

Lake Barkley Bass Assessment 2021

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

Water levels at Lake Barkley fluctuate approximately 5 feet between summer and winter pool. Winter pool level is 354-ft above mean sea level (msl) and is reached by December 1. 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 starting 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 Lake Barkley. Aquatic vegetation (Eurasian water milfoil, Naiad, Coontail, and Pondweed) cycles with rainfall in Lake Barkley. 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. The black bass population excelled during these periods of clarity with dense aquatic vegetation in the lake. 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 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 bald cypress saplings throughout the lake to replace lost habitat. In addition, the department is currently testing artificial bass spawning habitat that could potentially increase future bass recruitment.

Because of guidelines put in place due to the coronavirus outbreak, we could not utilize two netters during bass surveys in the spring 2020. Therefore, comparisons of 2020 catch rates with historic data should be made with caution.

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

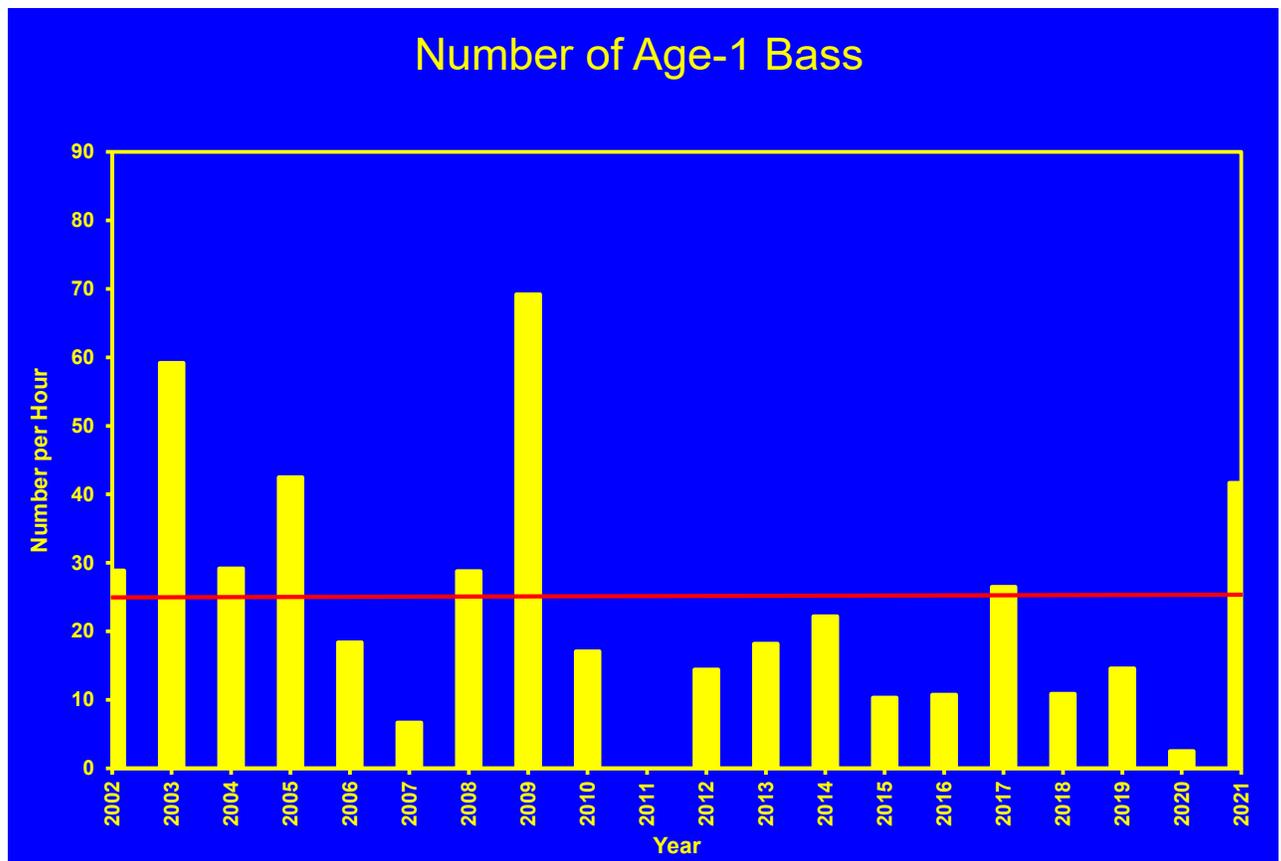
Largemouth bass at Lake Barkley are aged about every 5 years. The age of bass is determined by counting rings on a small bone (otolith), which is removed from the fish. Counting the rings on this bone is similar to counting the rings of a tree. At Lake Barkley, the length of an age-3 largemouth bass has averaged 13.1 inches since 2002 (represented by the red line). When compared to other lakes of this size, this is considered good growth for largemouth bass.



Parameter 2 – Number of Age-1 Bass (how good the spawn was)

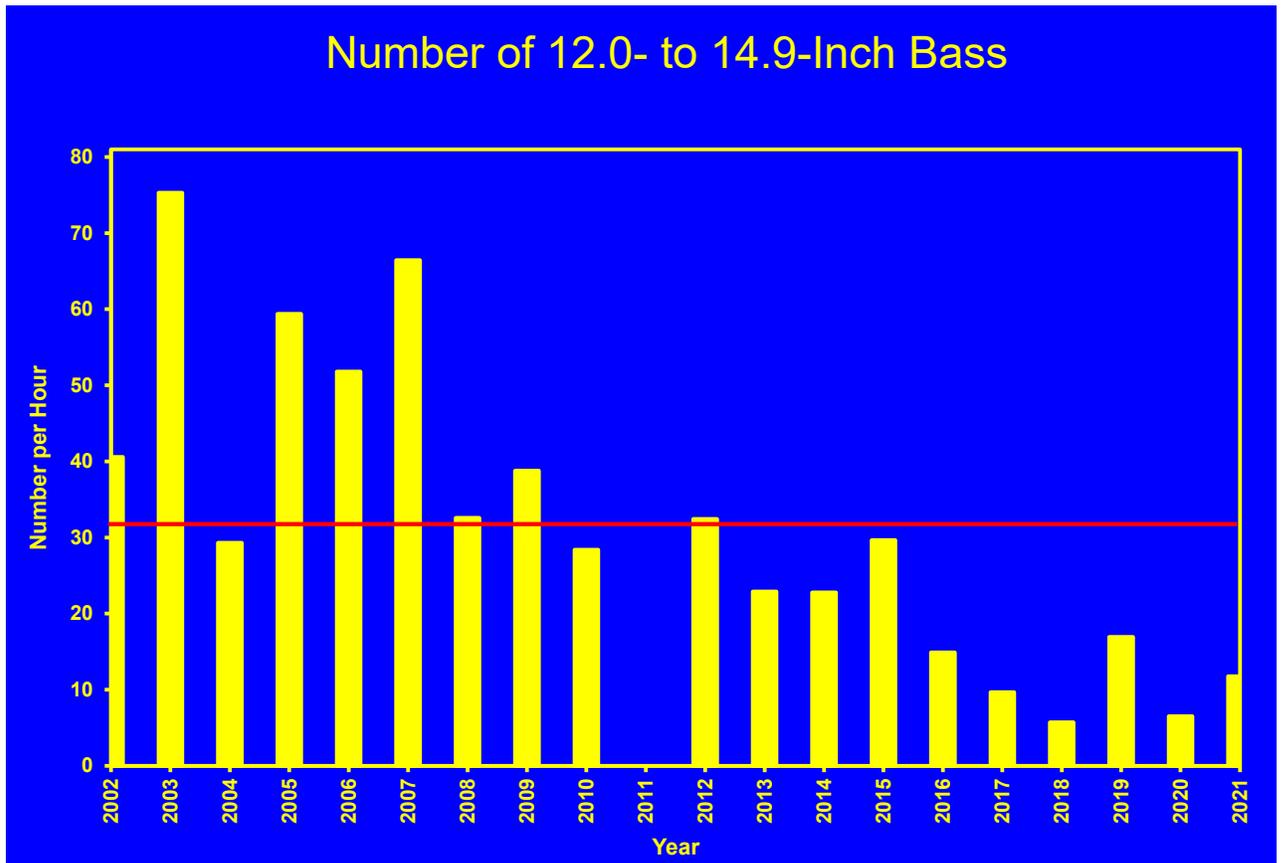
KDFWR looks at the electrofishing catch rates of age-1 largemouth bass to assess the production of young fish in the prior year. This is an important parameter because the number of bass produced can predict how good the fishing will be once these fish grow large enough for anglers to catch. Since 2002, age-1 largemouth bass catch rates averaged 24.9 fish per hour of electrofishing (represented by the red line). When compared to other lakes across the state, this is 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. Data collections during 2010-2012 surveys were conducted under flood conditions, so are likely not completely representative. However, we can predict that conditions for young fish production were probably average during the floods in those years. The catch rates of age-1 bass have been below the 20-year average for most of the past decade. However, the age-1 catch was relatively high in 2021 which should produce more keeper-sized fish in the coming years as most largemouth bass in Lake Barkley reach 15 inches in five years.



Parameter 3 – Number of 12.0- to 14.9-Inch Bass

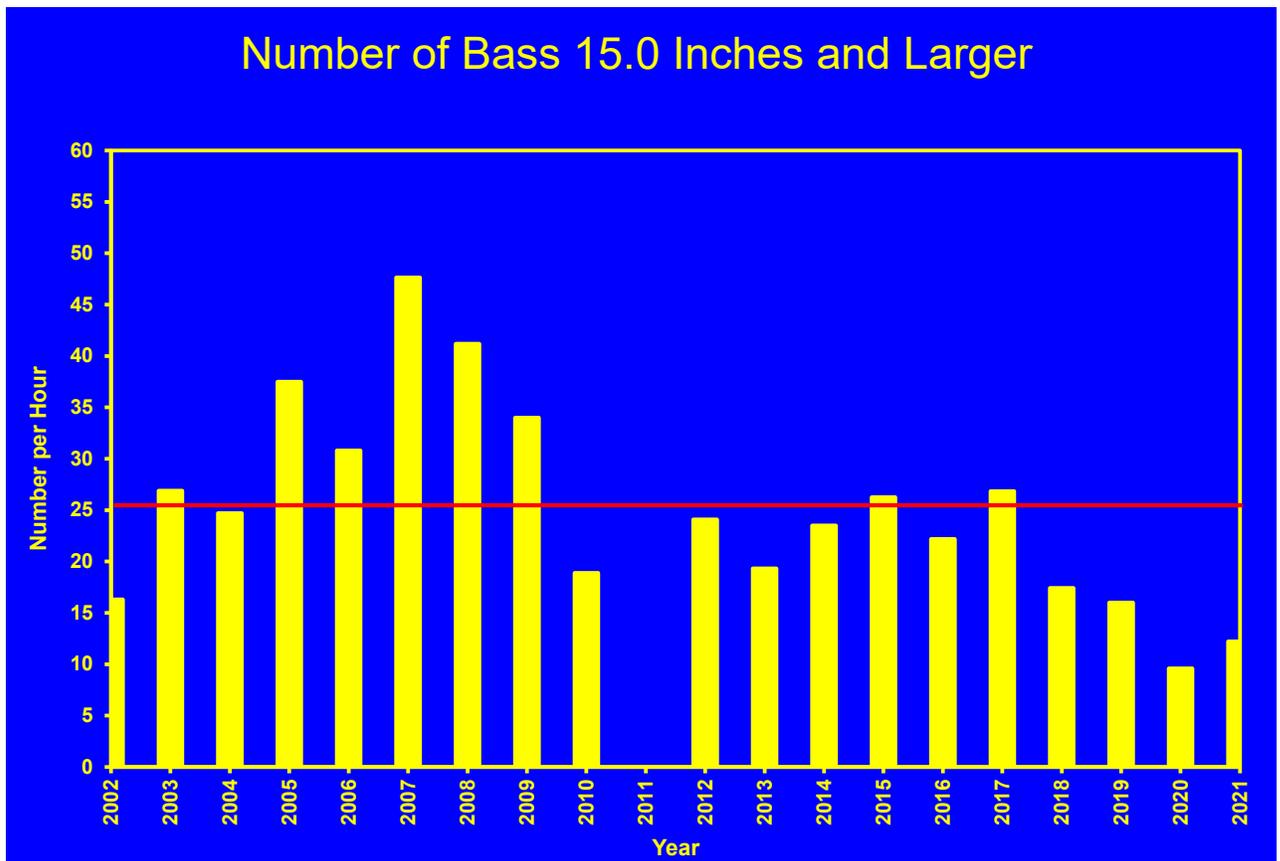
The electrofishing catch of 12.0- to 14.9-inch largemouth bass has averaged 31.4 fish/hour over the last 20 years (represented by the red line), which gives Lake Barkley an excellent rating when compared to other lakes across the state. However, this parameter has been in decline in recent years. Good catches of these fish in the early and mid-2000's are in response to the better year classes produced in those years. Data collected during 2010-2012 surveys occurred under flood conditions, so are likely not completely representative. Catch rates have been below the 20-year average since 2012 due to mostly poor spawns in the last decade.



Parameter 4 – Number of Bass 15.0 Inches and Larger

The catch rate of 15.0 inch and larger largemouth bass at Lake Barkley has averaged 25.0 fish/hour of electrofishing since 2002 (represented by the red line). Again, as compared to other lakes, this is an excellent catch rate for this size group. However, this is another parameter that has been in decline over the most recent years.

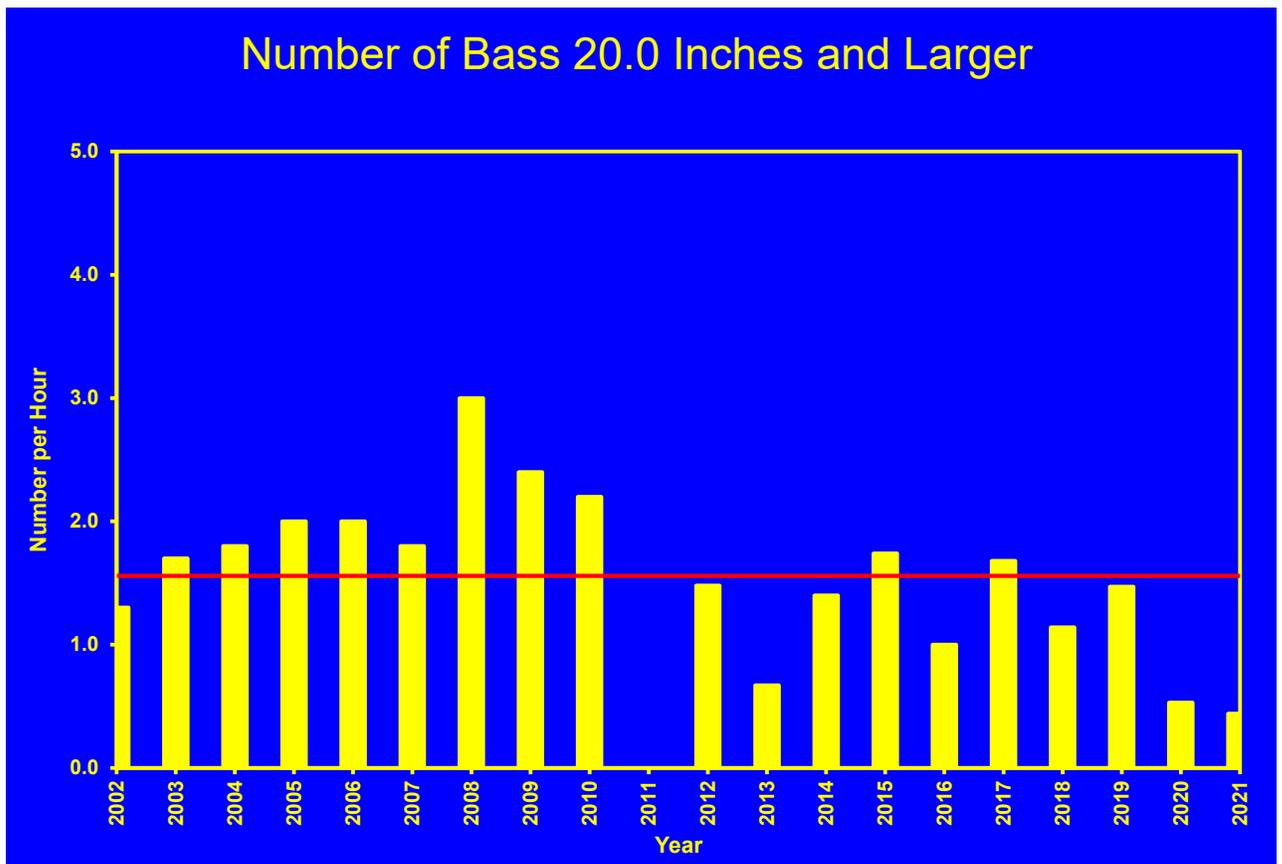
The number of 15.0 inch and larger bass at the lake increased in the mid 1990's due to the good year classes produced during the drought period which was associated with more aquatic vegetation in the lake. Poor year classes following the drought led to a decline in numbers of harvestable size bass in the late 1990's and early 2000's. For most of the last 20 years, catch rates have been at or near average except for low catches in the most recent years. Lower catch rates in the most recent surveys are likely a result of poor year classes for the better part of the last decade.



Parameter 5 – Number of 20.0-Inch and larger bass

The electrofishing catch of 20.0 inch and larger largemouth bass has averaged about 2.6 fish/hour for Lake Barkley since 1986 and about 1.6 fish/hour since 2002 (represented by the red line). Compared to other large lakes in the state, this is an excellent catch rate. Again, this is a parameter that had been in decline for the better part of the last decade.

High catch rates recorded in the mid 1990's were likely associated with the prior drought and an increase in aquatic vegetation throughout the lake. This catch rate has become less stable over the last decade and we are starting to see some of the lowest catches on record for this parameter at Lake Barkley. Despite this, many anglers are still catching these fish, and Lake Barkley remains one of the top lakes in the state to visit for trophy largemouth bass.



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

The largemouth bass fishery at Lake Barkley teetered between good and excellent since the 1990's. However, we have seen a consistent downward trend in many of our parameters over the last ten years which has resulted in only a fair ranking in 2021. Many parameters were at a high point in the late 1990s and early 2000s so this recent trend may partially be a return to normal for the bass population. Additionally, bass recruitment has been exceptionally poor, as six of the worst year classes since 1985 have been produced in the last ten years. Even so, Lake Barkley continues to be a top bass fishery in Kentucky and garners interest from anglers nationwide. The effects of Asian carp are a complex issue and remain under investigation, but these invasive fish continue to be a serious threat to the fishery.

