



## Lee Hall Reservoir 2012 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 the Chickahominy River and 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 17, 2011. The reservoir was last sampled on May 12, 2010. The 2011 sample consisted of shocking along 3 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 pond weed growth made for a difficult time of observing shocked fish. Each survey run consisted of 1200 seconds of effort for a combined total effort of 3,600 seconds (1 hour). Full community sampling was conducted on the first and third survey runs. The second survey run targeted only predator fish species of largemouth bass, chain pickerel, black crappie and yellow perch. 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 17, 2011.

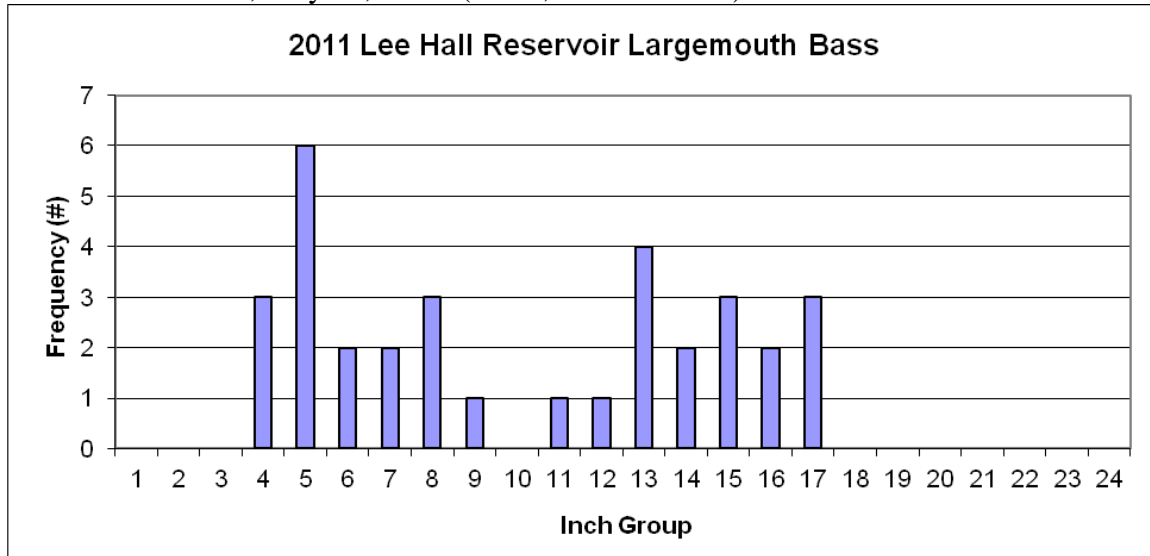
Species	# Collected	Catch Rate (CPUE)	Largest Length	Average Length
Largemouth Bass	33	33/hr	17.8"	10.6"
Bluegill	239	358.5/hr	6.4"	2.8"
Yellow Perch	65	65/hr	10.4"	5.1"
Pumpkinseed Sunfish	45	67.5/hr	5.4"	3.9"
Redear Sunfish	11	16.5/hr	7.1"	4.5"
Chain Pickerel	10	10/hr	22.6"	8.9"
Black Crappie	8	8/hr	11.9"	6.5"

### Largemouth Bass

The electrofishing survey produced a total of 33 largemouth bass for a CPUE (Catch Per Unit of Effort) of 33 f/hr. This catch rate showed an increase from the 2010 survey (CPUE: 23.1 f/hr). Lee Hall Reservoir has historically produced bass catch rates that fall well below other impoundments in Region 1, District 1. The electrofishing survey was conducted within the middle reservoir basin. An additional survey run in the lower reservoir basin was not conducted. 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. The overall distribution was less than ideal with very few fish greater than 15 inches collected. The average sized

bass measured 10.6 inches due to the large proportion of the collected bass being in the 4 to 8 inch size range. The largest bass measured only 17.8 inches and weighed 3.1 pounds.

Figure 1: Length frequency distribution of largemouth bass collected from electrofishing Lee Hall Reservoir, May 17, 2011. (N: 33, CPUE: 33 f/h)



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 – 70 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 2011 value for PSD (75) showed a major increase from the 2010 survey (PSD: 50). The 2011 RSD-P value (40) also showed an increase from 2010 (RSD-P: 33). The 2011 PSD value represents the collection of 20 stock-sized bass in which 15 of those bass were of quality-size (greater than 12 inches). A total of 8 preferred-sized bass were collected. These PSD value was above the desired range (PSD: 40–70) and the RSD-P value was at the high end of 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 (>8”, >12”, >15”) were 100, 99, 99 respectively. The 2011 values showed a favorable increase when compared to the 2010

sample (stock: 95, quality: 95, preferred: 91). The abundance of yellow perch and small sunfish provides a sufficient forage base for the largemouth bass.

### **Largemouth Bass Stocking Project Continued**

Lee Hall Reservoir was stocked with largemouth bass fingerlings each year from 2008 to 2010 as a three year study to see if supplemental stockings can strengthen the overall bass population. The bass were raised at the DGIF King & Queen Hatchery to an average size of 3 inches before being wire coded tagged. The tagged bass were stocked from a boat in a semi-pelagic manner around the middle basin of the reservoir. No largemouth bass fingerlings were stocked during 2011. The 2008 and 2010 stockings consisted of a stocking rate of 25 bass/acre for total fish stocked each year of over 5,800. The 2009 stocking rate was less due to problems at the hatchery. A total of 3,700 bass fingerlings were stocked in 2009. The increased numbers of largemouth bass will hopefully be able to control the abundance of sunfish that are present.

The 2011 electrofishing survey was able to collect 6 tagged bass out of the limited sample size of 33 total bass. Two bass from the 2010 stocking measured 7.8 and 8.3 inches in length. Three bass from the 2009 stocking were collected. These fish measured 11.7, 12.9 and 13.4 inches. Only one bass from the 2008 stocking was recovered. This fish measured 13.7 inches.

### **Bluegill**

Lee Hall Reservoir bluegill population has historically consisted primarily of bluegills less than 6 inches in length. The 2011 survey revealed more of the same with an abundance of juvenile bluegills. The sample collected 239 bluegills (CPUE: 358.9 f/h) over the course of two electrofishing runs. This catch rate showed a major decline from the high catch rate of 2010 (CPUE: 586.5 f/h). The bluegills ranged in size from 3 to 16 centimeter range (1.5 to 6 inch range). The average sized bluegill measured only 2.8 inches. The largest bluegill measured only 6.4 inches.

The bluegill PSD value of 2 showed a minor decline from the 2010 PSD value of 3. These values leave plenty of room for improvement when it comes to reaching the desired PSD range of 20-40. The 2011 sample collected two quality-sized bluegills from a total of 86 stock-sized bluegills. Bluegill growth rates are most likely feeling the pressure from direct competition from other sunfish species as well as the yellow perch population. The stunted nature of the bluegill population continues with every passing year even though catch rates have shown a decline. Juvenile bass, chain pickerel and mature black crappies have had some impact in reducing the abundance of juvenile bluegills. The catch rate of juvenile bluegills in 2010 was 312 fish/hr. The 2011 catch rate was only 153 juvenile bluegills/hr. Recent trap net surveys of Lee Hall Reservoir have shown some rather large brown and yellow bullheads that enjoy feeding upon 2 to 3 inch bluegills.

### **Yellow Perch**

Similar to past survey years, the electrofishing survey encountered a fair abundance of yellow perch. The yellow perch population appears to be dominated by fish

less than 6 inches in size with only a handful of perch reaching the 8 to 10 inch range. The sample collected 65 yellow perch (CPUE: 65 f/h) and showed a decline from the 2010 survey (CPUE: 100.3 f/h). The largest perch measured 10.4 inches. The high number of juvenile yellow perch brought the average size down to 5.1 inches. The majority of the sample consisted of yellow perch in the 4 to 6 inch size range. Compared to past surveys, there was an increase in 6 to 8 inch perch. The abundance of small yellow perch should provide a great forage base for the bass and chain pickerel. Lee Hall Reservoir, if given enough time, can produce a few yellow perch in the 12 inch citation-size range.

### **Pumpkinseed Sunfish**

The pumpkinseed sunfish size distribution has not changed much from year to year. The collected pumpkinseed sunfish ranged in size from 7 to 13 centimeters (3 to 5.5 inches). The sample collected 45 pumpkinseed sunfish (CPUE: 67.5 f/h) and showed a major decline from the 2010 sample (CPUE: 408 f/h). Pumpkinseed sunfish are one of the more colorful sunfish species that tend to have a smaller size potential than other species like bluegills and redear sunfish. Anglers can still expect to catch a fair number of pumpkinseed sunfish while fishing for bluegills on Lee Hall Reservoir. The pumpkinseed sunfish will provide young anglers with some action even though their overall size structure is rather limited.

### **Redear Sunfish**

The redear sunfish population appears to be in decline with only 11 redear sunfish collected. The catch rate of 16.5 redear sunfish/hr showed a decline when compared to the 2010 survey (CPUE: 39 f/h). The majority of the sample consisted of redear sunfish in the 7 to 12 centimeter range (3 to 5 inches). The average size redear sunfish was 4.5 inches in length. The largest redear sunfish measured 7.1 inches. The redear sunfish have the potential to grow to larger sizes than the bluegills and pumpkinseed sunfish that are present in Lee Hall Reservoir. The redear sunfish population may be stronger than what was represented during the 2011 survey. The mid-May sample time is usually when most adult redear sunfish will be spawning. Taking this into account, the schools of redear sunfish may have just not been encountered during the survey runs.

### **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 crappies tend to school up tightly in waters deeper than bass and bluegill. So the typical shoreline electrofishing run would miss the black crappies if they were holding in deeper water. The 2011 survey collected only 8 black crappies for a CPUE of 8 f/hr. This catch rate is poor, but still showed an increase from the 2010 survey (CPUE: 1.7 f/h). Past trap net surveys have been able to collect a higher abundance of black crappies with a decent size structure of fish in the 9 to 12 inch range. The 2011 size distribution consisted of fish from 11 to 30 centimeters (4.3 to 11.9 inches). The limited sample size yielded an average black crappie length to be 6.5 inches with the largest crappie measured at 11.9 inches. Lee Hall Reservoir has the potential to produce citation-sized crappies (15"+ or 2 lbs+). A banner year was 2007 with the report of 17 black

crappie citations caught by anglers. Three citation crappies were caught in 2008. No citations have been reported by anglers in 2009 and 2010. One citation crappie was reported in 2011.

### **Chain Pickerel**

The electrofishing sample collected only 10 chain pickerel for a CPUE of 10 f/h. This poor catch rate falls closely in line with the 2010 sample (CPUE: 9.4 f/h). The collected pickerel ranged in size from 3 to 22.6 inches. The limited sample size yielded an average size pickerel of 8.9 inches. It is too early to tell if the larger pickerel were hiding in deeper water or if they have been harvested by anglers. One positive sign of the 4 stock-sized pickerel was the fact that their overall relative weight value was 104. This value showed that these fish were finding a more than adequate supply of forage fish.

### **Additional Species**

The 2011 electrofishing sample collected a total of 16 fish species. The sample collected limited numbers of brown bullheads (6), white catfish (1), American eels (4), eastern silvery minnow (1), golden shiners (22), banded sunfish (1), bluespotted sunfish (2), creek chubsucker (32) and warmouth (4). These species will provide some diversity to the fishery and the chance of surprising an angler every once in a while.

### **Summary**

The 2011 electrofishing survey of Lee Hall Reservoir showed an increase in the catch rate for largemouth bass when compared to the 2010 survey. A total of 33 largemouth bass were collected over the 1 hour of effort. Collected bass ranged in size from 4 to 17 inches with the average bass measured at 10.6 inches. The survey collected 239 bluegills in 40 minutes of sampling time. The majority of the bluegills were in the 2 to 4 inch range. Only two bluegills reached the 6 inch measurement mark. The survey showed the yellow perch and pumpkinseed sunfish populations to be dominated by fish less than 6 inches in length. The survey showed a limited abundance of chain pickerel with only 10 collected. Recent fall sampling has shown better catch rates of chain pickerel during October and November surveys.

The DGIF listing of citations showed anglers reported 6 citations caught from Lee Hall Reservoir during 2011. The citations were for 4 largemouth bass, 1 yellow perch and 1 black crappie.