

COLORADO RIVER RECOVERY PROGRAM
FY 2007 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: FR- 115

I. Project Title: Cumulative Effects of Flaming Gorge Dam Releases, since 1996, on the Fish Community in Lodore and Whirlpool canyons, Green River.

II. Principal Investigator(s):

Lead Agency: Larval Fish Laboratory, Department of Fish, Wildlife, and Conservation Biology, Colorado State University; Bureau of Reclamation; U.S. Fish and Wildlife Service

Jointly Submitted by: Larval Fish Laboratory, CSU; Bureau of Reclamation; U.S. Fish and Wildlife Service

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III. Project Summary: The primary purpose of this study is to determine the cumulative effect that flow and temperature regimes have had on the fish community in Lodore and Whirlpool canyons of the Green River and recommend how to monitor effects into the future. A secondary purpose is to determine the distribution of the humpback chub population in Whirlpool Canyon to serve as the basis for future monitoring efforts. Future monitoring (i.e. population estimation), if deemed necessary, will be needed to evaluate the contribution of the Whirlpool Canyon population of humpback chub to the overall recovery of the species. Information gathered will be used to evaluate whether flow and temperature regimes from Flaming Gorge Dam are benefitting endangered fishes in the Green River without causing adverse changes in abundance of non-native fishes.

IV. Study Schedule: 2002-2008.

V. Relationship to RIPRAP:

Green River Action Plan: Mainstem.

II.D. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

VI. Accomplishment of FY 2007 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Thermographs

Thermographs data will be provided by George Smith, U.S. Fish and Wildlife Service, Denver, and by Dr. Mark Vinson, Utah State University, at up to 10 other localities in the Green River. We assisted with data collection by removing thermographs from the river in September 2007. The Green River upstream of the Yampa River experienced a relatively warm thermal regime in 2007, due to relatively low flows and warm weather in late June and July.

Task 2: Sample main channel fish community (large-bodied fishes).

We completed two electrofishing trips through the study area in 2007, as prescribed in the study proposal. Data entry and analysis is not complete for 2007 samples. Of note, main channel sampling conducted in October 2007 in Browns Park did not detect northern pike and smallmouth bass. This was in contrast to 2005 and 2006, when northern pike were found in upstream Browns Park (10 in 2005, 11 in 2006). In 2006 we also captured smallmouth bass in Browns Park (not in 2005 or before).

Table 1.—Tentative list of fishes captured in the Green River, from Browns Park downstream to Rainbow Park with electrofishing, trammel nets, and seining, 2002-2007. N = native, I = introduced. Brook trout was a new species 2006.

	Status	Electrofishing	Trammel netting	Seining
Mountain whitefish	N	X		X
Humpback chub	N	X	X	
Bonytail	N	X	X	X ¹
Roundtail chub	N	X	X	X
Colorado pikeminnow	N	X	X	X
Speckled dace	N	X		X
Bluehead sucker	N	X	X	X
Flannelmouth sucker	N	X	X	X
Razorback sucker	N	X		
Mottled sculpin	N	X		X
Cutthroat trout	I	X		
Brook trout	I	X		
Rainbow trout	I	X	X	
Brown trout	I	X	X	
Northern pike	I	X		X
Red shiner	I	X		X
Common carp	I	X	X	X
Fathead minnow	I			X
Sand shiner	I			X
Redside shiner	I	X		X
White sucker	I	X	X	X
WS x FM		X	X	
FM x BH		X		
WS x BH		X		
RZB x FM		X		X
Channel catfish	I	X	X	X
Green sunfish	I	X		X
Smallmouth bass	I	X	X	X
Walleye	I	X		

¹ Stocked fish.

Table 2.—Comparison of electrofishing capture rates (fish/hr electrofishing) of various nonnative fishes, including predaceous kinds, and number of fish removed (parenthetically) in the Lodore and Whirlpool Canyon reaches of the Green River, 2005 and 2006. Data for 2007 is not yet available. Brown trout were not removed but shown to represent their abundance relative to the other species captured.

	2005	2006
Black crappie	0.79 (62)	0
Bluegill	0.09 (7)	0.04 (4)
Brown trout	5.2 (411)	4.6 (410)
Northern pike	0.20 (16)	0.09 (8)
Common carp	3.7 (288)	2.7 (242)
White sucker	3.4 (269)	1.7 (151)
Channel catfish	4.3 (339)	6.2 (555)
Green sunfish	0.70 (55)	0.02 (2)
Smallmouth bass	1.8 (140)	1.8 (159)
Walleye	0	0.03 (3)

Task 3: Sample small bodied fish community.

About 100 seine samples were collected in the study area from middle Browns Park downstream to the lower end of Rainbow Park during summer and autumn 2007. We are in the process of identifying those samples; about 75% of summer seine samples have been preliminarily identified.

Smallmouth bass were not collected in seine samples in Brown’s Park in 2007. A significant new finding in 2006 was detection of smallmouth bass in seine samples in Browns Park. Samples collected in both summer and autumn detected the species about 10 river miles upstream of Lodore Canyon and about 11 river miles upstream of the previously known most upstream location.

Task 4: Sample larval drift and process samples.

Drift samples were collected in the Green River just upstream of the Yampa River from 6 July to 10 August 2007. A total of 108 samples was collected. In general, fish were few in samples compared to drift net samples collected in the nearby Yampa River. Preliminary identification of Green River drift net samples has been completed; no endangered fishes were captured in 2007 nor were any roundtail chubs. This is in contrast to 2006, when two Colorado pikeminnow larvae were captured in the Green River in Lodore Canyon, just upstream of the Yampa River confluence (July 13, 2006). This was significant because Colorado pikeminnow spawning has not been documented

in the Green River upstream of the Yampa River since before closure of Flaming Gorge Dam in 1962.

We did again see a response by smallmouth bass in summer 2007 to a turbidity event. On 29 July turbidity increased dramatically (zero visibility) and lasted through 30 July, clearing on 31 July back to a level observed on 28 July. During the high turbidity days of 28-29 July, we captured 26 smallmouth bass (15 and 11, respectively) that were 25 to 55 mm total length (mean TL = 37 mm). The only other smallmouth bass captured in 2007 was on 11 July and was 15 mm TL; turbidity was low. The turbidity event was associated with only a minor increase in flow and river stage. The large size of apparently displaced bass was surprising, and is potentially a substantial number if densities in drift nets were similar to that across the channel.

Task 5: Process preserved samples of small-bodied fish (seine hauls).

We have completed identification of 2006 seine samples and are progressing with 2007 samples.

Task 6: Prepare and submit annual report.

This report.

Task 7: A final report was prepared and approved in spring 2006 that summarized data collected from 2002 to 2004. Another report was prepared in spring 2007 and approved in autumn 2007 that summarized data collected from 2002 to 2006.

- VII. Recommendations: We saw a strong fish community response to drought conditions in the study area in 2002 to 2004. Because of ongoing fish community changes in Lodore and Whirlpool canyons, we will be recommending continued removal of non-native fishes and monitoring of the remainder of the fish community in that reach in 2008. Continued drift sampling is also recommended because of captures of early life stages of endangered fishes in 2006.

High flows in spring may be useful to scour rooted aquatic macrophytes in the Green River in Browns Park and disperse small northern pike into unsuitable habitat that may reduce their survival. It may also be useful to sample Browns Park with electrofishing boats or rafts in spring or summer to assess abundance of adult northern pike and smallmouth bass in the reach where we found young.

- VIII. Project Status: Ongoing and on track.

