

COLORADO RIVER RECOVERY PROGRAM
RECOVERY PROGRAM
FY 2006 ANNUAL REPORT

PROJECT NUMBER 110

- I. Project title: Development of a smallmouth bass and channel catfish control program in the lower Yampa River.

- II. Principal Investigator(s):
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- III. Product Summary:
Smallmouth bass and channel catfish continue to pose threats to the native and endangered fish community in the lower Yampa River. After six years of channel catfish removal (electrofishing and angling) and three years of smallmouth bass control (mainly electrofishing), populations seem well established and stable. Predation and competition continue to repress and prolong the recovery effort, and a positive native fish response to control has not yet been identified. The focus of this study is to reduce the number of smallmouth bass and channel catfish to the point where they no longer impede endangered fish recovery.

The control strategy, recommended for centrarchids (Lentsch et al. 1996) and ictalurids (Modde and Fuller 2000), is nonnative fish removal from the main river channel using mechanical techniques (i.e., electrofishing, trapping, angling etc.). In 2006, electrofishing was the only method used, however a substantial effort went towards improving control strategies. Besides implementing collective knowledge from the field (e.g., extending shock-time in bass habitat, and using temperature, flow and turbidity as cues to interrupt spawning, and to increase catch rates), sampling improved with the use of small boats which enabled greater maneuverability and access to the study area during flows less than 1000 cfs. A computer model is also being developed to identify areas of smallmouth bass vulnerability and to determine exploitation levels needed for effective population reduction.

- IV. Study Schedule:
a: Initial year: FY01
b: Final year: TBD

V. Relationship to RIPRAP:

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

III.A.1.c. (1) Remove channel catfish in Yampa Canyon.

III.A.1.d. Remove and translocate smallmouth bass.

VI. Accomplishment of FY06 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Study Area

The study area is within the borders of Dinosaur National Monument. It begins at river mile 46 at Deerlodge Park - a National Park Service designated campground on the eastern border of the Monument, and ends at river mile 0 at the Yampa's confluence with the Green River upstream from Echo Park and Whirlpool Canyon.

Background

In 1998-99 a feasibility study was designed to reduce channel catfish from several five mile reaches in the lower Yampa River. Measurable depletion was demonstrated by regressive CPE using electrofishing and volunteer assisted angling (Modde and Fuller 2000). In 2001 this study was presented as a more intensive effort to reduce catfish from the entire study area. After the first year of sampling, population depletion was not demonstrated, and it was until 2004 that measures of depletion were shown with mark-recapture structured population estimates. Since 2002 the smallmouth bass population dramatically increased; electrofishing catch rates that were less than one bass/hr in 2001 escalated to 36 bass/hour in 2004. Smallmouth bass remain the more serious threat as recent catch rates of humpback chub have shown serious decline (Finney 2006).

Study Design

The river was stratified into 10, 4-5 mile reaches similar to those used in the earlier study (1998-99). River reaches were used to monitor bass movement, to identify high density areas and to make statistical comparisons. The method used was electrofishing with one electrofishing raft and chase boat per shoreline. All smallmouth bass and channel catfish were collected, length and weight recorded, and removed from the river unless tagged and released during the first pass for a recapture structured population estimate.

2006 Sampling Results

This year the SOW was revised to eliminate a population estimate; rather, the effort began with a removal pass. Removal continued weekly until five passes were completed. Flows receded below 500 cfs in July before the sixth and seventh passes could be made, but

storm events in September provided flow enough for one more pass. During a total of six passes, 1,914 smallmouth bass and 4,633 channel catfish were removed from the study area (see Table 1). During the 2nd and 4th passes, eight yellow floy-tagged bass were caught. These were marked near Craig, Colorado and their downstream movement is likely associated to displacement during fluctuating flows.

Table 1. 2006 Smallmouth bass and channel catfish collected from the lower Yampa River study area.

Pass	Date	Bass Removed >100mm	Catch/Hr Bass >100mm	Bass Removed ≤100mm	Catch/Hr Bass ≤100mm	Catfish Removed	Catfish Catch/Hr
1	June 5-8	189	8.05	0	0	215	9.15
2	June 13-16	294	10.24	14	.52	446	15.53
3	June 20-23	173	5.74	7	.23	953	31.62
4	June 27-30	350	10.69	33	1.01	1168	35.66
5	July 10-14	255	6.92	12	.33	1681	45.59
6	Sept. 25-28	296	8.85	289	8.82	170	5.08
Total	24 days	1557	8.40	355	1.91	4633	25.00

Catch Per Effort (CPE) Smallmouth Bass

This year’s CPE, (all passes combined) was 10.31/hr, and for bass >100 mm, 8.4/hr. The CPE for the years 2004-2006, (all passes) are 24.46, 18.45 and 10.31, Figure1. This year the highest CPE per pass was 10.69/hr during the fourth pass. The highest CPE per pass last year was 29.7/hour (Figure1). These were both during very turbid conditions.

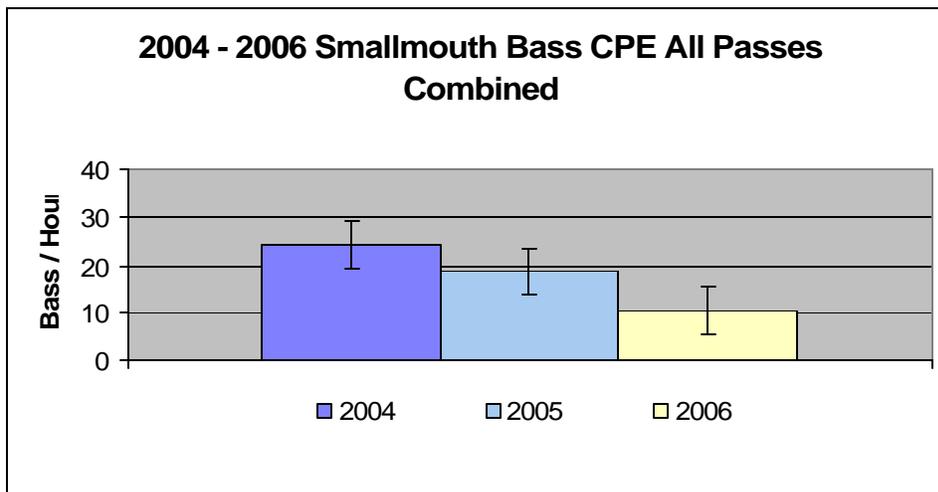


Figure 1. The 2004-06 catch per hour, all passes combined and all sizes.

This years CPE during each pass shows no reduction from first to last (Figure 2).

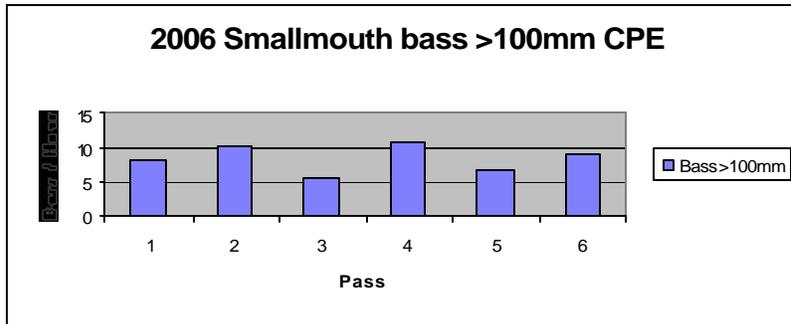


Figure 2. The 2006 CPE for bass greater than 100 mm total length shows no reduction in catch/hour.

During the course of the first five passes, very few bass <100 mm were collected. Then during pass six this younger age-class greatly contributed to the catch (Figure 3).

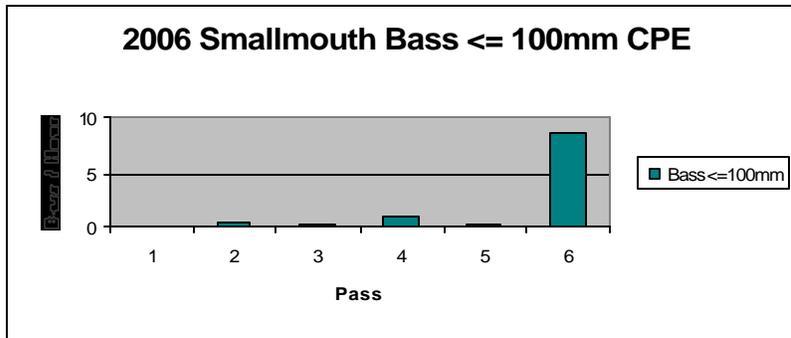


Figure 3. 2006 CPE during each pass shows few yoy bass collected prior to the last pass.

Channel Catfish CPE

The CPE for the years 2004-2006, (all passes combined) are 28, 27, and 25 catfish per hour respectively, (Figure 4).

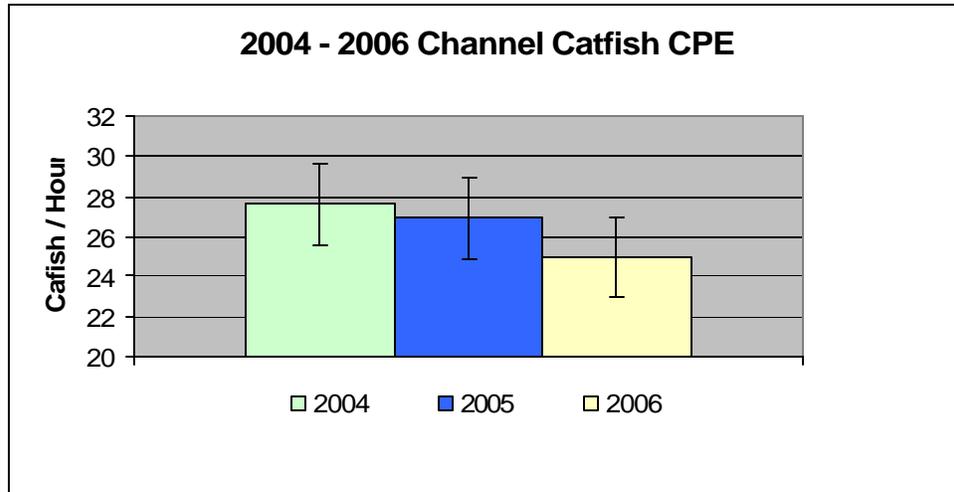


Figure 4a. 2004 -2005 channel catfish CPE electrofishing all passes combined.

The channel catfish CPE increased each pass until the fifth pass and then decreased during the last pass (likely caused by cold water temperatures in September; Figure 4b).

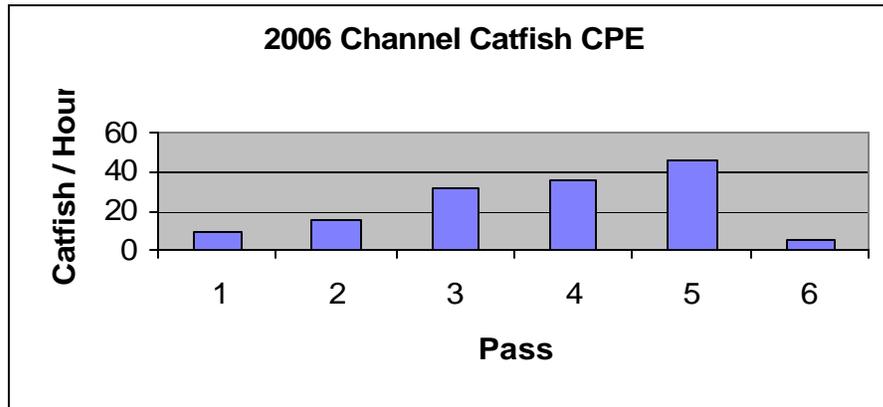


Figure 4b. 2006 Channel catfish CPE for each pass.

Smallmouth Bass Size

Mean total length (TL) of smallmouth bass collected was 178 mm. The size most frequently caught was 200-225 mm (figure 5). This represents the cohort most caught last year at 150-175mm and in 2004 at 125-150 mm total length. This year's distribution of size implies wide size-class range and steady recruitment, Figure 5.

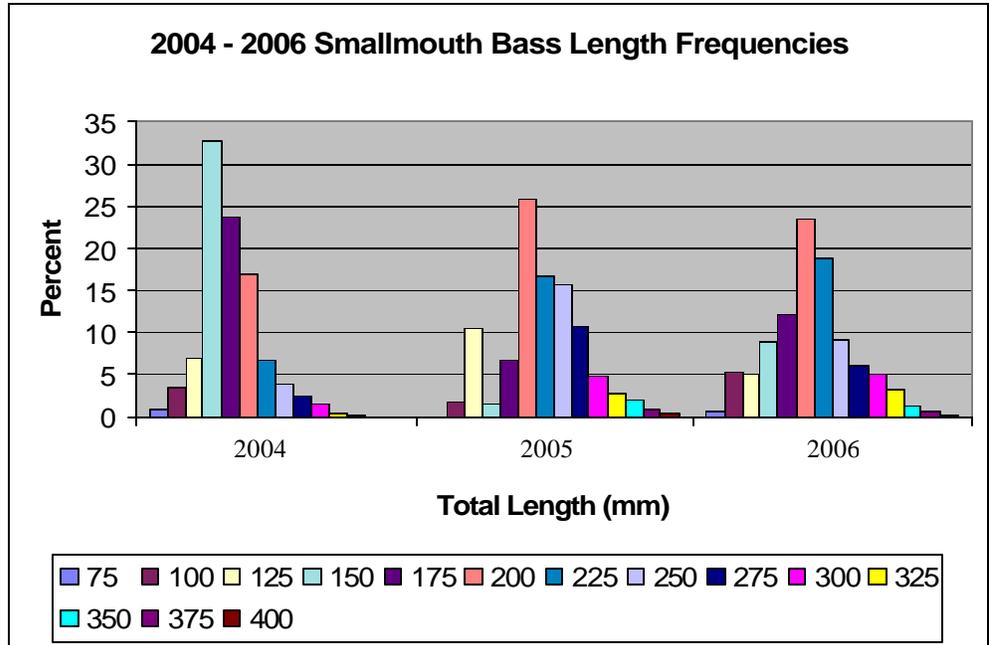


Figure 5. 2004 – 2006 smallmouth bass length frequencies.

Channel Catfish Size

A total of 4632 channel catfish were removed from the river. The mean total length (TL) for all passes was 274 mm (same as last year). Once again, catfish at 225-250 mm were most common and very few less than 200 mm were collected, Figure 6.

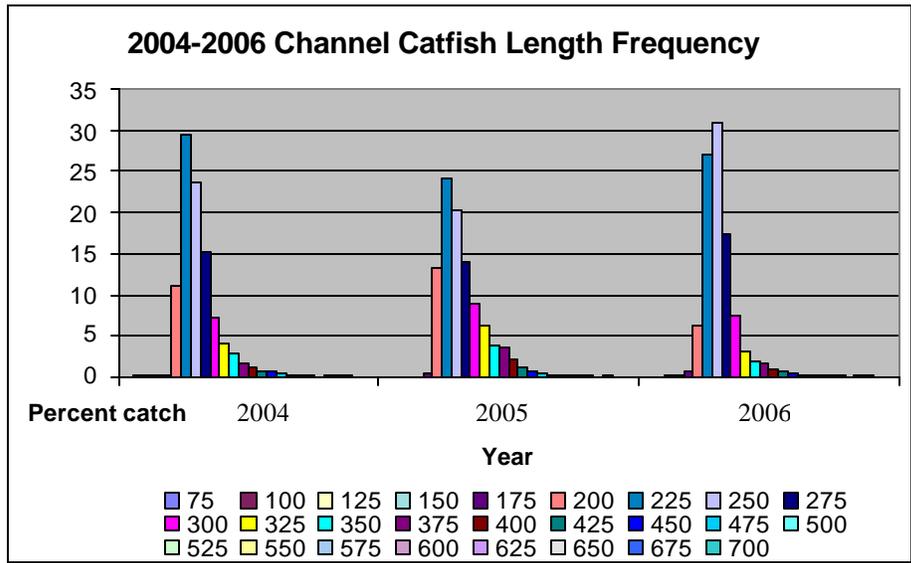


Figure 6. 2006 channel catfish length frequency.

VII. Recommendations

Smallmouth bass

1. I recommend continuing and maximizing this effort with tactics that utilize environmental constraints, population dynamics and adaptive management.
2. Evaluate the effect of flows on smallmouth bass reproductive success.
3. Determine the timing and measure of turbidity that affects CPE.

Channel Catfish

4. Since 2004 catch results have changed very little, we have not achieved significant river-wide depletions. Mean lengths (though they dropped in beginning years) and length frequencies remain similar year after year. There is little recruitment from within the canyon, but sustained recruitment by migration from areas outside the study area. With strong seasonal recruitment (catfish at ~ 200mm length), and no control effort in areas of contribution, the population seems to rebound from year to year regardless the removal effort. Unless catfish control intensifies and expands into source areas, I recommend they be monitored with the whole fish community as described below.

Native Fishes

5. I recommend monitoring the fish community by selecting 4 one-mile monitoring reaches (as in previous years) and while shocking as described above, collect all species to determine species composition and the native fish response to nonnative fish control.

VIII. Project Status:

This project continues through 2007. A synthesis report will be submitted to the recovery program before March 2007.

IX. FY 06 Budget Status:

	<u>Total</u>
A. Funds Provided:	120,435
B. Funds Expended:	120,435
C. Difference:	0
D. Recovery Program funds spent for publication charges:	\$0

X. Status of Data Submission:

Data is being entered in dBASE files and will be submitted to the program data base manager upon completion of the study.

Signed: Mark H. Fuller
Principal Investigator

November 9, 2006
Date

XII. References:

- Modde, T., and M. Fuller. 2002. Feasibility of channel catfish reduction in the lower Yampa River. Final Report, Project 88. Submitted to the Recovery Implementation Program, U.S. Fish and Wildlife Service, Denver, CO.
- Tyus, H.M., and J.F. Saunders. 1996. Nonnative fishes in the upper Colorado River basin and a strategic plan for their control. Final Report of University of Colorado Center for Limnology to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Lentsch, L.D., R.T. Muth, P.d. Thompson, B.G Hoskins and T.A. Crowl. 1996. Options for selective control of nonnative fishes in the upper Colorado River basin. Utah Division of Wildlife Resources Publication 96-14, Salt Lake City, Utah.
- Carlander, K. D., 1977. Life history data on centrarchid fishes. Handbook of freshwater fishery biology; v. 2.
- Cleary, R. E., 1956. Observations on factors affecting smallmouth bass production in Iowa. Journal of Wildlife Management. 20(4):353_359.