MEMORANDUM

TO: Johns Lake Management District

DATE: February 11, 2015

SUBJECT: Results of the Johns Lake exotic species survey conducted on October 30, 2014

On October 30, 2014 a survey of Johns Lake was conducted to determine the distribution and abundance of Eurasian watermilfoil (Myriophyllum spicatum). Surface observations were used to locate plants and rake-tows were used to verify their identification. GPS coordinates were recorded at each location to accurately map EWM distribution and determine bed size.

Management History
By 2000, Eurasian watermilfoil (EWM) had dominated much of the plant community in Johns Lake. In 2001, all of the Eurasian watermilfoil found in the lake was treated with Navigate® (granular 2,4-D) at a rate of 150 lbs/acre. Since then, Eurasian watermilfoil has been maintained at very low densities in Johns Lake through annual surveys and small spot treatments.

After trying a liquid 2,4-D approach in 2012 with little to no success, Navigate® was again used in 2013. By targeting an area of 0.5 acre with Navigate®, the total abundance of EWM decreased to 0.3 acre during the fall 2013 survey. Even though EWM decreased in abundance, it was unclear whether or not weather-related factors or the chemical treatment was the cause of the slight decline. The most recent treatment on Johns Lake occurred on June 4, 2014. A total of 0.3 acre was treated with 45 lbs of Navigate® at a rate of 4 ppm (parts per million).

Survey Results
Five locations of Eurasian watermilfoil were found during the October 30, 2014 survey (Figure 1). The locations consisted of two beds with a highly scattered density and three areas with single plants or small groups of plants. The total area covered was 0.2 acre. No dense areas of EWM were observed. The two areas in the southwest part of the lake have historically contained EWM, although some years in larger quantities. EWM was not observed in the northeast portion of the lake in the fall 2014 where it had been found during the fall 2013 survey.
Eurasian Watermilfoil Management Options

Johns Lake, due to ongoing management efforts, has had a low frequency of occurrence of EWM in recent years. At one time, a larger population of EWM existed. Through careful monitoring and annual spring treatments, EWM has been reduced to a generally small acreage of scattered plants at less than nuisance levels. Moving forward there are three options to consider in the future management of Eurasian watermilfoil in Johns Lake.

Chemical treatment

Traditionally, annual chemical treatments have been the tool of choice for managing EWM in Johns Lake. In the spring of 2015, a chemical treatment could again be utilized. Milfoil beds should be targeted using Navigate®. The application rate for milfoil ranges from 2.0 to 4.0 ppm. For small, isolated beds, the maximum labeled rate of 4.0 ppm (56.8 lbs/acre-ft) is recommended. The higher concentration requires less contact time to be effective.

Chemical treatments can provide seasonal relief from EWM, but may not provide long-term control at these small scales. Often these beds are found in the same locations from year to year. These treatments also serve to prevent or slow the further spread of EWM throughout the lake. While this approach rarely leads to eradication, these treatments can serve as a means to prevent wide-spread expansion of EWM. Table 1 provides a breakdown of estimated treatment costs for 2015.

Table 1. Treatment cost estimate for Johns Lake, 2015.

<table>
<thead>
<tr>
<th>Bed</th>
<th>Acreage</th>
<th>Depth (ft)</th>
<th>Acre-ft</th>
<th>Rate</th>
<th>lbs</th>
<th>Cost/lb</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.1</td>
<td>4.5</td>
<td>0.45</td>
<td>56.8</td>
<td>26</td>
<td>$4.10</td>
<td>$105</td>
</tr>
<tr>
<td>B</td>
<td>0.1</td>
<td>3.5</td>
<td>0.35</td>
<td>56.8</td>
<td>20</td>
<td>$4.10</td>
<td>$82</td>
</tr>
<tr>
<td>Total</td>
<td>0.2</td>
<td></td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td>186</td>
</tr>
</tbody>
</table>

Setup $440
Labor $100
Navigate $186
Total $726

Manual removal

Manually removing EWM plants can be an effective method at eliminating newly found single plants or small isolated beds. This can be done through a variety of approaches, however, the most appropriate approaches for the current situation are hand-pulling or diver-assisted suction harvesting (DASH). Hand-pulling is much easier to perform in shallow water while DASH operations are used in deeper water. The DASH method employs a pump with a large hose mounted on a boat. The diver pulls the plants from the lake bed by hand and feeds them into the hose. The plant matter is pumped onto the boat.
where it is screened out. Currently there are only a few companies in Wisconsin that offer DASH. To find out more about this option, Association should contact the local DNR office.

If manual is utilized, it is important that lake residents and users know the difference between native northern watermilfoil and Eurasian watermilfoil and remove only Eurasian watermilfoil found around the lake. It would be wise to start by monitoring previous treatment locations to remove any surviving EWM. It is important to remove the entire plant (including fragments) and roots in order to keep it from spreading. This can be a great way to keep new infestations from becoming established.

**No Management**
The third option in managing EWM in Johns Lake is to wait to see how the milfoil behaves. Recent DNR research has suggested that in some lakes where EWM is introduced, it does not reach high enough levels to cause ecological or recreational harm. In these situations, often the plants are actively managed or the EWM remains at low occurrences and behaves like a native plant. However, this is not something that can be accurately predicted. If left unmanaged, EWM may or may not reach nuisance levels. If it did not, annual monitoring would still be needed to keep track of this species. However, if EWM increased significantly in the lake, it would likely mean returning to a more aggressive management approach, namely chemical treatments, which, on a larger scale, would also be more costly to conduct.

**Monitoring Recommendation**
It is recommended that the District continue sponsoring annual surveys to stay proactive in the management of Eurasian watermilfoil in Johns Lake. Locating and treating new EWM locations early is the best way to reduce the spread throughout the lake. The fall of the year is the ideal time to perform these surveys as milfoil is full grown and native plants have started to die back due to colder water temperatures. The annual cost for these surveys is $500.
Figure 1. Distribution of Eurasian watermilfoil in Johns Lake, Waushara County, WI during the October 30, 2014 survey.