COLORADO RIVER RECOVERY PROGRAM
FY 2013 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. Bureau of Reclamation Agreement Number(s): R10PG40042 & R13PG40018

Project/Grant Period:
Start date (Mo/Day/Yr): 6/3/2013
End date: (Mo/Day/Yr): 9/30/2017
Reporting period end date: 9/30/2013
Is this the final report? Yes _____ No __X__

III. Principal Investigator(s):

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IV. Abstract:

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. This fish passage structure has been operated in 7 of the last 10 years (it was completed in August 2004).

A total of 13,401 fish were documented using the fish ladder in 2013. This is the second highest total ever documented for this fish passage facility. Two endangered razorback sucker and one razorback sucker X flannelmouth sucker hybrid were observed in 2013.

V. Study Schedule: 2004-Ongoing

VI. Relationship to RIPRAP:
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.

VII. Accomplishment of FY 2013 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Fish Passage

1. In 2013, 2 razorback sucker and 1 razorback sucker X flannelmouth sucker (RZxFM) hybrid were collected in the Government Highline fish trap (Appendix; Tables 1 and 2). One razorback sucker (433 mm TL) was collected twice, on 4 June and then again on 27 June. The other (334 mm TL) was collected on 28 June. Both razorback sucker had PIT tags at the time of capture. The razorback sucker X flannelmouth sucker hybrid (491 mm TL), collected on 22 May, was implanted with a PIT tag and released alive upstream of the diversion structure.

2. A total of 13,401 fish were handled and counted in the trap of the Government Highline Diversion Dam fish passage 17 May and 5 July 2013. This is the second highest number of fish ever collected at this fish passage, even though the facility was only operated for 49 days before it had to be closed due to low water (Appendix; Table 3). This is the seventh year of operation since the structure was completed. However, since this facility has been run for differing lengths of time and for different time periods in several years, we would suggest that making specific year-to-year comparisons about yearly catch totals and species composition should generally be discouraged.

   Native fishes (and their hybrid forms) accounted for 79.9% (N = 10,702) of the total catch in 2013 (Appendix; Table 3). Nonnative fishes (and their hybrid forms) accounted for 20.1% (n = 2,699) of the total catch in 2013. Bluehead sucker accounted for 35.5% (n = 4,758) of the total catch and flannelmouth sucker accounted for 32.3% (n = 4,326) of the total catch during 2013 (Appendix; Table 1). These two native species dominated the total catch in 2011 (24.6% bluehead, 33.1% flannelmouth), 2010 (42% bluehead, 32% flannelmouth sucker), and 2009 (54% bluehead, 26% flannelmouth sucker). Roundtail chub accounted for 11.6% (n = 1,557) of the total catch during 2013. The most prevalent nonnative fish found in the fish trap during 2013 was white sucker (14.9% of total catch; n = 1,999) followed by white sucker X bluehead sucker hybrids (1.2% of total catch; n = 161), white sucker X flannelmouth sucker hybrids (1.2% of total catch; n = 160), brown trout (0.8% of total catch; n = 111), channel catfish (0.5% of total catch; n = 73), common carp (0.5% of total catch; n = 73), and longnose sucker (0.5% of total catch; n = 70). Channel catfish, 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 2013 in the fish trap.

3. One gizzard shad, 1 northern pike, 3 largemouth bass, and 4 smallmouth bass were also collected in 2013.

4. All fish found in the fish trap were counted and sorted by species. All native fish, as well as nonnative 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, including native X nonnative hybrid suckers were removed.

Operation and Maintenance

1. Operation of the fish passage began on 17 May 2013. This is a later start date than usual. However, during the prior winter, it appears that this facility had been broken into, because several items very specific to the operation of this facility were missing when crews went to open the facility in spring 2013 (this same thing occurred at the Redlands Fish Passage Facility). These included (but weren't limited to) a clutch and bit off of the Makita brand drill that is used to raise/lower the water control slide gates (a high-dollar, special order item that takes 4 weeks to be manufactured), a metal breaker bar (used to raise/lower gates in fish sorting tanks), and the electrical plug off of the sump pump (used to fill the fish handling tanks). Luckily, all of the miscellaneous hand tools and the power drill itself were still in the locked storage facility. Replacement items were purchased and installed and the facility was re-keyed to prevent further break-ins/vandalism.

2. Accumulated debris and trash were manually removed from the Price-Stubb non-selective fish passage facility 5 miles downstream of the Government Highline Fish Passage in early July 2013.

Tours

1. On 30 May 2013, we gave a tour of the facility to approximately 60 people who were part of tour organized by the Water Education Foundation. This tour group included congressional representatives, as well as representatives from the many water user groups in and around Grand Junction, CO.

2. A second tour (called Water in the West) of about the same size, which was scheduled to take place on 8 October 2013 was cancelled when the government shutdown occurred.

VIII. Additional noteworthy observations: None

IX. 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 2014 starting about 15 April and running through mid-October. These tentative dates may need to be adjusted, based upon the ability of the adjacent Grand Valley Water Users canal, as well as the ability of downstream diversions structures to get sufficient quantities of water to fill their canals.

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 may also necessary to dredge out sediment where the 12-inch pipe returns processed fish from the passageway to prevent fish stranding and possible death, especially in low water periods.

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 fish passageway 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. Luckily, this wasn't an issue in 2013, since the fish passageway was closed once base flows were reached. We were able to keep sediment adequately sluiced through the facility at higher flows. However, this is a situation that will have to be dealt with on a year-by-year basis.

X. Project Status: On track and ongoing

XI. FY 2013 Budget Status

A. Funds Provided: $51,120
B. Funds Expended: $51,120
C. Difference: $0
D. Percent of the FY 2013 work completed, and projected costs to complete: 100%
E. Recovery Program funds spent for publication charges: $0

XII. Status of Data Submission (Where applicable): Data has been entered into Excel spreadsheets and submitted to the UCREFRP database manager.

XIII. Signed: Dale Ryden, Travis Francis — 11/13/2013
Principal Investigator — Date

APPENDIX: Data tables

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Government Highline Diversion Dam during 2013.

| Common Name | Number of Fish | Percent of Total Fish |
|---|---|---|
| NATIVE FISH | | |
| bluehead sucker | 4,758 | 35.5 |
| flannelmouth sucker | 4,326 | 32.3 |
| razorback sucker | 2 | < 0.1 |
| roundtail chub | 1,557 | 11.6 |
| mountain whitefish | 22 | 0.2 |
| speckled dace | 4 | < 0.1 |
| TOTAL | 10,669 | 79.6 |
| NONNATIVE FISH | | |
| black bullhead | 10 | < 0.1 |
| black crappie | 1 | < 0.1 |
| brown trout | 111 | 0.8 |
| channel catfish | 73 | 0.5 |
| common carp | 73 | 0.5 |
| green sunfish | 15 | 0.1 |
| gizzard shad | 1 | < 0.1 |
| largemouth bass | 3 | < 0.1 |
| longnose sucker | 70 | 0.5 |
| northern pike | 1 | < 0.1 |
| rainbow trout | 15 | 0.1 |
| smallmouth bass | 4 | < 0.1 |
| white sucker | 1,999 | 14.9 |
| TOTAL | 2,376 | 17.7 |
| HYBRID FISHES | | |
| Native X Native Hybrids: | | |
| razorback sucker X flannelmouth sucker | 1 | < 0.1 |
| bluehead sucker X flannelmouth sucker | 34 | 0.3 |
| Native x Nonnative Hybrids: | | |
| bluehead sucker X white sucker | 161 | 1.2 |
| flannelmouth sucker X white sucker | 160 | 1.2 |
| TOTAL | 356 | 2.7 |
| ALL TOTALS | 13,401 | 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 2013.

| 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 |
| 2012 | fish passageway & fish trap not run due to insufficient flows | | | |
| 2013 | 0 | 2 | 0 | 0 |
| Totals | 0 | 4 | 22 | 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 2013.

| Year | Total Number of Fish | Total Native | Total Nonnative | Percent Composition Native Fishes | Nonnative Fishes |
|---|---|---|---|---|---|
| 2004 | fish passageway & fish trap not run due to insufficient flows | | | | |
| 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 |
| 2012 | fish passageway & fish trap not run due to insufficient flows | | | | |
| 2013 | 13,401[g] | 10,702 | 2,699 | 79.9 | 20.1 |
| Totals | 80,472 | 68,493 | 11,979 | 85.1 | 14.9 |

[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 from 2 May to 15 October.

[d] Fish trap operated continuously from 20 April to 15 October.

[e] Fish trap operated continuously from 16 April to 15 October.

[f] Fish trap operated continuously from 19 April 19 to 14 October.

[g] Fish trap operated for 49 days (continuously from 17 May to 5 July).