

# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2023 ANNUAL REPORT  
PROJECT: 167

## Project Title

Smallmouth Bass Removal in the White River, Utah/Colorado

## Bureau of Reclamation Agreement Numbers and Grant Periods:

R19AP00059 (UDWR; 10/1/2019-9/30/2024)

R20PG00024 (USFWS; 10/1/2019-9/30/2024)

R23AP00309 (CPW; 6/05/2023-9/30/2027)

Reporting Period End Date: 9/30/2023

Is this the final report? Yes  No

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## Abstract:

The management of Smallmouth Bass (*Micropterus dolomieu*) in the White River is a collaborative effort between Utah Division of Wildlife Resources (UDWR-V), U.S. Fish and Wildlife Service (FWS-V), and Colorado Parks and Wildlife (CPW). This collaboration involves multiple projects that remove bass via raft electrofishing passes. Colorado Pikeminnow abundance estimate sampling (project 128) and Colorado three species monitoring both remove bass in the White River as ancillary catch with other primary focuses. Dedicated bass removal by all three agencies is conducted from Taylor Draw Dam (river mile [RM] 104.3) to Enron boat ramp (RM 24). Pikeminnow abundance estimates continue to the

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Green River confluence (RM 0). Since species other than Smallmouth Bass are targeted during project 128, these data are included in some analyses, but not all, and most of this report will focus on dedicated bass removal efforts. Fishing methods vary greatly when focusing efforts on bass removal versus native species. This year, a total of 1,339 Smallmouth Bass were removed from the White River in all projects. Like previous years, most of these fish were removed on the upper portion of the river between Taylor Draw Dam and the Utah state line.

### **Study Schedule:**

2012-Ongoing

### **Relationship to RIPRAP:**

GREEN RIVER ACTION PLAN: WHITE RIVER

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

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

### **Accomplishment of FY 2023 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:**

#### Smallmouth Bass Removal from Taylor Draw Dam to the Green River Confluence

Smallmouth Bass removal was conducted by all three agencies this year. Fish and Wildlife Service Vernal, CPW, UDWR-V performed targeted Smallmouth Bass removal via raft electrofishing passes. The FWS-V conducted project 128 from Taylor Draw Dam (RM 104.3) to the Green River confluence (RM 0) removing Smallmouth Bass opportunistically from April 25<sup>th</sup> to June 1<sup>st</sup>, 2023 (Table 1). All three agencies had dedicated Smallmouth Bass removal efforts spanning from June 12<sup>th</sup> to August 11<sup>th</sup>, 2023. CPW did not conduct three species work on the White River this year.

Crews conducted 30 days of dedicated removal effort and 198 hours of electrofishing (Table 1). A total of 1,339 Smallmouth Bass were removed across projects, ranging in size from 52mm to 387mm total length [TL] (Figure 1). The majority of Smallmouth Bass removed were in the subadult size class (100-199mm TL; Figure 1) with a total of 943 fish. Additionally, 98 juveniles (<100mm TL) and 289 adults (>200mm TL) were removed. This year we had a combined (including project 128) catch-per-unit-effort (CPUE) of 3.5 fish/hour and a CPUE of 6.7 fish/hour for dedicated removal. This CPUE of 6.7 fish/hour is identical to last year's catch rate (Figure 2; Lawry et al. 2022), and relatively low compared to other years since removals began. Targeted catch by size class was 0.42 fish/hour for juveniles, 4.78 fish/hour for subadults, and 1.49 fish/hour for adults. Catch rates by size class encompassing all efforts were 0.26 fish/hour for juveniles, 2.49 fish/hour for subadults, and 0.76 fish/hour for adults. Only 14 adult Smallmouth Bass were noted expressing gametes with six of those fish being male and the other eight female. Bass reported as ripe ranged in size from 206-294mm TL with an average of 239mm TL.

Although it's important to remove Smallmouth Bass during other projects, dedicated bass removal remains the most effective method (Lawry et al. 2022; Smith et al. 2021). With exceptionally high water this year in the White River, bass removed during Colorado Pikeminnow abundance estimates (project 128) were few (n = 13). This aids in confirming that our timing for dedicated removal with flows and temperatures is crucial to be most effective (Figure 3). Crews that conducted earlier removal passes, more in line with previous years, encountered abysmal catch rates in normally a productive removal

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section. When comparing effort in those sections later in the season, removal efforts became more effective as discharge decreased and temperatures increased (Figure 3; Figure 4; Table 1).

Catch rates have historically been highest in the uppermost sections of the White River just below Taylor Draw Dam (Lawry et al. 2022; Smith et al. 2019, 2020, 2021). This remains to be true this year as our highest removal numbers continue to come from those upstream sections (Table 2; Figure 5; Figure 6). Due to consistent high bass numbers in the upper reaches, more passes are conducted through those sections, with no dedicated removal occurring from 2013-2016 from Big Trujillo (RM 89) to the UT state line (RM 71.2). Although the lower sections seem to have fewer bass numbers, there continues to be persistent smaller groups below Big Trujillo. Previous years also saw hot spots of bass past the state line particularly near the Bonanza Bridge (RM 59.5; Smith et al. 2019, 2020, 2021). This fluctuation in bass presence downstream of the state line is the reason it is important to continue monitoring those areas year to year despite low catch rates in recent years.

This year's results indicate another lower catch year for the White River. Compared to last year, catch was nearly identical (Figure 2; Lawry et al. 2022). In 2021, some of the highest catch rates recorded occurred, and it was conjectured that the drop in catch, for 2022, was due to strong monsoonal activity in the late summer months of 2021. There was also a change in dam operations in both 2021 and 2022, possibly causing disruption of young of year bass recruitment (Lawry et al., 2022). This seems to hold true since low numbers continue to be seen in 2023 (Figure 1; Figure 6; Figure 7). Still, there was a strong cohort of subadult fish present in the system. Traditionally, sampling on the White River ends by late June or early July because flows reach unnavigable levels (< 400cfs), but high water this year moved sampling back allowing work to occur in late July and early August (Table 1). However, late season sampling (e.g., sampling in July and August) may have increased subadult catch rates. The later sampling occurs, hypothetically the more juvenile fish begin reaching subadult size. Fish deemed subadults early in sampling could be from 2021 with later sampling subadults having a mix of 2021 and 2022 fish. Although, without aging these bass, we cannot say for certain which year classes were being captured in the late season catch.

### Shortcomings

Maximizing the effectiveness of our time on the White River is crucial, especially in lower reaches where so few passes are conducted for bass removal. Due to high water conditions this year, it was difficult for agencies to plan their removal passes in adequate bass conditions (e.g., high temperatures and decreasing discharge). However, all passes were completed despite unfavorable early conditions and staffing shortages.

### **Additional noteworthy observations:**

Although this report is centered on Smallmouth Bass in the White River it is important to note that other nonnative fishes in the river are becoming more abundant. In 2023, 487 Black Crappie (*Pomoxis nigromaculatus*), 396 Green Sunfish (*Lepomis cyanellus*), and 656 White Sucker (*Catostomus commersoni*; including hybrid suckers) were removed. These numbers are noteworthy and deserve further investigation if these trends continue. High numbers of Black Crappie were also noted and reported in last year's report, as well as high numbers of White Suckers and their hybrids which can be detrimental to native suckers present in the river (Lawry et al. 2022). It is suspected that Black Crappie may be entering the river from spilling over Taylor Draw Dam, escaping the reservoir. Further

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investigation into where exactly these fish are coming from and what we can do to prevent it may be necessary if these trends continue.

### **Recommendations:**

Due to the success of flow spikes in the Green River system, and the potential effects of dam operations and monsoonal events in 2021 contributing to low catch these past couple of years, we would recommend continued exploration of this in the White River system (Bestgen et al. 2018). Collaboration of the Program Director's Office and the Rio Blanco Water Conservancy District as well as the town of Rangely, CO to change where water is moved out of the dam, and perhaps small experimental flow spikes during low flows and high temperatures, could further reduce bass presence in this system.

Investigation into ways to remove bass during lower flows, when rafting is not possible (< 400cfs), would also be beneficial considering these low flows are the time when bass are spawning. This could be accomplished by implementing more angling surveys below the dam as was suggested in 2022. Other methods could be utilizing canoe trips in the fall and attempting barge or backpack shocking and angling in the smaller, shallow pools to further disrupt bass before they overwinter.

Investigation of habitat modifications below Taylor Draw dam should be considered. Habitat below the dam is conducive to Smallmouth Bass spawning, as it consists primarily of rip-rap and angular boulders rife with interstitial spaces that non-native predators prefer. The upper reach has routinely been identified as a hot spot and potential source of Smallmouth Bass in the White River (Lawry et al. 2022; Smith et al. 2019, 2020, 2021). Consulting with the Rio Blanco Water Conservancy District and stream habitat specialists could lead to habitat modifications that discourage bass retention and recruitment below the dam.

Continue to support any public involvement in removal including angler harvest incentives or tournaments that might be conducted within the Rio Blanco Water Conservancy District. Public access is a major challenge for crews working on these projects. Support for the acquisition of public boat launches would dramatically improve capture efficiency, especially in the more upstream reaches below Taylor Draw dam where bass numbers are highest.

Consider collection of otoliths in order to age bass collected from the White River dedicated bass removal. This would give us better insight into what year classes are still present in the White River. It could also allow us to better categorize bass by lengths knowing if in fact those lengths correlate to the correct ages.

### **Status of Data Submission**

All data have been submitted to Chris Michaud by the November 1, 2023, deadline.

### **Signed:**

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Principal Investigator  
12/12/2023

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12/13/2023

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Principal Investigator  
12/15/2023

## References

- Bestgen, K.R. 2018. Evaluate effects of flow spikes to disrupt reproduction of smallmouth bass in the Green River downstream of Flaming Gorge Dam. Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver, Colorado. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 214.
- Breen, M.J., J.A. Skorupski Jr., A. Webber, and T. Jones. 2012. Smallmouth bass control in the White River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO.
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- Smith, C., T. Jones, M.J. Breen, R.C. Schelly, and J. Logan. 2015. Smallmouth bass control in the White River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO.
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Smith, C., T. Jones, M.J. Breen, M.S. Partlow, and J. Logan. 2021. Smallmouth bass control in the White River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO.

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**Table 1.** Smallmouth Bass removal on the White River detailed passes and dates for all projects.

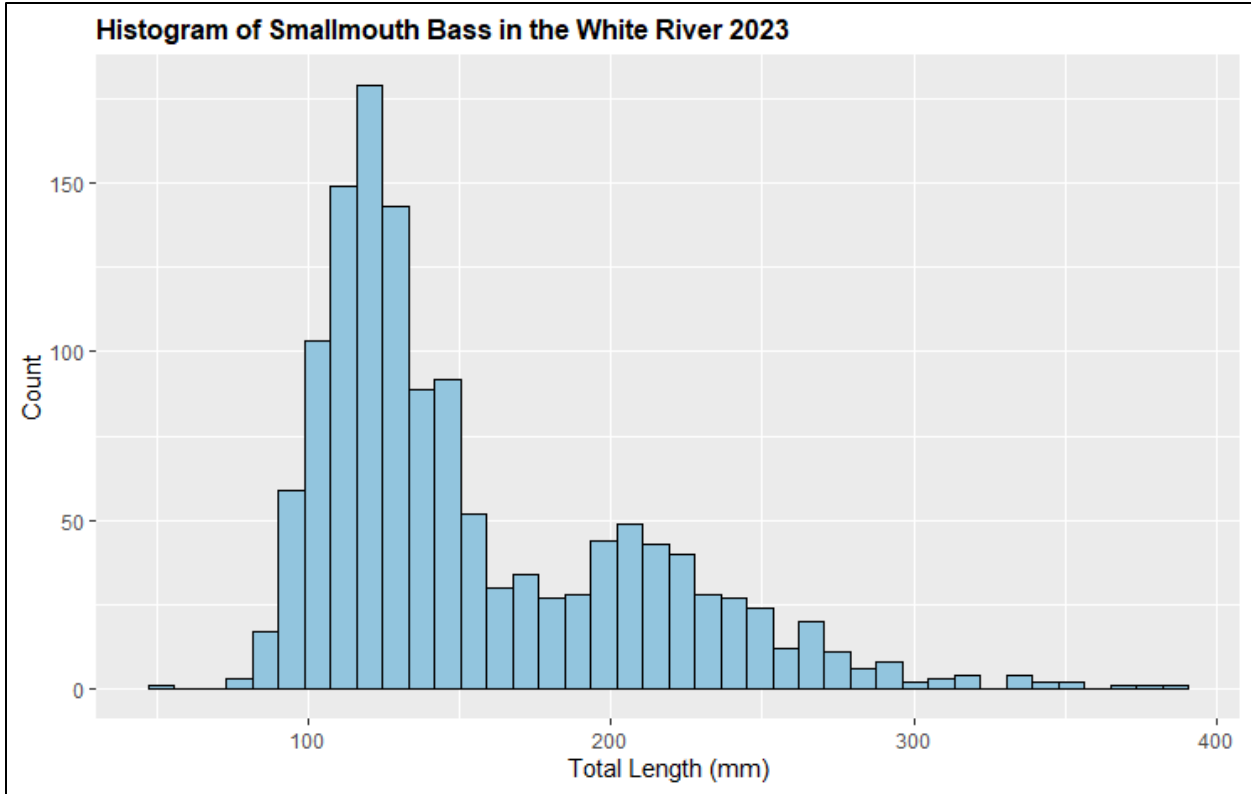
<b>Project</b>	<b>Agency</b>	<b>Dates</b>	<b>River Mile</b>	<b>Days</b>	<b>Bass Removed</b>
128	FWS-V	4/25/23 - 4/28/23	104.3 - 0	4	2
128	FWS-V	5/2/23 - 5/19/23	104.3 - 24	11	6
128	FWS-V	5/23/23 - 6/1/23	104.3 - 7.5	6	5
<b><i>Project 128 Pikeminnow Sampling Totals</i></b>				<b>21</b>	<b>13</b>
167	UDWR-V	6/12/23 - 6/14/23	87.6 - 60	3	10
167	FWS-V	6/13/2023	93.5 - 87.6	1	4
167	FWS-V	6/14/2023	104.3 - 93.5	1	36
167	CPW-GS	6/22/2023	104.3 - 87.6	1	26
167	CPW-GS	6/23/2023	104.3 - 87.6	1	35
167	UDWR-V	6/26/23 - 6/30/23	87.6 - 26.5	5	29
167	CPW-GS	6/27/23 - 6/28/23	104.3 - 87.6	2	72
167	FWS-V	6/28/23 - 6/29/23	87.6 - 60	2	26
167	FWS-V	7/5/23 - 7/6/23	93.5 - 87.6	2	20
167	UDWR-V	7/12/23 - 7/14/23	87.5 - 60	3	61
167	FWS-V	7/25/23 - 7/28/23	104.3 - 87.6	4	491
167	FWS-V	8/1/23 - 8/4/23	104.3 - 87.6	4	387
167	FWS-V	8/11/2023	93.5 - 87.6	1	129
<b><i>Project 167 Dedicated Bass Removal Totals</i></b>				<b>30</b>	<b>1326</b>
<b>Grand Total (all combined)</b>				<b>51</b>	<b>1339</b>

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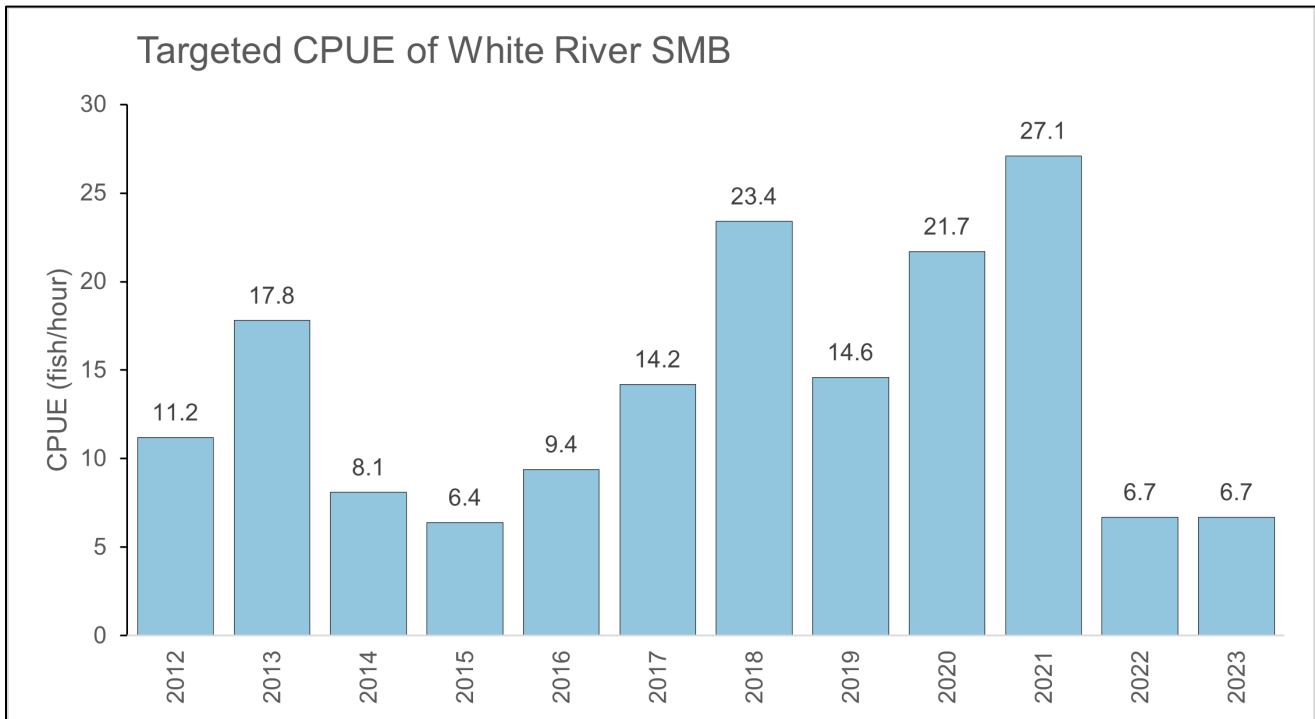
**Table 2.** Targeted bass removal effort in the White River by reach in 2023.

Reach Name	Gear Code	Sampling Date Range	Sampling River Mile Range	Total Effort (hr)	Number of Target Species Encountered	Fish/Hour
Dam to Big Island	EL	Jun 14 - Aug 03	102.1 - 104.3	19	232	11.93
Big Island to Douglas Creek	EL	Jun 14 - Aug 03	97.1 - 102.7	31	350	11.22
Douglas Creek to Chevron	EL	Jun 14 - Aug 02	93 - 97.1	12	138	11.58
Chevron to Big Trujillo	EL	Jun 13 - Aug 11	86.7 - 96.5	49	480	9.73
Big Trujillo to State Line	EL	Jun 12 - Jul 13	71.2 - 89	40	26	0.64
Stateline to Bonanza Bridge	EL	Jun 13 - Jul 14	59.5 - 72	30	76	2.56
Bonanza Bridge to Enron	EL	Jun 28 - Jul 14	26.5 - 61.5	16	24	1.49



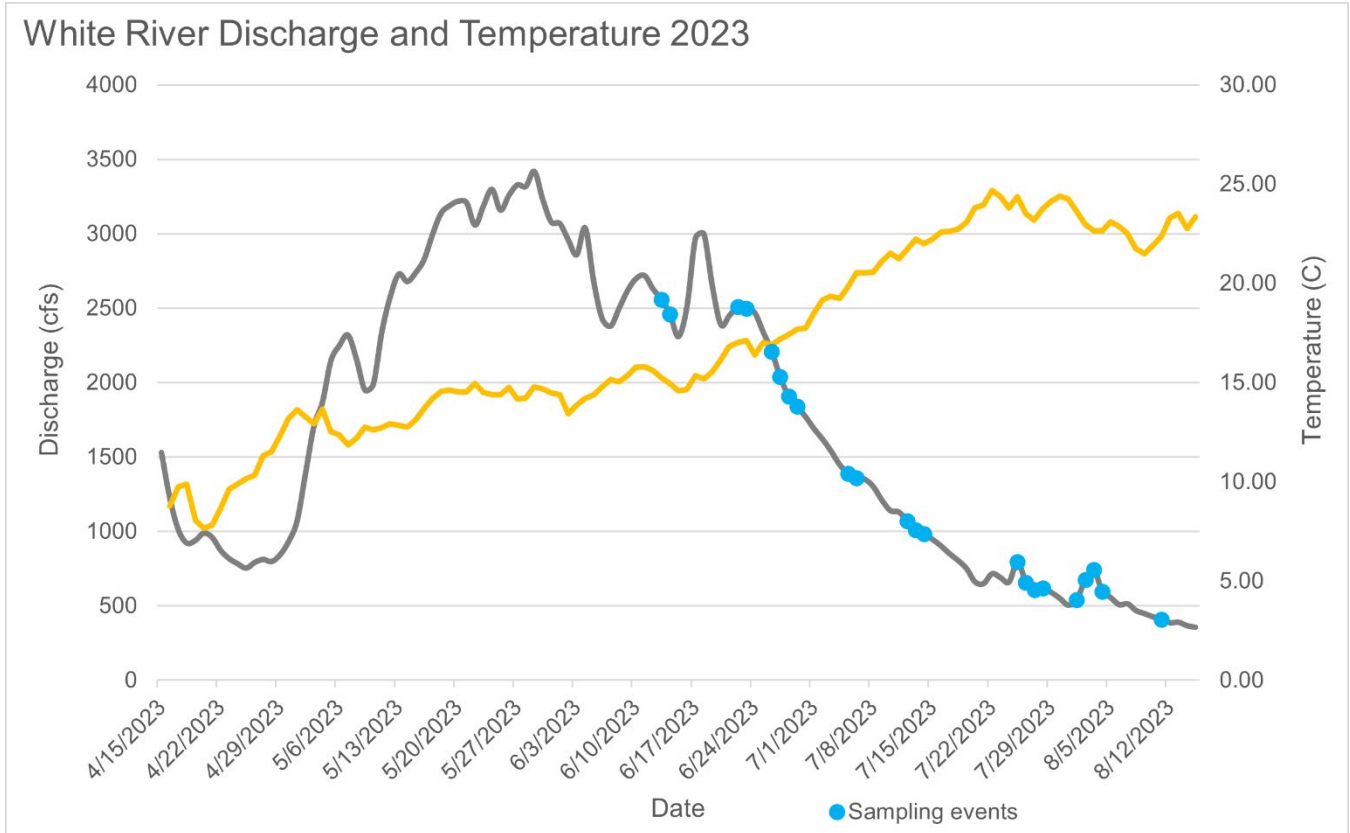


**Figure 1.** Length frequency histogram of Smallmouth Bass in the White River in 2023.



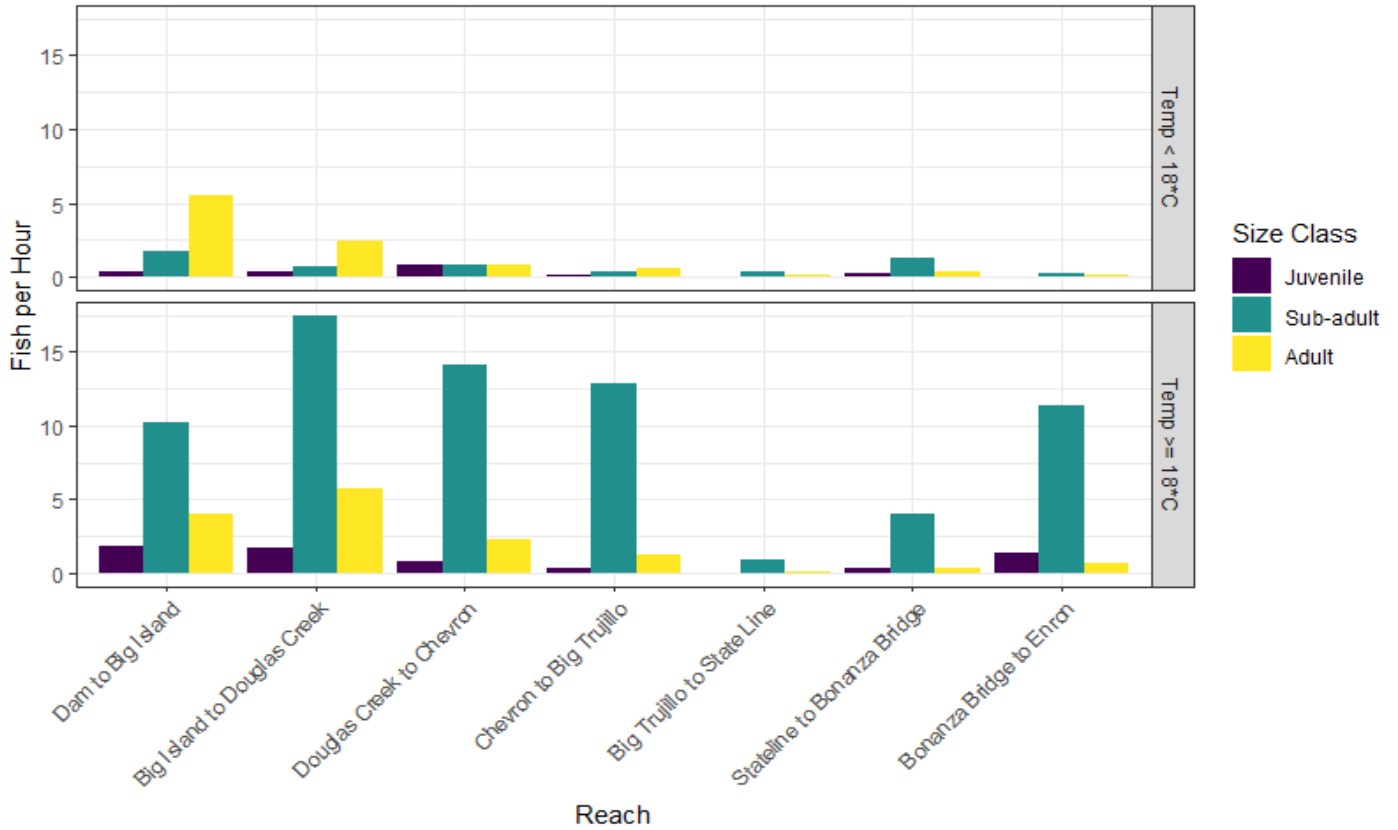
**Figure 2.** Catch-per-unit-effort (CPUE) of dedicated Smallmouth Bass removal in the White River from 2012 to 2023.

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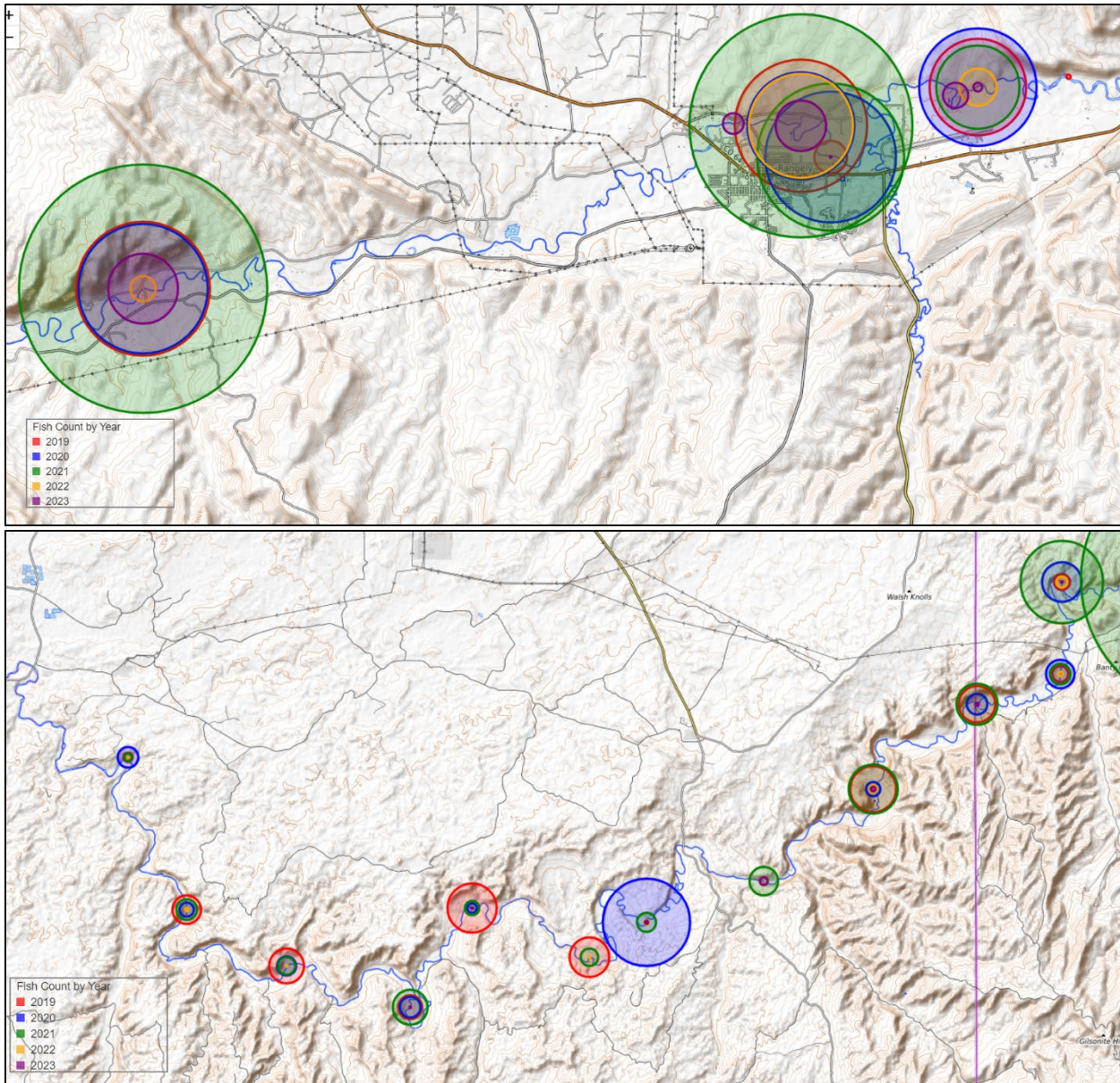
**Figure 3.** Discharge (cubic-feet-per-second [cfs]; gray line) from Watson, UT (USGS gauge #09306500) and temperature (Celsius [C]; yellow line) from a permanent antenna array near Bonanza Bridge [RM 59.5] overlaid with all targeted sampling events on the White River in 2023.

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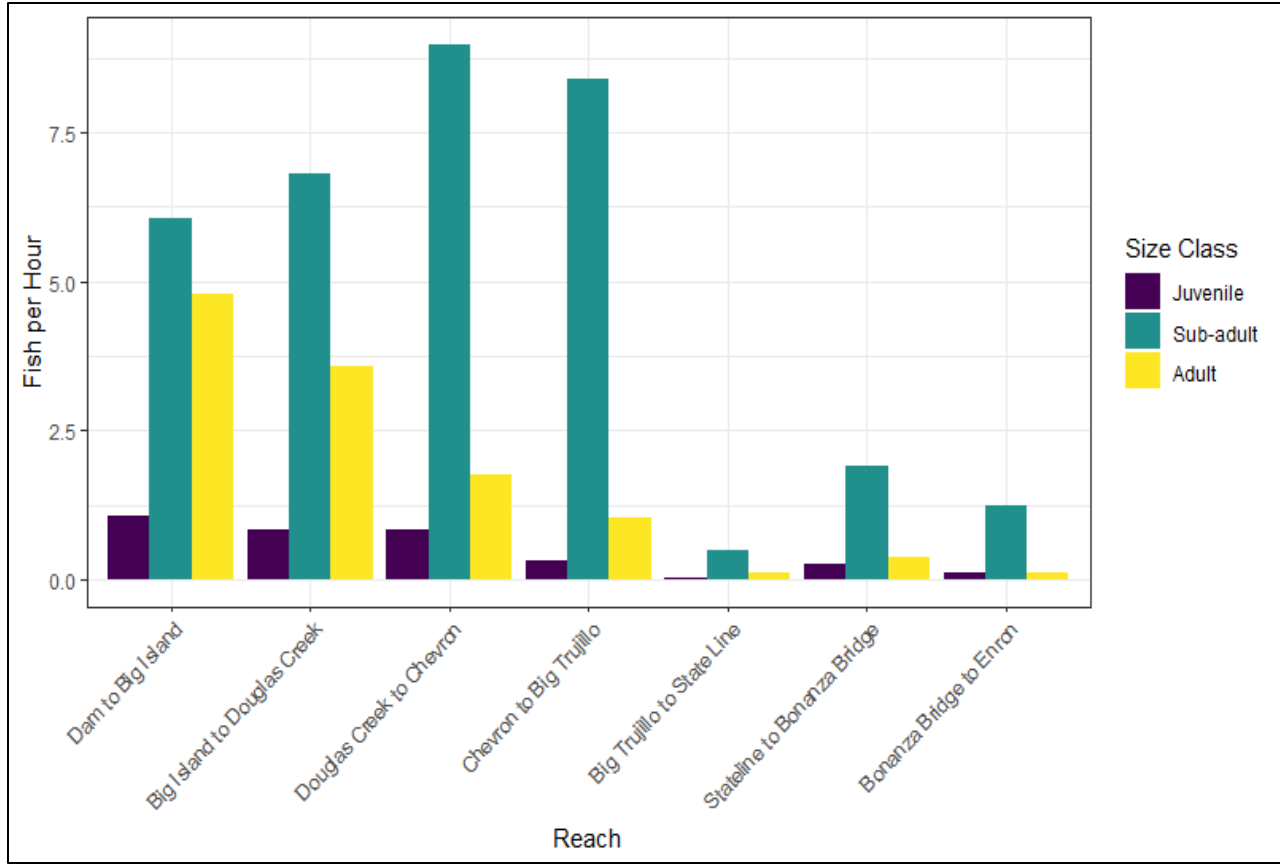
**Figure 4.** Targeted removal catch-per-unit (CPUE) by size class, reach, and temperature in the White River in 2023.

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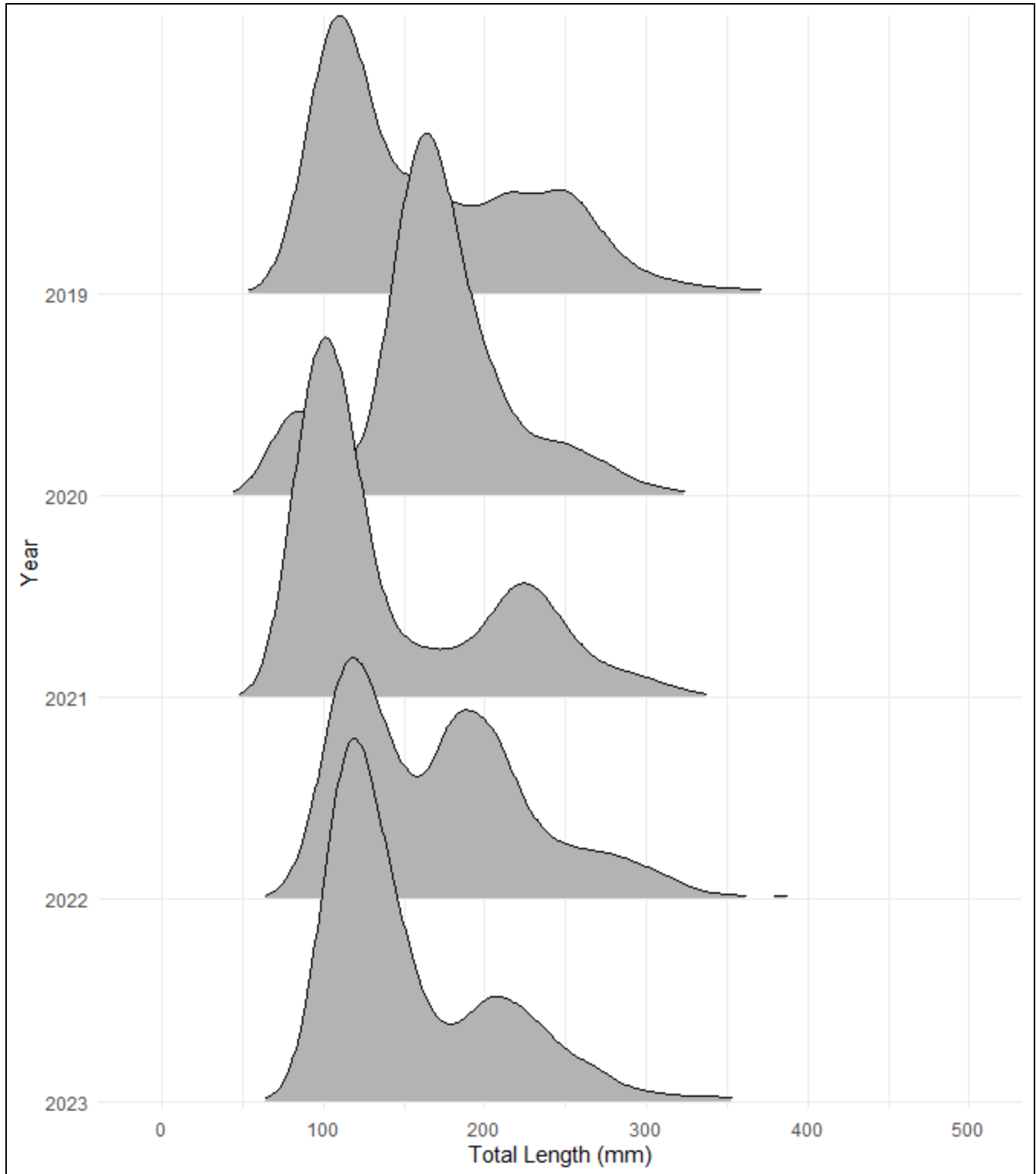
**Figure 5.** Density maps by total Smallmouth Bass counts from 2019 to 2023 on the White River. The upper photo encompasses the upper portion just below Taylor Draw Dam [RM 104.3] to Big Trujillo [RM 89] with the lower photo displaying from Big Trujillo [RM 89] to Enron [RM 24]. Circles correspond to electrofishing stop points.

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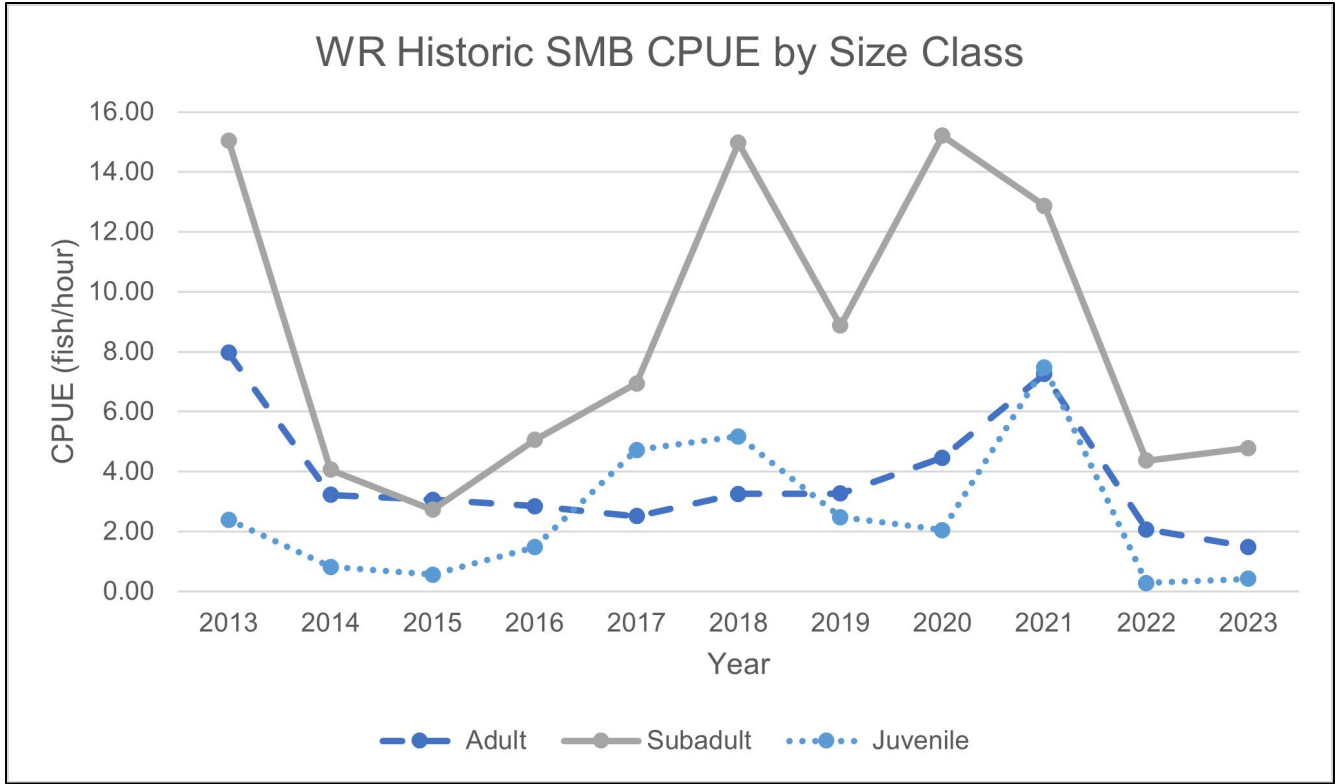


**Figure 6.** Targeted removal catch-per-unit-effort (CPUE) of Smallmouth Bass by size class (juvenile [ $<100\text{mm}$ ], subadult [ $100\text{-}199\text{mm}$ ], adult [ $>200\text{mm}$ ]) and reaches within the White River in 2023.

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**Figure 7.** Length-frequency of Smallmouth Bass removed in the White River from 2019 to 2023. Each curve is a smoothed histogram, with the Y-axis for each year expressed as a kernel density.



**Figure 8.** A decade (2013-2023) of catch-per-unit-effort (CPUE) of Smallmouth Bass by size class (adult [ $>200\text{mm}$ ], subadult [ $100\text{-}199\text{mm}$ ], juvenile [ $<100\text{mm}$ ]) in the White River.