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## Lee Hall Reservoir 2019 Fisheries Management Report Virginia Department of Game and Inland Fisheries

This 230-acre reservoir is owned by the City of Newport News and forms part of the City’s water supply network, receiving water from Chickahominy Lake as well as Diascund and Little Creek Reservoirs. The reservoir is located in Newport News Park, which was opened for recreational activities in 1966. With a total area of about 8,000 acres, it is one of the largest municipal parks east of the Mississippi.

The Virginia Department of Game and Inland Fisheries conducted an electrofishing survey of Lee Hall Reservoir on May 29, 2018. The reservoir was last sampled on May 19, 2015. The 2018 survey consisted of sampling along 4 historical shoreline regions. The combination of these sampling runs provides a picture of the present fish assemblage. Electrofishing efforts consisted of shocking along the shoreline habitat as close as possible, with the majority of the effort concentrated in the 2 to 4 foot depth range. The excessive amounts of curly leaf pondweed made for a difficult time of observing shocked fish. The growth rate of curly leaf pondweed has become extremely high over the last 5 to 6 years that large sections of the reservoir are covered from the early spring to early summer time frame. The curly leaf pondweed typically dies off by the early part of June. Each survey run consisted of 1200 seconds of effort for a combined total effort of 4,800 seconds (1.33 hour). Full community sampling was conducted on each survey run. Lee Hall Reservoir is rich with species diversity with a total of 16 fish species collected.

Table 1. Summary of the primary fish species collected by electrofishing of Lee Hall Reservoir, May 29, 2018

Species	# Collected	Catch Rate (#/hr)	Max Length (")	Mean Length (")
Largemouth Bass	126	94.5	20.4	10.33
Bluegill	320	240	6.57	3.37
Yellow Perch	22	16.5	12.1	7.3
Redear Sunfish	122	91.5	10.16	4.21"
Black Crappie	13	9.75	12.4	7.7

Mean Largemouth Bass length based on the 117 bass collected that were not from the 2018 year class. Nine YOY bass in the 2 to 4 centimeter range were collected.

### Largemouth Bass

The electrofishing survey produced a total of 126 largemouth bass for a CPUE (Catch Per Unit of Effort) of 94.5 fish/hr. This catch rate showed a minor increase from the 2015 survey (CPUE = 89 fish/hr). Lee Hall Reservoir has historically produced bass catch rates that fall well below other impoundments in Region 1, District 1. The historic catch rate of largemouth bass from electrofishing surveys from 1996 to 2015 is 41.5 fish/hr. So the last few years have been pretty productive when compared to past surveys. The electrofishing survey consisted of two sample runs within the middle reservoir basin and two runs in the reservoir basin between Interstate 64 and the railroad tracks. This area is usually good for holding larger bass along the flooded tree lines adjacent to Interstate 64. The size distribution of the collected bass can be seen on the enclosed length frequency histogram under Figure 1. The overall distribution revealed several year classes present, with a large concentration of fish in the 4 to 6 inch range. These fish most likely are all comprised of bass from the 2017 year class. The average sized bass measured 10.33 inches when the 9 young of year (YOY) are removed from the calculation. This average length showed a decline from the 2015 survey (mean TL = 10.73 inches). The survey date in late May allowed for the collection of YOY (Young of Year) bass in the 2 and 4 centimeter range (1 inch). The largest bass measured 20.4 inches and weighed 5.25 pounds.

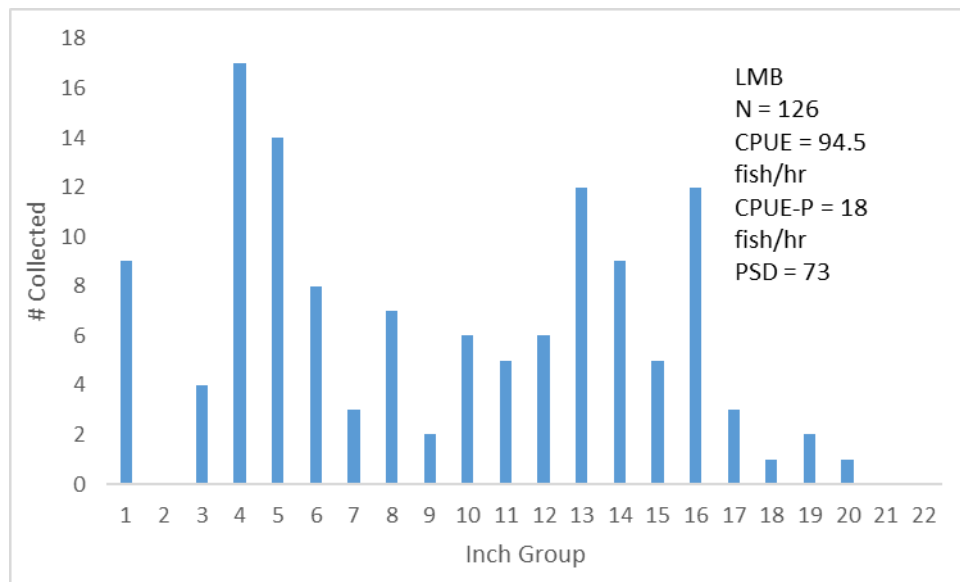


Figure 1. Length frequency distribution of largemouth bass collected from electrofishing Lee Hall Reservoir, May 29, 2018

Fisheries biologists of the past established certain size classifications to describe the fish they collected. It is through these size classifications that population dynamics are analyzed. The size designations are stock, quality, preferred, memorable, and trophy. The PSD (Proportional Stock Density) is the proportion of bass in the population over 12 inches (quality size) in relation to the total number of stock-sized bass (8 inches and

greater). A balanced bass/bluegill fishery has a bass PSD value within the 40 – 60 range. With largemouth bass being the most popular game fish in this country, it has been considered that a “preferred” bass is one that is over 15 inches in length. The RSD-P (Relative Stock Density of Preferred bass) is the proportion of stock-sized bass that are 15 inches or greater. The PSD and RSD-P values represent the distribution of collected fish, but one must take into account the total number of bass collected along with the total of stock-sized bass in the sample.

The 2018 value for PSD (73) showed a decline from the 2015 survey (PSD = 86), The 2018 RSD-P value (34) also showed a decline from 2015 (RSD-P = 46). The 2018 PSD value represents the collection of 71 stock-sized bass in which 52 of those bass were of quality-size (greater than 12 inches). A total of 24 preferred-sized bass were collected. The PSD value was above the desired range (PSD = 40–60), indicating a high proportion of larger-sized fish being collected. The RSD-P value was within the desired range (RSD-P = 10–40) that would represent a balanced bass population.

Weights were taken on largemouth bass to calculate relative weight values. Relative weight values are an indication of body condition. A value from 95 to 100 represents a fish that is in the healthy range and finding a decent amount of food. A higher relative weight value indicates fish with a better body condition. The relative weight values for stock, quality, and preferred bass ( $\geq 8''$ ,  $\geq 12''$ ,  $\geq 15''$ ) were 103, 101, and 100 respectively. The 2018 values showed a favorable increase when compared to the 2015 survey (stock = 95, quality = 94, preferred = 95). The abundance of juvenile yellow perch found in past surveys was not detected during the 2018 survey. The largemouth bass may be keying in their foraging behavior of the gizzard shad population. The one memorable-sized bass had a high relative weight value of 108 as this fish has now problems finding adequate forage.

### **Bluegill and Redear Sunfish**

Lee Hall Reservoir bluegill population has historically consisted primarily of bluegill less than 6 inches in length. The 2018 survey revealed more of the same with a high proportion of bluegill less than 5 inches in total length. The survey collected 320 bluegill (CPUE = 240 fish/hr) over the course of the four electrofishing runs. This catch rate showed a major increase from 2015 (CPUE = 97.5 fish/hr). The historic catch rate (1996 – 2015) of bluegill from Lee Hall Reservoir has been 250 fish/hr. The bluegill size distribution ranged from 1 to 6 inches. The average sized bluegill measured only 3.37 inches, which was a minor decline from 2015 (mean TL = 3.41 inches). The largest bluegill measured 6.57 inches. Only 4 bluegill were greater than 6 inches in length. A total of 188 bluegill were in the 3 inch size class.

The bluegill PSD value of 2 showed a less than pleasing result and a decline from the 2015 PSD value of 7. These values leave plenty of room for improvement when it comes to reaching the desired PSD range of 20-40. The 2018 survey collected four quality-sized bluegill from a total of 214 stock-sized bluegill. Bluegill growth rates are most likely suffering from the impact of Copper Sulfate applications and the high flow through nature of this terminal reservoir. The various predator species within the fishery

may have combined their efforts to crop down the overall bluegill population that used to be even more abundant.

The redear sunfish population appears to be in fair shape. The survey collected a total of 122 redear sunfish. The catch rate of 91.5 fish/hr showed a substantial increase when compared to the 2015 survey (CPUE = 25.5 fish/hr). The majority of the sample consisted of juvenile fish in the 2 to 3 inch range. The size distribution ranged from 1 to 10 inches. The average size redear sunfish was 4.21 inches, which showed a decline from 2015 (mean TL = 4.61 inches). The largest redear sunfish measured an impressive 10.16 inches. The redear sunfish have the potential to grow to larger sizes than the bluegill and pumpkinseed sunfish that are present in Lee Hall Reservoir. Anglers may be pleasantly surprised by a few of these larger fish.

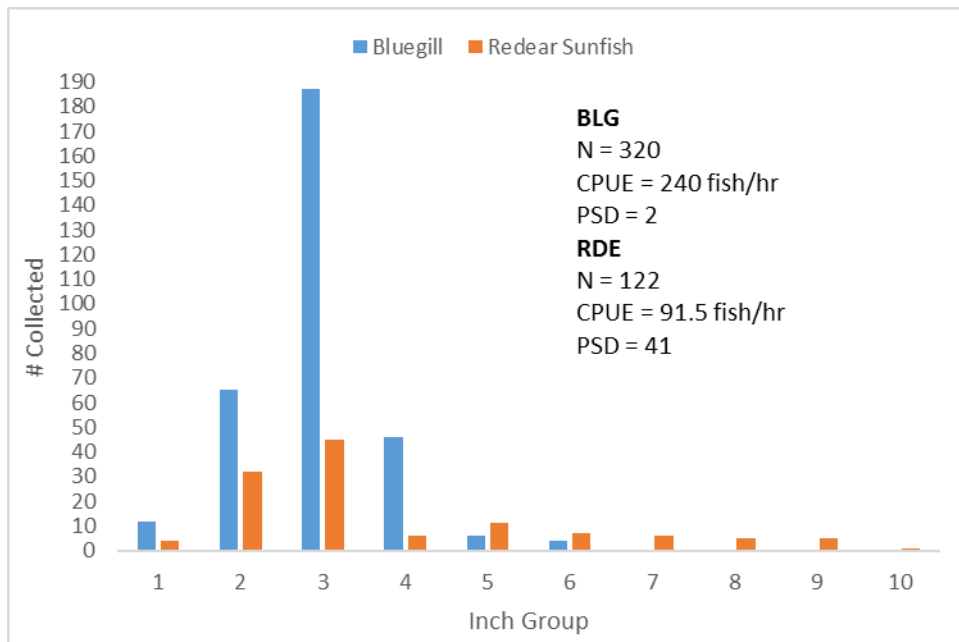


Figure 2. Length frequency distribution of bluegill and redear sunfish collected from electrofishing Lee Hall Reservoir, May 29, 2018

### Yellow Perch

The 2018 survey revealed a limited presence of yellow perch with only 22 collected (CPUE = 16.5 fish/hr). Past surveys of Lee Hall Reservoir revealed a yellow perch population dominated by fish less than 6 inches in length. The survey revealed a yellow perch distribution from 3.5 to 12 inches. The catch rate showed a decline from the 2015 survey (CPUE = 25 fish/hr). The largest perch measured 12.1 inches and weighed 1 pound. The perch distribution consisted of 5 fish greater than 10 inches in total length. The average-sized yellow perch still left something to be desired at a length of 7.3 inches, which showed a slight increase from 2015 (mean TL = 6.73 inches). These larger-sized

yellow perch may surprise an angler every now and then. Lee Hall Reservoir, if given enough time, can produce a few yellow perch in the 12 inch citation-size range.

### **Black Crappie**

The black crappie population in Lee Hall Reservoir has historically produced some larger fish over the years. Overall population density has shown a decrease in abundance. Black crappie tend to school up tightly in waters deeper than bass and bluegill. So the typical shoreline electrofishing run would miss the black crappie if they were holding in deeper water. The 2018 survey collected only 13 black crappie for a CPUE of 9.75 fish/hr. This catch rate is poor and showed a minor decline when compared to the 2015 survey (CPUE = 10.5 fish/hr). The size distribution consisted of fish from 4 to 12 inches. The limited sample size yielded an average black crappie length to be 7.7 inches, down from 2015 (mean TL = 8.05 inches). The largest crappie measured in at 12.4 inches with a weight of 0.98 pound. Lee Hall Reservoir has the potential to produce a few citation-sized crappie (15"+ or 2 lbs+). Angler will need to put their time in on the water to find these elusive fish.

### **Additional Species**

The 2018 electrofishing survey collected a total of 16 fish species. The sample collected limited numbers of brown bullheads (5), yellow bullhead (2), common carp (1), grass carp (2), American eels (29), white perch (1), chain pickerel (4), pumpkinseed sunfish (1), golden shiners (4), bluespotted sunfish (5) and warmouth sunfish (19). These species will provide some diversity to the fishery and the chance of surprising an angler every once in a while.

### **Summary**

The 2018 electrofishing survey of Lee Hall Reservoir showed a minor increase in the catch rate for largemouth bass when compared to the 2015 survey. Both of the last two surveys have had catch rates far above the historic average, but were below the all-time record CPUE found during the 2013 survey (121 bass/hr). The largemouth bass population has shown improvements over the last few years. The 2018 survey was conducted later than most previous surveys due to cooler than average weather in April and scheduling conflicts. An earlier survey would most likely have shown some larger female bass within shocking distance of the shoreline. Collected bass ranged in size from 1 to 20 inches with the average bass measured at 10.33 inches. Relative weight data of collected bass was very favorable and revealed the fish were finding sufficient forage.

The survey revealed a favorable increase in the catch of bluegill with 320 bluegill collected (CPUE = 240 fish/hr). The majority of the bluegill were less than 5 inches in total length. Anglers should not expect to catch too many large bluegill from Lee Hall Reservoir. The redear sunfish population is not as abundant as the bluegill population, but the redear sunfish have a greater growth potential. The largest redear sunfish measured in at 10.16 inches. The black crappie abundance showed a minor decline when compared to the 2015 survey. Black crappie catch rates have been spotty at best during electrofishing

surveys. Trap nets surveys are usually more productive during early spring. A few decent yellow perch in the 10 to 12 inch range were collected.

The survey showed a limited abundance of chain pickerel with only 4 collected. The excessive growth of curly leaf pondweed made for a difficult time observing and netting the stunned fish. The continued stocking of triploid grass carp by Newport News Waterworks over the last few years will hopefully be beneficial in cropping down the growth of this aquatic plant. The two collected grass carp measured 10.75 and 33.7 inches. Lee Hall Reservoir provides a decent place for anglers to enjoy the park setting of Newport News Park and the chance of catching some decent largemouth bass.