

COLORADO RIVER RECOVERY PROGRAM  
FY 2004 ANNUAL PROJECT REPORT

RECOVERY PROGRAM  
PROJECT NUMBER: 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):

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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: 2002-2005.

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 2004 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Thermographs

Thermographic 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. The Green River upstream from the Yampa River experienced a moderately warm thermal regime in 2004, although not as warm as 2002 or 2003.

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

We completed two electrofishing trips through the study area in 2004, as prescribed in the study proposal. Flows were low but turbid in July and September. Electrofishing efficiency was much improved over 2002 sampling and similar to that in 2003. This was due to polarity adjustments to electrofishing rafts used for that sampling. A tentative list of the fishes captured by electrofishing, trammel netting, and seining in 2002–2004 is presented (Table 1). Endangered fish captures for 2004 are presented (Table 2), with similar captures for 2002 and 2003 shown for comparison (Tables 3 and 4). In 2004, a total of nine Colorado pikeminnow (five recaptures) and four humpback chubs (three recaptures) were captured. Data not reported included many ( $N > 50$ ) bonytail (*Gila elegans*) captured during September 2004 sampling in and downstream from Echo Park. Bonytail were captured with electrofishing and trammel nets from just above the Echo Park boat ramp, downstream 5 or more river miles (RM) to near Jones Hole Creek. Notably, near the Echo Park boat ramp we captured a smallmouth bass, 330 mm in total length (TL), that had consumed one of the stocked bonytail. We only recently completed field work on this project, and because of that and the pending year-end final report for this project, we limited discussion of 2004 data collection.

Table 1.–Tentative list of fishes captured in the Green River, from Browns Park downstream to Rainbow Park with electrofishing, trammel nets, and seining, 2002–2004.

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

<sup>a</sup> N = native, I = introduced

<sup>b</sup> Kevin, define footnote.

Table 2. Captures of Colorado pikeminnow (CPM) and humpback chub (HBC) adults during 2004 sampling in the Green River in Lodore and Whirlpool canyons, and Echo and Island parks.

Species	date			gear	RM		R/L	TL	weight	recap?	PIT tag #	notes
	dd	mm	yyyy		start	end		(mm)	(g)			
CPM	27	07	2004	EL	355.0	352.4	R	684	2630	Y	223F732450	RM 354.2; male
CPM	27	07	2004	EL	352.0	348.9	L	630	2006	Y	7F7B1B146B	RM 350.7
CPM	27	07	2004	EL	346.8	344.9	R	756	3520	Y	5312134118	also radio-tagged: LMK008; female
CPM	28	07	2004	EL	338.3	336.5	L	399	494	N	425C4C275C	RM 337.6
CPM	29	07	2004	EL	336.0	334.6	R	575	1275	Y	5124123F17	RM 335.5; male
CPM	29	07	2004	EL	336.0	334.6	R	610	1745	N	426A3A0938	RM 334.6; tuberculate male
CPM	29	07	2004	EL	335.0	334.0	L	491	999	N	42423A760E	RM 334.5
CPM	20	09	2004	EL	357.9	355.0	L	765	3658	Y	5312134118	female
CPM	21	09	2004	EL	351.3	347.8	L	546	1080	N	426950031F	
HBC	28	07	2004	EL	341.9	340.8	R	375	148	Y	5326582968	RM 341.6
HBC	28	07	2004	TR	342.0	342.0	L	297	212	Y	425C183E46	net 1, 0640-0930 hrs
HBC	23	09	2004	EL	339.1	336.9	L	401	492	Y	425B6C2413	RM 338.0
HBC?	23	09	2004	TR	341.7	341.7	R	332	252	N	4242156255	net 2, 0730-0950 hrs

Table 3. Captures of Colorado pikeminnow (CPM) and humpback chub (HBC) adults during 2002 sampling in the Green River in Lodore and Whirlpool canyons, and Echo and Island parks.

species	date			gear	RM		R/L	TL	weight	recap?	PIT tag #	notes
	dd	mm	yyyy		start	end		(mm)	(g)			
CPM	09	07	2002	EL	351.3	349.7	R	595	1576	yes	7F7D224D6B	
CPM	09	07	2002	EL	348.6	347.1	R	590	1645	yes	5318301332	male - ripe, heavily tuberculated
CPM	11	07	2002	EL	335.8	334.9	L	562	1323	no	4242351C2E	male - milt, tuberculate
CPM	11	07	2002	AN	333.6	333.6	L	544	1182	yes	5326687A03	tuberculate; on Rapala
CPM	09	09	2002	EL	362.0	360.9	L	695	2581	no	4242425557	
CPM	09	09	2002	EL	358.3	358.2	L	598	1540	yes	7F7B134306	blind left eye
CPM	11	09	2002	EL	344.1	342.4	L	525	988	yes	42424A6D3B	
CPM	12	09	2002	EL	339.0	338.5	R	536	1274	yes	42424E3358	
CPM	12	09	2002	EL	338.2	336.9	R	665	2305	no	53261D6534	
CPM	12	09	2002	EL	335.3	334.4	L	583	1566	no	5316014258	
CPM	08	10	2002	TR	342.5	342.5	R	520	1109	yes	42424A6D3B	net 3, 1730-1930 hrs
CPM	08	10	2002	TR	342.5	342.5	R	520	1109	yes	42424A6D3B	net 3, 1930-2145 hrs
CPM	09	10	2002	TR	341.7	341.7	R	505	1155	yes	223F4D1F3B	net 3, 1905-2135 hrs
HBC	08	10	2002	TR	342.0	342.0	L	288	183	no	53266A5D6A	net a, 1940-2135 hrs
HBC	09	10	2002	TR	341.6	341.6	L	369	390	no	53197A2D12	net 1, 1500-1700 hrs

Table 4. Captures of Colorado pikeminnow (CPM) and humpback chub (HBC) adults during 2003 sampling in the Green River in Lodore and Whirlpool canyons, and Echo and Island parks.

species	date			gear	RM		R/L	TL (mm)	weight (g)	recap?	PIT tag #	notes
	dd	mm	yyyy		start	end						
CPM	21	07	2003	EL	362.0	360.7	L	611	1781	yes	532627674B	RM 361.7
CPM	21	07	2003	EL	361.0	359.3	R	604	2254	yes	7F7B134306	blind left eye
CPM	21	07	2003	EL	360.7	359.3	L	567	1420	yes	51276570B2	
CPM	22	07	2003	EL	354.9	353.7	R	515	1044	no	425A484C50	tuberculate
CPM	22	07	2003	EL	348.6	347.2	L	512	1006	no	4242421300	
CPM	22	07	2003	EL	348.6	347.2	L	745	3307	no	423E572E2C	female
CPM	23	07	2003	EL	347.2	346.2	R	465	827	no	425B081B5F	
CPM	23	07	2003	EL	346.2	345.1	R	505	1109	no	425B493656	
CPM	23	07	2003	EL	345.2	343.0	L	528	1061	yes	2241161E1C	RM 344.9, GR-YA confluence
CPM	23	07	2003	EL	342.0	340.6	L	540	1085	yes	5325565608	RM 340.6
CPM	23	07	2003	EL	339.1	338.1	L	706	2973	yes	223F676267	Jones Creek confluence
CPM	23	07	2003	EL	338.1	336.3	L	507	1004	no	425B27280A	
CPM	23	07	2003	EL	336.9	336.2	R	651	2185	yes	52283D5D59	
CPM	23	07	2003	EL	347.2	346.2	R	399	424	no	425A28741D	
CPM	24	07	2003	EL	335.7	334.5	L	556	1172	no	425B3E0ED8	
CPM	24	07	2003	SE	328.2	328.2	R	485	842	no	425B281F52	
CPM	15	09	2003	EL	359.9	358.8	L	574	2040	no	423F6B2539	
CPM	18	09	2003	EL	337.3	336.6	L	560	1858	yes	1F40492A2E	
CPM	08	10	2003	TR	337.6	337.6	R	581	—	no	5326641F1B	net 6, 1940-2145 hrs
HBC	17	09	2003	TR	342.7	342.7	R	250	134	no	4240174151	net 3, 1700-1850 hrs
HBC	06	10	2003	TR	342.2	342.2	L	264	139	no	425C183E46	net 4, 2020-2220 hrs
HBC	07	10	2003	TR	341.8	341.8	R	252	---	no	425A4A3B3E	net 1, 1815-2035 hrs
HBC	08	10	2003	TR	341.6	341.6	L	232	100	no	4269525551	net 5, 0655-0925 hrs
HBC	13	10	2003	TR	342.2	342.2	L	263	136	yes	425C183E46	net 4, 1820-2048 hrs

Task 3: Sample small-bodied fish community.

Over 150 seine samples were collected in the study area from middle Browns Park downstream to the lower end of Rainbow Park during spring, summer, and autumn. We are in the process of identifying those samples. Relatively few fish were collected in samples from Lodore Canyon compared to Whirlpool Canyon.

Small-bodied smallmouth bass (*Micropterus dolomieu*) were found in backwaters throughout Whirlpool Canyon and are now present in Lodore Canyon in 2004. We captured smallmouth bass in backwater habitat in Lodore as small as 12–20 mm TL in July seine samples, which suggested that this species reproduced in that reach. We also detected many young smallmouth bass in seine samples in Whirlpool Canyon and in the Rainbow-Island Park reach.

The rapid upstream dispersal of red shiners in the Green River documented in 2003 was not observed in 2004. In summer 2003, and in prior studies in 1994–1996, red shiners were abundant in lower Lodore Canyon, rare or not present in upper Lodore Canyon, and with the exception of a single large specimen, were absent in Browns Park. By autumn 2003, we documented the presence of red shiners throughout Browns Park from above Swinging Bridge downstream through Lodore Canyon. This represents a range extension of about 30 river miles for this species over a very short time. They were often the most abundant species in seine samples in Browns Park, particularly in backwater habitat. Adult and juvenile size classes were present, which suggested successful reproduction by that species in that reach. In 2004, we did not observe red shiners upstream from Lodore Canyon in any season, a pattern similar to that observed in prior studies.

Task 4: Sample larval drift and process samples.

Drift samples were collected in the Green River just upstream from the Yampa River during summer 2004. About 150 samples was collected, which included several diel samples at occasions throughout the summer. In general, fish were few in samples compared to drift net samples collected in the nearby Yampa River. We are beginning to identify those drift net samples. We continued to find substantial numbers of smallmouth bass larvae (first documented in 2003), which was strong evidence for continued reproduction by that species in the Green River in Lodore Canyon.

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

We have completed identification of 2002 and 2003 samples and are progressing with 2004 seine samples.

Task 6: Prepare and submit annual report.

This report.

Task 7: Prepare final report (includes incorporation of peer review comments).

In progress.

Task 8: Submit draft final report to Biology Committee.

We agreed to provide a draft final report to the Biology Committee by 31 January 2005.

- VII. Recommendations: This was the last year of sampling for this study before we analyze data and write our report. The recommendation is to finish sample and data analysis and write the final report. Because of ongoing fish community changes in Lodore and Whirlpool canyons, we will be recommending continued monitoring of the fish community in those reaches.
- VIII. Project Status: Ongoing and on track.
- IX. FY 2004 Budget Status
- A. Funds Provided: \$59,595
  - B. Funds Expended: \$58,000
  - C. Difference: \$1,595, these funds are needed to finish identification of samples collected in 2004.
  - D. Percent of the FY 2004 work completed, and projected costs to complete: About 75% completed; no additional funds needed.
  - E. Recovery Program funds spent for publication charges: \$0
- X. Status of Data Submission (Where applicable): Copy of data will be sent to the database manager in January 2005.
- XI. Signed: Kevin R. Bestgen                      08 Nov. 2004  
Principal Investigator                      Date