

I. Project Title: **Annual Operation and Maintenance of the Fish Passage Structures at the Redlands Diversion Dam on the Gunnison River and the Government Highline Diversion Dam on the Upper Colorado 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 both the fish passageways at the Redlands Diversion Dam on the Gunnison River and the Government Highline Diversion Dam on the Upper Colorado in Debeque Canyon. In 2004, the Redlands passageway was operational from 13 April to 12 October. Construction of the fish passageway at Government Highline Diversion Dam was completed by August 1. However, this passageway was not run in 2004 because of insufficient water to run the fish passageway. This is the ninth year that the fish passageway at Redlands has been operated since it was completed in late-June 1996. In these 9 years, 67 sub-adult and adult Colorado pikeminnow and nine razorback sucker have ascended the fish passageway. The first stocked bonytail was collected in the fish trap during June of 2003. Five sub-adult Colorado pikeminnow and three previously stocked razorback sucker used the fish passageway in 2004. Eleven thousand, seven hundred twenty fish were collected in the fish trap during 2004. 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, this trend was reversed. This marks the first year since 2000 that there has been an increase in the relative percentage of native fishes collected in the fish trap. Bluehead sucker comprised 41% of the total fish in the fish trap in 2004 followed by flannelmouth sucker (27%). Channel catfish were the most numerous nonnative fish collected (9% of the total) followed by white sucker (8%). In 2004, the number of green sunfish (0.5%; 61 fish) declined for the first time in three years. The number of black bullhead (0.5%; 59 fish) also declined in 2004 from 2003 (1%; 192 fish). All nonnative fish, except salmonid species, were removed. Since its completion in 1996, 72,873 fish have used the fishway.

- IV. Study Schedule:
  - Redlands Fish Passageway
  - a. initial year: 1996
  - b. final year: Ongoing

- Government Highline Fish Passageway
- a. initial year: 2004
- 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.
- B. Colorado River Action Plan: Colorado River
  - II.B.3.a(4). Operate, monitor, and evaluate the success of fish passage at  
Government Highline Diversion Dam.

- VI. Accomplishment of FY 2004 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

- A. FY-2004 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 at Redlands fish passageway.

Shortcoming:

Task not performed at Government Highline fish passageway.

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

Task completed at Redlands fish passageway.

Shortcoming:

Task not performed at Government Highline fish passageway.

- B. Findings (2004 Highlights)

## Fish Passage

### Redlands Diversion Dam

1. Five sub-adult Colorado pikeminnow were collected in the fish trap of the fish passageway at the Redlands Diversion Dam during 2004 (Appendix; Table 1). This brings the total number of Colorado pikeminnow that have been captured in the fish trap at the passageway of the Redlands Dam to 67 from 1996 through 2004.

Two pikeminnow used the fishway in late-June (June 30) and the three other pikeminnow used the fishway in between July 1 and July 26, which is similar to the seasonal use patterns in former years, 1996–2003. The pikeminnow that was found in the fish trap on July 26 had previously been captured near Potash (river mile 51.3) on June 5, 2003. This Colorado pikeminnow was originally captured in the Green River (river mile 12) on April 17, 2002. Between the original capture point and capture in the fish trap, this fish moved about 12 miles downstream in the Green River, moved upstream about 171 miles, and finally into the Gunnison River. It moved upstream 2.3 miles in the Lower Gunnison River to the Redlands Diversion Dam. This documents another inter sub-basin movement of a Colorado pikeminnow. Two pikeminnow were captured in the fish trap on the same day (June 30). Unfortunately, one of these fish was in poor condition when found in the trap and eventually died. The other pikeminnow was in good condition and was released upstream of the diversion dam.

2. Three razorback sucker were found in the fish trap during 2004. Two razorback sucker used the fishway in July and one in August. To date, nine razorback sucker have been captured in the fish trap at the passageway of the Redlands Dam.
3. Eleven thousand, seven hundred twenty fish were trapped and counted in the trap of the Redlands Diversion Dam fishway between 13 April and 12 October 2004. The total number of all fishes that used the fish ladder in 2004 was the second highest in nine years. The highest annual catch recorded was in 1997 (12,233)(Appendix; Table 3). Native fishes comprised 77% of the total number of fishes collected in 2004, compared to 94% in 1996 and 1997, 93% in 1998 and 1999, 92% in 2000, 83% in 2001, 66% in 2002, and 68% in 2003. This marks the first year since 2000 that there has been an increase in the relative percentage of native fishes collected in the fish trap. 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).

Bluehead sucker comprised 41% of the catch and flannelmouth sucker 27%. The numbers of channel catfish (994) and white sucker (925) that used the

fish ladder in 2004 were the highest ever recorded during the 9 years of operation of the fish ladder at Redlands. Prior to 2004, the highest number of channel catfish that were collected in the fish trap was 887 in 2003. The number of green sunfish declined in 2004 (61) compared to 330 collected in 2003 and 256 in 2002.

4. 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.

#### Operation and Maintenance

1. An additional structure was attached at the fish trap in August 2004 to improve safety and working conditions for biologists. Previously, workers that entered the fish trap to net fish had to do so by climbing down the foot rungs. However, there was inadequate hand holds as workers climbed down the ladder rungs. A galvanized, steel ladder with vertical steel hand railing and steel rungs replaced five of the existing rubberized-covered steel rungs. Funds for the labor and parts (\$ 673.00) were provided by the Colorado River Fishery Project, U. S. Fish and Wildlife Service.

#### Government Highline Dam

Not run in 2004 due to insufficient water to operate the fish ladder.

#### 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 2005 starting about 1 April and running through September or mid-October (see recommendation #1 in Burdick 2001). At Government Highline Diversion Dam, initiate collection of information on the number of fish by species in the fish trap starting about the first of April 2005 and continuing through September or mid-October, given adequate water is available to run the fishway in the low-water months beginning in mid- to late-June and continuing through July, August, and September.
- B. Operation and Maintenance: As a line item, add \$ 1,000 to the FY 2005 budget for this project, annually, to cover unexpected and unpredictable costs related to vandalism at the Redlands fishway. Vandalism has and always will be an issue at this site because it is remote and the adjacent area is constantly used by the public. Costs would be mostly for repair and replacement of chain-link fencing and associated hardware for the security perimeter fence and hand and chain railing.

#### VIII. Project Status:

- A. "On track and ongoing".

IX. FY 2004 Budget Status

- A. Funds Provided: \$ 44,200 + \$ 3,978 (overhead)
- B. Funds Expended: \$ 44,200 + \$ 3,978 (overhead)
- C. Difference: \$ -0-
- D. Percent of the FY 2004 work completed, and projected costs to complete: 100%.  
Recovery Program funds spent for publication charges: \$ -0-

X. Status of Data Submission (Where applicable): The five Colorado pikeminnow and three razorback sucker captured in the fish trap of the passageway at the Redlands Diversion Dam during 2004 were checked for a PIT-tag. Three Colorado pikeminnow and all three razorback sucker had been previously PIT-tagged. Two Colorado pikeminnow were PIT tagged prior to their release. One Colorado pikeminnow was found dying in the fish trap and eventually died. 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 will be provided to the UCRB database coordinator upon his request.

XI. Signed: Bob D. Burdick                      11/10/2004  
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, 11/10/2004

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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 13 April to 12 October 2004.

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
<b>NATIVE FISH</b>		
bluehead sucker	4,772	40.7
flannelmouth sucker	3,128	26.7
razorback sucker	3	< 0.1
roundtail chub	1,071	9.1
Colorado pikeminnow	5	< 0.1
bonytail	0	0
speckled dace	1	< 0.1
TOTAL	8,980	76.6
<b>NONNATIVE FISH</b>		
black bullhead	59	0.5
brown trout	14	0.1
channel catfish	994	8.5
common carp	103	0.9
bluegill	3	< 0.1
green sunfish	61	0.5
largemouth bass	6	< 0.1
smallmouth bass	9	< 0.1
rainbow trout	7	< 0.1
white sucker	925	7.9
TOTAL	2,181	18.6
<b>HYBRID FISHES</b>		
bluehead sucker X flannelmouth sucker	31	0.3
bluehead sucker X white sucker	299	2.6
flannelmouth sucker X white sucker	229	2.0
TOTAL	559	4.8
<hr style="border-top: 1px dashed black;"/>		
<b>ALL TOTALS</b>	<b>11,720</b>	<b>100.0</b>

APPENDIX (cont.)

Table 2. Capture statistics for five sub-adult Colorado pikeminnow (CS) and three razorback sucker (RZ) captured in the fish trap of the Redlands passageway, 13 April through 12 October 2004.

Name	Most Recent Capture Data			Former Capture or Stocking Data							
	Total Length (mm)	Weight (g)	Date	Recapture		Wild or Stocked Fish	Date	River		Total Length (mm)	Period of Common Time at Large (yrs)
				Y	N			River	Mile		
CS	461		6/30		X	Wild	--	--	--	--	--
CS	472		6/30	X		Wild	5/27/03	CO	44.0	410	1.09
CS	527		7/01		X	Wild	--	--	--	--	--
CS	467		7/19	X		Wild	5/26/04	CO	58.2	462	0.15
CS	483		7/26	X		Wild	6/05/03	CO	51.3	427	1.14 <sup>a</sup>
							4/17/02	GR	12.0	301	1.13 <sup>b</sup>
RZ	443		7/19	X		Stocked	6/21/01	GU	57.1	431	3.08
RZ	457		7/21	X		Stocked	11/04/99	GU	57.1	221	4.71
RZ	460		8/09	X		Stocked	10/04/01	GU	57.1	280	2.85

<sup>a</sup> first recapture

<sup>b</sup> first capture

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 2004.

Year	Total Number of Fish	Total Native	Total Nonnative	Percent Composition	
				Native Fishes	Nonnative 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
2003	7,259	4,909	2,350	67.6	32.4
2004	11,720	9,011	2,709	76.9	23.1