2024 Biologist Report West Virginia Division of Natural Resources **SOUTH BRANCH POTOMAC RIVER** SMALLMOUTH BASS



DNR

Introduction

The South Branch Potomac River is a 141-mile tributary that flows northeast from its headwaters in Hightown, Highland County, Virginia, to its confluence with the North Branch near Green Spring, Hampshire County, West Virginia, where it forms the Potomac River mainstem (Figure 1). The West Virginia Division of Natural Resources (WVDNR) maintains 19 public fishing and boating access sites along the South Branch Potomac River (District 2 Fishing Guide, Interactive Fishing Map) and manages its sportfish populations. A cool-water section spans throughout Pendleton County to Petersburg and is managed as a stocked trout fishery before transitioning into a warmwater fishery near Petersburg. Common warmwater sportfish include Smallmouth Bass, Channel Catfish, and Redbreast Sunfish. This report highlights the results from the annual Smallmouth Bass population assessment conducted in October 2024 and contains a review of historical survey results from the South Branch Potomac River since 2005.



Royal Glen Pool

Survey Area and Methods

WVDNR District 2 Fisheries Management staff conducted nighttime boat electrofishing surveys to assess the black bass (Smallmouth Bass and Largemouth Bass) populations of the South Branch Potomac River at five sites during October 7-10, 2024. The survey sites included the Royal Glen, Durgon, Parsons, Wapocoma, and Indian Rocks pools (Figure 1). At each site, biologists conducted between 17-42 minutes of electrofishing, totaling 2.7 hours of effort. The amount of time spent sampling varies depending on flow, water level, and pool size. Collected black bass were measured, weighed, and then released.



Figure 1. South Branch Potomac River located in the Eastern Panhandle of West Virginia. Tan points show the locations of the headwaters in Hightown, Virginia, and the confluence near Green Spring, West Virginia and the five electrofishing survey sites from upstream to downstream: Royal Glen, Durgon, Wapocoma, Parsons, Indian Rocks.

Survey Results

A total of 569 Smallmouth Bass were collected during the South Branch Potomac River surveys in October 2024. This equates to an overall catch rate (number of fish collected per hour of electrofishing) of 211 fish/hr. Site-specific catch rates were highest at the Wapocoma and Indian Rocks pools (Table 1, 251 fish/hr) and lowest at the Durgon pool (Table 1, 140 fish/hr). A considerable portion of the Smallmouth Bass were 7 to 8 inches in length (Figure 2, n=125, 22%) with an average size of 9.4 inches and weight of 0.5 pounds. A total of 36 young-of-year Smallmouth Bass (less than 5.4 inches) were collected across all sites and young-of-year catch rates ranged from 10-21 fish/hr. The largest Smallmouth Bass was captured at the Indian Rocks pool measuring 20.2 inches and weighing 4 pounds (Table 1). Of the 176 Smallmouth Bass collected at Indian Rocks, 37.5% were longer than 11 inches and 22.2% were longer than 14 inches. Two Largemouth Bass (less than 6 inches) were captured, one at the Wapocoma pool and one at the Parsons pool. The South Branch Potomac River is not known to have a sustainable population of Largemouth Bass.



Figure 2. Length frequency histogram of Smallmouth Bass collected during nighttime boat electrofishing surveys at five sites on the South Branch Potomac River in 2024.

Historical Review

A long-term dataset (2005-present) exists for the five sampling sites on the South Branch Potomac River that shows historical trends from annual fall electrofishing surveys. Typically, the upstream-most sites, Royal Glen and Durgon pools, have higher catch rates of Smallmouth Bass compared to the downstream-most sites (Table 1), but that was not the case in 2024. Catch rates were lower than the historical average at the Royal Glen and Durgon pools and higher than average at the Wapocoma, Parsons, and Indian Rocks pools in 2024 (Table 1). Catch rates have been as high as 837 fish/hr in 2013 and as low as 24 fish/hr in 2018 at the Royal Glen pool (Figure 3). An unusually high volume of precipitation fell (near Romney, WV) in May, June, and September 2018, with monthly rainfall totals of 7.34, 8.85, and 11.95 inches, respectively (PRISM Climate Group, Oregon State University, https://prism.oregonstate.edu, accessed 15 Jan 2025), causing the highest monthly average streamflow values (in cubic feet/second) throughout this historical timeframe (USGS stream gauge station 01608500 near Springfield, WV). High flow events are detrimental to nests, eggs and larvae during the spawning and rearing periods in late-spring and early-summer (Winemiller and Taylor 1982; Lukas and Orth 1995) and have been shown to predict the abundance of young-of-year (age-0) Smallmouth Bass that survive to the fall

Table 1. Electrofishing effort (minutes), total catch or number of Smallmouth Bass collected, catch rate(fish/hr), and maximum length (inches) of the longest Smallmouth Bass collected at each of the five samplingsites from the 2024 electrofishing surveys and historical averages of 2005-2023 electrofishing surveys fromthe South Branch Potomac River.

2024				
Site	Effort (min)	Total Catch	Catch Rate (fish/hr)	Max. Length (in)
Royal Glen	17.0	45	159	14.4
Durgon	26.1	61	140	15.2
Wapocoma	40.0	167	251	16.5
Parsons	36.5	120	197	15.4
Indian Rocks	42.0	176	251	20.2
Historical Averages				
Site	Effort (min)	Total Catch	Catch Rate (fish/hr)	Max. Length (in)
Royal Glen	19.8	140	420	15.0
Durgon	31.0	130	254	16.5
Wapocoma	40.0	136	204	19.0
Davaara				
Parsons	28.6	87	180	15.5



Figure 3. Smallmouth Bass catch rates (fish/hour) during nighttime boat electrofishing surveys at five sites on the South Branch Potomac River from 2005-2024.

(Smith et al 2005; Miller and Brewer 2020; Keplinger and Rota 2024). For example, catch rates of young-of-year Smallmouth Bass were 0 fish/hr at the Parsons and Indian Rocks pools and 3 fish/hr at the Royal Glen and Wapocoma pools in Fall 2018 (Figure 4, no data available for Durgon pool) and is likely a result of high flow events that occurred throughout the year. Historical average young-of-year catch rates ranged from 20-37 fish/hr at each site.

In addition to high streamflows, summer drought conditions (low streamflows) can also have a negative effect on young-of-year Smallmouth Bass abundance, as well as the juvenile and adult population. Low flows decrease the amount of space available to fish (i.e. pool size, water depth) which can lead to fish movement or mortality. Mortality increases at high densities due to increased predation and disease contraction and transmission (Keplinger et al. 2022). Summer low streamflows are often coupled with warm water temperatures adding an additional stressor for fish. In 2024 an extreme drought occurred from mid-June to early August throughout the eastern panhandle of West Virginia that broke record low streamflows (USGS stream gauge station 01608500 near Springfield, WV); however, it did not seem to have an effect on the



Figure 4. Young-of-year (YOY) Smallmouth Bass catch rates (fish/hour) during nighttime boat electrofishing surveys at five sites on the South Branch Potomac River from 2005-2024.

Smallmouth Bass population. Notable differences from the 2024 fall electrofishing surveys were lower than average catch rates at the upstream reaches (i.e., Royal Glen and Durgon pools) and slightly lower than average catch rates of young-of-year Smallmouth Bass across all sites, but these results do not raise population-level concerns. Recruitment and abundance of Smallmouth Bass is highly variable year-to-year and is often influenced by environmental conditions. The upstream reaches of the South Branch Potomac River are impacted by drought more significantly than the larger, downstream reaches. Additionally, a heavy rainfall event occurred just prior to sampling in 2024 which may have increased fish movement downstream allowing access to habitats with better resource availability that may have ultimately led to the lower catch rates upstream. The long-term dataset is an important resource to help understand how and why a population changes through time and the influence of environmental factors.



Figure 5. Carly Fenstermacher, District 2 Assistant Fisheries Biologist, holding the largest Smallmouth Bass by length (21.9 inches and weighing 4.6 pounds) collected during electrofishing surveys from the South Branch Potomac River since 2005.

In 2024 the longest Smallmouth Bass collected from each pool was below the historical average except from Indian Rocks. Additionally, the longest Smallmouth Bass from the Wapocoma pool was 2.5 inches shorter than the historical average of 19.0 inches (Table 2). The largest Smallmouth Bass by length captured since 2005 by WVDNR biologists was 21.9 inches and 4.6 pounds from the Wapocoma pool in 2023 (Figure 5). An assessment was conducted in 2021 and 2022 to estimate growth rates and age structure of the South Branch Potomac River Smallmouth Bass population. All fish continuously grow throughout their life, but the rate at which they grow varies by species and population. Based on the assessment. young-of-year Smallmouth Bass from the South Branch Potomac River are

estimated to grow approximately 4.5 inches during their first summer. From there, growth rates gradually decline each consecutive year. By age-7, growth rates decline to less than one inch per year. There can be a lot of variation and overlap of lengths in each age class, such that 18-inch Smallmouth Bass collected for this effort were observed to be 6 to 9 years old (Figure 6). An unusually old fish from this population, estimated to be 15 years old at 19.1 inches in total length, was excluded from the growth curve because it was considered an outlier.

Fishing Report and Conclusions

Of the five sites surveyed by WVDNR biologists, the Indian Rocks pool provides anglers the best chance of catching Smallmouth Bass that exceed 18 inches. This site is characterized by large rock

outcrops and deep water with easy access for launching small boats and kayaks from the concrete ramp. The Wapocoma pool, located within the Wapocoma Campground, provides another opportunity to catch sizable Smallmouth Bass lurking in the deep, rocky habitat. When the bass aren't biting, there are plentiful Redbreast Sunfish to save the day. If a memorable- or trophysized Smallmouth Bass is not the target, the upstream reaches of the South Branch Potomac River are best for catching a quantity of fish over quality.



Figure 6. Growth curve of Smallmouth Bass collected from the South Branch Potomac River in 2021 and 2022. Points denote individual fish (n=129), the black line is the fitted von Bertalanffy growth model expressed over the observed lengths and ages, and the shaded teal area represents the upper and lower 95% confidence interval for the mean length at each age.

In recent decades a catch-and-release ethic has taken over the angling community. Catch-and-release practices have their time and place; however, many fish populations could benefit from varying levels of harvest. In 2020-2022, the WVDNR conducted an angler-reward tagging study to assess harvest of Smallmouth Bass from the South Branch Potomac River. Angler harvest was reported to be very low at 1.63%. Although angler harvest is not a significant source of mortality, it was found that 86% of Smallmouth Bass between ages 2 and 3 (or between 7.6 and 12.2 inches) die from natural causes each year (Keplinger et al. 2022; Keplinger and Rota 2024). This high mortality rate is caused by large numbers of Smallmouth Bass that recruit to those lengths, but struggle to survive due to limited resources in crowded conditions (Figure 2). If harvest of Smallmouth Bass is of interest, WVDNR fisheries biologists encourage anglers to target those less than 12 inches. These small fish have a 14% chance of surviving to the next year (not including possible angling mortality after release), so anglers should consider harvesting these fish to enjoy at home. Lower densities of small fish could provide growth benefits to the population over time (Keplinger and Rota 2024).

Before heading out on a fishing trip, be sure to have a fishing license and stay up to date with the current fishing regulations. The South Branch Potomac River has a daily creel limit for black bass (Smallmouth Bass, Largemouth Bass) of 6 fish per day with no length limits, and there are currently two catch-and-release areas including an 8-mile section from the Petersburg Gap Bridge to the Fisher Bridge and a 9.5-mile section from the Romney Bridge to the Blues Beach Bridge.



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