COLORADO RIVER RECOVERY PROGRAM
FY 2010 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 161

I. Project Title: Population dynamics modeling of introduced smallmouth bass, Upper Colorado River Basin.

II. Principal Investigator(s):
Lead Agencies: Larval Fish Laboratory, CSU

Kevin Bestgen / John Hawkins/ Gary White
Larval Fish Laboratory
Department of Fish, Wildlife, and Conservation Biology
Colorado State University
Ft. Collins, CO 80523
voice: KRB (970) 491-1848, JAH (970) 491-2777
fax: (970) 491-5091
email: kbestgen@colostate.edu
jhawk@lamar.colostate.edu
gwhite@colostate.edu

Dana Winkelman and Andre Breton
Cooperative Fish and Wildlife Research Unit
Department of Fish, Wildlife, and Conservation Biology
Colorado State University
Ft. Collins, CO 80523
Dana.winkelman@colostate.edu
Andre.Breton@colostate.edu

III. Project Summary: The non-native piscivores smallmouth bass *Micropterus dolomieu* and northern pike *Esox lucius* 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dynamics models using data collected in the system, the comprehensive non-native fish removal database, and our own unpublished information.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 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.

IV. Study Schedule: Initial Year 2009 (now 2010)
Final year 2012 (advanced from 2011 due to later than expected start date)

V. Relationship to RIPRAP *(Version: March 8, 2000)*:

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.

VI. Accomplishment of FY 2009-2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: This is a summary of a September 2009 conversation we had with Program Director Tom Chart, regarding progress on the smallmouth bass population dynamics project. We officially started this project in mid-June (16th) when we received funding, and at that point could advertise the post-doc position, which we did. In the ad, we suggested a desire for expertise in population vital rate estimation (abundance, survival, etc.), population modeling, demonstrated ability in writing and publication, among many other things, and also inquired about database management skills. In addition to listing the ad on the American Fisheries Society job board and several other sites, we made personal contacts with colleagues at other universities and labs across the country to promote the position. We listed a closing date of 1 August 2009 for full consideration, but left it open-ended in case suitable candidates became available after that, or if the initial pool was not suitable.

By 1 August, we received 10 applications, a bit short of what we were expecting. I served on a search committee for another concurrent post-doc position on campus, and that experience revealed that several of our applicants also applied for that relatively different position (again with few total applicants), suggesting that the national applicant pool is relatively thin at this time. Most population modelers are apparently taking permanent jobs with NMFS or NOAA at this time, as those agencies are apparently facing retirements at a time when population modeling expertise is in high demand. There was essentially only one person in our initial pool who met all of our desired qualifications, although another was close, having estimation skills and data management expertise. Unfortunately, the high-ranked candidate took another position before 1 August. We then re-initiated the search via personal contacts and expanded our calls to other folks in the hope of getting more applicants and left the position open until 1 September. We got only one more application, that from Dr. Andre Breton. Our search committee (an official search is required, with all the constraints and timelines, as dictated by the Office of Equal Opportunity) decided to interview Dr. Breton and the other potential candidate, which after official clearance from CSU, etc., we accomplished that in early September. After another official approval to make an offer to Andre, we did that and he accepted.

Dr. Breton has a deep understanding of quantitative estimation and database management through his previous work with marine birds, has demonstrated ability with population modeling, is a good writer, and is a quick study and very excited to engage in this project. He should be able to get up to speed quickly. He also knows several other quantitative analysis folks here, including co-principal investigator Dr. Gary White, and those interactions will favor the success of the project. His lack of experience with fish (most candidates had little or no fish or aquatic experience even though we advertised for that) should not be a concern as Dana, John, and myself will work closely with him on those issues as needed.

Dr. Breton is in residence and he has begun familiarizing himself with the database. The hiring schedule will not allow for much in the way of a substantive contribution to the non-native fish workshop in early December, but we intend to be there and introduce Dr. Breton to the group. That will be a good opportunity to begin to interact with biologists, and we can discuss in some detail, our proposed approach to the project. This schedule will also allow for incorporation of data on effects of consecutive years of relatively high and cool flows on smallmouth bass reproduction and survival, regimes that we have had few of in recent years. Combined with data already collected during years with lower and warmer flows, this more recent information should give us a much better view of the effects of varying environmental influences on smallmouth bass ecology in the system.

FY 2010--Since the last annual report was submitted we have made substantial progress on this project. Dr. Breton attended the non-native fish workshop and presented a database template for a fully-functional Access database at the 2010 Researchers meeting. The data derived from Recovery Program databases required substantial effort to organize and most of winter and spring 2010 were spent on that activity. Most time was spent contacting the database manager and individual researchers rectifying records to obtain a near final version of the data; that process is ongoing as small errors continue to be corrected. We have also met with Recovery Program staff to update them on project progress including meetings in September (Bestgen and Program staff) and October (Martinez and all PI's).

Analyses are nearly completed on revised abundance estimates for the main reaches where smallmouth bass exist in the Upper Colorado River Basin. This is a main product of this synthesis project and those analyses will be presented in one talk at the December 2010 Non-native Fish Workshop in Grand Junction. A second presentation will focus on plans and approaches for the population dynamics aspects of this project, which will be the focus of the second full year of study in this project. We are also working with Pat Martinez on a third presentation focusing on a description of the data available to better understand escapement of smallmouth bass from Elkhead Reservoir and other off-channel translocation sites. Associated with this, we are working with Ray Tenney, Colorado River Water Conservation District, to better understand reservoir and spill management at Elkhead Reservoir, information that should increase understanding of smallmouth bass timing of escapement and time at large in the Yampa River. This is a logical beginning of a process to better understand escapement and provide a quantifiable estimate of escapement rates of translocated bass from the reservoir.

VII. Recommendations: Continue with project implementation, with a slightly revised start and end date for the schedule.

VIII. Project Status: On track and within budget.

IX. FY 2009-2010 Budget Status

A. Funds Provided: $32,424 (FY2009), plus $60,641 (FY 2010)
B. Funds Expended: $32,424 for FY 2009 expended, 36,000 (FY 2010), $68,424
C. Difference: $24,641, delay in post-doc hiring is reason for large portion of remaining budget.
D. Percent of the FY 2009-2010 work completed, and projected costs to complete: about 65%, but on track based on delayed hiring of post-doc (e.g., some 2010 funding was carried over to FY 2011).
E. Recovery Program funds spent for publication charges: None

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

XI. Signed: *Kevin R. Bestgen* 11 Nov. 2010
Reporting Principal Investigator Date