

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 (Mo/Day/Yr): 10/1/2014
End date (Mo/Day/Yr): 9/30/2019
Reporting period end date (Mo/Day/Yr): 9/30/2018
Is this the final report? Yes _____ No X

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IV. Abstract:

A fish screen to limit entrainment of fishes into the Grand Valley Irrigation Company's (GVIC) irrigation canal was constructed during winter 2001–2002, becoming fully operational a few years later. A similar fish screen was constructed in summer 2005 for the Grand Valley Water Users (GVWU; aka Government Highline) irrigation canal, becoming fully operational during spring 2010. However, during times when heavy in-river debris loads clog these fish screens (3/32-inch spacing), preventing sufficient amounts of water from passing down the canal to meet irrigation and/or power generation demands, the irrigation companies have the option of lifting the screens and diverting water through the bypass channel. During these time periods, it is possible for fish from the river to become entrained in these irrigation canals. Fish then become stranded in the canals when they are dewatered at the end of the irrigation season, each fall. Additionally, while the fish screens (when in operation) are effective at precluding entry of larger fish into the canal, larval fish from the river can freely pass through the 3/32-inch wedge wire screens becoming entrained into the canals whenever they are present. After the 2017 irrigation season (which ended in early November 2017), a total of 40,686 native fish were actively salvaged from these two irrigation canals and returned alive to adjacent sections of 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 2018 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY 2018 Tasks and Deliverables:

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

Fish salvage is conducted by driving major portions of the roads adjacent to the irrigation canals, looking for pools of water that contain fish after the irrigation water is turned off for the year. Diversion of irrigation water from the Colorado River during the spring and summer months for irrigation and power generation is usually halted in early November. After the canals have been shut off, it usually takes 5-7 days for the water to drain down to a low enough level to allow sampling to take place. Pools of water are sampled with truck-mounted electrofishing units and/or seines. All native fish collected are identified and loaded into a hatchery truck, transported to, and released into the Colorado River. Total numbers of native fish collected and transported are recorded. Nonnative fish encountered are left in the canal. Sampling ceases at the end of the week immediately prior to Thanksgiving week, or once ice becomes too thick in the remaining pools to preclude the effective collection of fish.

Task 2. Compile and summarize fish salvage data for fish collected in the GVIC and GVWU canals; prepare annual RIP report.

Task 3. Provide funding, via this scope-of-work, for fall fish salvage efforts in the GRCC/Tusher irrigation canal, near Green River, Utah by personnel from the Green River Basin FWCO (Vernal, UT). The annual report for GRCC/Tusher canal salvage efforts will be prepared separately by the Green River Basin FWCO.

Tasks completed.

B. Findings (FY 2018 Highlights)

Grand Valley Irrigation Company (GVIC) canal

The Grand Valley Irrigation Company's (GVIC) canal was sampled from the diversion dam head works in the Colorado River, downstream to 22 Road, between 6 and 17 November 2017, alternating days with GVWU canals. Sampling was limited to areas where the roads were dry enough to avoid damaging the road surface with our heavy

vehicles. Crews traveled the canal road and sampled every pool encountered that could hold fish.

A total of 1,964 native fish were collected in the GVIC canal, including (in descending order) 964 speckled dace, 533 flannelmouth sucker, 380 roundtail chub, 87 bluehead sucker. No endangered fish were collected in the GVIC canal in FY-2018 (i.e., November 2017).

A running total of all native fishes collected in the GVIC canal from 2002-2017 is provided in Table 1 of the Appendix. However, effort varied considerably among these 16 years and therefore, direct comparison of individual fish species collected and the overall total number of fish collected among years is not advisable.

Grand Valley Water User's (GVWU) canal

The Grand Valley Water User's (GVWU; aka Government Highline) canal was sampled from the point at which the canal enters the Grand Valley through a series of tunnels, east of Palisade, to about 22 Road, between 6 and 17 November 2017, alternating days with the GVIC sampling. Sampling was limited to areas where the roads were dry enough to avoid damaging the road surface with our heavy vehicles. As with the GVIC canal, crews traveled the canal road and sampled every pool encountered that could hold fish.

A total of 38,722 fish were collected in the GVWU canal, including (in descending order) 21,161 roundtail chub, 10,833 speckled dace, 6,649 flannelmouth sucker, and 79 bluehead sucker. No endangered fish were collected in the GVWU canal in FY-2018 (i.e., November 2017). The vast majority of these fish were collected from a short section of the canal (dubbed the "Hotspot") between 35³/₁₀ and 35⁸/₁₀ roads in Palisade, CO.

A running total of all native fishes collected in the GVWU canal from 2002-2017 is provided in Table 2 of the Appendix. However, effort varied considerably among these 16 years and therefore, direct comparison of individual fish species collected and the overall total number of fish collected among years is not advisable.

Palisade Irrigation District (Price Ditch – piped canal)

The Price Ditch is the Palisade Irrigation District's main water conveyance system. It is a large lateral canal that branches off of the GVWU canal just as that canal enters the Grand Valley from a tunnel in the east side of the valley near Palisade, CO. The Price Ditch first runs through a pump house, then through an underground concrete pipe that starts out as a 4-foot diameter pipe and then, within ¼ of a mile of its origination point, necks down to a 3-foot diameter pipe. In conjunction with fish salvage efforts in the GVWU canal, we salvage fish from the first section (the 4-foot diameter underground pipe) of the Price Ditch. This entails crawling through an underground pipe with headlamps and hand-held dip nets to actively collect any stranded fish off of the bottom surface of the rounded pipe in pitch black conditions. Electrofishing is impossible, except at the very upstream terminus of the Price Ditch at the pump house. Seines are

also not a viable option for collecting fish in this location.

We sampled the Price Ditch pipeline on 15 November 2017. However, no fish were left in the area of the pipeline on that date (Table 3 in the Appendix).

VIII. Recommendations:

- A. Continue operating the fish screens.
- B. Continue fall fish salvage operations to rescue and relocate native fish that have become entrained into irrigation canals in the Grand Valley.

IX. Project Status: “On track and ongoing”

X. FY 2018 Budget Status

- A. Funds Provided: \$32,097
- B. Funds Expended: \$32,097
- C. Difference: \$0
- D. Percent of the FY 2018 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: \$0

XI. Status of Data Submission (Where applicable): Data was submitted to UCRRP database by January 2018

XII. Signed: Brendan Crowley & Dale Ryden 11/01/2018
Principal Investigator Date

APPENDIX: Tables

Table 1. Total numbers of native fish collected by species and year in the Grand Valley Irrigation Company (GVIC) canal.

CALENDAR YEAR	FM	BH	FM X BH	RT	SD	MF	MS	RZ	BT	CS	TOTALS
2017	533	87	0	380	964	0	0	0	0	0	1,964
2016	552	60	0	902	1,919	0	0	8	1	0	3,442
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-flannemouth sucker, BH-bluehead sucker, RT-roundtail chub, SD-speckled dace, MF-mountain whitefish, MS-mottled sculpin, RZ-razorback sucker, CS-Colorado pikeminnow, BT- bonytail

Table 2. Total numbers of native fish collected by species and year in the Grand Valley Water User's (GVWU; aka Government Highline) canal.

CALENDAR YEAR	FM	BH	FM X BH	RT	SD	MF	MS	RZ	CS	BT	TOTALS
2017	6,649	79	0	21,161	10,833	0	0	0	0	0	38,722
2016	4,004	183	0	25,455	24,612	0	0	0	0	0	54,254
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	598	66	0	5,732	1,004	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

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

Table 3. Total numbers of native fish collected by species and year in Palisade Irrigation Company's underground Price Ditch (piped canal).

CALENDAR YEAR	FM	BH	FM X BH	RT	SD	MF	MS	RZ	CS	BT	TOTALS
2017	0	0	0	0	0	0	0	0	0	0	0
2016	5	5	0	8	17	0	0	0	0	0	35

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