Cason
& ASSOCIATES, LLC
LAKE & POND MANAGERS

P.O. Box 230
Berlin, WI 54923

Phone: 920-361-4088
Fax: 920-361-4086

MEMORANDUM

TO: **The Jordan Lake Rehabilitation and Protection District**

DATE: **February 12, 2015**

SUBJECT: **Results of the October 20, 2014 milfoil mapping survey**

Recent Management

Eurasian watermilfoil (*Myriophyllum* spicatum) in Jordan Lake has occurred at nuisance levels in the past, with its highest abundance at 38.6 acres in the fall of 2009. A variety of strategies were employed to try and reduce the abundance of Eurasian watermilfoil. These strategies included hand-pulling, chemical 'spot' treatments and whole lake, low-dose treatments. These treatments dramatically reduced the overall abundance of Eurasian watermilfoil in the lake. In the fall of 2011, the distribution had been reduced to approximately one acre.

During the fall 2010 survey, milfoil samples were collected for DNA analysis to determine whether or not the plants were a hybrid milfoil. DNA testing revealed that Jordan Lake contains both Eurasian watermilfoil *and* the hybrid milfoil cross between Eurasian watermilfoil and northern watermilfoil (*Myriophyllum spicatum X sibiricum*).

In the spring of 2013, more Eurasian/hybrid watermilfoil was found than was originally mapped in the fall of 2012. On June 12, 2013, a total of 21 acres of Eurasian/hybrid watermilfoil was treated using Navigate® (granular 2,4-D). On September 26, 2013, an aquatic invasive species mapping survey located 20 locations of Eurasian/hybrid watermilfoil, covering a total area of 7.0 acres. Of these 20 locations, ten were discreet beds, and ten contained individual plants or small groups of plants.

The most recent treatment in Jordan Lake occurred on June 3, 2014, when a total of 18.5 acres were treated. Two treatment approaches were used. On the west end of the lake, 15.3 acres were treated with 120 gallons of DMA 4 IVM® (liquid 2,4-D) at a rate of 2.0 ppm (parts per million). In the main basin, 3.2 acres were treated with 795 lbs of Navigate® at a rate of 4.0 ppm.

Survey Methods

A survey was performed on October 20, 2014. Surface observations and rake tows were used to determine the boundaries of beds of Eurasian/hybrid watermilfoil. GPS coordinates were recorded at each location to help determine exact location and size using ArcMap software. The density and depth of each bed were also recorded.

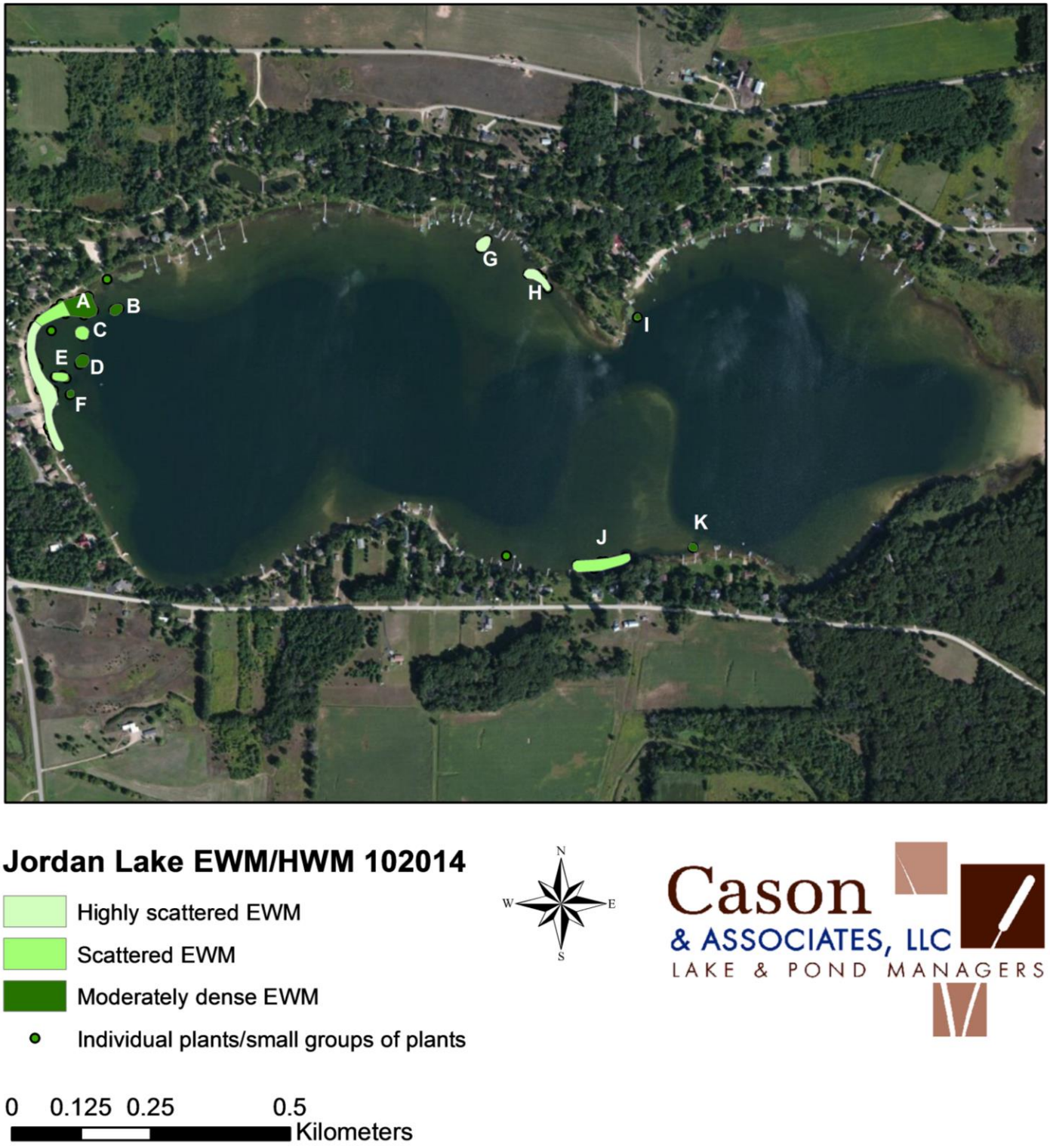
Survey Results
A total of 14 locations of Eurasian/hybrid watermilfoil covering an area of 3.4 acres were found during the October 2014 survey. Eleven of these locations were discreet beds while three contained individual plants or small groups of plants (**Figure 1**). Bed density ranged from highly scattered to moderately dense. Beds ranged in depth from 3.5 to 9.0 feet. Most locations were found in areas that had previously been chemically treated. In general, the acreage and densities of the Eurasian/hybrid watermilfoil beds throughout Jordan Lake during the fall 2014 survey had declined since the fall 2013 survey.

Conclusions and Recommendations
Eurasian/hybrid watermilfoil on Jordan Lake remained below nuisance levels in 2014, with exception to the area immediately to the west of the public boat landing. Compared to the more than 20 acres treated in the spring of 2013, the overall abundance has significantly decreased to only 3.4 acres in the fall of 2014. Moving forward there are three options to consider in the future management of Eurasian watermilfoil in Jordan Lake.

Chemical treatment
Traditionally, annual chemical treatments have been the tool of choice for managing Eurasian/hybrid watermilfoil in Jordan Lake. In the spring of 2015, a chemical treatment could again be utilized. The lone milfoil bed 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.

Figure 1. Distribution of Eurasian/hybrid watermilfoil in Jordan Lake, Adams County, WI during the October 20, 2014 survey.



Cason & ASSOCIATES, LLC
LAKE & POND MANAGERS

877-309-8408
www.casonassociates.com
info@casonassociates.com

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

Bed	Acreage	Depth (ft)	Acre-ft	Rate	lbs	Cost/lb	Cost
A	1.9	4.5	8.6	56.8	486	$4.12	$2,001
B	0.1	9.0	0.9	56.8	51	$4.12	$211
C	0.1	6.0	0.6	56.8	34	$4.12	$140
D	0.1	6.0	0.6	56.8	34	$4.12	$140
E	0.1	5.5	0.6	56.8	31	$4.12	$129
F	0.1	5.0	0.5	56.8	28	$4.12	$117
G	0.1	4.0	0.4	56.8	23	$4.12	$94
H	0.2	3.5	0.7	56.8	40	$4.12	$164
I	0.1	5.0	0.5	56.8	28	$4.12	$117
J	0.5	4.0	2.0	56.8	114	$4.12	$468
K	0.1	4.5	0.5	56.8	26	$4.12	$105
	3.4		15.8		895		$3,686

Setup	$470
Labor	$400
Navigate	$3,686
Total	$4,556

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 Jordan 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, the milfoil 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 Jordan 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 some native plants have started to die back due to colder water temperatures. The annual cost for these surveys is $950.