

Electrofishing Survey Report

Forest Lake

Florence, SC

June 7, 2019

Prepared For:

Mr. Ben Spencer



QUALITY LAKES

Your Professional Lake Management Partner.

Quality Lakes Inc.

C. Wade Bales, Fisheries Biologist

843.812.6844

2646 Langfordville Rd., Ridgeland, SC 29936

www.qualitylakes.com

Summary of Survey Methods:

On May 21, 2019, an electrofishing survey was conducted on Forest Lake located in Florence, SC. The goal was to assess the fish populations and determine management options based on goals of the community. Using boat-mounted electrofishing gear, circuits were made around the lake and bass, bream, and other species were collected. Bass and bream were measured (total length), weighed, and released. Other species of interest were noted. Aquatic plants and percent coverage were noted and water quality parameters were tested.

Results

A total of ten fish species were collected during the Forest Lake survey, including largemouth bass, bluegill sunfish, redear sunfish (shellcrackers), pumpkinseed sunfish, black crappie, golden shiners, gizzard shad, bullhead catfish, white perch, and mudfish. Golden shiners, bullhead catfish, white perch, and mudfish are all considered competitive species that have negative effects on bass and sunfish reproduction and growth. Due to the nature of the drainage into Forest Lake, it is highly unlikely these species could be eradicated or prohibited from populating the lake.

The top predator, in this case largemouth bass, is a good indicator of fish population status. Only 15 largemouth bass were collected, and none were classified as recruits (< 8 inches), indicating bass spawning, survival, and growth into larger size groups is limited in Forest Lake (Figure 1). Most of the bass collected were 16+ inches and in good condition, with average relative weights of all bass collected at 94 (Figure 2). The largest bass weighed 7 lbs. Relative weight is a metric used to index overall bass plumpness, which is an indicator of overall health and condition. Bass with relative weights 90-100 are generally considered in good shape.

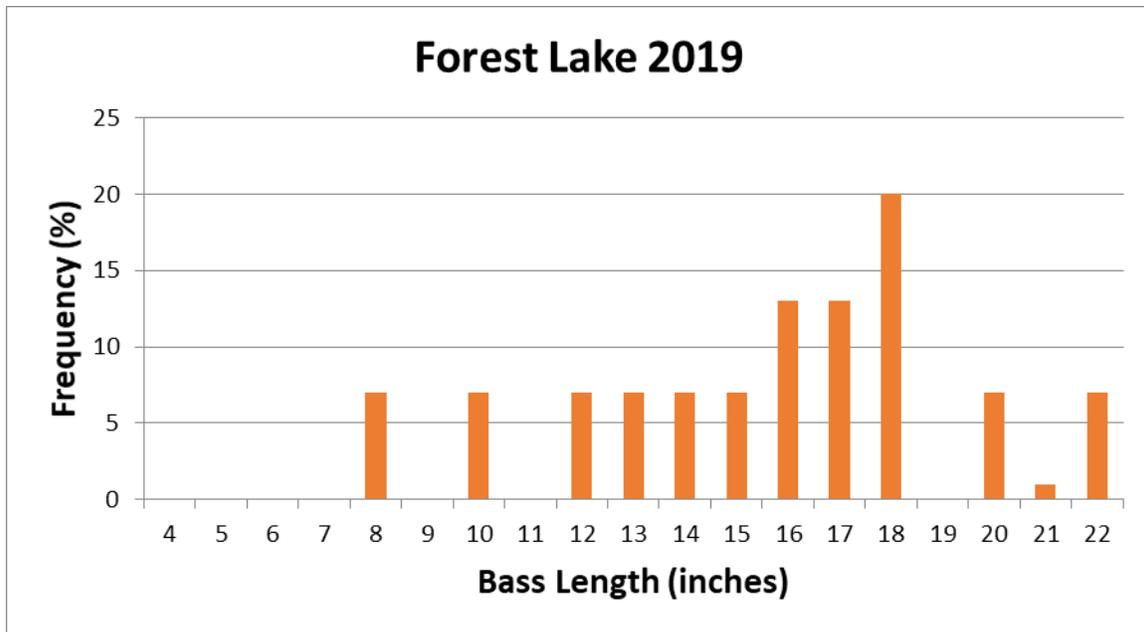


Figure 1. Length-frequency distribution of largemouth bass collected from Forest Lake, May 21, 2019.

Bluegill sunfish, the backbone of the lake's prey base for bass and a popular panfish for anglers, are generally all 5-7 inch fish (Figure 3). Bluegill spawning, survival, and growth to larger sizes is also limited, similar to largemouth bass. Only three percent of the bluegill population is less than 4 inches, further supporting poor spawning survival and recruitment of bluegill.

Water quality tests indicated a typical coastal plain lake, with water pH = 8, alkalinity and hardness at 34 mg/l, and dissolved oxygen at 11 mg/l. There was an algal bloom present at the time of the survey which was influencing the pH and driving it above 7 which is not unusual for this time of year. Overall Forest Lake is a low-fertility, low alkalinity/low hardness lake. These water quality conditions also have a negative impact on bluegill/sunfish spawning and growth.

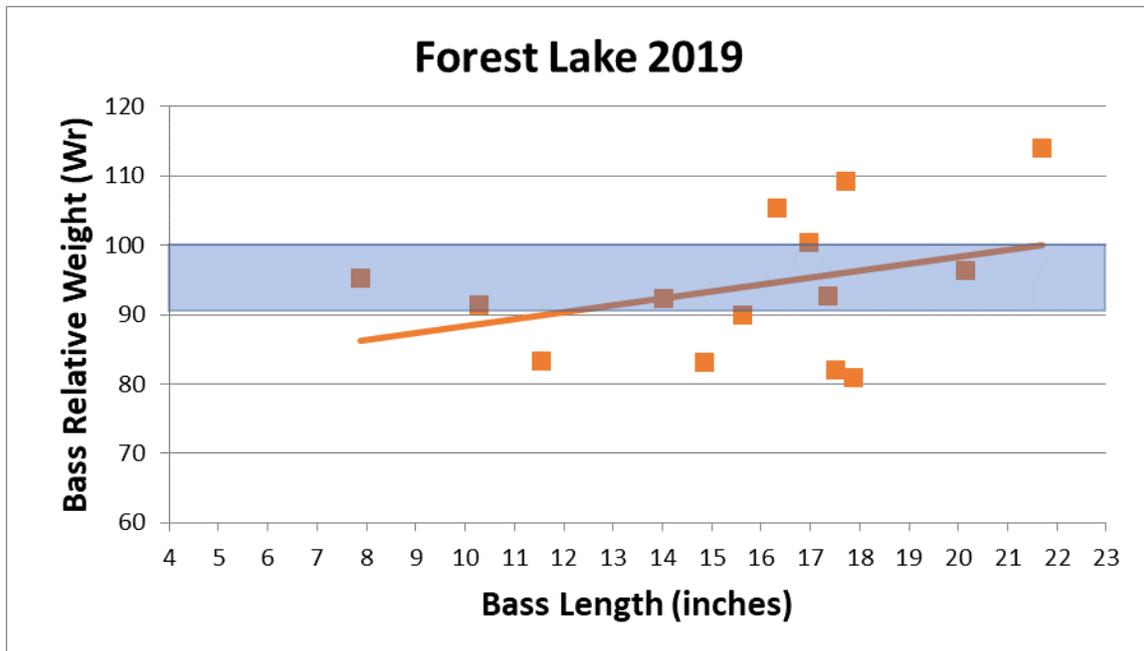


Figure 2. Relative weight (Wr) estimates for largemouth bass collected from Forest Lake, May 21,2019.

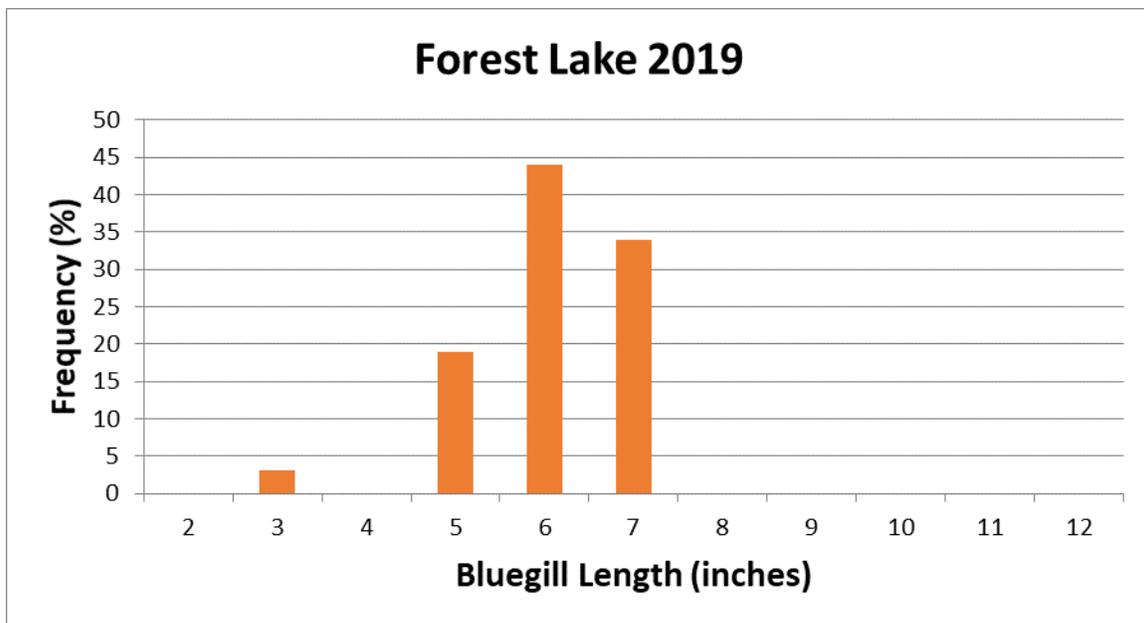


Figure 3. Length-frequency distribution of bluegill sunfish collected from Forest Lake, May 21,2019

Discussion and Recommendations:

Overall results indicated a suppressed bass and bluegill fishery characterized by poor recruitment and growth of recruits annually. While electrofishing is not a good estimator of population size, our experience indicates the bass population density in Forest Lake is very low, however, their condition is very good. This makes logical sense as the prey base is also not as abundant as it should be, and thus fewer prey are available but because there are fewer predators than normal, they are in good shape. Only six black crappie were collected, however this is not surprising as electrofishing is not a good sampling tool for crappie unless they are spawning.

We feel these conditions occurred due to competitive fish species present (bullhead catfish, golden shiners, white perch, mudfish), low lake fertility and low alkalinity, and predation by cormorants. Competitive fish species eat fish eggs and more importantly compete directly with young bass and bluegill for food, thus reducing survival of freshly-spawned fish. Low fertility and alkalinity is a function of the drainage and watershed; liming would correct these conditions however we could not tell you how long liming would last. Cormorants are significant predators of any fish less than 8 inches, and we see nearly zero bass or bluegill spawning success when cormorants are present. Additionally, we saw no freshly spawned gizzard shad, another indication the birds are negatively impacting the prey base. We observed 12 cormorants on site at the time of the survey.

Based on these findings, we recommend the following management steps to promote a healthy bass, bluegill, and crappie fishery:

1. Practice catch and release for largemouth bass and bluegill.
2. Harvest all catfish, mudfish, or other non-sunfish species.
3. Seek depredation permits for cormorants.
4. To improve the bluegill population, supplemental stocking of advanced bluegill fingerlings would be necessary (3-5 inches). To make a reasonable difference lake-wide, stock 250+ 3-5" bluegill per surface acre. Remember however, this size group will be heavily preyed upon by cormorants if they are present.

5. Stock threadfin shad to improve the prey base for bass and crappie. These should be stocked in the spring. As with bluegill, threadfin shad will be heavily preyed on by cormorants if present. We would recommend a minimum of four loads of adult threadfin shad (approximately 160 lbs total). Crappie will not flourish without an abundant threadfin shad population. Currently golden shiners are providing limited food for crappie. Therefore crappie spawning is sporadic and survival is low.
6. Add submerged structure for fish habitat. This provides more substrate for aquatic insects, an important food source for young fish, and it provides spawning habitat for species such as shad and crappie. Structure also provides shelter for young fish avoiding cormorants.
7. Liming would correct water quality to promote fish spawning and growth, however, we cannot determine how long liming would last due to annual rainfall and flushing. Effective liming would require approximately 750 tons of agricultural limestone.
8. Stocking more largemouth bass is an option **only** after the bluegill population has been improved. Stocking more bass now will increase bass numbers, but their overall condition and growth will decrease since food is limited.

Unfortunately improving the bass and panfish fishery in Forest Lake has some major challenges. Due to the size of Forest Lake, corrective stocking measures will require significant resources. Typically in systems like Forest Lake, a rotational stocking program is necessary to supplement fish spawning. While one stocking event, such as bluegill and/or threadfin shad, would be great for one season, even without any cormorants present, stocking would need to be continued at least every 2-3 years. Angler harvest would have to be limited as well.

We hope you find these recommendations applicable to your goals. Please let us know if we can assist you with these management steps or provide further explanation of our approach.