

I. Project Title: **Assessment of Stocked Razorback Sucker Reproduction in the Lower Green and Lower Colorado Rivers**

II. Bureau of Reclamation Agreement Number: R19AP00059

Project/Grant Period: Start Date: 10/01/2018  
End date: 09/30/2023  
Reporting period end date: 09/30/2019  
Is this a final report? Yes  No

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IV. Abstract: Determining the location, timing, extent, and success of razorback sucker spawning is essential for evaluating the effectiveness of the stocking program, identifying recruitment, and guiding future management. This study was designed to determine the presence/absence, distribution, and spawning period of razorback suckers in the Green River downstream from the town of Green River (since 2009) and in the Colorado River downstream of Moab (since 2014). The study was prompted by increasing razorback sucker encounters, the presence of multiple age classes, and congregations of ripe razorback suckers (2001-2003 and 2006-2008; Bestgen et al 2012, UDWR unpublished data) during Colorado pikeminnow surveys. Larval razorbacks have been successfully collected every year since the beginning of the project by either light trapping and/or seining. Total number of larvae captured annually via light trapping has increased on both the Green and Colorado rivers since sampling began in 2009 and 2014, respectively. Young-of-the-year razorback suckers have been documented in both the lower Green and Colorado rivers during recent years.

V. Study Schedule: Initial year 2009, final year ongoing.

VI. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.
- V.B.2. Conduct appropriate studies to provide needed life history information.

VII. Accomplishment of FY 2019 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Lower Green River light trap sample collection: Larval light trap samples were collected at 12 sites between river miles 119.6 (Saleratus Wash) and 30.9 (Lower Anderson Wash) during three sampling events from 5/06/2019-6/06/2019. A total of 106 light trap samples were collected. Sixteen of the traps contained zero larval fish. The 90 samples that contained larval fish were sent to Colorado State University Larval Fish Laboratory (CSU LFL) for identification. During sampling, main channel temperatures ranged from 12.0 °C to 21.0 °C with an average temperature of 16.0 °C. Habitat temperatures ranged from 11.0 °C to 25.0 °C with an average temperature of 17.0 °C.

A total of 113 light trap samples were taken in 2018 and 106 were sent to CSU LFL for identification of larval fish contained in samples. Analysis and resubmission of the 2018 report will occur pending identification.

Task 2: Lower Green River sampling for YOY and age 1+ razorback sucker: Seine samples were collected between river miles 119.6 and 2.8 during two sampling events, 7/15/2019-8/08/2019. A total of 3,998 m<sup>2</sup> was seined in 126 seine hauls within 60 individual habitats. These habitats included backwaters, which constituted 54% of all areas sampled, flooded tributaries (20%), shorelines (11%), embayments (9%), side channels (4%), and isolated pools (2%). Forty-five samples were sent to CSU LFL for fish identification. The majority of other small-bodied fish were identified in the field and released. Native fishes captured in the Green River during this study included YOY flannelmouth sucker (n=401) with a mean total length of 32 mm (24-62 mm), juvenile flannelmouth sucker (n=1) total length 120 mm, juvenile Colorado pikeminnow (n=4) with a mean total length of 146 mm (125 mm-178 mm), YOY Colorado pikeminnow (n=1), speckled dace (n=2), bluehead sucker (n=1), and unidentified sucker (n=16) preserved and pending identification from CSU LFL. Nonnative fishes captured on the lower Green River included red shiner, sand shiner, fathead minnow, common carp (n=673), black crappie (n=23), channel catfish (n=13), bluegill sunfish (n=13), green sunfish (n=3), black bullhead (n=5), largemouth bass (n=3), and gizzard shad (n=1).

Two additional 6x8 inch aquarium net hauls were completed near Keg Springs (river mile 78.9) and Horseshoe Canyon (river mile 60) on 7/16/2019. Both hauls contained larval fish that we preserved and sent to CSU LFL. Cast nets were also utilized to access habitats that were too deep for seining. No native fish were captured using this method. During sampling, main channel temperatures ranged from 22.0 °C to 28.0 °C with an average temperature of 25.0 °C. Habitat temperatures ranged from 22.0 °C to 33.0 °C with an average temperature of 26.0 °C.

The mean discharge during our sampling efforts, measured at gauge #09315000 near Green River, Utah, was 4,814 CFS with flows ranging from 8,410 CFS-3,090 CFS. The mean in 2018 was 2,059 CFS (we only completed one pass in July), whereas the average for the past four year has been around 2,969 CFS.

A total of 41 seine samples were collected during 2018 and one sample was preserved and sent to CSU LFL for fish identification. Analysis and resubmission of the 2018 report will occur pending sample identification.

Task 3: Colorado River light trap sample collection: Light trap samples were collected at 12 sites between river miles 63.8 and 21.2 during three sampling events from 5/13/2019-6/11/2019. A total of 105 light trap samples were collected. Twenty five samples contained no larval fish. The 80 samples containing larval fish were preserved and sent to CSU LFL for identification. During sampling, main channel temperatures ranged from 13.0 °C to 16.0 °C with an average temperature of 16.0°C. Habitat temperatures ranged from 13.0 °C to 20.0 °C with an average temperature of 14.0 °C.

A total of 50 light trap samples were taken in 2018, and 46 samples were sent to CSU LFL for identification of larval fish. Analysis and resubmission of the 2018 report will occur pending sample identification.

Task 4: Colorado River sampling for YOY and age 1+ razorback sucker: Seine samples were collected between river miles 70.7 and 2.7 during two sampling events between 7/17/2019-8/16/2019. A total of 1,961 m<sup>2</sup> was seined in 64 seine hauls within 34 habitats. These habitats included backwaters, which constituted 39% of all areas sampled, flooded tributaries (37%), shorelines (8%), embayments (8%), side channels (5%) and isolated pools (3%). Eleven samples were sent to CSU LFL for fish identification. Juvenile Colorado pikeminnow (n=20, TL 67-165mm) were captured in deep backwaters and flooded tributaries utilizing cast nets and seines within 6 sites from river miles 3-58.2. During sampling, main channel temperatures ranged from 22.0 °C to 27.5 °C with an average temperature of 21.0 °C. Habitat temperatures ranged from 19.0°C to 32.0 °C with an average temperature of 24.0 °C.

A rare juvenile razorback sucker with a total length of 167 mm and a weight of 42 grams was captured near Mussleman Canyon (river mile 32). Previously, seven YOY razorback suckers were found between river miles 3.5-39 in 2017 and ten YOY razorback suckers were encountered during 2018 seining. Prior to 2017, the last encounter with a YOY razorback in this reach was during fall seining efforts that occur around September under Project 138: Young-of- the-year Colorado Pikeminnow Monitoring (Creighton 2012); three individuals were documented from river miles 49.1-43.9 (TL=80, 107, 108 mm). Other native fishes captured in the Colorado River included juvenile flannelmouth sucker (n=2) with a mean total length of 138 mm (117-160 mm), YOY flannelmouth sucker (n=2) with a mean total length of 25 mm (25-26 mm) and speckled dace (n=1). Nonnative fishes captured on the Colorado River included red shiner, sand shiner, fathead minnow, gizzard shad (n=320), common carp (n=111), largemouth bass (n=17), channel catfish (n=13), western mosquitofish (n=12), smallmouth bass (n=2), plains killifish (n=3), white sucker (n=2) and brown trout (n=1).

The mean discharge during our sampling efforts, measured at gage #09180500 near Cisco, Utah, was 10,428 CFS with flows ranging from 15,600 CFS- 5,380 CFS. The mean in 2018 was 2,246 CFS (we only completed one pass in July), whereas the average

for the last four years has been around 4,332 CFS.

A total of 37 seine samples were taken in 2018, 13 samples were preserved and sent to CSU LFL for fish identification. Analysis and resubmission of the 2018 report will occur pending sample identification.

Task 5: Preliminary sample identification, data entry, analysis and reporting: All data has been entered. Collected samples have been submitted to CSU LFL for identification. This annual report will be updated and resubmitted upon completion of the larval fish identification.

VIII. Additional noteworthy observations:

*Lake Powell inflow area:* We did not sample the inflow area this year.

IX. Recommendations:

- Continue sampling via light trapping for larval razorback sucker in both the Colorado and Green Rivers (May-June) to determine the annual success and timing of reproduction.
- Continue seining in both the Colorado and Green Rivers (July-September) to determine successful recruitment of YOY and juvenile razorback suckers.
- Continue experimental sampling downstream of Cataract Canyon an effort to determine if larval, YOY, and juvenile razorback sucker are utilizing low velocity flooded vegetative shorelines.
- Consider using alternative sampling methods to document recruitment success in areas that are difficult to sample via seine. Alternative methods may include using a trawl to sample cobble bars and higher velocity habitats.

X. Project Status: On track and ongoing.

XI. FY 2019 Budget Status

A. Funds Provided:	\$ 61,827
B. Funds Expended:	\$ 61,827
C. Difference:	\$ 0
D. Percent FY 2019 work completed:	100%
E. Recovery Program funds spent for publication charges:	\$ 0

XII. Status of Data Submission: All data will be submitted upon completion of larval identification by CSU.

XIII. Signed: Chelsea Gibson November 29, 2019  
Principal Investigator Date

XIV. Literature cited:

Bestgen, K.R., Zelasko, K.A., White, G.C. 2012. Monitoring reproduction, recruitment, and population status of razorback sucker in the upper Colorado River basin.

Final report of Larval Fish Laboratory at Colorado State University to Upper Colorado River Endangered Fish Recovery Program. Denver, CO.

Bestgen, K.R., G.B. Haines, R. Brunson, T. Chart, M. Trammell, R.T. Muth, G. Birchell, K.Christopherson, and J.M. Bundy. 2002. Status of wild razorback sucker in the Green River Basin, Utah and Colorado, determined from basinwide monitoring and other sampling programs. Draft Report of Colorado State University Larval Fish Laboratory to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Creighton, K., J.A. Skorupski, M.J. Breen, B. P. Kiefer. 2012. Young-of-year Colorado pikeminnow monitoring, Annual Report. Upper Colorado River Endangered Fish Recovery Program Project 138.