Developing a Management Plan for a Small Private Lake

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Pleasant Lake

- Located in Town of Stratford, Fulton County NY
- Meso-oligotrophic
- Class B lake
  - Suitable for contact & recreation
- Managed by Pleasant Lake Stewardship Committee

Image Source: Stratford Pleasant Lake Club
• Lake surface Area: 0.98 km$^2$
• Watershed: 5.02 km$^2$
• 1:5 ratio
### Rating

<table>
<thead>
<tr>
<th>Rating</th>
<th>Area of Watershed (km²)</th>
<th>Percent of Watershed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhat Limited</td>
<td>2.47</td>
<td>49.2</td>
</tr>
<tr>
<td>Very Limited</td>
<td>1.52</td>
<td>30.3</td>
</tr>
<tr>
<td>Null or Not Rated</td>
<td>1.03</td>
<td>20.5</td>
</tr>
<tr>
<td>Totals for Areas of Interest</td>
<td>5.02</td>
<td>100.0</td>
</tr>
</tbody>
</table>

- **Very limited**
- **Somewhat limited**
- **Not limited**
- **Not rated or not available**
Past Monitoring

• 1934 by the New York Conservation Department
• 1984 by New York State Department of Environmental Conservation
• CSLAP monitoring since 2000
• AIS surveys by the APIPP
  • No AIS detected

• No formal lake management plan to date
Stakeholder Main Concerns

• Maintaining good water quality

• Prevention of invasive species

• Shoreline erosion and dock damage from boat wakes
Water Quality Sampling

- Sampling of Pleasant Lake occurred in October of 2018
  - Water samples taken at 1 m increments
  - Water quality parameters measured at 1 m increments
- Total Nitrogen concentration was determined using peroxodisulfate digestion followed by the cadmium reduction method (Pritzlaff 2003; Ebina et al. 1983)
- Total phosphorus concentration was determined using the persulfate digestion method (Liao and Marten 2001)
- Nitrite+ nitrate was measured using the cadmium reduction method (Pritzlaff 2003)
Results: Nutrients

<table>
<thead>
<tr>
<th>Date</th>
<th>Site</th>
<th>nitrate+nitrite (mg/L)</th>
<th>Total Nitrogen (mg/L)</th>
<th>Total Phosphorus (ug/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/3/2018</td>
<td>Eastern Basin</td>
<td>bd</td>
<td>0.14</td>
<td>7</td>
</tr>
<tr>
<td>10/12/2018</td>
<td>Eastern Basin</td>
<td>bd</td>
<td>0.18</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Inlet</td>
<td>bd</td>
<td>0.16</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Outlet</td>
<td>bd</td>
<td>0.14</td>
<td>bd</td>
</tr>
<tr>
<td>Long Term Avg.</td>
<td></td>
<td>bd</td>
<td>0.40</td>
<td>8</td>
</tr>
</tbody>
</table>
Conclusions

• Water quality parameters were well within the range that can support aquatic organisms

• Total Phosphorus (TP) values were found to be very low within the basins of the lake, and TP for the outlet was below our detection limit of 4 µg/L

• Nitrite + nitrate as well as Total Nitrogen (TN) were both found to be low, with nitrite + nitrate falling below the detection limit of 0.02 mg/L

• The results of our sampling and analysis suggest that stakeholders should take a comprehensive approach to managing their lake looking toward the future
Management Considerations

• Prepare a Early Detection Rapid Response (EDRR) plan for potential introduction of invasive species

• Educate residents on how invasive species spread

• Test for leaking septic systems and update/perform maintenance as needed

• Increase riparian buffer zones to limit runoff and shoreline erosion

• Enforce no wake zone within 100 ft of shoreline as stated by law
Questions?

Fish: They say fish have a five second memory...
Fish: What's a fish?
Fish: Don't know, why do you ask?
Fish: Ask what?