

# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

2022 ANNUAL REPORT

PROJECT: 123d

**Project Title:**

Walleye control on the lower Green River

**Bureau of Reclamation Agreement Number:**

R19AP00059

**Project/Grant Period:**

Start date: 10/01/2019

End date: 09/30/2024

Reporting period end date: 09/30/2022

Is this the final report? Yes \_\_\_\_\_ No X

**Principal Investigator:**

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**Abstract:**

A total of 177 Walleye were removed from the lower Green River during the 2022 field season. UDWR-Moab field staff completed six days of targeted Walleye removal under Project 123d between the Tusher Diversion Dam (RM 128) and Green River State Park (RM120), a reach determined in years prior to produce high catch rates of Walleye. A total of 18 hours of effort were expended, resulting in the removal of 41 Walleye (2.28 fish/hr). The total amount of targeted Walleye removal under Project 123d was reduced this year as Project 128 (Colorado Pikeminnow population monitoring) ran concurrently and utilizes the same style of sampling (boat mounted electrofishers). Sampling by UDWR-Moab field staff associated with Project 128 removed an additional 136 Walleye from the lower Green River with 285.5 hours of effort (0.48 fish/hr). While the total number of Walleye removed from the lower Green River is higher in 2022 (177) than 2021 (101), there was a decline from 2021 when comparing catch-per-unit-effort (CPUE) (Table 7).

**Study Schedule:**

2014-Ongoing

**Relationship to RIPRAP:**

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).

III.A. Reduce negative interactions between nonnative and endangered fishes.

III.A.2. Identify and implement viable active control measures.

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

### GREEN RIVER ACTION PLAN: MAINSTEM

III Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).

III.A Reduce negative impacts to endangered fishes from sportfish management activities.

III.A.4 Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed.

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

#### *Task 1: Removal efforts*

Researchers with the Utah Division of Wildlife Resources Moab Field Station (UDWR-Moab) completed 303.5 hours of electrofishing effort on the lower Green River in 2022 (Table 1). Crews removed 177 Walleye (0.58 fish/hr) through both targeted efforts associated with Project 123d and ancillary captures associated with Project 128 (Colorado Pikeminnow population monitoring).

Targeted Walleye removal on the lower Green River (Project 123d) occurred in the spring between March 17<sup>th</sup> and April 14<sup>th</sup>, 2022. Flows varied between 1940 cubic feet/second (cfs) and 3600 cfs (USGS Gauge 09315000 in Green River, UT) with main channel river temperatures increasing from 6.8°C to 11.6°C. Removal was focused between the Tusher Diversion Dam (RM 128) and Green River State Park (RM 120). Forty-one Walleye were removed over 18 hours of electrofishing effort (2.28 fish/hr), representing a decline in both total number of Walleye removed and CPUE from last year (Table 7). Late season monsoons in 2021 left significant silt deposits in this reach preventing access to known Walleye hotspots and may have been a factor associated with lower catch rates.

All additional sampling in this reach occurred under Project 128. Sampling for Project 128 was conducted between April 23<sup>rd</sup> and June 4<sup>th</sup>, 2022 with the completion of three passes from Green River State Park (RM 120) to the confluence with the Colorado River (RM 0). Flows ranged between 2600 cfs and 17,100 cfs (USGS Gauge 09315000 in Green River, UT) with main channel river temperatures increasing from 11.6 °C to 17.8 °C. Field crews completed 285.5 hours of electrofishing, yielding 136 Walleye (0.48 fish/ hr) on the lower Green River (Table 1). These data support the current practice of restricting targeted Walleye removal effort to the uppermost reaches of the lower Green River between the Tusher Diversion Dam and Green River State Park.

Walleye total lengths were similar to recent years averaging 458 mm and ranging between 201 and 632 mm. Forty-five Walleye in spawning condition (25.4% of the total catch) were encountered in the lower Green River during the 2022 field season with 97.8% of the ripe fish being male. The notable lack of age-0 Walleye supports the assumption that this species has not consistently reproduced or recruited successfully, however the capture of six juvenile (<300mm) Walleye during 2022 may indicate a rise in residency as opposed to seasonal upstream incursions of adult (>300mm) Walleye to spawn. The capture of these six fish in a single season is three times the total number of juvenile Walleye (two fish) encountered on the lower Green River from the previous eight years of targeted and ancillary efforts. A total of two PIT tags associated with Bonytail were detected within the stomachs of Walleye during 2022 field sampling.

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### *Task 2: Data Management, analysis, and reporting*

Data were submitted to the database manager on November 1, 2022. This report will serve as the annual progress report including a summary of the data collected for Project 123d on the lower Green River. Data collected on the lower Colorado River will be reported under Project 126a by USFWS-GJ FWCO.

#### **Additional noteworthy observations:**

Comparisons of CPUE between Project 123d and 128 on the lower Green River assists with understanding the importance of targeted Walleye removal efforts. Both projects utilize the same means of mechanical fish capture (boat mounted electrofishers) and as Colorado Pikeminnow and Walleye display considerable niche overlap and occupy similar habitats, researchers sample in similar means. However, a significant difference in CPUE exists as Project 123d averaged 2.28 fish/hr while Project 128 yielded 0.48 fish/hr (Table 6). This can possibly be attributed to a number of factors. First, targeted sampling is concentrated within sub-reaches that have yielded high catch rates for Walleye in the past (Figure 3). Second, researchers maintain the flexibility to modify timing and location of targeted sampling with the goal of maximizing Walleye captures. Third, targeted Walleye removal effort focused in early spring, a time when catch-rates are consistently higher in the lower Green River (Figure 2). A final consideration is that the Tusher Diversion Dam located at river mile 128 may become an obstacle to upstream passage during years when the fish ladder is blocked by debris, concentrating Walleye within its tail waters.

#### **Recommendations:**

- Continue targeted removal effort between Tusher diversion dam and Green River State Park (RM 128-120) as this segment has the highest catch rates for Walleye in the reach. Removal should be conducted spring through early summer to correspond with spawning movements, or when justified by noteworthy catch rates.
- Continue Walleye removal as a component of existing projects, especially Project 128.

#### **Project Status:**

On track, ongoing, complete, etc.

#### **FY2022 Budget Status**

Funds Provided: \$54,741

Funds Expended: \$54,741

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:**

Compiled data was submitted to the database manager in November 2022.

#### **Signed:**

Sam Brockdorff

Principal Investigator

12/05/2022

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**Table 1: Overall effort summary for the Lower Green River, 2022.**

<b>Project Number</b>	<b>Date Range</b>	<b>River Mile Range</b>	<b>Total Sampling Days</b>	<b>Total Effort (Hrs.)</b>	<b>Number of Walleye Captured</b>	<b>CPUE</b>
123d	March 17 <sup>th</sup> - April 14 <sup>th</sup>	128-120	6	18.0	41	2.28
128	April 23 <sup>rd</sup> - June 4 <sup>th</sup>	132.7-0	29	285.5	136	0.48
<b>Total</b>			<b>35</b>	<b>303.5</b>	<b>177</b>	<b>0.58</b>

**Table 2: Targeted and ancillary captures of native species on the lower Green River, 2022.**

<b>Species</b>	<b>Total Captured</b>	<b>Median Length (mm)</b>	<b>Length Range (mm)</b>
Bonytail	11	270	202-322
Colorado Pikeminnow	26	284	92-544
Flannelmouth Sucker/ Razorback Sucker	7	515	477-535
Razorback Sucker	871	467	142-573

**Table 3: Targeted and ancillary captures of nonnative species on the lower Green River, 2022.**

<b>Species</b>	<b>Total Captured</b>	<b>Median Length (mm)</b>	<b>Length Range (mm)</b>
Black bullhead	7	180	140-210
Brown trout	4	193.5	75-280
Channel catfish (>450 mm)	6	533	495-630
Grass carp	15	742	689-946
Green sunfish	43	107	45-193
Rainbow trout	2	454	418-490
Smallmouth bass	54	199	125-415
Walleye	177	459	201-632
White Sucker	13	247	218-330
Yellow bullhead	3	180	151-201

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**Table 4: Sampling summary by period, 2022.**

<b>Period</b>	<b>Date Range</b>	<b>River Mile Range</b>	<b>Total Sampling Days</b>	<b>Total Effort (Hrs.)</b>	<b>Number of Walleye Captured</b>	<b>CPUE</b>
Spring	March 17 <sup>th</sup> - May 31 <sup>st</sup>	132.7-0	31	264.4	164	.62
Early Summer	June 1 <sup>st</sup> - June 4 <sup>th</sup>	52.2-0	4	39.1	13	.33

**Table 5: Walleye encounters and catch-per-unit-effort by period and size class, 2022.**

<b>Period</b>	<b>Juveniles Captured</b>	<b>Juvenile CPUE</b>	<b>Adults Captured</b>	<b>Adult CPUE</b>
Spring	6	.02	158	.60
Early Summer	0	.00	13	.33

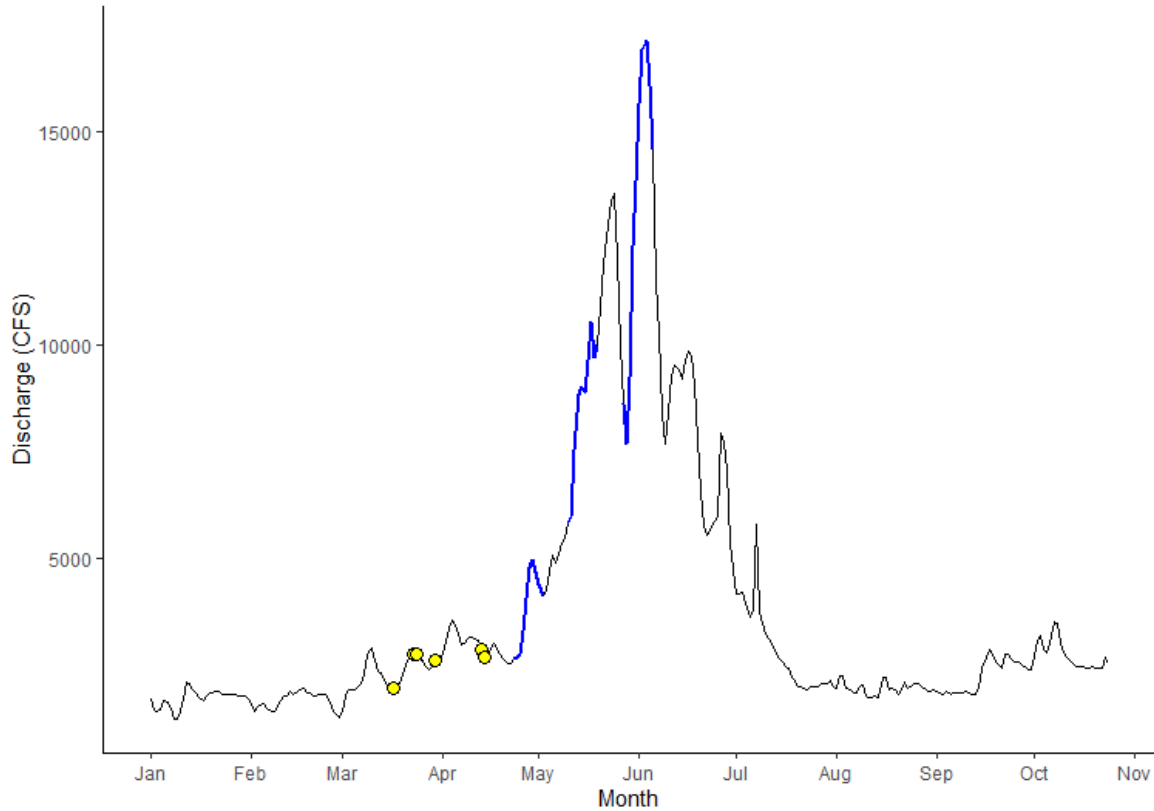
**Table 6: Walleye encounters and CPUE by location and size class, 2022.**

<b>River Mile</b>	<b>Juveniles Captured</b>	<b>Juvenile CPUE</b>	<b>Adults Captured</b>	<b>Adult CPUE</b>
RM 128- 120.1	4	.12	45	1.34
RM 120-0	2	.01	126	.17

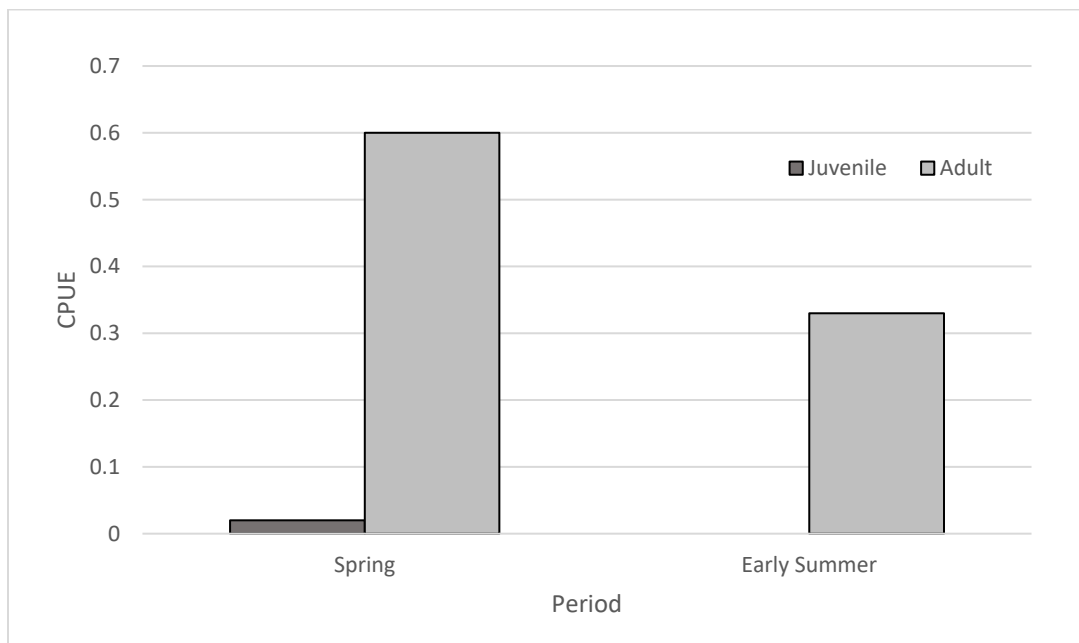
**Table 7. Walleye catch-per-unit-effort, Tusher Reach, 2017-2022.**

<b>Year</b>	<b>Number Captured</b>	<b>Total Effort (Hrs.)</b>	<b>CPUE</b>
2022	41	17.96	2.82
2021	101	31.35	3.22
2020	113	39.7	2.85
2019	151	43.4	3.48
2018	12	7.2	1.66
2017	32	25	1.28

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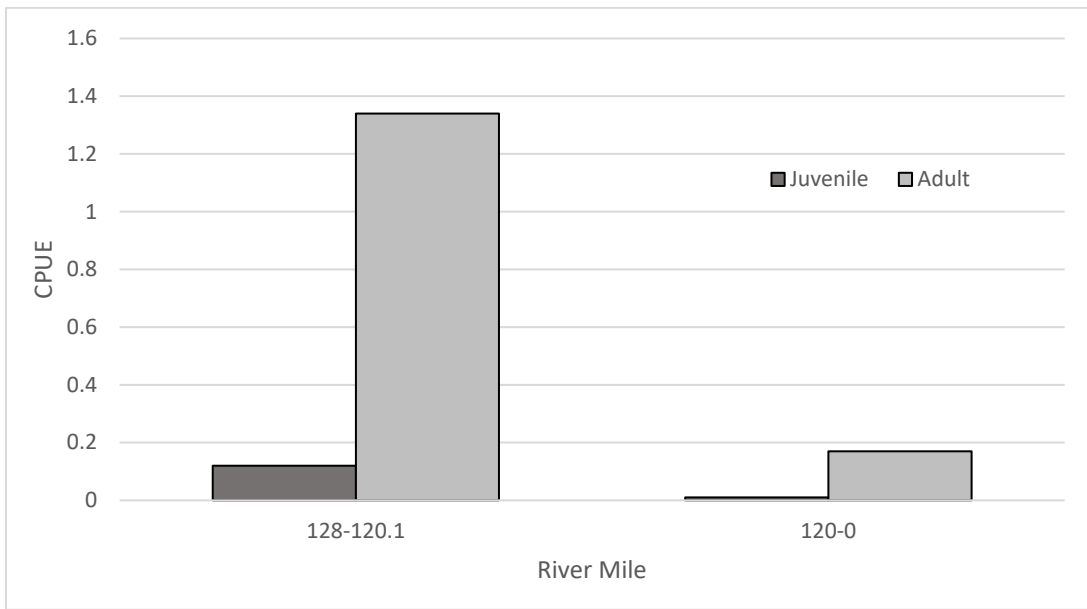


**Figure 1: Sampling events and discharge on the Green River through the 2022 field season. USGS Gauge 09315000 in Green River, UT. Yellow dots represent targeted Walleye fishing events while the blue highlights represent Project 128 passes.**

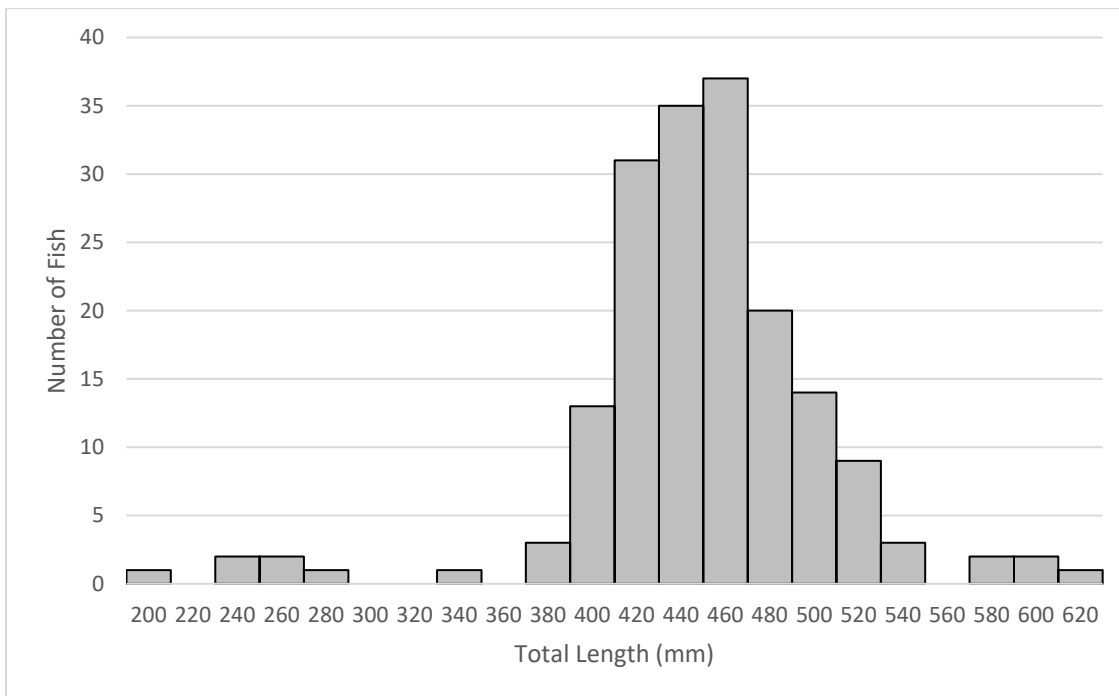


**Figure 2: Walleye CPUE by period subdivided by size class, 2022.**

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**Figure 3: Walleye CPUE by river mile subdivided by size class, 2022.**



**Figure 4: Length frequency histogram of Walleye captured, 2022.**

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**ANNUAL PERFORMANCE PROGRESS REPORT (PPR)**

BUREAU OF RECLAMATION AGREEMENT NUMBER: R19AP00059

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 123d

Project Title: Walleye Control in the Lower Green and Colorado Rivers

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Project/Grant Period: Start date: 10/01/2018  
End date: 09/30/2023  
Reporting period end date: 9/30/2022  
Is this the final report? Yes \_\_\_\_\_ No X

Performance: All work was completed under the Tasks 1 and 2 of FY22 123d scope of work

*Walleye removal in the Green River Sub-basin*

Utah Division of Wildlife Resources completed 17.96 hours of targeted Walleye electrofishing effort on the lower Green River between March 17<sup>th</sup> and April 14<sup>th</sup>, 2022. All effort was focused on high value Walleye habitat downstream of the Tusher Diversion Dam (RM 128-120). A total of 41 Walleye were removed from the Green River (2.82 fish/hr) in 2022 through targeted 123d efforts. Additional nonnative fish removed include 1 Channel Catfish, 3 Green Sunfish, 1 Rainbow Trout, and 15 Smallmouth Bass. Native encounters include 20 Razorback Sucker. Endangered species were enumerated, measured, tagged (if not already) and returned to the river. These data were analyzed and reported within the annual report for Project 123d by December 2022 (Task 2 was completed).

*Walleye removal in the Colorado River Sub-basin*

Utah Division of Wildlife Resources completed 8.49 hours of targeted Walleye removal on the Colorado River in 2022. Effort was focused in two locations, Big Hole to Cisco boat ramp (RM 116.5-110.5) and Big Bend to the Moab Bridge (RM 71-64). Sampling took place between June 15<sup>th</sup> and June 16<sup>th</sup>, 2022 with 15 Walleye (1.77 fish/hr) encountered and removed. Additional nonnative encounters include 20 Black Bullhead, 1 Bluegill, 1 Creek Chub, 6 Green Sunfish, 96 Smallmouth Bass, 6 White Suckers and 1 Yellow Bullhead. Native species encountered include 15 Bonytail, 2 Colorado Pikeminnow, 4 Razorback Sucker, 3 Roundtail Chub, and 2 unidentified juvenile chub. Endangered species were enumerated, measured, tagged (if not already) and returned to the river. These data will be reported by USFWS-GJ FWCO and analyzed separately under Project 126a.