Pickerel-Crooked Lakes Plant Survey 2020

By Tip of the Mitt Watershed Council

Survey performed and summary prepared by Tip of the Mitt Watershed Council

Funded by Petoskey-Harbor Springs Area Community Foundation and the Pickerel-Crooked Lakes Association

December 2020

Introduction

In 2019, Tip of the Mitt Watershed Council received a grant from the Petoskey-Harbor Springs Area Community Foundation to conduct a "spot-check" of aquatic vegetation on Pickerel and Crooked Lakes, specifically to assess any infestations of invasive species. A comprehensive survey of aquatic plant species on Larks Lake and mapping of vegetation communities using a drone was also part of the overall project. This report covers work only on Pickerel and Crooked Lakes.

The Pickerel-Crooked Lakes Association (PCLA) has undertaken multiple efforts to manage invasive species on their lake. In 2006, volunteers carried out surveys to inventory all purple loosestrife infestations in Pickerel and Crooked Lakes and later used herbicide and *Galerucella* beetles, a biological control agent, until 2014 as treatment. In recent years, PCLA has partnered with Tip of the Mitt Watershed Council to mechanically remove purple loosestrife. Two comprehensive plant surveys were conducted on Pickerel and Crooked Lakes in 2008 and 2015 by Tip of the Mitt Watershed Council. The surveys found curly-leaf pondweed (*Potamogeton crispus*), narrow-leaf cattail, and purple loosestrife. In addition, Eurasian watermilfoil was found in the Crooked River in 2015 and was later found in Crooked Lake. PCLA has used benthic mats to curtail Eurasian watermilfoil growth as well as herbicides for both Eurasian watermilfoil and curly-leaf pondweed.

After discussions with PCLA and fielding citizen complaints, the Watershed Council decided to focus the study area on the following. Locations were chosen based on the assumption that invasive species might enter the lake at public accesses or thrive in areas with high nutrients:

1. Mouth of Oden Creek
2. Boat launches
3. Hency Rd. canal
4. Mouth of the Minnehaha
5. Lagoon on east side of Oden Island
6. West of Graham Point

Results

Mouth of Oden Creek

Three points were sampled for plants near the mouth of Oden Creek (Figure 1). *Cladophora* algae was abundant as was muskgrass and bulrushes. Only a few leaves of curly-leaf pondweed were found at the nearest location to the mouth of Oden Creek. This is one area where PCLA has been contracting herbicide treatments through Clear Lake Water Management, Inc.

West of Graham Point

This area was a concern for riparian landowners. Two sample sites were surveyed parallel with Graham Rd. Common milfoil was the dominant species and the density was moderate (Figure 1). Wind and shallow water prevented staff from going closer to the shore. Iduna Creek is likely depositing nutrients into this area. Septics may also be a concern. At this time, there is no evidence of invasive species in this area.

Boat Launches

The Little Traverse Township boat launch has had Eurasian watermilfoil in the past (Figure 1). Efforts appear to be working as no Eurasian watermilfoil was found. Muskgrass was the most dominant species nearest the boat launch. Two additional samples were taken on what would be a normal route for a boat coming from the boat launch and headed towards the Crooked River. Both locations did not have Eurasian watermilfoil. Common watermilfoil was the dominant species at those locations.

The area around Artesian Lane was visually surveyed, but did not have any plants to sample (Figure 2).

One sample point was taken at Camp Petosega (Figure 2). The dominant plant species was chara. Variable leaf pondweed was also present. While it can be very tall and a nuisance to swimmers, it is native and does not present any ecological harm.

Mouth of the Minnehaha

The Minnehaha Creek brings in nutrients to Crooked Lake—this is a natural occurrence but could contribute to additional plant growth. Citizens have been complaining about this area. Only sago pondweed, elodea, and common watermilfoil were found at two sites near Minnehaha Creek (Figure **3**). These plants likely provide good habitat for fish near the creek mouth.

Hency Rd. Canal

The Hency Rd. canal was visually surveyed from Crooked Lake, but was too shallow to enter. Plants were sparse in that area and mostly consisted of bulrush. No sample was taken as visible plants were not invasive.

Additional Notes

In the course of the survey, PCLA contacted the Watershed Council with a possible sighting of Eurasian watermilfoil at Windjammer Marina. Watershed Council staff positively identified the plant as Eurasian watermilfoil and PCLA acted quickly to share treatment options with Windjammer Marina. It is believed Windjammer Marina decided on herbicides, however a search for a permit on the State of Michigan's online water resource permit portal (MiWaters) shows Windjammer Marina did not conduct treatment in 2020.

The Watershed Council helped PCLA identify Wildlife and Wetland Solutions as a contractor for herbicide treatment of *Phragmites* on Crooked Lake near the Crooked River. The Watershed Council identified one additional site with *Phragmites*—at the property just east of the Little Traverse Township boat launch.

The Watershed Council was not able to enter and survey the lagoon on the east side of Oden Island due to low water levels and an abundance of plants. Staff did survey the navigation route along the sand bar, which is frequented by most boats on Crooked Lake. While vegetation was dense, no Eurasian watermilfoil or other invasive species were found.

The use of a drone in the project was intended to help measure the size of plant populations and help with identification. In the course of the field season, staff discovered the drone's limitations, which ultimately led to it not being used on Crooked or Pickerel Lakes. The original project focused merely on capturing imagery, and did not factor in the right requirements for making maps. The requirements include the need for images to have a certain amount of overlap and angle, which can only be collected properly through use of a mapping program installed on the drone's controller (e.g. Pix4d, DroneDeploy, Ground Station Pro, etc.). Beyond capturing the images, a second piece of computer software is needed to analyze the images, stitch them together, and create a map (e.g. Pix4d, Terra, MapsMadeEasy). The Watershed Council had neither the controller that could perform mapping operations nor the computer software that could process images at the time of the aerial survey. It is very difficult for computers to process maps of water because of the constantly changing surface and the inability for the computer to detect patterns. In addition to these challenges, weather was also an obstacle. A drone can normally operate in wind 7 mph or less. Any ripple on the water reduces visibility and ideally wind of less than 3 mph is desirable. The time of day is also an important factor. Capturing aerial imagery when the sun is directly overhead reduces shadows. Furthermore, quality-assuring aerial images would be difficult—aerial images used for maps are normally compared to measurements taken on the ground from fixed points. This would be difficult due to waves and currents. A permanent bulkhead or channel marker would be needed to make ground-truthing measurements. The parts of Crooked Lake sampled in this

survey may not be right for drone imagery due to a mucky or marly substrate, which makes it hard to decipher between vegetation and lake bottom.

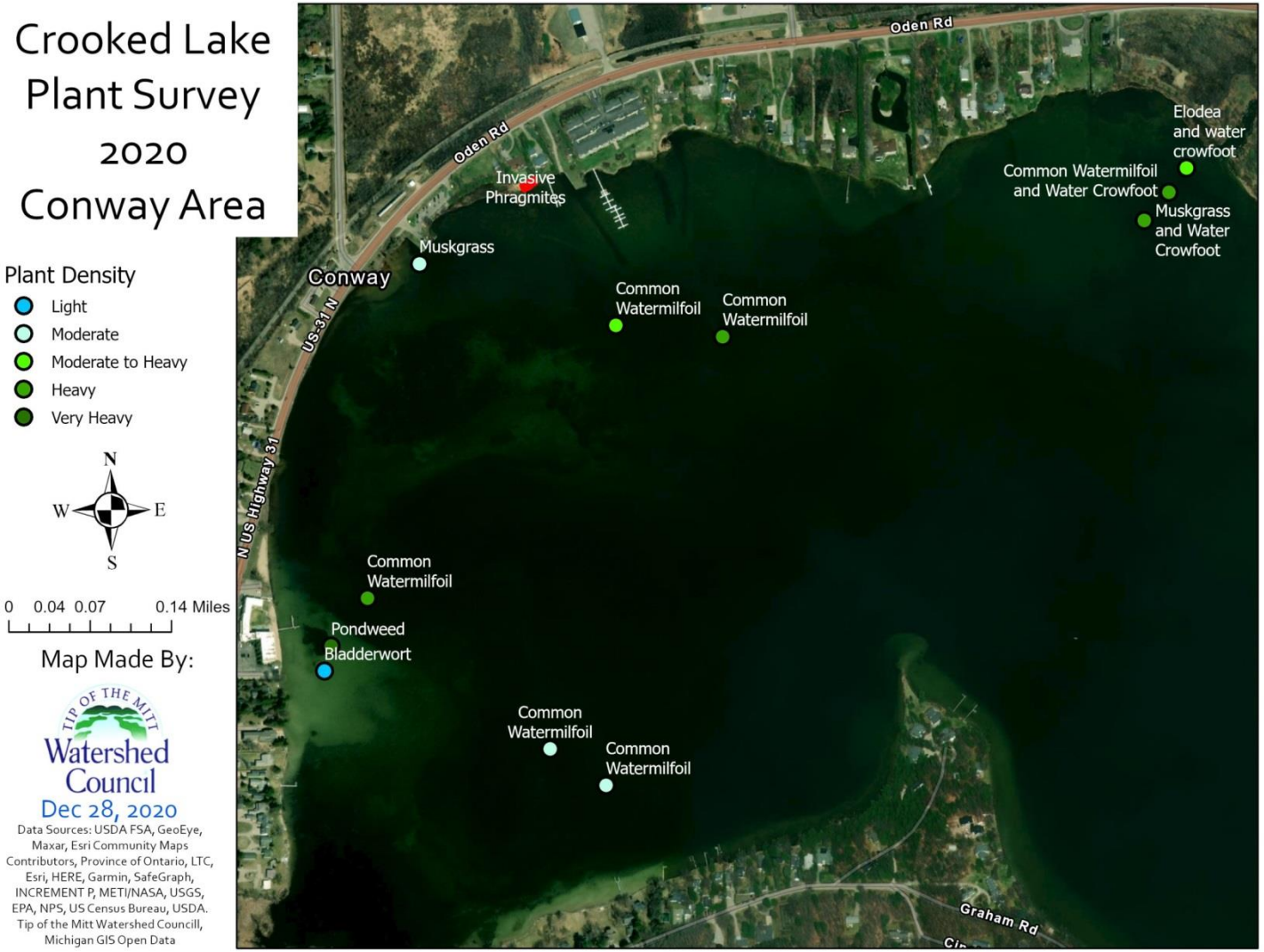

Figure 1. Plant survey findings west of Graham Point and near the Inland House, Little Traverse Township boat launch, and mouth of Oden Creek.

Figure 2. Plant survey findings in Pickerel Lake.

Figure 3. Plant survey findings on Crooked Lake near the mouth of Minnehaha Creek and Oden Island.