

COLORADO RIVER RECOVERY PROGRAM
RECOVERY PROGRAM
FY 2007 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 threaten the native and endangered fish community in the lower Yampa River. Predation and competition from smallmouth bass and channel catfish are believed to pose considerable negative impacts to endangered humpback chub and Colorado pikeminnow. The study began in 2001 with objectives to reduce the abundance of channel catfish and smallmouth bass to the point where they no longer threaten endangered fish or impede their recovery. Additionally, the native fish community is being monitored to determine the native fish response to mechanical control.

The control strategy is nonnative fish removal from the main river channel using mechanical techniques (i.e., electrofishing, trapping, angling etc.). In 2007, electrofishing was the only method used, however a substantial effort went towards improving control strategies. Modeling was used to identify areas of smallmouth bass vulnerability and to determine exploitation levels needed for effective population reduction. The model helped to determine the minimum exploitation level needed to impact the smallmouth bass population ($u = 65\%$). Such an effort has not likely yet been achieved.

The study area begins at river mile 46 at Deerlodge Park in Dinosaur National Park and ends at river mile 0 at the Yampa's confluence with the Green River just upstream from Echo Park and Whirlpool Canyon.

IV. Study Schedule:

a: Initial year: FY01

b: Final year: 2007

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

- I. 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. Each control activity will be evaluated for effectiveness, and then continued as needed.
- III.b.3. (Nonnative fish removal in Yampa Canyon).

VI. Accomplishment of FY07 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Background

In 1998-99 a feasibility study was designed to mechanically remove and reduce channel catfish from several five mile reaches in the lower Yampa River. Measurable depletion was demonstrated using electrofishing and angling (Modde and Fuller 2000). In 2001 the effort was extended to remove channel catfish from the entire study area. After the first several years of sampling, river-wide population depletions were not demonstrated, and it was until 2004 that measures of depletion were shown using population estimates and post removal estimates. Since 2002 smallmouth bass abundance rapidly increased; electrofishing catch rates that were less than one bass/hr in 2001 escalated too 36 bass/hour by 2004. Smallmouth bass remain the more serious threat as recent catch rates of humpback chub have shown serious decline, a reduction in abundance the coincides with the proliferation of smallmouth bass (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 per shoreline. All smallmouth bass and channel catfish >400 mm

were measured and weighed, and removed from the river unless tagged and released during the first pass to figure the population estimate.

2007 Sampling Results

As per the 2006 SOW revision to eliminate a population estimate; all effort in 2007 was again committed to removal. The first pass was June 5-8 and trips continued weekly until four passes were completed. We were denied access through the canyon the remainder of the season; flows receded below 600 cfs by 02 July. During a total of four passes, 906 smallmouth bass and 54 channel catfish > 399 mm were removed from the study area, see Table 1. No recaptures from upstream or downstream of the study area where collected.

Table 1. 2007 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 >400mm Removed	Catfish >400mm Catch/Hr
1	June 5-8	145	4.96	35	1.09	7	.24
2	June 12-15	165	5.45	76	2.51	10	.33
3	June 19-22	110	3.93	42	1.5	13	.46
4	June 26-28	205	6.88	128	4.3	24	.81
Total	24 days	625	5.33	281	2.36	54	.46

Catch Per Effort (CPE) Smallmouth Bass

This year's CPE for bass >100 mm TL was 5.33/hr (all passes combined), The same catch rate for the years 2004-2007 show decline ranging from 21.6, to 5.4 bass per hour see Figure 1.

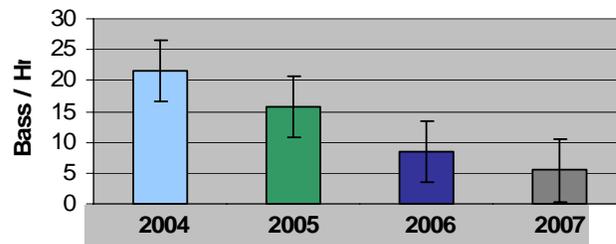


Figure 1. The 2004-2007 smallmouth bass (>100 mm TL) catch per hour all passes combined.

The CPE per pass shows no reduction in successive passes from spring to summer for years 2004-2007, Figure 2, but when comparing CPE by reach we can show that since 2004 CPE has declined (all passes combined), Figure 3.

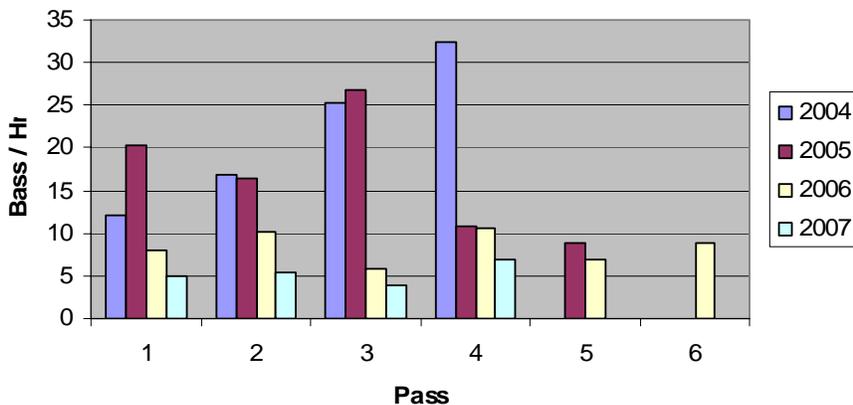


Figure 2. As in previous years, the 2007 CPE for bass > 100 mm TL shows no reduction in catch/hour.

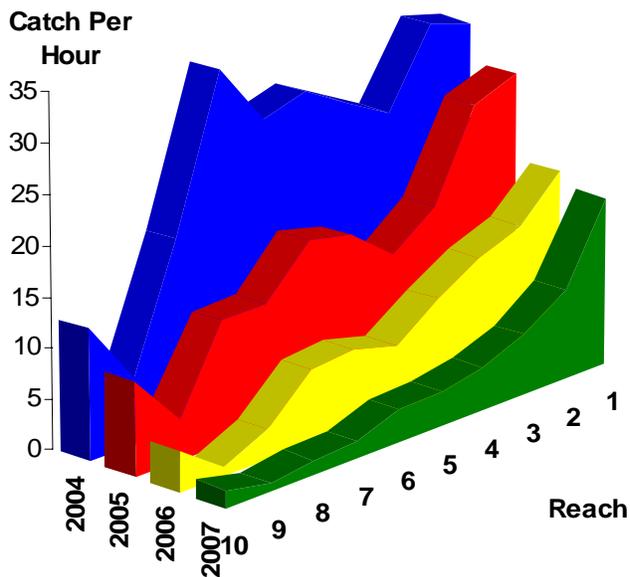


Figure 3. The smallmouth bass CPE in each reach since 2004 shows yearly decline, and lower catch rates become more prominent over time in the study area's lower reaches. Reach 1 is the furthest upstream reach (rm 46).

Smallmouth Bass Size

Mean total length (TL) of smallmouth bass collected was 157 mm. The size most frequently caught with the exception of YOY was 150-175mm in both 2006 and 2007, figure 4.

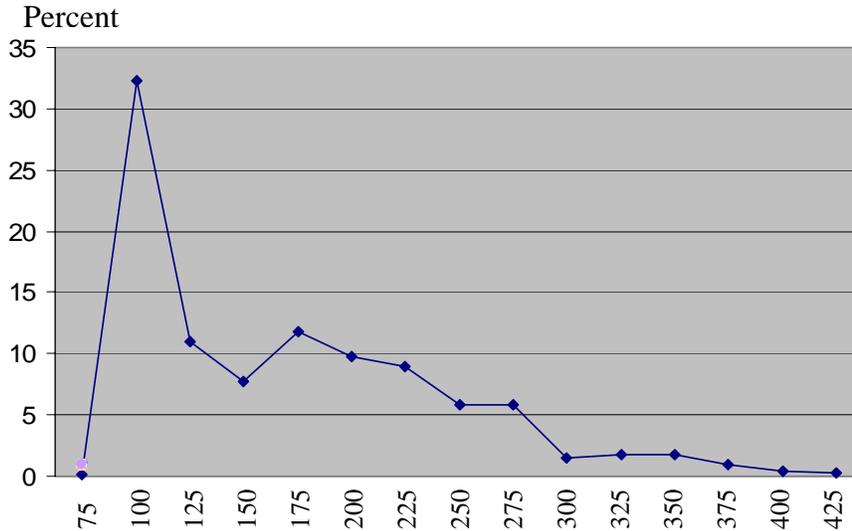


Figure 4. The 2007 length frequency of smallmouth bass removed from the Yampa River (rm 46-0).

Channel Catfish CPE

The CPE's for the years 2004-2006, (all passes combined) are 28, 27, and 25 catfish per hour respectively. The CPE for 2007 is less (not comparable) because only catfish greater than or equal to 400 mm were removed. This year 54 channel catfish with mean TL 475 mm were collected (all passes). As in 2004-2006, the channel catfish CPE increased each pass with increasing water temperature. Large channel catfish (>400 mm) make up a small part of the population, for example, last year 4,632 channel catfish were removed and only 161 or 3.48 % were greater than 399 mm TL.

Fish Monitoring

The fish community was monitored in four one-mile reaches by electrofishing. Sampling included the use of two electrofishing rafts (one per shoreline), one netter and the time electroshocking. The netter was to board all fish with a one-quarter inch net without targeting a specific size or species. Three of the four reaches were the same used in 2001 and 2004 see locations below. All monitoring was completed during pass 3, June 19-21.

Removal Reach	Upstream rm	Downstream rm
1	39	38
3	35	34
4	31	30
6	24.5	23.5

In all monitor reaches, 10 species were collected. The two most frequent caught were natives, the flannel mouth sucker and blue head sucker, see figure 5.

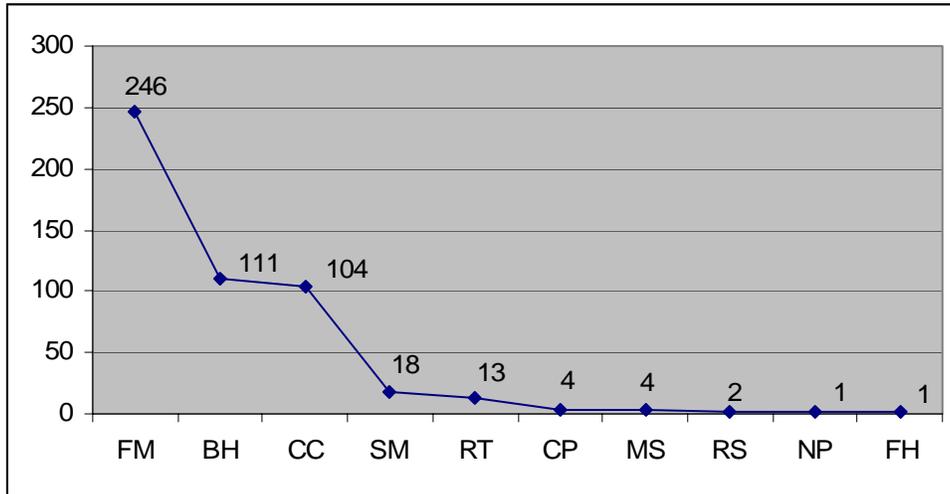


Figure 5. The total number of fishes collected while monitoring four one-mile reaches in the lower Yampa River.

VII. Recommendations

Smallmouth bass

1. I recommend continuing both smallmouth bass and channel catfish control and to be prepared to increase the sampling occasions if catch data indicates the SMB population is increasing.

2. Evaluate the affects of fluctuating flows and turbidity levels on smallmouth bass survival, displacement, vulnerability to capture and reproductive success.

Channel Catfish

3. Since 2004 catch results have changed very little, with high seasonal recruitment (catfish at ~ 200mm length), and no control in areas connected to the study area, abundance rebounds from year to year regardless the removal effort. Unless catfish control is intensive and extends into adjoining areas, I recommend removing only catfish greater than 400 mm TL.

Native Fishes

5. I recommend continuing monitoring the fish community as described above 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 December 2007.

IX. FY 07 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

November 15, 2007

Principal Investigator

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.