Survey Objectives

Late-Spring electrofishing was performed in Big Bass Lake during the spring, 2019 for the purpose of assessing the status of prevalent fish populations. This report summarizes the survey findings by describing fish relative abundance and size structure to help characterize fish population status, particularly for largemouth bass, smallmouth bass, bluegill, pumpkinseed, rock bass, and common carp.

Survey Methods

- Late-Spring electrofishing (SEII) surveys follow standard DNR assessment protocols. Gamefish and panfish are primarily targeted in these surveys, but portions of survey effort are also allocated to index relative abundance for all species.
- Late-spring electrofishing is performed when water temperatures reach 55-70°F. Electrofishing is performed along the shoreline perimeter of the waterbody, where the survey effort (distance) performed is based on the size of the waterbody. All fish sampled in the survey are identified to species, measured and enumerated as needed.
- Electrofishing was performed on May 14th, 2019. The entire shoreline (1.83 miles of effort) was surveyed and all fish species encountered were sampled. This survey was performed out of typical survey rotation in order to evaluate a special harvest regulation on bass that was intended to increase the bass abundance to help manage bluegill size-structure.

Fish Population Metrics

- **Relative abundance** is described as catch per unit effort (CPE). For electrofishing, fish species CPE is calculated as the number of fish captured per total shoreline miles shocked.
- **Size structure** is described visually through length frequency plots and using a variety of size structure metrics, including mean total length (TL), minimum TL, maximum TL, and proportion size distribution (PSD). Fish PSD typically measures the percentage of catchable size fish in a population greater than or equal to a specified length standard. For instance, PSD14 would be the percentage of catchable fish in a population ≥ 14”.

Waterbody Info

- Big Bass Lake is shallow seepage lake that is classified as a Simple-Cool-Dark lake based on simple fish assemblage, its cool thermal regime, and its water clarity.
- Surface Area: 174 acres, Max Depth: 13’, Shoreline: 2 miles.
- Special Regulations: Bass: 14-18” protected slot, fish less than 14” can be kept, 5 daily bag limit, and 1 fish over 28”.
Figure 1. Length frequency plots of smallmouth bass, bluegill, black crappie, and walleye populations sampled during late-spring electrofishing in the Mosinee Flowage during spring, 2019.
Summary of Findings

Relative abundance

• Largemouth bass exhibited the greatest catch rates in the survey. For this class of lake, largemouth bass CPE in Big Bass Lake exceeded the 95th percentile. This is considered exceptional.

• Moderate catch rates were observed for bluegill during this survey. Big Bass Lake bluegill CPE ranked between 25th-50th percentile when compared to electrofishing standards for this lake class. This relative abundance status is considered fair, because its within typical range of normal CPE values.

• Lower catch rates were observed for all other species observed in this survey. Fyke netting surveys provide a better description of the status of these species, since late-spring electrofishing is best suited for assessing the status of bass and sunfish species.

• Low abundance and representation of many other species in Big Bass lake is probably normal, since the lake classified as having a simple fish community. Lakes with simple fish communities have low species diversity and typical species interactions in these lakes.

• Caveats: Lower electrofishing catch rates do not always indicate that a populations is performing poorly. Historical data and relative abundance standards are needed for better status assessment.

Size Structure

• Largemouth bass exhibited a larger than normal size structure based on mean total length. Compared mean total length standards for this type of lake, largemouth bass in Big Bass Lake exceeded the 75th percentile. This is quite unusual for a high density population. Typically, higher densities of largemouth bass can reduce bass size structure or impact growth in smaller waterbodies with limited food resources. For now, size does not appear to be a limited by population density. It appears that the effects of the special regulation harvest regulation are working. Additional future monitoring efforts will be required to observe if these population dynamics remain stable.

• Bluegill size structure was exceptional. Mean and maximum total length greatly exceeded the 75th percentile for similar lakes. It was difficult to make a complete comparison with historical data due to differences in gear and survey season, but it appears that bluegill size structure has improved over time. It is unknown whether this improvement in size structure was the result of a change in bass harvest regulations or from panfish harvest dynamics. Regardless, it will be important to maintain status quo fish management to better understand the true effectiveness.

• Low sample sizes for other species limited our ability to estimate size structure metrics. Needless to say the northern pike data we collected suggested that Big Bass Lake has the capacity to hit a larger northern pike growth potential, which is unique for small shallow lakes in central Wisconsin.

Table 1. Electrofishing catch summary statistics characterizing species relative abundance and size structure in 2019.

<table>
<thead>
<tr>
<th>Species</th>
<th>Catch</th>
<th>CPE</th>
<th>Mean TL</th>
<th>Minimum TL</th>
<th>Maximum TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARGEMOUTH BASS</td>
<td>213</td>
<td>116.39</td>
<td>11.5</td>
<td>3.7</td>
<td>18.8</td>
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<tr>
<td>BLUEGILL</td>
<td>104</td>
<td>56.83</td>
<td>8.2</td>
<td>5.5</td>
<td>10.1</td>
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<tr>
<td>YELLOW PERCH</td>
<td>12</td>
<td>6.55</td>
<td>5.4</td>
<td>3.4</td>
<td>6.6</td>
</tr>
<tr>
<td>BROWN BULLHEAD</td>
<td>6</td>
<td>3.28</td>
<td>11.4</td>
<td>7.7</td>
<td>15.3</td>
</tr>
<tr>
<td>GOLDEN SHINER</td>
<td>3</td>
<td>1.64</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NORTHERN PIKE</td>
<td>3</td>
<td>1.64</td>
<td>28.8</td>
<td>23.2</td>
<td>33.4</td>
</tr>
<tr>
<td>BLACK CRAPPIE</td>
<td>2</td>
<td>1.09</td>
<td>10.4</td>
<td>7.1</td>
<td>13.7</td>
</tr>
<tr>
<td>WHITE SUCKER</td>
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<td>1.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>