

COLORADO RIVER RECOVERY PROGRAM
FY 2014 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 161

I. Project Title: Population Dynamics Modeling of Introduced Smallmouth Bass, Upper Colorado River Basin

II. Bureau of Reclamation Agreement Number(s): 9-FG-81-0143 R09AC40885

Project/Grant Period: Start date (Mo/Day/Yr): 4 June 2009
End date: (Mo/Day/Yr): 30 September 2014
Reporting period end date: 30 September 2014
Is this the final report? Yes _____ No X

III. Principal Investigator(s):

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IV. Abstract: Non-native and piscivorous smallmouth bass *Micropterus dolomieu* are established and common in the lower Yampa River, the upper and middle Green River basins, and the upper Colorado River. In response to the predatory threat posed by non-native fishes such as smallmouth bass, the Upper Colorado River Recovery Implementation Program initiated efforts to control such species via mechanical removal in affected stream reaches. The aim of this study is to expand the scope of recent population dynamics models using data collected in the system, the comprehensive non-native fish removal database, and our own unpublished information. Our goal is to develop abundance estimates and population trend data for reaches of interest and a comprehensive age- or size-structured model to understand factors that affect smallmouth bass population dynamics in the Upper Colorado River Basin. Results of this study will assist with formulating comprehensive non-native fish control strategies in the Upper Colorado River Basin.

V. Study Schedule:

Initial Year 2010

Final year 2014 (advanced due to later than expected start date and two additions of funds to incorporate additional data)

VI. Relationship to RIPRAP:

Green River Action Plan: Yampa and Little Snake Rivers

III.A.1. Implement Yampa Basin aquatic wildlife management plan to develop nonnative fish control programs in reaches of the Yampa River occupied by endangered fishes. Each control activity will be evaluated for effectiveness and then continued as needed.

Green River Action Plan: Mainstem

III. Reduce negative impacts of nonnative fishes and sportfish management activities

(Nonnative and sportfish management)

III.A.2.c Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement an integrated, viable active control program.

VII. Accomplishment of FY 2014 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

FY-2014—In 2012, the Program decided to fund about an additional year of effort in the project to incorporate smallmouth bass removal data collected in 2011; we are also proceeding with some portion of the 2012 data. Inclusion of that data will provide a more up-to-date view of progress toward smallmouth bass control in the basin. This was thought potentially beneficial given relatively high flows that occurred in those years, which may have reduced bass reproductive success, along with increased bass removal effort. The 2009 and 2010 data was acquired in spring 2011 and was incorporated into the database described below and 2011 data are also available. The 2012 data was acquired in late summer 2013. New abundance estimates for some of those years when data was available and revisions of earlier ones are now available and those results were presented at the non-native fish workshop in early December 2013; findings were also presented at the 2010, 2011, and 2012 workshops. New estimates indicate progress toward control in some reaches through 2012. Preliminary results of those estimates were also recently discussed with Recovery Program staff and the draft section of the report detailing those estimates has been prepared and is under internal review.

Another activity conducted in 2011 and 2012, and finalized in April 2013 was analysis of smallmouth bass recapture data that described escapement of that species from Elkhead Reservoir; this was another use of the additional funding received in 2011. Results of those estimates were recently discussed with Recovery Program staff and the Biology Committee in the form of a final report. Those results were presented at the non-native fish workshop in early December 2012; findings were also presented at the 2010 and 2011 workshops. There are no plans to present this at the 2014 workshop because it

is a final product.

In 2014 we also finished drafting a version of a report that described smallmouth bass abundance estimates and populations dynamics, with an emphasis on exploring removal effectiveness over time. That report was reviewed by the Recovery Program, sent out for peer-review, and comments received were incorporated into the final report. Neither the Elkhead Reservoir escapement report nor the abundance estimate reports were part of the original scope of work for this project.

The original scope of work included mainly a population dynamics model, including early life stage data (mainly from otolith studies under Recovery Program projects FR-115 and 140), which could assess Program progress towards controlling smallmouth bass. We prepared a report on that model and submitted it for Program review, after which it was sent out for peer review. At this juncture, we have received on review back, and after others are in hand we will be complete this report as well.

In Spring 2014, we also completed a workshop aimed at educating interested scientists about the abundance dynamics model. The online workshop was successful, based on participation by about 20 individuals. We also completed a User's Guide for the model and software so interested persons could conduct their own analyses.

VIII. Additional noteworthy observations:

Presentations generated from this project totaled 13, including those at Recovery Program-sponsored nonnative fish workshops and the annual Researchers meetings, and involved Elkhead escapement, bass abundance estimates and population dynamics, and demonstrations of the population dynamics model. Two seminars were also given in the weekly series in the Department of Fish, Wildlife, and Conservation Biology. We also presented implications of this research and sampling activities at two meetings with Dinosaur National Monument staff in winter 2013 and 2014. Results are also being used to inform flow needs for Yampa River fishes.

IX. Recommendations: Finish abundance dynamics model report.

X. Project Status: overdue; in the final stages. Significant portions of the budget (~ 30%) were dedicated to acquisition and organization of sampling data, which was not budgeted for in the original project nor subsequent additions.

XI. FY 2014 Budget Status

A. Funds Provided: \$254,966

B. Funds Expended: \$216,504

C. Difference: \$38,492 (de-obligated when agreement ended)

D. Percent of the FY 2014 work completed, and projected costs to complete:

E. Recovery Program funds spent for publication charges: \$0

XI. Status of Data Submission (Where applicable): NA

XII. Signed: Kevin Bestgen 12 November 2014
Principal Investigator Date
(Just put name and date here, since you will be submitting the report electronically)

APPENDIX: *E.g., more comprehensive/final project reports (NOT to be used in place of a complete annual report.). If distributed previously, simply reference the document or report.*

Tasks completed:

Documents

Breton, A. R, D. L. Winkelman, K. R. Bestgen, and J. A. Hawkins. Draft report. Population dynamics modeling of introduced smallmouth bass in the upper Colorado River basin. Draft final report to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado. Larval Fish Laboratory Contribution 186.

Breton, A. R., J. Hawkins, K.R. Bestgen, D. L. Winkelman and G. C. White. 2014. A retrospective assessment of the Upper Colorado River Recovery Program's efforts to control nonnative smallmouth bass. Final report to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado. Larval Fish Laboratory Contribution Number 169.

Breton, A. R., J. A. Hawkins, K. R. Bestgen, D. L. Winkelman, and G. C. White. 2013. Escapement rates of translocated smallmouth bass (*Micropterus dolomieu*) from Elkhead Reservoir to the Yampa River. Final report to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado. Larval Fish Laboratory Contribution 168.

Users guide for abundance dynamics model

Presentations

13 research presentations or seminars

Workshops

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