining populations” in the Upper Colorado River Basin, but status of most populations, which are established largely via repatriation of stocked hatchery individuals, is poorly known. A

fundamental requirement of any recovery action, including stocking, is evaluation. A thorough analysis of survival of hatchery-reared razorback suckers was recently completed for a portion of the Upper Colorado River Basin, in the Green and Colorado River subbasins (Zelasko et al. 2009). However, stocking and recapture data collected since 2006 will aid evaluation of both the integrated stocking plan for the species (Nesler et al. 2003) and efforts aimed at re-establishing self-sustaining razorback sucker populations (U.S. Fish and Wildlife Service 2002).

Razorback sucker stocking data, 2004–2007, and capture data, 2005–2008, were acquired from the Upper Colorado River Basin database, USFWS, Grand Junction, CO. Searches were conducted for PIT tag sequences with invalid, missing, or extra characters, stocking records with duplicate PIT tags, captures of hybrids, and multiple same-day detections of individuals at stationary antennas. Errors were rectified, when possible, and unusable records were removed from the data set.

Variables identified that may affect razorback sucker survival and/or capture probability included: fish TL and weight at time of stocking; location, month, season, and year of stocking; agency, method, and source of rearing; time since stocking; year of capture. Missing individual lengths were replaced with mean values of lengths of fish from the same "batch" (same year class, lot, rearing source, and date and location of stocking), when available. Records with no batch from which to calculate mean lengths (n = 11) were removed from analysis. Stock locations (river and river mile) were converted into five river reaches and stocking months were grouped into seasons. Details of razorback sucker rearing practices were gathered from USFWS personnel in Vernal, UT, and Grand Junction, CO. That information is being examined to determine the most appropriate grouping of stocked razorback suckers to estimate differences in survival among fish originating from distinct, and often complex, rearing methods.

Queries in Microsoft Access were used to relate stock records to capture records by PIT tags and create capture histories for every stocked individual. Recapture records of fish during the same years in which they were stocked, as well as multiple within-year recaptures, were removed because they are not useful for survival analyses. The final dataset consists of 98,437 records of razorbacks stocked from 2004 through 2007. Of those, 1,606 individuals were recaptured one to three times from 2005 to 2008, resulting in 1,653 total recapture events. Summary tables of stocked razorback suckers (by year, season, month, reach, TL, agency, rearing source, recaptures, as well as combinations of those variables) were created to determine consistency of sources, stocking areas, fish sizes and other variables, and to identify possible sources of confounding. The summaries will aid in deciding which variables to include in the model set to be tested and in understanding analysis results.

Prior to data analysis, the Program Director's office will be consulted in order to facilitate better understanding of the available data and ensure that all variables of interest have been considered. Additional tasks in preparation for analysis include: rearing method grouping, data input file creation, *a priori* model set generation, and physical model building. Preliminary results may be made available in a presentation at the Program's 31st Annual Researchers Meeting, January 2010.

The second aspect of this study, development of a razorback sucker monitoring program, is still

being developed. A portion of the results useful for this aspect are being developed in the Floodplain Synthesis project, relating to light trap sampling.

VII. Recommendations: Continue research.

VIII. Project Status: Data analysis for the survival estimation portion of the study is about to commence. That aspect is about 30% complete. The monitoring program development has just started.

IX. FY 2009 Budget Status

A. Funds Provided: $83,603
B. Funds Expended: $12,000
C. Difference: $71,603
D. Percent of the FY 2009 work completed, and projected costs to complete: about 20% complete. All funds were provided in FY 2009 for tasks in FY 2009 and FY2010. No additional funds needed to finish project.
E. Recovery Program funds spent for publication charges: None

X. Status of Data Submission (Where applicable): NA

XI. Signed: *Kevin R. Bestgen* 10 Nov. 2009
Reporting Principal Investigator Date