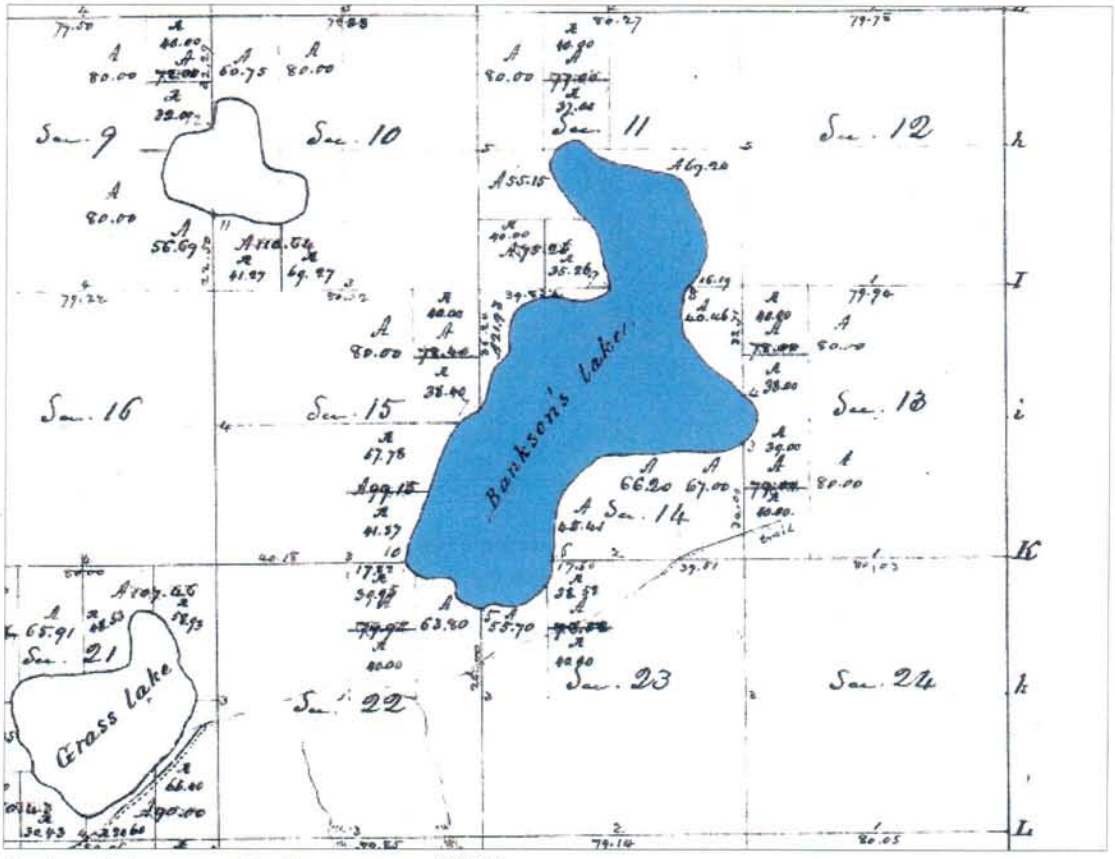
Bankson Lake Maps and Facts

December 2016

As part of the ongoing management program on Bankson Lake, the Bankson Lake Association Lake retained Progressive AE to create a series of high-resolution maps of Bankson Lake. This booklet contains several of the maps along with a brief explanation of various map features.

Shortly before Michigan attained statehood in 1837, a survey of the region was commissioned by the Surveyor General of the United States. An east-west base line and a north-south meridian line were established from which all additional measurements were to be based. One of the earliest maps of Bankson Lake was created during Michigan's original land survey.



Bankson Lake area original survey map (1888).

Lake Depth

1963

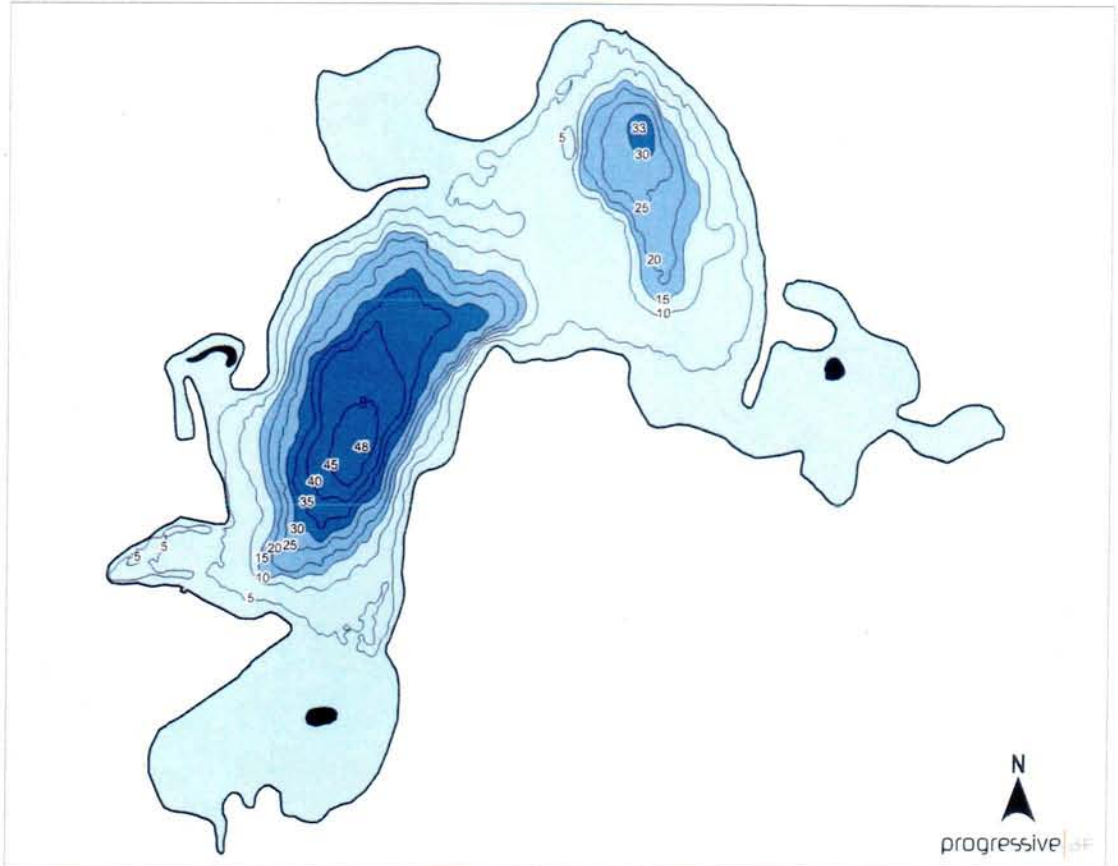
Bankson Lake was first mapped by the Michigan Department of Conservation Institute of Fisheries Research in 1963. In those days, holes were drilled through the ice and weighted drop lines were used to measure depths and to collect bottom samples. This was a laborious process that took several days to complete. The early map showed a surface area of 217 acres and a maximum depth of 42 feet in Bankson Lake. The shaded areas denote portions of the lake with a sandy bottom, and the "squiggly" shoreline designations indicated areas with encroaching shore.

2016

In recent years, computer software has been developed and refined allowing hydro-acoustic soundings collected with a depth finder to be used to create highly accurate depth contour maps. This technology was used in July of 2016 to re-map the bottom of Bankson Lake.

Currently, Bankson Lake has a surface are of 343 acres a mean or average depth of about 10 feet, and a lake volume of 3,547 acre-feet (or 1.2 billion gallons). The shallowness ratio of 0.5 for Bankson Lake indicates that 50% of the lake is less than five feet. Lakes with shallowness ratios greater than 0.5 are more susceptible to impacts from high-speed boating activity. Shoreline development factor is a measure of the irregularity of the shoreline. With a shoreline development factor of 2.7, the shoreline of Bankson Lake is 2.7 times longer than if the lake were perfectly round. The littoral zone is the portion of the lake (less that about 15 feet) shallow enough to support aquatic plant growth. The littoral zone in Bankson Lake is approximately 256 acres. Thus, about 75% of the lake has the potential to support rooted plant growth.

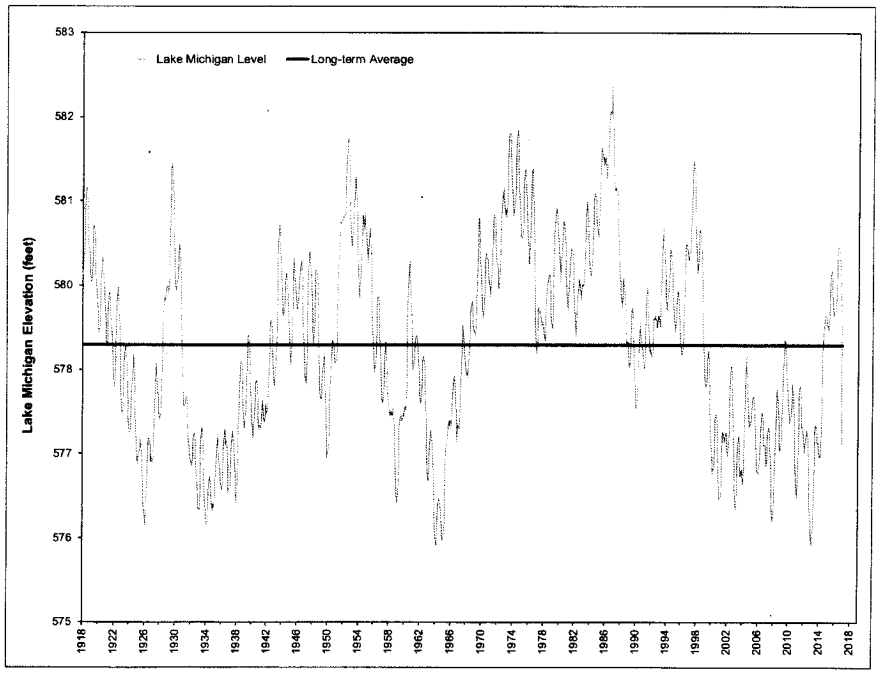
Bankson Lake depth contour map, 1963. Source: Michigan Department of Conservation Institute for Fisheries Research.

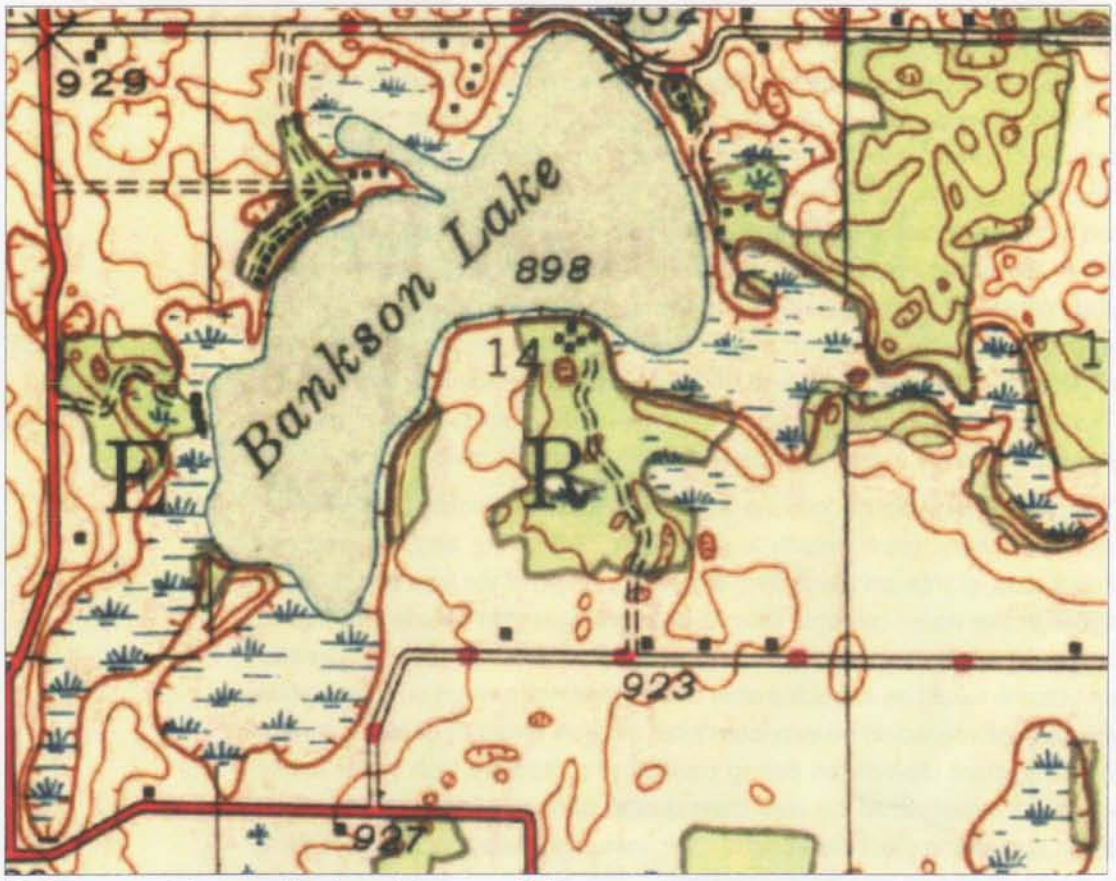


Bankson Lake depth contour map, July 2016. Lake shoreline digitized from aerial orthodigital photography (USDA FSA 2014).

Water Level

The 2016 depth contour map shows a greater maximum depth (48 feet versus 42 feet), and a dramatically different shoreline configuration than was measured in 1963. Interestingly, these differences appear to be related to a fluctuating water level in Bankson Lake. The 1963 mapping was conducted at a time when water levels on Lake Michigan were near historic lows, while the 2016 mapping occurred during a prolonged period of above-average Lake Michigan water levels. Water level fluctuations in Bankson Lake appear to mimic water level fluctuations in Lake Michigan. The fluctuation in Bankson Lake water level is apparent when viewing historical and more recent U.S. Geological Survey maps.





USGS topographic map of Bankson Lake area, 1946.

USGS topographic map of Bankson Lake area, 1981.

Plant Height and Sediment Characteristics

Plant Height

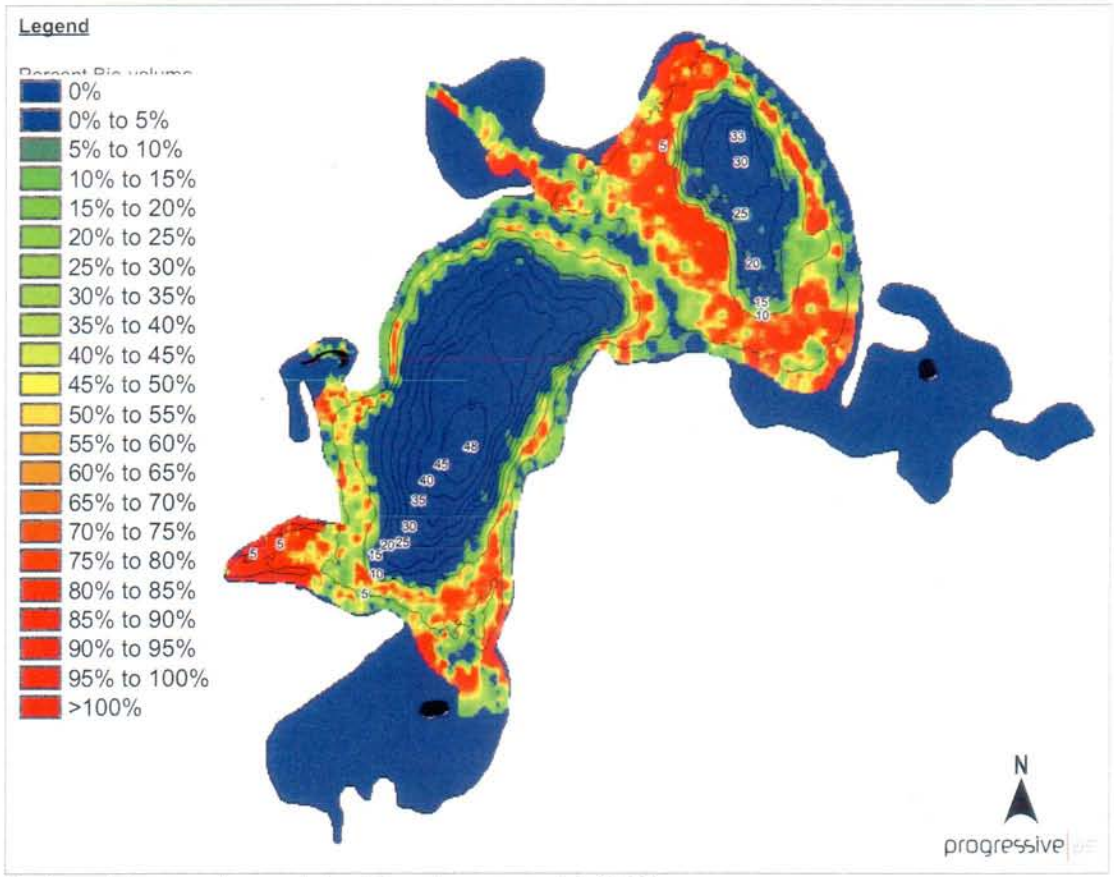
The hydro-acoustic soundings of the lake bottom also provided a measure of plant bio-volume (i.e., the height of plants in the water column). In Bankson Lake, plants were found growing to a depth of about 15 feet. When plants grow to the surface, they occupy 100% of the water column, and those areas are shown in red on the map. When plants are not present, 0% of the water column contains plants, and those areas are shown in blue. When plants grow half-way to the surface, they occupy 50% of the water column, and are shown in yellow. At the time of the survey, the coves at the east, west and south end of the lake were too shallow to navigate. Thus, while these areas are shown in blue on the map indicating no plant growth, the coves in Bankson Lake contain abundant plant growth.

Changes in bio-volume can be expected both seasonally and year-to-year. Generally, plant growth is sparser in the spring and, as summer progresses, plants are found over a greater portion of the lake and growing higher in the water column. Year-to-year changes can be evident due to variability in weather, variations in water level, or other factors. Greater bio-volume would be expected after a mild winter or a warm summer, while less bio-volume would be expected after a harsh winter or cooler summer. Similarly, plant bio-volume during periods of prolonged high water levels would be expected to be less than during periods of low water levels. When evaluating plant bio-volume over time, climatological and lake level fluctuations should also be considered.

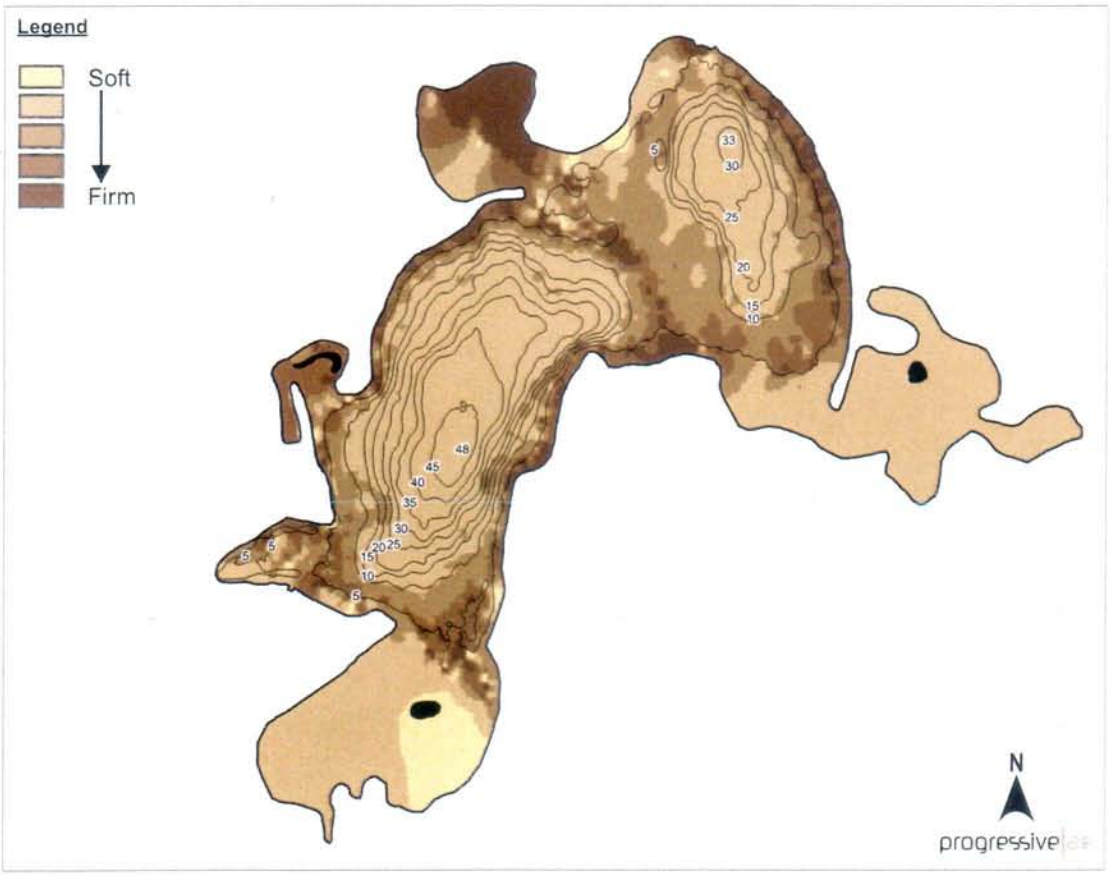
From a lake management perspective, another important use of bio-volume measurements is to evaluate the impact of exotic plant invasions. Infestations of exotic species such as Eurasian milfoil or starry stonewort can increase bio-volume as these plants tend to grow higher in the water column than many native plants. These plants may also colonize areas of the lake that were formerly free of plants. While bio-volume does not reveal which plants are in the lake, bio-volume measurements can be supplemented with plant identification surveys to evaluate plant types.

Sediment Characteristics

In addition to the measurements of water depth and plant bio-volume, the hydro-acoustic soundings provide a measure of bottom hardness in Bankson Lake. In general, near-shore areas have harder sediments while deeper areas or isolated coves have softer bottom sediments. The hard sediments on the north shore and on the shallow sand bar between the deep basins in Bankson Lake correspond to the "sandy" areas depicted in the original 1963 depth contour map.



Bankson Lake aquatic vegetation bio-volume map, July 2016.



Bankson Lake sediment composition map, July 2016.

A 2014 aerial photograph of Bankson Lake shows current development patterns around the lake (USDA FSA 2014).