

**Balsam Lake General Biological Survey #519072:
Jonathan Fieroh, Region 5 Fisheries**

12/27/2019

Balsam Lake (M-P909) is a remote 39-acre water located in the West Canada Lakes Wilderness in Hamilton County. It is located just East of Spruce Lake and also outlets into Spruce Lake. Brook trout were first stocked in 1933 but the earliest, and only, fish survey did not take place until 1956 when a single brook trout was collected. The stocking policy was cancelled in 1957 but stocking was renewed on an experimental basis in 1968 and 1969; this attempt also failed apparently from acidic conditions. An experimental stocking policy of 1,600 Windfall strain brook trout was instituted in 2008, based on regional improvements in water chemistry. The 2019 biological survey was the first since the 1956 fisheries survey. The maximum depth is about 45 feet, and there was sufficient dissolved oxygen for trout to a depth of at least 40 feet.

Water samples were drawn for both normal and advanced chemical analysis at depths of 5 and 30 feet (Table 1.). The acid/base chemistry has improved when compared to the 1999 DEC chemistry survey, and all the chemical metrics are within the tolerable limits for fish survival.

Table 1. 2019 Balsam Lake water chemistry variables.

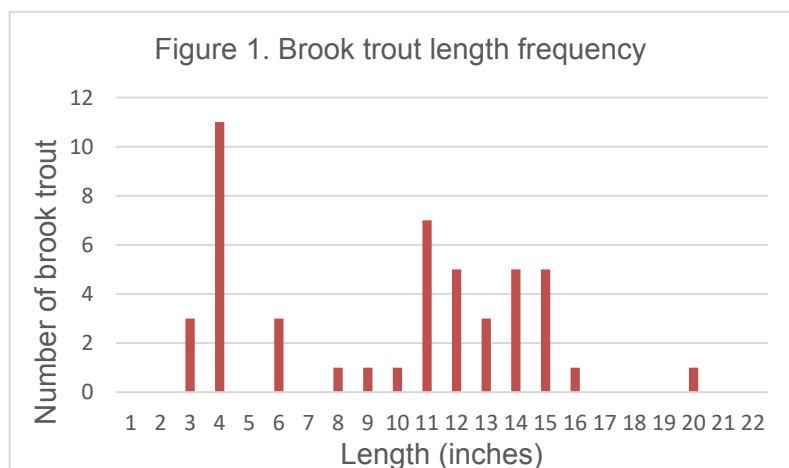
| Year | Depth (feet) | Air Equilibrated pH (pH units) | Acid Neutralizing Capacity (µeq/L) | Inorganic Monomeric "toxic" Aluminum (µM/L) | Base Cation Surplus (µeq/L) | BC/RCOOs- | Conductivity (µmhos/cm) | Silica mg/L |
|------|--------------|--------------------------------|------------------------------------|---|-----------------------------|-----------|-------------------------|-------------|
| 2019 | 5 | 5.68 | 8.7 | 0.22 | 3.5 | 4.0 | 7.6 | 2.0 |
| | 30 | 5.57 | 12.4 | 1.11 | -2.1 | 3.7 | 10.2 | 2.9 |

In 2019, three 150-ft Swedish experimental gill nets, a 30-ft minnow net, and a minnow trap were set overnight. While only a single trout was collected in the previous (1956) survey, 47 brook trout were captured in 2019.

Brook trout ranged from 3 to more than 20 inches in length (Figure 1.).

Analysis of the fisheries information was complicated due to the discovery of no fish barrier on the outlet of Balsam Lake which is a low gradient stream. The lack of a barrier allows for a connection between the Windfall strain fingerlings stocked in Balsam Lake in the spring and the Temiscamie x Domestic hybrid brook trout stocked in Spruce Lake in the fall. Fish could move freely between the two waters.

Overall, the brook trout population of Balsam Lake is in excellent shape, with both good



numbers and size distribution. A subset of brook trout were aged by scale analysis and fish aged 1 through 6 were present in the sample. Three additional fish species were discovered during the 2019 survey and it is likely that these species are now also present in Spruce Lake (Table 2.). Golden shiners have been known to be present in Spruce Lake since 1999, but the origin of the other two species is unknown. Both white suckers and golden shiners are well known competitors with brook trout. As one would expect in a brook trout water containing competitive species, such as white suckers and golden shiners, the brook trout length at age appeared to be a bit less than normal particularly among the younger fish.

Table 2. Number and length ranges of fish collected at Balsam Lake, 2019.

| Species | Number collected | Minimum length (in) | Maximum length (in) |
|---------------|------------------|---------------------|---------------------|
| White sucker | 4 | 8.7 | 10.8 |
| Creek chub | 2 | 6.3 | 6.7 |
| Golden shiner | 402 | 3.0 | 6.5 |

The annual stocking of 1,600 brook trout fingerlings is providing a very good fishery and will be continued, however there is no longer any reason to stock the Windfall strain here, as these fish are easily able to mix with the Temiscamie x Domestic brook trout stocked in Spruce Lake. The strain stocked in Balsam Lake will be changed to Temiscamie x Domestic.