

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

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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 fish passageway at the Redlands Diversion Dam on the Gunnison River. In 2008, the Redlands passageway was operational from 15 April to 15 October. This is the thirteenth year that the fish passageway at Redlands has been operated since it was completed in late-June 1996. In these 13 years, 102 sub-adult and adult Colorado pikeminnow, 25 razorback sucker, and one bonytail have ascended the fish passageway. For the first time in these 13 years, no Colorado pikeminnow were found in the fish trap; only 1 razorback sucker was found in the fish trap in 2008. Three thousand six hundred ninety nine fish were collected in the fish trap during 2008; 76% were native fish. Native fishes comprised about 92% of this total for each of the first 5 years. However, in 2002 and again in 2003, the percentage of native fish declined to about 66 and 68%, respectively. However, in 2004, 2005, 2006, and 2007 this trend was reversed. In 2008, the rate of native fishes declined to 76% from 2006 and 2007. Flannelmouth sucker comprised 35% of the total fish in the fish trap in 2008 followed by bluehead sucker (29%). Channel catfish were the most numerous nonnative fish collected (10% of the total) followed by white sucker (4%) and white sucker X flannelmouth sucker hybrids (3%). Channel catfish, white sucker, and white sucker X flannelmouth sucker numbers decreased slightly from 2007 while green sunfish and white sucker X bluehead sucker numbers increased slightly. No gizzard shad were collected during 2008. And, while the number of smallmouth bass reached a high of 21 in 2005, none were captured in 2006 or in 2007, and only 4 were collected during 2008. All channel catfish captured in the fish trap were returned alive downstream from the dam in 2008. All other nonnative fish, except salmonid species, were removed. Since its completion in 1996, 106,033 fish have used the fishway.

IV. Study Schedule:

- A. initial year: 1996
- b. final year: Ongoing

V. Relationship to RIPRAP:

- A. Colorado River Action Plan: Gunnison River
 - II.B.1.c. Operate and maintain fish ladder.
 - II.B.1.d. Monitor and evaluate success.

VI. Accomplishment of FY 2008 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY-2008 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. Findings (2008 Highlights)

Fish Passage

1. Only one endangered fish, a 466 mm TL adult razorback sucker, was collected in the fish trap of the fish passageway at the Redlands Diversion Dam during 2008 (Appendix; Table 1). To date, 25 razorback sucker have been captured in the fish trap at the passageway of the Redlands Dam (Appendix; Table 2). This is the first year in the thirteenth year since the fish trap has been operated that a Colorado pikeminnow has not been found in the fish trap. The total number of Colorado pikeminnow that have been captured in the fish trap at the passageway of the Redlands Dam from 1996 through 2008 is 102 (Appendix; Table 2). In 2007, 21 Colorado pikeminnow were collected in the Redlands fish trap.
2. Three thousand six hundred ninety nine fish were counted in the trap of the Redlands Diversion Dam fishway between 15 April and 15 October 2008.

This annual total is the lowest in 13 years of operation. Native fishes comprised 76% of the total number of fishes collected in 2008, compared to 94% in 1996 and 1997, 93% in 1998 and 1999, 92% in 2000, 83% in 2001, 66% in 2002, 68% in 2003, 77% in 2004, 74% in 2005, 85% in 2006, and 83% in 2007. From 2001–2003, there was a significant downward trend in the relative percentage of native fishes compared to the first 5 years that the ladder was operated and monitored when the relative percentage of native fishes was somewhat constant at about 92% per year (Appendix; Table 3). The relative percentage of native fish has continued to steadily increase since 2003, but declined for the first time during 2008 since 2006. The total number of all fishes collected in the 13-year operation of the fish trap is 106,033. Overall, native fish still continue to comprise about 84% of all fish processed.

Flannelmouth sucker comprised 35% of the catch and bluehead sucker 29% during 2008. The numbers of white sucker (631) that used the fish ladder in 2006 declined by about 58% from 2005 (1,520) and further declined in 2007 (168) and again in 2008 (153). Channel catfish numbers declined in 2008 (355) from 2007 (501) and 2006 (432). The number of green sunfish in 2008 (17) was slightly greater than 2007 (9) and 2006 (6) but was markedly lower than 2005 (35) and from the numbers from 2004 (61), 2003 (330), and 2002 (256). Four smallmouth bass were collected during 2008 whereas no smallmouth bass were collected in 2006 nor 2007 compared to the highest ever recorded in the fish trap during 2005 (21).

4. Adult gizzard shad were not collected in the fish trap during 2008. The number of adult gizzard shad was considerably higher in 2007 (43) from that of 2006 (3). During the 2008 smallmouth bass marking and removal, 18 juvenile and adult gizzard shad were collected in the Grand Valley reaches of the Colorado and Lower Gunnison rivers, compared to 135 during 2007.
5. All fish found in the fish trap were counted and sorted by species. All native fish including rainbow and brown trout were released upstream of Redlands Diversion Dam. All channel catfish were returned alive immediately downstream from the dam. All other nonnative fish plus hybrid suckers, except salmonid species, were removed.

Operation and Maintenance

1. Maintenance to remove sediment and debris in the forebay portion of the fishway deposited by the 2008 runoff flows in the Gunnison River was performed during mid-June immediately following runoff. In 2008 due to the high spring and early-summer runoff flows in the Gunnison River, sediment accumulation in the forebay and within the fish ladder itself was noticeably greater than in former years. Following runoff FWS personnel again used compressed air to free up sediment that had become compacted at the head

end of the fish ladder and attraction flow intake. A diesel-powered air compressor furnished by the Bureau of Reclamation was used to accomplish this work. A backhoe owned and operated by Redlands Water and Power Company personnel also was used in conjunction with the compressed air to free debris and sediment in the forebay area of the fish ladder. Approximately 16 tons of gravel was hauled on site and spread to replace gravel that had been washed away from the entrance area of the fish ladder during runoff. Again this year as in 2005, the two layers of diffuser grating in the floor of the entrance of the fish ladder had to be manually removed to facilitate removal of debris and sediment that had become lodged there during the 3-week period when the fish entrance was inundated with runoff flows from the Gunnison River.

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 2009 starting about 15 April and running through mid-October.

B. Operation and Maintenance:

1. To maintain optimum performance of the fish passageway, sediment maintenance is an on-going, annual task.

VIII. Project Status:

A. "On track and ongoing".

IX. FY 2008 Budget Status

- A. Funds Provided: \$ 56,365
B. Funds Expended: \$ 56,365
C. Difference: \$ -0-
D. Percent of the FY 2008 work completed, and projected costs to complete: 100%.
Recovery Program funds spent for publication charges: \$ -0-

X. Status of Data Submission (Where applicable): The single razorback sucker captured in the fish trap of the passageway at the Redlands Diversion Dam during 2008 was checked for a PIT tag. Neither a 400 khz nor 134 khz frequency PIT tag could be detected in this razorback sucker (TL 466 mm). This fish was inserted with a 134 khz PIT tag prior to release.

The following data were collected from the single T & E fish prior to it being released: total length (mm), 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 was also computerized. These completed, computerized data will be provided to the UCRB database coordinator upon his request.

XI. Signed: Bob D. Burdick 11/14/2008
Principal Investigator Date

APPENDIX:

A. More comprehensive/final project reports. If distributed previously, simply reference the document or report.

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.

B. Appendix: 3 tables attached.

Prepared and compiled by Bob D. Burdick, 11/14/2008
2008-redlands-0&M-rpt.doc

APPENDIX

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Redlands Diversion Dam from 15 April to 15 October 2008.

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
NATIVE FISH		
bluehead sucker	1,065	28.8
flannemouth sucker	1,285	34.7
razorback sucker	1	< 0.1
roundtail chub	464	12.5
Colorado pikeminnow	0	---
bonytail	0	---
TOTAL	2,815	76.1
NONNATIVE FISH		
black bullhead	47	1.3
brown trout	11	0.3
channel catfish	355	9.6
common carp	103	2.8
gizzard shad	0	---
green sunfish	17	0.5
largemouth bass	1	< 0.1
smallmouth bass	4	0.1
rainbow trout	5	0.1
white sucker	153	4.1
TOTAL	696	18.8
HYBRID FISHES		
bluehead sucker X flannemouth sucker	3	< 0.1
bluehead sucker X white sucker	79	2.1
flannemouth sucker X white sucker	106	2.9
TOTAL	188	5.1

ALL TOTALS	3,699	100.0

APPENDIX (cont.)

Table 2. Number of Colorado pikeminnow, razorback sucker, and bonytail captured in the fish trap of the Redlands passageway between 1996 and 2008.

<u>Year</u>	<u>No. of Colorado pikeminnow</u>	<u>No. of Razorback sucker ^a</u>	<u>No. of Bonytail ^a</u>
1996	1	0	0
1997	18	0	0
1998	23	0	0
1999	5	0	0
2000	4	0	0
2001	1	5	0
2002	7	1	0
2003	3	0	1
2004	5	3	0
2005	4	6	0
2006	10	5	0
2007	21	4	0
2008	0	1	0
Totals	102	25	1

^a all razorback sucker and bonytail captured in the fish trap were from fish originally stocked in the Colorado and Gunnison rivers.

Table 3. Comparison of the total number of fish, total native vs. nonnative fishes, and percent composition of native and nonnative fish captured in the fish trap of the Redlands passageway between 1996 and 2008.

<u>Year</u>	<u>Total Number of Fish</u>	<u>Total Native</u>	<u>Total Nonnative</u>	<u>Percent Composition</u>	
				<u>Native Fishes</u>	<u>Nonnative Fishes</u>
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
2003	7,259	4,909	2,350	67.6	32.4
2004	11,720	9,011	2,709	76.9	23.1
2005	11,403	8,414	2,989	73.8	26.2
2006	11,095	9,384	1,711	84.5	15.5
2007	6,963	5,801	1,162	83.4	16.6
2008	3,699	2,818	881	76.2	23.8
Totals	106,033	88,817	17,216	83.8	16.2