



## ⊠ North Carolina Wildlife Resources Commission ⊠

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Gordon S. Myers, Executive Director

### MEMORANDUM

**TO:** City of Southern Shores

**FROM:** Kathryn M. Potoka  
District 1 Fisheries Biologist  
Inland Fisheries Division

**DATE:** September 2, 2016

**SUBJECT:** 2016 Southern Shores Sportfish Community Sampling Results

The canals of Southern Shores, located in Dare County, NC, is connected to the Currituck Sound. Because of its freshwater nature and multiple connections to the Currituck Sound, the sportfish community of the Southern Shores canals contains both freshwater and saltwater species that support a local recreational fishery. However, North Carolina Wildlife Resources Commission (NCWRC) biologists have not sampled the Southern Shores canals in recent years. The objective of this survey was to obtain sportfish community data needed to provide insights into the current status of sportfish in the Southern Shores canals.

On 29 June 2016, NCWRC staff collected sportfish in the Southern Shores canals. A boat-mounted electrofishing unit (7.5 GPP) was used to capture sportfish at four sample sites during daylight hours (Figure 1). All fish encountered were collected and placed in a circulating live well. Following collection, fish were identified to species, enumerated, and measured (mm TL); additionally, Largemouth Bass *Micropterus salmoides* were weighed (g). Electrofishing time (seconds), water temperature (°C), percent oxygen saturation (%), dissolved oxygen (mg/L), conductivity (μS), and salinity (ppt) were recorded for each sample site (Table 1).



FIGURE 1.—Southern Shores electrofishing sample sites, 2016.

TABLE 1.—Mean, minimum, and maximum water quality measurements for Southern Shores electrofishing samples.

	Temperature (°C)	Percent Oxygen Saturation	Dissolved Oxygen (mg/L)	Conductivity (µS)	Salinity (ppt)
Mean	26.6	81.2	6.3	3,061.8	1.6
Min	26.4	72.3	5.6	2,514.0	1.3
Max	26.8	95.9	7.0	3,718.0	1.9

We evaluated fish community composition (percent of the total catch by species) and indexed relative abundance using catch-per-unit-effort (CPUE, fish/h). Length-frequency distributions (25-mm intervals for Largemouth Bass and 10-mm length intervals for other species) were constructed to describe size composition for each species. Largemouth Bass length and weight data were log<sub>10</sub>-transformed for linear regression analysis.

We collected 228 fish from four electrofishing sites in the Southern Shores canals during this survey. The samples were dominated by White Perch *Morone americana* (36.3 %), Bluegill *Lepomis macrochirus* (23.5%), and Pumpkinseed Sunfish *Lepomis gibbosus* (16.4%; Table 2). We also collected Largemouth Bass, Yellow Perch *Perca flavescens*, Black Crappie *Pomoxis nigromaculatus*, and Redear Sunfish *Lepomis microlophus* (Table 2). Additional species collected are listed in Table 2.

TABLE 2.—*Scientific & common names, number, total length range (mm), and % composition of total catch for each species collected during Southern Shores electrofishing survey.*

Scientific Name	Common Name	Number	Total Length Range	% Composition
<i>Alosa aestivalis</i>	Blueback Herring	2	309-375	0.9
<i>Amia calva</i>	Bowfin	1	539	0.4
<i>Brevoortia tyrannus</i>	Menhaden	1	164	0.4
<i>Esox niger</i>	Chain Pickerel	2	420-535	0.9
<i>Ictalurus catus</i>	White Catfish	4	240-341	1.8
<i>Leiostomus xanthurus</i>	Spot	5	120-133	2.2
<i>Lepisosteus osseus</i>	Longnose Gar	3	339-610	1.3
<i>Lepomis gibbosus</i>	Pumpkinseed Sunfish	37	89-187	16.4
<i>Lepomis macrochirus</i>	Bluegill	53	85-235	23.5
<i>Lepomis microlophus</i>	Redear Sunfish	4	97-241	1.8
<i>Lepomis</i> spp.	Hybrid Sunfish	1	210	0.4
<i>Micropterus salmoides</i>	Largemouth Bass	11	294-509	4.9
<i>Morone americana</i>	White Perch	82	100-249	36.3
<i>Mugil cephalus</i>	Striped Mullet	5	304-465	2.2
<i>Notemigonus crysoleucas</i>	Golden Shiner	1	159	0.4
<i>Perca flavescens</i>	Yellow Perch	13	128-225	5.8
<i>Pomoxis nigromaculatus</i>	Black Crappie	1	289	0.4

### *Largemouth bass*

We collected 11 Largemouth Bass from all sample sites. Mean CPUE of Largemouth Bass greater than 200 mm was 10 fish/h (ranging from 8 to 13 fish/h). Of the 11 largemouth bass captured, no fish under 200 mm were collected, six (55%) were between 200 and 349 mm, and five (45%) were greater than 350 mm (Figure 2). The length weight regression indicated adequate body condition for Southern Shores Largemouth Bass. The slope for the standard weight equation for Largemouth Bass is 3.191 (Wege and Anderson 1978). The slope for Largemouth Bass in Southern Shores was 3.06, indicating that fish are becoming more rotund as length increases (Figure 3).

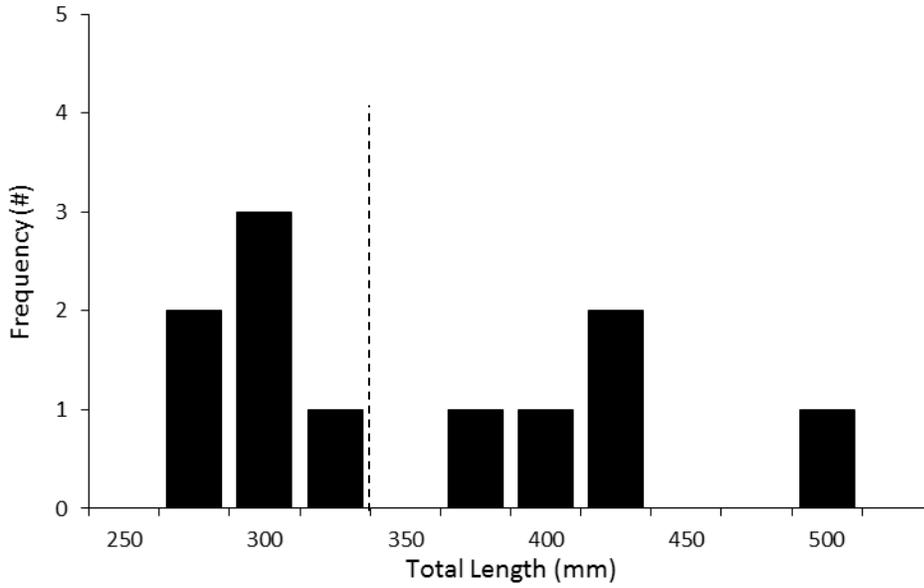


FIGURE 2.—Length frequency histogram for Southern Shores canals Largemouth Bass, 2016. The dashed line represents the 356 mm minimum length limit.

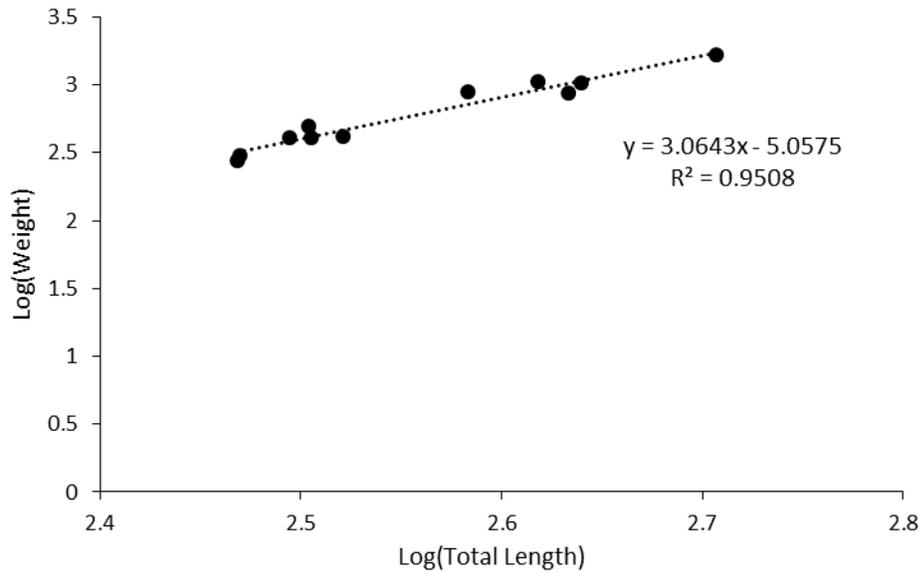


FIGURE 3.—Linear regression of the log<sub>10</sub> transformed weight versus log<sub>10</sub> transformed total length of Largemouth Bass collected by electrofishing in Southern Shores canals 2016.

*Sunfish*

We collected 53 Bluegill from four sites during the study, and CPUE was 51.8 fish/h (ranging from 12.7 – 98.0 fish/h). Bluegill lengths ranged from 85 mm to 235 mm, with peaks occurring between 90 – 109 mm, 150-160 mm, and 210 – 220 mm (Figure 4). No Bluegill less than 80 mm were collected.

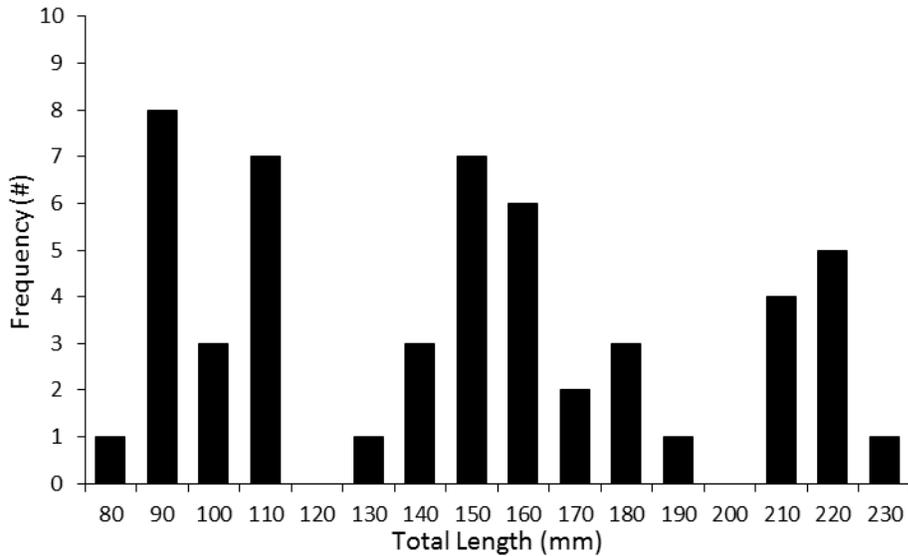


FIGURE 4.—Length frequency histogram for Southern Shores canal Bluegill, 2016.

We collected 37 Pumpkinseed Sunfish from four sample sites. Lengths ranged from 89 to 187 mm and were relatively evenly distributed. Peaks occurred at 100 mm, 130 mm, and 150 mm.

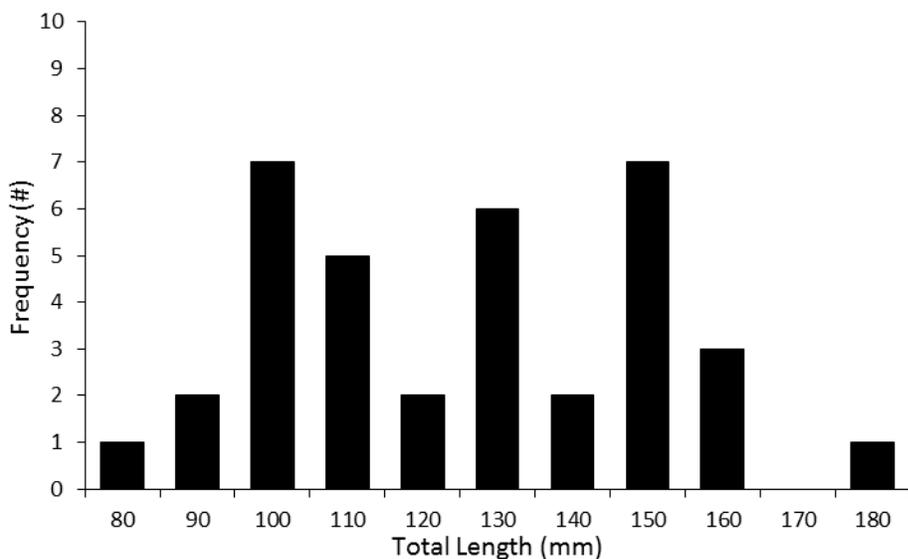


FIGURE 4.—Length frequency histogram for Southern Shores canal Pumpkinseed Sunfish, 2016.

The summer survey at Southern Shores canals revealed healthy fisheries for sunfish and Largemouth Bass, despite low numbers. Relative abundance of sunfish was high. Largemouth Bass surveys at Southern Shores canals can be challenging due to the relatively high salinity, making our electrofishing gear less effective. The length frequencies distributions of sportfish indicated robust populations with wide ranges of sizes classes. Length-weight relationships of Largemouth Bass indicated good growth with fish getting more rotund as they became longer. The low abundance of harvestable length Largemouth Bass may indicate inadequate forage basin to support larger fish, or could suggest high mortality for larger fish. However, the sunfish populations suggest that an adequate forage basin exists. Because the sample size of Largemouth Bass was so low it is difficult to make inferences regarding size distributions and population characteristics. It would be valuable to repeat this survey in coming years to compare sampling results over time. The current stocks of fish in the canals should continue to support local fishing activity. Additionally, the abundance of White Perch in the canals provide great fishing opportunities. Few catfish were collected during our survey and all were collected in one site that had the lowest salinity readings.

### *Recommendations*

- 1) Maintain current length and creel limits for Southern Shores sportfish.

### *References*

Wege, G. J. and R. O. Anderson. 1978. Relative weight ( $W_r$ ): a new index of condition for largemouth bass. Pages 79–91 in G. D. Novinger and J. G. Gillard, editors. New approaches to the management of small impoundments. American Fisheries Society, North Central Division, Special Publication 5, Bethesda, Maryland.