SURVEY SUMMARY
NCWRC – Inland Fisheries Division – Coastal Region

Lockwood Folly River Sport Fish Survey, 2023

NEED

Due to its geographic location, the Lockwood Folly River is uniquely susceptible to hurricane-induced fish kills. Previous sampling indicates the Lockwood Folly River has relatively few nonnative fish species and hosts a native ictalurid community, which are rare in coastal North Carolina and earned it the designation as a Native Catfish Conservation Unit in the North Carolina Wildlife Resources Commission 2019 Catfish Management Plan. This is the first sampling event since native catfish were designated as Inland Game Fish. Occasional monitoring is necessary to evaluate the unique fisheries resources and to inform management strategies that maintain or enhance angling opportunities.

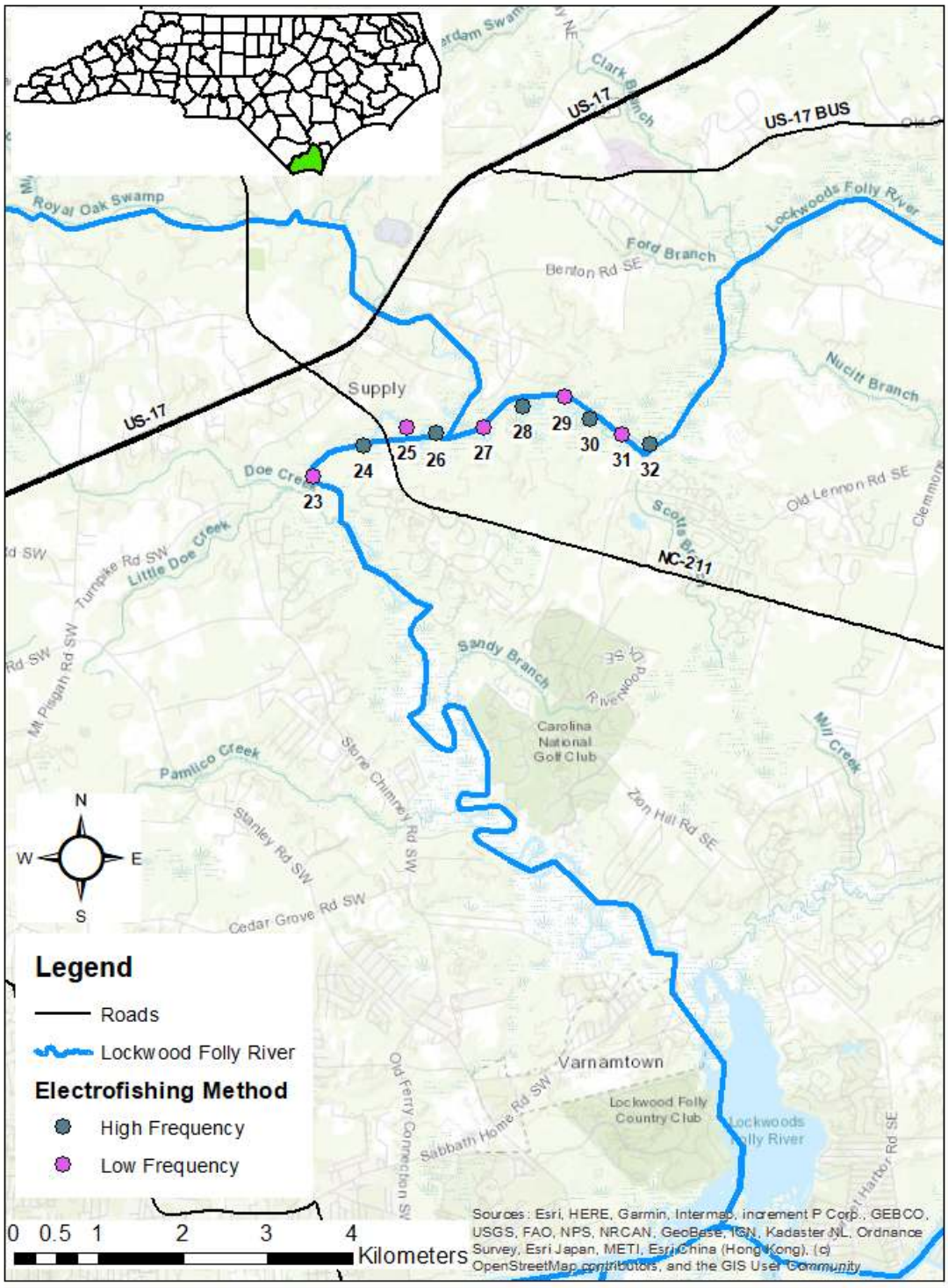
OBJECTIVES

1. Evaluate species composition, relative abundance, and size structure of fisheries resources in the Lockwood Folly River.

METHODS

Personnel: April Boggs Pope and Kyle Rachels – District 4 Fisheries Biologists
Waterbody: Lockwood Folly River – 10 sampling sites.
Fish Sampling Gear: Boat-Mounted Electrofishing (Smith-Root Apex, 15 PPS and 120 PPS, 2.0–5.5 kW)
Other Gear Utilized: YSI meter to measure water temperature (°C), conductivity (µS/cm), dissolved oxygen (mg/L), % saturation, salinity (ppt).
Species of Primary Interest: Largemouth Bass; Sunfish; Catfish
Sample Date(s): August 2023
Funding Source: Federal Aid in Sport Fish Restoration and agency license receipts.
Project Name in BIODE Fish: D4 Rivers
Citation:
Boggs Pope, A., and K. Rachels. 2023. Lockwood Folly River Sport Fish Survey, 2023. North Carolina Wildlife Resources Commission, Federal Aid in Sport Fish Restoration, survey summary, Raleigh.

STUDY AREA


US-17
US-17 BUS
Royal Oak Swamp
Lockwoods Folly River
Ford Branch
Benton Rd SE
Supply
Nuciit Branch
24
25
26
27
28
29
30
31
32
23
Doe Creek
Old Lennon Rd SE
NC-211
Little Doe Creek
Turnpike Rd SW
Mt Pisgah Rd SW
Sandy Branch
Riverwood Dr SE
Carolina National Golf Club
Pamlico Creek
Stone Chimney Rd SW
Stanley Rd SW
Cedar Grove Rd SW
Zion Hill Rd SE
Mill Creek
N
W
E
S
Legend
Roads
Lockwood Folly River
Electrofishing Method
High Frequency
Low Frequency
Varnamtown
Lockwood Folly Country Club
Sabbath Home Rd SW
Old Ferry Connector Rd SW
0 0.5 1 2 3 4
Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

BIOLOGICAL OBSERVATIONS

Sampling at 10 sites for 2.5 h resulted in the collection of 192 fish from 20 species (Tables 1 and 2). Sampling upstream was limited by downed trees and sampling downstream was limited by salinity. High frequency electrofishing targeted all fish at five sites and low frequency electrofishing targeted catfish at five sites. High frequency and low frequency electrofishing combined yielded 147 inland game fish. The most abundant species observed using high frequency electrofishing was Bluegill. The most abundant species observed using low frequency electrofishing was White Catfish. Two species of greatest conservation need (SGCN), Ironcolor Shiner (*n* = 2) and Flat Bullhead (*n* = 17), were observed. A single Largescaled Spinycheek Sleeper represents the first occurrence record of the species in the Lockwood Folly River and was vouchered with the North Carolina Museum of Natural Sciences.

High frequency electrofishing at five sites for a total of 1.3 h yielded 17 Largemouth Bass. Overall mean catch per unit effort (CPUE) (SE) was 13.4 (3.7) fish/h (Figure 1). Total length ranged from 70 mm to 528 mm, with a mean of 240 mm and a bimodal length frequency distribution (Figure 2).

Five species of sunfish were captured at five sites with 1.3 h of high frequency electrofishing, including Bluegill (*n* = 33), Pumpkinseed (*n* = 3), Redear Sunfish (*n* = 16), Spotted Sunfish (*n* = 3), and Warmouth (*n* = 5). Bluegill overall mean CPUE (SE) was 26.0 (6.6) fish/h. Redear Sunfish overall mean CPUE (SE) was 12.6 (4.7) fish/h. Warmouth overall mean CPUE (SE) was 4.0 (1.8) fish/h. Modal size classes for Bluegill included 80–90 mm and 140–150 mm.

Two species of ictalurids were collected, including White Catfish (*n* = 52) and Flat Bullhead (*n* = 17). Low frequency electrofishing at five sites for a total of 1.3 h, targeting catfish, yielded 17 Flat Bullhead and 49 White Catfish. White Catfish mean CPUE (SE) using low frequency electrofishing was 38.5 (7.5) fish/h (Figure 3). Flat Bullhead mean CPUE (SE) using low frequency electrofishing was 13.2 (6.4) fish/h. High frequency electrofishing for a total of 1.3 h, targeting all species, yielded 3 White Catfish. No non-native or invasive ictalurids were captured during 2023 sampling.

MANAGEMENT RECOMMENDATIONS

1. Maintain current harvest regulations.
2. Develop public access opportunities in the freshwater section of the Lockwood Folly River.
3. Incorporate methods for sampling inland game fish in estuarine waters.
4. Develop capacity for Aquatic Nuisance Species prevention, monitoring, and control activities.

TABLE 1. Sample site information. All sites were accessed from the Sunset Harbor Boating Access Area.

Sample date	Site name	Electrofishing method	Latitude	Longitude	Salinity (ppt)
8/28/2023	LWF32	High Frequency	34.008594	-78.228752	0.1
8/28/2023	LWF31	Low Frequency	34.009605	-78.232463	0.1
8/28/2023	LWF30	High Frequency	34.011326	-78.236532	0.1
8/28/2023	LWF29	Low Frequency	34.013635	-78.239751	0.1
8/28/2023	LWF28	High Frequency	34.012698	-78.245097	0.1
8/28/2023	LWF27	Low Frequency	34.010453	-78.250027	0.1
8/28/2023	LWF26	High Frequency	34.009854	-78.256164	0.1
8/29/2023	LWF25	Low Frequency	34.010530	-78.259993	0.1
8/29/2023	LWF24	High Frequency	34.008673	-78.265501	0.2
8/29/2023	LWF23	Low Frequency	34.005449	-78.272022	0.2

TABLE 2. Summary statistics of fish collected with high frequency and low frequency electrofishing in the Lockwood Folly River in 2023. All Flat Bullhead Catfish and 49 White Catfish were captured using low frequency electrofishing, and all other fish were captured using high frequency electrofishing.

Common name	Scientific name	Number collected	Minimum total length (mm)	Maximum total length (mm)	Mean total length (mm)
Inland game fish					
Bluegill	*Lepomis macrochirus*	33	34	212	132
Chain Pickerel	*Esox niger*	1	446	446	446
Flat Bullhead	*Ameiurus platycephalus*	17	56	306	192
Largemouth Bass	*Micropterus salmoides*	17	70	528	240
Pumpkinseed	*Lepomis gibbosus*	3	84	136	116
Redear Sunfish	*Lepomis microlophus*	16	38	236	179
Spotted Sunfish	*Lepomis punctatus*	3	114	124	119
Warmouth	*Lepomis gulosus*	5	88	214	148
White Catfish	*Ameiurus catus*	52	48	538	270
Nongame fish					
American Eel	*Anguilla rostrata*	1	54	54	54
Bowfin	*Amia calva*	5	414	570	490
Coastal Shiner	*Notropis petersoni*	16	-	-	-
Dusky Shiner	*Notropis cummingsae*	3	-	-	-
Hogchoker	*Trinectes maculatus*	1	46	46	46
Ironcolor Shiner	*Notropis chalybaeus*	2	-	-	-
Inland Silverside	*Menidia beryllina*	2	70	70	70
Largescaled Spinycheek Sleeper	*Eleotris amblyopsis*	1	100	100	100
Longnose Gar	*Lepisosteus osseus*	5	260	526	335
Spotfin Mojarra	*Eucinostomus argenteus*	5	-	-	-
Striped Mullet	*Mugil cephalus*	4	-	-	-
Total		192			

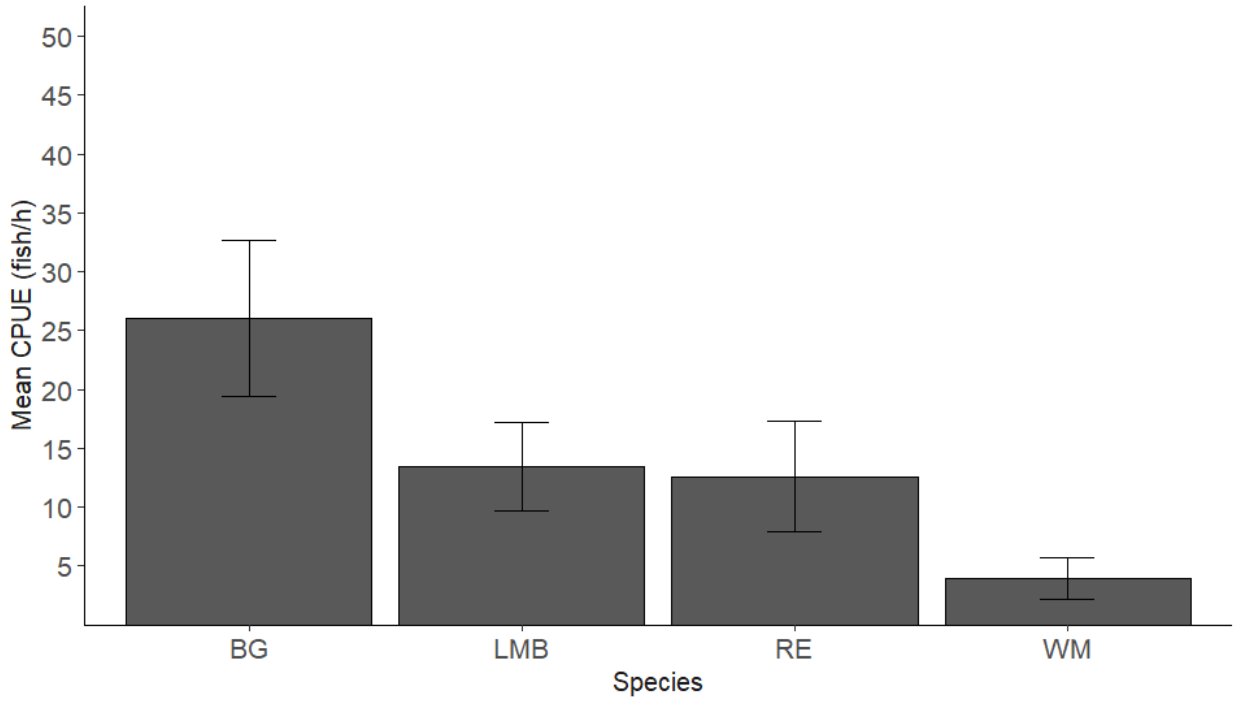


FIGURE 1. Overall catch per unit effort (CPUE)(±SE) for the most commonly observed inland game fish during high frequency boat electrofishing of Lockwood Folly River, 2023. Bluegill = BG, Largemouth Bass = LMB, Redear Sunfish = RE, and Warmouth = WM.

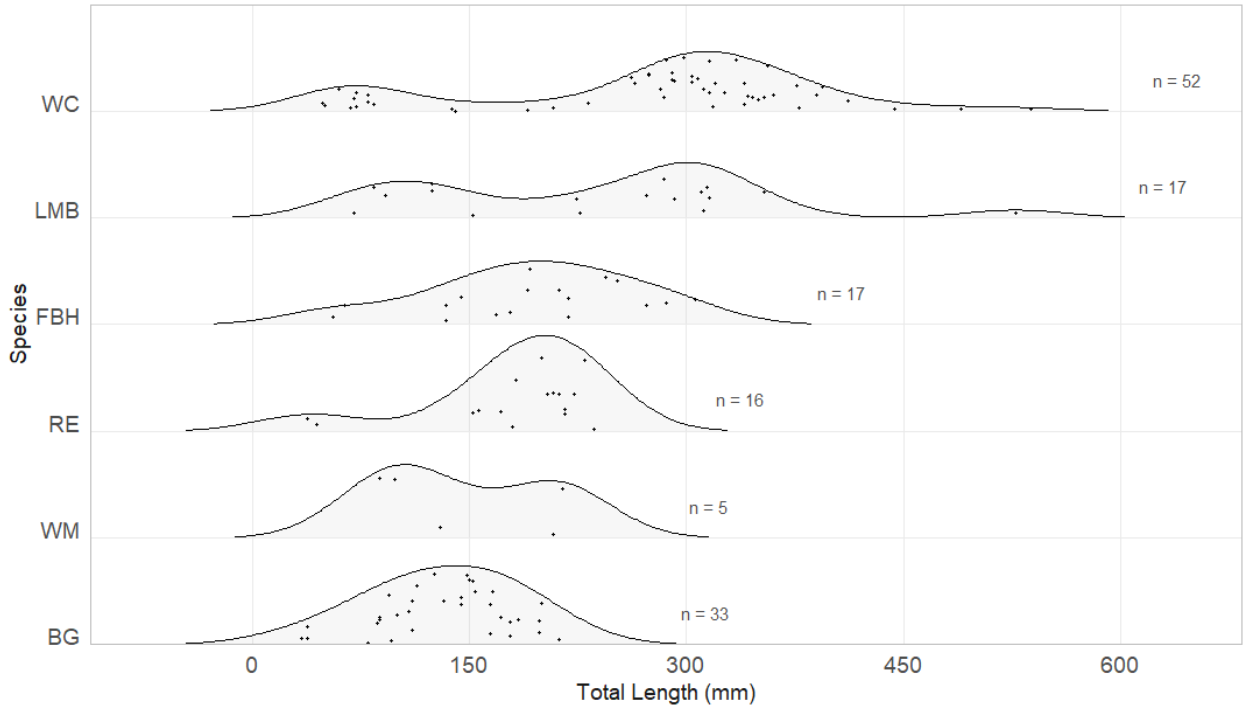


FIGURE 2. Length frequency distribution for White Catfish (WC), Largemouth Bass (LMB), Flat Bullhead (FBH), Redear Sunfish (RE), Warmouth (WM), and Bluegill (BG) captured in the Lockwood Folly River, 2023.

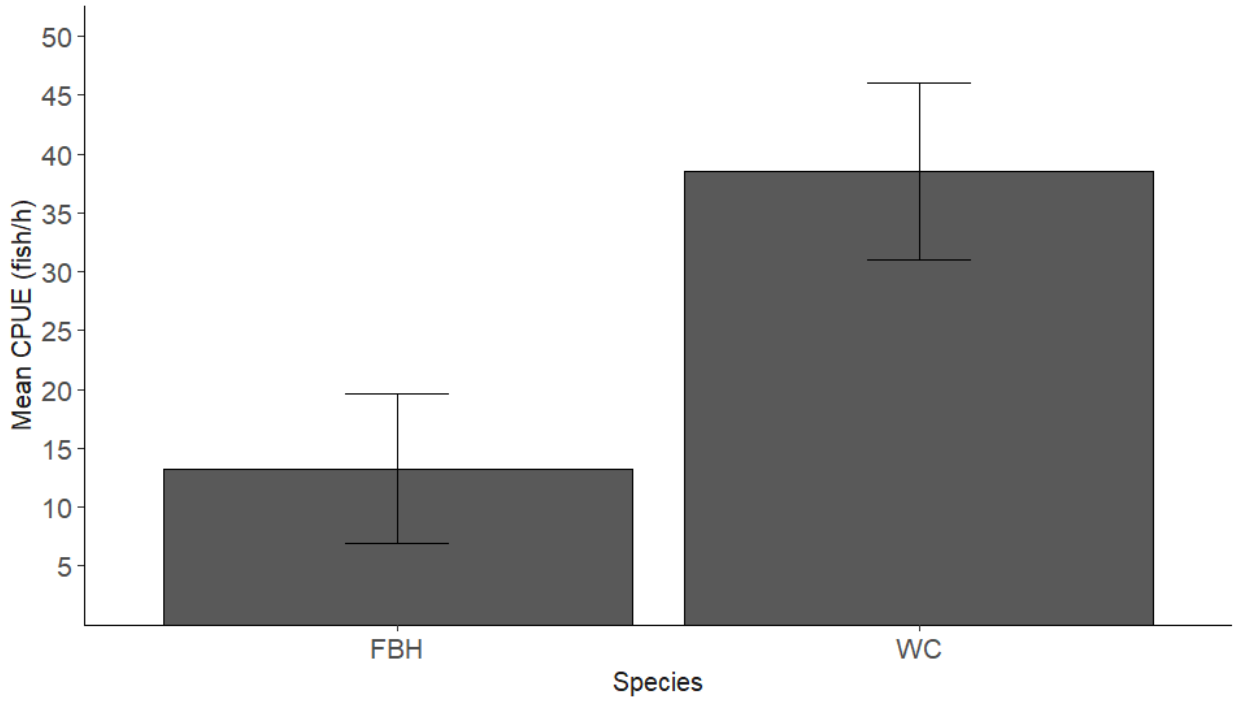


FIGURE 3. Overall catch per unit effort (CPUE)(±SE) for Flat Bullhead (FBH) and White Catfish (WC) during low frequency boat electrofishing of Lockwood Folly River, 2023.