I. Project Title: **Retrieval of fish from the Grand Valley Irrigation Company and Grand Valley Water Users canals**

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

Project/Grant Period: Start date: 10/1/2014
End date: 9/30/2019
Reporting period start/end date: 10/1/2015 to 9/30/2016
Is this the final report? Yes __X__ No _____

III. Principal Investigator(s):

Brendan Crowley, Biological Technician
Dale Ryden, Project Leader
U.S. Fish and Wildlife Service
Grand junction FWCO
445 West Gunnison Avenue, Suite 140
(970) 628-7202
E-mail:brendan_crowley@fws.gov
dale_ryden@fws.gov

IV. Abstract:

A fish screen was constructed on the Grand Valley Irrigation Company (GVIC) irrigation canal in winter 2001-2002, becoming fully operational a few years later. A fish screen was completed in the summer 2005 for the Grand Valley Water Users (GVWU) canal, becoming fully operational during the spring of 2010. However, during flow events when debris overloads the screens (3/32-inch spacing) and water cannot pass through them to provide sufficient water down canal to irrigation users and for power generation, the irrigation companies have the option of lifting the screens and diverting water through the bypass channel. When this happens fish become entrained in the canal, which leads to their becoming stranded in the canals when they are dewatered in the fall. While the fish screens (when they are being operated) are intended to bypass larger juvenile and adult fish back to the river, larval fish from the river can freely pass through the 3/32-inch wedge wire spacing and become entrained in the canal throughout the entire irrigation season. After the 2015 irrigation season, 50,106 native fish were salvaged from the canals and returned to the Colorado River.

V. Study Schedule:
A. initial year: 2002
B. final year: Ongoing

VI. Relationship to RIPRAP: Colorado River Action Plan: Colorado River; II.B.1.b. Screen GVIC diversion canal to prevent endangered fish entrainment; II.B.3.b. Screen Government Highline diversion canal to prevent endangered fish entrainment

VII. Accomplishment of FY 2016 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY-2016 Tasks and Deliverables:

Task 1. Sample GVIC and GVWU canals; remove native fish and re-locate to the Colorado River.

Task completed.

B. Findings (FY-2016 Highlights)

Fish salvage is conducted by driving along the canal roads (immediately adjacent to the cabals themselves) and looking for pools of standing water that contain fish after the irrigation water is turned off for the year. Diversion of water into these canals from the Colorado River during the spring and summer months for irrigation and power generation typically ceases at the end of October or in early November. Due to drainage of ground water and water from lateral canals back into the main canals, it typically takes 5-7 days after diversion of water from the river has ceased for the GVIC and GVWU canals to drain down to a level at which they can effectively salvaged. Pools of water are sampled with truck-mounted electrofishing units and/or seines. All native fish collected are identified, enumerated, and loaded into a hatchery truck. These fish are then transported to and released back into the Colorado River. Nonnative fish encountered are left in the canals where they will winter kill.

It typically takes a crew of 7-8 people two full weeks to complete fish salvage in these two canals. Salvage work typically ceases just prior to Thanksgiving week. However, occasionally heavy icing in the canals occurs due to early winter cold fronts and storms. When this happens, ice can become so thick in the remaining pools that it is impossible to effectively collect fish. The other factor that can hamper salvage efforts is rain. Once the clay-based canal roads saturated with water, they become extremely slick and there is a distinct danger of having trucks slide sideways into the canals. Additionally, the irrigation companies have asked us to avoid driving on muddy canal roads whenever possible, because it leaves heavy rutting once the roads dry. Thus heavy rains can shorten the period of time we can effectively salvage fish from these two canals.

<u>Grand Valley Irrigation Company (GVIC)</u>

This canal was sampled from the diversion dam head works in the Colorado River to 22 Road in November 2015. Crews traveled the canal road and sampled every pool encountered that could hold fish.

A total of 1,005 fish were collected. This comprised of 458 flannelmouth sucker, 389 roundtail chub, 25 bluehead sucker, 131 speckled dace, and 2 endangered razorback sucker. The two razorback sucker were both stocked in the Colorado River at mile 240.7

in Rifle, CO. Their total lengths were 442 and 402 mm. Neither fish had been recaptured in the river since being stocked on 10/16/2014.

A running total of all native fishes collected in this canal from 2002-2015 is provided in Appendix; Table 1. However, effort varied considerably among these fourteen years. Therefore direct comparison of individual fish species collected and the total number collected among years is not advisable.

Grand Valley Water User's (GVWU or Highline Canal)

The GVWU (Highline) Canal was sampled from the point at which the canal enters the Grand Valley East of Palisade to about 18 Road in November of 2015. As with the GVIC canal, sampling crews traveled the canal roads and sampled every pool encountered that could hold fish.

A total of 49,101 fish were collected. This comprised of 6,310 flannelmouth sucker, 85 bluehead sucker, 22,290 roundtail chub, 20,414 speckled dace, 2 razorback sucker. The vast majority of these fish were collected from a short section of the canal near 35 Road in Palisade, CO.

The two razorback sucker were both stocked in the Colorado River at mile 240.7 in Rifle, CO. Their total lengths were 398 and 401 mm. Neither fish had been recaptured since being stocked on 10/16/2014.

A running total of all native fishes collected in this canal from 2002-2015 is provided in Appendix; Table 2. However, effort varied considerably among these fourteen years. Therefore direct comparison of individual fish species collected and the total number collected among years is not advisable.

VIII. Recommendations:

A. Continue operating the fish screens.

B. Continue late-fall salvage operations to relocate native fish that either are entrained into the canal system when the screens are not operational or pass between the 3/32-inch wedge wire screen spacing (e.g., larval fish).

IX. Project Status: "On track and ongoing"

X. FY 2016 Budget Status

A. Funds Provided: $33,619
B. Funds Expended: $33,619
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-

XI. Status of Data Submission (Where applicable): Will be submitted to UCRRP database by January 2015

XII. Signed: Brendan Crowley 10/31/2015
Principal Investigator Date

APPENDIX: Tables

Table 1. Total numbers of native fish collected by species and by year from 2002-2015 in the Grand Valley Irrigation Company Canal.

YEAR	FM	BH	FM X BH	RT	SD	MF	MS	RZ	BT	CS	TOTALS
2015	458	25	0	389	131	0	0	2	0	0	1,005
2014	657	12	0	139	26	1	0	1	9	0	845
2013	467	34	0	1,669	153	0	0	1	3	0	2,327
2012	2,386	451	0	2,453	450	0	0	2	2	0	5,744
2011	428	17	1	258	6	1	0	2	0	0	713
2010	571	4	0	478	80	0	0	0	0	0	1,061
2009	877	48	0	79	232	4	0	0	0	0	1,240
2008	892	59	0	150	0	0	0	1	0	0	1,102
2007	128	3	0	35	0	0	0	0	0	0	166
2006	2,252	123	0	1,322	0	0	0	1	0	0	3,698
2005	897	80	0	730	0	0	0	0	0	0	1,707
2004	1,783	22	0	588	26	0	0	0	0	0	2,419
2003	-	-	-	-	-	-	-	-	-	-	2,908
2002	-	-	-	-	-	-	-	-	-	-	3,371

Fish Species: FM-flannelmouth sucker, BH-bluehead sucker, RT-roundtail chub, SD-speckled dace, MF=mountain whitefish, MS-mottled sculpin, RZ-razorback sucker, CS-Colorado pikeminnow, BT- bonytail chub

Table 2. Total numbers of native fish collected by species and by year from 2002-2015 in the Grand Valley Water User's Canal

YEAR	FM	BH	FM X BH	RT	SD	MF	MS	RZ	CS	BT	TOTALS
2015	6,310	85	0	22,290	20,414	0	0	2	0	0	49,101
2014	19	2	0	2	8	0	0	0	0	0	31
2013	337	37	0	3,230	566	0	0	2	0	8	7,410*
2012	1,574	632	0	5,924	3,942	0	0	1	0	2	12,075
2011	808	77	1	16,813	328	3	19	3	0	0	18,052
2010	1,517	88	0	23,299	1,043	30	0	0	0	0	25,977
2009	6,255	797	0	26,527	5,135	7	1	0	0	0	38,722
2008	738	77	0	754	23	6	0	0	0	0	1,598
2007	433	93	0	6,543	70	0	0	1	0	0	7,140
2006	-	-	-	-	-	-	-	-	-	-	-
2005	722	173	0	3,815	48	0	0	0	1	0	4,759
2004	893	118	0	5,166	140	0	1	0	24	0	6,343
2003	-	-	-	-	-	-	-	-	-	-	~ 3,000
2002	-	-	-	-	-	-	-	-	-	-	~ 1,100

*In 2013, a combination of ~3,230 young of the year flannelmouth sucker, roundtail chub, and speckled dace were added to the total number of fish caught that year

Fish Species: FM-flannelmouth sucker, BH-bluehead sucker, RT-roundtail chub, SD-speckled dace, MF=mountain whitefish, MS-mottled sculpin, RZ-razorback sucker, CS-Colorado pikeminnow, BT- bonytail chub