

- I. Project Title: Middle Green River floodplain sampling
- II. Bureau of Reclamation Agreement Number: R13PG40020  
Project/Grant Period: Start date: 10/01/2012  
End date: 09/30/2015  
Reporting period end date: 09/30/2014  
Is this the final report? Yes  No
- III. Principal Investigators:  
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- IV. Abstract:  
We sampled floodplain wetlands during high water connection this spring using light traps to identify sites where razorback sucker larvae were being entrained. Sites that were flooded included Escalante Ranch, Stewart Lake, Bonanza Bridge, the Stirrup, Above Brennan, Johnson Bottom, and Leota Bottom. Razorback sucker larvae were collected from Escalante, Stewart, Stirrup, and Above Brennan. USFWS sampled Escalante, Above Brennan, and Leota 7 during the fall to determine whether razorback sucker juveniles had survived through summer. In total, only five juvenile razorbacks were collected from Leota Bottom. Adult razorbacks were also collected, representing individuals that entered the wetlands during high water and remained there once the river level had dropped.
- V. Study Schedule: 2012-2016
- VI. Relationship to RIPRAP:  
Green River Action Plan: Mainstem  
I.A.3.d.1. Conduct real-time larval razorback and Colorado pikeminnow sampling to guide Flaming Gorge operations.  
I.D.1.b.(4)(a) Implement LTSP  
V.D.1. Implement razorback sucker monitoring plan
- VII. Accomplishment of FY 2014 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

### **Larval Trigger and Spring Peak Flow Hydrology**

U.S. Fish and Wildlife Service monitors larval razorback sucker (RZB) drift through the use of light traps, starting each spring in May or as water temperatures indicate spawning is imminent. We detected the first RZB larvae on May 28 at Cliff Creek, when mean daily flow at Jensen, UT was 15,100 cfs and mean water temperature was 14.9°C. Bureau of Reclamation began increasing Flaming Gorge releases on May 30, to a peak of around 9,000 cfs on June 8. Releases from Flaming Gorge remained relatively high through June 23. The Green River at Jensen peaked at 19,500 cfs on June 8, and had mean daily flows higher than 18,600 cfs for four days after larvae were first detected

in the river. The Yampa River at Deerlodge Park peaked at 16,500 cfs on June 1, and mean daily discharge decreased to <10,000 cfs by June 10. Details of spring larval sampling can be found in the annual report for project 22f, but much of the larval identification and final data are still pending laboratory verification, which is currently in process.

Once floodplain wetlands were connected to the river and contained enough water to sample with light traps, we deployed traps to confirm larval RZB had been entrained from the main channel. Light traps were deployed in wetlands at the Stirrup, Escalante Ranch, Above Brennan, and Leota Bottom. Table 1 summarizes the wetland light trapping effort for 2014. Escalante Ranch was connected to the Green River on 27 May, at 14,600 cfs mean daily flow. By June 11, the sampling crew noted water was flowing from the wetland back to the river, at 16,800 cfs. The Stirrup wetland was connected to the Green River during the entire period when we sampled it with light traps. Flows during this time were 15,500-17,500 cfs. We visited Above Brennan on May 27 when the mean flow at Jensen was 14,600 cfs. Although the downstream outflow breach had deep water in it, the wetland depression had not started taking in water. When light trapping commenced at Above Brennan on June 2 (17,500 cfs), the wetland was connected to the Green River through both the upstream and downstream breaches (inflow and outflow, respectively). Ouray National Wildlife Refuge (ONWR) staff monitored breach connections at Leota during the spring runoff period, and indicated the Green River had breached the Leota 7 levee on June 2. Access to the wetland was difficult at this time because the road leading to that unit was also flooded while the breach was inundated, and Leota 7 is located on the river side of the bottom. We started sampling the Leota 7 wetland near the breach once we were able to access it. ONWR began filling all of the Leota units through the upstream inlet structure and canal system before Leota 7 had breached, so there is the possibility that small-bodied fish could have entered the wetlands from the inlet system. Based on preliminary identification of larvae, we found the first larval RZB in Escalante Ranch on June 4, Stirrup on June 10, and Above Brennan on June 11. More extensive analysis and identification is currently being conducted by the Larval Fish Lab, and may result in different dates for these sites. It is also interesting to note that larvae were collected from both single breach and flow through wetlands.

**Escalante Ranch wetland-** We sampled the Escalante Ranch wetland with 18 fyke nets from 24 -28 March to determine overwinter survival among 989 bonytail stocked by the Ouray National Fish Hatchery on 19 September 2013. We caught five individuals (TL=255, 295, 254, 275, 300mm during this time. One of these fish was not tagged when we captured it in March. Of the remaining four, two showed no growth since stocking, and the other two had each grown 5 mm since the September stocking. The low number of fish caught suggests high winter mortality, which is possibly a result of the low dissolved oxygen levels in this wetland from October until ice-off as revealed by data recorded by a mini-DOT logger. The DO logger recorded near anoxic conditions for 174 consecutive days.

We also deployed flat plate and submersible PIT tag antennas in the wetland to determine overwinter survival of these fish. Between 12 March and 18 April, we detected 36 PIT tags from bonytail stocked the previous fall. Three of these detections were fish captured during the March netting.

Fall sampling in the Escalante Ranch wetland occurred from 20–22 October and 10 fyke nets were set to determine the relative abundance and recruitment of razorback sucker. Despite our detection of larval razorbacks in this wetland in June of this year, we only captured one adult during fall sampling. This fish was 503mm, and had been stocked at Split Mountain boat ramp in 2003. It had been recaptured in 2006 near Rock Creek, in Desolation Canyon, and must have entered the wetland during high flows. Nonnative species captured included (in order of abundance) common carp,

fathead minnow, black bullhead, green sunfish, white sucker (multiple size classes including adults), channel catfish (numerous large adults), and black crappie. Ouray NFH stocked 1,025 bonytail (mean TL=248 mm) into this wetland on June 3 while it was actively flooding, but none were captured in fall sampling.

**Above Brennan-** This wetland reset in 2012, and was therefore dry prior to the relatively high runoff of 2014. Similar to our initial efforts at the Escalante Ranch wetland this year, our first sampling effort from 28-29 August was intended to determine the presence of bonytail stocked in this wetland by Ouray National Fish Hatchery on 3 June 2014. We set six baited fyke nets, six baited hoop nets, and also conducted multiple seine hauls primarily in shoreline habitat. We caught one razorback sucker (TL=418mm) (in a fyke net) and many nonnatives. These included, in order of abundance, common carp, fathead minnow, black bullhead, young-of-year black crappie, red shiner, adult white sucker, and one young-of-year smallmouth bass. We translocated the razorback sucker into the Green River adjacent to the (dry) furthest upstream inlet of Above Brennan.

We returned to Above Brennan in the fall from 27-29 October, wherein we targeted razorback sucker with 10 fyke nets. We also set a trammel net for two hours on 29 October. Once again, our native fish catch consisted of one adult razorback sucker (TL=470mm), which we translocated into the Green River from the western midpoint of Above Brennan. This fish had originally been stocked at Ouray National Wildlife Refuge in September 2010. Nonnative fishes captured included common carp, fathead minnow, black bullhead, green sunfish, multiple size classes of black crappie, red shiner, channel catfish, and adult white sucker. None of the stocked bonytail were captured during either sampling trip.

**Leota 7-** Leota 7 also reset in 2012, and was the largest wetland that we sampled this year. Leota 7 connected directly to the Green River during peak flows through a breach, but Ouray NWR had been filling the wetland complex through their canal system prior to this connection. We sampled with 10 fyke nets between 14-17 October to determine the presence or absence of razorback sucker, from which five young-of-year individuals (TL 101-152mm) were captured and released to a backwater near the Leota canal outlet at RMI 256. Nonnative fishes caught included common carp, fathead minnow, black bullhead, and green sunfish, of which almost all were young-of-year. The fact that few adult nonnative fish were observed suggests that razorback larvae can survive and recruit in the presence of similarly sized competitors or predators. The presence of these larger predator species in the other wetlands is likely responsible for the lack of razorback recruitment in those sites. The Leota complex was also very large, with the different sub-units connected through water control structures and canals. It is possible that juvenile razorback sucker are present throughout the complex.

Given the observed low dissolved oxygen levels at the Escalante Ranch wetland during the winter of 2013-2014, we placed miniDOT loggers at the Above Brennan wetland and Leota 7 to monitor water conditions throughout the winter of 2014-2015. We also have water quality data from similar loggers that were deployed after wetland connections, and are working to download and analyze that data for clues as to why bonytail appear to be absent from areas where they were stocked this spring.

VIII. Additional noteworthy observations:

IX. Recommendations:

We recommend continuing this project to monitor the entrainment and recruitment of razorback sucker, as well as survival of stocked bonytail in floodplain wetlands. This data

will be essential in evaluating the success of the Larval Trigger Study Plan, as well as the timing and connection of peak flows resulting from flow management. The wetlands we sampled hold enough water that we believe they will overwinter fish. We will continue to monitor fish community composition and survival in spring, in hopes that any remaining endangered fish will be able to return to the river.

The presence of large populations of nonnative fishes, such as green sunfish, black crappie, channel catfish, black bullhead, and fathead minnow, raise concerns about the ability of entrained larval razorbacks to survive next spring. If these wetlands do not reset in fall or winter of 2014/2015, options for resetting them should be investigated and considered. These may include draining before winter to freeze remaining water or chemical renovation.

We further recommend studying the possible causes of bonytail mortality in floodplain wetlands. Revised stocking procedures recommend stocking these fish in low velocity habitats, such as connected floodplain wetlands when they are either actively connected or prior to anticipated flooding. The lack of bonytail captures in both Escalante Ranch and Above Brennan is puzzling, and we are attempting to identify possible causes. But without more extensive sampling in these wetlands, or an adequate set of parameters to test, causes of mortality in this species will remain unknown.

- X. Project Status: on track and ongoing
- XI. FY 2014 Budget Status
  - A. Funds Provided: \$68,205
  - B. Funds Expended: \$68,205
  - C. Difference: -0-
  - D. Percent of the FY 2014 work completed: 100%
  - E. Recovery Program funds spent for publication charges: -0-
- XII. Status of Data Submission: Data will be submitted to the database manager by December 2014.
- XIII. Signed: M. Tildon Jones 14 November 2014  
Principal Investigator Date

**Table 1. Wetland light trap sampling, 2014.**

Wetland Name	# light traps	Dates Sampled	RZB Larvae Detected?
Escalante Ranch	4	29-30 May 2-6 June 9-13 June	Yes
Stirrup	4 2	2-6 June 9-13 June	Yes
Above Brennan	4 2	2-6 June 9-13 June	Yes
Leota 7	6	18-20 June	No RZB, but FM collected