



SURVEY SUMMARY

NCWRC – Inland Fisheries Division – Coastal Region



Chowan River Largemouth Bass Survey, 2023

NEED

The last Largemouth Bass survey on the Chowan River occurred in 2019, therefore a need for updated population metrics was necessary for making management recommendations, identifying trends in the population, and providing anglers with relevant information concerning the state of the fishery.

OBJECTIVES

Assess the Chowan River Largemouth Bass population during fall 2023 using relative abundance (catch-per-unit effort; fish/h), length distributions, proportional size distribution, and relative weight (W_r).

METHODS

Personnel: Deon Kerr and Chris Smith – District 1 Fisheries Biologists.

Waterbody: Chowan and Meherrin rivers and their tributaries at 25 sampling sites.

Fish Sampling Gear: Boat-Mounted Electrofishing, High Frequency (Smith-Root Apex, 60 PPS, 4.0–5.0 kW). Electrofishing sampling effort ranged from 900 to 1200 seconds.

Other Gear Utilized: YSI 2030 PRO water quality meter for water temperature ($^{\circ}\text{C}$), dissolved oxygen (mg/L and % saturation), conductivity ($\mu\text{S}/\text{cm}$), and salinity (ppt).

Species of Primary Interest: Largemouth Bass.

Sample Date(s): October 4, 5, 9, 10, 17, and 18.

Funding Source: Federal Aid in Sport Fish Restoration and agency license receipts.

Project Name in BIODE Fish: District 1 Coastal Rivers Sportfish Surveys

Citation:

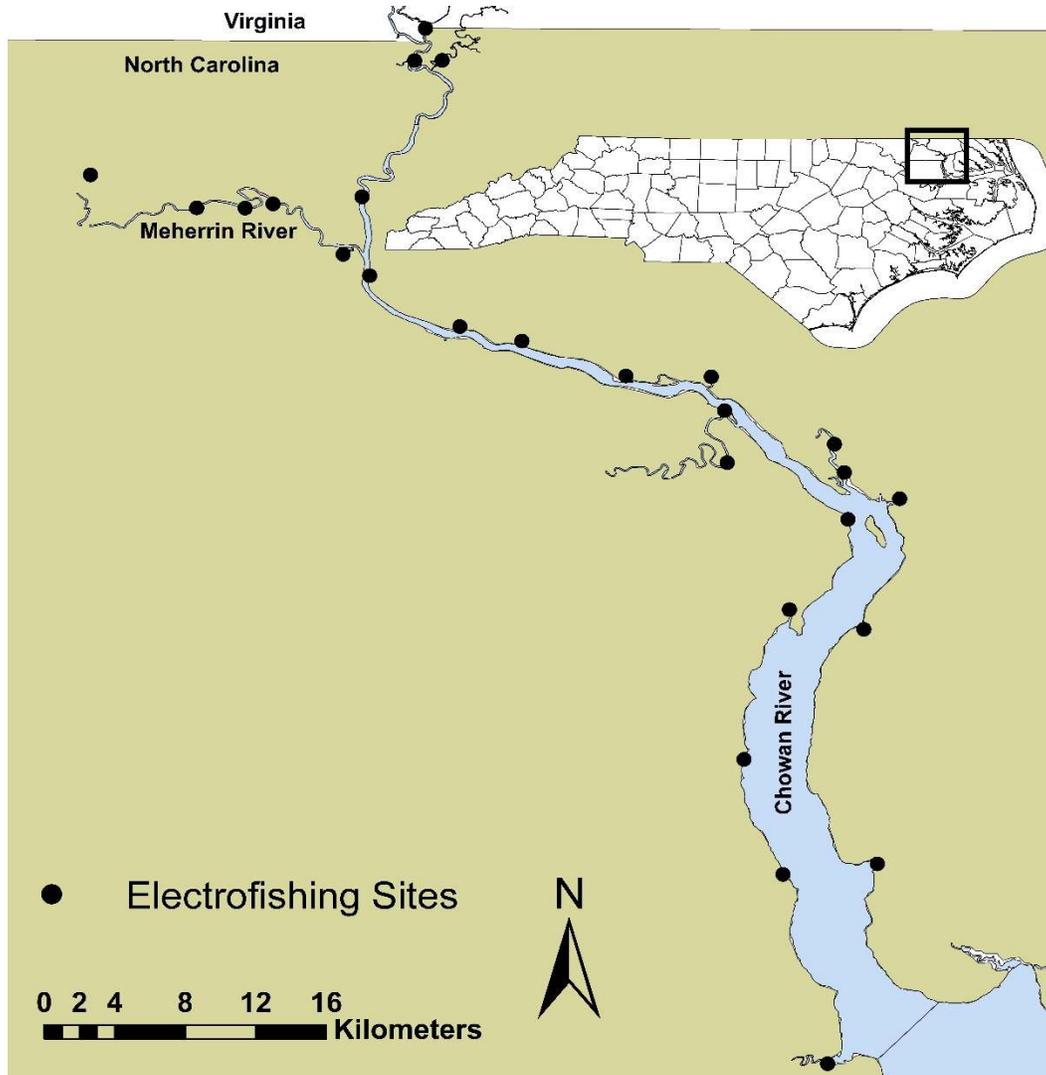
Kerr, D. K., and C. A. Smith. 2024. Chowan River Largemouth Bass Survey, 2023. North Carolina Wildlife Resources Commission, Federal Aid in Sport Fish Restoration, survey summary, Raleigh.



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STUDY AREA



BIOLOGICAL OBSERVATIONS

Largemouth Bass were sampled at 25 randomly selected sites throughout the Chowan River and its tributaries during October 2023 for six days via nearshore boat electrofishing (Table 1). A total of 124 Largemouth Bass were collected, measured (TL; mm) and weighed (g) in 7.3 hours of effort (total CPUE = 17 fish/h). The average catch per unit effort (CPUE) for Largemouth Bass was 18 fish/h, fish ≥ 200 mm total length had an average CPUE of 17 fish/h. Individuals ranged 58–590 mm. Of the total 124 individuals measured, the average total length was 340 mm (Figure 1). Individuals represented proportional size distribution (PSD) groups:



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stock-length (n = 27), quality-length (n = 45), preferred-length (n = 37), and memorable-length (n = 6; Table 2).

The relative weight (*Wr*) metric was used to determine the condition of Largemouth Bass captured. Mean relative weight for Largemouth Bass was 91 with quality-length fish having the highest overall relative weight (*Wr* = 92; Figure 2). Quality-length Largemouth Bass were most abundant, with the highest catch-rate of 6.2 fish/h. Quality-length individuals represented the largest value of PSD compared to all other size categories. Additionally, no trophy-length Largemouth Bass were sampled (fish > 630 mm). No Alabama Bass were detected.

In summary, relative weights indicated adequate forage and physiological well-being (target mean *Wr* is ≥ 90) for quality, preferred, and memorable Largemouth Bass in the Chowan River in 2023. Dissolved oxygen was sufficient at all sites (≥ 3.5 mg/L). Elevated salinity was observed (≥ 0.1 ppt) at nine of the 25 sample sites (ranged 0.1–1.8ppt) which may have influenced the presence-absence of Largemouth Bass. This range of salinity was less than the electrofishing threshold (≥ 4.0 ppt) suggesting that gear sampling efficiency was likely not the result of lower-than-expected total CPUE during the survey (target CPUE = 25 fish/h). In addition to the low total CPUE, the number of sampled stock-length fish was also low compared to quality and preferred Largemouth Bass. Stock-length Largemouth Bass typically outnumber all other PSD categories which can result in a positive influence on total CPUE. Due to low relative abundance as well as low stock-length Largemouth Bass, further investigation is needed to determine if recruitment issues are occurring in the Chowan River.

MANAGEMENT RECOMMENDATIONS

1. Determine if Chowan River Largemouth Bass are experiencing low recruitment in all or part of the drainage with sampling efforts in 2024.
2. Investigating potential stock decline warranting a future comprehensive report for 2026 that would compare trends of Largemouth Bass, CPUE, and water quality parameters.
3. Investigate influential water quality parameters such as DO and salinity to determine future steps needed for monitoring.
4. Interview anglers via 2024 annual creel survey for effort, catch, and harvest information.



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TABLE 1. Sample site information for the October 2023 Chowan River Largemouth Bass Survey. Water quality data was collected at the end of each site.

Date	Site Name	Location	DO (mg/L)	Specific Conductivity (μS/cm)	Salinity (ppt)	Site CPUE (LMB/h)
10/4/2023	CWN50	Bennetts Creek	3.5	674	0.4	10
10/4/2023	CWN48	Bennetts Creek	5.2	628	0.3	12
10/4/2023	CWN63	Warwick Creek	4.6	542	0.3	0
10/4/2023	CWN42	Lower Chowan	5.9	472	0.2	45
10/4/2023	CWN33	Keel Creek	6.0	1667	0.0	29
10/5/2023	CWN66	Wiccacon River	4.4	98	0.1	30
10/5/2023	CWN78	Middle Chowan	4.4	77	0.0	21
10/5/2023	CWN81	Middle Chowan	4.7	72	0.0	18
10/8/2023	CWN100	Upper Chowan	3.9	64	0.0	11
10/8/2023	CWN121	Meherrin River	3.5	67	0.0	0
10/8/2023	CWN93	Middle Chowan	4.4	63	0.0	35
10/8/2023	CWN90	Middle Chowan	5.2	123	0.1	0
10/10/2023	CWN138	Meherrin River	4.0	70	0.0	16
10/10/2023	CWN135	Meherrin River	3.9	69	0.0	17
10/10/2023	CWN131	Meherrin River	3.7	72	0.0	18
10/10/2023	CWN150	Meherrin River	5.7	75	0.0	26
10/17/2023	CWN118	Upper Chowan	3.9	86	0.0	15
10/17/2023	CWN117	Upper Chowan	3.7	82	0.0	8
10/17/2023	CWN115	Upper Chowan	3.7	80	0.0	22
10/17/2023	CWN110	Upper Chowan	4.3	78	0.0	11
10/18/2023	CWN4	Salmon Creek	5.0	3179	1.0	8
10/18/2023	CWN64	Rockyhock Creek	6.5	2706	1.6	8
10/18/2023	CWN18	Lower Chowan	8.8	3036	1.8	5
10/18/2023	CWN36	Dillard Creek	3.8	1241	0.7	33
10/18/2023	CWN24	Middle Chowan	7.1	2478	1.5	5



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TABLE 2. Summary statistics for Largemouth Bass collected by electrofishing during the 2023 Chowan River Sportfish Survey.

Length Category	Number Collected	Minimum Total Length	Maximum Total Length	Total CPUE (fish/h)	PSD
<200 mm	9	58	199	1.2	NA
Stock	27	201	294	3.7	23
Quality	45	303	379	6.2	39
Preferred	37	380	509	5.1	32
Memorable	6	510	590	0.8	5
Total	124	58	590	17.0	100

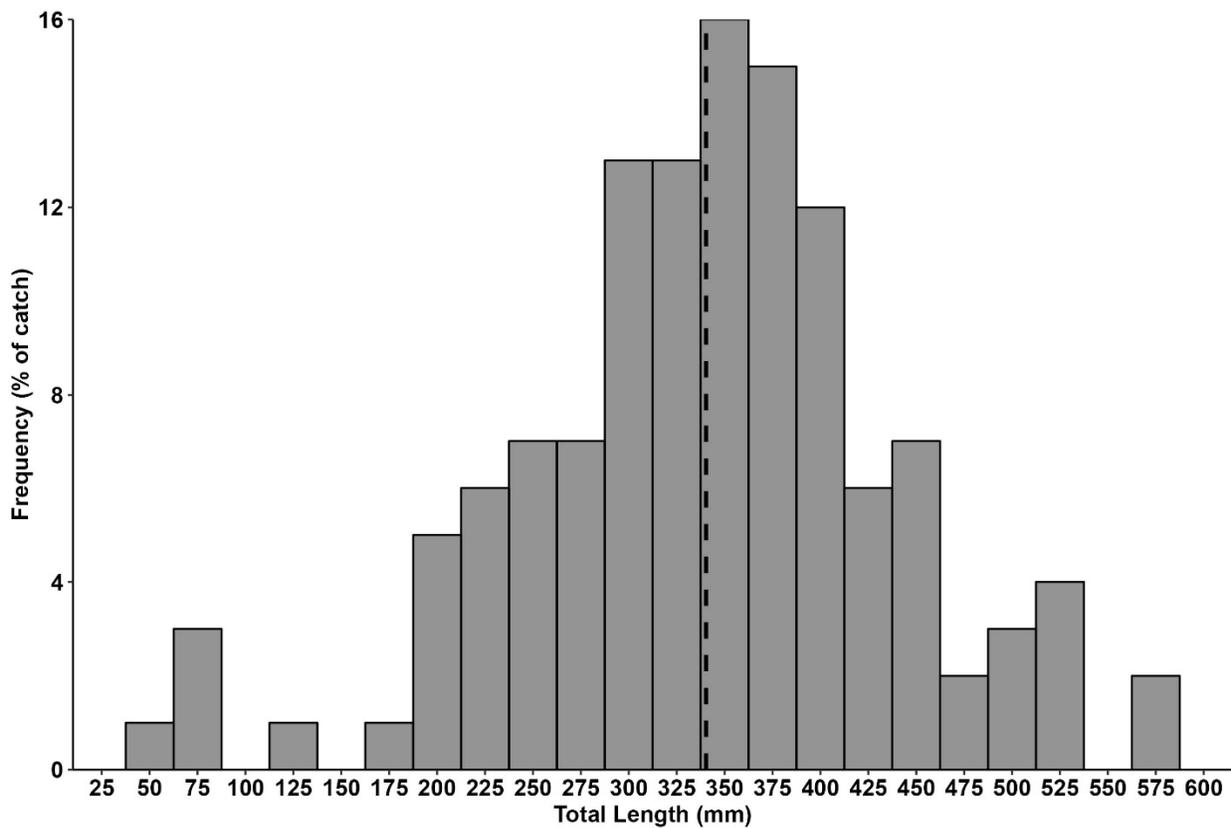


FIGURE 1. Length frequency distribution of Largemouth Bass (n = 124) collected during the 2023 Chowan River Largemouth Bass Survey. Dashed line represents the mean total length (340 mm) of Largemouth Bass captured.



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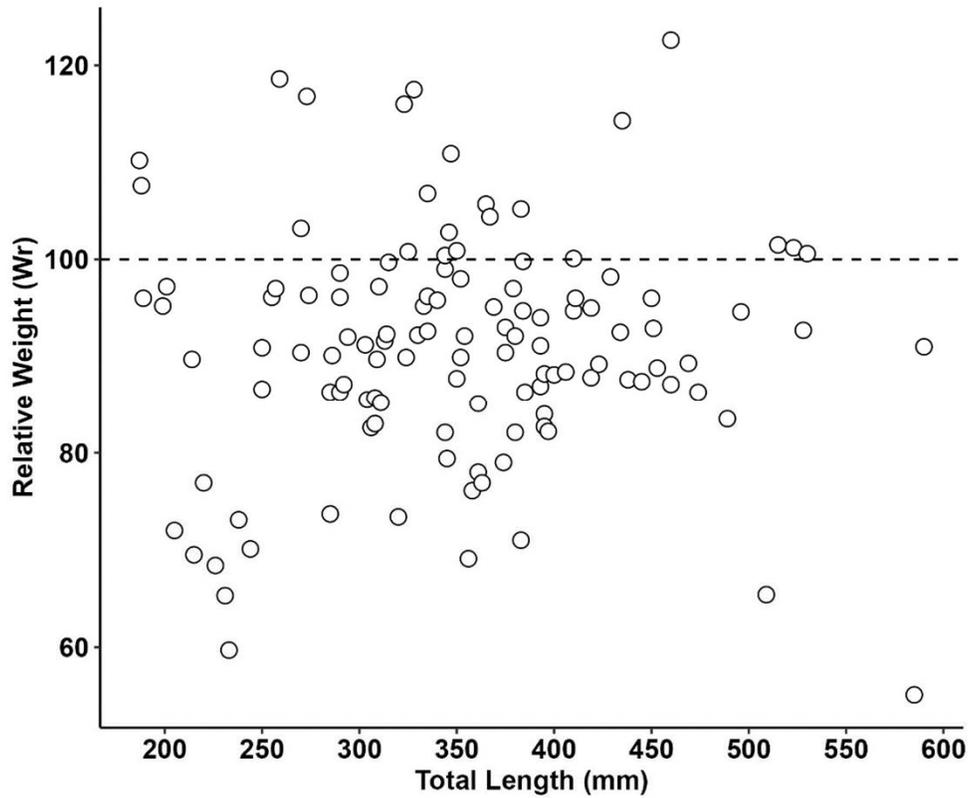


FIGURE 2. Relative weight (W_r) plotted as a function of total length (mm) of 119 Largemouth Bass (≥ 150 mm) collected during the Chowan River survey 2023. The horizontal dashed line at $W_r = 100$ denotes the 75th percentile of weights at given lengths of Largemouth Bass across its entire range.