

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2021 ANNUAL REPORT

PROJECT: 98b

Project Title

Upper Yampa River Northern Pike management and monitoring

Bureau of Reclamation Agreement Number:

R20PG00024

Project/Grant Period:

Start date: 10/01/2019

End date: 09/30/2024

Reporting period end date: 9/30/2021

Is this the final report? Yes No

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Abstract:

The purpose of this project is to reduce the abundance of nonnative fishes in the Yampa River between Hayden and Craig, Colorado. This segment of the river is immediately upstream of designated critical habitat for threatened and endangered fish species. Project 98b is primarily focused on removing Northern Pike and reducing spawning success. Boat electrofishing is utilized to remove Northern Pike from flooded backwater spawning habitat in the early spring, and other nonnative fishes are removed opportunistically as well. We euthanized 121 Northern Pike and 1,356 White Sucker in 2021 in 41.4 total hours of electrofishing. Fewer Northern Pike were removed in 2021 than 2019 (n = 197; Smith 2019). Although our targeted electrofishing efforts in backwater areas do not provide a formal quantitative means to monitor or assess the population status of Northern Pike in this reach, the number of Northern Pike removed annually in this project has declined markedly since Colorado Parks and Wildlife (CPW) began using gill nets to remove Northern Pike from the Yampa River in 2014. Targeted electrofishing focused on removal of Northern Pike from backwater spawning habitat remains an effective means of control, especially in backwaters with limited suitability for gillnetting.

Study Schedule: 2004-Ongoing

Relationship to RIPRAP:

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

III.B.2 Control nonnative fishes via mechanical removal

III.B.2.a. Estimate nonnative status, trends, and distribution

III.B.2.d. Remove Northern Pike from Yampa River

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III.B.2.e. Remove smallmouth bass

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

We completed four electrofishing passes between May 3, 2021 and May 20, 2021. These electrofishing passes occurred between the Hayden Pump Station boat ramp (RM 171.6) and the South Beach boat ramp (RM 134.5). We completed two additional electrofishing passes in conjunction with “The Surge” between June 22, 2021 and June 25, 2021. The Surge is a component of Project 125 (Colorado State University Larval Fish Lab [LFL]), wherein multiple agencies simultaneously conduct smallmouth bass removal throughout the Yampa River downstream of Hayden, Colorado. Surge removal efforts occurred from the Dorsey boat ramp (RM 151.5) to South Beach (RM 134.5). Smallmouth Bass captured during Surge passes are reported in the Project 125 Annual Report (Hawkins and Tuttle 2021, in prep.), however Northern Pike and White Sucker are reported herein.

Northern Pike

We removed a combined total 121 Northern Pike (41.4 total hours of electrofishing) from the focal reach during our four passes ($n = 107$; 3.3 pike/hr) and the two Surge passes ($n = 14$; add 0.9 pike/hr) in 2021. Despite cancellation of all spring electrofishing in 2020 due to COVID-19 concerns, the total number of pike removed did not increase this year. When compared with previous years, the total number of pike removed in 2021 is the second lowest on record (Figure 1).

We consider Northern Pike <300 mm total length (TL) juveniles, fish >300 mm TL adults, and fish >450 mm TL as piscivores. Of the 107 fish removed during 98b passes, 2 were juveniles and 105 were adults, of which 89 were classified as piscivores (Table 1). Nine of the 14 fish removed during the Surge were juveniles and 5 were adults, of which 2 were piscivores (Table 1).

Length-frequency of pike captured during passes in 2021 was heavily skewed; larger individuals 500-600 mm in length were the most common (Figure 2a). Only two juvenile fish were captured during the 98b passes (Table 1). More juvenile fish were captured later in the summer during the Surge passes (Table 1; Figure 2b), but the proportion of juvenile fish captured in 2021 is smaller than what has been observed in previous years (Figure 3). This may indicate an unsuccessful spawn in 2020, despite cancellation of spring electrofishing efforts that year. However, it could also be simply an artifact of an unusually compressed electrofishing schedule and challenging electrofishing conditions due to delayed spring snowmelt and overall low water conditions.

The overall catch rate for Northern Pike in 2021 was 3.3 pike/hr of electrofishing. This overall catch rate is similar to the overall catch rates observed in 2018 and 2019 (Figure 4). Catch rates in 2021 were highest during the first pass and varied in subsequent passes (Figure 5). Total catch values were also highest during the first pass and variable in subsequent passes (Figure 6). It should be noted that catch rates reported after 2015 are likely biased high when compared to those reported between 2005 and 2015. Historically, the entire main channel river reach was electrofished (not just backwaters). Beginning in 2016, crews began electrofishing almost exclusively in backwaters and recording effort and capture locations therein. This change reduced total electrofishing effort. While this biased overall catch rates high in comparison to those prior to 2016, removal efficiency was increased.

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More Northern Pike (n = 17) were caught in the two-mile reach between RM 141 – RM 139 than any other location (Figure 7). This was followed closely by RM 153-151 where 16 pike were captured and RM 167-165 where 14 pike were captured.

White Sucker and other species

We removed 1,356 White Sucker in 2021. As with Northern Pike, the RM 141 – RM 139 reach yielded the most White Sucker (n = 288) of any two-mile reach (Figure 8). The first surge pass yielded the most White Sucker captures (Figure 9) and the highest White Sucker catch rate was likewise produced in the first surge pass (Figure 10).

In addition to Northern Pike and White Sucker, 159 Creek Chub and 110 nonnative Green Sunfish were removed from the focal reach this year. No native fishes were captured during pike removal efforts in the 98b focal reach.

Shortcomings

Spring is recognized as the preferred Northern Pike removal season because we are able to identify and access discrete spawning habitat (i.e., backwaters). On a typical year, these backwaters are flooded by late March to mid-April and removal efforts begin immediately. Spring 2021 was an exception. Cold temperatures throughout April prohibited the high elevation snowpack from melting, and river flows remained too low to inundate backwater areas. When river flows finally did come up in early May, they were lower than in previous years, and fewer backwaters than usual were inundated. The high-water season was abbreviated: by late May, river flows were already back down. Consequently, we removed fewer pike than what we would expect under normal hydrologic conditions.

Concerns regarding future access to the “151” backwater, particularly for gill netting efforts, prompted us to not consider removal in this backwater in 2021 because of the landowner’s distaste for electrofishing. Given the decline in the number of pike captured and catch rates that we have observed while electrofishing this backwater in recent years, especially when compared to the higher catch rates produced by gill netting, we felt it was better left alone.

Recommendations:

We recommend conducting five passes as early as possible in the spring to remove as many Northern Pike as possible in backwaters where spawning individuals are concentrated. Two passes were eliminated from this project due to budget reductions in 2020.

Project Status:

On track and ongoing.

FY 2021 Budget Status

Funds Provided: \$103,590

Funds Expended: \$103,590

Difference: \$0

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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

Data will be uploaded in the STReaMS database in December of 2021.

Signed:

Christian Smith
Principal Investigator
11/19/2021

Katherine Lawry
Principal Investigator
11/19/2021

References

Hawkins, J. and D. Tuttle 2021. Evaluation of Smallmouth Bass and Northern Pike management in the middle Yampa River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO

Smith, C. 2019. Upper Yampa River Northern Pike management and monitoring. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO

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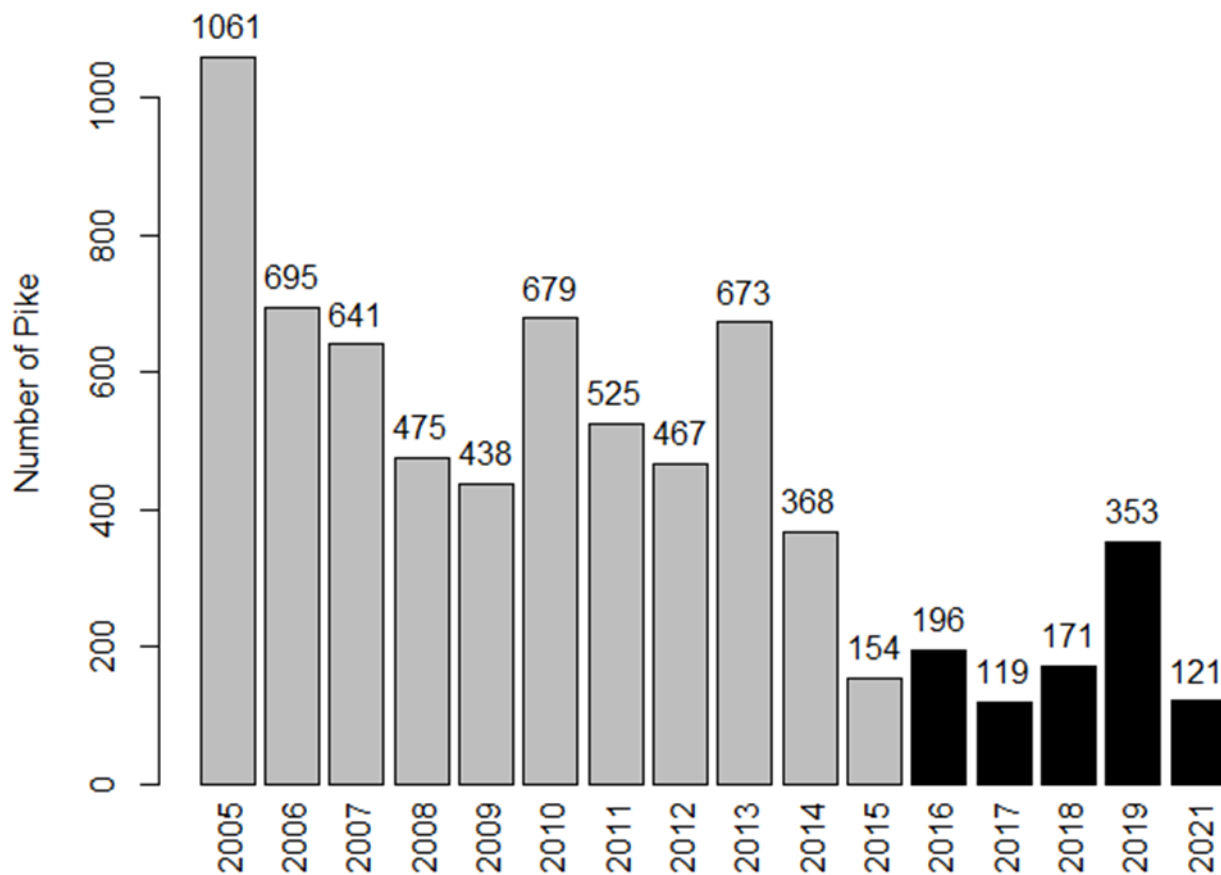


Figure 1. Total number of Northern Pike removed annually from 2005 – 2021 in the Yampa River between Hayden and Craig, Colorado. Caution should be exercised when comparing total catch from 2005 – 2015 (gray) to total catch from 2016 – 2021 (black), as methods were changed in 2016. In years 2005 – 2015, the entire main channel was electrofished, along with all backwaters. Beginning in 2016, effort was focused primarily in backwaters and the entire main channel was no longer electrofished

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Table 1. Juvenile (includes all Northern Pike < 300 mm), adult (300 ≤ 449 mm), and piscivore (≤450 mm) class Northern Pike captured in the Yampa River for each pass in 2021. Dates sampled are indicated for each pass.

| Pass/Date | Juveniles | Adults | Piscivores | Total |
|---------------------------|-----------|-----------|------------|------------|
| Pass 1: May 3 - May 7 | 1 | 4 | 31 | 36 |
| Pass 2: May 10 - May 12 | 0 | 2 | 14 | 16 |
| Pass 3: May 13 - May 17 | 0 | 5 | 19 | 24 |
| Pass 4: May 18 – May 20 | 1 | 5 | 25 | 31 |
| Surge 1: June 22- June 23 | 6 | 2 | 2 | 10 |
| Surge 2: June 24- June 25 | 3 | 0 | 1 | 4 |
| Total | 11 | 18 | 92 | 121 |

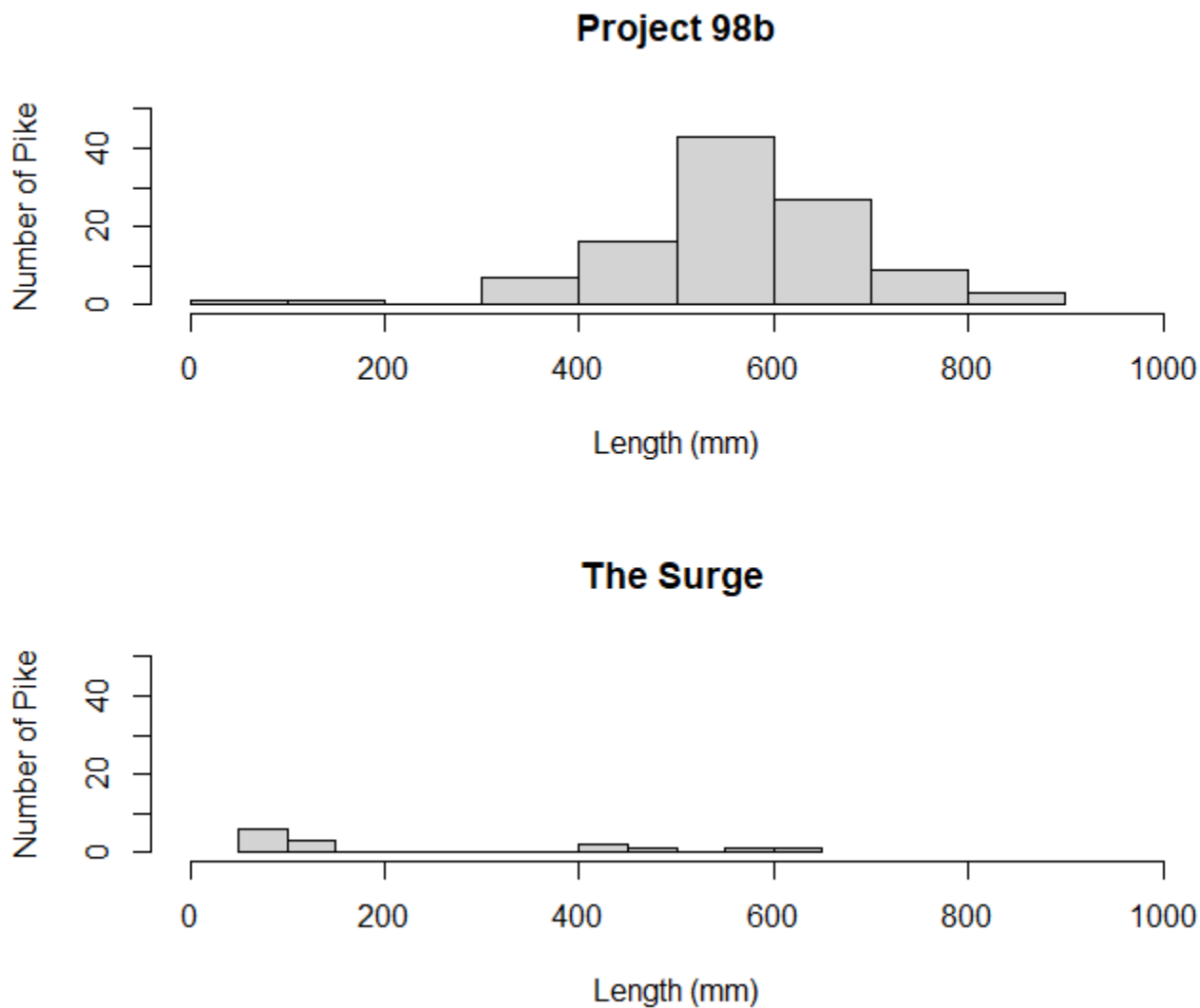


Figure 2a. Length frequency of Northern Pike captured in the Project 98b reach in 2021 (top). Figure 2b. Length frequency of Northern Pike captured during the surge passes in 2021 (bottom).

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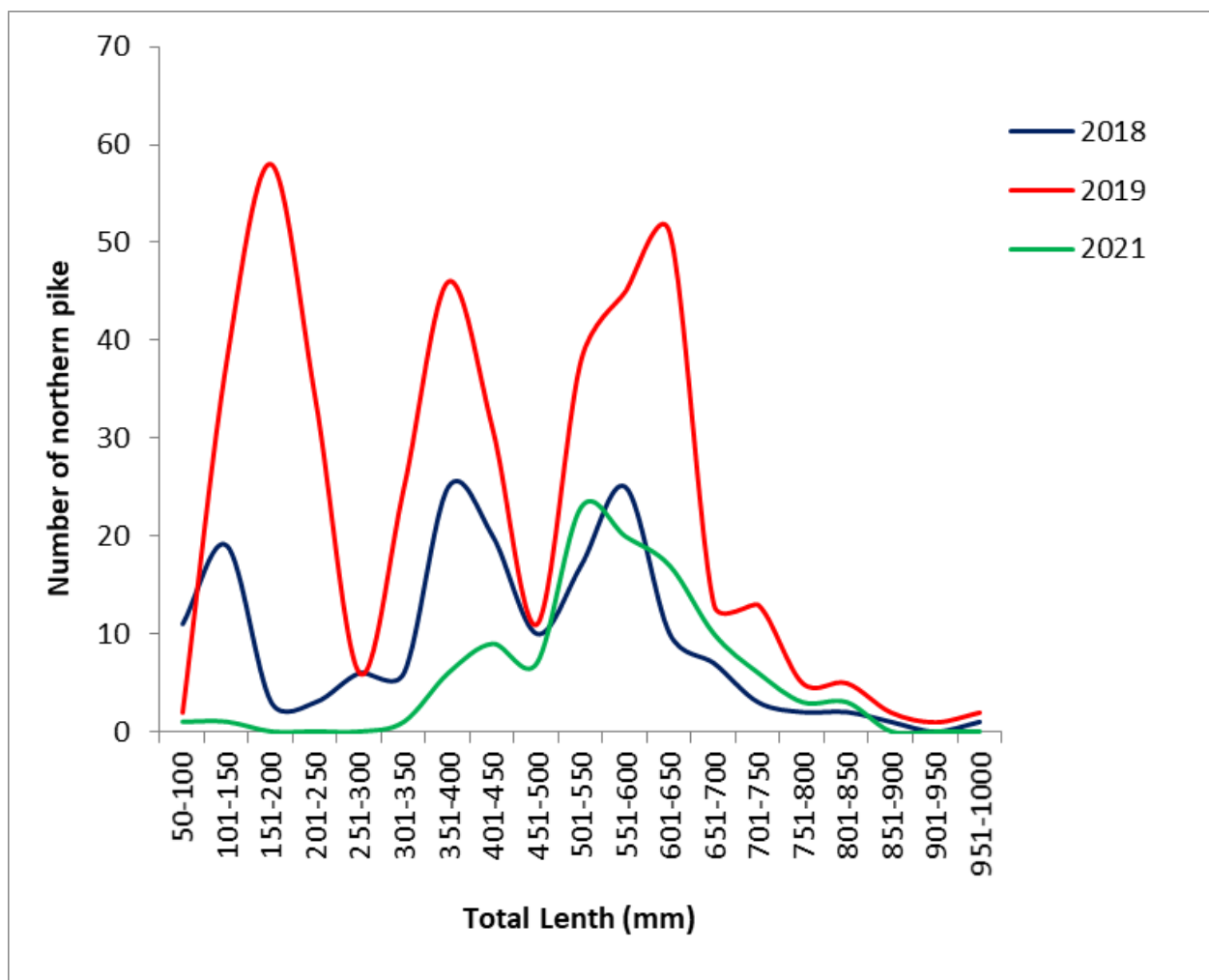


Figure 3. Length frequency of Yampa River Northern Pike captured via boat electrofishing in Project 98b, 2018-2021. (Note that 2020 is missing because electrofishing was cancelled in spring of 2020 due to COVID-19 concerns.)

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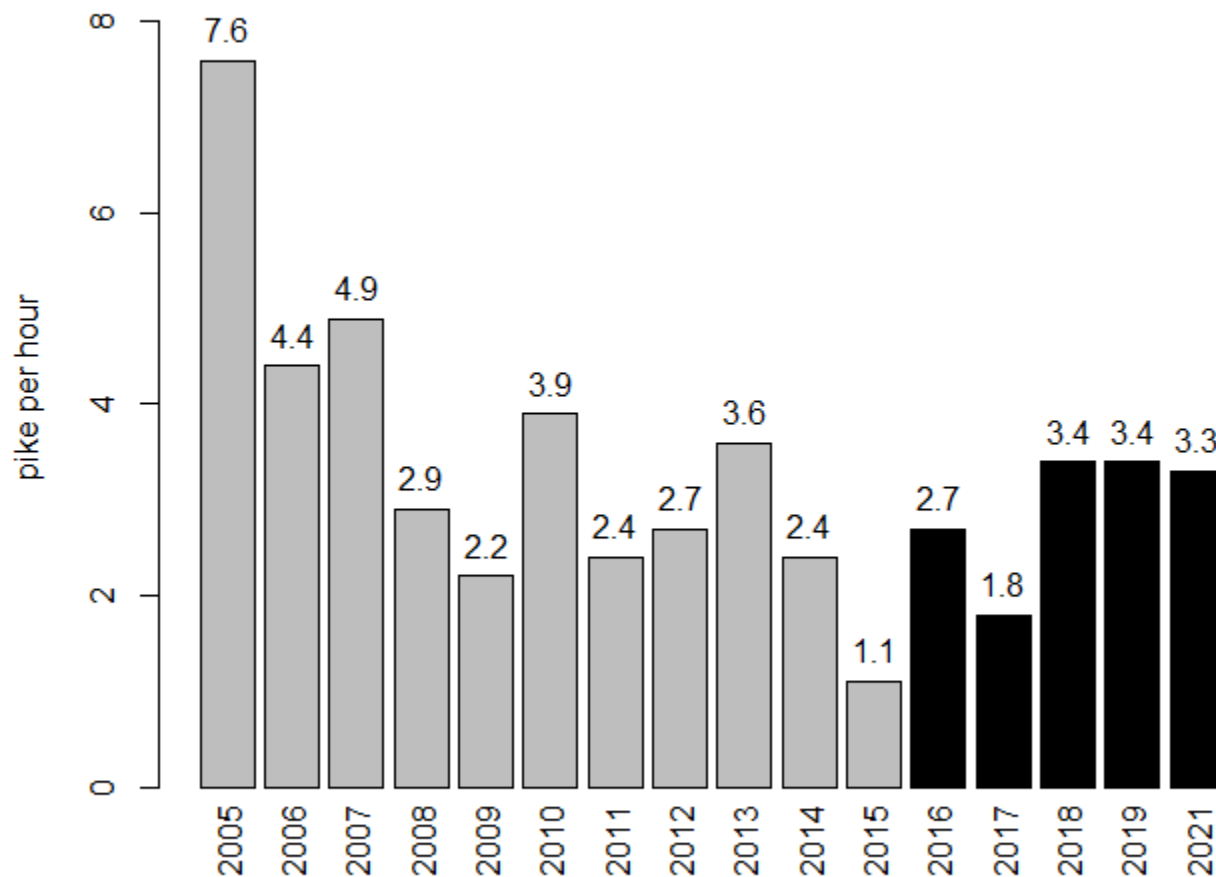


Figure 4. Overall Northern Pike catch rates per hour (CPUE) from 2005 - 2021 from the Project 98b study reach. Caution should be exercised when comparing total catch from 2005 – 2015 (gray) to total catch from 2016 – 2021 (black). Changes to Northern Pike removal and data collection methodology were employed beginning in 2016 wherein effort was focused primarily in backwaters and the entire main channel was no longer electrofished. Total electrofishing effort (in hours) was reduced. Catch rates for 2016-2021 (black) are therefore biased higher than catch rates from 2005 – 2015 (gray).

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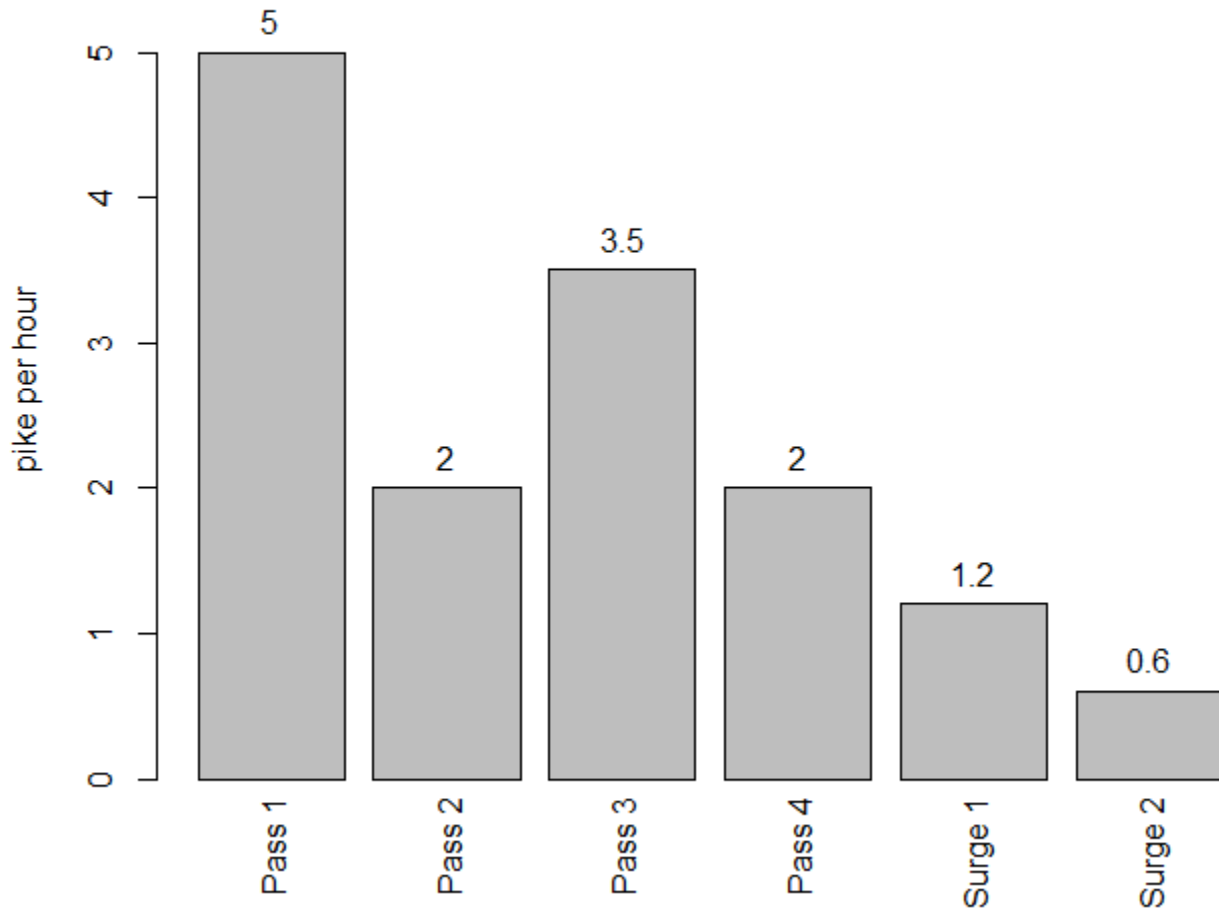


Figure 5. Catch rates for Northern Pike by pass in 2021. The first four electrofishing passes were for Project 98b. The final two passes were conducted as part of the Surge/Project 125.

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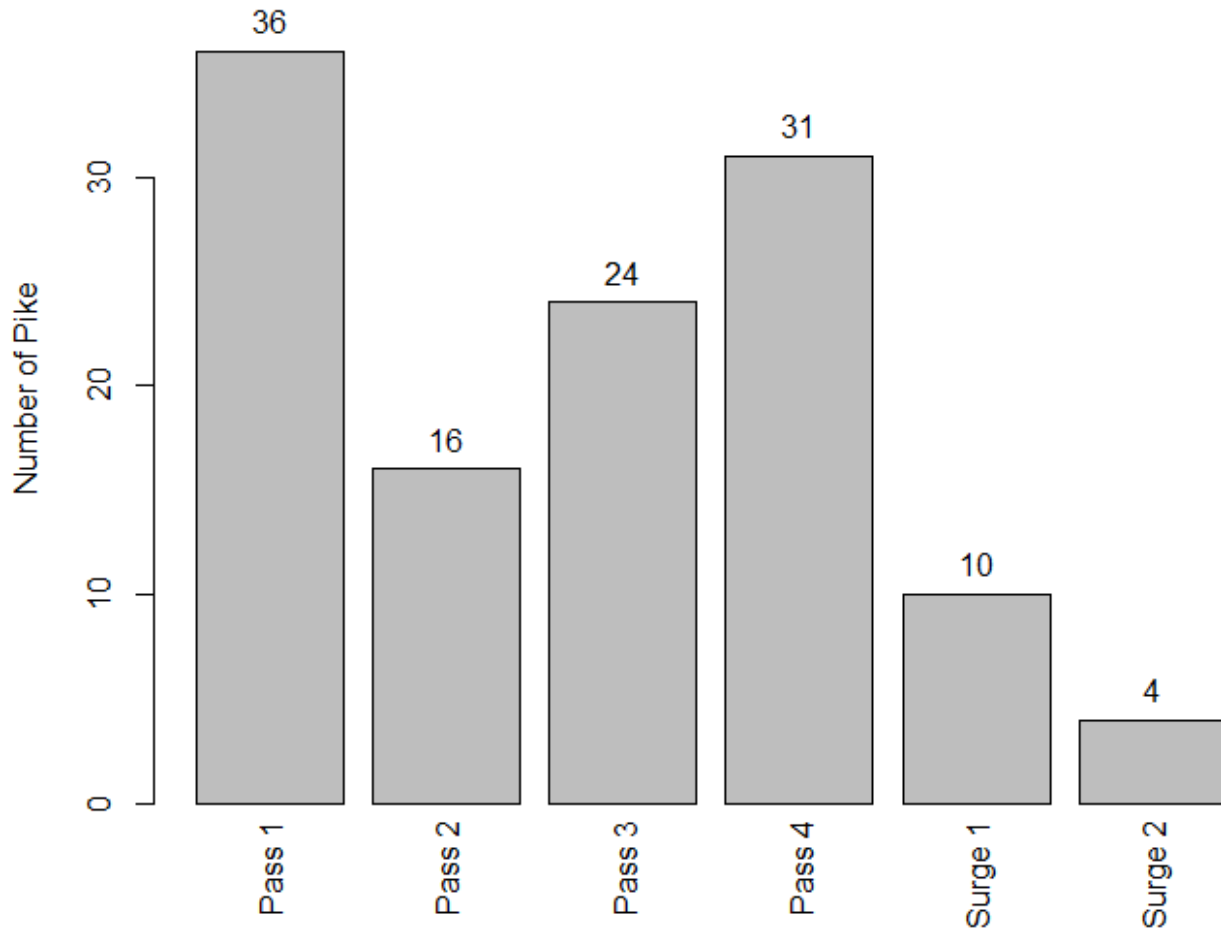


Figure 6. Northern Pike (n) captured by pass in 2021. The first four electrofishing passes were for Project 98b. The final two passes were conducted as part of the Surge/Project 125.

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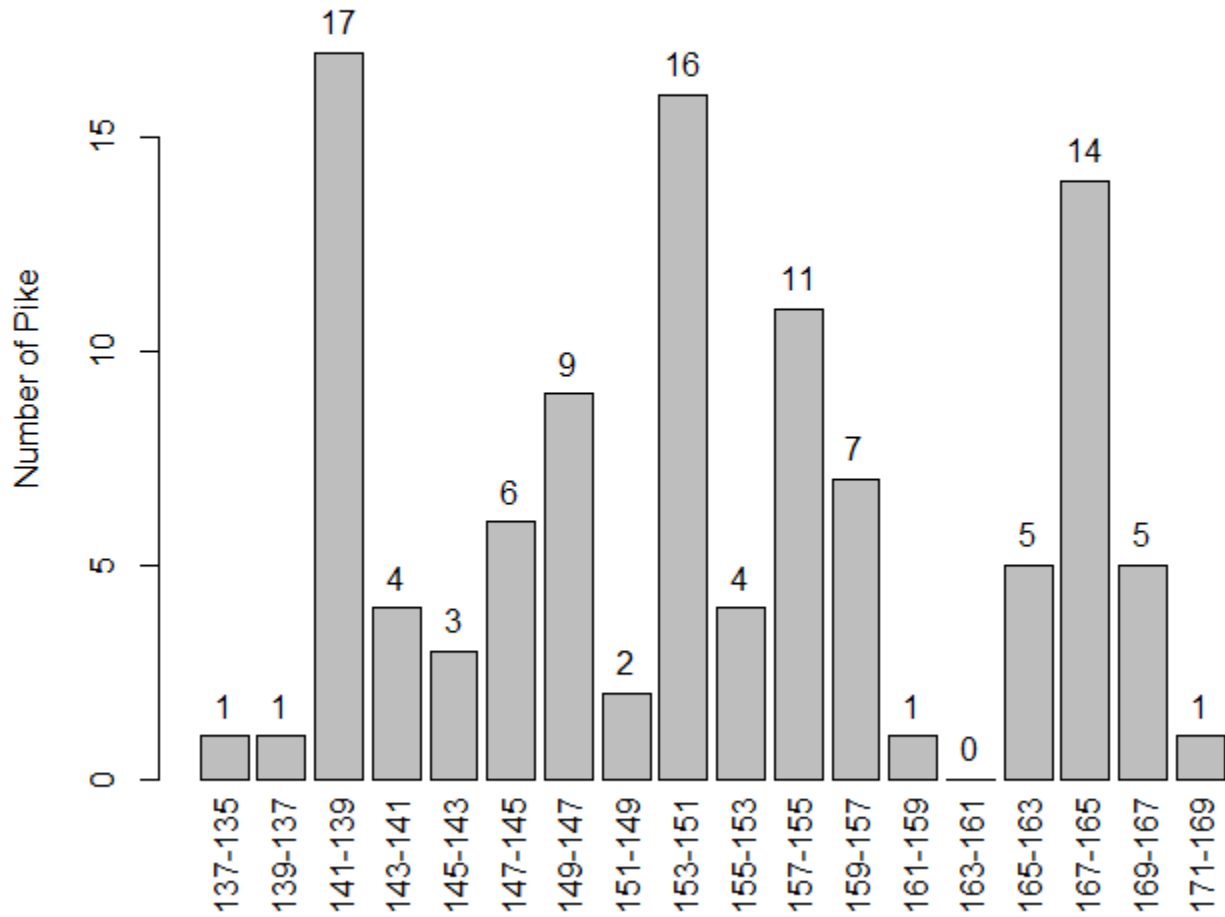


Figure 7. Total number of Northern Pike captured in two-river mile reaches, Yampa River 2021.

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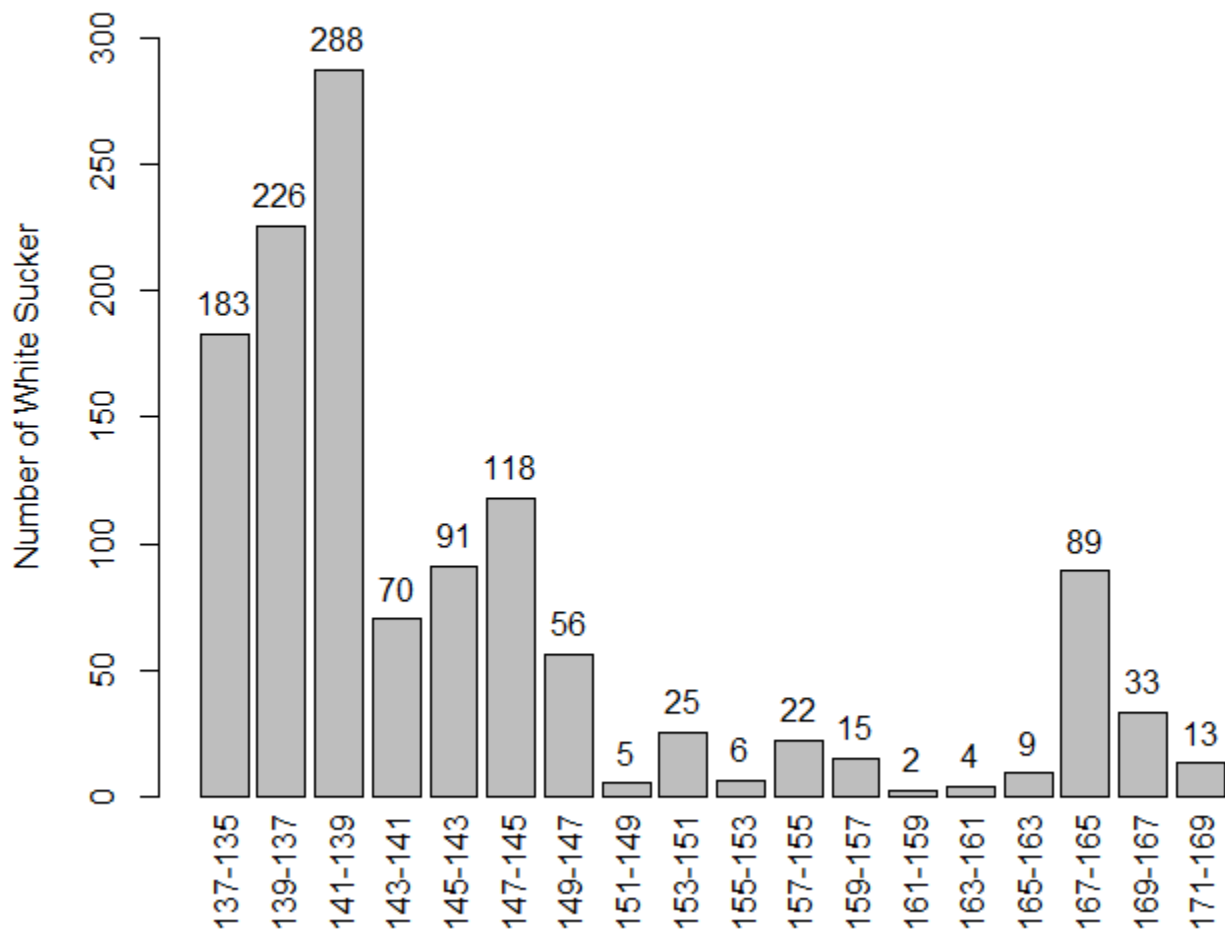


Figure 8. Total number of White Sucker captured in two-river mile reaches, Yampa River 2021.

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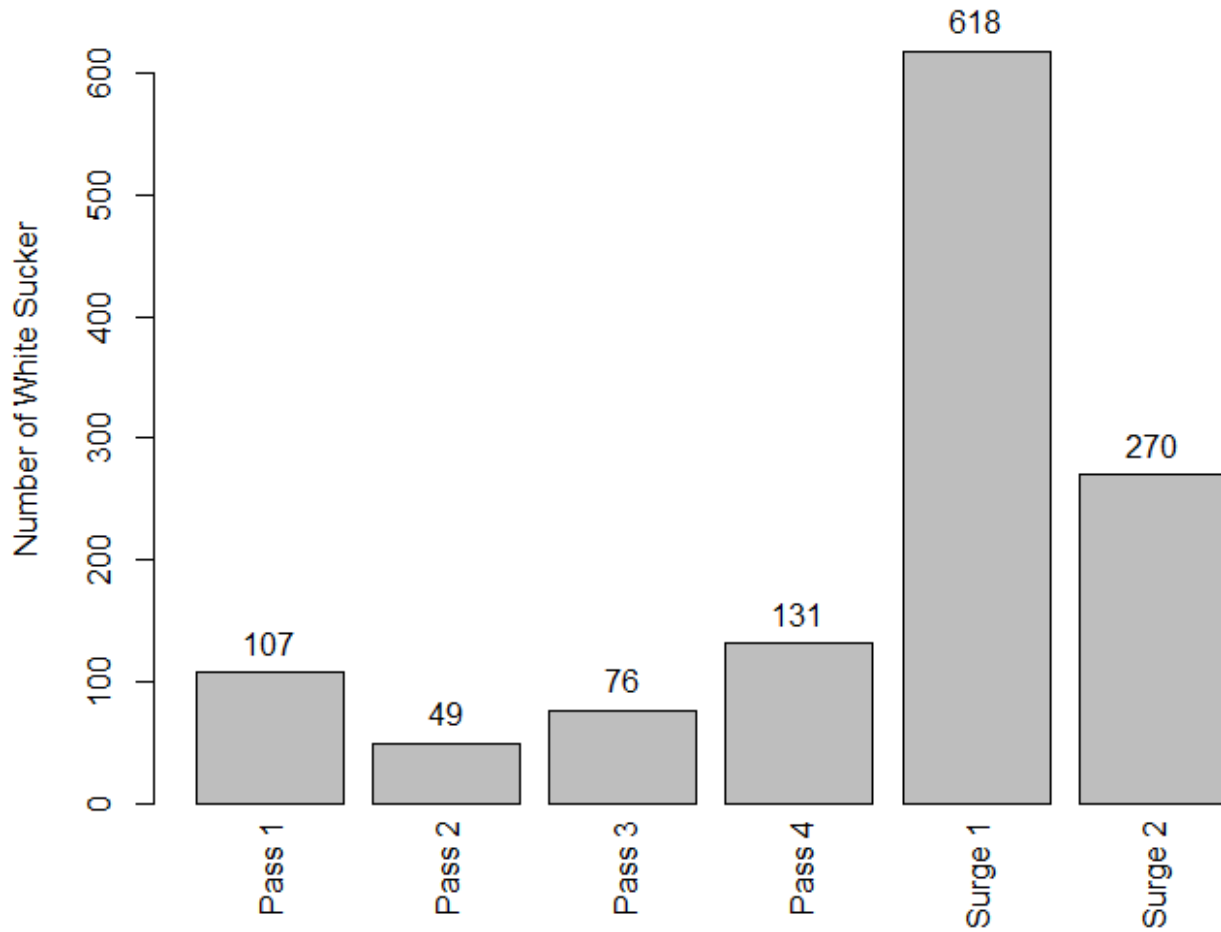


Figure 9. White Sucker (n) captured by pass in 2021. The first four electrofishing passes were for Project 98b. The final two passes were conducted as part of the Surge/Project 125.

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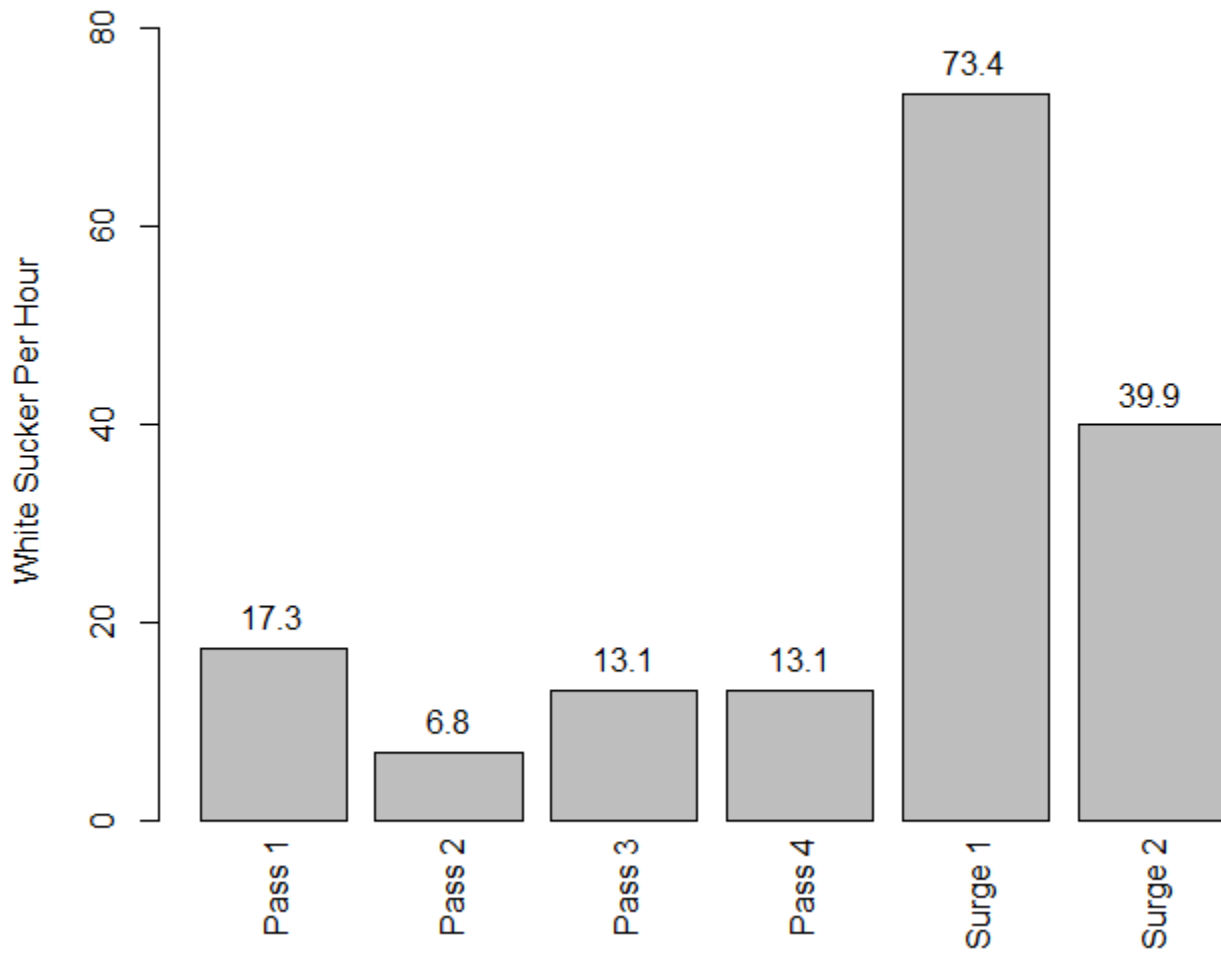


Figure 10. Catch rates for White Sucker by pass in 2021. The first four electrofishing passes were for Project 98b. The final two passes were conducted as part of the Surge/Project 125.