COLORADO RIVER RECOVERY PROGRAM
FY 2011 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: C4b-GVP

I. Project Title: **Annual Operation and Maintenance of the Fish Passage Structure at the Government Highline Diversion Dam on the Upper Colorado River**

II. Principal Investigator(s): Bob D. Burdick, Fishery Biologist (LEAD)
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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 2011, the fish trap was operated continuously between 19 April and 14 October. This is the fourth 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. In 2011, three humpback chub and 22 bonytail were collected in the fish trap at Government Highline fishway. To date, two adult razorback sucker, six humpback chub, and 22 bonytail have used the fishway. Eight thousand eight hundred seventy fish were processed in the fish trap during 2011. To date, 67,071 fish have used the fish passage at Government Highline Diversion Dam spanning from 2005-2006 and 2008-2011. Flannelmouth sucker and bluehead sucker comprised 33 % and 25% of the all fishes in the fish trap, respectively, and white sucker and brown trout comprised 16% and 2% of the nonnative fish in the trap. Native fishes comprised 86% of the total fish during 2011, compared to 89% in 2010, 91% in 2009, and 90% in 2008.

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 2011 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY-2011 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 (2011 Highlights)

Fish Passage

1. In 2011, 22 bonytail and three humpback chub were collected in the fish trap of the fish passageway at the Government Highline Diversion Dam (Appendix; Table 1). One adult razorback sucker was collected in 2008. To date, 2 razorback sucker, six humpback chub, and 22 bonytail have been captured in the fish trap (Appendix; Table 2). One other adult razorback sucker was collected in the fish trap during 2005. The previous three humpback chub were collected in 2005.

2. Eight thousand eight hundred seventy five fish were counted in the trap of the Government Highline Diversion Dam fishway between 19 April and 14 October 2011. Native fishes comprised 86% of the total number of fishes collected in 2011 (Appendix; Table 3). This is the third 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 three years of data, annual use comparisons by species are still somewhat premature.

   Flannelmouth sucker comprised 33% of the catch and bluehead sucker 25% during 2011 (Appendix; Table 1). These two native species also dominated the catch in 2010 (42% bluehead, 32% flannelmouth sucker) and 2009 (54% bluehead, 26% flannelmouth sucker). Roundtail chub comprised 19% of the total catch during 2011. The most prevalent nonnative fish found in the fish trap during 2011 was white sucker (1,401, 16%) followed by brown trout (133, 2%) and white sucker X flannelmouth sucker hybrids (195, 2%). 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 2011 in the fish trap (n=38).

3. No gizzard shad were collected in 2011.

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 2010. 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. This cleanout was not performed in 2011.

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 2012 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 following runoff. 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 2011 Budget Status

A. Funds Provided: $ 51,120
B. Funds Expended: $ 51,120
C. Difference: $ –0–
D. Percent of the FY 2011 work completed, and projected costs to complete: 100%. Recovery Program funds spent for publication charges: $ –0–

The three humpback chub captured were checked for a PIT tag. None had been previously implanted with micro-chips. So, these fish all were implanted with 134 khz pit tags prior to release. All 22 bonytail were checked for a PIT tag; all had been previously PIT tagged and were believed to be bonytail that had been stocked by the Colorado Division of Wildlife on August 2, 2011, in Debeque Canyon approximately 3-1/2 mile upstream from the Government Highline Diversion Dam and fish passage.

Status of Data Submission (Where applicable): The following data were collected from the T & E fish prior to their release: total length (mm), reproductive condition, date, location of capture, and PIT tag ID. These data have been computerized. The total number of fishes that were collected in the fish trap at Government Highline fish passageway has also been computerized. These completed, computerized data will be provided to the UCRB database coordinator upon his request.

XI. Signed: *Bob D. Burdick* 11/13/2011
Principal Investigator Date

APPENDIX:

A. Appendix: 3 tables attached.

Prepared and compiled by Bob D. Burdick, 11/13/2011
2011-GrandValley Project-0&M-rpt.doc

APPENDIX

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Government Highline Diversion Dam from 19 April to 14 October 2011.

Common Name	Number of Fish	Percent of Total Fish
NATIVE FISH		
bluehead sucker	2,186	24.6
flannelmouth sucker	2,940	33.1
razorback sucker	0	- - -
roundtail chub	1,676	18.9
Colorado pikeminnow	0	- - -
bonytail	22	0.2
humpback chub	3	< 0.1
mountain whitefish	38	0.4
TOTAL	6,865	77.3
NONNATIVE FISH		
black bullhead	7	< 0.1
brown trout	133	1.5
bluegill	2	< 0.1
channel catfish	38	0.4
common carp	60	0.7
cutthroat trout	0	- - -
green sunfish	5	< 0.1
largemouth bass	3	< 0.1
black crappie	1	< 0.1
longnose sucker	30	< 0.3
smallmouth bass	0	- - -
rainbow trout	21	0.2
white sucker	1,401	15.8
TOTAL	1,701	19.2
HYBRID FISHES		
bluehead sucker X flannelmouth sucker	5	< 0.1
bluehead sucker X white sucker	109	1.2
flannelmouth sucker X white sucker	195	2.2
TOTAL	309	3.5
ALL TOTALS	8,875	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 2011.

Year	No. of Colorado pikeminnow	No. of Razorback sucker [a]	No. of Bonytail	No. of Humpback Chub
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
2011	0	0	22	3
Totals	0	2	0	6

[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 2011.

Year	Total Number of Fish	Total Native	Total Nonnative	Percent Composition Native Fishes	Percent Composition Nonnative Fishes
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
2011	8,875 [f]	6,870	2,005	77.4	22.6
Totals	67,071	57,791	9,280	86.2	13.8

[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.
[f] Fish trap operated continuously between April 19 and October 14.