

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

II. Bureau of Reclamation Agreement Number(s): R15PG00083

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Is this the final report? Yes \_\_\_\_\_ No X

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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 Redlands Water and Power diversion dam on the Gunnison River. In 2015, the Redlands fish passageway was operational from 15 April to 16 October. This is the twentieth year that the Redlands fish passageway has been operated since it was completed in late-June 1996.

V. Study Schedule: 1996-Ongoing

VI. Relationship to RIPRAP:  
Colorado River Action Plan  
Gunnison River  
II.B.1.c. Operate and maintain fish ladder.  
II.B.1.d. Monitor and evaluate success.

VII. Accomplishment of FY 2015 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Fish Passage

1. Six Colorado pikeminnow (*Ptychocheilus lucius*) were captured in the Redlands fish passage during 2015 (Appendix; Table 1 & 2). These six fish had total lengths that ranged from 384 to 475 mm with a mean of 424 mm.

Three were new fish that had 134 khz PIT tags implanted at the Redlands fish passage. The other three were recaptures from previous studies. One Colorado pikeminnow was tagged in 2013 in Cataract Canyon, another was tagged in 2014 in Ruby Horsethief Canyon, and the final one was tagged in 2015 in the Grand Valley. All six Colorado pikeminnow were trans-located to Delta at river mile (RMI) 57.1 on the Gunnison River. The total number of Colorado pikeminnow capture events recorded at the Redlands fish passage from 1996 through 2015 is 147 (Appendix; Table 3).

2. Three razorback sucker (*Xyrauchen texanus*) were captured in the Redlands fish passage during 2015 (Appendix; Table 1 & 2). The total lengths of these fish were 395, 408 and 497 mm. The largest of the three was tagged at this facility in 2015. The other two were stocked near Delta, Colorado at Gunnison RMI 57.1 in 2010 and 2014. The total number of razorback sucker capture events recorded at the Redlands fish passage from 1996 through 2015 is 34 (Appendix; Table 3).
3. Forty four bonytail (*Gila elegans*) were captured in the Redlands fish passage during 2015 (Appendix; Table 1 & 2), the highest total of any year of operation. The total lengths of these fish ranged from 280 to 390 mm, with a mean of 332 mm. Forty one of these fish were stocked by Ouray National Fish Hatchery Grand Valley Unit in 2015 in various parts of the Grand Valley. Three of these fish had a 134 khz PIT tag implanted at the Redlands passage in 2015.
4. A total of 7,467 fish of all species were handled at the Redlands fish passage between 15 April and 16 October 2015. Native fishes composed 73% of the total catch in 2015 (the third lowest relative percentage of native fishes ever observed), 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, 83% in 2007, 76% in 2008, 86% in 2009, 87% in 2010, 81% in 2011, 89% in 2012, 83% in 2013, and 68% in 2014 (Appendix; Table 4). The total number of all fishes collected in the 20-year operation of the fish trap is 174,081. Overall, native fish account for about 82% of all fish processed during this 20-year period.

Bluehead sucker composed 42% and flannelmouth sucker 17% of the total catch during 2015. White sucker and white sucker hybrids composed 21% of the total catch in 2015.

Channel catfish numbers in 2015 were 145. The three most abundant years for this species were 2006 (432), 2013 (995), and 2014 (1,029). Only one smallmouth bass was collected and euthanized at the Redlands fish passage in 2015.

4. Two adult gizzard shad ( $\geq 180$  mm TL) were collected and euthanized in 2015, the two most abundant years for this species were 2012 (22) and 2007 (43). By way of comparison, during the 2015 non-native fish removal study,

279 adult gizzard shad were collected in the Grand Valley reaches of the Colorado and Lower Gunnison rivers, compared to 2007 (135), 2008 (18), 2009 (36), 2010 (48), 2011 (0), 2012 (73), 2013 (54), and 2014 (116). Many age zero and juvenile gizzard shad were also removed from the Grand Valley during the 2015 non-native fish removal effort.

6. All fish found in the fish trap were counted and sorted by species. All native fish, as well as nonnative rainbow trout and brown trout, were released upstream of Redlands Diversion Dam. All channel catfish were returned alive to the river immediately downstream from the dam. All other nonnative fish plus hybrid suckers were euthanized and disposed of according to protocols specified in our state collecting permit.

### Operation and Maintenance

#### Redlands Fish Passage:

1. Some manual effort (shovels and high pressure hose) and closing the attraction flow head gate (for a rather long period of time) was necessary to remove sediment and debris in the upstream fore bay of the Redlands fish passage. Typically, during mid-June immediately following runoff, sediment removal is necessary with the assistance of the Redlands Water and Power Companies backhoe.
2. Annual weed control was continued throughout 2015.

#### Price-Stubb Fish Passage:

1. In mid-July 2015, three USFWS personnel cleaned all of the debris out of the Price-Stubb fish ladder on the Colorado River at river mile 188.3.
2. Multiple trips were made to Price-Stubb to clean and maintain the MUX that operates the antenna installed in the fore bay of the fish ladder

VIII. Additional noteworthy observations: See above.

IX. 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 2016 starting about 15 April and running through mid-October. Consider FLOY-tagging some of the native three species of concern (roundtail chub, flannelmouth sucker, and bluehead sucker) to determine the number of fish that are re-using the ladder per annum and are being counted more than once in the annual tally.

Continue trans-location of Colorado pikeminnow collected in the Redlands fish passage to release points farther upstream in the Gunnison River, in an effort to encourage long-term retention of these fish in the mainstem Gunnison River.

- B. Operation and Maintenance: Continue with annual grounds and facility maintenance in 2016.

- X. Project Status: “On track and ongoing”.
- XI. FY 2015 Budget Status
- A. Funds Provided: \$70,486
  - B. Funds Expended: \$70,486
  - C. Difference: -0-
  - D. Percent of the FY 2015 work completed, and projected costs to complete: 100%
  - E. Recovery Program funds spent for publication charges: -0-
- XII. Status of Data Submission (Where applicable): Will be submitted to UCRRP database by January 2016.
- XIII. Signed: Travis Francis 10/29/2015  
Principal Investigator Date

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 16 October 2015.

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
<b>NATIVE FISH</b>		
bluehead sucker	3,099	41.50
bonytail	44	0.59
Colorado pikeminnow	6	0.08
Colorado cutthroat	0	0.00
flannelmouth sucker	1,247	16.70
mountain whitefish	0	0.00
razorback sucker	3	0.04
roundtail chub	984	13.18
speckled dace	26	0.35
<b>TOTAL</b>	<b>5,409</b>	<b>72.44</b>
<b>NONNATIVE FISH</b>		
black bullhead	101	1.35
black crappie	0	0.00
blue gill	6	0.08
brook trout	0	0.00
brown trout	31	0.42
channel catfish	145	1.94
common carp	65	0.87
fathead minnow	1	0.01
green sunfish	87	1.17
gizzard shad	2	0.03
largemouth bass	0	0.00
longnose sucker	6	0.08
northern pike	0	0.00
rainbow trout	1	0.01
red shiner	24	0.32
smallmouth bass	1	0.01
splake	0	0.00
white sucker	577	7.73
<b>TOTAL</b>	<b>1047</b>	<b>14.02</b>
<b>HYBRID FISHES</b>		
<u>Native X Native Hybrids:</u>		
razorback X flannelmouth sucker	0	0.00
bluehead X flannelmouth sucker	20	0.27
<u>Native X Nonnative Hybrids:</u>		
bluehead X white sucker	285	3.82
flannelmouth X white sucker	702	9.40
bluehead X longnose sucker	1	0.01
flannelmouth X longnose sucker	0	0.00
white X longnose sucker	3	0.04
<b>ALL TOTALS</b>	<b>7,467</b>	<b>99.96</b>

**Table 2.** 2015 PIT tagged fish histories.

Month of Passage	Species	PIT Tag Histories
May-15	Roundtail chub ( <i>Gila robusta</i> ) N=1	N=1 tagged by FWS GJ at CO RMI 136 in Black Rocks on 10/10/2012
Jul-15	Bonytail ( <i>Gila elegans</i> ) N=2	N=1 tagged at Redlands passage 2015 N=1 stocked 7/21/2015 at Redlands Pkwy launch at CO RMI 166.7
Aug-15	Razorback sucker ( <i>Xyrauchen texanus</i> ) N=2	N=1 tagged at Redlands passage 2015 N=1 stocked 8/19/2010 near Delta at GU RMI 57.1
	Colorado Pikeminnow ( <i>Ptychocheilus lucius</i> ) N=6	N=3 tagged at Redlands passage 2015 N=1 tagged by UDWR M at CO RMI -6.0 in Cataract on 10/4/2013 N=1 tagged by FWS GJ at CO RMI 147.2 in Ruby Horsethief on 4/16/2014 N=1 tagged by FWS GJ at CO RMI 160.2 in the Grand Valley on 6/2/2015
	Bonytail ( <i>Gila elegans</i> ) N=34	N=1 tagged at Redlands passage 2015 N=29 stocked 7/21/2015 at Redlands Pkwy launch at CO RMI 166.7 N=1 stocked 7/14/2015 near Fruita at CO RMI 157 N=1 stocked 7/7/2015 near Palisade at CO RMI 184 N=2 stocked 6/30/2015 near Fruita at CO RMI 157
Sep-15	Razorback sucker ( <i>Xyrauchen texanus</i> ) N=1	N=1 stocked 10/22/2014 near Delta at GU RMI 57.1
	Bonytail ( <i>Gila elegans</i> ) N=7	N=6 stocked 7/21/2015 at Redlands Pkwy launch at CO RMI 166.7 N=1 stocked 6/30/2015 near Fruita at CO RMI 157
	Roundtail chub ( <i>Gila robusta</i> ) N=1	N=1 missidentified and then tagged at Redlands passage 2015
Oct-15	Bonytail ( <i>Gila elegans</i> ) N=1	N=1 tagged at Redlands passage 2015

**Table 3.** Number of Colorado pikeminnow, razorback sucker, and bonytail capture events in the fish trap of the Redlands passageway between 1996 and 2015.

Year	Colorado pikeminnow	Razorback sucker	Bonytail <sup>a</sup>	Humpback chub
1996	1	0	0	0
1997	18	0	0	0
1998	23	0	0	0
1999	5	0	0	0
2000	4	0	0	0
2001	1	5	0	0
2002	7	1	0	0
2003	3	0	1	0
2004	5	3	0	0
2005	4	6	0	0
2006	10	5	0	0
2007	21	4	0	0
2008	0	1	0	0
2009	2	1	0	0
2010	4	1	0	1 <sup>b</sup>
2011	2	1	7	0
2012	12	0	0	0
2013	2	1	0	0
2014	17	2	5	0
2015	6	3	44	0
Totals	147	34	57	1

<sup>a</sup> all bonytail captured in the fish trap were from fish originally stocked in the Colorado and Gunnison rivers.

<sup>b</sup> wild fish originally PIT tagged at the head end of Westwater Canyon on the Colorado River (river mile 123.4), 10/07/2008 by Utah DWR.

**Table 4.** 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 2015.

<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
2009	3,580	3,066	514	85.6	14.4
2010	6,708	5,805	903	86.5	13.5
2011	8,705	7,087	1,618	81.1	18.9
2012	11,570	10,249	1,321	88.6	11.4
2013	16,687	13,810	2,877	82.8	17.2
2014	13,331	9,046	4,285	67.8	32.2
2015	7,467	5,429	2,038	72.7	27.3
<b>Totals</b>	174,081	143,309	30,772	82.3	17.7