

COLORADO RIVER RECOVERY PROGRAM
FY 2008 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 123a

I. Project Title: Smallmouth Bass Control in the Green River

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III. Project Summary:

The Upper Colorado River Endangered Fish Recovery Program has determined that control of nonnative fish in the upper Colorado River basin is essential to the recovery of the four endangered fish species: Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. Smallmouth bass abundance has dramatically increased in the Green River since 2000. This information resulted in a recommendation from the December 2003 Nonnative Fish Control Workshop (Grand Junction, CO) to attempt control of this species in the Green River. Three years of removal and Nonnative Fish Control Workshops have added to the knowledge base of the effort required to successfully remove smallmouth bass from the Green River. During the December 2006 workshop, participants discussed the importance of increasing the removal effort and reallocating effort to concentration areas, resulting in this revised scope of work for the Echo Park to Split Mountain reach of the Green River in Utah. This year was the second field season of increased effort in the study reach.

IV. Study Schedule: To be continued as needed

V. 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.

GREEN RIVER ACTION PLAN: MAINSTEM

III. Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).

III.A. Reduce negative impacts to endangered fishes from sportfish management activities.

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.

VI. Accomplishment of FY 2008 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

All scheduled sampling (16 passes) was completed according to the scope of work for the 2008 fiscal year. We accomplished the objectives of conducting a population estimate for adult and juvenile bass in the study reach and removing bass from Echo Park to Split Mountain boat ramp. We were able to achieve over 65% exploitation for juveniles based on the point estimate, but not for fish greater than 200mm total length (TL).

Abundance Estimates, Exploitation, and Population Size Structure

The adult (≥ 200 mm TL) and juvenile (100-199 mm TL) abundance point estimates were 1,148 (47 bass/mile) and 3,175 (130 bass/mile) individuals, respectively, in the study reach (Table 1). The estimate for adult bass, in particular, was extremely variable, which probably resulted from a relatively low number of fish being marked due to high flows during the marking passes. Three hundred thirty-eight adults and 2,194 juveniles were removed from the population during the study period. Intra-study growth based on tag returns was considered when grouping fish into age classes. The lengths at which age classes were separated were adjusted to reflect typical growth of fish without having marked fish change from one age class to another. Growth rates showed high variability for juvenile fish, with average weekly growth rates of less than 1mm/week to 5-7mm/week. Fish smaller than 100mm total length were grouped together because there was no clear separation later in the sampling between young of year and age-1 fish. Exploitation rates derived from the abundance estimates differ from those derived from tag returns (Table 2), in part because of variable estimates. Five juvenile bass (4%) without tags were included as recaptures, based on the presence of a fin clip. There were also two adults that appeared to have lost tags (5%).

The length frequency of bass captured for all sixteen passes is shown in Figure 1. In comparison to 2007, the most notable difference is the dramatic decrease in bass < 100 mm TL. The majority of bass captured in this size class appeared to be age-1, and very few young of year bass were observed this season. Also, there was a slight increase

in the number of bass 126-150mm, and a decrease in every other size category. Last year, the number of young of year bass captured increased rapidly in early August and peaked at about 1,900 individuals in mid-August (Fig. 2). This year, young of year bass were captured beginning in late August and peaked in early September at 79 individuals, about three weeks later than 2007. This decrease and delay is attributed to higher flows and water temperatures remaining cooler for longer this year. The time at which mean water temperature at the Jensen gage remained above 15°C was also about three weeks later this year compared to 2007 (USGS data).

Catch Rates

Catch rates for smallmouth bass generally declined over the season (Figure 3). This was true whether analyzing adults, juveniles, or adults and juveniles combined. Catch rates showed a greater decline for adults than for juveniles (Fig. 4). An increase in catch rate was observed during pass 12, when heavy rains increased turbidity. In particular, catch rates for adults increased more dramatically during these conditions. This raises questions about the distribution of adult bass in the river channel and whether targeting the shorelines is effective in removing adults. The catch rate this year for adults and juveniles combined decreased compared to previous years (Fig. 5).

Movement

Fifty-three tagged bass (11 adults, 42 juveniles) from this study were recaptured, allowing an analysis of movement. Four adults (36%) were recaptured in the same area where they were tagged, four were encountered upstream of their original capture, and three (27%) were recovered downstream. Of the 42 juveniles recaptured, 17 (40%) were caught in the same area, four (9.5%) were captured upstream, and 22 (52%) were found downstream. Two of the juveniles recaptured were found in the study reach below this one. Two of the recaptured adults were caught by USFWS crews in Yampa Canyon. There were also seven adult bass with red tags not included in these numbers from the Utah Division of Wildlife study reach below Split Mountain, and one bass with a yellow tag from a study reach upstream from Yampa Canyon. There also appeared to be two juveniles with fin clips indicating they were tagged in the Yampa River, and six fish with tags whose numbers could not be discerned or the number portion was missing.

Ancillary Fish Captures

In addition to the smallmouth bass in the reach, numerous other nonnative species were captured (Table 4). Walleye numbers increased from 2007, which was the first year similar numbers of passes were completed. Eighteen of the 25 walleye caught were found in the approximately eight river miles of Split Mountain Canyon. In 2007 gizzard shad were observed for the first time, but none were captured this year.

- VII. Recommendations:
Continue as scheduled and adjust the Haines and Modde model by incorporating these data.
- VIII. Project Status: On track and ongoing

Pass	TL <100mm	Juveniles	Adults	Total
1	56	70	29	155
2	49	66	14	129
3	85	155	21	261
4	117	194	34	345
5	39	257	51	347
6	20	203	41	264
7	7	256	34	297
8	3	161	39	203
9	0	194	17	211
10	1	112	7	120
11	21	124	7	152
12	79	210	37	326
13	5	109	16	130
14	45	163	12	220
15	61	37	13	111
16	45	19	9	73
Total	633	2330	381	3344

Table 4. Ancillary fish captures in the study reach.

Species	Number Captured
Black Crappie	20
Bluegill	38
Green Sunfish	530
White Sucker and Hybrids	504
Northern Pike	16
Walleye	25

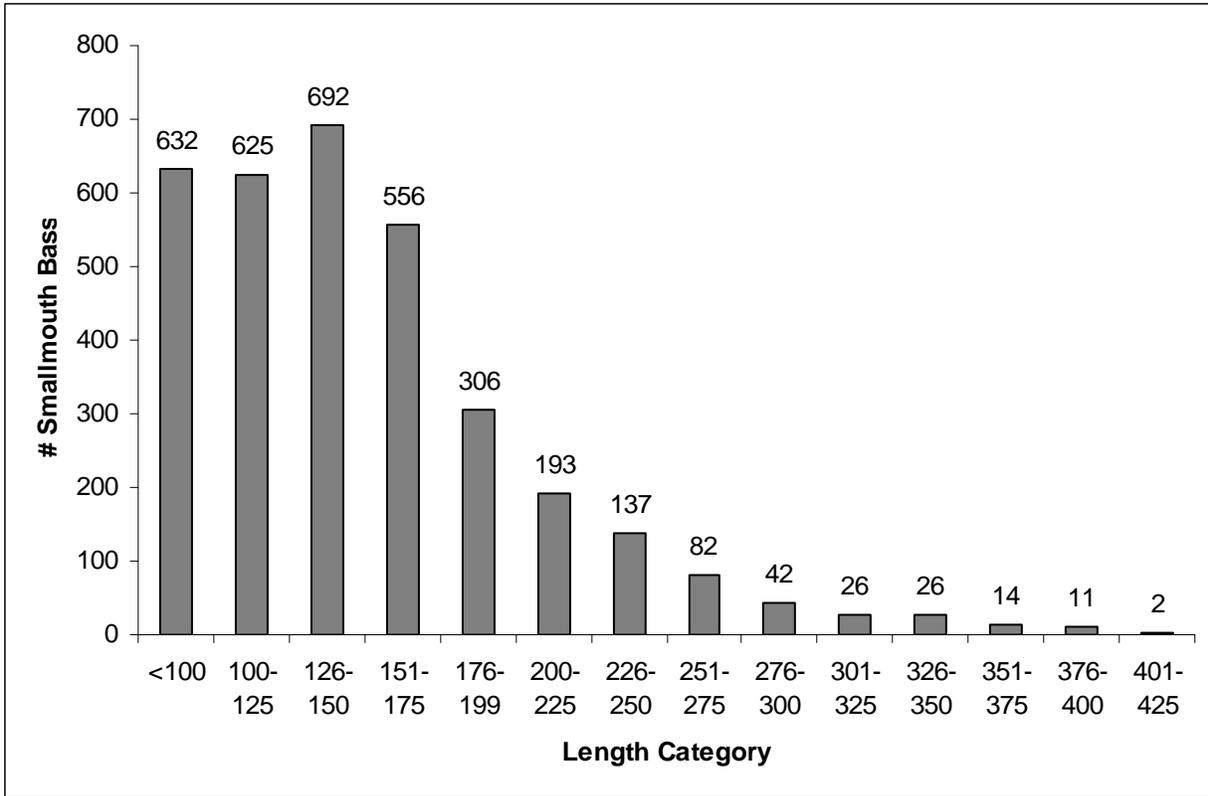


Figure 1. Length frequency of smallmouth bass captured in the study reach.

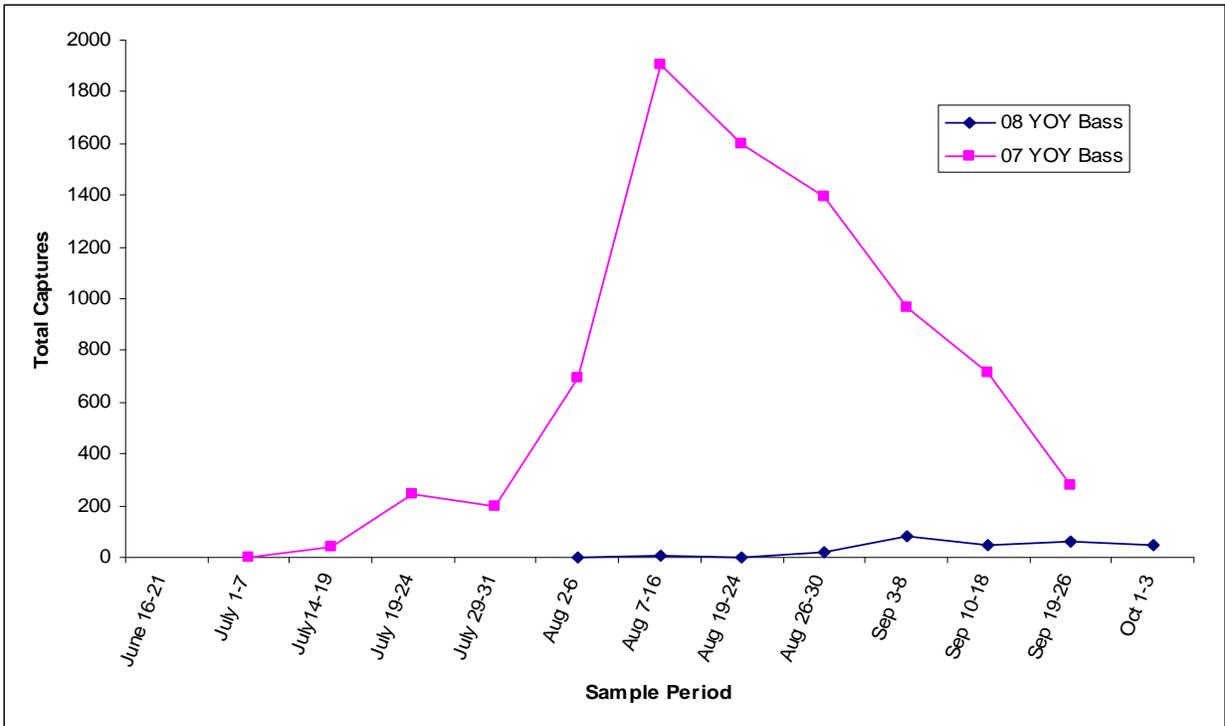


Figure 2. Total catch of young of year smallmouth bass in 2007 and 2008.

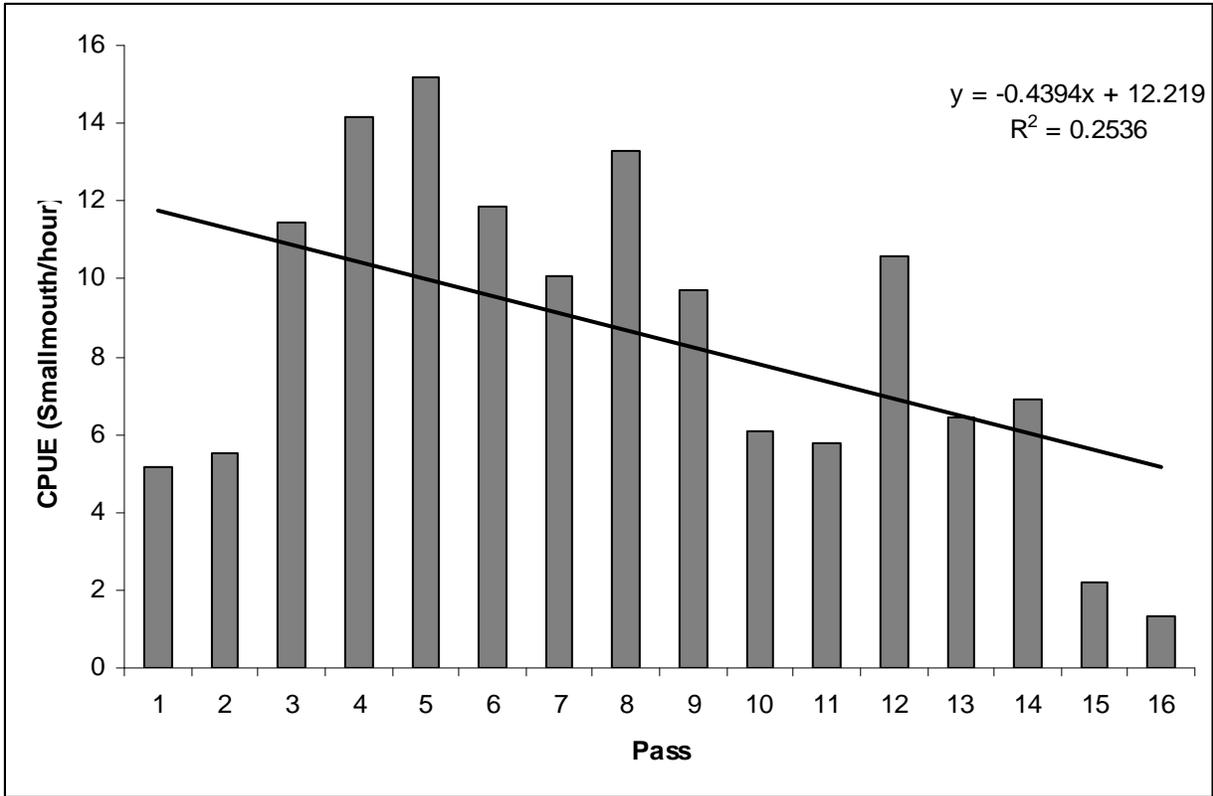


Figure 3. Smallmouth bass (juvenile and adult) catch rate by pass, 2008.

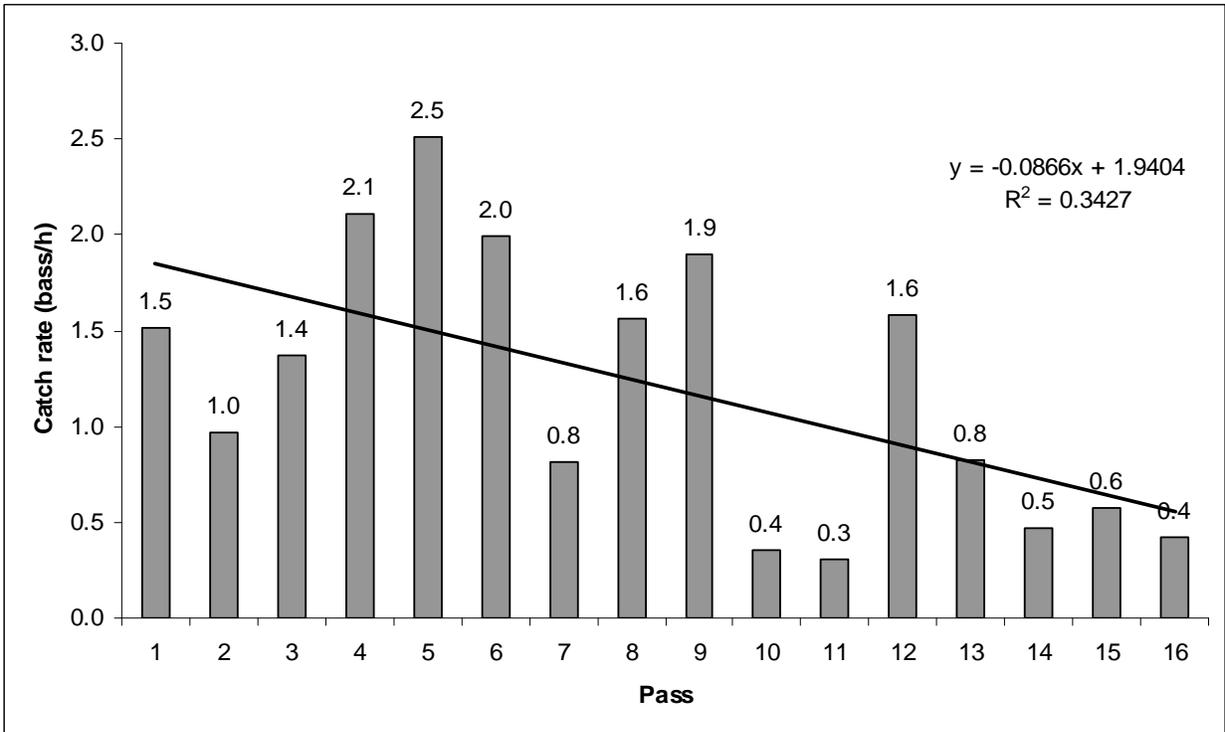


Figure 4. Catch rates for adult smallmouth bass by pass, 2008.

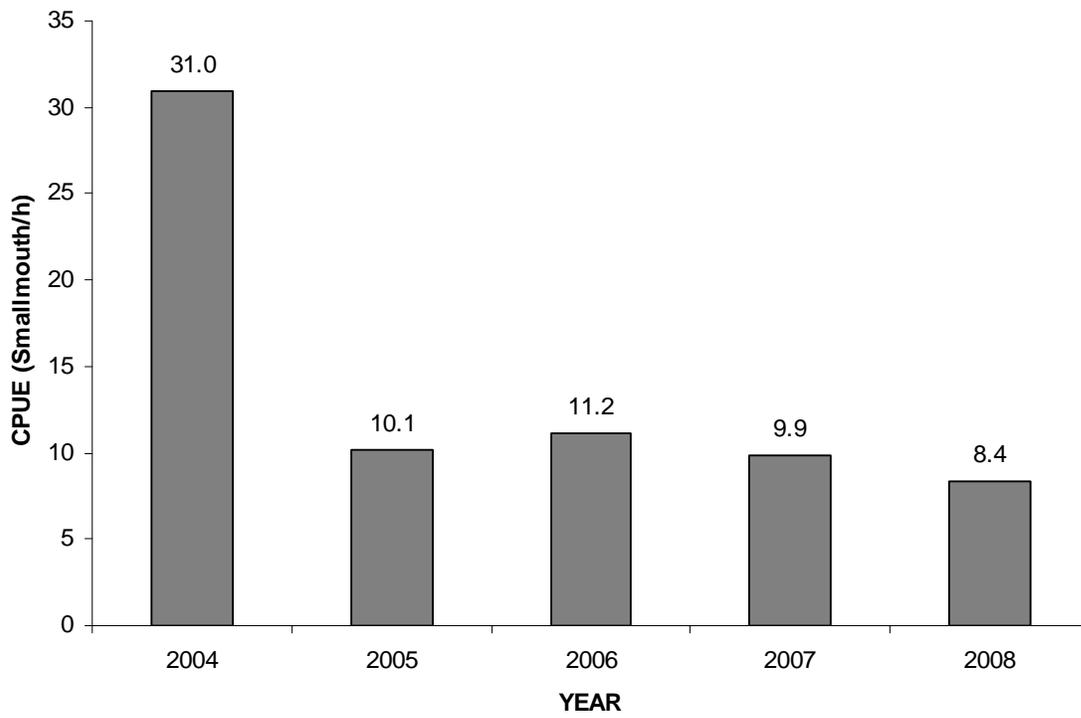


Figure 5. Smallmouth bass catch rates (juvenile and adult) in the reach for 2004-2008.