

## **COLORADO RIVER RECOVERY PROGRAM FY 2006 ANNUAL REPORT**

I. Project Title: Evaluation of survival and growth of larval razorback sucker entrained in floodplain wetlands

II. Principal Investigator(s):

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III. Project Summary:

Floodplain 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 floodplain habitats are accessible (Muth et al. 1998). This seasonal timing of razorback sucker reproduction indicates possible adaptation for utilizing floodplain habitats (Muth et al. 1998).

Based on the assumption that floodplain wetlands provide critical rearing habitat for razorback suckers, the Recovery Program initiated an extensive floodplain habitat restoration program (Levee Removal). The goal of the Levee Removal Program was to restore natural floodplain 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-floodplain connection to pre Flaming Gorge Dam levels.

To evaluate the effectiveness of upstream breaches made during the Levee Removal Project, the Program initiated an entrainment study. Over the following years, this project evolved into an effort to also evaluate drift of larvae in the Green River and drift and entrainment rates of these larvae into floodplain wetlands throughout the middle Green River. Preliminary data gathered during 2004 and 2005 showed that near-neutrally buoyant beads and larvae were transported considerable distances downstream, and were entrained in flood plain wetlands near the spawning bar as well as 54 miles or more downstream. These data support the notion that a mosaic of flood plain wetland habitats dispersed up and down the river downstream from spawning areas may be an optimal management goal.

The 2004 and 2005 data also showed that beads (and larvae) were not mixed in the lateral dimension of the stream channel until well downstream, 10 miles or more. Rather, beads and larvae remained on the side of the river where they were released. The implication is that flood plain wetlands near the spawning areas require larvae produced on the same side of the channel, or the likelihood of entrainment will be low. Optimization of larval entrainment in the flood plain will be crucial for ensuring survival of larval razorback suckers, and ultimately recovery.

Over the course of the entrainment study over all years, released larvae have had the potential to enter many of the floodplains of the middle Green; however, their ultimate survival is unknown. Survival estimates of these larvae could provide important information for facilitating future studies of recruitment of razorback sucker from floodplain rearing habitats, the management of these and other floodplain sites, and in discerning the role of such habitats in endangered fish recovery. Monitoring of floodplain habitats for razorback sucker will continue through FY2007.

IV. Study Schedule: Initial year - FY - 2005 Final year - FY 2007

V. Relationship to RIPRAP:

#### GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- II. Restore Habitat (Habitat development and maintenance)
- II.A. Restore flooded bottomland habitats.

#### GREEN RIVER ACTION PLAN: MAINSTEM

- II. Restore Habitat (Habitat development and maintenance)
- II.A. Restore flooded bottomland habitats.
- II.A.3. Implement levee removal strategy at high priority sites.
- II.A.3.d. Evaluation.

VI. Accomplishment of FY 2006 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Field Data Collection – Fyke netting (fall 2005 & 2006)

2005

Crews sampled various floodplains in August, September, and October of 2005 for larval razorback sucker entrained during the bead study. Sites sampled include the Stirrup, Baeser, and Leota L-7. Crews set eight nets at the Stirrup on August 9<sup>th</sup> and recorded results on the 10<sup>th</sup>. Crews returned to the Stirrup to set four nets on August 11<sup>th</sup>. These nets were pulled on the 12<sup>th</sup>. Species caught over these two sampling sessions include razorback sucker, Colorado pikeminnow, carp, red shiner, green sunfish, fathead minnow, black bullhead, brook stickleback, and creek chub. The total number of razorback sucker captured was 149. Fish ranged in total length from 33mm to 81mm. The average total length for these fish was 51.9mm. These razorback suckers were likely the survivors from 55,000 excess 25mm larvae that had been stocked into the Stirrup on June 30, 2005.

Crews returned to the Stirrup in October of 2005. Species assemblage was similar to the previous effort, though no Colorado pikeminnow were found at this time. One unidentified chub (160mm) was found. Forty razorback sucker were caught during this effort. Total lengths ranged from 52mm to 103mm. The average total length for these fish was 71.4mm, an overall increase from August of almost 20mm.

Four nets were set at the Baeser floodplain on September 19<sup>th</sup>, 20<sup>th</sup>, and 21<sup>st</sup>. No natives were sampled in Baeser during this effort. Species captured in this floodplain were fathead minnow, brook stickleback, red shiner, green sunfish, black bullhead, carp, and channel catfish.

Crews set fyke nets out in Leota L-7 on September 12<sup>th</sup>, 13<sup>th</sup>, and 14<sup>th</sup>. Net sets on the 12<sup>th</sup> and 13<sup>th</sup> did not catch any native species, only black bullhead, fathead minnow, green sunfish, carp, red shiner, and channel catfish. On the 15<sup>th</sup> of September, two nets caught razorback sucker and/or flannelmouth sucker. Three razorback sucker and one flannelmouth sucker were caught during this sampling effort. All razorback sucker were over 100mm (range = 102mm to 136mm). The flannelmouth sucker was 89mm.

## 2006

Larval releases were only done at Thunder Ranch during the 2006 entrainment study. Thunder Ranch was sampled on October 23<sup>rd</sup> for these razorback sucker. Because the wetland was only about one foot deep at this time, crews set only one fyke net, but multiple unbaited minnow traps. Crews also attempted multiple seine hauls. Seine hauls were relatively ineffective due to the deep mud pervasive at the site. The one fyke net yielded (in order of decreasing abundance) fathead minnow, green sunfish, red shiner, and black bullhead. None of these fish was greater than 51mm. These were also the only fish found in the minnow traps and seine hauls (though green sunfish were more abundant with these gear types). Most of these individuals were young-of-year; however, a few age-1 green sunfish were captured.

Larval fish, likely from the release, were also observed at the Bonanza site, which is approximately 16 miles downriver from the Escalante spawning bar (the site of the larval releases for Thunder Ranch). Unfortunately, the Bonanza site dried over the summer so crews were unable to sample this site.

Larval fish did not likely get into Stewart Lake since it is only about six miles from the release site on the opposite side of the river. Results from the entrainment study from 2005 showed that it took greater than 10 river miles for beads/larvae to mix across the river, suggesting that they could not have made it to river right by the Stewart Lake inlet. Regardless, Stewart Lake was drained for selenium mitigation purposes, thus any razorback larvae that would have made it, did not survive and thus, Stewart Lake was not sampled this fall.

Baerer was very shallow and crews decided not to sample the floodplain given the difficulty involved with such an effort.

Above Brennan was also quite shallow in October of 2006. Crews attempted to sample this floodplain, but were unsuccessful due to boat and trailer difficulties.

The Stirrup was also sampled this fall. Crews placed three fyke nets on October 10<sup>th</sup> and returned on October 12<sup>th</sup> to pull these nets. No natives were captured. Species assemblage included (in order of decreasing abundance) black bullhead, fathead minnow, green sunfish, carp, white sucker, and channel catfish. Due to the sheer number of fish, only a representative sample from the first net was counted and measured. This representative sample contained 104 black bullhead ranging from 65mm to 155mm (average length = 122.8mm). Extrapolating to the entire sample, we almost certainly captured over 1000 black bullhead.

Crews could not get to Johnson Bottom to sample this area due to road conditions at the intended time of sampling. Crews did not attempt to sample the Leota ponds.

Task 2: Data Management and Analysis

Data will be entered into a “floodplain” database, upon the creation of this database (slated for winter 2006).

Task 3: Report Preparation

Annual RIP Report (Nov 9, 2006) – complete

Final Report (results will be included in C-6 rz entrainment final report) March 2007

VII. Recommendations:

- Continue to evaluate razorback sucker survival in floodplains used for entrainment purposes
- Given that nonnatives constitute the largest abundance of fish in the Stirrup floodplain (most likely the best floodplain for over-wintering fish based on the size and depth of the wetland), a more active management approach to this floodplain and others like it should be devised to provide better habitats for razorback sucker
- Monitor floodplain wetlands over the winter to determine over-wintering capability of the wetland, return to sample the wetland in the spring if fish remained alive to determine over-winter survival of razorback sucker
- If the floodplain does not over-winter fish, begin study of amount of water and water quality necessary for floodplain to be able to over-winter fish

VIII. Project Status:

On track and ongoing, though significant changes may be made for FY 2007 due to the perception that a more intense management of these floodplains may be necessary to sustain razorback sucker in them.

IX. FY 2006 Budget Status

- A. Funds Provided: \$26,500
- B. Funds Expended: \$26,500
- C. Difference: \$0
- D. Percent of the FY 2006 work completed, and projected costs to complete: 100% - \$0
- E. Recovery Program funds spent for publication charges: \$0

XI. Signed: Trina Hedrick 10/17/2006  
Principal Investigator Date