

Barkley Lake Bass Assessment 2017

Lake Barkley is a mainstem reservoir on the Cumberland River in western Kentucky and western Tennessee. Barkley Lake was completed in 1966 to form the 57,920-acre reservoir, of which 41,775 acres lie in Kentucky. The Kentucky portion of Barkley Lake is classified as a eutrophic lake.

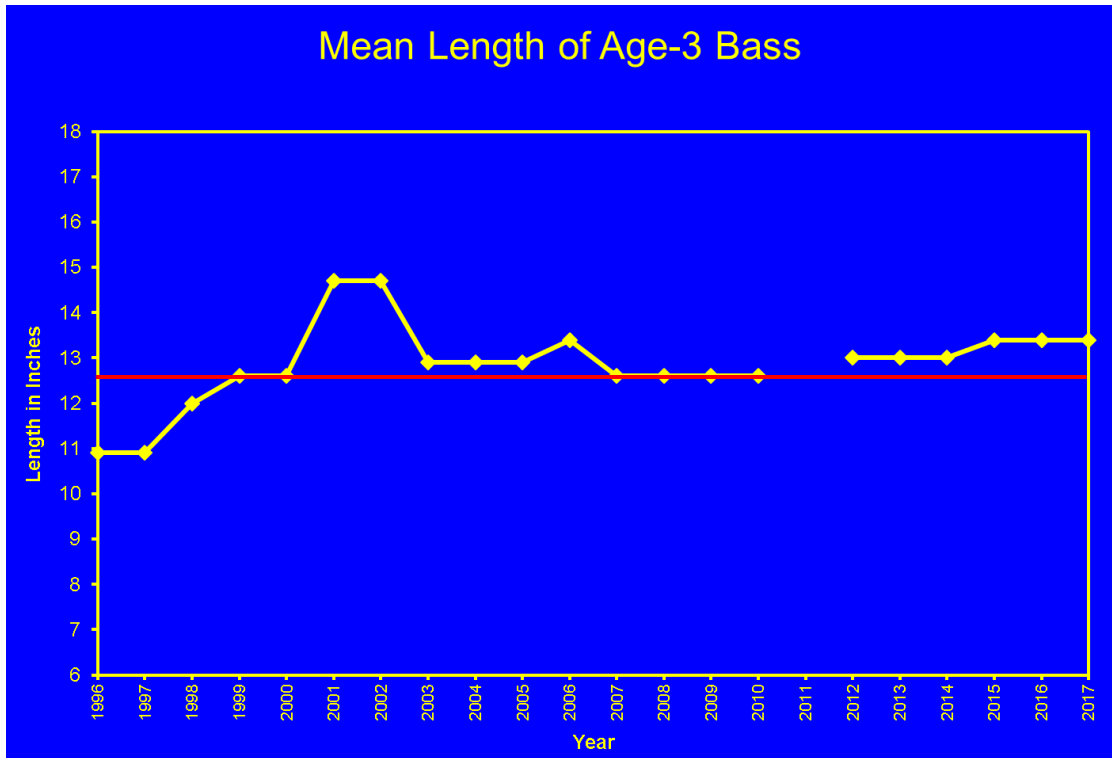
Water levels at Lake Barkley fluctuate annually approximately 5 feet between summer and winter pool levels. Winter pool level is 354-ft above mean sea level (msl) and is obtained by the first of December. Water levels begin to rise on April 1 to reach summer pool level of 359-ft msl by May 1. The water level is drawn down from summer pool around July 5th. Occasionally, some embayments of Lake Barkley will thermally stratify during mid to late summer.

Fish habitat in the form of aquatic vegetation, tree stumps and standing timber is limited in Barkley Lake. Aquatic vegetation (Eurasian water milfoil, Naiad, Coontail, and Pondweed) cycles with rainfall in the lake. Vegetation increased dramatically when water clarity increased due to drought conditions during 1985 through 1988. Declines in the acreage of aquatic vegetation occurred during the 1990's with a return to normal rainfall patterns and decreases in water clarity. Between 2001 and 2007, there were periods of dry weather which played a part in increased water clarity and aquatic vegetation in the lake. During these periods, the black bass population excelled. The weed beds provide a nursery area for small fish, and a good feeding ground for larger bass. The woody structure in the lake consists of stumps left along creek channels prior to impoundment, trees that have fallen along the shoreline and buttonball bushes that grow in the shallow littoral zone. However, over time stumps rot away, buttonball bushes die due to inundation, and the fallen trees deteriorate within a few years or wash away. The Fisheries Division of the Kentucky Department of Fish and Wildlife Resources and local anglers have added stake beds, brush piles, and planted cypress and willow tree saplings throughout the lake to replace lost habitat.

The cumulative effect of filter feeding Asian carps and newly established zebra mussels may lead to a sustained increase in water clarity. Although the effects are speculative this may lead to an increase in submerged aquatic vegetation which would make excellent nursery habitat for juvenile bass.

Parameter 1 – Length at age-3 (growth rate)

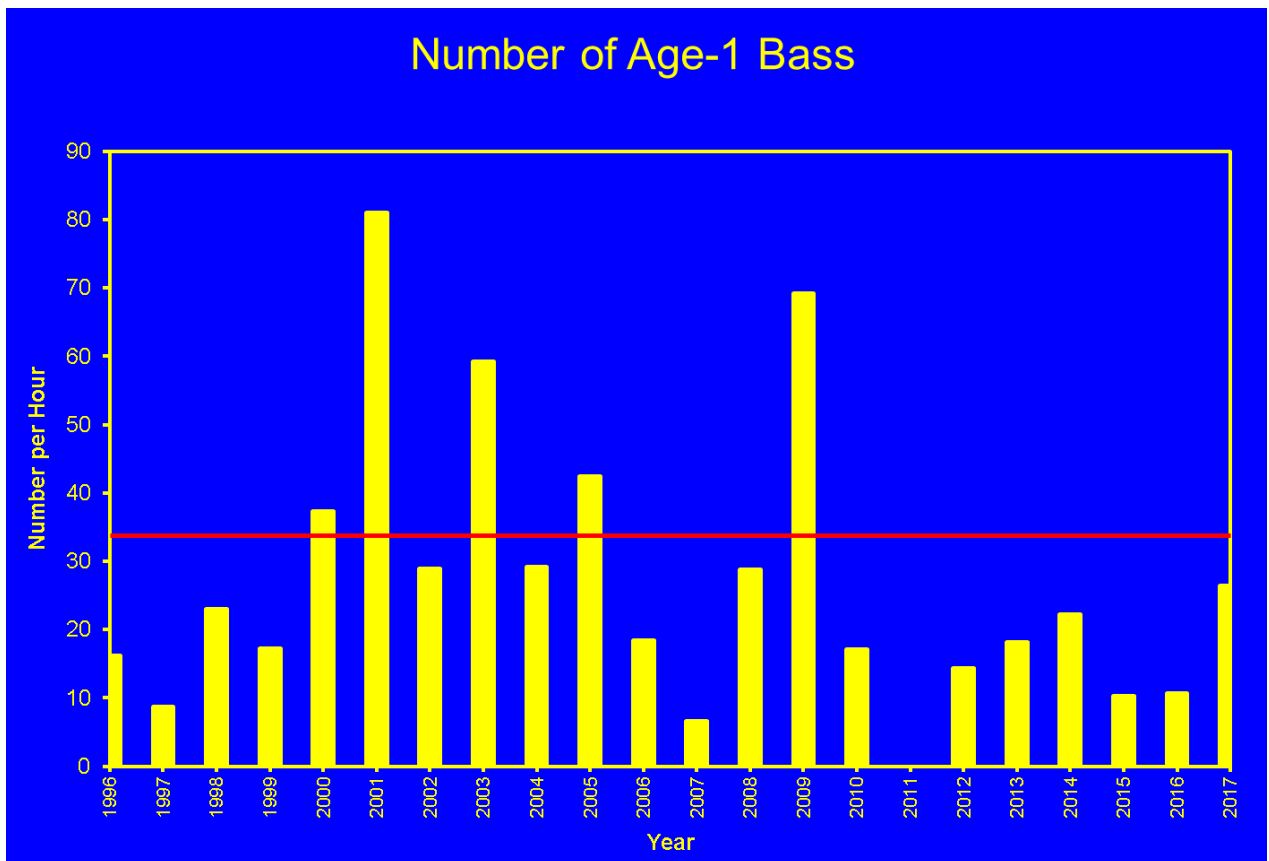
Largemouth bass at Lake Barkley are aged about every 4 to 5 years. The age of bass is determined by counting rings on a small bone (otolith), which is removed from the fish. Counting the rings on this bone is similar to counting the rings of a tree. At Lake Barkley, the length of an age-3 largemouth bass has averaged 12.7 inches since 1995 (represented by the red line). When compared to other lakes of this size, this is considered to be good growth for largemouth bass.



Parameter 2 – Numbers of age-1 bass (how good the spawn was)

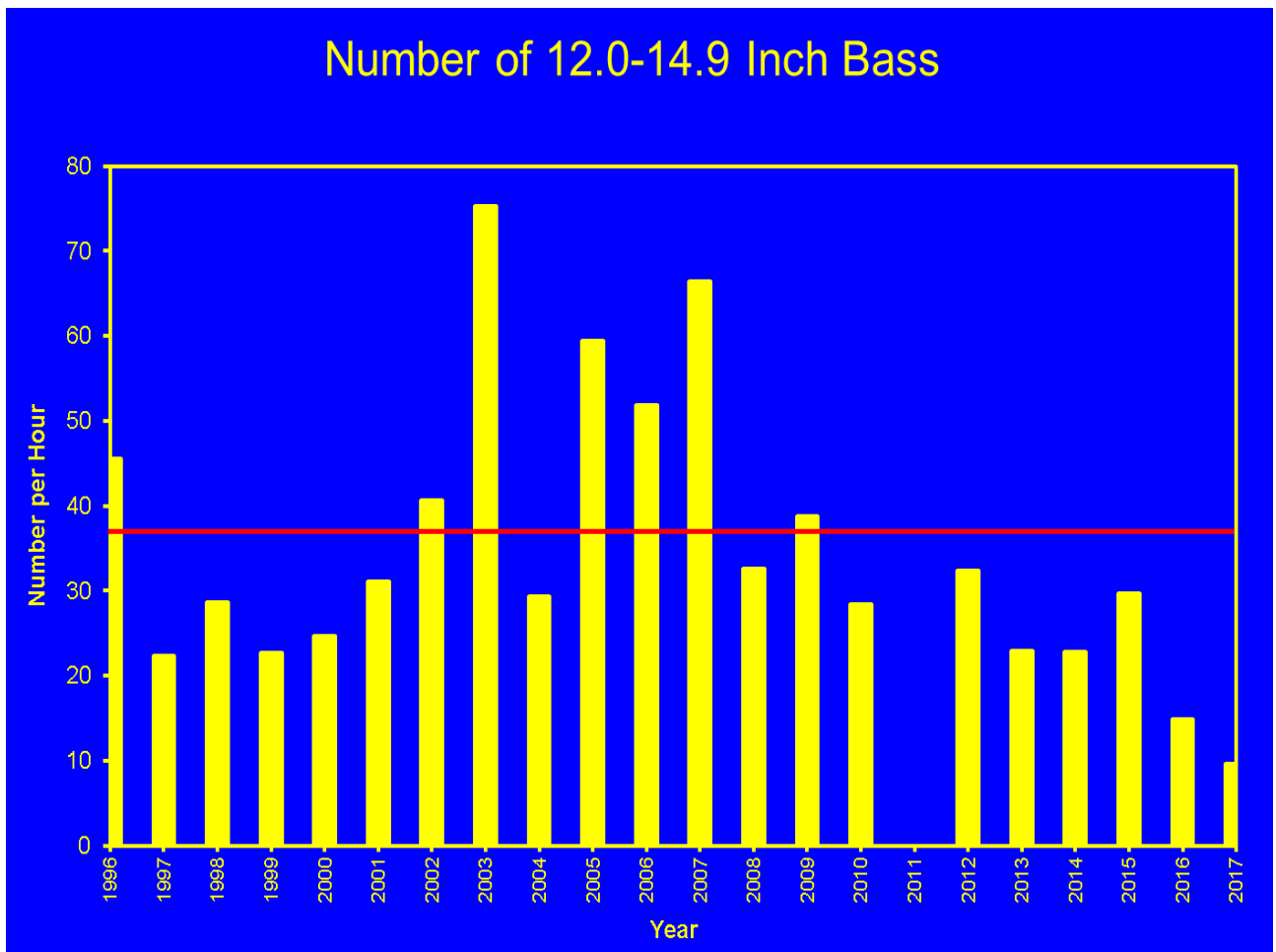
KDFWR looks at the electrofishing catch rates of age-1 largemouth bass to assess the production of young fish in the prior year. This is an important parameter because the number of bass produced represents how good the fishing will be once these fish grow large enough for anglers to catch. Since 1995 at Lake Barkley, age-1 largemouth bass catch rates averaged around 29.0 fish per hour of electrofishing. When compared to other lakes across the state, this is considered to be a good age-1 catch rate.

Following a drought in the Cumberland River drainage around 1990 which resulted in dense beds of aquatic vegetation, the production of small largemouth bass increased. This era was followed by a decline in the bass population during the mid 1990's in response to weather patterns and a decline in the vegetation. During the past few years, we have seen variable weather patterns that caused difficulty in sampling. Our data points for 2011-2013 may not be representative. However, we can predict that conditions for young fish production were probably average during the floods in those years. The most recent sample of age-1 bass in 2017 was higher than any year after 2009, but was still slightly below the long term average. The average largemouth bass in Lake Barkley reaches 15 inches in five years.



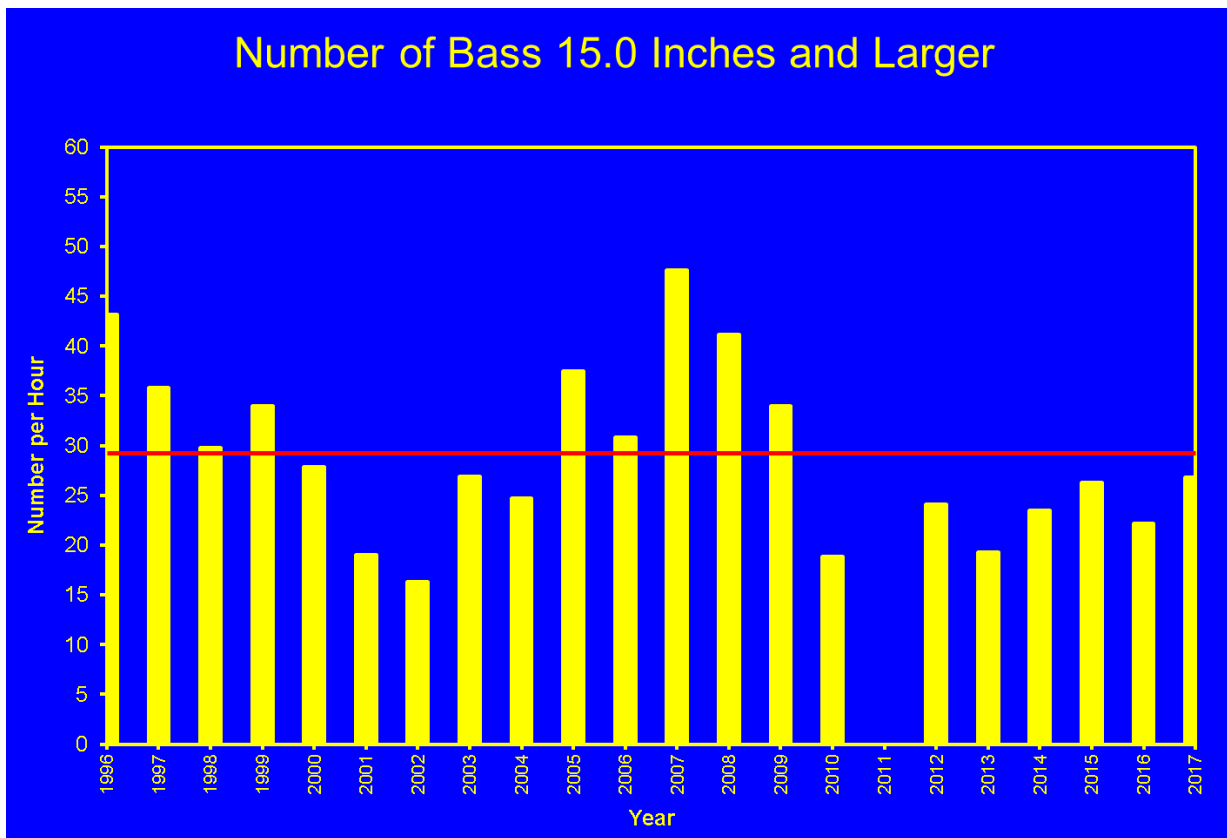
Parameter 3 – Numbers of 12.0-14.9 inch bass

The electrofishing catch of 12.0-14.9 inch largemouth bass has averaged 37.4 fish/hour over the last 20 years, which gives Lake Barkley an excellent rating when compared to other lakes across the state. The low catch rates recorded in the late 1990's are a response to poor year classes produced from 1995 to 1997. The increases recorded in 2003 and 2005 are in response to the better year classes produced around 2001 to 2003. Data collected during 2010 - 2012 sampling was conducted under flood conditions, so are likely not accurate. Catch rates were again below average in 2017 which was expected due to the poor spawns observed in 2014 and 2015. We expect this number to increase back to normal levels next year due the spawn in 2016.



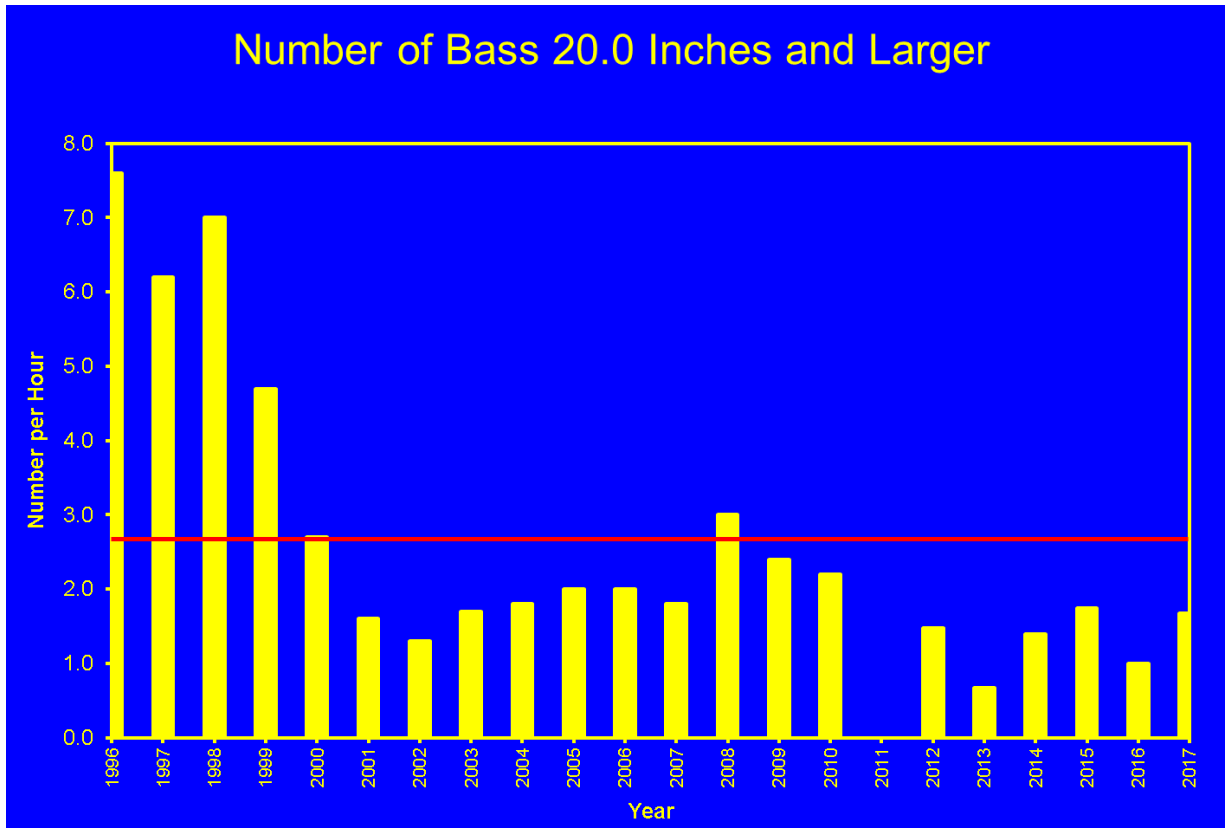
Parameter 4 – Numbers of 15.0 inch and larger bass

The catch rate of 15.0 inch and larger largemouth bass at Lake Barkley has averaged just under 30.0 fish/hour of electrofishing. Again, as compared to other lakes, this is an excellent catch rate for this size group. The numbers of 15.0 inch and larger bass at the lake increased in the mid 1990's due to the good year classes produced during the drought period which was associated with more aquatic vegetation in the lake. The decline in numbers of harvestable size bass seen in the late 1990's and early 2000's was a result of poor year classes produced in prior years following the drought. In more recent years, the fishery has recovered as indicated by average or slightly below average catches of larger bass. Variable water levels kept us from collecting accurate samples during 2010-2012. As a result, the low catches in 2010 and 2012 may not be representative of the population. Likely due to the high number of age-1 bass collected in 2009, the numbers of harvestable size bass has remained fairly steady in recent years.



Parameter 5 – Numbers of 20.0 inch and larger bass

The electrofishing catch of 20.0 inch and larger largemouth bass has averaged about 3.0 fish/hour for Lake Barkley since 1986. Compared to other lakes in the state, this parameter is rated as excellent. The high catch rates recorded in the mid 1990's were mostly likely associated with the prior drought and an increase in aquatic vegetation throughout the lake. Because of inter-annual environmental variability we cannot assume that trophy fish production will return to mid 90's levels, but the catch of large bass and angler's success rates remains high.



Overall – Total Assessment Score (All five parameters added together)

The largemouth bass fishery at Lake Barkley has teetered on the edge of good and excellent since the late 1990's. It continues to be a premier bass fishery and garners interest from anglers nationwide. Despite a few years of inability to sample and strange water levels, the bass population has sustained itself and should continue to provide good fishing for the next few years. The effects of Asian carp remain to be seen, but these invasive fish remain a serious threat to the fishery.

