

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

II. Bureau of Reclamation Agreement Number: R15PG00083

Project/Grant Period: Start date: 10/1/2014  
End date: 9/30/2019  
Reporting period end date: 9/30/2019  
Is this the final report? Yes  X  No

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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. These fish screens (3/32-inch spacing), when in operation, are thought to be effective at precluding entrainment of fish down to 20-30 mm TL. However, during times when heavy in-river debris loads clog these fish screens, 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. Some of these fish may become residents in deep-water reaches of the canal and underground siphons that hold water year-round. After the 2018 irrigation season (which ended in early November 2018), a total of 3,263 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, pending available funds

VI. Relationship to RIPRAP:

Colorado River Action Plan:

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 2019 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY 2019 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.

Tasks completed.

B. Findings (FY 2019 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 5 and 16 November 2018, 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 944 native fish were collected in the GVIC canal, including (in descending order) 452 roundtail chub, 272 flannelmouth sucker, 199 speckled dace, 18 bluehead sucker, 2 flannelmouth sucker X bluehead sucker hybrids, and 1 endangered razorback sucker.

The razorback sucker was 461 mm TL when collected on 13 November 2018, immediately behind Palisade High School. It had been stocked at RM 183.6 at Riverbend Park boat launch in Palisade, CO on 1 October 2014. That stocking location is just downstream of the GVIC headgates and water intake. This was the first contact of any kind with this fish since it was stocked. After collection from the canal it was again stocked at the Riverbend Park boat launch in Palisade.

A running total of all native fishes collected in the GVIC canal from 2002-2018 is provided in Table 1. However, effort varied considerably among these 17 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 5 and 16 November 2018, alternating days with the GVIC canal 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 2,256 fish were collected in the GVWU canal, including (in descending order) 956 roundtail chub, 867 flannelmouth sucker, 346 speckled dace, and 87 bluehead sucker. No endangered fish were collected in the GVWU canal in FY-2019 (i.e., November 2018). The distribution of fish in the GVWU canal in fall 2018 was much more spread out. In most years, the vast majority of fish collected in GVWU canal are collected from a short section of the canal (dubbed the "Hotspot") between 35<sup>3</sup>/<sub>10</sub> and 35<sup>8</sup>/<sub>10</sub> roads in Palisade, CO.

A running total of all native fishes collected in the GVWU canal from 2002-2018 is provided in Table 2. 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 in 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 14 November 2018. A total of 63 native fish were collected in the Price Ditch pipeline, including (in descending order) 45 flannelmouth sucker, 8 bluehead sucker, 5 roundtail chub, and 5 speckled dace. No endangered fish were collected in the Price Ditch tunnel in November 2018 (Table 3).

#### Highly variable numbers of fish collected from canals

The number of native and endangered fish collected during canal salvage operations in the GVWU canal in November 2018 (FY 2019) was relatively low, especially when compared with numbers of fish collected in recent years (2015-2017). River flows immediately upstream of the GVWU canal intake were extremely low during several months of the water year preceding canal shutdown and draining in fall 2018. River flows were also very clear, which would have exposed fish utilizing this area during daylight hours to the threat of avian predation. In addition, the river bed immediately upstream of the GVWU canal intake is choked with sand that is dropped out as the GVWU slows down river flows. This habitat, from a food base or spawning habitat perspective, is very sterile. It is our guess that this combination of factors led to very low fish usage and thus entrainment of fish into the GVWU canal during the 2018 water year.

Conversely, the numbers of native fish collected in GVIC canal were not markedly lower than several previous years that had much higher flows.

#### 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: Funding for this project was cancelled for FY 2020 (i.e., November 2019)

#### X. FY 2019 Budget Status

- A. Funds Provided: \$32,849
- B. Funds Expended: \$32,849
- C. Difference: \$0
- D. Percent of the FY 2019 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: \$0

#### XI. Status of Data Submission: Data was submitted to UCRRP database January 2019



**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	CS	BT	TOTALS
2018	272	18	2	452	199	0	0	1	0	0	944
2017	533	87	0	380	964	0	0	0	0	0	1,964
2016	552	60	0	902	1,919	0	0	8	0	1	3,442
2015	458	25	0	389	131	0	0	2	0	0	1,005
2014	657	12	0	139	26	1	0	1	0	9	845
2013	467	34	0	1,669	153	0	0	1	0	3	2,327
2012	2,386	451	0	2,453	450	0	0	2	0	2	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

**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
2018	867	87	0	956	346	0	0	0	0	0	2,256
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-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 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
2018	45	8	0	5	5	0	0	0	0	0	63
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