



## Holliday Lake 2016

Holliday Lake is a 145-acre impoundment owned and operated by the Virginia Department of Conservation and Recreation. The lake is the focal point of the 250-acre Holliday Lake State Park located in the Appomattox-Buckingham State Forest. The lake is steep-sided and clear. There is a boat ramp providing anglers access to the lake as well as a hiking trail that provides bank fishing access. Warmwater fish species at Holliday Lake include largemouth bass, bluegill, redear sunfish, channel catfish, black crappie, and yellow perch. The largemouth bass fishery is managed with a 12-inch minimum length limit and five fish per day creel limit. All other species are under general statewide fishing regulations.

Spring electrofishing sampling is conducted periodically by Virginia Department of Game and Inland Fisheries biologists to assess the health of the Holliday Lake fishery. The largemouth bass fishery changed somewhat since the lake was last sampled with fewer fish in the smaller size classes (10"-11") but more larger fish (13"-15"). The fishery was dominated by bass less than 12 inches but most bass in 2015 fall between 12"-15". Overall the density of bass in Holliday Lake remained stable but the size structure shifted to larger sizes.

Besides largemouth bass, Holliday Lake also provides a fishery for several "panfish" species. Bluegill are present in Holliday Lake but their numbers continue to decline since the illegal introduction of yellow perch in the late 1990's. Since 1998, bluegill numbers have declined from over 700 fish/hour sampled by electrofishing to only 17 fish/hour in 2015. There are limited numbers of bluegill over eight inches present in the reservoir but most bluegill are in the 7-8 inch range. Similarly, redear sunfish numbers in our samples were nearly non-existent in 2015 with only four redear observed in our electrofishing survey. Redear have never been plentiful at Holliday Lake but there were fish up to 10 inches collected. Black crappie are also present in limited numbers at Holliday Lake. Nearly all crappie sampled in 2015 were between nine and twelve inches.

Yellow perch have become well established at Holliday Lake. The density of the species seems to have stabilized since the explosion in numbers in the early 2000's. There is now the opportunity to catch perch 10-12 inches but they are in low abundance. This is a great opportunity for anglers to fish for and catch a species that is not common in Southside Virginia but the introduction has taken a toll on the other warmwater species in the lake. Sunfish numbers have declined drastically and this could impact the largemouth bass as they rely on an abundant sunfish population. Bluegill have always been the dominant prey for largemouth bass in the system but their numbers have declined in the past ten years, the largemouth fishery could be impacted. We will continue to monitor the Holliday Lake fishery and hope that the sunfish species can rally. Enjoy fishing for and keeping yellow perch from Holliday Lake, yellow perch provide great tasting freshwater fillets!

Holliday Lake is restricted to electric motor or paddle only to enhance the experience of this beautiful park. The lake can be reached by following state route 626 east from route 24 (north of Appomattox). Follow route 626 until the turn-off on state route 723 that will take you to the lake. Signs are posted to assist visitors in finding the state park and boat launch facility. There is a fee to enter the park and access the boat ramp.

## Methods

- Four runs totaling 1.82 hours of daytime, boat electrofishing (entire shoreline) were completed on 4/13/15 for community assessment and largemouth bass population dynamics information. Water temperature was 19° C.

## Key Findings

- Density of largemouth bass was very similar the last three samples; CPUE was 129 fish/hr (2015), 139 fish/hr (2008), and 136 fish/hr (2005). Although CPUE remained stable, CPUE changed dramatically for bass in the Stock (200-299 mm), Quality (300-379 mm), and Preferred (880-509 mm) size classes. Stock size declined while Quality and Preferred increased.
- There was a significant shift in the size distribution in 2015 toward larger fish from the previous samples in 2005 and 2008. The fishery is dramatically truncated at 38 cm, average size of adults ( $\geq 200$  mm) was 335 mm which is an increase from 2008 sampling which averaged 262 mm. Ninety four bass were collected (80 fish/hr) larger than 320 mm in 2015 but only three fish were collected (3 fish/hr) larger than 320 mm in 2008.
- Proportional Stock Density (PSD) was very low in 2008 with a value of 12 and was less than half the value in 2005 (40) but had rebounded to 87 in 2015. While the 2015 improvements are dramatic, the number of Stock size (200-299 mm) collected was unusually low which increases this value higher than it would have been with average stock size catch rates.
- Growth data on largemouth bass was collected in 2015 for the first time since 2002. Growth was fair and comparable to the previous sample. Few older fish were collected, except age 6, indicating bass are not stockpiled and there is adequate harvest, possibly too much harvest. Bass currently reach the minimum size between 2 and 3 years of age. Holliday Lake is relatively infertile, so high growth rates are not expected.
- Catch rates of 1 and 2 year old fish was low and a potential concern for future recruitment into larger sizes. Additional sampling, possible later in the spring may be warranted to check recruitment. Early spring sampling may not reflect young bass numbers due to high water clarity and limited cover for much of the lake.
- Bluegill CPUE declined to 27 fish/hr in 2008 (72 fish/hr, 2005) and again in 2015 (17 fish/hr). These catch rates are much lower than averages for other regional small lakes. The 2008 and 2015 samples were collected when water temperatures were cooler than samples collected before 2008, and the extreme low catch rates may have been influenced, to some extent, by sample timing.
- PSD of bluegill was normal to high with a value of 67 but RSDp was high at 50, potentially indicating a fishery dominated by larger bluegill that is being heavily preyed upon.
- Redear sunfish densities have historically been low and continue to remain a minor contributor to the sunfish population.

- Black crappie were sampled in fairly low numbers in all years sampled 2002-2015 (average = 35 fish/hr). Most fish collected in 2015 were between 240-310 mm and were 3-6 years of age. Crappie growth is good and angler harvest is not high enough to “crop” off good year classes as quickly as observed in some of the other regional small lakes, based on the number of older fish collected.
- Yellow perch relative abundance in 2015 (50 fish/hr) increased from the two previous samples. However, 41 one of those were age 1 fish and the number of adult perch in the lake remains low compared to sampling in 2002 when they were first sampled in the lake. Yellow perch growth is adequate to achieve sizes desirable for harvest by anglers based on growth data collected in 2015, where fish reach 278 mm by age 4.

### **Management Recommendations**

- Continue to monitor largemouth bass size structure every second year.
- Schedule the next sampling for Holliday Lake in late April or early May to improve sunfish and younger bass collections.
- Stock channel catfish at 10 per acre annually if funds allow.

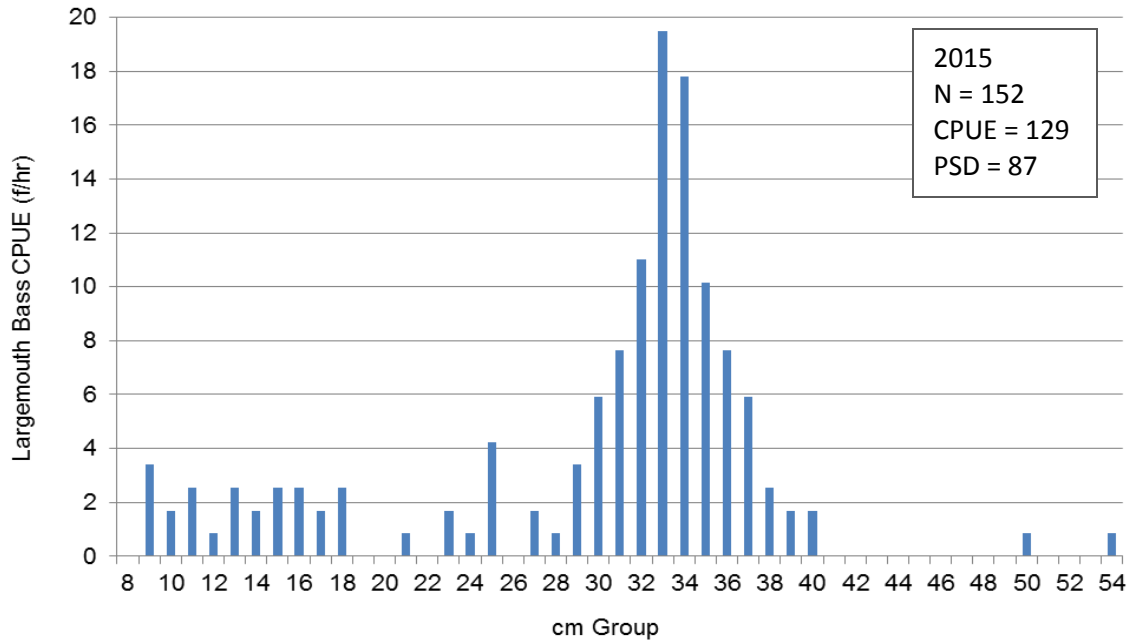


Figure 1. Length frequency distribution for largemouth bass collected by electrofishing Holliday Lake on 4/14/15.

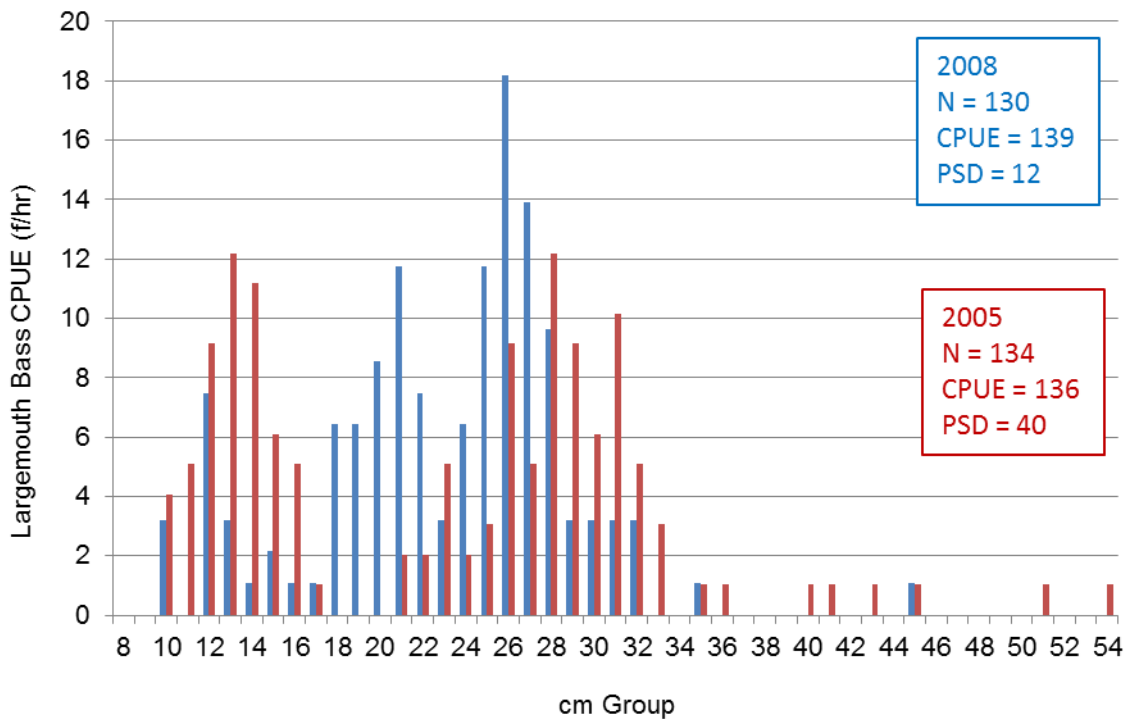


Figure 2. Length frequency distribution for largemouth bass collected by electrofishing Holliday Lake on 5/11/05 and 4/18/08.

Table 1. Largemouth bass electrofishing CPUE (fish/hr) data collected from Holliday Lake, spring 2002-2015.

Year	N	Total CPUE	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	CPUE Memorable	Sample Time
2015	152	129	22	14	86	7	0.8	1.1800
2008	130	139	32	94	11	1	1.1	0.9350
2005	134	136	54	50	26	4	2.0	0.9836
2002	111	111	43	32	33	3	0.0	1.0000

Table 2. Largemouth bass proportional and relative stock indices collected from Holliday Lake during 2002-2015 spring electrofish sampling.

Year	PSD	RSDp	RSDm
2015	87	7	0.8
2008	12	2	1.0
2005	40	7	2.5
2002	53	4	0.0

Table 3. Largemouth bass age and growth data for Holliday Lake collected in 1998, 2002, and 2015.

Year		Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8
2015	mm	155	267	338	340	340	354	325	353
	N	5	5	11	8	1	6	1	1
2002	mm	135	239	309	350	342	398	379	334
	N	42	27	20	4	10	3	3	2
1998	mm	139	220	296	329	348	366	350	
	N	8	27	24	6	8	1	1	0

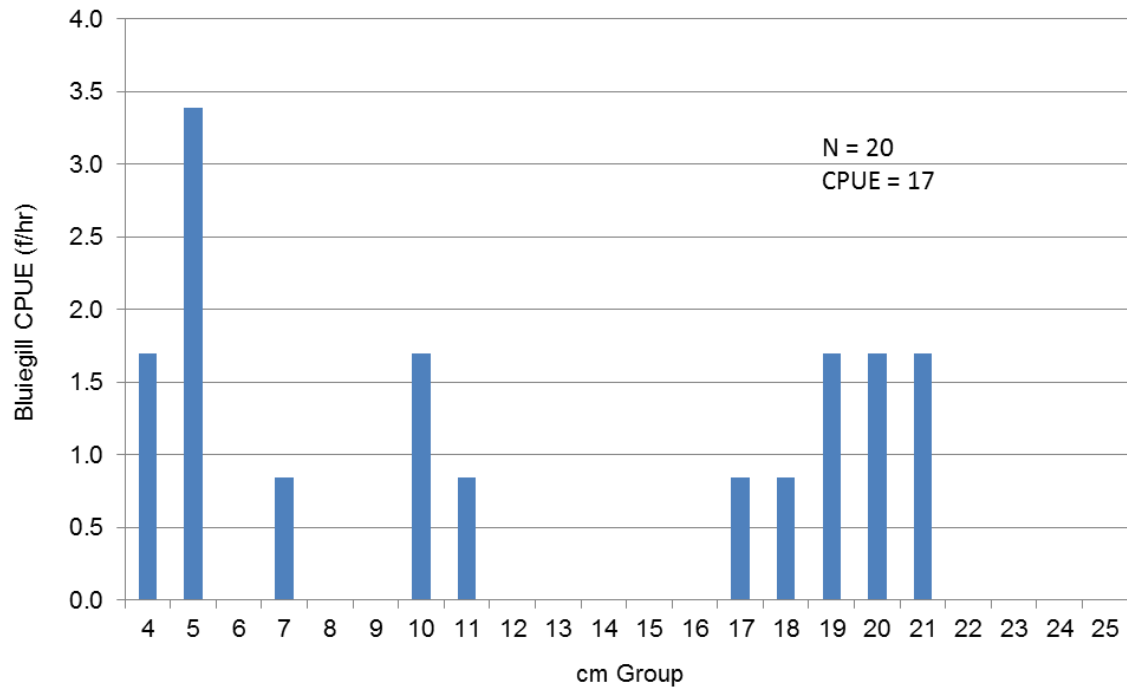


Figure 3. Length frequency distribution for bluegill collected by electrofishing Holliday Lake on 4/14/15.

Table 4. Bluegill electrofishing CPUE (fish/hr) data collected from Holliday Lake, spring 2002-2015.

Year	N	Total CPUE	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	Sample Time
2015	20	17	7	3	2	5	1.1800
2008	25	27	0	1	20	5	0.9350
2005	24	72	9	18	42	3	0.3333
2002	41	82	16	54	6	6	0.5000

Table 5. Bluegill proportional and relative stock indices collected from Holliday Lake during 2002-2015 spring electrofish sampling.

Year	PSD	RSDp
2015	67	50
2008	96	20
2005	71	5
2002	18	9

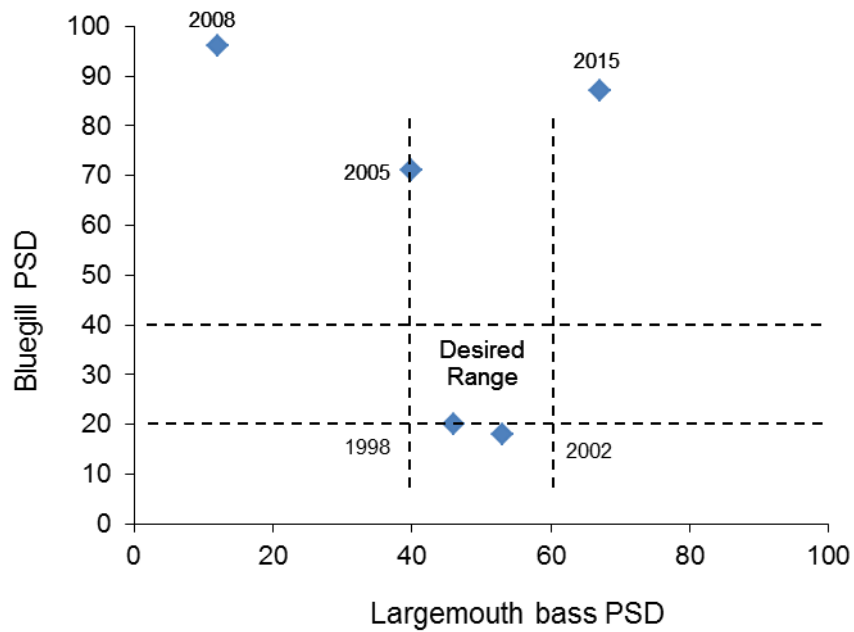


Figure 4. Largemouth bass/bluegill PSD relationship based on electroshocking surveys at Holliday Lake, 1998-2015.

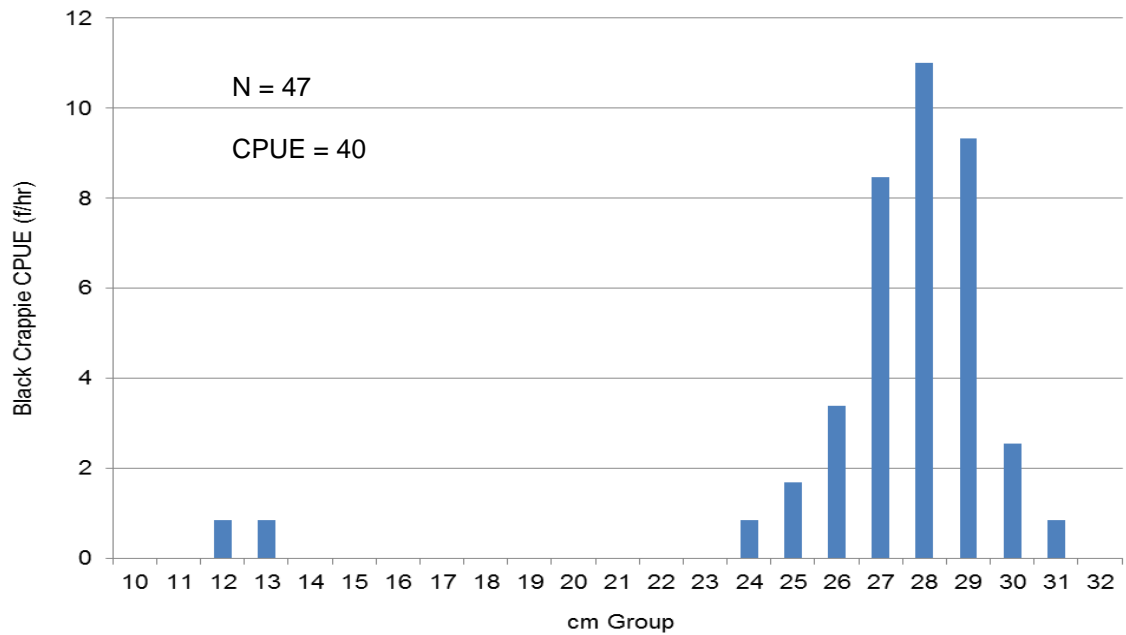


Figure 5. Length frequency distribution for black crappie collected by electrofishing Holliday Lake on 4/14/15.



Table 6. Black crappie electrofishing CPUE (fish/hr) data collected from Holliday Lake, spring 2002-2015.

Year	N	Total CPUE	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	Sample Time
2015	47	40	1	1	1	37	1.1800
2008	28	30	0	0	25	5	0.9350
2005	49	50	2	8	34	6	0.9836
2002	16	21	4	4	8	5	0.7500

Table 7. Black crappie proportional and relative stock indices collected from Holliday Lake during 2002-2015 spring electrofish sampling.

Year	PSD	RSDp
2015	98	96
2008	100	18
2005	83	13
2002	77	31

Table 8. Black crappie age and growth data for Holliday Lake collected in 1998 and 2015.

Year		Age 2	Age 3	Age 4	Age 5	Age 6	Age 7
2015	mm	132	270	290	285	290	300
	N	1	10	7	2	7	1
1998	mm	139	181	217	237	268	280
	N	2	8	35	19	1	8

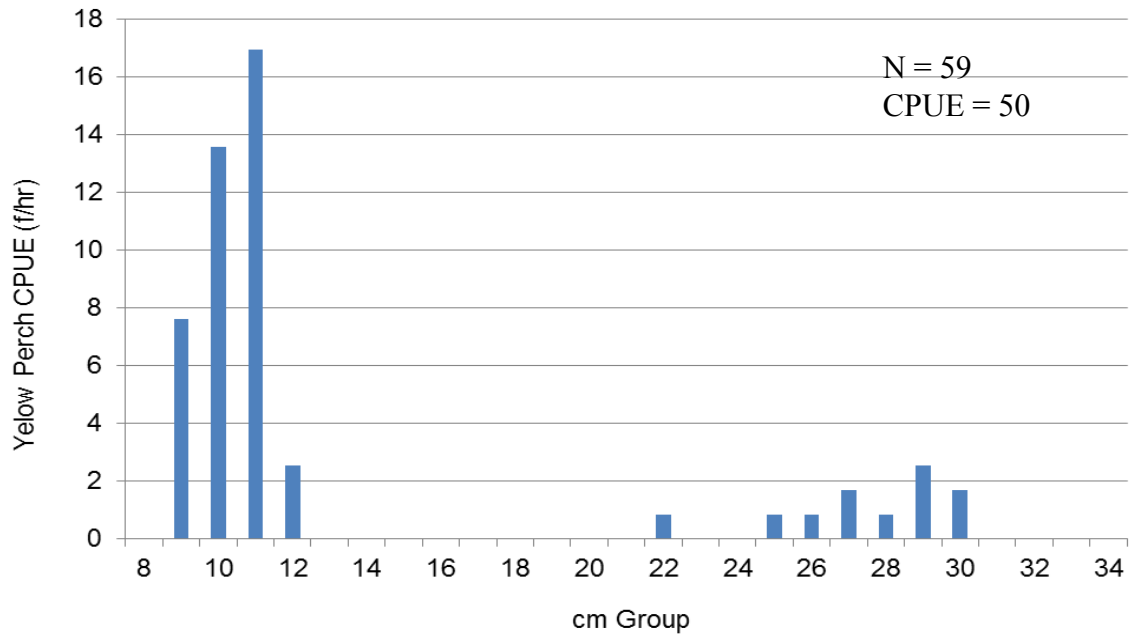


Figure 6. Length frequency distribution for yellow perch collected by electrofishing Holliday Lake on 4/14/15.

Table 9. Yellow perch electrofishing CPUE (fish/hr) data collected from Holliday Lake, spring 2002-2015.

Year	N	Total CPUE	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	Sample Time
2015	59	50	41	0	1	8	1.1800
2008	22	24	0	4	13	6	0.9350
2005	13	13	1	2	4	6	0.9836
2002	107	214	148	60	6	0	0.5000

Table 10. Yellow perch proportional and relative stock indices collected from Holliday Lake during 2002-2015 spring electrofish sampling.

Year	PSD	RSDp
2015	100	91
2008	82	27
2005	83	50
2002	9	0

Table 11. Yellow perch age and growth data for Holliday Lake collected in 2015.

	Age 3	Age 4	Age 5	Age 6	Age 7
mm	231	278	280		300
N	1	6	2	0	1