2017 Lake Keokee Fisheries Management Report

Lake Keokee is a 92-acre Department-owned impoundment located in Lee County, Virginia and lies within the Clinch Ranger District of the Jefferson National Forest. At normal pool elevation the reservoir has a maximum depth of 35 feet and a mean depth of 17 feet. The lake is surrounded by forested land, and provides a beautiful setting for a fishing trip.

When the lake was constructed in 1975, much of the timber within the lake basin was left standing for fish habitat. Over time the trees deteriorated and toppled into the lake. Although trees and brush can provide good fish habitat, the accumulation of fallen timber prevented boats from safely accessing many areas of the lake. The problem was compounded by the fact that water and ice support the submerged portion of a standing tree, so that the break often occurred at, or just below, the water's surface. The remaining stump or stob was a navigational hazard. It is difficult for anglers and boaters to avoid bumping into these stobs, and a boat can easily get lodged on top of one that is hidden just beneath the lake's surface.

In 2002, a project was initiated to draw down the lake and remove much of the fallen timber to improve boat access and increase public safety. The project was a cooperative effort of the Department and the U. S. Forest Service, Clinch Ranger District. The improved access allows more thorough fish population sampling, as well as increased management options. For instance, improved access allows biologists to fertilize the lake to increase productivity. During the time that the lake was drawn down, the exposed soil was aerated and re-vegetated naturally. All of the water was not released from the lake during the draw down process. A conservation pool was maintained so that fish in the lake would remain there until the lake refilled. However, biologists stocked fingerling largemouth, bluegills, redear sunfish and channel catfish after the lake refilled to compensate for any recruitment losses incurred during the drawdown.

In 2011, biologists began a project to improve the water chemistry of the lake through powdered lime and fertilizer applications. The project goal is to improve water quality and increase primary production in the lake and increase fish population abundance. Lake liming is performed every other year and fertilizer is generally applied every few weeks from May through October as needed.

Regulations

As of spring 2016 the fish populations in Lake Keokee were managed under statewide regulations as follows:

Species	Length Limit	Creel Limit
Largemouth bass	none	5 per day
Bream (all species combined)	none	50 per day
Crappie	none	25 per day

In summer 2016, an 18-inch minimum length limit and 5 fish per day creel limit was implemented for channel catfish in Lake Keokee. The purpose of this regulation change is to improve the size structure of the channel catfish population and distribute the harvest of stocked channel catfish more evenly among anglers.

Stocking

Approximately 1,100 catchable-size channel catfish (average length = 11 inches) were stocked into Lake Keokee in fall 2016.

Habitat

No fertilizer was applied in 2016, but the fertilization program will resume in spring 2017.

Population Sampling

Fish populations at Lake Keokee are sampled each year in May using boat-mounted electrofishing gear. Fish collected during these population surveys are measured, weighed and released back into the lake. Sampling time is recorded in seconds so that the relative abundance (number of fish collected per hour) can be determined. Biologists get important information about the size structure of the population by looking at the length data. The abundance and size structure data allow biologists to compare the current sample collection to past results and to the results of samples collected at other lakes.

Largemouth Bass - The relative abundance (number collected per hour of sampling) of largemouth bass during the 2016 sample was 96 fish/h (Figure 1). This represents a substantial increase in abundance from the previous year and can be largely attributed to an increase in the number of adult (≥ 8 inch) largemouth bass from 2015. The catch rate of adult largemouth bass in 2016 was 72 fish/h compared to 35 fish/h in 2015 representing a 105% increase. The catch rate of juvenile (≤ 8 inch) bass was also slightly higher in 2016.

Largemouth bass observed in the 2016 sample ranged in length from 3 – 20 inches with an average length of 9.2 inches (Figure 2). The proportion of adult largemouth bass that were ≥ 15 inch decreased in 2016 and was one of the lowest observed since the liming and fertilization project began (Figure 3). One percent of the adult largemouth bass measured 20 inches or longer.

The predominance of small largemouth bass in Lake Keokee suggests the growth for this species may still be slow despite the fertilization and liming efforts. The length distribution of largemouth bass might also suggest high harvest mortality once fish reach 10-11 inches in length. Although there is no minimum length limit currently in place for this species on Lake Keokee, the significant decline in fish above 10-11 inches may suggest this as the minimum length acceptable to anglers for harvest.

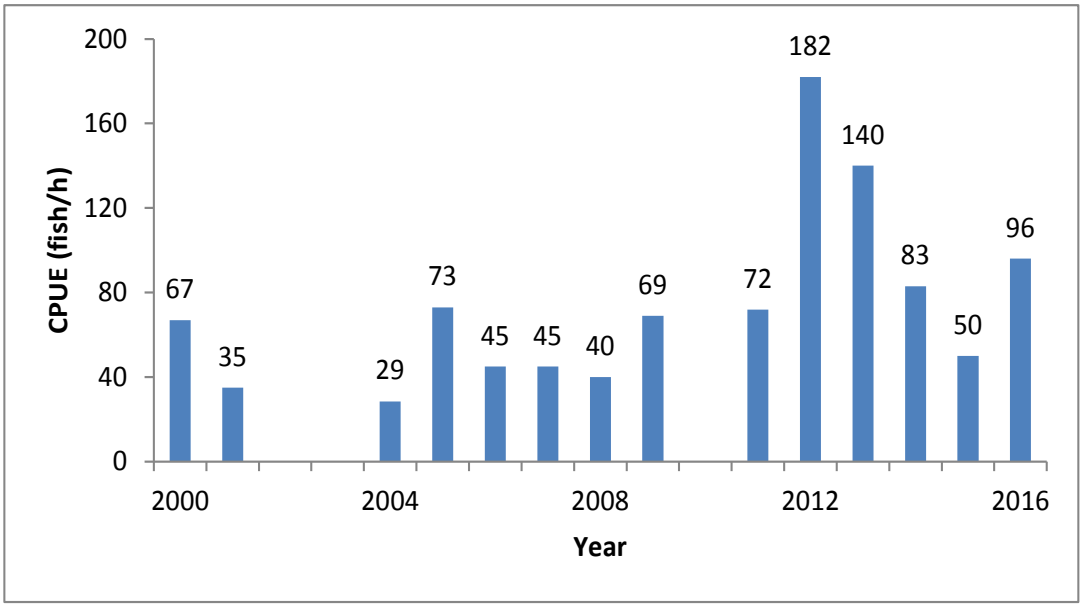

Figure 1**.** Number of largemouth bass collected per hour of sampling in Lake Keokee 2000-2016. The lake was not sampled from 2002, 2003, or in 2010.

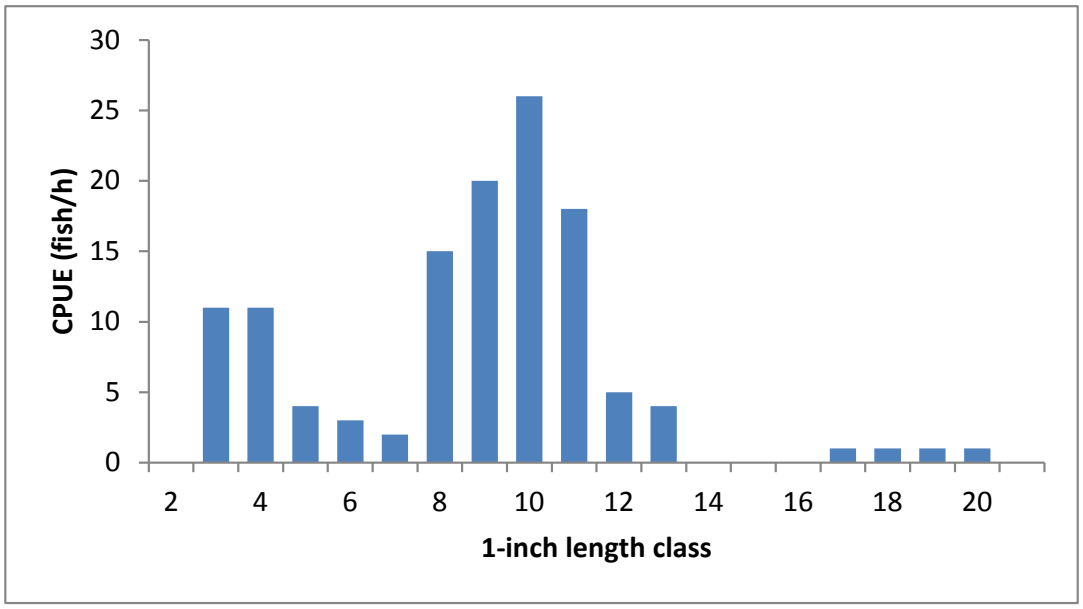

Figure 2**.** Length frequency distribution of largemouth bass collected during Lake Keokee electrofishing samples in spring 2016.

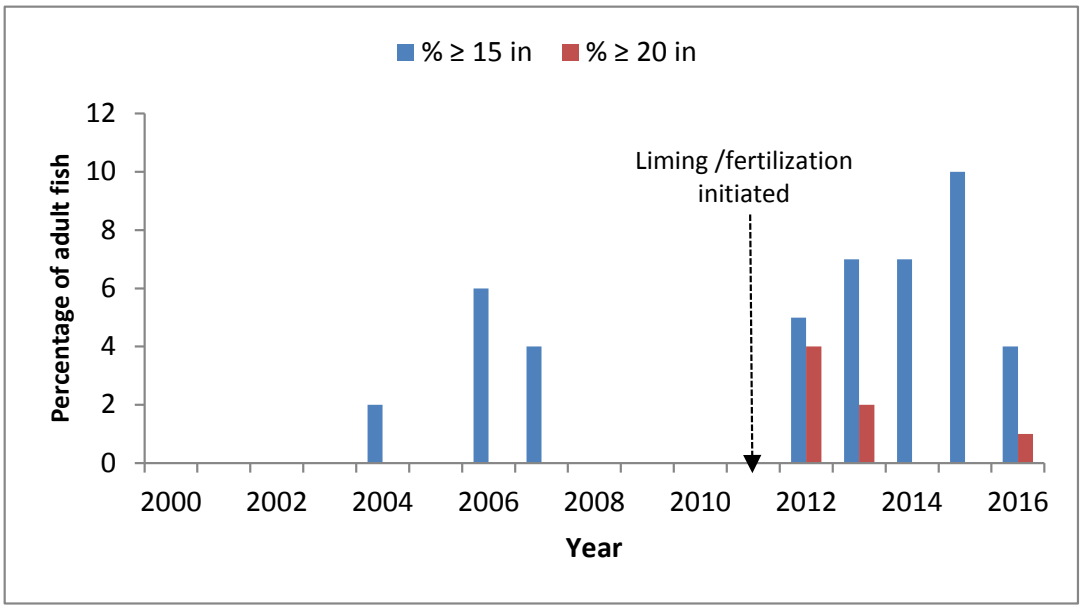

Figure 3**.** Proportion of adult (**≥** 8 inch) largemouth bass in two size group (**≥** 15 in and **≥** 20 in) collected during Lake Keokee electrofishing samples in spring 2016. The lake was not sampled in 2002, 2003, or in 2010.

Sunfish - Similar to the pattern observed in largemouth bass, the relative abundance of bluegill increased substantially in 2016 to 103 fish/h (Figure 4). The proportions of quality (≥ 6 inch) and preferred (≥ 8 inch) bluegill were higher than that observed in recent years at 75% and 21%, respectively. The abundance of redear sunfish in the current sample (11 fish/h) was up slightly

from 2015 (9%). Seventy-one percent of the redears sampled in 2016 were ≥ 7 inches and 29% were ≥ 9 inches. Anglers frequently report catching large bluegill and redear.

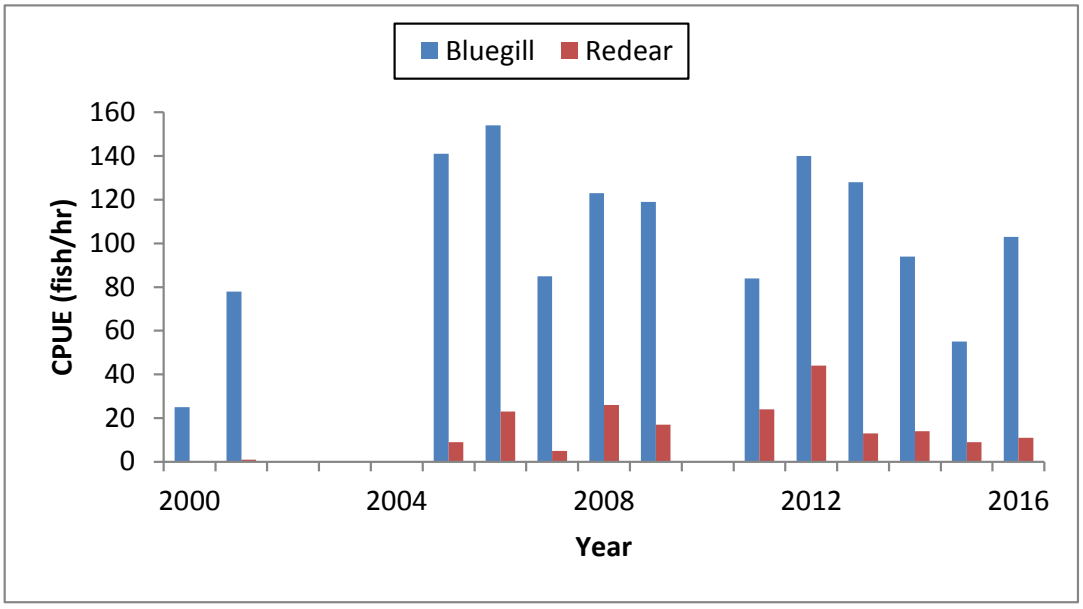

Figure 4**.** Number of bluegill and redear sunfish collected per hour of electrofishing at Lake Keokee from 2000 through 2016. The lake was not sampled in 2002, 2003, or in 2010.

Crappie - Black crappie were first collected at Lake Keokee in the 2005 electrofishing sample. Crappie may have been present prior to 2005, but undetected by electrofishing because much of the shoreline was inaccessible. The 2016 sample produced a total of 11 fish representing a slight increase in relative abundance (9 fish/h) compared to 2015 (Figure 5).

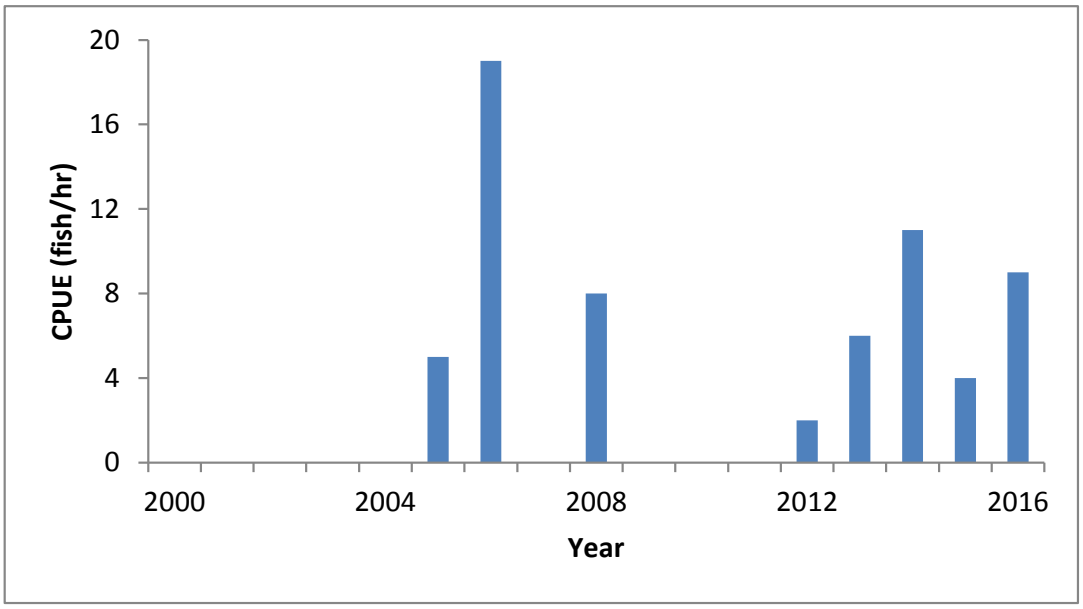

Figure 5 . Number of black crappie collected per hour of sampling in Lake Keokee 2000-2016. The lake was not sampled in 2002, 2003, or in 2010

In summary, Lake Keokee offers good fishing for largemouth bass, bluegills and redear sunfish, although most of the fish caught will be small. Some larger individual fish are present, especially bluegills and redear sunfish, and may provide a memorable day for the lucky or skillful angler. VDGIF biologists continue to seek solutions for improving the quality of the fishery. The partial drawdown, and subsequent removal of standing and fallen trees around the shoreline, improved navigability but did not provide long term improvements to the fishery. Although the largemouth bass population in Lake Keokee appears to be benefiting from the liming and fertilization efforts, additional years of monitoring data will be needed to determine if improvements are sustained over the long term.

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