Slocum Lake

Slocum Lake, located in unincorporated Wauconda Township, near the border of Lake and McHenry County, is a natural pot-hole slough of glacial origin. The lake has a mix of residential and undeveloped shoreline and is managed by Mylith Park Association, Williams Park Improvement Association, and the Water’s Edge Homeowners Association.

The Bangs Lake Drain enters the Slocum Lake from the east and the water leaves the lake over a dam on the south shore where it flows eventually into the Fox River.

Slocum Lake has a surface area of 225.4 acres with an average depth of 5.3 ft and a maximum depth of 7.3 ft. It is used by residents for swimming, fishing, and boating. Gas motors are permitted on the lake and a private boat launch is located at Mylith Park.

Water quality parameters, such as nutrients, suspended solids, oxygen, temperature, water clarity were measured from May-September 2013. The aquatic plant community was assessed in July when most of the plants are likely to be present. In general the water quality

Environmental Services Water Quality Specialists
Gerard Urbanozo gurbanozo@lakecountyil.gov
Kelly Deem kdeem@lakecountyil.gov
Kathy Paap kpaap@lakecountyil.gov
Lake Facts:
- Major Watershed: Fox River
- Sub-Watershed: Mutton Creek sub basin.
- Location: T 44N, R9E, S 28
- Surface Area: 225.4 acres
- Shoreline Length: 3.9 miles
- Maximum Depth: 7.3 ft
- Average Depth: 5.1 ft
- Lake Volume: 1141.9 acres-feet
- Watershed Area: 5520 acres
- Lake Type: Glacial
- Management Entity: Mylith Park Association, Williams Park Improvement Association, the Water’s Edge Homeowners Association.
- Current Uses: Swimming fishing, boating, and sailing.
- Access: Private

in Slocum Lake is poor. Total phosphorus in Slocum Lake averaged 0.152 mg/L, which is a slight (1.3%) increase from the 2005 concentration of 0.150 mg/L and significantly higher than the Illinois Environmental Protection Agency impairment rate of 0.050 mg/L.

Nitrogen is the other nutrient critical for algal growth. The average Total Kjeldahl nitrogen (TKN) concentration for Slocum was 2.41 mg/L, which was higher than the county median of 1.170 mg/L and lower than the 2005 concentration (2.90 mg/L). A total nitrogen to total phosphorus (TN:TP) ratio of 16:1 indicates that phosphorus was the nutrient limiting aquatic plant and algae growth in Slocum Lake.

By using phosphorous as an indicator, the trophic state index (TSIp) ranked Slocum Lake as hypereutrophic with a TSIp value of 76.6. This means that the lake has excess nutrients which can result in excessive algal growth. The 2013 average total suspended solids (TSS) concentration for Slocum Lake was 33.0 mg/L, which was higher than the county median of 8.0 mg/L and a 38.4% decrease from the 2005 average of 53.6 mg/L. May had the highest TSS (39 mg/L) which is also the month when carp spawning activity causes re-suspension of sediments. A nonvolatile suspended solid (NVSS) of 25 mg/L in May suggests that 64% of the suspended solids are sediments.

Water clarity was measured by Secchi depth, with the lowest reading in August (0.685 ft) and the highest was in July (1.1 ft). The average Secchi depth for the season was 0.81 ft, which was shallower than the county median (3.0 ft).

The average conductivity of Slocum Lake was 0.7670 mS/cm which is lower than the county median (0.7875 mS/cm). This was a 29.63% decrease from the 2005 average (1.119 mS/cm). The chloride concentration in Slocum Lake in 2013 was 150 mg/L which was higher than the county median of 145 mg/L.

Slocum Lake does not have a diverse and plant community, with only three different aquatic plant species (Coontail, Eurasian Watermilfoil, and Sago Pondweed) observed covering 17% of the lake. The lack of aquatic plants in the lake is affected by the high TSS and low water clarity.

The carp population is likely contributing to the high turbidity, that prevents plant growth. Reducing the carp population would lead to an increase in water clarity and aquatic plant diversity and density. Due to the shallow nature of the lake, wind and wave activity can also contribute to the sediments and nutrients being re-suspended. A large amount of suspended material in the water column can inhibit successful predation by sight feeding fish, such as bass or pike. These predator fish are necessary in controlling or reducing the carp population within the lake.
Sources of runoff for Slocum Lake were single family (26.6%) and public and private open space (24.1%). The impervious surfaces (parking lots, roads, buildings, compacted soil) do not allow rain to infiltrate into the ground. Land management practices of the large amount of residential area in the watershed impacts the lake. The developed area in the Slocum Lake watershed is 67.25%. Controlling water that runs from the land’s surface into the lake is important for drainage lakes.

Slocum Lake Watershed Land Use

Slocum Lake watershed encompasses 5520 acres and Bangs Lake and several small lakes (Banana Pond, Taylor Lake, Heron Pond, and Lakewood Marsh). The Bangs Lake Drain flows into Slocum Lake along with several storm drains around the lake. A majority of the watershed is located on the east side of which a majority is residential and open space. The water flows out of Slocum Lake over a spillway and into Slocum Lake Drain where it joins with Fiddle Creek and eventually flows into the Fox River.
Water clarity is an indicator of water quality related to chemical and physical properties. Measurements taken with a Secchi disk indicate the light penetration into a body of water. Algae, microscopic animals, water color, eroded soil, and resuspension of bottom sediment are factors that interfere with light penetration and reduce water transparency. If light penetration is reduced significantly, macrophyte growth may be decreased which would in turn impact the organisms dependent upon them for food and cover. The 2013 average clarity for Slocum Lake was 0.81 feet; this was a 21% decrease in the lake’s transparency since 2005 (1.03 feet) and the water clarity was below the county median of 3.0 feet.

Carp, algae, runoff, wind and wave activity easily affect a shallow lake like Slocum due to the lack of aquatic plants to take up nutrients and stabilize the lake bottom.

Volunteers measure water clarity using the Secchi disk twice a month May through October. In 2013 there were 42 lakes participating in Lake County.

If you would like more information please contact:

Kelly Deem
(847) 377-8009
kdeem@lakecountyil.gov

www.epa.state.il.us/water/vlmp/index.html

Turbid waters become warmer as suspended particles absorb heat from sunlight, causing oxygen levels to fall. (Warm water holds less oxygen than cooler water.) Photosynthesis decreases with lesser light, resulting in even lower oxygen levels.

VLMP — WATER QUALITY

Water clarity is an indicator of water quality related to chemical and physical properties. Measurements taken with a sechhi disk indicate the light penetration into a body of water. Algae, microscopic animals, water color, eroded soil, and resuspension of bottom sediment are factors that interfere with light penetration and reduce water transparency. If light penetration is reduced significantly, macrophyte growth may be decreased which would in turn impact the organisms dependent upon them for food and cover. Participation in the Illinois Environmental Protection Agency’s (IEPA) Volunteer Lake Monitoring Program (VLMP) would provide Slocum Lake a historical VLMP data that can be used to determine long term water quality trends and support current lake management decision making.
Total Suspended Solids

Another measure of water clarity is turbidity, which is caused by particles of matter rather than the dissolved organic compounds. Suspended particles dissipate light, which may limit the depth plants can grow.

The total suspended solid (TSS) parameter (turbidity) is composed of nonvolatile suspended compounds (NVSS), non-organic clay or sediment materials, and volatile suspended solids (TVS) (algae and other organic matter).

Slocum Lake’s high TSS values are typical of lakes that have low clarity (Secchi disk depth), high phosphorus levels and experience algae blooms. Seasonal Secchi reading changes are affected by algal growth. The low density of algae in spring provides deeper clarity but as the water temperature warms, clarity decreases with more algae present in the water.

The Secchi depths in 2013 were at its shallowest in August (0.68 feet). The deepest in July (1.10 feet) corresponded with the lowest TSS concentration (28.0 mg/L). The 2013 TSS concentrations in Slocum Lake averaged 33.0 mg/L which was above the county median of 8.0 mg/L and 38.4% lower than the 2005 average concentration of 53.6 mg/L.

The calculated average nonvolatile suspended solids (NVSS) was 15.56 mg/L. Almost half of the TSS concentration in 2013 can be contributed to sediment particles. The May TSS was 39.0 mg/L, and a calculated NVSS of 24.76 mg/L, which means that 63.5% of the suspended solids in the water was sediment. The increase in turbidity could have been caused by spring rains washing sediments that became suspended in the water column. In addition, Slocum Lake’s high TSS can be attributed to the lack of aquatic plants, high carp population, along with wind and wave action.

The algae and organic matter in the water column was also high in 2013. The average TVS was 128 mg/L which is above the county median of 119.0 mg/L. Algae bloom was observed during every sampling month in 2013.

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<table>
<thead>
<tr>
<th>DATE (2013)</th>
<th>TSS (mg/L)</th>
<th>SECCHI (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>39.0</td>
<td>0.72</td>
</tr>
<tr>
<td>June</td>
<td>32.0</td>
<td>0.72</td>
</tr>
<tr>
<td>July</td>
<td>28.0</td>
<td>1.10</td>
</tr>
<tr>
<td>August</td>
<td>32.0</td>
<td>0.68</td>
</tr>
<tr>
<td>September</td>
<td>34.0</td>
<td>0.83</td>
</tr>
</tbody>
</table>
Organisms need nutrients to live or grow that are typically taken in from the environment. In a lake the primary nutrients needed for aquatic plant and algal growth are phosphorus and nitrogen. In most lakes, including Slocum Lake, phosphorus is the limiting nutrient, which means everything that plants and algae need to grow is available in excess: sunlight, warm temperature, and nitrogen. Phosphorus has a direct effect on the amount of plant and algal growth in lakes. The 2013 average total phosphorus epilimnion (near surface sample) concentration in Slocum Lake was 0.152 mg/L, this was a slight increase from the 2005 concentration (0.150 mg/L). Lakes with concentrations exceeding 0.05 mg/L can support high densities of algae and aquatic plants, which can reduce water clarity and dissolved oxygen levels and are considered impaired by the IEPA.

Phosphorus originates from a variety of sources, many of which are related to human activities which include: human and animal waste, soil erosion, detergents, septic systems, common carp, and runoff from farmland and lawns. Nitrogen is the other nutrient critical for algal growth. Total Kjeldahl nitrogen is a measure of organic nitrogen, and is typically bound up in algal and plant cells. The average 2013 TKN for Slocum Lake was 2.41 mg/L and an 17% decrease from the 2005 concentration (2.90 mg/L). The County median is 1.17 mg/L.

**CONDUCTIVITY AND CHLORIDE**

Conductivity is a measure of a waters ability to conduct electricity, measured by the water’s ionic activity and content. The higher the concentration of (dissolved) ions the higher the conductivity becomes. Conductivity readings, which are influenced by chloride concentrations, have been increasing throughout the past decade in Lake County. Lakes with residential and/or urban land uses in their watershed often have higher conductivity readings and higher Cl- concentrations because of the use of road salts. Storm water run-off from impervious surfaces such as roads and parking lots can deliver high concentrations of Cl- to nearby water bodies. Road salt used in the winter road maintenance consists of the following ions: sodium chloride, calcium chloride, potassium chloride, magnesium chloride, or ferrocyanides which are detected when chlorides are analyzed. The 2013 average conductivity for Slocum Lake 0.767 mS/cm. This parameter was below the county median of 0.7875 mS/cm and which is a 31% decrease from the 2005 value of 1.119 mS/cm. These values are influenced by the winter road maintenance of Route 176, Route 12 and the surrounding residential areas.

The United States Environmental Protection Agency has determined that chloride concentrations higher than 230 mg/L can disrupt aquatic systems and prolonged exposure can harm 10% of aquatic species. Slocum Lake’s Cl- was 150 mg/L which is a 42% decrease from 2005 (257 mg/L.). Chlorides tend to accumulate within a watershed as these ions do not break down and are not utilized by plants or animals. High chloride concentrations may make it difficult for many of our native species to survive. However, many of our invasive species, such as Eurasian watermilfoil, Cattail and Common Reed, are tolerant to high chloride concentrations.
**Trophic State Index**

Another way to look at phosphorus levels and how they affect lake productivity is to use a Trophic State Index (TSI) based on phosphorus (TSIp). TSIp values are commonly used to classify and compare lake productivity levels (trophic state). A lake's response to additional phosphorus is an accelerated rate of eutrophication. Eutrophication is a natural process where lakes become increasingly enriched with nutrients.

Lakes start out with clear water and few aquatic plants and over time become more enriched with nutrients and vegetation until the lake becomes a wetland. This process takes thousands of years to take place. However, human activities that supply lakes with additional phosphorus that drives Eutrophication is speeding up this process significantly. The TSIp index classifies the lake into one of four categories: oligotrophic (nutrient-poor, biologically unproductive), mesotrophic (intermediate nutrient availability and biological productivity), and eutrophic (nutrient rich, highly productive), or hypereutrophic (extremely nutrient-rich, productive). In 2013, Slocum Lake was hypereutrophic with a TSIp Value of 76.61, placing it 137th out of 175 lakes in the county. Lake Carina was 1st at 37.35.

**Lake Level**

The Slocum lake level was taken at the staff gauge next to the dam. The water level in Slocum Lake did not vary by more than 5.4” throughout the summer. The lake level was at its lowest in September when the lake surface water was measured at 54.60”. The lake gained 0.72” in July but had its largest monthly drop in August at 3.36”. Slocum Lake has a large watershed that covers 5520 acres, which helps replenish water lost through evaporation during the summer. It is recommended that in the future, staff gauge readings be taken weekly or bi-weekly if possible. This will give lake managers a much better idea of lake level fluctuations relative to rainfall events and can aid in future decisions regarding lake level.

<table>
<thead>
<tr>
<th>2013</th>
<th>Level (in)</th>
<th>Seasonal Change</th>
<th>Monthly change (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>58.32</td>
<td>-1.68</td>
<td>-1.68</td>
</tr>
<tr>
<td>July</td>
<td>59.04</td>
<td>-0.96</td>
<td>0.72</td>
</tr>
<tr>
<td>August</td>
<td>55.68</td>
<td>-4.32</td>
<td>-3.36</td>
</tr>
<tr>
<td>September</td>
<td>54.60</td>
<td>-5.4</td>
<td>-1.08</td>
</tr>
</tbody>
</table>

Staff gauge is a great tool for measuring water level in lakes, rivers, reservoirs. The data collected can be compiled to help understand the natural fluctuations of the lake. Large fluctuations in lake level can lead to shoreline erosion. The staff gauge at the dam was hard to read and should be cleaned and maintained or replaced if necessary.

“**Eutrophication Process**

When human activities accelerate lake eutrophication, it is referred to as cultural eutrophication. Cultural eutrophication may result from shoreline erosion, agricultural and urban runoff, wastewater discharges or septic seepage, and other non-point source pollution sources.”

**Permanent Staff Gauge at Slocum Lake**
Swimming Beach Monitoring

All licensed inland beaches are tested bi-weekly from May to September by the Lake County Health Department’s Environment Services Department. The water samples are tested for E. coli bacteria, which are found in the intestines of humans and almost all warm-blooded animals. While not all strains of E. coli are the same, certain strains can make humans sick if ingested in high enough concentrations. The presence of E. coli in swimming areas means that other disease causing bacteria maybe present as well. If water samples come back high for E. coli (>235 E. coli/100 ml), LCHD informs the management body for the bathing beach that the beach is closed and a sign is posted indicating the beach closure. There are multiple reasons for high E. coli counts. Sewage runoffs from septic fields, storm drains, fecal contamination from waterfowl, dogs and cats, surface run-off from poorly drained areas adjacent to the beach, and high concentrations from nearby creeks.

During the summer, poor water circulation in the swimming area may contribute to the high bacterial counts. Water samples collected in the summer of 2013 at Williams Park Beach did not exceed the maximum allowable limit. This indicates that fecal contamination was not a problem at the beach that summer.

How to Prevent Illness and Beach Closure

- If you are sick, do NOT swim.
- Don’t swim when you have diarrhea. You can spread germs in the water.
- Take a shower prior to entering the beach area.
- Children who are not toilet trained should wear tight fitting rubber or plastic pants.
- Pick up garbage around the beach area.
- Avoid swimming during algae blooms.
- Do not ingest the water while swimming.
- Keep pets, ducks and geese out of the beach area.
- Identify sources of pollution (ex: failing septic systems, stagnant standing water near the beaches, creeks and storm drains).

Protect Your Waters

- Remove all plants, mud, fish, or animals before transporting equipment.
- Eliminate all water from equipment before transporting equipment.
- Dry anything that comes in contact with water (boat, trailers, equipment, clothing, etc.).
- Remove all mud and dirt since it might contain aquatic hitchhikers.
- Never release plants, fish or animals into a body of water unless they came out of that body of water.
- Do not release bait into the waters you are fishing.
- Do not release aquarium fish or aquatic pets in to the lake.
**Blue-green Algae**

Algae are important to the freshwater ecosystems, and most species of algae are not harmful. Algae blooms are often caused by blue-green algae, or “cyanobacteria”, which are similar to bacteria in structure but utilize photosynthesis to grow. They have no nucleus and lack the photosynthetic pigments found in algae. They usually are too small to be seen individually, but can form visible colonies that can cover large areas of lakes. Certain species of blue-green algae can produce toxins that could pose a health risk to people and animals when they are exposed to them in large enough quantities.

Blooms can last for an extended period of time, which prevents sunlight from reaching underwater plants and algae that are important to the ecosystem. The water can appear blue-green, bright green, brown, or red and may look like paint floating on the water. A water sample was collected at Mylith Park in May 2013 was analyzed for Harmful Algal Bloom (HAB). The sample results showed a microcystin concentration of 336.51 µg/L. Samples over 10 µg/L have potential health risks associated with recreational exposure to elevated concentrations of microcystin.

Poisoning has caused the death of cows, dogs, and other animals. Most human cases occurred when people swim or ski in affected recreational water bodies during a bloom. If you suspect that you are experiencing symptoms related to exposure to blue-green algae such as stomach cramps, diarrhea, vomiting, headache, fever, muscle weakness, or difficulty breathing contact your doctor or the poison control center. For more information or to report a blue-green algae bloom, contact the Lake County Health Department Environmental Services (847) 377-8030.

Not all blue-green algae produce harmful toxins. The three types of cyanobacteria that are often associated with Harmful Algal Bloom (HAB) are the Anabaena, Aphanizomenon, and Microcystis. The presence of these cyanobacteria does not generally mean that the toxins are present in the water. The presence of toxins can only be verified through a sample analyzed in the lab.

**For More Information On Blue-green algae:**
www.epa.state.il.us/water/surface-water/blue-green-algae.html

**To Report Blue-green Algae Bloom:**
Lake County Health Department
847-377-8030
Bathymetric maps, also known as depth contour maps, display the shape and depth of a lake. They are valuable tools for lake managers because they provide information about the surface area and volume of the lake at certain depths. This information can then be used to determine how much of the lake loses dissolved oxygen in the summer, how much of the lake bottom can be inhabited by plants, and is essential in the application of whole-lake herbicide treatments, harvesting activities and alum treatments of your lake. Other common uses for the map include sedimentation control, fish stocking, and habitat management. The LCHD-ES collects field data using Biosonics equipment along with a Trimble GPS unit with sub-foot accuracy. Once collected, the data will be analyzed and imported into ArcGIS for further analysis. In ArcGIS, the contours are drawn and the lake volume is calculated. The Lake County-ES has created bathymetric maps for many of the larger lakes in the county. The LCHD-ES recommends the creation of a bathymetric map for all lakes larger than six acres and can provide the names of several companies that can be hired to do the work. If you are interested in the creation of a bathymetric map of your lake, please contact the LCHD-ES at (847) 377-8030.

Shoreline Erosion

Erosion is a natural process primarily caused by water which results in the loss of material from the shoreline. Disturbed shorelines caused by human activity such as clearing of vegetation and beach rocks, and increasing runoff will accelerate erosion. Rain and melting snow and wave action are the main causes of erosion. Rain can loosen soil and wash it down gradient towards the lake.

A shoreline assessment was conducted at Slocum Lake on Sept. 23, 2013. Based on the 2013 assessment, there was a decrease from 2001 in shoreline erosion with approximately 16% of the shoreline having some degree of erosion. Overall, 84% of the shoreline had no erosion, 12% had slight erosion, 4% had moderate, and 0% had severe erosion which is an improvement from the previous assessment. In 2001, Slocum Lake had 64% with no erosion, 7% had slight, and 29% had moderate erosion along its shores.

Creating a native plant buffer helps prevent soil erosion as well as filter out pollutants and unwanted nutrients from entering the lake. Plant roots hold the soil particles in place so they are not easily washed away during a rain event, melting snow or wave action. Loose rocks and gravel placed on top of a filter fabric prevents soil from washing away before newly planted seed and vegetation has a chance to grow. Eroded materials cause turbidity, sedimentation, nutrients, and pollutants to enter a lake. Shore line buffer zone planted with native vegetation not only reduces runoff by increasing water infiltration into the ground, it also offers food and habitat for wildlife. Less runoff means less nutrients and other pollutants entering the lakes and streams. Excess nutrients are the primary cause of algal blooms and increased aquatic plant growth. Once in the lake, sediments, nutrients and pollutants are harder and more expensive to remove.

Erosion occurs when water levels drop and newly exposed soil is subjected to rain, wind and wave action. The water level in Slocum Lake dropped 5.4” between May and September. but remained stable during the summer, resulting in little observed erosion around the lake in 2013.
2014 Slocum Lake Shoreline erosion

<table>
<thead>
<tr>
<th>EROSION</th>
<th>2013</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>84</td>
<td>64</td>
</tr>
<tr>
<td>Slight</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Moderate</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total %</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Examples of Shoreline Erosion

Slight

Moderate

Severe
AQUATIC PLANTS

Aquatic plant mapping survey provides information based on the species, density and distribution of plant communities in a particular lake. An aquatic plant sampling was conducted on Slocum Lake on July 2013. There were 240 points generated based on a computer grid system with points 60 meters apart. Aquatic plants occurred at 40 of the sites (17% total lake coverage). There were only three aquatic plant species found in Slocum Lake in 2013 which is similar to the 2005 survey.

Eurasian Watermilfoil (EWM) was the dominant plant species (15%) and the second most abundant was Coontail, which occurred at 6.3% of the sites. Sago Pondweed was present at only one sampling location. EWM is an exotic plant species that begins growing very early in the season and grows to the waters surface forming a canopy. EWM maybe out competing other native plants such as Sago Pondweed allowing it to grow in limited amounts in the lake. The milfoil weevil, Euhrychiopsis lecontei, which is a native weevil that feeds exclusively on milfoil species were observed during the 2005 sampling season but not in 2013. Weevil populations can be cyclical which means that their population may increase as the EWM density.

Water clarity and depth are the major limiting factors in determining the maximum depth at which aquatic plants will grow. When light levels in the water column falls below 1% of the surface light level, plants can no longer grow.

The 1% light level in Slocum Lake ranged from 6-7 ft. suggests that there was enough light penetration for aquatic plants to grow. Aquatic plants play an important role in the lakes ecosystem by providing habitat for fish and shelter for aquatic organism. Plants provide oxygen, reduce nutrients such as phosphorus to prevent algae bloom, and help stabilize sediment. A native plant community tends to be diverse and usually does not impede lake activities such as boating, swimming and fishing.

AQUATIC PLANTS

<table>
<thead>
<tr>
<th>Rake Density (coverage)</th>
<th># of Sites</th>
<th>% of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Plants</td>
<td>200</td>
<td>83</td>
</tr>
<tr>
<td>&gt;0-10%</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>10-40%</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>40-60%</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>60-90%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt;90%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Sites with Plants</td>
<td>40</td>
<td>17</td>
</tr>
<tr>
<td>Total # of Sites</td>
<td>240</td>
<td>100</td>
</tr>
</tbody>
</table>

LCHD Staff identifying plants during sampling.

DISTRIBUTION OF RAKE DENSITY ACROSS ALL SAMPLES SITES IN 2013
Floristic Quality Index

Floristic quality index (FQI; Swink and Wilhelm 1994) is an assessment tool designed to evaluate the closeness that the flora of an area is to that of undisturbed conditions. It can be used to: 1) identify natural areas, 2) compare the quality of different sites or different locations within a single site, 3) monitor long-term floristic trends, and 4) monitor habitat restoration efforts. Each aquatic plant in a lake is assigned a number between 1 and 10 (10 indicating the plant species most sensitive to disturbance). This is done for every floating and submersed plant species found in the lake. These numbers are averaged and multiplied by the square root of the number of species present to calculate an FQI. A high FQI number indicates that there are a large number of sensitive, high quality plant species present in the lake. Non-native species were counted in the FQI calculations for Lake County lakes. In 2013, Slocum had an FQI of 7.1 ranking 136 out of 162 in Lake County. The median FQI of lakes that we have studied from 2000-2013 is 12.5.

In many lakes macrophytes contribute to the aesthetically pleasing appearance of the setting and are enjoyable in their own right. But even more important, they are an essential element in the life systems of most lakes. They perform a number of useful functions in maintaining the food chain of life in the lake.

- Macrophyte leaves and stems provide a habitat or home for small attached plants and animals. Some are microscopic in size and some are larger. These attached organisms are valuable as food for animals higher in the food chain, such as fish and birds.
- Many types of small organisms live in the sediment. There are insects that spend the immature stages of life in the sediments, leaving when they become adults. Decomposing plant life provides part of the food supply for these sediment dwelling organisms and the emerging insects, in turn, are food for fish.
- The submerged portions of macrophytes provide shelter and cover for small or young fish from larger fish that would feed on them.
- Types of plants that extend above the water can provide cover for waterfowl and their young, and many plants can serve directly as food for certain types of waterfowl.
- Aquatic plants provide many water quality benefits such as sediment stabilization and competition with algae for available nutrients.

Excerpt: Department of Ecology, Washington state
A National Pesticide Elimination System (NPDES) permit is required when pesticides are applied to, over or near the waters of the State. This permit applies to all public waters that have an outflow to the State waters. A Notice of Intent (NOI) must be filled and submitted electronically to the Illinois Environmental Protection Agency (IEPA) at least 14 days prior to any application of pesticides.

PESTICIDE PERMIT REQUIREMENTS FOR PESTICIDE APPLICATION

- When is a NPDES permit needed?
  Prior to any pesticide application made directly to, over or near waters of the state.

- Who should obtain NPDES permit coverage?
  The individual pond owner who will apply the herbicide. If the pond owner hires a contract applicator either the contract applicator or the pond owner could apply for NPDES coverage.

- How do I apply for NPDES permit coverage?
  File a Notice of Intent (NOI) with the IEPA. The form can be printed from the site listed above. Don't forget the 14 day public notice period and the information regarding the approval and notification process listed above, so plan ahead.

- What does the permit cost?
  Currently there is no fee however fees may be introduced at a later date.

- How long is the permit good for?
  Five years from the date of issuance but not from the date of coverage.

- Is anything else needed besides the permit?
  An Adverse Incident Report is needed if there are any adverse impacts related to the application such as spills or accidental overdosing. The incident must be reported to the Illinois Emergency Management Agency immediately and the report must follow within 15 days.

  A Pesticide Discharge Management Plan (PDMP) is required if the annual threshold of 80 acres is past and if you do not meet any of the additional exemptions within the permit. The threshold is determined not only by the size of the pond or lake but by the number of treatments. For example, if a 10 acre pond is treated 9 times with different herbicides within a one-year period, it would be counted as 90 treatment acres and the 80 acre threshold limit would have been passed. This would trigger the need for a PDMP. If treated with the same herbicide 9 times, the additional treatments would not count toward the threshold.

- Additional things to remember
  You are allowed to apply only a pesticide that is labeled for aquatic use. The General NPDES permit only applies to pesticide applications that will be made directly to or over waters of the State or at water’s edge. Pesticide applications to dry ditches which discharge into waters of the State may also require General NPDES permit coverage.

  You must file an updated NOI to modify your NPDES permit coverage to add additional use patterns or treatment areas at least 14 days prior to beginning the pesticide applications. The General NPDES permit coverage is good for 5 years from the issuance date on the permit.

Excerpt: Illinois DNR
Carp (Cyprinus carpio)

Carp are considered to be one of the most damaging invasive fish species. Originally introduced to the Midwest waters in the 1800’s as a food fish, carp can now be found in 48 States. In the U.S., the common carp is more abundant in manmade impoundments, lakes, and turbid sluggish streams and less abundant in clear waters or streams with a high gradient (Pflieger 1975; Trautman 1981; Ross 2001; Boschung and Mayden 2004). They are also highly tolerant of poor water quality. Participation in the Clean Waters Clean Boats program will help prevent other invasive species from entering the lake. Never release plants, fish or animals into a body of water unless they came out of that body of water.

The common carp has a dark copper-gold back with sides that are lighter, a yellowish belly and olive fins. They have 2 pairs of short barbells on their upper lip and their dorsal and anal fins have a leading spine that are serrated. They spawn from early spring to late summer in water ranging from 15 – 28 C and prefer freshly flooded vegetation as spawning substrate. They prefer to spawn in shallow weedy areas in groups consisting of one female and several males. A single female can produce up to 100,000-500,000 which hatch in 5-8 days. The spawning ritual involves a lot of thrashing in shallow water contributing to turbidity problems. Carp are omnivorous and feed over soft bottom substrate where they suck up silt and filter out crustaceans, insect larvae and other desirable food items. Carp are very active when feeding and can be observed around shallow areas where they uproot plants which increases turbidity and nutrient concentrations. Increase in nutrients causes algal blooms and reduction in light penetration that impacts aquatic plants.

There are several ways to control the carp population in a lake. Rotenone (piscicide) may be used to eradicate carp from a lake. However, it may be expensive because the entire lake and feeder creek needs to be treated to prevent carp from repopulating the lake. Rotenone is approved for use as a piscicide by the USEPA and has been used in the U.S. since the 1930’s. This piscicide can only be applied by an IDNR fisheries biologist. It is also biodegradable and there is no bioaccumulation. Warm-blooded mammals have low toxicity because they have natural enzymes that would break down the toxin.

Treating the entire system would eradicate carp and allow aquatic plants to become established. Unfortunately, the concentration required to remove carp are high enough to kill native fish species. Native fish species can be re-stocked 30-50 days after treatment. Assess current fish population to ensure that there are enough native predator fish such as bass, catfish and northern pike to help control the carp population. The removal of carp would certainly increase Slocum Lake’s water clarity and possibly allow for the growth of aquatic plants. This will help increase the DO levels and reduce TP and TSS concentrations.

The spawning ritual involves a lot of thrashing in shallow water contributing to turbidity problems.

Family: Cyprinidae (Minnows or carps)
Order: Cypriniformes (carps)
Class: Actinopterygii (ray-finned fishes)
Protecting the quality of our lakes is an increasing concern of Lake County residents. Each lake is a valuable resource that must be properly managed if it is to be enjoyed by future generations. To assist with this endeavor, Population Health Environmental Services provides technical expertise essential to the management and protection of Lake County surface waters.

Environmental Service’s goal is to monitor the quality of the county’s surface water in order to:

- Maintain or improve water quality and alleviate nuisance conditions
- Promote healthy and safe lake conditions
- Protect and improve ecological diversity

Services provided are either of a technical or educational nature and are provided by a professional staff of scientists to government agencies (county, township and municipal), lake property owners’ associations and private individuals on all bodies of water within Lake County.

For more information visit us at:
http://www.lakecountyil.gov/Health/want/BeachLakeInfo.htm

LAKE RECOMMENDATIONS

Slocum Lake’s water quality had improved since 2005 with decreases total suspended solids (TSS) and chloride concentrations. The shoreline improved since 2001 with a significant decrease in moderate shoreline erosion. The total phosphorus concentration slightly increased in 2013 compared to 2005, but was lower than 2001. There were no changes in the plant diversity and the lack in density of native plants should be addressed in future management plans.

Slocum Lake management is administered by Mylith Park Association, Williams Park Improvement Association, Water’s Edge Homeowners Association and Slocum Lake Residents Association.

To improve the overall quality of Slocum Lake, ES (Environmental Services) has the following recommendations:

- Encourage homeowners to incorporate native plants in their landscaping through rain gardens or shoreline filter strips
- Create an aquatic plant management program that would restore plant diversity and density
- Help reduce Cl by supporting wise use of road salt in the watershed
- Participate in Volunteer Lake Monitoring Program
- Participate in the Clean Waters Clean Boats Program
- Monitor lake level fluctuations
- Assess current fish population
- Reduce or eradicate common carp
- Mitigate shorelines exhibiting erosion