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Lee Hall Reservoir 2020 Fisheries Management Report Virginia Department of Wildlife Resources

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 15, 2020. The reservoir was last sampled on May 29, 2018. The 2020 survey consisted of sampling along four standardized shoreline sites. 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 within the middle reservoir basin. 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 14 fish species collected.

Table 1. Summary of the primary fish species collected by electrofishing of Lee Hall Reservoir, May 15, 2020

Species	# Collected	Catch Rate (CPUE #/hr)	Max Length (")	Average Length (")
Largemouth Bass	154	115.5	22.72	12.18
Bluegill	321	240.8	7.36	3.43
Yellow Perch	3	2.3	10.23	8.52
Redear Sunfish	220	165	10.16	4.99
Black Crappie	7	5.3	10.59	7.56

Largemouth Bass

The electrofishing survey produced 154 largemouth bass for a CPUE (Catch Per Unit of Effort) of 115.5 fish/hr. This catch rate showed an increase from the 2018 survey (CPUE = 94.5 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 2018 is 46 fish/hr. Therefore, the last few years have been pretty productive when compared to past surveys. The 2020

survey showed a promising display of preferred-sized bass with 50 fish greater than 15 inches in length. The CPUE-P of 37.5 fish/hr placed Lee Hall Reservoir near the top of the list for small impoundments sampled in Region 1, District 1 during 2020. This catch rate of preferred-sized bass is the highest on record for Lee Hall Reservoir.

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 two noticeable concentrations of fish in the 7 to 10 inch range as well as the 13 to 17 inch range. The average sized bass measured 12.18 inches, which showed a favorable increase from the 2018 survey (mean TL = 10.33 inches). The largest bass measured a decent 22.72 inches with a weight of 6.83 pounds, up from the 2018 survey (max wt. = 5.25 pounds).

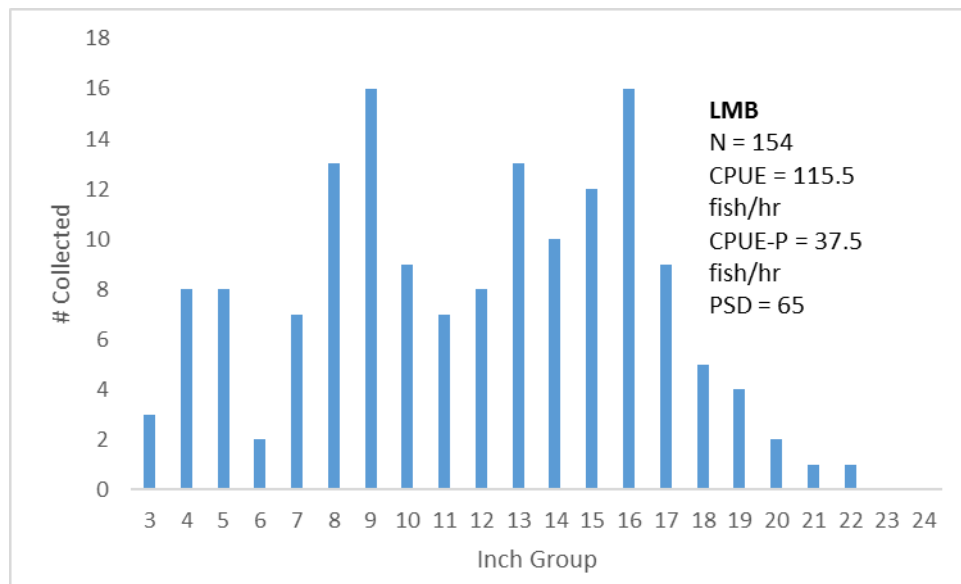


Figure 1. Length frequency distribution of largemouth bass collected from the electrofishing of Lee Hall Reservoir, May 15, 2020

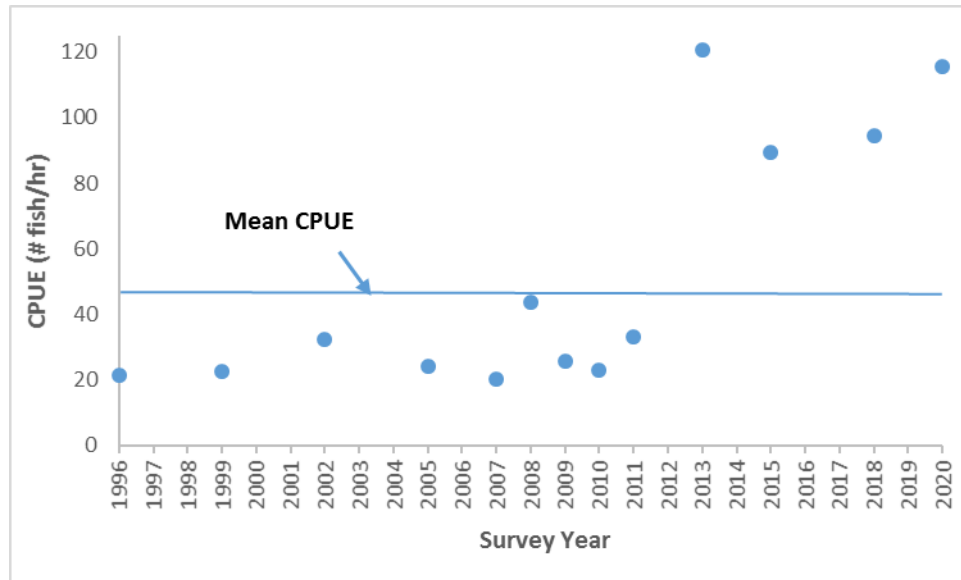


Figure 2. Comparison of past Largemouth Bass CPUEs (1996-2018) from electrofishing surveys of Lee Hall Reservoir

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 2020 value for PSD (65) showed a decline from the 2018 survey (PSD = 73). The 2020 RSD-P value (39) also showed an increase from 2018 (RSD-P = 34). The 2020 PSD value represents the collection of 127 stock-sized bass in which 83 of those bass were of quality-size (greater than 12 inches). A total of 50 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 historic mean for bass PSD is a high value of 78.25. 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 104, 102, and 99 respectively. The 2020 values showed a favorable values on par with the 2018 survey (stock = 103, quality = 101, preferred = 100). The abundance of juvenile yellow perch

found in past surveys was not detected during the 2018 and 2020 surveys. The largemouth bass may be keying in their foraging behavior on the gizzard shad population.

Bluegill and Redear Sunfish

The Lee Hall Reservoir bluegill population has historically consisted primarily of bluegill less than 6 inches in length. The 2020 survey revealed more of the same with a high proportion of bluegill less than 5 inches in total length. The survey collected 321 bluegill (CPUE = 240.8 fish/hr) over the course of the four electrofishing runs. The 2020 survey matched the 2018 survey (CPUE = 240 fish/hr). The historic catch rate (1996 – 2018) of bluegill from Lee Hall Reservoir has been 249 fish/hr. The bluegill length distribution ranged from 1 to 7 inches. The average sized bluegill measured only 3.43 inches, which was a minor increase from 2018 (mean TL = 3.37 inches). The largest bluegill measured 7.36 inches. Only five bluegill were greater than 6 inches in length. A total of 158 bluegill (49%) were within the 3-inch size class.

The bluegill PSD value of 2 showed a poor result and a match to the 2018 survey (PSD = 2). These values leave plenty of room for improvement when it comes to reaching the desired PSD range of 20-40. The 2020 survey collected five quality-sized bluegill from 209 stock-sized bluegill.

The redear sunfish population appears to be in decent shape. The survey collected 220 redear sunfish. The catch rate of 165 fish/hr showed a substantial increase when compared to the 2018 survey (CPUE = 91.5 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 4.99 inches, which showed an increase from 2018 (mean TL = 4.21 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.

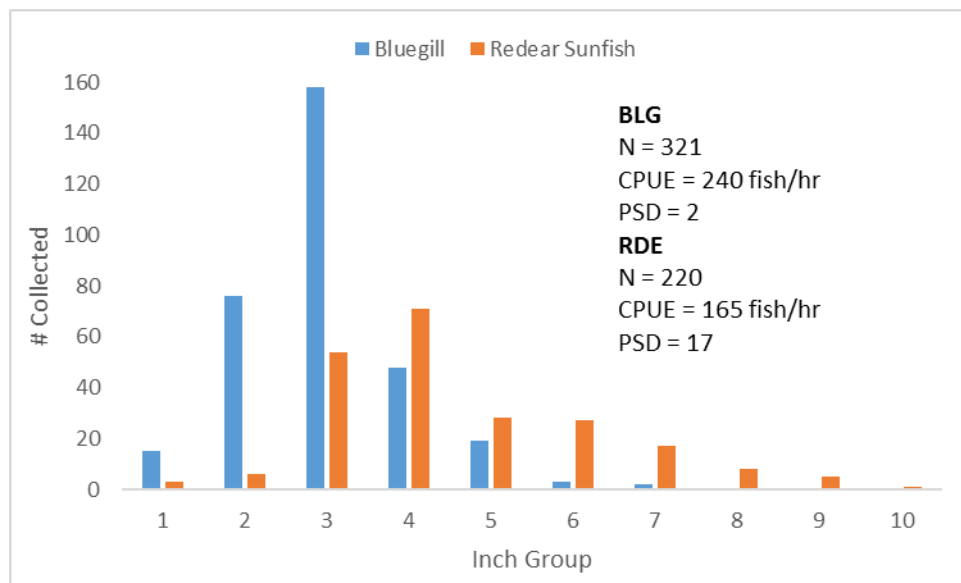


Figure 2. Length frequency distribution of bluegill and redear sunfish collected from the electrofishing of Lee Hall Reservoir on May 15, 2020

Yellow Perch

The 2020 survey revealed a limited presence of yellow perch with only 3 collected (CPUE = 2.3 fish/hr). Past surveys of Lee Hall Reservoir revealed a yellow perch population dominated by fish less than 6 inches in length. The 2020 perch collection measured from 7.56 to 10.24 inches, with the largest fish weighed at 0.58 pound. The catch rate showed a decline from the 2018 survey (CPUE = 16.5 fish/hr). The average-sized yellow perch, although a small sample set, measured 8.5 inches, which showed an increase from 2018 (mean TL = 7.3 inches). Past angler citation data has shown that Lee Hall Reservoir can produce a limited abundance of yellow perch in the 12-inch 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. Therefore, the typical shoreline electrofishing run would miss the black crappie if they were holding in deeper water. The 2020 survey collected only 7 black crappie for a CPUE of 5.25 fish/hr. This catch rate is poor and showed a minor decline when compared to the 2018 survey (CPUE = 9.75 fish/hr). The size distribution consisted of fish from 3.58 to 10.59 inches. The limited sample size yielded an average black crappie length to be 7.56 inches, which was down from 2018 (mean TL = 7.7 inches). The largest crappie measured in at 10.59 inches with a weight of 0.64 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 Collected

The 2020 electrofishing survey collected a total of 14 fish species. The sample collected limited numbers of brown bullheads (7), creek chubsucker (2), American eels (11), blueback herring (1), chain pickerel (9), pumpkinseed sunfish (4), golden shiner (1), bluespotted sunfish (2) and warmouth sunfish (16). Of note, the collected brown bullhead showed the most excitement with the average size at 12.27 inches. The largest brown bullhead measured 12.71 inches and weighed 1.37 pounds. The collected chain pickerel ranged in size from 1.5 to 16.5 inches, with the average size at 9.7 inches. These species will provide some diversity to the fishery and the chance of surprising an angler occasionally.

Summary

The 2020 electrofishing survey of Lee Hall Reservoir showed a major increase in the catch rate for largemouth bass when compared to the 2018 survey. Both of the last two surveys have had catch rates far above the historic average of 45.9 fish/hr. The largemouth bass population has shown improvements over the last few years. Collected bass ranged in size from 3 to 22 inches with the average bass measured at 12.18 inches. Relative weight data of collected bass was very favorable and revealed the fish to be in great physical shape and finding sufficient forage.

The survey revealed similarity to 2018 in the catch of bluegill with 321 bluegill collected (CPUE = 240.8 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 showed a favorable increase from 2018 and greater growth potential than the bluegill. The largest redear sunfish measured in at 10.16 inches. The black crappie abundance showed a decline when compared to the 2018 survey. Black crappie catch rates have been spotty at best during electrofishing surveys. Trap nets surveys are usually more productive during early spring to catch a higher density of black crappie. The survey revealed a decline in the abundance of yellow perch. The survey showed a limited abundance of chain pickerel with only nine collected.

The excessive growth of curly leaf pondweed within the middle reservoir basin 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 be beneficial in cropping down the growth of this aquatic plant. 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. Newport News Park provides boat rentals to anglers and the reservoir is a good place for kayak anglers to explore. Anglers should check in with the ranger station at the campground to pay for their daily use permits.

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