

I. Project Title: Evaluation of survival and growth of larval razorback sucker and bonytail stocked into floodplain depressions (Baeser Bend) of the middle Green River.

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III. Project Summary:

In 2002, a cooperative study by UDWR and Vernal FWS was conducted at The Stirrup floodplain depression that evaluated growth and survival of larval razorback sucker and bonytail chub stocked into The Stirrup floodplain which had been “reset” due to an extended drought and the subsequent drying of the floodplain depression. The approach of this study was to fill The Stirrup depression by pumping water into the site, constructing enclosures to maintain tighter control of the experiment, and stocking these enclosures with nonnative fish species at densities that have been demonstrated to be present during the natural connection of the river with the floodplain depression. Larval razorback sucker were then stocked into the enclosures to evaluate growth and survival in the presence of abundant nonnative fishes. These larval razorback sucker were stocked into two enclosures at different densities. The highest density enclosure was stocked at a rate of 1.8 million larvae/acre and the lower density enclosure was stocked at a rate of approximately 241,000 larvae/acre. The subsequent evaluation of larval survival and growth revealed that several thousand larval razorback sucker survived in the presence of abundant nonnative species (Table 3.). Furthermore, growth rates of the surviving larvae were excellent, averaging 140 mm at the end of the first growing season.

In 2003, we used the Baeser Bend floodplain depression to evaluate survival at lower stocking densities, to identify the lower stocking threshold needed to enable detection of surviving larvae. We also evaluated the potential influences of stocking larval bonytail in conjunction with larval razorback sucker in an environment containing nonnative predators. Results in 2003 suggest that larval survival is density dependant. The project will continue through 2004.

IV. Study Schedule:

The initial year of this project is 2003. Fieldwork will be completed in the fall of 2004 and the final report will be complete in July 2005.

V. Relationship to RIPRAP:

GREEN RIVER ACTION PLAN: MAINSTEM

- II. Restore habitat.
- II.A. Restore and manage flooded bottomland habitat.
- II.A.3. Implement levee removal strategy at high-priority sites.
- II.A.3.c. Evaluation.

VI. Accomplishment of FY 2003 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Construct and install enclosures

The experimental enclosures were constructed at the Baeser floodplain site beginning in March and were completed in early May. Twelve 1/8-acre enclosures were constructed using field fence and steel t-posts as the framework over which 7mm hardware cloth was attached. Over the hardware cloth a layer of 1-mm mesh screen was attached using lath and screws. The final layer intended to contain stocked larval razorback sucker was poly-tarp. The bottom 30 cm of the 1-mm mesh screen was buried in a trench and the bottom of the poly-tarp was anchored using 1/2" re-bar.

Task 2: Stock larval razorback sucker and bonytail, and nonnative fishes, into enclosures

Water was pumped into the floodplain site in order to allow stocking of bonytail larvae on 13 May. A total of 2,000 bonytail larvae were stocked into two enclosures prior to high flows and floodplain connection. The Baeser floodplain connected with the river on Tuesday 20 May 2003 and was full by 22 May. The high flows (~19,000 cfs) totally inundated the study enclosures making it necessary to wait for flows to subside before larvae could be stocked into the enclosures. After waiting for a week for the floodplain site to drain, water levels were still too high to stock larvae so we employed water pumps to get additional water out. Baeser was pumped with two 11-hp trash pumps for a week and then two more pumps from CRFP Vernal (Pfeifer) were added for two days of pumping.

Finally, on Friday 20 June, 17,000 razorback sucker larvae were stocked into 12 enclosures at six densities to evaluate survival of razorback sucker larvae in the presence of nonnatives.

Numbers of larvae stocked into each 1/8-acre enclosure were as follows:

- 2 enclosures with 4,500
- 2 enclosures with 2,250
- 2 enclosures with 1,000
- 2 enclosures with 500
- 2 enclosures with 150
- 2 enclosures with 100

Originally the study approach was to have two enclosures used as controls. However, due to the over-topping of the enclosures as a result of the high flows, controls without any non-native species present was not possible. Composition of nonnative species in Baeser following connection was evaluated prior to stocking razorback sucker larvae by sampling for two nights with 1/4" mesh fyke nets. Composition of fish species present was approximately 90% YOY carp, 5% red shiner, 2% fathead, 2% green sunfish, and 1% bullhead catfish. Other species collected in very low numbers included juvenile white sucker and sand shiner.

Task 3: Field Data Collection

Following stocking of larval bonytail and razorback sucker, water quality was monitored over 24-hour periods one to two times per week. Zooplankton densities were monitored weekly both inside and outside the enclosures. Fish were monitored visually at least two times weekly.

Sampling of the enclosures at Baeser began August 5 and was completed on August 29. Fyke nets were set in four enclosures beginning with the highest density for four nights. Two 1/4" mesh and one 3/4" mesh fyke nets were set in each enclosure. All fish were removed from the fyke nets and placed on a sorting table to aid in locating any surviving razorback suckers or bonytail. All fish were removed from the floodplain site. The likelihood of the floodplain site completely drying up prompted us to salvage live bonytail and razorback sucker by taking them to the Stirrup floodplain site. Survival of razorback sucker was detected in the lowest and the highest density enclosures. However, survival among all enclosures was quite variable. The highest survival (11%) was observed in one of the highest density (36,000 larvae/acre) enclosures and survival was one of the lowest (0.2%) in the other highest density enclosure. On average the four enclosures with the lowest density of stocked razorback sucker had the lowest estimated survival rate. This suggests that survival of larval razorback sucker is positively density dependent.

Task 4: Data entry and analysis

All data have been entered into a database and analysis is scheduled to be complete by January 2004.

Task 5: Report Preparation

Annual RIP Report was completed on November 5, 2003
Draft report to coordinator 15 March 2005; to peer review and Biology
Committee 15 April 2005; final draft to Biology Committee 1 July 2005.

VII. Recommendations: This project should continue as scheduled in the approved scope of work.

VIII. Project Status:

This project is on track and ongoing. Fieldwork will be completed in 2004 and the final completion report will be submitted in July 2005.

IX. FY 2003 Budget Status

- A. Funds Provided: \$76,100
- B. Funds Expended: \$76,100
- C. Difference: \$ 0
- D. Recovery Program funds spent for publication charges: \$0

X. Status of Data Submission (Where applicable): Data will be submitted at the completion of the study.

XI. Signed: Ron Brunson November 5, 2003
Principal Investigator Date