

- I. Project Title: Evaluating effects of non-native predator removal on native fishes in the Yampa River, Colorado
- II. Principal Investigator(s): Larval Fish Laboratory  
Kevin Bestgen and John Hawkins  
Department of Fishery and Wildlife  
Colorado State University  
Ft. Collins, CO 80523  
voice: KRB (970) 491-1848, JAH (970) 491-2777  
fax: (970) 491-5091  
email: [kbestgen@picea.cnr.colostate.edu](mailto:kbestgen@picea.cnr.colostate.edu)
- III. Project Summary: Control actions for several non-native fish predators have been implemented in several rivers of the upper Colorado River Basin but effects of those removals on restoration of native fishes is unknown. Understanding the response of the native fish community to predator removal is needed to understand if removal programs are having the desired effect. Therefore, the objective of this project is to document fish community changes in response to predaceous fish removals in a reach of the Yampa River, Colorado. A general hypothesis for this work might be whether non-native fishes affect native ones or not.
- IV. Study Schedule: *2004 to 2007*
- V. Relationship to RIPRAP:  
REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH  
MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)  
Green River Action Plan: Yampa and Little Snake Rivers: Formal program guidance is yet being developed.
- VI. Accomplishment of FY 2005 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: Project data collected in FY 05 were reported at the non-native predator workshop conducted in Grand Junction, Colorado, in December 2004. We sampled a total of 28 habitat types in autumn 2004, in both control (N = 17) and treatment (N = 11) reaches. We collected an additional nine samples spring 2005, in both control (N = 4) and treatment (N = 5) reaches. Habitat types included backwaters, riffles, pools, shorelines, and isolated pools. These locations were sampled with either seines, a backpack electrofisher, an electric seine, or a bank electrofisher, with emphasis on obtaining representative samples of small-bodied fishes.

A total of 2,932 fish were captured in samples in both control and treatment reaches in autumn. Samples were dominated by non-native fishes in both treatment and control reaches. Treatment reaches supported about 8.1% native fishes including flannelmouth sucker, roundtail chub, and speckled dace. Control reaches supported 8.6% native fishes of those same taxa. Smallmouth bass relative abundance in 2004 (22%) was reduced

compared to 2003 (39%). Fathead minnow relative abundance was reduced in 2004 (1%) compared to 2003 (15%), sand shiner increased in 2004 (45%) compared to 2003 (13%), white sucker increased slightly in 2004 (12%) compared to 2003 (9%), and creek chub abundance was about the same in 2004 (7%) and 2003 (8%); those taxa collectively were the most common in both treatment and control reaches.

Isolated pool and main channel (all habitat types) fish communities differed in fish composition. In main channel habitat, only 892 fish were captured and 1.3% were native fish. In comparison, 2,034 were captured in isolated pools and 10.6% were native. Smallmouth bass were 65% of the main channel fish community but were only 2.5% in isolated pools. Each native taxa was more abundant in isolated pools than in main channel habitat.

This was true in 2003 as well, when only four native fish, all speckled dace, were captured in mainstem habitat. All other native fishes were captured in isolated backwaters, and generally those had few non-native predators such as smallmouth bass. Native fishes comprised about 10% of all fishes captured in isolated pools, compared to < 1% of fishes in mainstem habitats. In general, small-bodied fishes were more abundant in 2003 in isolated backwaters than in the predator-rich mainstem.

A comparison of data collected in 1981 from the same Yampa River reach to that collected in 2003 and 2004 suggested a large influx in large-bodied predaceous fishes since then. Samples also showed a large decline in abundance of small-bodied native fishes. In 1981, small-bodied native fishes from 2 reaches within the study area were 20 and 33% of samples collected, compared to 10% or less now.

Data collected in autumn 2005 (mostly FY 2006, October) are not yet available as we just finished field work in late October.

Data slides associated with the December 2003 and 2004 workshop presentations on effects of predaceous fishes in the Upper Colorado River Basin are attached at the end of this document. Those data should be considered preliminary and not dispersed prior to preparation and approval of a final report. **Note: Slides have been removed from this annual report (Pat Nelson).**

- VII. Recommendations: We have continued to collect data in autumn 2005 that will be reported for FY 2006. Based on broad movements of smallmouth bass out of treatment reaches in 2003, the study area length was doubled so that control and treatment reaches are now each 12 miles long. This was a result of the workshop conducted in December 2003. We are also testing additional gear types (electric seine) to increase efficiency of sampling in the Yampa River. We will place continued emphasis on small-bodied fishes in the following years because this is where we expect most of the fish response to occur, if any. We also plan some sampling for large-bodied species to assess predator removal effects since springtime removals and to ensure that native fishes for which a response is being estimated, still occur in the study reach. Another activity completed this year that was associated with this project was additional smallmouth bass removal from the treatment reach. This was accomplished by completing three intensive sampling passes

