

I. Project Title: Rearing razorback sucker in Baeser Bend, wetland of the Green River

II. Principal Investigator:

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III. Project Summary:

It is thought that razorback suckers that are raised in a natural wetland should have better survival than those raised in a hatchery environment. Baeser Bend is a natural wetland where we have stocked larval and fingerling razorback suckers in an attempt to allow them to learn the behavioral skills needed to survive in the wild (e.g. foraging, predator avoidance). We stock these fish into the wetland, wait until they grow to a size sufficient to avoid most predation in the wild, and then capture, tag, and release them into the Green River. For 2011, in the absence of detecting razorbacks in Baeser, we used remaining project funds to sample floodplain wetlands for endangered fish following unusually high flows this spring.

IV. Study Schedule: 2008-ongoing

V. Relationship to RIPRAP:

Green River Action Plan: Mainstem

IV.A. Augment or restore populations as needed.

IV.A.1. Develop state stocking plan for the four endangered fishes of the Green River.

IV.A.1.c. Implement plan.

VI. Accomplishment of FY 2011 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Soon after ice-off, on March 28, 2011 we set 16 fyke nets in Baeser Bend to salvage any remaining razorback suckers that we did not capture during harvest efforts the previous fall. While setting nets, we observed dead razorback suckers along the shore, and after searching the perimeter of the wetland, we collected 16 dead razorbacks in various degrees of decay. We scanned each fish but did not detect PIT tags. These fish likely were winter killed fish that had been preserved by the cold water and ice.

We did not catch any razorbacks the next day in our nets, and caught very few fish at all (mostly fathead minnow). We determined that our efforts to salvage fish would probably be in vain, and after consulting with members of the Biology Committee, we decided that the remaining funds that were set aside for salvage efforts at Baeser Bend should be spent on surveying efforts on other wetlands in the middle Green River instead of trying to salvage fish that probably were not there.

Our first survey effort was on May 23, 2011 at Leota Bottoms #4. The Ouray National Fish Hatchery (hatchery) stocked approximately 46,000 fingerling razorback suckers into Leota 4 in October 2010. We set 8 fyke nets and electrofished in a johnboat for approximately 2 hours. We captured 4 razorback suckers while electrofishing that measured 100-130 mm. We pulled the nets the next day and captured 5 razorback suckers measuring 100-165 mm. We tagged the 165 mm razorback and released it into the mainstem river, and the others were returned to Leota 4 untagged. It is important to note that the wetland was connected to the river on this date and stayed connected for almost 3 months after this date. The remainder of our sampling occurred in the fall after one of the highest water years recorded in the Green River. Many wetlands that had not seen water in years were completely inundated.

We sampled Leota 4 and Leota 6 from September 7-9. We used trammel nets, fyke nets, and minnow traps. We captured 22 razorback suckers during this sampling: 19 in Leota 4 and 3 in Leota 6. One fish from Leota 4 was a 395 mm recapture that the hatchery stocked into the mainstem river in 2009, and it had entered the wetland. Fifteen fish were untagged (181-330 mm). We believe that these fish are part of the cohort of fingerlings stocked into Leota 4 during October 2010. We PIT tagged these and released them into the mainstem river. Three young of year razorbacks (85-110 mm) were captured in fyke nets in Leota 4. There was a possibility that these fish were escapees from the hatchery. The effluent canal from the hatchery connects to Leota 4. During pond harvest at the hatchery facility, gates are opened which could allow fish to enter Leota 4. However, during 2011, razorback sucker spawning was delayed and didn't occur until late June in the Green River. In contrast, the hatchery-reared razorback suckers hatched on May 5. All three young of year died in the fyke nets. We sent these mortalities to the Colorado State University Larval Fish Lab, so they could determine a hatch date. They aged the fish and determined a hatch date of mid-June, indicating that these fish were naturally spawned and did not escape from the hatchery. Two fish from Leota 6 were untagged (255 and 330 mm), and the other was a 440 mm recapture the hatchery stocked into the mainstem river in 2009 and had entered the wetland. We tagged the two untagged fish and released them and the recapture into the mainstem river.

From October 18-20, we sampled Leota 1, 3, and 7 using fyke and trammel nets. We captured 42 razorback suckers (11 in Leota 1, 26 in Leota 3, and 5 in Leota 7) ranging from (200-450 mm). Only one of these (450 mm) was tagged. This fish had been stocked by the hatchery into the mainstem river and probably entered Leota 7 during high water. We believe that the remaining fish were from the October 2010 stocking at Leota 4. We PIT tagged these fish and released them into the Green River. It appears that there

may have been very high survival of these stocked fingerling razorback sucker, since we captured them in every portion of the Leota Bottoms complex that we've sampled. It is possible that many fish from this fingerling stocking entered the mainstem river during high water. If this is the case, we may capture many untagged razorbacks during our spring 2012 Colorado pikeminnow sampling.

We sampled Sheppard Bottoms 1, 3, and 5 from October 18-21, using fyke and trammel nets. We captured only one razorback sucker in Sheppard 3, a 415 mm tagged fish that the hatchery stocked into the mainstem river in 2009. We returned it to the river.

We sampled Wyasket Lake and Pond from October 18-21 with fyke and trammel nets, and November 15 with seines. We captured 15 young of year razorback suckers (106-161 mm) in Wyasket Lake. We PIT tagged 8 of the larger fish and released them back into Wyasket Lake. The remaining fish were too small to tag and were released back into Wyasket Lake. One mortality was preserved and will be delivered to the Colorado State University Larval Fish Lab. The last time this size class of razorback sucker had been documented in the middle Green River (not associated with hatchery production) was in 1996 at Old Charley wetland.

We set two fyke nets and seined Old Charley wetland from October 18-20, and again seined on November 15. We captured 9 tagged razorback suckers (367-436 mm) while seining, and found one dead razorback on the bank. These fish were all stocked by the hatchery into the mainstem river and subsequently entered Old Charley wetland during high water this year. We returned them to the river. Any fish remaining in Old Charley will surely winter kill. The maximum depth of this wetland to date is less than 2 ft., so it will almost certainly freeze completely this winter.

We set 3 fyke nets and 1 trammel net at Baeser Bend on October 21 and caught one bonytail (312 mm). This fish was stocked into the Stirrup in April 2011, was detected leaving the Stirrup on May 19, and entered Baeser Bend at high water. We released the fish back to the river. As of October 21, the water depth at Baeser Bend was over 3 ft., so there is a possibility that it will be able to overwinter nonnative fish. If this is the case, our plans for an overwinter reset and spring larval stocking in 2012 should be reconsidered.

We sampled Thunder Ranch wetland from October 24-26 with fyke and trammel nets. We captured only 2 native fish: a 180 mm roundtail chub and a 175 mm flannelmouth sucker. We captured 90 northern pike (300-580 mm). This is alarming, since during all of our other wetland sampling this year, only 4 other northern pike were captured (one 541 mm in above Brennan, one 425 mm in Old Charley, one 525 mm in Leota 4 and one 500 mm in Leota 6). In 2010 we sampled Thunder Ranch for the same amount of time in the same place with the same amount of nets and did not catch any pike. The Biology Committee was interested in finding out the origin and age of these northern pike so on November 1 we set a trammel net and caught 19 more northern pike from which we extracted the otoliths for future microchemistry work.

We sampled Johnson Bottoms from November 8-10 with fyke and trammel nets. We captured 3 bonytail, all of which were stocked into Johnson Bottoms on October 11, 2011. We released these fish back into Johnson Bottoms.

We sampled the wetland above Brennan from November 8-10 with fyke and trammel nets. We captured one razorback (473 mm) that the hatchery stocked into the mainstem river. We returned it to the wetland. A summary of all razorback captures during 2011 wetland sampling is found in Table 1.

In our wetland sampling, we found the following nonnative fish in order of abundance: fathead minnow, black bullhead, common carp, green sunfish, crappie, channel catfish, red shiner, sand shiner, white sucker, northern pike, bluegill, stickleback, darter, walleye, yellow perch, and Utah chub. The only native fish captured were reported above.

To date, we've stocked 1,516 razorback suckers from Baeser Bend into the Green River. We have since documented 66 of these fish in the Green River. This is a recapture rate of 4.4%. The hatchery recapture rate is about 1.5% (Koreen Zelasko, personal communication). Based on our data, we believe fish that grow up in a wetland survive better in the river than those raised in a hatchery environment. We feel that it is important to stock more fish into wetland environments before releasing them into the river to help better understand this observed difference in survival.

VII. Recommendations:

We recommend resetting Baeser Bend wetland and stocking larval razorback suckers into this wetland. We documented many nonnative fish species this fall in Baeser Bend, and the water level was high enough to potentially preclude winter kill of these fish. We recommend checking the wetland for live fish in spring of 2012. If there is a complete winter kill, we recommend stocking larval razorback sucker into the wetland in May 2012, allowing the fish to grow, maintaining water levels, and harvesting fish in the fall of 2013. If there is not a complete winter kill, we either need to use rotenone to reset it, or wait until environmental conditions reset it. We also recommend using a backhoe to dig a deeper canal structure from the pumping station out into the wetland. Doing this would allow us to more effectively pump water out of the wetland when it needs to be drained. It would also reduce the amount of hose needed to pump water back into the wetland from the river, when it needs to be filled. We believe that the ability to lower water levels in the wetland will ultimately result in our having to spend less time, effort, and money harvesting fish in future years, compared to 2009 and 2010.

We documented endangered fish in 10 of the 15 wetlands we sampled this fall. There are many we did not sample because we had neither the time nor the funding to do so. We captured wild-produced young of year razorback suckers in Wyasket Lake and Leota 4, thus documenting natural recruitment. If we'd had sufficient time and resources to sample more places with more effort, we may have been able to document this life stage

of razorback sucker in other wetlands. It is important to understand how endangered fish use these wetlands, and surveys such as the ones we conducted this fall can provide this information. We recommend starting a new scope of work that deals with wetland fish surveys. We also recommend that this scope of work not be associated with the Baeser Bend scope of work. Now that we have documented endangered fish in some of these wetlands, we feel that it is important to follow up in the spring to determine overwinter survival. We recommend sampling Wyasket Lake and Leota 4 in the spring to determine overwinter survival of razorbacks. Although we did not document razorback sucker in Johnson Bottoms, we suspect this wetland harbors them. We recommend sampling Johnson Bottoms in the spring to determine overwinter survival of stocked bonytail and to document wild young of year razorback suckers.

We found a large number of northern pike in Thunder Ranch. This wetland will likely connect to the river in May 2012. We recommend funding intensive netting at this wetland to reduce the number of northern pike in this wetland before it connects to the river next spring.

VIII. Project Status: on track and ongoing

IX. FY 2011 Budget Status:

- A. Funds Provided: \$20,946.19
- B. Funds Expended: \$20,946.19
- C. Difference: 0
- D. Percent of the FY 2011 work completed, and projected costs to complete: 0
- E. Recovery Program funds spent for publication charges: 0

X. Status of Data Submission: Data will be submitted to Travis Francis by December 2011.

XI. Signed: Aaron Webber November 15, 2011
Principal Investigator Date

Table 1. Summary of all razorback sucker captures during 2011 wetland sampling.

Site Sampled	RZB 0-175mm	RZB 176-350mm	RZB > 350mm
Leota 1	0	11	0
Leota 3	0	26	0
Leota 4 spring	9	0	0
Leota 4 fall	3	15	1
Leota 6	0	2	1
Leota 7	0	4	1
Sheppard 1	0	0	0
Sheppard 3	0	0	1
Sheppard 5	0	0	0
Old Charley	0	0	9
Wyasket Pond	0	0	0
Wyasket Lake	15	0	0
Above Brennan	0	0	1
Johnson Bottoms	0	0	0
Baerer Bend	0	0	0
Thunder Ranch	0	0	0
Total	27	58	14