

I. Project Title: Evaluation of larval razorback sucker drift into flood plain wetlands.

II. Principal Investigators:

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III. Project Summary:

Flood plain wetlands are presumed to be important rearing habitat for the endangered razorback sucker (Wydoski and Wick 1998; Muth et al. 1998; Lentsch et al. 1996). Reproduction by razorback suckers occurs in the spring during peak flows of the hydrograph when highly productive flood plain habitats are accessible (Muth et al. 1998). This seasonal timing of razorback sucker reproduction indicates possible adaptation for utilizing flood plain habitats (Muth et al. 1998).

Based on the assumption that flood plain wetlands provide critical rearing habitat for razorback sucker, the Recovery Program initiated an extensive flood plain habitat restoration program (Levee Removal). The goal of the Levee Removal Program was to restore natural flood plain wetland habitats and functions that support recovery of endangered fish (specifically the razorback sucker; Lentsch et al. 1996). To accomplish this goal, levees at selected wetlands were lowered to increase the frequency of the riverine-flood plain connection to pre-Flaming Gorge Dam levels. In nearly all cases a single breach was cut at the downstream end of selected sites (except Leota L-7). This breach configuration was based on the assumptions that: 1) Rates of sediment deposition would be lowest with a downstream breach, resulting in less need for annual excavation to maintain connections between the site and the river; and 2) Downstream breaches would be less risky in terms of affecting site morphology and main channel stability, and would be less likely than an upstream breach to reroute the main channel or convert the wetland into a secondary channel. However, the primary problem with downstream configuration of levee breaches is that transport of drifting larvae to the flood plain is not maximized. This is significant because flood plain wetlands are occupied by high densities of nonnative fish and other potential predators. Optimization of larval entrainment in the flood plain may be crucial for ensuring some survival of entrained larval razorback sucker. Sites with single downstream breaches do not optimize larval entrainment because fish can only be entrained on days of increasing flow.

An experimental effort to improve connection was conducted in the spring of 2000 and breaches were cut on the upstream ends of the Above Brennan and Bonanza Bridge sites. Breaches configured in this manner should maximize larval razorback entrainment because water flowing into the site is not dependent on “filling surges”. Instead, water will flow into these sites constantly during the period river flows exceed the flood ability level of the upstream breaches. Evaluating the effectiveness of these new levee breach configurations will provide answers to several important questions pertaining to the flood plain restoration program. These are: 1) Can we entrain larval razorback suckers in the flood plain by lowering levees to improve the riverine-flood plain connection? 2) Can they be entrained at high enough numbers to ensure some survival from predation by nonnative fish and piscivorous insects? And how should future levee breaches be configured? To evaluate the entrainment effectiveness of the new upstream breaches, the strategy is to monitor the passage of drifting larvae into the sites and estimate the number of larvae entrained. Then, assuming some larvae are entrained, determine if any survive within the sites.

Study Goal

To determine larval fish entrainment effectiveness of upstream breach configurations.

Study Objectives

1. Monitor passage of drifting native sucker larvae into flood plain sites through new upstream connections.
2. Determine an estimate for the number of larvae entrained in each site.
3. Determine if upstream breach connections are more effective for entraining larval razorback suckers than downstream breaches.
4. Determine if any entrained native sucker larvae survive in the flood plain.

IV. Study Schedule:

Initial year - FY 2001

Final year - FY 2004

As a result of low river flows these flood plains did not connect in 2001 or 2002, so the project and funding will be carried over to FY 2003.

V. Relationship to RIPRAP:

GREEN RIVER ACTION PLAN: MAINSTEM

II. Restore habitat

II.A.3. Implement levee removal strategy at high priority sites.

II.A.3.c. Evaluation

VI. Accomplishment of FY 2002 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Due to extremely low water conditions in the middle Green River, field work scheduled for this project was not initiated. Work and funding has been carried over into FY 2003.

VII. Recommendations:

Proceed with project as outlined in approved FY 2002 scope-of-work contingent upon adequate river flows.

VIII. Project Status:

Field work for this project will be initiated during FY 2003.

IX. FY 2002 Budget Status

- A. Funds Provided: \$ 36,500
- B. Funds Expended: \$ 2,714
- C. Difference: \$ 33,786
- D. Percent of the FY 2002 work completed, and projected costs to complete: 7% (see section VI.). Field work was not completed in FY 2002. Work and funds will be carried over to FY 2003. Funds expended were for sampling equipment (flow meters, drift nets etc.) and training of seasonal crews.
- E. Recovery Program funds spent for publication charges: \$ 0

X. Status of Data Submission: N/A

XI. Signed: Ron Brunson November 27, 2002
Principal Investigator Date

References:

Birchell, G. J., K.D. Christopherson, and D. Ward. 1998. Physical description of sampling sites. Chapter 2 in Green River levee removal and flood plain connectivity evaluation preliminary synthesis report. Utah Division of Wildlife Resources, Salt Lake City, Utah 201 pp.

Lentsch, L., T. Crowl, P. Nelson, and T. Modde. 1996. Levee removal strategic plan. Utah Division of Wildlife Resources, Salt Lake City, Utah. 21 pp.

Modde, T., M. Fuller, and G.J. Birchell. 1998. Native Fish. Chapter 6 in Green River levee removal and flood plain connectivity evaluation preliminary synthesis report. Utah Division of Wildlife Resources, Salt Lake City, Utah 201 pp.

Muth, R.T., G.B. Haines, S.M. Meismer, E.J. Wick, T.E. Chart, D.E. Snyder and J.M. Bundy. 1998. Reproduction and early life history of razorback sucker in the Green River, Utah and Colorado, 1992 - 1996. Final Report submitted to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. U.S. Fish and Wildlife Service, Denver, CO. 62 pp.

Wydoski, R.S. and E.J. Wick. 1998. Ecological value of floodplain habitats to razorback suckers in the Upper Colorado River Basin. Final Report submitted to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. U.S. Fish and Wildlife Service, Denver, CO. 55 pp.