

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022 ANNUAL REPORT

PROJECT: C-4bRED

Project Title

Annual Operation and Maintenance of the Fish Passage Structure at the Redlands Diversion Dam on the Gunnison River

Bureau of Reclamation Agreement Number:

R20PG00024

Project/Grant Period:

Start date: 10/01/2019

End date: 09/30/2024

Reporting period end date: 09/30/2021

Is this the final report? Yes _____ No X

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Abstract:

The purpose of this project is to collect and summarize annual data on the overall number of large-bodied fish, number of different fish species, and seasonal distribution of fish use at the fish passageway at the Redlands Water and Power diversion dam on the Gunnison River. In 2022, the Redlands fish passageway was operational from 26 April to 6 October. This is the twenty-seventh year that the Redlands fish passageway has been operated since it was completed in late June of 1996.

Study Schedule:

1996-Ongoing

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.

Accomplishment of FY 2022 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Fish Passage

For reference, the Colorado River confluence with the Gunnison River is found at Colorado river mile (RMI) 170.9.

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Nine Colorado pikeminnow (*Ptychocheilus lucius*) were captured at Redlands fish passage in 2022 (Table 1 & 2). The total lengths of these fish ranged from 334 to 586 mm with a mean total length of 512 mm. Four were new fish implanted with 134 khz PIT tags at the Redlands fish passage in 2022. The remaining five were tagged during a previous encounter. One was tagged in 2017 near Moab, Utah at Colorado RMI 57.3. One fish's initial encounter isn't in STReAMS; however, this fish was detected at Tusher Diversion on the Green River at RMI 129.3 in 2020 and 2021. Two were tagged (2018 and 2020) after being collected in the Redlands fish passage. One was tagged in 2020 at the bottom end of Westwater Canyon at Colorado RMI 113.5. All nine Colorado pikeminnow were translocated to the Gunnison River at Escalante at river mile (RMI) 42.7 (n=8), or Whitewater RMI 15.3 (n=1). The total number of Colorado pikeminnow capture events recorded at the Redlands fish passage from 1996 through 2022 is 263 (Table 3).

Three razorback sucker (*Xyrauchen texanus*) were captured in the Redlands fish passage during 2022 (Table 1 & 2). The total length of these fish were 410, 443 and 483 mm. All three fish were stocked near Delta, Colorado at Gunnison RMI 57.1 in either 2018, 2019 or 2020. The total number of razorback sucker capture events recorded at the Redlands fish passage from 1996 through 2022 is 47 (Table 3).

Three bonytail (*Gila elegans*) were captured in the Redlands fish passage during 2022 (Table 1 & 2). The total lengths of these fish were 309, 335 and 337 mm. All three of these fish were likely stocked this year as their stocking data has not yet been uploaded into STReAMS, but the tags were distributed to Ouray National Fish Hatchery Grand Valley Unit in January 2022. The total number of bonytail capture events recorded at the Redlands fish passage from 1996 through 2022 is 76 (Table 3).

No humpback chub (*Gila cypha*) were captured in the Redlands fish passage during 2022. Although we had one chub that was tentatively identified as a humpback chub upon capture, this fish was originally tagged in Westwater Canyon in 2020 and was identified as a roundtail chub. We changed our species designation to *Gila* spp. The total number of humpback chub capture events recorded at the Redlands fish passage from 1996 through 2022 is four (Table 3).

Thirteen roundtail chub (*Gila robusta*; of the 1,363 collected in the fish trap) were recaptured (three previously PIT tagged in 2020) from Black Rocks (N=2) and Westwater (N=1) at Colorado RMI 136 and 120.7, respectively. Five roundtail chub were salvaged from Grand Valley canals and returned to the Colorado River in 2021. One roundtail chub was tagged in the Grand Valley during Colorado Parks and Wildlife 3-species monitoring. Four roundtail chub were recaptured that do not have their initial tagging encounter uploaded into STReAMS (Table 1 & 2).

A total of 7,425 fish of all species were handled at the Redlands fish passage between 26 April and 06 October 2022. Native fishes composed 63.6% of the total catch in 2022 (Table 4). The total number of all fishes collected in the 27-year operation of the fish trap is 218,658. Overall, native fish account for about 80% of all fish processed during this 27-year period.

The three species that composed most of our catch were bluehead sucker (*Catostomus discobolus*; 18%), flannelmouth sucker (*Catostomus latipinnis*; 26.9%) and roundtail chub (18.4%). White sucker (*Catostomus commersonii*) and white sucker hybrids combined made up 23.6% of our total catch (Table 1).

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The number of channel catfish (*Ictalurus punctatus*) collected in 2022 was 604, the third most abundant year in Redland's catch history. The two most abundant years for this species were 2013 (n=995), and 2014 (Table 1; n=1,029).

Seven smallmouth bass (*Micropterus dolomieu*) were collected and euthanized at the Redlands fish passage in 2022. Their total lengths ranged from 230 to 335 mm with a mean total length of 284 mm (Table 1).

No gizzard shad (*Dorosoma cepedianum*) were collected in 2022; the most abundant catch year for this species was 2007 (Table 1; n=43).

All fish found in the fish trap were counted and sorted by species. All native fish, as well as nonnative rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*), 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 including native X nonnative sucker hybrids were euthanized and disposed of according to protocols specified in our state collecting permit.

Operation and Maintenance

In some years, during mid-June immediately following runoff, sediment removal is necessary either manually or with the assistance of the Redlands Water and Power Company's backhoe. Redlands Water and Power did contact us about springtime backhoe work and removed the sediment bar near the fish return tube and forebay of the fish passage in March 2021. This work was completed in conjunction with repairing the dam. The gearbox that lifts and lowers the headgate of the fish passage broke in 2021. The gearbox used at this facility is no longer being produced by the manufacturer Hydrogate. Low base flows allowed us to take the gearbox from the attraction flow headgate and replace the fish passage headgate because there was not enough water in the river to necessitate additional fish attraction flows at the downstream terminus of the fish passage. Bob Norman (retired BOR) helped us find another option for purchasing gearboxes for this facility. A new gearbox was ordered and will be installed on the attraction flow headgate this winter before facility operation in FY23.

Annual weed control was continued throughout 2022.

Additional noteworthy observations:

NA

Recommendations:

Biological:

Continue to collect information on the number of fish, by species, in the fish trap of the Redlands Dam fish passageway starting about 15 April and running through mid-October, if funding allows.

Continue translocation 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 main stem Gunnison River.

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Operation and Maintenance:

Continue with annual grounds and facility maintenance in 2023. Replace gearbox on headgate.

Project Status:

On track and ongoing

FY2022 Budget Status

Funds Provided: \$80,461

Funds Expended: \$80,461

Difference: -0-

Percent of the FY 2022 work completed, and projected costs to complete: 100%

Recovery Program funds spent for publication charges: -0-

Status of Data Submission

Uploaded into STReaMS 11/08/2022.

Signed:

Travis Francis

Principal Investigator

11/21/2022

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Table 1.

Total number of juvenile and adult fish captured in the fish trap of the passageway at the Redlands Diversion Dam from 26 April to 06 October 2022.

<u>Common Name</u>	<u>Number of Fish</u>	<u>Percent of Total Fish</u>
NATIVE FISH		
bluehead sucker	1,333	17.95
bonytail	3	0.04
Colorado pikeminnow	9	0.12
flannelmouth sucker	1,996	26.88
<i>Gila</i> both roundtail and humpback traits	1	0.01
Young of year <i>Gila</i>	0	0.00
humpback chub	0	0.00
mountain whitefish	7	0.09
razorback sucker	3	0.04
roundtail chub	1,363	18.36
speckled dace	1	0.01
TOTAL	4,716	63.52
NONNATIVE FISH		
black bullhead	158	2.13
bluegill	2	0.03
brown trout	32	0.43
channel catfish	604	8.13
common carp	116	1.56
fathead minnow	1	0.01
green sunfish	18	0.24
gizzard shad	0	0.00
largemouth bass	2	0.03
longnose sucker	7	0.09
northern pike	0	0.00
rainbow trout	3	0.04
red shiner	1	0.01
sand shiner	0	0.00
smallmouth bass	7	0.09
white sucker	1,282	17.27
TOTAL	2,233	30.07
HYBRID FISHES		
<u>Native X Native Hybrids:</u>		
flannelmouth X bluehead sucker	10	0.13
<u>Native X Nonnative Hybrids:</u>		
bluehead X white sucker	121	1.63
flannelmouth X white sucker	345	4.65
ALL TOTALS	7,425	100.00

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Table 2.
2022 PIT-tagged fish histories

Month of Passage	Species	PIT Tag Histories
May-22	<i>Gila spp.</i> N=1	N=1 tagged October 2020 in Westwater (CO RMI 124.5) and identified there as a roundtail chub, detected on PIT antenna in Salt Creek in 2021.
	roundtail chub (<i>Gila robusta</i>) N=14	N=1 tagged October 2020 at Westwater (CO RMI 120.8) N=1 tagged October 2020 at Black Rocks (CO RMI 136) N=1 tagged November 2021 after salvage from GVIC and released at CO RMI 174.0. N=1 initial tagging event not in STReaMS, not a program tag, detected by PIT antenna multiple times in 2021 at Price Stubb and GVWU dams N=2 initial tagging event not in STReaMS N=9 tagged on this capture occasion for tour demonstrations
Jun-22	Colorado pikeminnow (<i>Ptychocheilus lucius</i>) N=1	N=1 tagged August 2018 at Redlands Ladder, detected October 2020 by PIT antenna in Black Rocks (CO RMI 135.8)
	razorback sucker (<i>Xyrauchen texanus</i>) N=1	N=1 stocked September 2020 near Delta (GU RMI 57.1)
	roundtail chub (<i>Gila robusta</i>) N=1	N=1 tagged September 2020 at Black Rocks (CO RMI 136); detected on PIT antenna at Black Rocks October 2020
Jul-22	Colorado pikeminnow (<i>Ptychocheilus lucius</i>) N=3	N=1 tagged October 2017 at CO RMI 57.3 N=1 tagged June 2020 at CO RMI 113.5 N=1 tagged July 2020 at Redlands Ladder
	razorback sucker (<i>Xyrauchen texanus</i>) N=2	N=2 stocked September 2018 or 2019 near Delta (GU RMI 57.1)
Aug-22	bonytail (<i>Gila elegans</i>) N=1	N=1 missing tagging encounter in STReaMS
	Colorado pikeminnow (<i>Ptychocheilus lucius</i>) N=5	N=1 initial tagging event not in STReaMS, detected June and September 2020 and August 2021 at Tusher Diversion (GR RMI 129.3), captured July 2022 at CO RMI 107.9 N=4 tagged on this occasion
	roundtail chub (<i>Gila robusta</i>) N=2	N=2 initial tagging event not in STReaMS)
Sep-22	bonytail (<i>Gila elegans</i>) N=2	N=2 missing tagging encounter in STReaMS

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Table 3.

Number of Colorado pikeminnow, razorback sucker, and bonytail capture events (not individuals) in the fish trap of the Redlands passageway between 1996 and 2022.

Year	Colorado pikeminnow	razorback sucker	bonytail	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
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
2016	33	1	33	0
2017	7	1	2	2
2018	39	2	8	0
2019	0	6	8	0
2020	32	1	5	1
2021	2	2	4	0
2022	9	3	3	0
Totals	263	47	76	4

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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 2021.

Year	Total Number of Fish	Total Native Fishes	Total Nonnative Fishes	Percent Composition	
				Native Fishes	Nonnative Fishes
1996	8,375	7,885	490	94.1	5.9
1997	12,233	11,547	686	94.4	5.6
1998	7,589	7,060	529	93.0	7.0
1999	8,264	7,654	610	92.6	7.4
2000	6,662	6,157	505	92.4	7.6
2001	6,317	5,221	1,096	82.6	17.4
2002	4,454	2,956	1,498	66.4	33.6
2003	7,259	4,909	2,350	67.6	32.4
2004	11,270	9,011	2,259	80.0	20.0
2005	11,403	8,414	2,989	73.8	26.2
2006	11,095	9,384	1,711	84.6	15.4
2007	6,963	5,801	1,162	83.3	16.7
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	81.4	18.6
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	67.9	32.1
2015	7,467	5,429	2,038	72.7	27.3
2016	10,347	7,486	2,861	72.3	27.7
2017	7,342	5,251	2,091	71.5	28.5
2018	6,635	5,492	1,143	82.8	17.2
2019	3,438	2,018	1,420	58.7	41.3
2020	5,241	4,410	831	84.1	15.9
2021	4,599	3,047	1,552	66.3	33.7
2022	7,425	4,726	2,699	63.6	36.4
Totals	211,233	171,013	40,220	80.96	19.04