

COLORADO RIVER RECOVERY PROGRAM
FY 2012 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 158

I. Project Title: Assessment of larval Colorado pikeminnow presence and survival in low velocity habitats in the middle Green River

II. Bureau of Reclamation Agreement Number(s): R09AP40902

Project/Grant Period: Start date (Mo/Day/Yr): 10/01/2008
End date: (Mo/Day/Yr): 11/30/2013
Reporting period end date: 09/30/2012
Is this the final report? Yes _____ No X

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IV. Abstract: This study addressed the possible influence nonnative fishes may have on age-0 pikeminnow as they arrive and grow in backwater habitats. The first objectives were to confirm the arrival and entrainment of larval pikeminnow into backwaters. The second focus was on blocking selected backwaters and depleting nonnatives. Arrival and entrainment could not be confirmed because results from identification are not yet available. Backwaters were successfully depleted, and the number and size of small-bodied nonnatives were suppressed for 1.5 months. Results regarding the presence and survival of age-0 pikeminnow are inconclusive until identification is complete.

V. Study Schedule: FY 2009 - FY 2012

VI. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative interactions between nonnative and endangered fishes.
- III.A.2. Identify and implement viable active control measures.
- III.A.2.c. Implement and evaluate the effectiveness of viable active control measures.
- III.A.2.f. Develop control program for removal of small nonnative cyprinids in backwaters and other low velocity habitats.

GREEN RIVER ACTION PLAN: MAINSTEM

- III. Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control.
- III.A.4.b. Nonnative cyprinids and centrarchids in nursery habitats.
- III.A.4.b.(1) Small nonnative cyprinids from backwaters and other low velocity Habitats in the lower Green River

VII. Accomplishment of FY 2012 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1. Determine abundance of larval pikeminnow present in drift at Split Mountain and arriving in backwaters in the Ouray reach

Three drift nets were set daily at the Split Mountain campground for 23 days during the period from 26 June 2012 to 27 July. Average daily discharge at the Jensen gage measured between 1,790 and 1,490 cfs during this period. All fish captured were preserved and have been submitted to the Larval Fish Lab for identification. Results from identification are not available at this time, and likely will be completed sometime in 2013.

Backwaters and low velocity habitats were sampled along the Green River within Ouray National Wildlife Refuge from 10-12 July 2012 and 31 July to 3 August 2012. Eighteen unique backwater habitats were sampled for larval and young-of-year Colorado pikeminnow after larval drift had been noted by LFL personnel in Echo Park. Many of these habitats were sampled during both sampling periods. Larval fish were collected and preserved since fish were not at a stage of development where positive identification was possible in the field. These samples have been sent to LFL for identification. Results are pending, and likely will be available in 2013.

Task 2. Deplete nonnative fish in backwaters prior to larval pikeminnow drift and experiment with a blocking scenario to keep backwaters free of nonnative fish

Twelve treatment backwaters were selected and placed systematically (moving downstream) into a randomized block study design. Four blocks (three backwaters per block) contained one of three treatment types by random selection. Thus, the study design included three treatments, all of which were initially depleted of nonnatives: (1) four control backwaters that were not blocked after initial depletions; (2) four backwaters blocked by 1/4 inch mesh nets; and (3) four backwaters that were blocked by a 1/2 inch mesh nets. The study reach was scouted a week prior to select backwaters based on ISMP protocol and feasibility of effectively depleting backwaters. Initial setup and depletion of backwaters occurred from 25—28 June 2012 with all 12 backwaters successfully depleted by 90—99%, prior to Larval Fish Lab reporting Larval Colorado pikeminnow drift in Echo Park. Nonnatives were enumerated and a sub-sample of 30 individuals was taken to determine average total length of nonnative species in addition to total lengths for all native fish collected. A proportion of fishes were unidentifiable to species and preserved for identification; thus, most results are pending, but those that can be reported are quantified. On average, backwaters were depleted by 1,224, 1,904 and 4,645 nonnatives in 1/4, 1/2 and control treatments, respectively. Average nonnative length in 1/4, 1/2 and control treatments were 48, 42 and 42 mm, respectively.

Task 3. Determine fish community in manipulated and control backwaters

After establishing the block nets and depleting the backwaters, they were revisited every two weeks on six separate occasions, with the last sampling event occurring from the 18—25 of September. During this investigation, habitat information under the ISMP sampling protocol was collected, as well as information on backwater temperature using temperature loggers. Nonnatives were enumerated and a 30 individual sub-sample was taken to determine average total length of nonnative species in addition to total lengths for all native fish collected. Total numbers of nonnatives remained lower than initial depletions (A) in all treatments for the two three sampling events (B-C), but then increased in D and then remained high in sampling events E through G (Figure 1). Although all treatment abundances were low in sampling event, B had a slight pattern, where both blocking treatments had fewer nonnatives than the control. This pattern diminished by the next sampling event (C) and did not occur in any other sampling events thereafter (Figure 1). It is likely that the increase is due to nonnatives not being able to return to blocked backwaters, but those that did were at a smaller size class. This is supported by the average total length of the nonnatives through time (Figure 2). It demonstrates that after depletion (A), we are able to effectively keep out larger individuals, but is also dependent on the size of the block net. Quarter inch block nets consistently excluded larger individuals than 1/2 inch block nets, but 1/2 inch still excluded larger individuals in comparison to control backwaters. This pattern stayed consistent from sampling events B—E, but the average length began to increase in sampling event E (Figure 2). This pattern was no longer present in sampling events F and G, which is similar to the total abundance of nonnatives in Figure 1. The patterns

demonstrate that we were effective in depleting and excluding more and larger nonnatives in blocked backwaters, but after a period of time individuals returned and were larger in all treatments. The increase of abundance and size of nonnatives present can be linked to nonnatives having multiple cohorts in a season and high growth rates. The positive aspect to this is native fishes also had high growth rates, specifically age-0 flannelmouth sucker. In three months, flannelmouth mean total length nearly doubled and many individuals exceeded 100 mm (Table 1). These growth rates will greatly increase the change of native fishes survival.

VIII. Recommendations:

- Continue drift netting below Split Mountain Canyon, but select a new site. The site at Split Mountain campground has produced few larval captures, despite high captures of pikeminnow in the nursery reach in 2009 and 2010. These captures also do not appear to correlate very well with pulses of larvae from the Echo Park drift net site.
- Continue surveys for pikeminnow larvae shortly after drift begins. This task fills a void between the drift net samples and ISMP sampling. Sampling for larval fish in this time period will help verify that larvae are arriving in nursery habitat and may narrow down when mortality occurs.
- Continue blocking study to see a variety of flow conditions to assess the validity of manipulating backwater habitats to increase the survival of age-0 pikeminnow. Although this study occurred in three years, 2012 was the first with an effective and feasible study design to test the hypothesis. The 2012 season was a drought year and even though pikeminnow presence was low, it is information that will be of value to compare with other flow conditions. To conclude the study at this point would deem the study inconclusive with only one year of a sound study design and under the drought conditions.

IX. Project Status:

On track and ongoing

X. FY 2012 Budget Status

- A. Funds Provided:
- B. Funds Expended:
- C. Difference: \$0
- D. Percent of the FY 2012 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: \$0

XI. Status of Data Submission (Where applicable):

XII. Signed: Joseph A. Skorupski Jr. 11/11/2012
 Principal Investigator Date

Table 1. Mean and range total lengths (mm) of flannelmouth sucker during seven sampling events in backwater habitat.

Sampling Event	Mean TL	Range TL
A	45	34-86
B	40	30-57
C	43	33-65
D	56	40-88
E	66	46-91
F	71	51-98
G	78	60-111

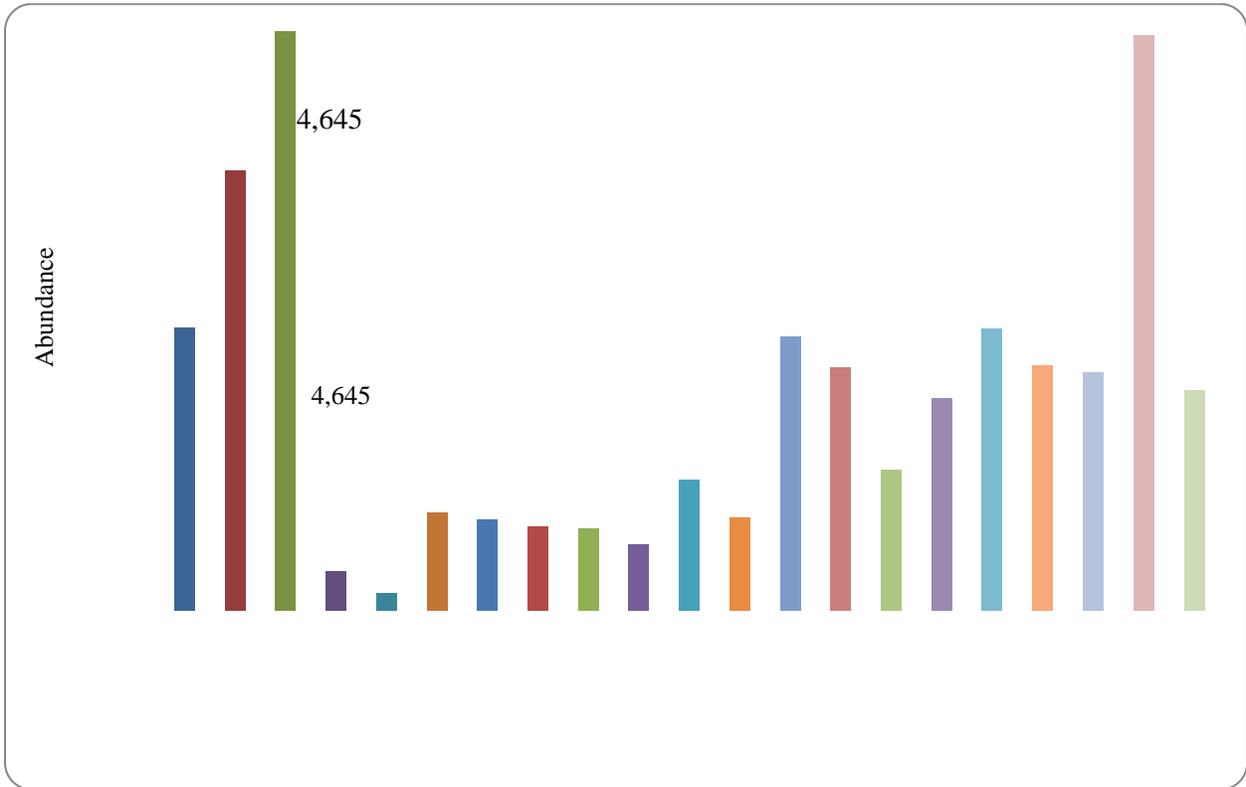


Figure 1. Mean abundances of all nonnative species captured for 1/4, 1/2 and control treatments during six sampling events (A-G).

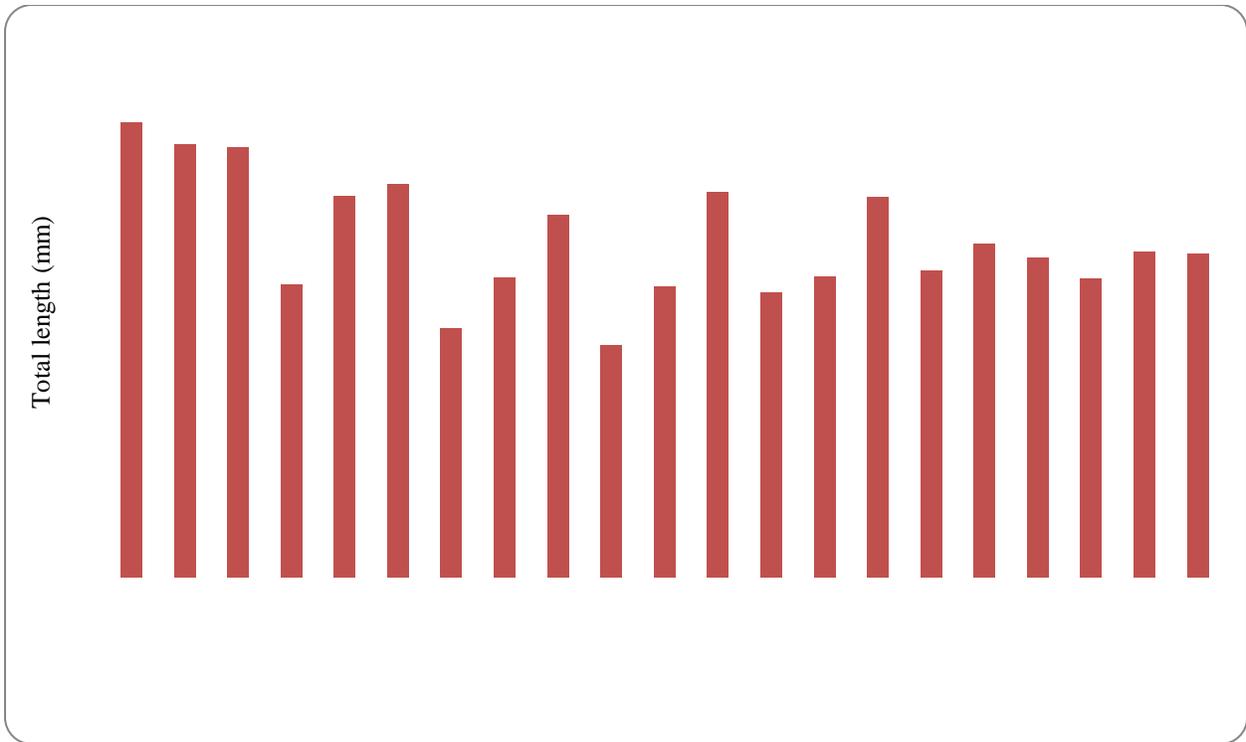


Figure 2. Mean total length of all nonnative species captured for 1/4, 1/2 and control treatments during six sampling events (A-G).