Lake and Pond Solutions Co.

CASE STUDY: TARGETED MUCK REDUCTION WITH MD PELLETS

NOVEMBER 2016

PROJECT OVERVIEW

[redacted] Lake is a 6.5 acre private stormwater lake located in SE Wisconsin. It has three main fingers and three small islands located on the southern portion of the lake. The maximum depth is 10.9' while the average depth is 5.1'. Despite having a 12-diffuser summer aeration system and a SolarBee for winter aeration, the lake saw extensive fish kills during the winters of 2009 and 2014.

Following the 2014 fish kill, total phosphorus and dissolved phosphorus in the lake quadrupled to 0.280 ppm and 0.110 ppm, respectively. As expected, algae growth exploded including difficult to control species like hydrodictyon, pithophora, and spirogyra.

[redacted] Lake Stats

Acreage	6.50
Max Depth	10.9'
Average Depth	5.1'
< 3' Deep	20.40%
3 - 6' Deep	46.10%
6 - 9' Deep	27.20%
> 9' Deep	6.30%
Avg. Dissolved P	0.127 ppm
Avg. Total P	0.228 ppm

Hydrodictyon growth on [redacted] Lake (2014)

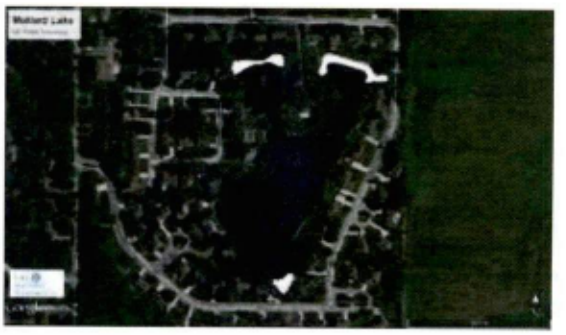
In 2015, spring sampling showed another staggering increase in total and dissolved phosphorus (double from the previous spring). The thought was that decaying fish from the previous year had charged lake sediments with high amounts of phosphorus. The HOA undertook a nutrient reduction program using aluminum sulfate in an attempt to significantly reduce phosphorus levels. Although the treatment was successful by dropping phosphorus and limiting algae growth, it was short lived as phosphorus soared even higher by the fall.

During the winter of 2015, [redacted] Lake HOA and LPS decided on a plan to look at the soft sediment accumulation and reduction as a way to reduce in-lake nutrient loading.

METHODS

Due to the sheer size of the pond, 3 key areas of excessive soft sediment accumulation where chosen as test sites (see inset picture on right). The NW area was 0.16 acres in size, the NE area was 0.17 acres in size, and the South area (near the outflow) was 0.09 acres in size.

On March 28th, 2016, LPS took soft sediment readings in each area using a custom marked 10-foot pole with a sediment disc. Random locations were chosen and depth of soft sediment was recorded.



An aggressive 42#/acre rate of Aquafix MD Pellets was chosen and applied monthly for five months (May – September) in order to achieve accelerated results. Pellets were hand spread and all algae treatments were performed at least 3 days out from any MD Pellet application to limit adverse reactions.

On September 15th, 2016, LPS took post season soft sediment readings in each area. Random locations were again chosen and depth of soft sediment was recorded and averaged.

RESULTS

In the NW and South areas, average soft sediment was reduced by 5.85" – 14.5". Those same areas also saw reductions in each minimum and maximum reading. The NE area did not show as much of an average reduction (3") although the minimum reading did decrease. It should be pointed out that the NE end of this area is where the most extensive muck in the lake was found (42"). No aeration is present there and it's theorized that oxygen demand was too great to achieve dramatic results. The control site, located at the SW end of the lake, saw no significant changes to soft sediment levels.

[redacted] Lake Muck Depths

NW LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	9	21	14.25	15,9,21,12
9/15/2016	0	18	8.4	18,6,0,6,12

NE LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	6	42	16.5	15,9,18,9,6,42
9/15/2016	0	42	13.5	0,9,0,6,42,24

S LOBE				
DATE	MIN	MAX	AVG	Readings
3/28/2016	21	24	22.5	21,24
9/15/2016	6	12	8.0	12,6,6

SW LOBE (Control)				
DATE	MIN	MAX	AVG	Readings
3/28/2016	8	17	12.4	8,14,12,17,11
9/15/2016	7	17	12.8	7,12,17,13,15

Data collected by Lake and Pond Solutions Co. (2016)

SUMMARY

Aquafix MD Pellet applications of 42#/acre resulted in reductions of 3" – 14.5" over the span of all test areas. These results were confirmed by two separate [redacted] Lake HOA members who performed their own soft sediment testing. In their sampling, they showed average reductions of 5.58" with maximum reductions up to 18".

"I'm encouraged as overall we saw an improvement on all the test areas. I'm sure we'll never win the war but we're putting up a good battle." – Kurt L. ([redacted] Lake HOA)

"These results are encouraging, especially when we know that if we did nothing, the muck layer would be thicker in the fall than in the spring." – Ron L. ([redacted] Lake HOA)

The [redacted] Lake HOA in conjunction with Lake and Pond Solutions Co. are looking to expand the test areas in 2017.