COLORADO RIVER RECOVERY PROGRAM **Project No: C-6 rz entr.**
FY 2004 ANNUAL REPORT

I. Project Title: Evaluation of larval sucker drift into floodplain wetlands

II. Principal Investigator(s):

Kevin Christopherson
Utah Division of Wildlife Resources
Northeast Region
152 East 100 North
Vernal, Utah 84078
Phone: (435) 781-9453 fax: (435) 789-8343
E-mail: kevinchristopherson@utah.gov

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 sucker, 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.

Valdez (2003) developed a larval razorback sucker drift model to be used as a predictive tool for the number of floodplain acres and number of razorback larvae necessary to reach the recovery goals. An important element of this model demonstrated how quickly razorback larvae "fall" out of the river as part of the planktonic drift. If this prediction is correct most of the larvae produced at Razorback Bar would not reach the major floodplain sites at Ouray. This has major management implications for the relative importance of different floodplain sites along the Green River and the importance of other potential spawning sites. Optimization of larval entrainment in the floodplain will be crucial for ensuring survival of larval razorback suckers, and ultimately recovery. If the model is correct, sites like the Thunder Ranch and Stewart Lake wetlands become the most important sites on the middle Green River.

The goal of this study is to evaluate larval sucker entrainment into the Thunder Ranch and Stewart Lake flooplain wetlands and use the data to revise management for middle Green River floodpains based on potential larval razorback sucker entrainment. A secondary goal was to evaluate if the beads are acceptable surrogates for drifting larvae.

IV. Study Schedule: Initial year - FY - 2004 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 2004 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Field Data Collection – Bead release and drift netting

The Thunder Ranch and Stewart Lake flooplains did not connect with the river in 2004. Work conducted during the 2004 field season was a pilot study to evaluate how accurately passive drifting particles (beads) represent downstream drift of hatchery reared razarback sucker larvae.

Biodegradable gelatinous neutrally buoyant beads (beads) and marked hatchery spawned razorback sucker larvae were released simultaneously in to the river at known numbers at Razorback Bar (RM 311) on May 26, 2004. Drift net stations were set up at 1 mile and 5 miles down river from the spawning bar to sample drifting larvae and beads.

Samples were collected for seven hours, but all of the beads and larvae were captured during a four-hour period. A total of 4,506 beads (0.30%) and 253 marked larvae (0.36%) were collected. Approximately 0.28 percent of the river flow was sampled.

Both the larvae and the beads pulsed through the sampling sites in similar ways. The larvae came through first and traveled to the 1-mile site (1.6 km) in approximately 30 minutes and continued to be collected for 3 hours. The beads were collected approximately 90 minutes after release and were captured for 90 more minutes. The vast majority of beads and marked larvae were collected on river right.

A similar pattern was observed at the site 5 miles (8 km) below the release location. Again, the marked larvae came through first followed by the beads. Both pulsed through in three hours, and the majority was collected on river right.

Wild razorback larvae were also collected in the samples, but distribution differed significantly from the released larvae. Over 81 % of wild larvae were collected at the downstream collection site (5 miles down stream) and 61% were collected on river left. This suggests that there was a spawning area downstream from Razorback Bar and located on river left.

In summary, the drifting beads behaved like drifting larvae and will be a useful tool in evaluating larval entrainment rates for floodplain wetland sites.

Task 2: Drift Net Sample Processing

All drift net samples have been processed to remove larval suckers and enumerate beads. Drift net samples were examined for beads following the day of collection. Drift samples were then examined closer to remove larval suckers and preserve them in alcohol for later analysis and to check for marks. Larval sucker samples from the 1-mile drift net station have been analyzed and analysis of samples from the 5-mile station is in progress.

Task 3: Data Management

Site and collection data have been entered into a database. The remaining data will be entered upon completion of analysis of larval fish samples.

Task 4: Report Preparation

Annual RIP Report (November 14, 2004) complete
Final report: Draft Final Report (March 2007)

VII. Recommendations:

- Release larger batches (increase power of analysis)
- Sample mid-channel as well as floodplain inlets (evaluate longitudinal and lateral distribution)
- Sample wetlands with drift nets and light traps to asses relative entrainment
- Release at the Razorback/Escalante spawning bar and other potential spawning sites
- Continue to evaluate the most effective breach connections and floodplain locations for entraining razorback larvae during different connecting flows and use this data to refine floodplain management

VIII. Project Status:

On track and ongoing

IX. FY 2004 Budget Status

A. Funds Provided: $43,900
B. Funds Expended: $43,900
C. Difference: $0
D. Recovery Program funds spent for publication charges: $ 0

X. Status of Data Submission: Data will be submitted at the completion of the study.

Data will be submitted at the conclusion of the project (December 2004)

XI. Signed: Kevin Christopheson 11/9/2003 revised 3/23/2005
Principal Investigator Date