

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2021 ANNUAL REPORT

PROJECT: 167

**Project Title**

Smallmouth Bass control in the White River

**Bureau of Reclamation Agreement Number:**

R19AP00059 (UDWR)

R20PG00024 (USFWS)

R17AP00301 (CPW)

**Project/Grant Period:**

Start date: 10/1/2019

End date: 9/30/2024

Reporting period end date: 9/30/2021

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

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## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

### **Abstract:**

U.S. Fish and Wildlife Service, Utah Division of Wildlife Resources, and Colorado Parks & Wildlife worked collaboratively to control an established and growing population of Smallmouth Bass (*Micropterus dolomieu*) in the White River (Colorado and Utah). In 2021, a total of 6,816 Smallmouth Bass were removed (270 hrs of total effort) between Taylor Draw Dam and the Enron boat ramp (river mile 104.3-24.0). Adult (> 200 mm total length [TL]) bass catch rates were slightly lower in the reach immediately downstream of Taylor Draw Dam than in the next reach downstream for the first time on record. Adults comprised 31.1% of bass captures in Colorado and 8.0% in Utah. Adult, juvenile (100-199 mm TL), and Smallmouth Bass less than 100 mm TL were abundant in 2021, demonstrating that successful reproduction and survival have occurred in this system for at least the past three years.

### **Study Schedule:**

2012-Ongoing

### **Relationship to RIPRAP:**

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

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

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

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

GREEN RIVER ACTION PLAN: WHITE RIVER

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

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

III.B.2. Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.

### **Accomplishment of FY 2021 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:**

The data and analysis within this report are inclusive of combined efforts by U.S. Fish and Wildlife Service Green River Basin Fish and Wildlife Conservation Office (GRB FWCO), Colorado Parks and Wildlife (CPW) and Utah Division of Wildlife Resources Vernal (UDWR V). Annual Performance Progress Reports by CPW and UDWR are attached.

#### Smallmouth Bass removal from Taylor Draw Dam to the Colorado-Utah border

U.S. Fish and Wildlife Service Green River Basin Fish and Wildlife Conservation Office, CPW, and UDWR V removed Smallmouth Bass *Micropterus dolomieu* from the Taylor Draw Dam to the Colorado/Utah border (river mile [RM] 104.3-72.) between 10 May and 16 June 2021 (Table 1). The majority of Colorado effort in 2021 occurred in the 17 miles downstream of Taylor Draw Dam, as previous data suggested this was the area containing the highest bass densities and an abundance of spawning adult bass (Breen et al. 2012; Webber et al. 2013, 2014; Smith et al. 2015, 2016, 2017, 2018, 2019, 2020). Additionally, six days of removal were conducted from the BLM Big Trujillo boat launch to the Utah border (RM 87.5-71.6). Crews removed 5,324 Smallmouth Bass during 24 days of electrofishing (188.1 hrs of total effort) in the Colorado portion of the White River (Table 1). Total catch consisted of 1,658 adults ( $\geq$  200 mm total length [TL]), 2,136 juveniles (100-199 mm TL), and 1,530 fish < 100 mm TL (likely age-1). Of the 1,658 adults removed, 30 were large enough to be

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

considered piscivores ( $\geq 325$  mm TL) posing a competitive threat to Colorado pikeminnow (*Ptychocheilus lucius*) and a predatory threat to juvenile native fishes. A total of 752 adult bass were expressing gametes, and more ripe males were caught than females ( $n = 392$  and  $358$ , respectively, with two fish lacking sex determination information). More Smallmouth Bass were removed in the Colorado portion of this project in 2021 than in any other year, and the Catch rate (28.3 bass/hr; Figure 1) for Colorado was the second highest on record.

Mean TL of Smallmouth Bass removed was 152.5 mm (SE  $\pm 0.9$  mm TL; range = 52-424 mm TL; Figure 2). The size structure of bass caught in 2021 reveals dominance of the juvenile size class, which likely corresponds to fish spawned in 2020 (Figure 3). Like smaller juveniles, smaller adults are more numerous in 2021 than in any previous year (Figure 3), further indicating the strength of the 2018 year class and establishment of the species in Colorado.

Unlike previous years, the adult catch rate was highest (CPUE = 12.3 bass/hr; Figure 4) in reach 2 (RM 102.6-97.1) instead of immediately downstream of the Taylor Draw Dam (RM 104.3-102.6). During spring and early summer 2021, the Taylor Draw Dam hydroelectric facility was shut down for repairs, which reduced flows in the river left channel and increased flows in the river right and middle channels. Typically, low flows in the middle and right channel create optimal Smallmouth Bass habitat. The increased flow in these channels in 2021 may have precluded bass from occupying or spawning in these two channels, thereby reducing catch rates in the reach from Taylor Draw dam to RM 102.6.

Similar to years past, adult CPUE declined downstream of Douglas Creek (RM 97.1; Figure 4; Webber et al. 2013, 2014, Smith et al. 2015, 2016, 2017, 2018, 2019, 2020). Catch rates for juveniles between 100 to 199 mm TL were fairly high (CPUE  $> 10.0$  bass/hr) in all reaches upstream of the Big Trujillo boat launch, and like adult catch rates, were highest in reach 2 (Figure 4). Also consistent with previous years, the catch rate downstream of the Big Trujillo boat launch was lower (CPUE = 16.5/hr, total effort = 50.3 hrs) than upstream reaches (CPUE = 32.6 bass/hr, total effort = 137.8 hrs; Figure 4) in 2021.

Targeted Smallmouth Bass removal from the Big Trujillo boat launch to the Utah state line was not conducted between 2013 and 2016 due to lower observed bass densities compared to reaches upstream during Project 128 passes (Bestgen et al. 2017). Increased Smallmouth Bass catch rates during Project 128 passes in 2017 prompted GRB FWCO to expand our project efforts into this orphaned reach. Loss of vehicular access to the state line in 2019 forced the reallocation of removal resources through multiple iterations. Starting in 2021, GRB FWCO and UDWR V combined efforts to conduct bass removal throughout this difficult-to-access stretch.

### Smallmouth Bass removal from the Colorado-Utah border to the Enron boat ramp

Utah Division of Wildlife Resources Vernal and GRB FWCO removed Smallmouth Bass from the White River downstream of the Colorado/Utah border from 19 May to 4 June 2021 (Table 1). Smallmouth Bass removal in the Utah section upstream of the Bonanza Bridge (RM 72.0-59.5) was conducted by GRB FWCO and UDWR V over six days (31.6 hrs of total effort) from 20-28 May 2021 (Table 1). Downstream of the Bonanza Bridge, UDWR V completed three days of Smallmouth Bass removal (RM 59.5-24.0; 31.8 hrs of total effort) via cataraft electrofishing from 2-4 June 2021 (Table 1).

During this effort, 1,492 Smallmouth Bass were removed (mean  $\pm$  SE = 125.0  $\pm$  1.0 mm TL; range = 50-317 mm TL; Figures 5 and 6), representing a slight increase compared to 2020 (Smith et al. 2020; Figure

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

6). Catch consisted of 1,373 juveniles ( $\leq 199$  mm TL) and 119 adults ( $\geq 200$  mm TL), none of which were in the piscivore size class ( $\geq 325$  mm TL; Figure 5). The size structure of bass removed from Utah in 2021 revealed one dominant size class that appears to correspond to fish spawned in 2020, particularly individuals between 100-124 mm TL (Figure 5). Adult bass were dissected for sex determination and gamete expression. Of 105 Smallmouth Bass where sex determination was possible, we removed 82 female and 23 male adults; 30.5% of females and 4.3% of males were ripe at the time of collection. This data suggests our removal efforts were focused on the correct timeframe to target spawning Smallmouth Bass in the Utah portion of the White River in 2021.

Overall CPUE in Utah was 23.53 bass/hr, which is an increase over of the 2020 catch rate (16.13 bass/hr; Smith et al. 2020; Figure 7), and a substantial increase compared to 2019 (9.86 bass/hr; Smith et al. 2019; Figure 7). Assessment of 5-mile sample reaches suggests that population establishment and expansion has continued in 2021 (Figure 4). More specifically, CPUE for 100-199 mm bass is much higher in all but one of the Utah removal sections compared to Colorado. Of greater concern for 2021, however, is the increased number of adult bass in nearly all Utah sections (Figure 4), a pattern that initially surfaced in 2020 (Smith et al, 2020).

### Shortcomings

Effective Smallmouth Bass removal in the White River requires electrofishing rafts, which in turn require sufficient river flows (e.g.,  $>400$  cfs). Soil moisture was low in the White River headwaters entering the winter of 2020-2021 and the snowpack remained below average in the spring. In addition, cool weather during April and May 2021 delayed snowmelt and runoff. These environmental factors produced the shortest period of navigable flows since this project's inception, thus creating a shorter window for project implementation and agency coordination. Specifically, only so many crews can be on the river simultaneously to avoid overlap within sampling reaches (i.e., nest disturbance followed by short breaks). In addition, multiple river-wide obstructions prevented access to the White River downstream of the Bonanza bridge until peak flows, necessitating dragging electrofishing boats on shore to bypass. This change in access resulted in altered sampling schedules to avoid overlap of upstream crews. These logistical constraints contributed to six days of lost removal effort by GRB FWCO and one day by CPW.

### **Additional Noteworthy Observations:**

One Northern Pike *Esox lucius* was captured in the third removal reach near RM 93.5, below the Highway 64 bridge. We are hopeful that continued efforts by CPW to suppress a recent introduction of Northern Pike in Kenney Reservoir may limit Northern Pike escapement into the White River below Taylor Draw Dam.

### **Recommendations:**

Removal passes in the upper 11 miles (RM 104.3-93.5) of the White River below Taylor Draw Dam should continue to be the priority of this project. Removal should continue to target adult Smallmouth Bass before and during the spawning period because adults make up a larger proportion of the total catch in Colorado.

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

White River Smallmouth Bass total catch and catch rates in 2021 were very high when considering the duration of removal efforts and accessibility compared to those in the Green River. As such, targeted Smallmouth Bass removal in the White River should continue whenever feasible (i.e., when navigable flows are available). Furthermore, native fish monitoring efforts (i.e., Project 128) should complement but not replace removal efforts.

We recommend maintaining higher levels of Smallmouth Bass removal effort between Big Trujillo Wash (RM 87.5) and the Bonanza Bridge (RM 59.5). Higher Smallmouth Bass catch rates observed in this reach since 2017 justify additional effort. Additionally, splitting this workload between GRB FWCO and UDWR V worked well in 2021 to overcome difficult river access challenges.

Although adult bass densities are greatest in Colorado reaches, abundance has increased in Utah reaches and increased juvenile bass densities below the Bonanza Bridge are quite concerning. Regardless of upstream effort, we recommend a minimum of one complete bass removal pass from Bonanza Bridge to Enron be completed each year to continue to monitor this reach.

During years such as 2020 when water clarity is high for extended periods, angling should be considered a viable option when boat electrofishing removal is not possible. Encompassing approximately 32.4 hours of angling effort or five people over two days, Green River Basin FWCO crews removed 90 Smallmouth Bass of which 57 qualified as adults.

Coordinate with Rio Blanco Water Conservancy District and the Town of Rangely, CO for future opportunities to manipulate discharge below the Taylor Draw Dam hydroelectric tunnel to provide short duration high flow events in the White River during low flow years. Evaluate young-of-year Smallmouth Bass response to flow manipulations.

The closure of the hydroelectric facility in 2021 resulted in high flows in the river right and river middle channels near the dam. These high flows may have precluded occupation by spawning Smallmouth Bass in this area that typically produces high catch rates. Investigate whether closing the hydroelectric tunnel for even short periods may produce sufficient flows to disrupt, limit or preclude Smallmouth Bass spawning.

Continue to support local fishing tournaments and harvest incentives to encourage angler take of Northern Pike and Smallmouth Bass within the Rio Blanco Water Conservancy District boundaries.

### **Project Status:**

On track and ongoing.

### **FY 2021 Budget Status**

Funds Provided: \$90,817<sup>1</sup>

Funds Expended: \$90,817

Difference: \$0

Percent of the FY 2021 work completed, and projected costs to complete: 81.3%<sup>2</sup>

Recovery Program funds spent for publication charges: \$0

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<sup>1</sup> GRB FWCO and UDWR V annual funding only; CPW will report funding information related to Project 167 in the Project 98a Annual Report.

<sup>2</sup> GRB FWCO and UDWR V percent work completed only. UDWR V completed nine of nine days and GRB FWCO completed 17 of 23 days, of which three days were transferred to a pre-Flow Spike pass in Project 123a.

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## **Status of Data Submission**

On track and ongoing.

### **Signed:**

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Principal Investigator  
18 November 2021

Jenn Logan  
Principal Investigator  
18 November 2021

Matthew Breen  
Principal Investigator  
18 November 2021

Reviewed by  
Andrew A. Schultz Ph.D., Project Leader  
U.S. Fish and Wildlife Service  
Utah FAC Complex  
17 November 2021

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### References

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Table 1. Juvenile (includes all bass <200 mm TL) and adult Smallmouth Bass removed from the White River for each pass in 2021. River miles (RM) and dates sampled are also indicated for each pass.

<b>Agency, Date</b>	<b>RM</b>	<b>Juveniles</b>	<b>Adults</b>	<b>Total</b>
FWS, 10 May	93.5-87.5	69	25	94
FWS, 12 May	104.3-97.1	102	46	148
FWS, 13 May	104.3-102.6, 97.1-93.5	110	47	157
FWS, 14 May	93.5-87.5	131	52	183
FWS, 18 May	104.3-97.1	101	52	153
FWS, 19 May	104.3-102.6, 97.1-93.5	145	52	197
UDWR, 19-20 May	87.5-72.0	260	105	365
FWS, 20 May	93.5-87.5	244	77	321
FWS, 24-25 May	87.5-72.0	216	105	321
CPW, 25 May	104.3-97.1	257	183	440
CPW, 26 May	97.1-87.5	193	145	338
CPW, 27 May	104.3-98.0	184	97	281
UDWR, 26-27 May	87.5-72.0	85	58	143
CPW, 1 June	93.5-87.5	65	50	115
CPW, 2 June	104.3-97.1	207	150	357
CPW, 3 June	97.1-93.5	81	48	129
CPW, 8 June	104.3-97.1	136	118	254
CPW, 9 June	97.1-87.5	270	100	370
FWS, 14 June	104.3-97.1	380	81	461
FWS, 15 June	97.1-93.5	157	22	179
FWS, 16 June	93.5-87.5	273	45	318
<b>Colorado Totals</b>	<b>104.3-72.0</b>	<b>2,979</b>	<b>1,658</b>	<b>5,324</b>
UDWR, 20-21 May	72.0-59.5	171	39	210
FWS, 25-26 May	72.0-59.5	229	26	255
UDWR, 27-28 May	72.0-59.5	145	21	166
UDWR, 2-4 June	59.5-24.0	828	33	861
<b>Utah Totals</b>	<b>72.0-24.0</b>	<b>1,373</b>	<b>119</b>	<b>1,492</b>
<b>Combined Totals</b>	<b>104.3-24.0</b>	<b>4,352</b>	<b>1,777</b>	<b>6,816</b>

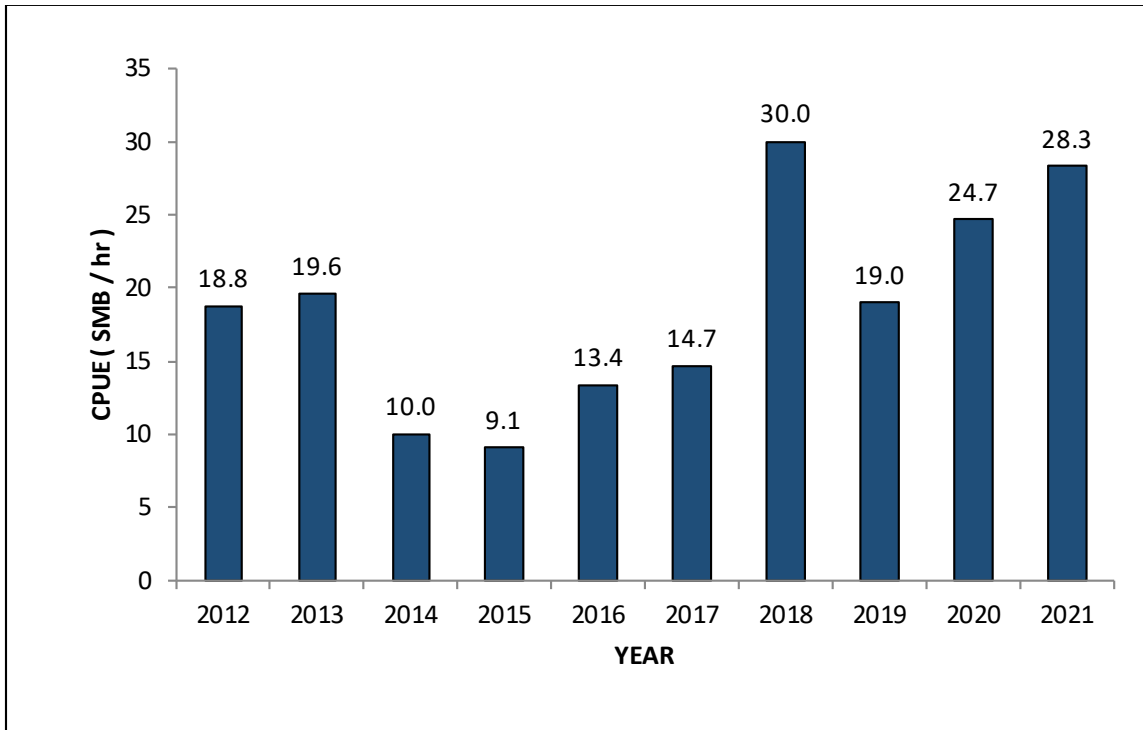


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Table 2. Ancillary captures from the White River, 2021.

Species	Total Captured	Length Range (mm)
Black Bullhead <i>Ameiurus melas</i>	68	107 - 233
Black Crappie <i>Pomoxis nigromaculatus</i>	27	82 - 231
Colorado Pikeminnow <i>Ptychocheilus lucius</i>	11	496 - 764
Green Sunfish <i>Lepomis cyanellus</i>	178	37 - 157
Northern Pike <i>Esox lucius</i>	1	602
Roundtail Chub <i>Gila robusta</i>	15	91-410
White Sucker x Bluehead sucker <i>Catostomus commersonii</i> x <i>Catostomus discobolus</i>	66	110 - 460
White Sucker x Flannelmouth Sucker <i>Catostomus commersonii</i> x <i>Catostomus latipinnis</i>	144	35 - 648
White Sucker <i>Catostomus commersonii</i>	128	100 - 480
Yellow Bullhead <i>Ameiurus natalis</i>	1	189

Figure 1. Catch-per-unit-effort (CPUE) for all Smallmouth Bass (SMB) captured in the White River in Colorado 2012-2021.



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Figure 2. Length-frequency of Smallmouth Bass removed from the White River in Colorado, 2021.

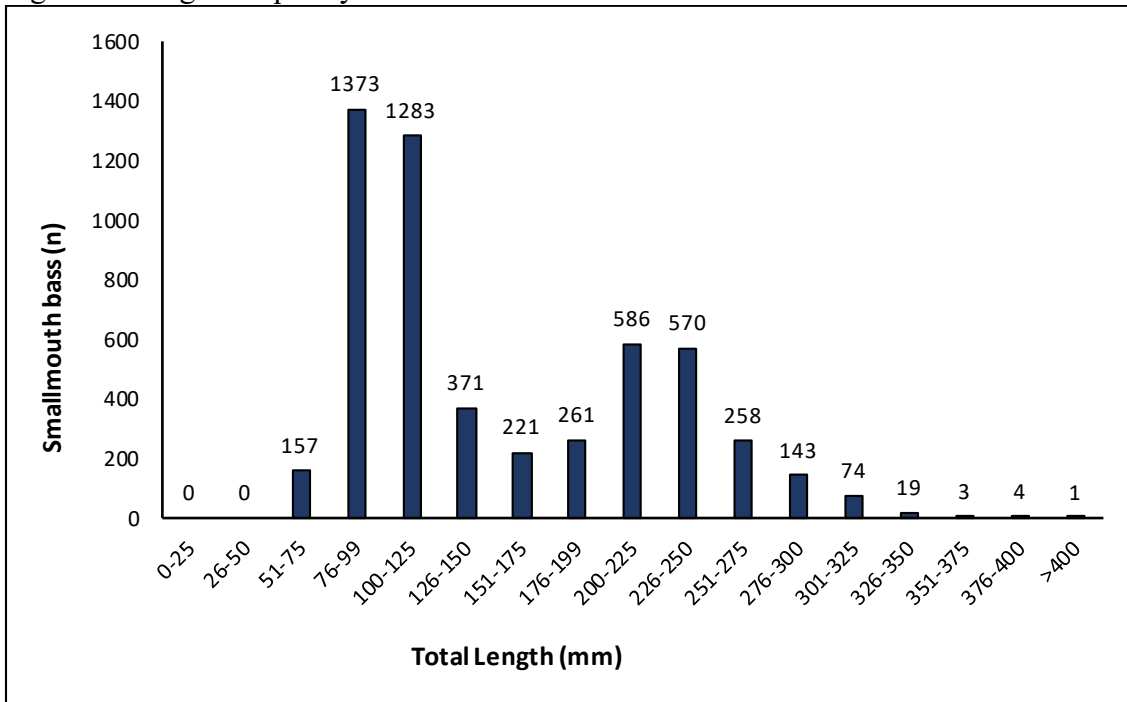
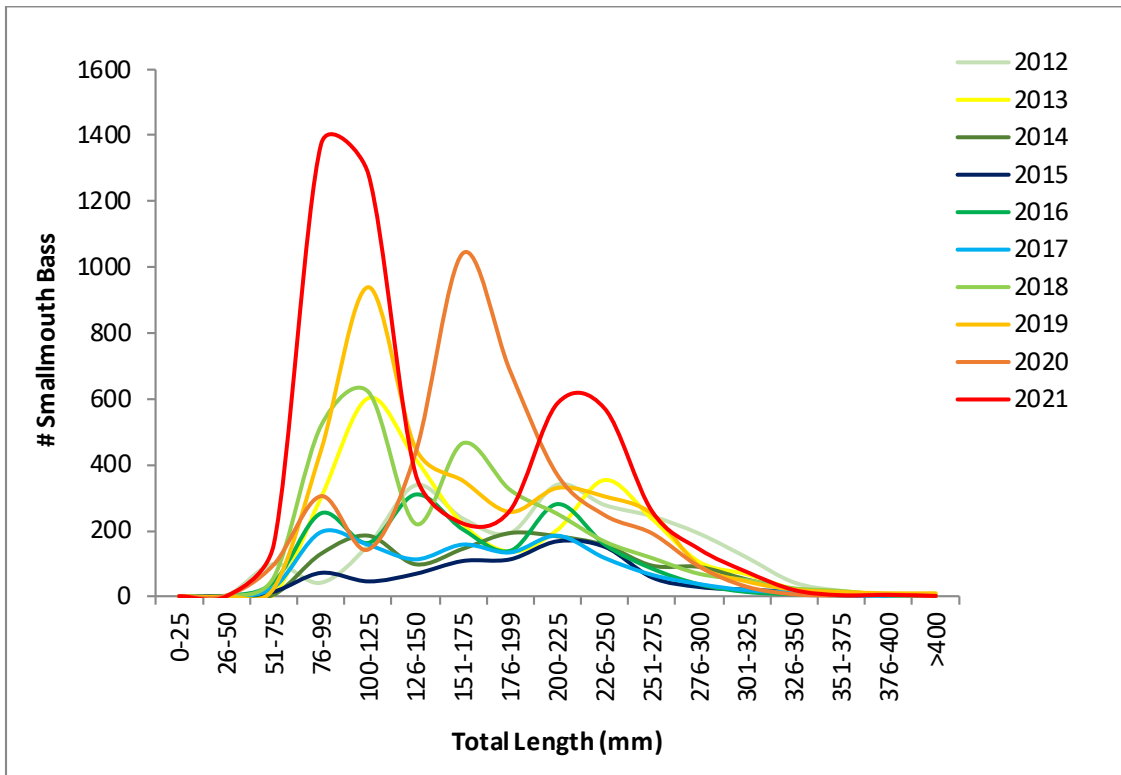


Figure 3. Length-frequency of Smallmouth Bass removed from the White River in Colorado, 2012-2021.



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Figure 4. Catch rates of Smallmouth Bass (SMB) by size class and river mile in the White River, Colorado and Utah, during Project 167 passes in 2021.

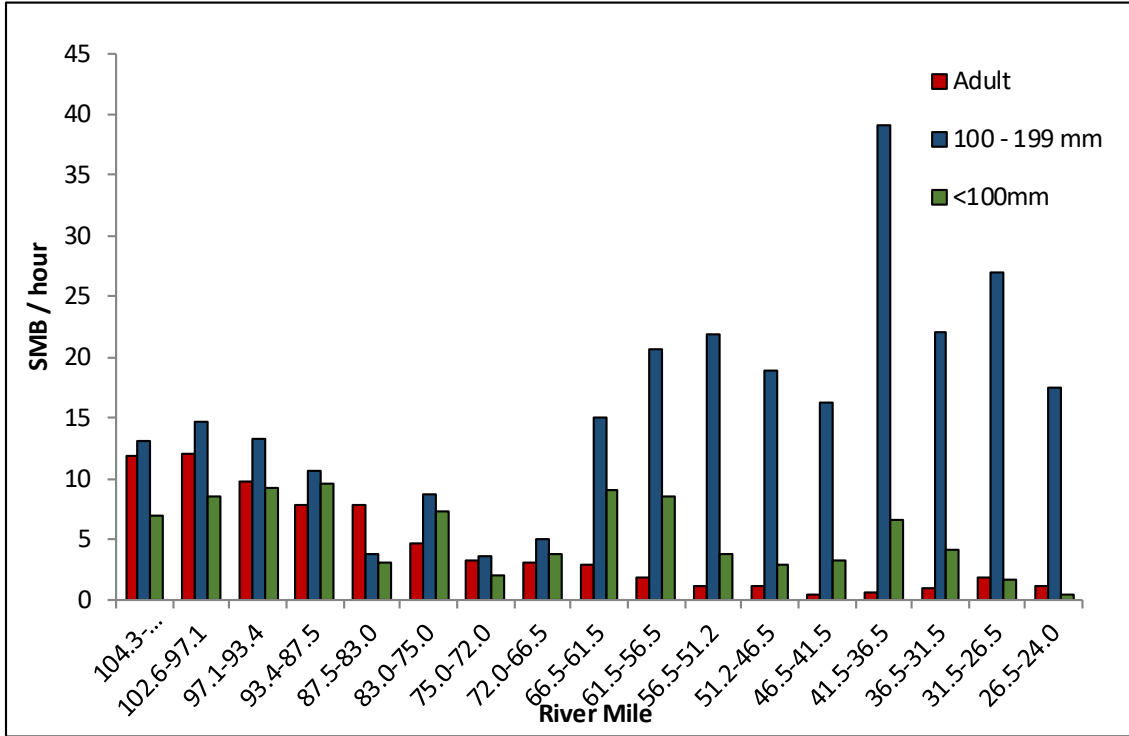
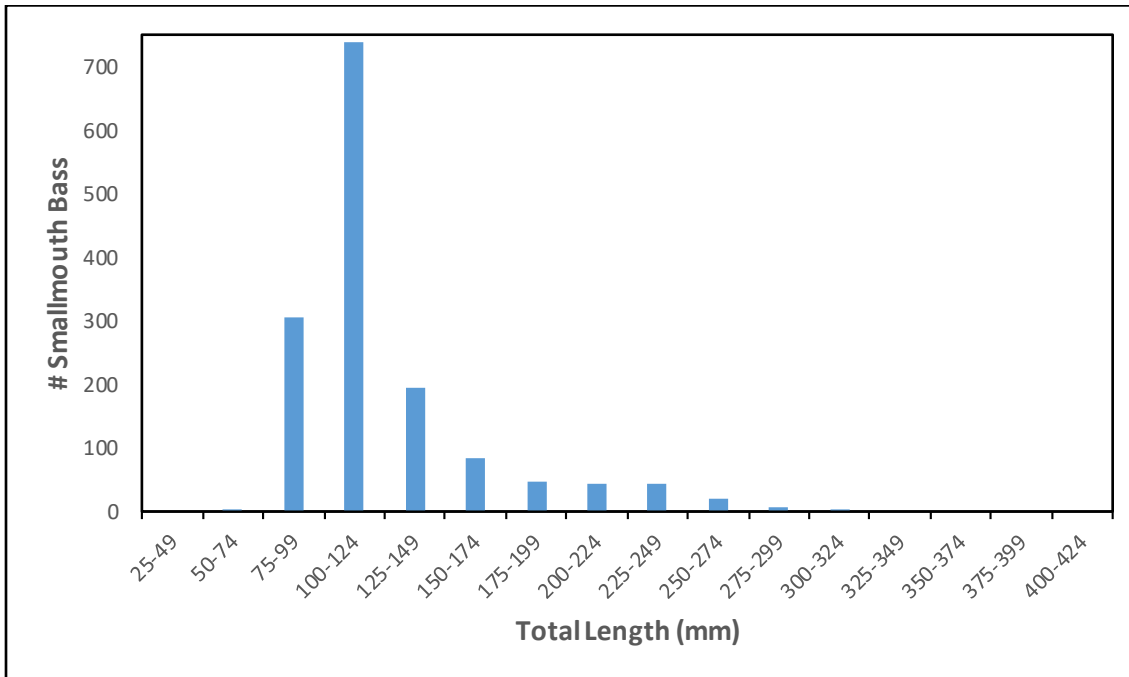


Figure 5. Length-frequency of Smallmouth Bass removed from the White River in Utah, 2021.



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Figure 6. Length-frequency of Smallmouth Bass removed from the White River in Utah, 2012-2021.

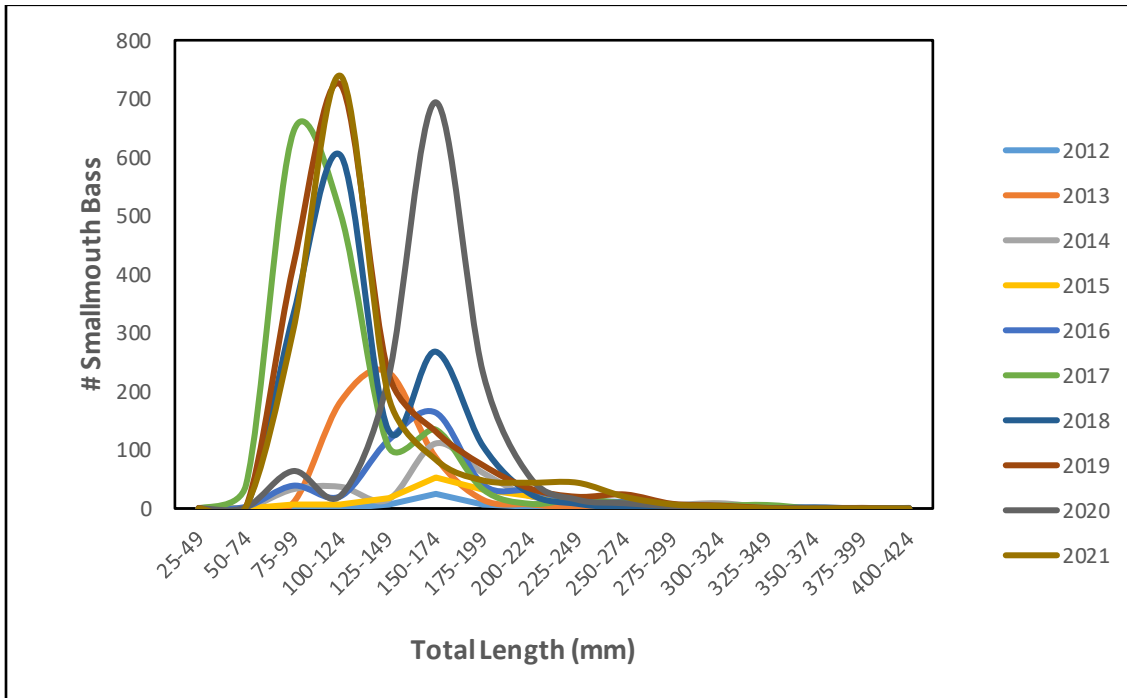
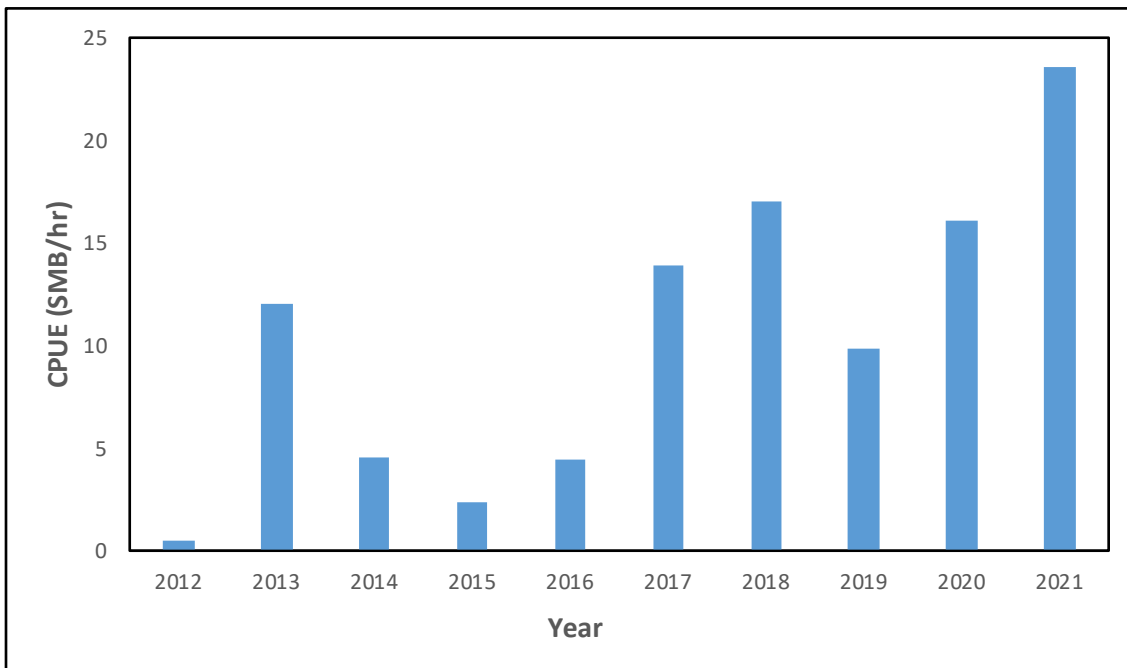


Figure 7. Catch-per-unit-effort (CPUE) for Smallmouth Bass (SMB) removed from the White River in Utah, 2012-2021.



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**ANNUAL PERFORMANCE PROGRESS REPORT (PPR)**

BUREAU OF RECLAMATION AGREEMENT NUMBER: R19AP00059

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167

**Project Title:**

Smallmouth Bass control in the White River

**Bureau of Reclamation Agreement Number:**

R19AP00059

**Project/Grant Period:**

Start date: 08/12/2019

End date: 09/30/2023

Reporting period end date: 09/30/2021

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

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**Performance:**

Tasks 2–3 were accomplished as outlined in the scope of work for this project. From 19 May to 04 June 2021 we completed nine days of cataraft electrofishing from river mile 87.5–24.0. Smallmouth Bass catch rates in the lower White River have increased substantially from 2020 levels, mainly due to juvenile Smallmouth Bass (< 200 mm total length). A total of 1,492 bass were removed from the Utah portion of the White River in 2021. Annual reporting is complete under task 3 and nonnative data will be submitted to Recovery Program personnel by January 2022.

# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

## ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: #R17AP00301

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167b

### Project Title:

Smallmouth Bass control in the White River

### Bureau of Reclamation Agreement Number:

#R17AP00301

### Project/Grant Period:

Start date: 09/22/2017

End date: 09/30/2022

Reporting period end date: 11/19/2021

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

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### Performance:

Task 1: Plan logistics, hire and train personnel, order and maintain equipment, and prepare for sampling-Complete

Task 5: Sample White River study area to capture and remove smallmouth bass- 89% complete

The equivalent of eight removal days were conducted on the White River by CPW crews from May 25<sup>th</sup> through June 9<sup>th</sup>, 2021. Due to a shortened period of suitable flow conditions, day 9 was not conducted in 2021. Two, 16-foot rafts equipped with ETS units electrofished opposite shorelines and all accessible backwater and slackwater habitats. Fish captured were measured in length to the nearest millimeter and weighed to the nearest gram. Centrarchid species, Northern Pike, Black Bullhead, non-native sucker species, and non-native sucker hybrids were targeted by electrofishing crews for removal. While not specifically targeted, some incidental captures of non-native cyprinid species also resulted in lethal removal. A single Colorado Pikeminnow was captured in 2021 by CPW crews. Other native non-listed species, salmonid species, Channel Catfish, and most non-native cyprinid species were not netted or handled.

Four passes were completed from Taylor Draw Dam (river mile (RM) 104.3) to Douglas Creek (RM 97.1). Three passes were completed between Douglas Creek (RM 97.1) and Big Trujillo Wash (RM 87.5). Additional passes in the White River downstream of Taylor Draw Dam were conducted by crews

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from the U.S. Fish and Wildlife Service (USFWS) and Utah Division of Wildlife Resources. Data for those projects are included in the 2021 Annual Report for Project 167.

Eight species of non-native fish were captured and lethally removed. Smallmouth Bass comprised approximately 89% of the total fish removed by CPW crews. Black Bullhead, Black Crappie, Fathead Minnow, Green Sunfish, Northern Pike, Red Shiner, White Sucker and non-native sucker hybrids were also lethally removed. One Northern Pike was collected in 2021.

- Total number of fish captured and removed by CPW = 2,596
- Total electrofishing effort expended by CPW= 72.24 hours

Table 1. Total number of each species removed, percentage of total catch represented by each species, and size range (in millimeters (mm)) of individuals captured by CPW crews in the White River downstream of Kenney Reservoir in 2021.

Species	Total Captured	% of Total Catch	Total Length Size Range (mm)
Black Bullhead	55	2.1%	122-233
Black Crappie	16	<1.0%	82-231
Green Sunfish	70	2.7%	37-157
Northern Pike	1	<1.0%	602
Smallmouth Bass	2,284	88.7%	52-387
Non-native cyprinid species	34	<1.0%	35-82
White Sucker and hybrids	136	5.3%	110-648
<b>Total</b>			
<b>2596</b>			

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Table 2. Catch-per-unit-effort (CPUE) as fish per hour for each species removed by CPW crews in the White River downstream of Kenney Reservoir in 2021.

<b>Species</b>	<b>CPUE (fish/hour)</b>
Black Bullhead	0.76
Black Crappie	0.22
Green Sunfish	0.97
Northern Pike	0.01
Smallmouth Bass	31.62
Non-native cyprinid species	0.47
<b>White Sucker and hybrids</b>	<b>1.88</b>

### Task 6: Organize and validate Project 167b data and submit to the USFWS-Complete

- All data submitted to USFWS (Green River- FWCO) for data analysis November 2021.
- All data submitted to STreaMs database November 2021.



# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2021 ANNUAL REPORT

PROJECT: 167b

## **Project Title**

Kenney Reservoir Removal of Northern Pike (in Scope of Work for CPW Projects 126b and 167b)

## **Bureau of Reclamation Agreement Number:**

R17AP00301

## **Project/Grant Period:**

Start date: 09/22/2017 (NOTE: this particular project under the BOR grant agreement number above did not receive BOR funds until the FFY 20: October 1, 2019 through September 30, 2020)

End date: 09/30/2022

Reporting period end date: 09/30/2021

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

## **Principal Investigator:**

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## **Abstract:**

Kenney Reservoir is an on-channel reservoir located in the White River, upstream of Taylor Draw dam at river mile (RM) 104.3. Colorado Parks and Wildlife (CPW) confirmed the presence of northern pike within Kenney Reservoir in the fall of 2018. In 2019, CPW captured multiple size classes of adult northern pike,  $\geq 300$ mm total length (tl), indicating that reproduction could be occurring in the reservoir. The 2018 and spring 2019 sampling efforts were completed with CPW funds. In 2020, crews were only able to spend two days and one night sampling for northern pike due to COVID-19 agency restrictions but no northern pike were captured. In 2021, crews used gill nets and fyke nets to sample for northern pike across eight days and completed 766.6 hours of netting effort between March 31<sup>st</sup> and May 11<sup>th</sup>, 2021. No northern pike were captured in 2021.

## **Study Schedule:**

2019-Ongoing

## **Relationship to RIPRAP:**

Project 126b encompasses smallmouth bass and northern pike removal efforts from the Colorado River in Silt, Colorado (RM 248.0) to Beavertail Mountain (RM 195.7) and removal of these species in private floodplain ponds upstream of Rifle, Colorado (RM 240.4).. Project 167b includes smallmouth bass and northern pike removal from the White River downstream of Taylor Draw dam (RM 104.3) in Rangely, Colorado, as well as northern pike removal efforts in Kenney Reservoir, just upstream of the Taylor Draw dam.. This report will only describe northern pike removal efforts from Kenney Reservoir. Detailed information regarding Project 126b (Colorado River and floodplain ponds) can be found in the 2021 Annual Report for Project 126a. Detailed information regarding Project 167b (White River) can be found in the 2021 Annual Report for Project 167.

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### General Recovery Program 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.

### Green River Action Plan: White River

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.B.2. Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.

III.B.2.a. Determine and implement an adequate level of mechanical removal to reduce smallmouth bass.

### **Accomplishment of FY 2021 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:**

Task 1. Plan logistics, hire and train personnel, order and maintain equipment, and prepare for sampling (Project #126b and #167b)

Schedule: January-Mid March

Deliverable: Task completed

Task 2-6: Tasks 2-6 are discussed in the 2021 Annual Report for Projects 126a and 167.

Task 7. Sample Kenney Reservoir to capture and remove northern pike.

Schedule: Late March/April-May; September/October

Deliverable: Partially completed. See below for information regarding the work that was completed.

Northern pike removal efforts at Kenney Reservoir occurred during their spawning season and began once the ice melted and the reservoir was accessible by boat. In 2021, Kenney Reservoir was free of ice by March 31<sup>st</sup>. From March 31<sup>st</sup> to May 11<sup>th</sup>, crews sampled the reservoir for a total of eight days using gill nets and fyke nets. In previous years, crews also sampled Kenney Reservoir using boat mounted electrofishing units but have found electrofishing to be much less effective at capturing target species when compared to gill nets and fyke nets. In 2021, CPW decided to withhold from boat electrofishing efforts in order to focus on the capture techniques that are most likely to capture northern pike in this location (gill nets and fyke nets). Each sampling day, between eight and 13 gill nets and zero to two fyke nets were set around the reservoir. The gill nets were checked approximately every two hours throughout the day to reduce mortality of native fish bycatch. A subset of the gill nets and both of the fyke nets were often then left in the reservoir overnight and checked again the following morning. Each gill net measured 150' long and was comprised of 1.5" standard mesh size. Each fyke net was equipped with a 50' lead, two rectangular frames, and five hoops containing two throats designed to trap fish that swim in.

On the first sampling trip to Kenney Reservoir (March 31<sup>st</sup> – April 2<sup>nd</sup>), crews completed 308.7 hours of gill net effort and 96.2 hours of fyke net effort. On the second sampling trip (April 6<sup>th</sup> – April 7<sup>th</sup>), crews completed 194.1 hours of gill net effort and 46.6 hours of fyke net effort. On the third sampling trip (April 16<sup>th</sup>), crews completed 31.7 hours of gill net effort. On the fourth sampling trip (April 29<sup>th</sup>), crews

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

completed 43.5 hours of gill net effort. On the final trip, crews completed 45.8 hours of gill net effort on May 11<sup>th</sup>. In total, 766.6 net hours of northern pike removal effort was completed in 2021. Plans for additional sampling in 2021 were abandoned because no northern pike were captured during the 766.6 net hours of removal effort which likely spanned the northern pike spawning season, when they appear to be the most vulnerable to capture by our sampling techniques. Instead, crews shifted focus to the Yampa River (project 98a) and White River (project 167B and CPW funded sampling upstream of Taylor Draw Dam) drainages where nonnative fish removal efforts would be more effective. Additionally, CPW began planning for and executing a project to drain and eliminate northern pike from Rio Blanco Reservoir, an off-channel reservoir located near the White River, upstream of Kenney Reservoir.

Twelve different fish species including flannelmouth sucker x bluehead sucker hybrids were handled and no northern pike were caught during removal efforts at Kenney Reservoir in 2021 (Table 1). Northern pike were not caught during 2020 removal efforts either. It appears that 2019-2021 CPW removal efforts, in addition to the angler harvest incentive (discussed below), have successfully prevented the expansion of the northern pike population within Kenney Reservoir so far (Figure 1). Some northern pike may still occupy Kenney Reservoir, though, and additional monitoring should continue.

Task 8. Data entry, data analysis, and preparation of final report. Present findings during the Annual Nonnative Fish Control Workshop (if convened), and at the Annual Recovery Program Researchers Meeting.

Schedule: October-January

Deliverable: Data entry, data analysis, and final report are completed. Findings will be discussed during the Nonnative Fish Control Coordination Calls in lieu of the Nonnative Fish Control Workshop.

### **Additional noteworthy observations:**

In 2021, Kenney Reservoir levels were drawn down due to Taylor Draw dam repairs. This limited the development of the backwater and wetland habitat on the upstream end of the reservoir and decreased the ability for fish to access this habitat. The water levels in the channels connecting the wetlands to Kenney Reservoir and the White River upstream fluctuated but remained narrow and shallow through the first month of this project, limiting access to fish moving in from the White River or Kenney Reservoir. During low flow periods when the channels were dry or impassable, gill nets were set by canoe in the wetlands and backwaters. This area was only accessible by jet boat for the final survey on May 11<sup>th</sup>, after the reservoir had returned to its normal elevation.

In addition to northern pike netting removal efforts conducted by CPW within Kenney Reservoir, CPW has coordinated with the reservoir owner, the Rio Blanco Water Conservancy District (RBWCD), to sponsor a northern pike angler harvest incentive. This year marks the third year in which the harvest incentive occurred. Any licensed angler that caught and turned in a northern pike from within the RBWCD boundary (Kenney Reservoir and portions of the White River upstream and downstream of Kenney Reservoir) was awarded \$20 per northern pike caught. Funds for this incentive were provided by the Colorado Water Conservation Board and distributed by the RBWCD. The angler harvest incentive began June 5<sup>th</sup> and continues through November 30<sup>th</sup>, 2021. As of November 15<sup>th</sup>, 2021, anglers have not submitted a northern pike as part of this incentive program. Nine and 19 northern pike were paid for through the harvest incentive fund in 2020 and 2019, respectively.

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### **Recommendations:**

Five weeks of field work were planned for the 2021 field season to complete the Scope of Work (SOW) requirements but only a portion of that work was completed because no northern pike were caught. It is recommended that a minimum of six days of field work be completed across spring and fall of 2022 based on 2021 results, and as identified in the FY 2022-2023 SOW.

### **Project Status:**

This project is considered on track, with revisions to be considered. Additional evaluation of project commitments and efforts will be made internally by CPW in 2021. Additional refinement of the techniques used in the study is appropriate and will serve to further increase the efficiency of removal effort.

### **FY 2021 Budget Status**

Funds Provided: \$135,490 for all projects (including 98a and 126b/167b)

Funds Expended: \$92,367 for all projects (including 98a and 126b/167b)

Difference: \$43,123 Funds expended includes expenditures through September 30<sup>th</sup>, 2021. Additional expenditures may have occurred during this time period but have not posted as of this reporting date.

Those expenditures will be reported in the FY 2022 budget status report.

Percent of the FY 2021 work completed, and projected costs to complete: Approximately 40% (8 days of the minimum 20 days outlined in the SOW)

Recovery Program funds spent for publication charges: -\$0-

### **Status of Data Submission**

Data will be uploaded into STReAMS by the end of March, 2022.

### **Signed:**

Tory Eyre

Principal Investigator

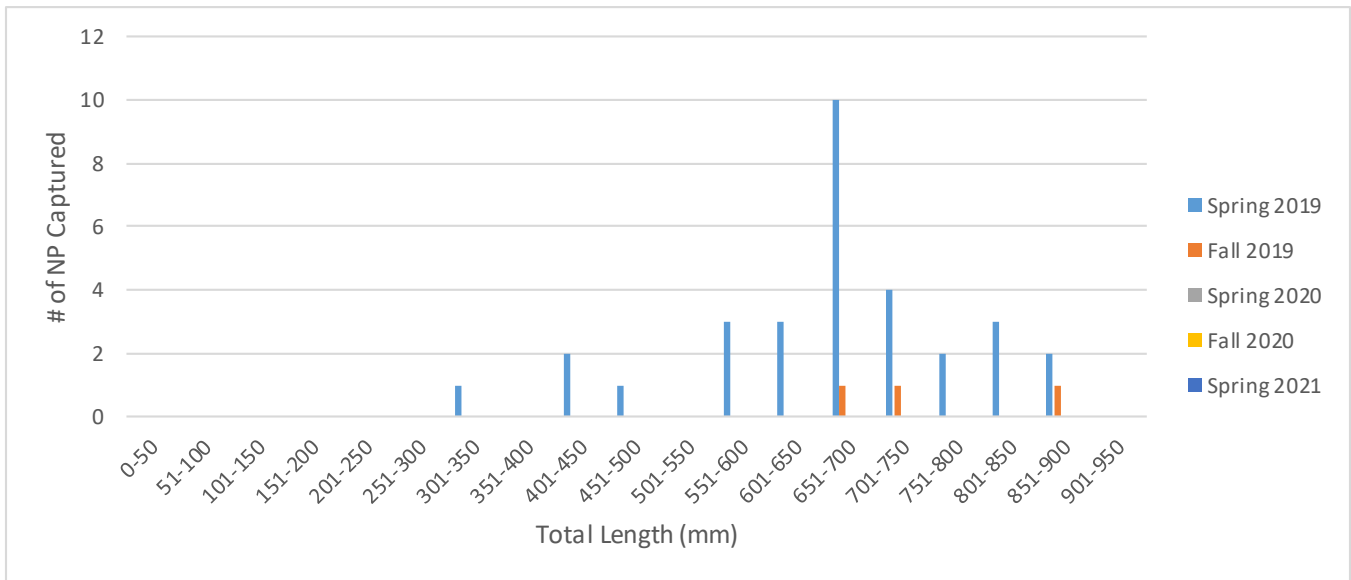
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**Table #1.**

Species of fish and length ranges encountered in millimeters (mm) during 2021 northern pike removal efforts in Kenney Reservoir.

Species of Fish Captured	Range of total lengths encountered (mm)
Black Bullhead	121-291
Black Crappie	179-297
Bluehead Sucker	165-396
Brown Trout	322-529
Channel Catfish	456-668
Common Carp	216-630
Flannelmouth Sucker	284-471
Flannelmouth Sucker x Bluehead Sucker Hybrid	349-381
Green Sunfish	86-140
Mountain Whitefish	250-392
Rainbow Trout	428
Roundtail Chub	168-424



**Figure 2.**

Northern pike (NP) length frequency distribution in millimeters (mm) for spring and fall removal efforts from 2019-2021 at Kenney Reservoir.

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**ANNUAL PERFORMANCE PROGRESS REPORT (PPR)**

BUREAU OF RECLAMATION AGREEMENT NUMBER: R17AP00301

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167b (in Scope of Work for CPW Projects 126b and 167b)

**Project Title:**

Kenney Reservoir Removal of Northern Pike

**Bureau of Reclamation Agreement Number:**

R17AP00301

**Project/Grant Period:**

Start date: 09/22/2017 (NOTE: this particular project under the BOR grant agreement number above did not receive BOR funds until the FFY 20: October 1, 2019 through September 30, 2020)

End date: 09/30/2022

Reporting period end date: 09/30/2021

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

**Performance:**

Kenney Reservoir is an on-channel reservoir located in the White River, upstream of Taylor Draw dam at river mile (RM) 104.3. Colorado Parks and Wildlife (CPW) confirmed the presence of northern pike within Kenney Reservoir in the fall of 2018. In 2019, CPW captured multiple size classes of adult northern pike,  $\geq 300$ mm total length (tl), indicating that reproduction could be occurring in the reservoir. The 2018 and spring 2019 sampling efforts were completed with CPW funds. In 2020, crews were only able to spend two days and one night sampling for northern pike due to COVID-19 agency restrictions but no northern pike were captured. In 2021, crews used gill nets and fyke nets to sample for northern pike across eight days and completed 766.6 hours of netting effort between March 31<sup>th</sup> and May 11<sup>th</sup>. No northern pike were captured in 2021.