

I. Project Title: **Annual Operation and Maintenance of the Fish Passage Structure at 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 the fish passageway at the Government Highline Diversion Dam on the Upper Colorado River in Debeque Canyon. In 2010, the fish trap was operated continuously between 16 April and 15 October. This is the third year that the fish passageway at Government Highline has been operated continuously since being completed in August 2004. The fish trap was operated for only 12 days in 2005, and 41 days in 2006. The fish trap was not operated during 2007. During 2009 and 2010, no threatened or endangered fish were captured in the fish trap. In 2008, only one adult razorback sucker was found in the fish trap in August. To date, two adult razorback sucker and three humpback chub have used the fishway. Eighteen thousand three hundred ninety fish were processed in the fish trap during 2010. To date, 58,000 fish have used the fish passage at Government Highline Diversion Dam spanning from 2005-2006 and 2008-2010. The fish passage was not operated during 2007, however. Bluehead sucker and flannelmouth sucker comprised 42% and 32% of the native fishes in the fish trap, respectively, and white sucker and brown trout comprised 6% and 0.8% of the nonnative fish in the trap. Native fishes comprised 89% of the total fish during 2010, similar to 2009 (91%) and 2008 (90%).

IV. Study Schedule:

Government Highline Fish Passageway
a. initial year: 2004
b. final year: Ongoing

V. Relationship to RIPRAP:

A. 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 2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY-2010 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 (2010 Highlights)

Fish Passage

1. No endangered fish were collected in the fish trap of the fish passageway at the Government Highline Diversion Dam during 2010 (Appendix B; Table 1). One adult razorback sucker was collected in 2008. To date, 2 razorback sucker and 3 humpback chub have been captured in the fish trap (Appendix B; Table 2). One other adult razorback sucker was collected in the fish trap during 2005. The three humpback chub were collected in 2005.
2. Eighteen thousand three hundred ninety fish were counted in the trap of the Government Highline Diversion Dam fishway between 16 April and 15 October 2010. Native fishes comprised 89% of the total number of fishes collected in 2010 (Appendix B; Table 3). This is the second full year of operation and we are still continuing to build the data base for fish that have been collected in the fish trap so that annual use comparisons can be made. Unfortunately, with only two years of data, annual use comparisons by species are somewhat premature.

Bluehead sucker comprised 42% of the catch and flannelmouth sucker 32% during 2010 (Appendix B; Table 1). These two native species dominated the catch during 2009 (54% bluehead, 26% flannelmouth sucker). Roundtail chub comprised 12% of the total catch. The most prevalent nonnative fish found in the fish trap during 2010 was white sucker (1,163, 6%) followed by brown trout (107, 0.9%) and white sucker X flannelmouth sucker hybrids (138, 0.8%). Channel catfish, formerly not found between Government Highline and Price Stubb dams prior to completion of fish passage at Price Stubb Dam in April 2008, were again collected during 2010 in the fish trap (n=88).

3. No gizzard shad were collected in 2010.
4. 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 Government Highline Diversion Dam. All channel catfish were returned alive immediately downstream from the dam. All other nonnative fish plus hybrid suckers were removed.

Operation and Maintenance

1. A trackhoe was used to remove approximately 25 dump-truck loads of river-borne sediment in front of the attraction flow, fish ladder entrances, and fish return tube in July. The sediment was hauled to an upland terrestrial site within the fishway project area for disposal and/or storage. This 'cleanout' was very much needed because in past years, the attraction flow intake had become almost plugged with sediment. To prevent stranding, fish released via the return pipe had to be manually moved to the river upstream of this point to a deeper section of river.

VII. Recommendations:

A. Biological:

1. Continue to collect information on the number of fish, by species, in the fish trap of the Government Highline fish passageway in 2011 starting about 15 April and running through mid-October.

B. Operation and Maintenance:

1. To maintain optimum performance of the fish passageway, sediment maintenance should be performed on "as needed basis" to remove sediment and debris from the forebay of the fishway and attraction flow intakes to prevent buildup and compaction of sediment. This could be performed coincident with the removal of sediment and debris from the Price-Stubb fish passage 5 miles downstream from the fish passage Grand Valley Water User's diversion dam with a trackhoe in mid-July or early-August. It is also necessary to dredge out sediment where the 12-inch pipe returns processed fish from the passageway to prevent fish stranding and possible death.
2. A large vegetated sediment bar continues to accrue in front of the intakes of the attraction flow grates and upstream to the inflow of the fishway itself. In 2009, river flows in August and September become low enough that fish exiting the pipe immediately upstream of the fish passage intake became stranded on a sediment bar in the river. As a result, to prevent stranding and possible death, fish had to be manually moved to the river upstream of this point to a deeper section of river.

VIII. Project Status:

A. "On track and ongoing".

IX. FY 2010 Budget Status

- A. Funds Provided: \$ 51,120
- B. Funds Expended: \$ 51,120
- C. Difference: \$ -0-
- D. Percent of the FY 2010 work completed, and projected costs to complete: 100%.
Recovery Program funds spent for publication charges: \$ -0-

Status of Data Submission (Where applicable): The total number of fishes that were collected in the fish trap at Government Highline fish passageway have been computerized. These completed, computerized data will be provided to the UCRB database coordinator upon his request.

XI. Signed: Bob D. Burdick 11/10/2010
Principal Investigator Date

APPENDIX:

- A. More comprehensive/final project reports. If distributed previously, simply reference the document or report.
- B. Appendix: 3 tables attached.

Prepared and compiled by Bob D. Burdick, 11/10/2010
2010-GrandValley-0&M-rpt.doc

APPENDIX B

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Government Highline Diversion Dam from 16 April to 15 October 2010.

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
NATIVE FISH		
bluehead sucker	7,691	41.8
flannelmouth sucker	5,913	32.2
razorback sucker	0	---
roundtail chub	2,119	11.5
Colorado pikeminnow	0	---
bonytail	0	---
mountain whitefish	622	3.4
speckled dace	2	< 0.1
TOTAL	16,347	88.9
NONNATIVE FISH		
black bullhead	74	0.4
brown trout	138	0.8
bluegill	10	< 0.1
channel catfish	88	0.5
common carp	68	0.4
cutthroat trout	1	< 0.1
green sunfish	14	< 0.1
largemouth bass	7	< 0.1
longnose sucker	13	< 0.1
smallmouth bass	0	< 0.1
rainbow trout	20	0.1
white sucker	1,163	6.3
TOTAL	1,596	8.5
HYBRID FISHES		
bluehead sucker X flannelmouth sucker	11	< 0.1
bluehead sucker X white sucker	99	0.5
flannelmouth sucker X white sucker	337	1.8
TOTAL	447	2.3

ALL TOTALS	18,390	100.0

Table 2. Number of Colorado pikeminnow, razorback sucker, bonytail and humpback chub captured in the fish trap of the Grand Valley Water User's passageway between 2005 and 2010.

<u>Year</u>	<u>No. of Colorado pikeminnow</u>	<u>No. of Razorback sucker^a</u>	<u>No. of Bonytail</u>	<u>No. of Humpback Chub</u>
2004	fish passageway & fish trap not run due to insufficient flows			
2005	0	1	0	3
2006	0	0	0	0
2007	fish passageway run for sediment maintenance only (fish trap not run)			
2008	0	1	0	0
2009	0	0	0	0
2010	0	0	0	0
Totals	0	2	0	3

^a all razorback sucker 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 Grand Valley Water User's passageway between 2005 and 2010.

<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>
2005	4,638 ^a	2,867	1,771	61.8	38.2
2006	11,978 ^b	10,747	1,231	89.7	10.3
2007	fish passageway run for sediment maintenance only (fish trap not run)				
2008	10,788 ^c	9,663	1,125	89.6	10.4
2009	12,402 ^d	11,286	1,116	91.0	9.0
2010	18,390 ^e	16,358	2,032	89.0	11.0
Totals	58,196	50,921	7,275	87.5	12.5

^a Fish trap operated for 12 days (June and September).

^b Fish trap operated for 41 days (five, 2-week periods).

^c Fish trap operated continuously between May 2 and October 15.

^d Fish trap operated continuously between April 20 and October 15.

^e Fish trap operated continuously between April 16 and October 15.