

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2021 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 2021, the Redlands fish passageway was operational from 10 May to 4 October. This is the twenty-sixth 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 2021 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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Two Colorado pikeminnow (*Ptychocheilus lucius*) were captured at Redlands fish passage in 2021 (Table 1 & 2). The total lengths of these fish were 516 and 583 mm. Both were new fish implanted with 134 khz PIT tags at the Redlands fish passage in 2021. Both Colorado pikeminnow were translocated to the Gunnison River at Escalante at river mile (RMI) 42.7 (n=1), or Whitewater RMI 15.3 (n=1). The total number of Colorado pikeminnow capture events recorded at the Redlands fish passage from 1996 through 2021 is 254 (Table 3).

Two razorback sucker (*Xyrauchen texanus*) were captured in the Redlands fish passage during 2021 (Table 1 & 2). The total length of these fish were 455 and 539 mm. Both fish were stocked near Delta, Colorado at Gunnison RMI 57.1 in 2016 and 2018. The total number of razorback sucker capture events recorded at the Redlands fish passage from 1996 through 2021 is 44 (Table 3).

Four bonytail (*Gila elegans*) were captured in the Redlands fish passage during 2021 (Table 1 & 2). The total lengths of these fish ranged from 288 to 313 mm with a mean total length of 300 mm. One of these fish was stocked near Palisade, Colorado at Colorado RMI 183.6. 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 2021. The total number of bonytail capture events recorded at the Redlands fish passage from 1996 through 2021 is 73 (Table 3).

No humpback chub (*Gila cypha*) were captured in the Redlands fish passage during 2021. The total number of humpback chub capture events recorded at the Redlands fish passage from 1996 through 2021 is four (Table 3).

Nine roundtail chub (*Gila robusta*; of the 1,714 collected in the fish trap) were recaptured (one previously PIT tagged in 2017, and eight previously PIT tagged in 2020) from Black Rocks at Colorado RMI 136. Two roundtail chub were recaptured that do not have their initial tagging encounter uploaded into STReAMS (Table 1 & 2).

A total of 4,599 fish of all species were handled at the Redlands fish passage between 10 May and 04 October 2021. Native fishes composed 66.3% of the total catch in 2021 (Table 4). The total number of all fishes collected in the 26-year operation of the fish trap is 211,233. Overall, native fish account for about 81% of all fish processed during this 26-year period.

The three species that composed most of our catch were bluehead sucker (*Catostomus discobolus*; 20.1%), flannelmouth sucker (*Catostomus latipinnis*; 8.6%) and roundtail chub (37.3%). White sucker (*Catostomus commersoni*) and white sucker hybrids combined made up 21.5% of our total catch (Table 1).

The number of channel catfish (*Ictalurus punctatus*) collected in 2021 was 198. The three most abundant years for this species were 2006 (n=432), 2013 (n=995), and 2014 (Table 1; n=1,029).

Thirteen smallmouth bass (*Micropterus dolomieu*) were collected and euthanized at the Redlands fish passage in 2021. Their total lengths ranged from 166 to 277 mm with a mean total length of 200 mm (Table 1).

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Four adult gizzard shad (*Dorosoma cepedianum*; ≥ 400 mm TL) were collected and euthanized in 2021, 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 FY22.

Annual weed control was continued throughout 2021.

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 in 2022 starting about 15 April and running through mid-October.

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.

Operation and Maintenance:

Continue with annual grounds and facility maintenance in 2022. Replace gearbox on headgate.

Project Status:

On track and ongoing

FY 2021 Budget Status

Funds Provided: \$86,783

Funds Expended: \$86,783

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Difference: -0-

Percent of the FY 2021 work completed, and projected costs to complete: 100%

Recovery Program funds spent for publication charges: -0-

Status of Data Submission

Uploaded into STReaMS 11/23/2021.

Signed:

Travis Francis

Principal Investigator

11/23/2021

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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 10 May to 04 October 2021.

Common Name	Number of Fish	Percent of Total Fish
NATIVE FISH		
bluehead sucker	924	20.09
bonytail	4	0.09
Colorado pikeminnow	2	0.04
flannelmouth sucker	397	8.63
<i>Gila</i> both roundtail and humpback traits	0	0.00
Young of year <i>Gila</i>	0	0.00
humpback chub	0	0.00
mountain whitefish	0	0.00
razorback sucker	2	0.04
roundtail chub	1,714	37.27
speckled dace	0	0.00
TOTAL	3,043	66.17
NONNATIVE FISH		
black bullhead	74	1.61
bluegill	0	0.00
brown trout	63	1.37
channel catfish	198	4.31
common carp	157	3.41
green sunfish	8	0.17
gizzard shad	4	0.09
largemouth bass	0	0.00
longnose sucker	5	0.11
northern pike	0	0.00
rainbow trout	1	0.02
red shiner	40	0.87
sand shiner	1	0.02
smallmouth bass	14	0.30
white sucker	680	14.79
TOTAL	1245	27.07
HYBRID FISHES		
<u>Native X Native Hybrids:</u>		
flannelmouth X bluehead sucker	4	0.09
<u>Native X Nonnative Hybrids:</u>		
bluehead X white sucker	105	2.28
flannelmouth X white sucker	206	4.48
ALL TOTALS	4,599	100.00

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Table 2.
2021 PIT-tagged fish histories

Month of Passage	Species	PIT Tag Histories
Jun-21	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-21	bonytail (<i>Gila elegans</i>) N=1	N=4 stocked July 2020 in Grand Valley
	Colorado pikeminnow (<i>Ptychocheilus lucius</i>) N=2	N=2 tagged July 2021 at Redlands Ladder
	bonytail (<i>Gila elegans</i>) N=1	N=1 stocked 7/16/2019 in Palisade at CO RMI 183.6
	roundtail chub (<i>Gila robusta</i>) N=7	N=1 tagged October 2017 at Black Rocks (CO RMI 136); one detected in Black Rocks September and October 2020 N=1 tagged October 2020 at Black Rocks (CO RMI 136) N=1 missing tagging encounter in STReAMS, tag distributed to UDWR-M 1/10/2017 N=1 missing tagging encounter in STReAMS, tag was not distributed by the Programs N=3 tagged on this capture occasion for tour demonstrations
	razorback sucker (<i>Xyrauchen texanus</i>) N=1	N=1 stocked September 2018 near Delta (GU RMI 57.1)
Aug-21	bonytail (<i>Gila elegans</i>) N=1	N=1 missing tagging encounter in STReAMS, tag distributed to ONFH-GV 1/11/2021
	roundtail chub (<i>Gila robusta</i>) N=3	N=3 tagged September or October 2020 at Black Rocks (CO RMI 136)
	razorback sucker (<i>Xyrauchen texanus</i>) N=1	N=1 stocked September 2016 near Delta (GU RMI 57.1)
Sep-21	bonytail (<i>Gila elegans</i>) N=2	N=2 missing tagging encounter in STReAMS, tag distributed to ONFH-GV 1/11/2021
	roundtail chub (<i>Gila robusta</i>) N=2	N=1 tagged September 2020 at Black Rocks (CO RMI 136) N=1 tagged on this capture occasion for tour demonstrations
Oct-21	roundtail chub (<i>Gila robusta</i>) N=1	N=1 tagged October 2020 at Black Rocks (CO RMI 136)

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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 2021.

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
Totals	254	44	73	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
Totals	211,233	171,013	40,220	80.96	19.04