

I. Project Title: Determination of Winter Use and Seasonal Flow Needs of Colorado Pikeminnow in the Lower Price River

II. Principal Investigator:

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III. Project Summary

Historically, large numbers of native fish including Colorado pikeminnow, flannelmouth suckers, bluehead suckers, speckled dace, roundtail chubs, and possibly razorback suckers inhabited the Price River (Quartarone 1993). Impacts resulting from development (i.e., dams, water diversions, water pollution, mineral extraction, highways, railroads, etc.) reduced native fish numbers throughout the Green and Colorado river systems. The native fish community in the Price River experienced all of these impacts.

According to anecdotal accounts and early fish sampling, the native fish community in the Price River appears to have been severely impacted since the early 1900s due to both biotic and physical changes. The extent of these instream habitat and flow alterations is not well understood, nor is the effect on the native fish community, including the endangered Colorado pikeminnow.

Endangered fish were absent from fish surveys in the Price River from the 1950s to the late 1970s. In fact, most biologists familiar with the system believed that endangered fish had been completely extirpated from this river. At the time that the endangered fish of the Colorado and Green rivers were beginning to be studied in earnest in the late 1960s and 1970s, researchers concluded these species to be mainly large river fish that dwelled in the main channels of the Green and Colorado rivers and not within small tributaries. As a result, research and recovery efforts focused on the mainstem systems, and tributary communities were largely ignored.

With the proposed construction of the Narrows Dam Project in the headwaters of the Price River, Trout Unlimited sponsored a single, 5-day sampling trip through the lower 20 miles of the Price River to determine the status of the existing fish community. This survey resulted in the capture of one juvenile Colorado pikeminnow 2.2 miles above the confluence of the Green River in 1995. Although possibly anomalous, the capture of this endangered fish was enough to prompt the Bureau of Reclamation to reinstate consultation with the US Fish and Wildlife Service (Service) to determine if the Narrows

Dam Project was likely to adversely affect Colorado pikeminnow. Because so little was known about the fish community in the Price River in 1995, a 2-year study was initiated through the Recovery Program to determine the status of the fish community and the presence of endangered fish in the lower 50 miles of the river.

The 2-year study, conducted from April through October in 1996 and 1997, unexpectedly found that juvenile and adult Colorado pikeminnow occupy the lower 50 miles of the Price River in densities comparable to other important reaches of the Green and Colorado rivers. Over 20 Colorado pikeminnow were captured, ranging in size from just over 150 mm to nearly 600 mm (Cavalli 1999). In 1998, a Colorado pikeminnow was captured in the Price River 83.5 miles above the confluence with the Green River, and two more Colorado pikeminnow were captured at the base of the Farnham Diversion at RM 88.5 in 1999. The Farnham Diversion appears to be a barrier to further upstream movement.

These findings suggest that the Price River may be biologically important to the Green River populations of Colorado pikeminnow. The purpose of this project is to determine if Colorado pikeminnow occupy the Price River seasonally or year-round and relate that information to seasonal flows, habitat use, and passage.

Field work for this project began in 2001. Data were collected on fish community and from established habitat transects within each of the four designated 1-mile subreaches in June, late August and early November. Electrofishing was also conducted outside the designated 1-mile subreaches to gather additional fish community data and in an attempt to locate Colorado pikeminnow in the Price River. One Colorado pikeminnow was captured in June outside a designated 1-mile subreach at RM 52.6. No additional endangered fish were captured or observed in 2001.

IV. Study Schedule:

- a. Initial Year: 2001
- b. Final Year: 2002

V. Relationship to the RIPRAP:

Protection of flows in the Price River will:

- 1) aid recovery of endangered fish species,
- 2) protect Colorado pikeminnow and its habitat within the Price River, and
- 3) contribute to maintaining flows in the Green and Colorado Rivers.

General Recovery Program Support:

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management)

Green River Action Plan:

- I.C. Price River
- I.C.2. Determine winter use and seasonal flow needs for Colorado pikeminnow in the Price River

VI. Accomplishments of FY2001 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Objective 1: Determine if the lower Price River is used by Colorado pikeminnow from October through March.

Work toward completion of this objective was initially planned to begin in October 2000. Because the final FY 2001 scope of work was not approved until after that date and ice conditions on the Price River occurred early in the winter of 2000-2001, it was not possible to complete work toward this objective during the first winter identified in the original scope of work. The FY 2002 scope of work identified this shortcoming and adjusted the time frame of the project to compensate for the work not conducted in the winter of 2000-2001. Work toward completion of this objective will occur during the winters of 2001-2002 and 2002-2003.

Electrofishing was conducted on the Price River during June, late August, and early November. These efforts covered an area of approximately 26 river miles. Most of this area was covered several times during the total of 31.86 electrofishing hours spanning the three sampling periods.

One Colorado pikeminnow was captured on June 5, 2001, at RM 52.6. This fish was 578 mm total length (TL), 500 mm standard length (SL), and weighed 1,364 g. It was not a recapture and received a PIT tag (531213687E) before being released alive. It did not receive a radio tag.

Electrofishing (25.35 total hours) was conducted over 20 river miles in early November in an attempt to capture Colorado pikeminnow to be radio-tagged. No additional Colorado pikeminnow were captured or observed through this effort. During this period of sampling, eight beaver dams were encountered (three in RM 88.5-82.5, two in RM 82.5-78.2, one in RM 54.8-53.8, one in RM 26-20.5, and one at RM 18). All but the two lowermost beaver dams appeared impassable and none of these dams were present during sampling that occurred earlier in the year. It is worth noting that Pete Cavalli (pers. comm.) never encountered a beaver dam previously on the Price River.

Due to a lack of radio-tagged Colorado pikeminnow in the Price River at this time, additional electrofishing efforts will be conducted during the winter of 2001-2002 as conditions allow.

Objective 2: Generally characterize relationships between flow, habitat use and passage and endangered fish in the Price River.

Four geomorphic reaches are present in the Price River below the Farnham diversion dam (RM 88.5). Two of these are alluvial reaches (below Farnham [Reach 4; RM 88.5-78] and the Woodside reach [Reach 2; RM 41-19.5]) and two are canyon reaches (the Mounds [Reach 3; RM 78-41] and below Woodside [Reach 1; RM 19.5-0]). Within each of these geomorphic reaches, a 1-mile subreach was designated for the purpose of collecting data on the respective fish communities and from established habitat transects

while allowing for comparison within each subreach among sampling periods. The subreaches designated in the two alluvial geomorphic reaches (below Farnham [Reach 4] and the Woodside reach [Reach 2]) and the two canyon geomorphic reaches (the Mounds [Reach 3] and below Woodside [Reach 1]) were RM 88.5-87.5, RM 29.4-28.4, RM 54.8-53.8 and RM 19-18, respectively.

Fish Community

Subreaches within each geomorphic reach were sampled in June, late August, and early November (Table 1) for a total of 8.83 electrofishing hours. Efforts resulted in the capture of flannelmouth sucker, bluehead sucker, speckled dace, carp, channel catfish, sand shiner, bluehead/mountain sucker hybrids, bluehead/white sucker hybrids, yellowstone cutthroat trout and fathead minnow (Table 1). Endangered fish were not captured or observed during any of these sampling occasions.

The majority of captures were flannelmouth sucker (n=398) and carp (n=373) with the majority of flannelmouth sucker concentrated in Reach 3 and the majority of carp concentrated in Reach 4. Flannelmouth sucker ranged from 82 mm to 545 mm TL. Carp ranged from 96 mm to 606 mm TL.

Table 1. Total captures with respect to species, reach, and sampling occasion.

REACH	DATE	SPECIES										
		CS*	FM	BH	SD	CP	CC	SS	BHx MS	BHx WS	YCT	FH
Reach 1 <i>RM 19-18</i>	6/6/2001		28	6		9	2					
	8/28/2001		26			2						
	11/15/2001		29		1	5						
Subtotal		-	83	6	1	16	2					
Reach 2 <i>RM 29.4-28.4</i>	6/6/2001		27	3	1	6	3	2	1			1
	8/23/2001		1			5						
	11/15/2001		13									
Subtotal		-	41	3	1	11	3	2	1			1
Reach 3 <i>RM 54.8-53.8</i>	6/4/2001		35	8	3	14	6					
	8/28/2001		73	5	3	13	7					
	11/16/2001		112	1	3	5	1					
Subtotal		-	220	14	9	32	14					
Reach 4 <i>RM 88.5-87.5</i>	6/7/2001		53	16	2	215	23			1	2	
	8/9/2001			2	1	57	1					
	11/14/2001		1		1	42						
Subtotal		-	54	18	4	314	24			1	2	
TOTAL		-	398	41	15	373	43	2	1	1	2	1

Colorado pikeminnow captured during 2001 sampling was caught outside of designated fish community sampling subreaches.

Habitat

Five transects were established within each of the designated subreaches to collect habitat data. Transects represented at least two run habitats and two riffle habitats per subreach. Where possible, a transect was established within each subreach that represented pool habitat. These transects were maintained among sampling occasions. Wetted width was measured at each transect. Water depth and mean column velocity were measured, and substrate and cover were described at ten equidistant points along each transect.

All habitat data were collected within a week of fish community sampling at approximately the same flows. Flows averaged 45.4, 26.5, and 41.8 cubic feet per second (cfs) for the June, late August and early November sampling periods, respectively (Figure 1). Temperatures averaged 17.6, 21.3, and 5.8 °C for the June, late August and early November sampling periods, respectively (Figure 1).

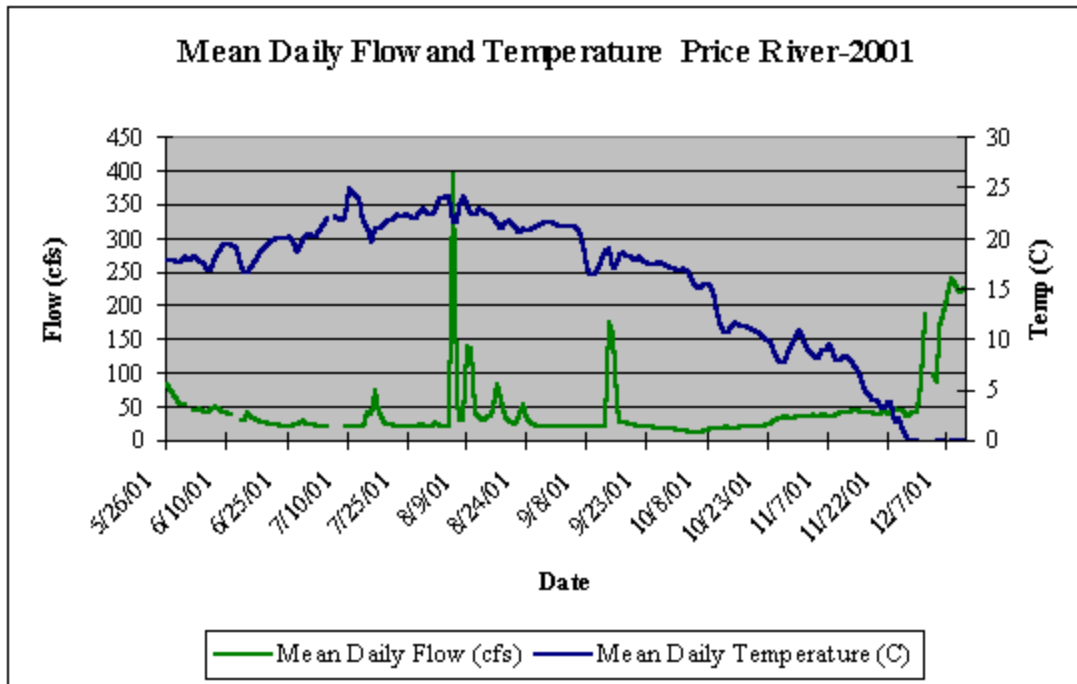


Figure 1. Mean daily flow and temperature on the Price River in 2001 (late May to present). This data is provisional and provided by USGS gage #09314500 (Price River at Woodside).

GPS coordinates were recorded at the approximate point of change between habitat types to assess channel characterization and describe percent habitat composition of subreaches at different flow regimes. A more comprehensive analysis of the habitat data collected is not available at this time.

VII. Recommendations:

- Efforts should continue toward determining seasonal use of the Price River by Colorado pikeminnow.
- Due to a lack of radio-tagged fish during the winter of 2001-2002, winter electrofishing surveys should be conducted as conditions allow.
- Colorado pikeminnow should be radio-tagged as they are captured in 2002 to determine the timing of their movement in and out of the Price River.
- A greater effort should be conducted to radio-tag Colorado pikeminnow in late summer or early fall to allow overwinter radiotelemetry to be conducted in the winter of 2002-2003.

VIII. Project Status:

Ongoing; field work is approximately 6 months behind schedule according to the FY 2001 scope of work. This change was addressed in the FY 2002 scope of work.

IX. FY 2001 Budget

- A. Funds budgeted: \$40,000
- B. Funds expended/obligated: \$20,000
- C. Difference: \$20,000
- D. Percent FY 2001 work completed: 50%
- E. Recovery Program funds spent for publication charges: \$ 0

X. Status of Data Submission:

Data will be submitted with the final report. A draft final report is due in May 2003.

XI. Signed: J. Michael Hudson Date: 12/10/2001