

I. Project Title: **Annual Operation and Maintenance of the Fish Passage Structure at the Redlands Diversion Dam on the Gunnison River**

II. Principal Investigator(s):

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III. Project Summary:

The purpose of this project is to collect and summarize annual data on the number of large-bodied fish, different fish species, and seasonal distribution of fish that use the Redlands passageway. In 2002, the passageway was operational from 1 April to 9 October. The fish ladder was voluntarily closed for 17 days between 22 April through 9 May 2002 to conserve water. This is the seventh year that the fish passageway at Redlands has been operated since it was completed in late-June 1996. In these 7 years, 59 sub-adult and adult Colorado pikeminnow and six razorback sucker have ascended the fish passageway. The seven adult Colorado pikeminnow and one adult razorback sucker that used the fish passageway in 2002 all did so in July. This included a 16.8-pound female Colorado pikeminnow which was the largest Colorado pikeminnow to ascend the Redlands passageway. The one razorback sucker had been previously stocked in the Gunnison River near Delta, Colorado. Four thousand, four hundred fifty four fish were collected in the fish trap during 2002. Native fishes comprised about 92% of this total for each of the first 5 years. However, in 2002, the percentage of native fish declined to about 66%. This marks the second consecutive year that there has been a significant decline in the relative percentage of native fish that have used the fish ladder. Bluehead sucker comprised 30% of the total fish in the fish trap in 2002, followed by flannelmouth sucker (19%). Channel catfish were the most numerous nonnative fish collected (14% of the total) followed by green sunfish (6%), white sucker (8%) and common carp (3%). All nonnative fish, except salmonid species, continue to be removed. Since its completion in 1996, 53,894 fish have used the fishway.

IV. Study Schedule:

a. initial year: 2002

b. final year: TBD

- V. Relationship to RIPRAP:
COLORADO RIVER ACTION PLAN: GUNNISON RIVER
II.B.1. Restore passage at Redlands.
II.B.1.c. Operate and maintain fish ladder.
II.B.1.d. Monitor and evaluate success.
- VI. Accomplishment of FY 2002 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. Tasks and Deliverables

Task 1. Routine O & M of the fish ladder and fish trap which includes monitoring, sorting, enumerating all fish in addition to cleaning trash and debris from trash racks, bar screens, fish trap, and fishway entrance. Task completed.

Task 2. Compile, computerize, and summarize fish use data; prepare annual progress report. Task completed.

B. 2002 Highlights

Seven adult Colorado pikeminnow were collected in the fish trap of the fish passageway at the Redlands Diversion Dam during 2002 (Appendix; Table 1). This included a 16.8-pound female Colorado pikeminnow, which is the largest pikeminnow to ever ascend the fish ladder in the seven years that the ladder has been operated and monitored. All pikeminnow used the fishway in July, which is similar to the seasonal use patterns for this species in former years, 1996-2001. This brings the total number of Colorado pikeminnow that have been captured in the fish trap at the passageway of the Redlands Dam to 59 from 1996 through 2002.

Only one razorback sucker was found in the fish trap during July 2002 (Appendix; Table 2). This fish had previously been stocked in the Gunnison River at Delta in September 1997 and had been at-large about 4.2 years before being captured in the fish trap. This brings the total number of razorback sucker that have been captured in the fish trap at the passageway of the Redlands Dam to six.

Four thousand, four hundred fifty four fish were trapped and counted in the trap of the Redlands Diversion Dam fishway between 1 April and 9 October 2002. The fish ladder was voluntarily closed for 17 days between 22 April through 9 May 2002 to conserve water. The total number of all fishes that used the fish ladder in 2002 was less than the annual catches of the previous five years (1996: 8,375; 1997: 12,233; 1998: 7,589; 1999: 8,264; 2000: 6,662; 2001: 6,317 (Appendix; Table 3)). Native fishes comprised 66% of the total number of fishes collected in 2002, compared to 94% in 1996 and 1997, 93% in 1998 and 1999, 92% in 2000, and 83% in 2001. This

marks the second consecutive year that the relative percentage of native fishes has declined in the 7 years that the ladder has been operated and monitored (Appendix; Table 3).

Bluehead sucker comprised 30% of the catch and flannelmouth sucker 19%. The numbers of channel catfish (613) and green sunfish (256) that used the fish ladder in 2002 were the highest ever recorded during the 7 years of operation of the fish ladder at Redlands. Prior to 2002, the highest number of channel catfish that were collected in the fish trap was 290 in 2001. The number of green sunfish was similar to that collected in 2001 (232). White sucker usage increased from a five-year low of 70 in 2000 to 373 in 2002.

All fish found in the fish trap were counted and sorted by species. All native fish and rainbow and brown trout were released upstream of Redlands Diversion Dam. All nonnative species plus hybrid suckers found in the trap were removed.

VII. Recommendations:

A. Biological: Continue to collect information on the number of fish, by species, in the fish trap of the Redlands Dam fish passageway in 2003 starting about 1 April and running through September (see recommendation no. 1 in Burdick 2001).

B. Operation and Maintenance:

1. Replace three of the steel-hinged grates that cover the fish trap with lighter weight grating which may include aluminum, fiberglass, or grip strut-style grating. Grating should be able to withstand the weight of three to four people.
2. Add a 120-AC electrical outlet at the entrance of the fish ladder to operate the five slide gates.
3. No other modifications to the existing within-passageway features or to the overall mechanical operation of the passageway are recommended.

VIII. Project Status:

On track and ongoing.

IX. FY 2002 Budget Status

- A. Funds Provided: \$ 24,000
- B. Funds Expended: \$ 24,000
- C. Difference: \$ -0-
- D. Percent of the FY 2002 work completed, and projected costs to complete: 100%.
- E. Recovery Program funds spent for publication charges: \$ -0-

X. Status of Data Submission (where applicable):

The seven Colorado pikeminnow and one razorback sucker captured in the fish trap of the passageway at the Redlands Diversion Dam during 2002 were checked for a PIT tag. Two of the Colorado pikeminnow and the single razorback sucker had been previously PIT-tagged. The remaining five Colorado pikeminnow were PIT-tagged prior to their release. The following data were collected from all T & E fish prior to their being released: total length (mm), weight (g), reproductive condition, and date and location of capture. These data have been computerized. The total number of fishes that were collected in the fish trap at Redlands fish passageway were also computerized. These completed, computerized data have been provided to the UCRB database coordinator.

XI. Signed: Bob D. Burdick 12/09/2002
Principal Investigator Date

Burdick, B. D. 2001. Five-year evaluation of fish passage at the Redlands Diversion Dam on the Gunnison River near Grand Junction, Colorado: 1996-2000. Recovery Program Project Number CAP-4b. Final Report prepared for the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. U. S. Fish and Wildlife Service, Colorado River Fishery Project, Grand Junction, Colorado. 57 pp. + appendices.

Prepared and compiled by: Bob D. Burdick, 12/09/2002

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APPENDIX

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Redlands Diversion Dam from 1 April to 9 October 2002.^a

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
NATIVE FISH		
bluehead sucker	1,370	30.0
flannemouth sucker	843	18.9
razorback sucker	1	< 0.1
roundtail chub	707	15.9
Colorado pikeminnow	7	0.2
speckled dace	25	0.6
TOTAL	2,953	66.3
NONNATIVE FISH		
black bullhead	43	1.0
brown trout	17	0.4
channel catfish	613	13.8
common carp	131	2.9
green sunfish	256	5.7
largemouth bass	7	0.2
smallmouth bass	13	0.3
rainbow trout	1	< 0.1
white sucker	373	8.4
TOTAL	1,454	32.7
HYBRID FISHES		
bluehead sucker X flannemouth sucker	3	< 0.1
bluehead sucker X white sucker	23	0.5
flannemouth sucker X white sucker	21	0.5
TOTAL	47	1.0

ALL TOTALS	4,454	100.0

^a Fish ladder was voluntarily closed for 17 days between 22 April through 9 May 2002 to conserve water.

Table 2. Capture statistics for seven Colorado pikeminnow (CS) and one razorback sucker (RZ) captured in the fish trap of the Redlands passageway, 1 April through 9 October 2002.^a

Most Recent				Former Capture or Stocking Data										
Capture Data			Stocked	Wild or		River			Total		Time at		Period of Common	Total
Weight	Recapture	Length (mm)		Y	N	Fish	Date	River	Mile	Length (mm)	Large (yrs)			
CS	435	563	7/02		X	Wild	--	--	--	--	--			
CS	940	7,650	7/03		X	Wild	--	--	--	--	--			
CS	607	1,340	7/08	X		Wild	5/12/97	CO	63.7	400	5.2			
CS	471	650	7/08		X	Wild	--	--	--	--	--			
CS	667	1,860	7/21	X		Wild	5/26/00	CO	26.5	559	2.2			
CS	451	593	7/22		X	Wild	--	--	--	--	--			
CS	496	807	7/27		X	Wild	--	--	--	--	--			
RZ	450	900	7/18	X		Stocked	9/25/97	GU	57.0	399	4.2			

^a Fish ladder was voluntarily closed for 17 days between 22 April through 9 May 2002 to conserve water.

Table 3. Comparison of the total number of fish, total native vs. non-native fishes, and percent composition of native and non-native fish captured in the fish trap of the Redlands passageway between 1996 and 2002.

Year	Total Number of Fish	Total Native	Total Non-native	Percent Composition	
				Native Fishes	Non-native Fishes
1996	8,375	7,885	490	93.9	6.1
1997	12,233	11,547	686	94.4	5.6
1998	7,589	7,060	529	92.8	7.2
1999	8,264	7,654	610	92.6	7.4
2000	6,662	6,157	505	92.3	7.7
2001	6,317	5,221	1,096	82.6	17.4
2002	4,454	2,956	1,498	66.3	33.7

53,894

48,480

5,414