

COLORADO RIVER RECOVERY PROGRAM  
FY 2013 ANNUAL PROJECT REPORT

RECOVERY PROGRAM  
PROJECT NUMBER: 22f

I. Project Title: INTERAGENCY STANDARDIZED MONITORING PROGRAM (ISMP)  
ASSESSMENT OF ENDANGERED FISH REPRODUCTION IN RELATION TO FLAMING GORGE  
OPERATIONS IN THE MIDDLE GREEN AND LOWER YAMPA RIVERS-Yampa and middle  
Green River assessment of Colorado pikeminnow and razorback sucker larvae

II. Bureau of Reclamation Agreement Number(s): R09AP40859 / 09FG402859

Project/Grant Period: Start date (Mo/Day/Yr): 1 Oct. 2008

End date: (Mo/Day/Yr): 30 Sept. 2013

Reporting period end date: 30 Sept. 2013

Is this the final report? Yes \_\_\_\_\_ No X

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IV. Abstract: The goal of Flaming Gorge flow and temperature recommendations (Muth et al., 2000) that were implemented in 2006 was to improve the status and prospects for recovery of endangered fish populations in the Green River. A major emphasis of those recommendations was to enhance the reproductive and recruitment success of endangered fishes in the middle Green River, in particular razorback sucker and Colorado pikeminnow. Larvae of razorback sucker *Xyrauchen texanus* and Colorado pikeminnow *Ptychocheilus lucius* were captured in the Green River basin in spring and summer 2011. Razorback sucker sampling was conducted with light traps primarily in the Green River between Jensen and Ouray and Colorado pikeminnow sampling was with drift nets in the lower Yampa River. Sampling was designed to provide a measure of timing of reproduction and a measure of annual reproductive success of each species. Diel variation in abundance of Colorado pikeminnow larvae in the drift was also assessed. This data will be used to assess effects of flow and temperature regimes on reproduction by razorback suckers and Colorado pikeminnow and to correlate abundance of larvae to abundance of juveniles in autumn.

V. Study Schedule: Ongoing in this agreement since 2008, similar sampling has been conducted since 1990, in most years. Anticipate continued annual sampling.

VI. Relationship to RIPRAP: Relationship to specific RIPRAP items:

Green River Action Plan: Mainstem

- I. Provide and protect instream flows--habitat management.
- I.A. Green River above Duchesne River.
- I.A.1. Initially identify year-round flows needed for recovery while providing experimental flows.
- I.A.2.a. Summer/fall flow recommendations.
- I.A.3. Deliver identified flows.
- I.A.3.a. Operate Flaming Gorge pursuant to the Biological Opinion to provide summer and fall flows.
- I.A.3.d. Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, if necessary.
- I.B. Green River below the Duchesne River.
- I.B.1. Initially identify year-round flows needed for recovery while providing experimental flows.
- I.B.2. State acceptance of initial flow recommendations.
- I.B.2.a. Review scientific basis.
- II. Restore habitat--habitat development and maintenance.
- II.A. Restore and manage flooded bottomland habitat.
- II.A.1. Conduct site restoration.
- II.A.1.a. Old Charlie Wash.
- II.A.1.a.(3) Monitor and evaluate success.
- II.C. Enhance water temperatures to benefit endangered fishes.
- II.C.1. Identify options to release warmer water from Flaming Gorge Reservoir to restore native fish habitat in the Green River.
- V. Monitor populations and habitat and conduct research to support recovery actions--research, monitoring, and data management.
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

Green River Action Plan: Yampa and Little Snake Rivers

- I. Provide and protect instream flows--habitat management.
- I.D. Yampa River below Little Snake River.
- I.D.1. Initially identify year-round flows needed for recovery.
- I.D.2. Evaluate need for instream flow water rights.
- I.D.2.a. Review scientific basis.

Green River Action Plan: Yampa and Little Snake Rivers

- V.A.1. Conduct standardized monitoring.
- V.B.2. Conduct appropriate studies to provide needed life history information.

VII. Accomplishment of FY 2013 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: Project Objectives

- 1). Determine timing and duration of spawning by razorback sucker and presence and abundance of larvae in the system as measured by capture of larvae in light traps. Sampling was extended to the White River this year. Additional sampling was also conducted in flood plain wetlands in early summer and autumn under this project.
- 2). Determine timing and duration of spawning by Colorado pikeminnow and presence and abundance of larvae in the system as measured by capture of larvae downstream of spawning areas in the lower Yampa River.

**Task Description (FY 2013)**

- I). Collect light trap samples for razorback suckers. The CRFP office in Vernal was responsible for this task.
- II). Collect drift net samples for Colorado pikeminnow. The Larval Fish Laboratory was responsible for this task.
- III). Identify light trap and drift net samples. Preliminary identifications will be conducted by the responsible sampling entity, with assistance from the LFL, as samples are collected to provide real-time data. Final specimen identification and curation will be conducted by the LFL.
- IV). Summarize specimen data collection in an annual report.

Accomplishments by Task.

- I). Light trap samples were collected during May and June, 2013 by the Vernal CRFP. Additional sampling near Green River flood plain wetlands was also conducted in summer 2013.
- II). Drift net samples were collected during June to August 2013 by the Larval Fish Laboratory.
- III). Identify light trap and drift net samples.

**Middle Green River light trap samples, 2013.** Samples sent to the Larval Fish Laboratory have been received and are being identified by the Larval Fish Laboratory. The duration of the sampling season was 14 May until 21 June, 2013. First razorback sucker larvae of the season were captured on 26 May at one location, which was relatively late and not expected in that flows were low; however, water temperatures were relatively cool as well. That date of first appearance was in contrast to 2011 when the first larvae were detected relatively late on 24 June and in 2012 when first detection was earlier, 16 May. Flows in 2011 were extremely high and cold, which greatly delayed reproduction by

razorback sucker; flows were lower and warmer in 2012. Dates of first appearance of razorback sucker were used to make decisions regarding Flaming Gorge Dam water management in the spring of the year for several years.

**Middle Green River light trap samples, 2012.** Samples sent to the Larval Fish Laboratory were identified. Razorback suckers were captured from 16 May-22 June. A total of 4,196 razorback sucker larvae were captured in 2012 and were 9-26 mm TL. This is by far, the largest number of razorback sucker larvae ever captured in the history of sampling under this program, dating back to 1992. The largest specimen was collected on 22 June, and is listed as RZ?, indicating at least one character was not typical for the species but that we feel confident in the identification. Large numbers of razorback sucker larvae continue to be captured during light trap sampling in the middle Green River since 2004 (Figure 1), indicating continued reproductive success of stocked fish. Also of interest in 2012, was the large number (812) of razorback sucker larvae captured upstream of known spawning areas at Escalante Ranch, and just downstream of the Split Mountain Boat Ramp.

**Additional 2011 Results.** Early life stage sampling was conducted in the White River in late spring and early summer 2011. Results indicated spawning by razorback sucker as well as Colorado pikeminnow. This work has been published in the North American Journal of Fish Management in late 2013.

**Lower Yampa River drift net sampling, 2013.** Samples were collected in the Yampa River about 0.2 to 0.8 km upstream from the Green River (n = 249 total samples collected in 2013), the same site that samples were collected from 1990 to 1996 (Bestgen et al. 1998) and in 1998 to 2012. Exploratory sampling occurred on 2 June; regular sampling commenced on 13 June and extended through 17 August. The first Colorado pikeminnow larva was collected on 28 June 2013 and larvae were present through 4 August 2013; preliminary identification of samples has been completed but verification remains so numbers of pikeminnow larvae captured is not known with certainty. However, 2013 appears to be another relatively strong year for reproduction for Colorado pikeminnow as many larvae were captured and the spawning season was very long.

We also report additional razorback sucker larvae captured in drift nets in 2013 (preliminary verification) beginning as early as 13 June and extending through at least 17 June. Final verification of all samples is underway.

**Lower Yampa River drift net sampling, 2012.** Samples were collected in the Yampa River about 0.2 to 0.8 km upstream from the Green River (n = 285 total samples, 2012), the same site that samples were collected from 1990 to 1996 (Bestgen et al. 1998) and in 1998 to 2011. First pikeminnow larvae were detected

in a limited number of samples analyzed on 22 June, a relatively early first capture. The last pikeminnow captured was on 10 August (9 mm TL), and represents a typical last capture date for this species. A total of 1,008 pikeminnow larvae were captured in 2012 (Figure 2) with at least one peak in abundance noted from 20-21 August. This was the largest number of Colorado pikeminnow larvae captured in many years and was exceeded only by captures in 1990 and 2000.

VIII. Recommendations:

- Continue sampling as planned in 2014.
- Our Cooperative Agreement with the Bureau of Reclamation expired on 30 September 2013, and this project was part of that agreement. We have been discussing options with the Bureau to have them de-obligate this funding and then re-obligate it so we can finish this important work.

IX. Project Status: Ongoing and on-track.

X. FY 2013 Budget Status

- A. Funds Provided: \$130,487
- B. Funds Expended: \$ 80,286
- C. Difference: \$ 50,201 remaining funds for sample analysis that remains.
- D. Percent of the FY 2013 work completed, and projected costs to complete: About 65% complete.
- E. Recovery Program funds spent for publication charges: None.

XI. Status of Data Submission (Where applicable): Data were made available to investigators.

XII. Signed: Kevin R. Bestgen                      19 November 2013  
Principal Investigator                      Date

APPENDIX: A major product based on these data was produced and finalized in 2011:

Bestgen, K. R., G. B. Haines, and A. A. Hill. 2011. Synthesis of flood plain wetland information: Timing of razorback sucker reproduction in the Green River, Utah, related to stream flow, water temperature, and flood plain wetland availability. Final report to the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. U. S. Fish and Wildlife Service, Denver, CO. Larval Fish Laboratory Contribution 163.

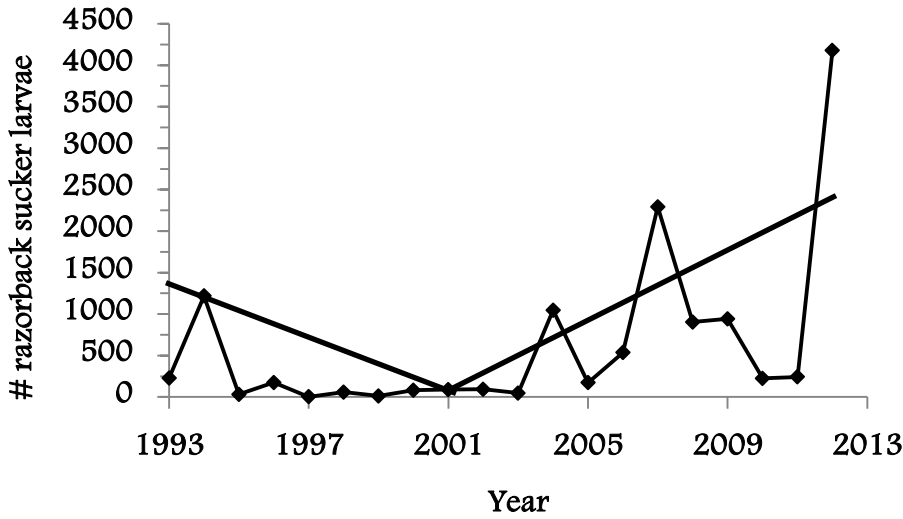


Figure 1. Number of razorback sucker larvae captured from 1993 to 2012 in the middle Green River, Utah, in light traps (all fish including those of questionable taxonomic identity included; 2013 sample identification is underway).

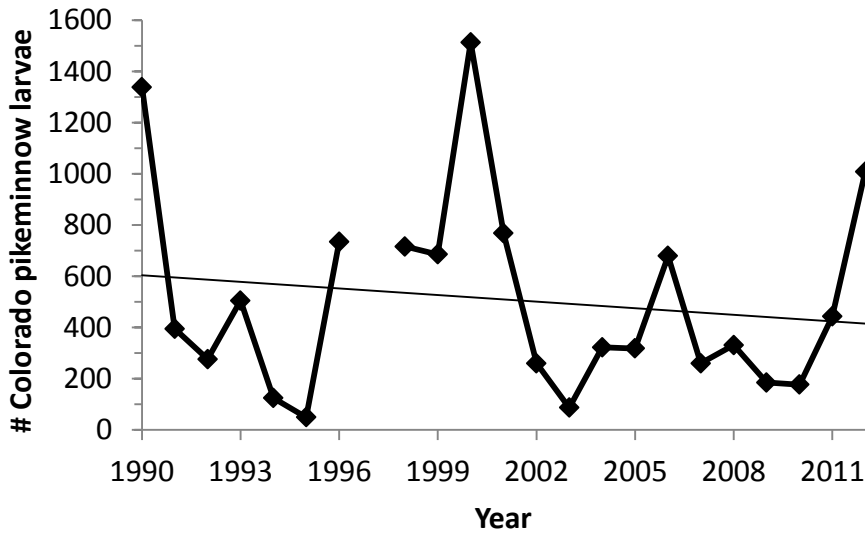


Figure 2. Number of Colorado pikeminnow larvae captured from 1990 to 2012 (no sampling in 1997, includes specimens from all diel samples, 2013 sample identification is underway) in the lower Yampa River, Colorado, during summer in drift nets.

*For projects where more than one agency/entity receives funds from the Bureau of Reclamation, append one PPR from each agency/entity. Otherwise, delete.*

## **ANNUAL PERFORMANCE PROGRESS REPORT (PPR)**

BUREAU OF RECLAMATION AGREEMENT NUMBER:     R09AP40859 / 09FG402859    

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER:     22f    

Project Title: INTERAGENCY STANDARDIZED MONITORING PROGRAM (ISMP)  
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TO FLAMING GORGE OPERATIONS IN THE MIDDLE GREEN AND  
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Project/Grant Period: Start date (Mo/Day/Yr): 1 Oct. 2008  
End date: (Mo/Day/Yr): 30 Sept. 2013  
Reporting period end date: 30 Sept. 2013  
Is this the final report? Yes  No

Performance: The goal of this project is to document timing and intensity of reproduction by razorback suckers and Colorado pikeminnow in the lower Yampa and middle green rivers. In 2013 we collected 249 drift net samples and additional seine samples in the lower Yampa River. In addition, we identified samples collected by the U. S. Fish and Wildlife Service in 2012 and began sample identification for 2013 samples. Another objective of this project is to summarize data collections. This was done in the attached report.

## ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: R10PG40061

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 22f

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Project/Grant Period: Start date (Mo/Day/Yr): 10/01/2006  
End date: (Mo/Day/Yr): 09/30/2013  
Reporting period end date (Mo/Day/Yr): 9/30/2013  
Is this the final report? Yes  X  No

Performance: USFWS completed tasks 1 and 3. Light traps were set for 29 nights during the period 14 May through 21 June 2012. Sites included long-term monitoring sites, which have been sampled for the duration of this project, as well as wetland sites inundated during releases from Flaming Gorge. Preliminary identification of light trap samples (task 3) was successfully performed and resulted in near real-time coordination of dam releases with the presence of razorback sucker. As a result, larval razorback sucker were entrained and documented in Stewart Lake wetland. All samples have been preserved and submitted to Colorado State University Larval Fish Lab for confirming identification and analysis.