

- 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
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- 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 2004 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: Project data collected in FY 04 were reported at the Non-native predator workshop conducted in Grand Junction, Colorado, in December 2003. We sampled a total of 70 habitat types in autumn 2003, in both control (N = 37) and treatment (N = 33) reaches. Habitat types included backwaters, eddies, embayments, riffles, shorelines, and isolated pools. These locations were sampled with either seines, a backpack electrofisher, or a bank electrofisher, with emphasis on obtaining representative samples of small-bodied fishes.

A total of 3,937 fish were captured in samples in both control and treatment reaches. Samples were dominated by non-native fishes in both treatment and control reaches. Treatment reaches supported about 7% native fishes including suckers, roundtail chub, and speckled dace. Control reaches supported < 3% native fishes of those same taxa. Smallmouth bass (39%), fathead minnow (15%), sand shiner (13%), white sucker (9%), and creek chub (8%) were the most abundant non-native fishes in both treatment and

control reaches.

A key point regarding abundance of native fishes was that only 4 individuals, 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 isolated backwaters than in the predator-rich mainstem.

Electrofishing was a more productive sampling gear in the Yampa River than seining, producing more species and more individuals, with the exception of a single large sample of sand shiners.

A comparison of data collected in 1981 from the same Yampa River reach to that collected in 2003 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 less than 7% now.

Data collected in autumn 2004 (mostly FY 2005, October–November) are not yet available as we just finished field work in early November.

Pursuant to a new request following the December 2004 workshop on effects of predaceous fishes in the Upper Colorado River Basin, I have attached at the end of this document some of the data slides from the Power Point presentation given the previous year (FY04). I did not attach the newest information because it is in a new fiscal and project year (FY05). Those data should be considered preliminary and not dispersed prior to preparation and approval of a final report.

- VII. Recommendations: We have continued to collect data in autumn 2004 that will be reported for FY 2005. 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.
- VIII. Project Status: On track and ongoing.
- IX. FY 2004 Budget Status
 - A. Funds Provided: \$59,100
 - B. Funds Expended: \$59,100
 - C. Difference: 0

- D. Percent of the FY 2004 work completed, and projected costs to complete: 100% of FY04 complete.
- E. Recovery Program funds spent for publication charges: NA
- X. Status of Data Submission (Where applicable): *[Indicate what data have been submitted to the database manager.]*
- XI. Signed: Kevin R. Bestgen 9 November 2004
Principal Investigator Date
(Just put name and date here, since you will be submitting the report electronically)

APPENDIX: *[More comprehensive/final project reports (NOT to be used in place of a complete annual report.). If distributed previously, simply reference the document or report.]*

Portions of a Presentation at the 2003 Workshop on non-native fish predators are presented below

Response of the Native Fish Community of the Yampa River to
Removal of Non-native Piscivores: Preliminary Results From 2003

by

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Objective

Assess baseline fish community present in Yampa River study area after
2003 removal effort and prior to more extensive future efforts

Number of samples in treatment and control reaches in Little Yampa Canyon by
habitat type, Yampa River 2003

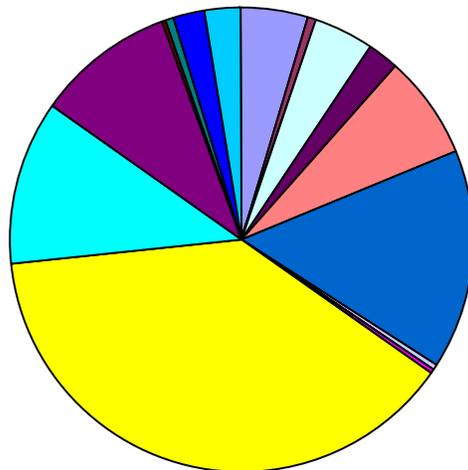
	<u>Treatment</u>		<u>Control</u>
No. of samples	33	37	
No. of samples with fish	26		35
Backwaters	8		9
Eddies	0		1
Embayments	5		7
Isolated pools	4		3
Pools	0		1
Riffles	6		8
Runs	2		1
Shorelines	8		7

% Composition of the fish community of the Yampa River study area, 2003

<u>Species</u>	<u>TREATMENT</u>	<u>CONTROL</u>
Native suckers	3	2
Roundtail chub	1	<1
Speckled dace	3	<1
Black bullhead	<1	12
Brook stickleback	6	<1
Common carp	3	<1
Creek chub	7	8
Fathead minnow	18	11
Smallmouth bass	38	39
Sand shiner	8	18
White sucker	12	6

% Composition of the Fish Community of the Yampa River Study Area, 2003

BB
 BC
 BG
 BS
 CP
 CR
 FH
 PK
 RD
 NP
 SM
 SS
 WS
 ID
 RT
 SD
 NS



% Species Composition by Sampling Gear, Yampa River, 2003

Species	T-EL	C-EL	T-SE	C-SE	
Native suckers	3	2	0	0	
Roundtail chub	1	<1	0	0	
Speckled dace		3	<1	0	0
Black bullhead	<1	13	0	<1	
Black crappie	<1	1	0	0	
Brook stickleback	6	1	0	<1	
Common carp	3	1	9	<1	
Creek chub	7	9	0	0	
Fathead minnow	18	11	9	4	
Smallmouth bass	38	42	0	4	
Sand shiner	7	11	82	88	
White sucker	12	6	0	0	

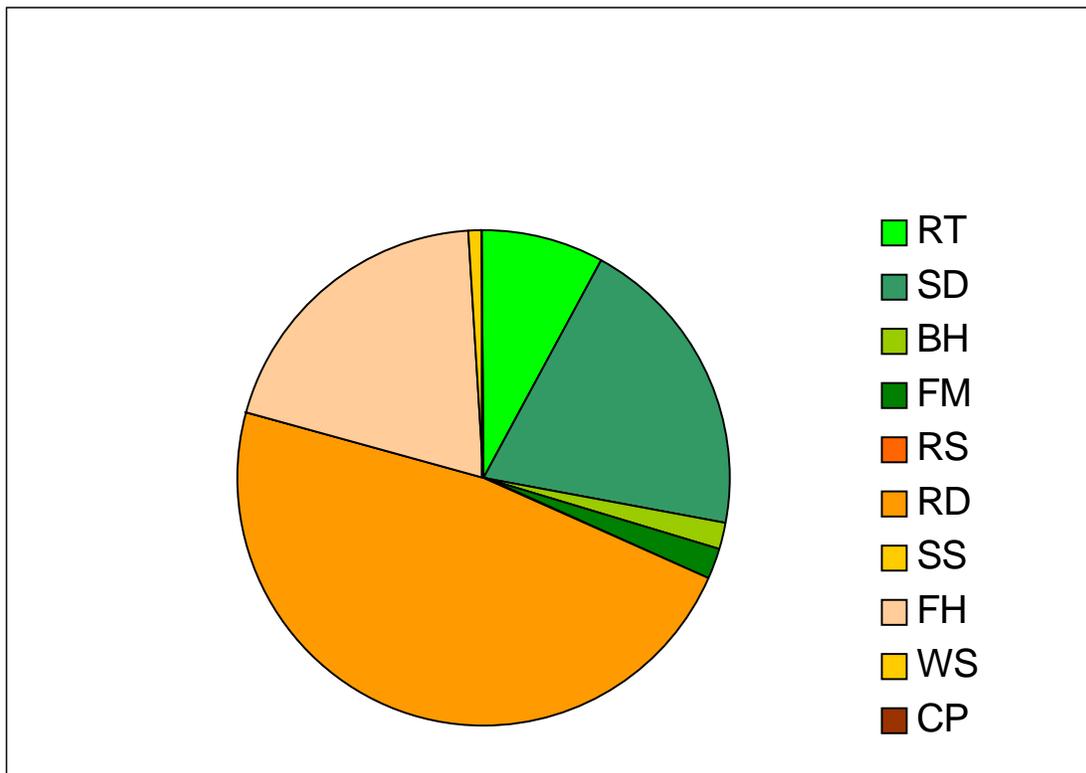
Main Channel and Isolated Pool Fish Communities, Yampa River, 2003

Species	Main channel	Isolated pool
Native suckers	0.0	5.0
Roundtail chub	0.0	1.5
Speckled dace	0.4	3.8
Black bullhead	1.7	7.7
Brook stickleback	0.8	7.3
Common carp	0.3	4.2
Creek chub	6.7	7.7
Fathead minnow	5.3	25.3
Smallmouth bass	65.2	12.2
Sand shiner	16.7	5.9
White sucker	1.2	18.6

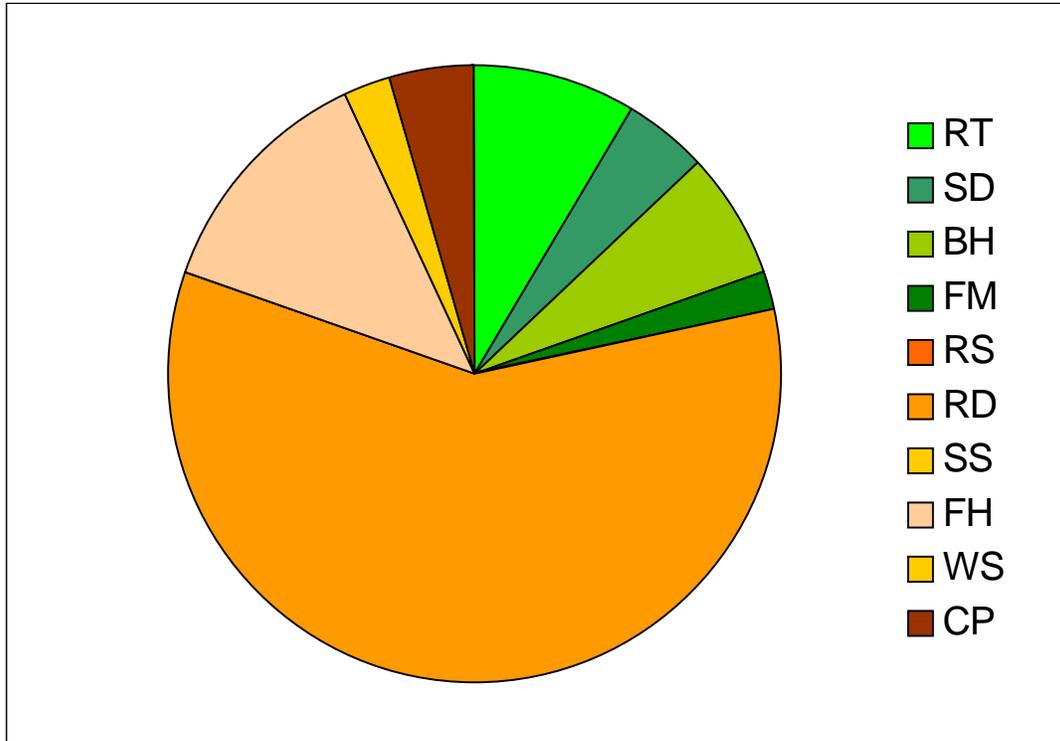
Species Composition, 1981 and 2003

Species	1981	2003
flannelmouth sucker	X	X
bluehead sucker	X	X
roundtail chub	X	X
speckled dace	X	X
black bullhead		X
black crappie		X
bluegill		X
brook stickleback		X
common carp	X	X
creek chub		X
fathead minnow	X	X
Iowa darter		X
plains killifish		X
reside shiner	X	X
red shiner	X	
smallmouth bass		X
sand shiner	X	X
white sucker	X	X
northern pike		X

% composition of the fish community, Yampa River, RM 116-111, 1981



% Composition of the Fish Community, Yampa River,
RM 111-106, 1981



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