UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

2024 ANNUAL REPORT

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

Bureau of Reclamation Agreement Numbers and Grant Periods:
R20PG00024
Start date: 10/01/2019.
End date: 09/30/2024.

Principal Investigators:
Travis Francis, Deputy Project Leader
U.S. Fish and Wildlife Service
Grand Junction FWCO
Email: travis_francis@fws.gov

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 2024, the Redlands fish passageway was operational from 19 April to 21 May, and again from 05 June to 16 October. From 22 May to 04 June the facility was flooded and inoperable. This is the twenty-ninth year that the Redlands fish passageway has been operated since it was completed in late June of 1996.

Study Schedule:
1996-Ongoing

Relationship to RAP:

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 2024 Tasks and Deliverables, Discussion of Findings and Shortcomings:

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

Twenty-four Colorado pikeminnow (*Ptychocheilus lucius*) were captured at Redlands fish passage in 2024 (Tables 1 & 2). The total lengths of these fish ranged from 457 to 692 mm with a mean total length of 534 mm. Thirteen were new fish implanted with 134 khz PIT tags at the Redlands fish passage in 2024. The remaining eleven were tagged during a previous encounter. One fish was tagged in 2014 in Canyonlands, Utah at Colorado River mile (RMI) 10.4; this fish was recaptured in 2016 downstream of Moab, Utah at Colorado RMI 61.5. One fish was tagged in 2019 near Moab, Utah at Colorado RMI 71.8; this fish was recaptured in 2021 in Westwater Canyon at Colorado RMI 123.3. Two fish were tagged in 2020 while making passage at Redlands Diversion; one of these fish made passage again in 2022 and 2023, the other fish was recaptured in 2023 in Butch Craig Pond near Whitewater, Colorado.

One fish was tagged in 2021 near Fruita, Colorado at Colorado RMI 157.4, and was later recaptured in 2021 at RMI 2.8 of the Gunnison River. Two fish were tagged in either 2022 or 2023 while making passage at Redlands Diversion. Three fish were tagged in 2023 downstream of Moab, Utah at Colorado RMIs 58.3, 60.3 and 60.6. The final fish was tagged in 2024 downstream of Green River, Utah at Green RMI 82.2. Fourteen of the Colorado pikeminnow captured in 2024 were translocated to the Gunnison River at Escalante at river mile (RMI) 42.7, nine were translocated to the Gunnison River at Whitewater RMI 15.3, and the remaining fish was released just above the fish ladder. The total number of Colorado pikeminnow capture events recorded at the Redlands fish passage from 1996 through 2024 is 316 (Table 3). These data (four of eleven fish that were previously tagged) make it apparent that once a Colorado pikeminnow makes an initial passage at Redlands Diversion, if it leaves the Gunnison River, there is a reasonable probability that it will return. A majority of the Colorado pikeminnow transitions upstream in the Gunnison occur in the post spawning window of July through the end of August.

Thirty-one razorback sucker (*Xyrauchen texanus*) were captured in the Redlands fish passage during 2024 (Tables 1 & 2). The total lengths of these fish ranged from 378 to 583 mm with a mean total length of 467 mm. All these fish were stocked near Delta, Colorado at Gunnison RMI 57.1 from 2014 through 2022. Fifteen of the razorback sucker were translocated from the passage to the Gunnison River at Escalante at river mile (RMI) 42.7, one was translocated to the Gunnison River at Whitewater RMI 15.3, and the remaining fifteen razorback sucker were released just above the fish passage. The total number of razorback sucker capture events recorded at the Redlands fish passage from 1996 through 2024 is 145 (Table 3). These data make it apparent that once a razorback sucker is stocked into the Gunnison River, if it leaves, there is a reasonable probability that it will return.

Twenty-eight bonytail (*Gila elegans*) were captured in the Redlands fish passage during 2024 (Tables 1 & 2). The total lengths of these fish ranged from 236 to 383 mm with a mean total length of 300 mm. All these fish were stocked this year near Fruita, Colorado at Colorado RMI 157 (n=18), or near Grand Junction, Colorado at Colorado RMI 166 (n=10). Seven of the bonytail were translocated to the Gunnison River at Escalante at river mile (RMI) 42.7. The remaining 21 bonytail were released just above the passage. The total number of bonytail capture events recorded at the Redlands fish passage from 1996 through 2024 is 133 (Table 3).

No humpback chub (*Gila cypha*) were captured in the Redlands fish passage during 2024. The total number of humpback chub capture events recorded at the Redlands fish passage from 1996 through 2024 is four (Table 3).

Four roundtail chub (*Gila robusta*; of the 1,209 collected in the fish trap) were recaptures. Two were tagged in either 2020 or 2021 in Black Rocks at Colorado RMI 136. The remaining two roundtail chub that were recaptured did not have their initial tagging encounter uploaded into STReaMS (Table 2).

A total of 6,375 fish of all species were handled at the Redlands fish passage between 19 April to 21 May, and again from 05 June to 16 October 2024. Native fishes composed 74.2% of the total catch in 2024 (Table 4). The total number of all fishes collected in the 29-year operation of the fish trap is 228,614. Overall, native fish account for about 80% of all fish processed during this 29-year period.

The three species that composed most of our catch were flannelmouth sucker (*Catastomus latipinnis*; 32.8%), bluehead sucker (*Catastomus discobolus*; 20.8%), and roundtail chub (19%). White sucker

(*Catostomus commersonii*) and white sucker hybrids combined made up 6.9% of our total catch (Table 1).

The number of channel catfish (*Ictalurus punctatus*) collected in 2024 was 420, the sixth most abundant year in Redlands catch history. The two most abundant years for this species were 2013 (n=995), and 2014 (n=1,029).

One smallmouth bass (*Micropterus dolomieu*) was collected and euthanized at the Redlands fish passage in 2024. Its total length was 282 mm (Table 1).

An annual record 55 gizzard shad (*Dorosoma cepedianum*) were collected in 2024. Their total lengths ranged from 127 to 411 mm with a mean total length of 278 mm (Table 1). The previous most abundant catch year for this species was 2007 (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 collection 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. In 2023, Redlands Water and Power hired a contractor and removed the sediment bar near the fish return tube and forebay of the fish passage on 19 July 2023. They also removed silt and debris from the grounds, spread new gravel, and filled in the scoured-out portions of fish ladder. That work has left both the fish passage forebay and fish return tube free and clear and in good condition throughout 2024.

Annual weed control was continued throughout 2024.

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 and other listed fishes collected in the Redlands fish passage to release points farther upstream in the Gunnison River, 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 2024.

Project Status:

On track and ongoing.

Status of Data Submission
Data was uploaded into the STReaMS database on 10/17/2024.

Signed:
Travis Francis
Principal Investigator
11/15/2024

Table 1. Total number of juvenile and adult fish captured in the fish trap of the passageway at the Redlands Diversion Dam from 19 April to 16 October 2024.

Common Name	Number of Fish	Percent of Total Fish
NATIVE FISH		
bluehead sucker	1,325	20.78
bonytail	28	0.44
Colorado pikeminnow	24	0.38
flannelmouth sucker	2,091	32.80
razorback sucker	31	0.49
roundtail chub	1,209	18.96
speckled dace	3	0.05
TOTAL	**4,711**	**73.90**
NONNATIVE FISH		
black bullhead	263	4.13
bluegill	30	0.47
brown trout	15	0.24
channel catfish	420	6.59
common carp	182	2.86
green sunfish	187	2.93
gizzard shad	55	0.86
longnose sucker	17	0.27
red shiner	34	0.53
sand shiner	2	0.03
smallmouth bass	1	0.01
white sucker	228	3.58
TOTAL	**1,434**	**22.50**
HYBRID FISHES		
Native X Native Hybrids:		
flannelmouth X bluehead sucker	17	0.27
Native X Nonnative Hybrids:		
bluehead X white sucker	67	1.05
flannelmouth X white sucker	146	2.29
ALL TOTALS	**6,375**	**100.00**

Table 2. 2024 PIT-tagged fish histories

Month of Passage	Species	PIT Tag Histories
April	roundtail chub (*Gila robusta*) N=4	N=1 initial tagging event not in STReaMS, not a program tag N=3 tagged on this capture occasion
May	Colorado pikeminnow (*Ptychocheilus lucius*) N=3	N=1 tagged April 2014 at CO RMI 10.4, recaptured June 2016 at CO RMI 61.5 N=1 tagged May 2021 at CO RMI 157.4, recaptured August 2021 at GU RMI 2.8 N=1 tagged on this capture occasion
June	roundtail chub (*Gila robusta*) N=1	N=1 captured October 2020 in Black Rocks (CO RMI 136)
July	bonytail (*Gila elegans*) N=1	N=1 stocked July 2024 near Fruita (CO RMI 157)

Month of Passage	Species	PIT Tag Histories
	Colorado pikeminnow (*Ptychocheilus lucius*) N=3	N=1 tagged May 2024 at GR RMI 82.2, recaptured June 2024 at GR RMI 82.2 N=2 tagged on this capture occasion
	razorback sucker (*Xyrauchen texanus*) N=2	N=1 stocked April 2015 near Delta (GU RMI 57.1) N=1 stocked September 2018 near Delta (GU RMI 57.1)
August	bonytail (*Gila elegans*) N=3	N=1 stocked July 2024 near Fruita (CO RMI 157) N=2 stocked August 2024 near Grand Junction (CO RMI 166)
	Colorado pikeminnow (*Ptychocheilus lucius*) N=15	N=1 tagged April 2019 at CO RMI 71.8, recaptured September 2021 at CO RMI 123.3 N=1 tagged July 2020 at Redlands Fish Trap and translocated to GU RMI 42.7, recaptured July, and August 2022 and 2023 at Redlands Trap and translocated to GU RMI 42.7 N=1 tagged August 2022 at Redlands Fish Trap and translocated to GU RMI 42.7 N=1 tagged August 2023 at Redlands Fish Trap and translocated to GU RMI 42.7 N=1 tagged April 2023 at CO RMI 58.3 N=1 tagged September 2023 at CO RMI 60.3 N=9 tagged on this capture occasion
	razorback sucker (*Xyrauchen texanus*) N=5	N=1 stocked September 2019 near Delta (GU RMI 57.1) N=4 stocked September 2020 near Delta (GU RMI 57.1)
	roundtail chub (*Gila robusta*) N=2	N=1 captured October 2021 in Black Rocks (CO RMI 136) N=1 tagged on this capture occasion
September	bonytail (*Gila elegans*) N=21	N=16 stocked July or August 2024 near Fruita (CO RMI 157) N=5 stocked August 2024 near Grand Junction (CO RMI 166)
	Colorado pikeminnow (*Ptychocheilus lucius*) N=3	N=1 tagged July 2020 at Redlands Fish Trap and translocated to GU RMI 42.7, recaptured May 2023 in Butch Craig Pond N=1 tagged September 2023 at CO RMI 60.6 N=1 tagged on this capture occasion
	razorback sucker (*Xyrauchen texanus*) N=23	N=1 stocked October 2014 near Delta (GU RMI 57.1) N=1 stocked August 2016 near Delta (GU RMI 57.1) N=2 stocked August 2017 near Delta (GU RMI 57.1) N=2 stocked September 2018 near Delta (GU RMI 57.1) N=9 stocked September 2019 near Delta (GU RMI 57.1) N=5 stocked September 2020 near Delta (GU RMI 57.1) N=1 stocked September 2021 near Delta (GU RMI 57.1) N=2 stocked September 2022 near Delta (GU RMI 57.1)
	roundtail chub (*Gila robusta*) N=3	N=1 initial tagging event not in STReaMS, not a program tag N=2 tagged on this capture occasion
October	bonytail (*Gila elegans*) N=3	N=3 stocked August 2024 near Grand Junction (CO RMI 166)
	razorback sucker (*Xyrauchen texanus*) N=1	N=1 stocked September 2020 near Delta (GU RMI 57.1)

Table 3. Number of Colorado pikeminnow, razorback sucker, bonytail, and humpback chub capture events (not individuals) in the fish trap of the Redlands passageway between 1996 and 2024.

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
2023	29	67	29	0
2024	24	31	28	0
Totals	**316**	**145**	**133**	**4**

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 2024.

Year	Total Number of Fish	Total Native Fishes	Total Nonnative Fishes	Percent Native Composition	Percent Nonnative Composition
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
2023	3,581	2,165	1,416	60.5	39.5
2024	6,375	4,728	1,647	74.2	25.8
Totals	**228,614**	**182,632**	**45,982**	**79.89**	**20.11**