



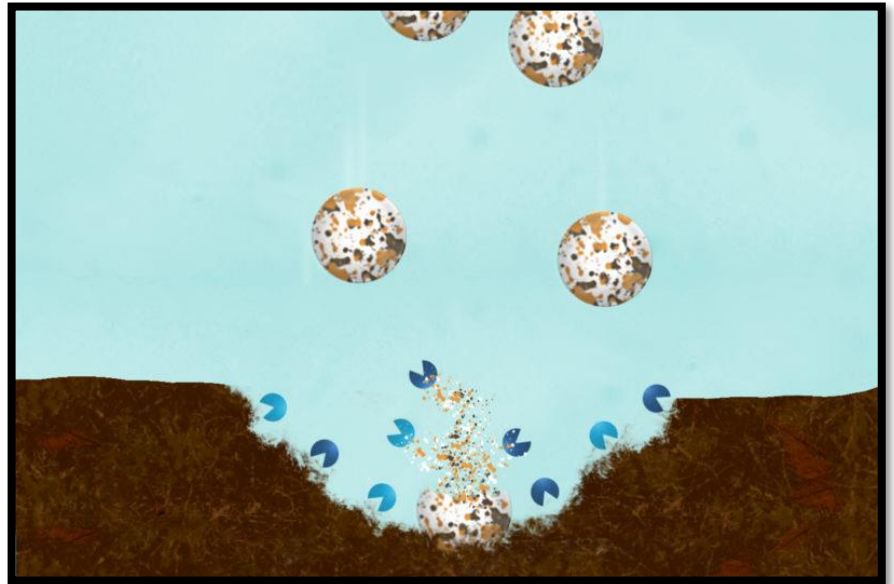
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# The Effectiveness of Muckbiotics on Organic Muck Reduction

*2021 Naturalake Biosciences Research & Case History Rewards Program*

Boyd Delebreau  
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## Project Overview:

A quantitative approach to determine the effectiveness of Muckbiotics on reducing organic muck. The testing site for this study was Fern Lake, a 0.80-acre private pond located in New London, Wisconsin. Fern Lake has an average depth of five feet and a single outflow on the north end of the pond. Aeration is present with three diffusers spread evenly throughout the pond. The Fern Lake HOA consists of thirteen houses that surround the pond and finance the management of it. Water runoff from surrounding fertilized lawns and lack of riparian buffers causes heavy nutrient accumulation of nitrogen and phosphorus. This nutrient overloading causes prolific pithophora algal blooms during the growing season. Lake & Pond Solutions performed three algae treatments during the 2021 growing season. The combination of fertilizer runoff, grass clippings, leaves from nearby trees, and decomposing algae increases organic muck levels throughout the entire pond. Significant muck levels have long been present in the southern lobe of the pond, which is narrow and shallow. However, the littoral zone around the entire pond also has evidence of considerable muck accumulation. Removal of this unwanted soft sediment and organic matter in the southern lobe by way of dredging would be extremely time-consuming and expensive. The use of Muckbiotics was implemented as a possible cost-effective and environmentally friendly option to reduce the organic muck layer in the target area.

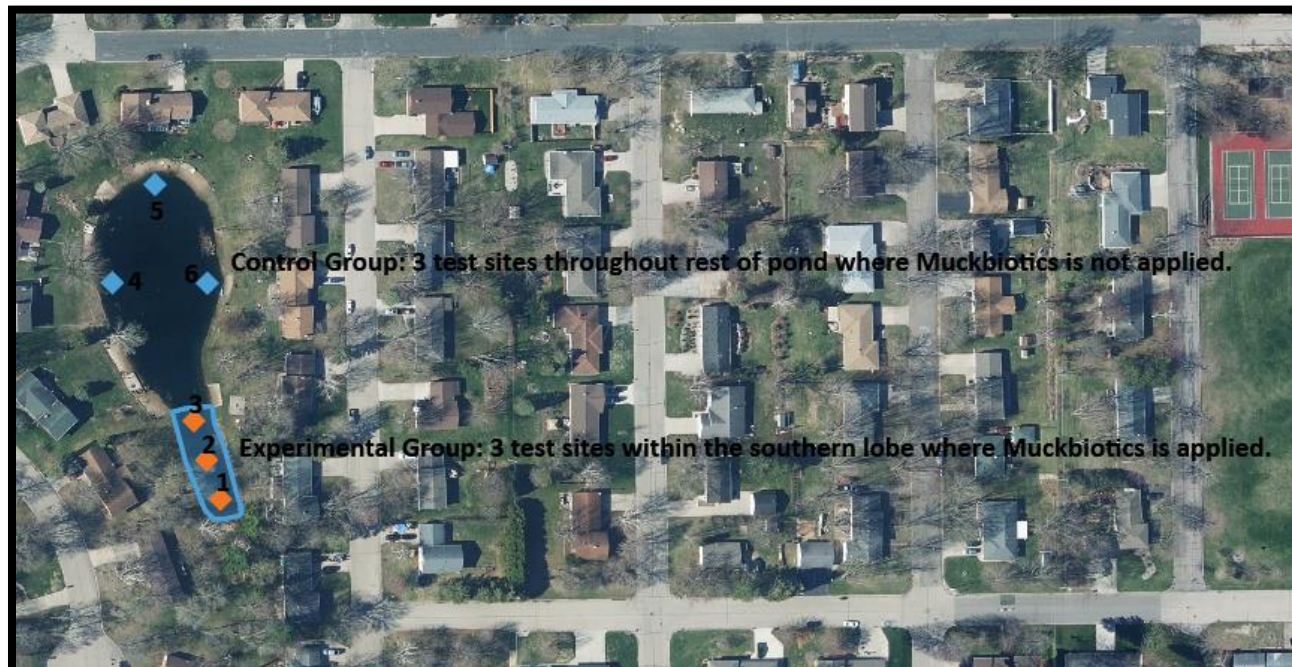
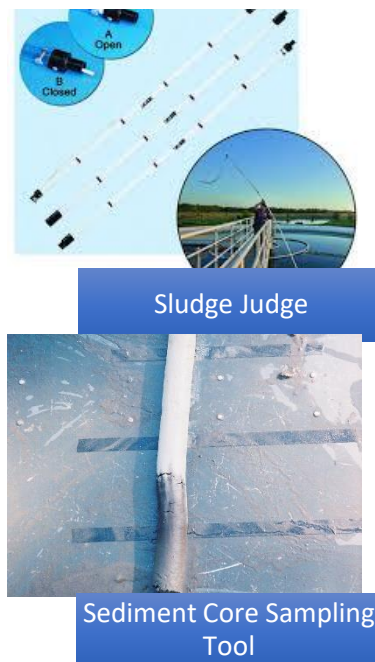


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## Material & Methods:

Muckbiotics was applied evenly within the southern lobe, the key area of this study. This target area was 0.13 acres in total. From May through October, an application rate of two pounds once per month was used in conjunction with Naturalake's recommended dosage rate found on the product sheet (5 lbs./0.25 ac. rate). Muckbiotics was not applied anywhere else in the pond. The experimental group consisted of three test sites (1-3) with an average depth of five feet evenly spaced throughout the southern lobe. The control group consisted of three test sites (4-6), with an average depth of five feet in the west, north, and east ends of the pond. These sites were located fifteen feet into the littoral zone, to effectively measure organic muck levels with our equipment. All six test sites were plotted on a GPS device to ensure accurate and consistent testing. A sediment core sampling tool was used to collect substrate samples from all six test sites. This was done from a boat at the start of testing in May and then again at the end of testing in October. Substrate at each testing site was classified by percentage of clay, silt, sand, and pebbles. Muck depth in inches was measured from a boat monthly from May through October by use of a Sludge Judge.

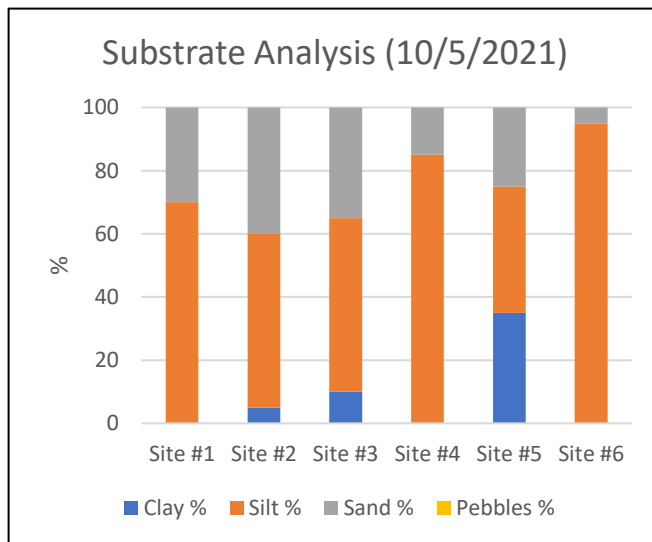
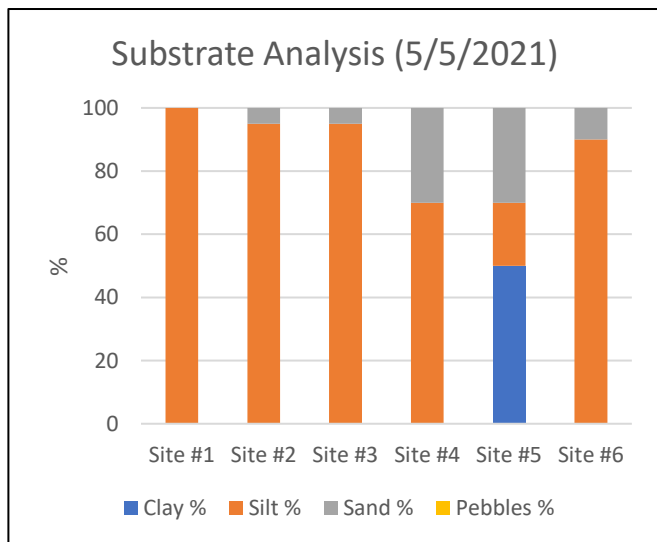
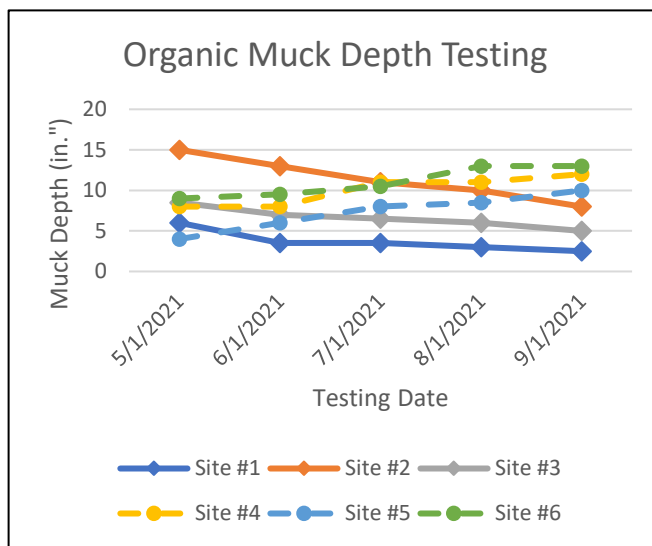


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**Results:**

At the end of testing, substrate analysis showed a decrease in soft sediment and an increase in coarse sediment percentage at all three experimental test sites. While, soft sediment percentage increased at all three control test sites. Our three test sites within the target area resulted in an average muck depth reduction of 4.5 inches in five months. Muck depth at these three sites gradually decreased beginning with initial application of Muckbiotics in May. The three sites comprising our control group saw an average muck depth increase of 4.7 inches in five months. All three control sites gradually increased in muck depth throughout the growing season.



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**Discussion:**

All three test sites within the southern lobe saw an impressive reduction in muck depth proving Muckbiotics to be an effective alternative to mechanical or hydraulic dredging. As evident with our control sites, if no management is done, muck depth will progressively rise from the influx of nutrients and organic matter throughout the summer. The ease of use and time-effective qualities of Muckbiotics make it an attractive option for small-scale ponds to gain an upper hand on excessive muck accumulation and restore balance to the water body. Application of Muckbiotics in Fern Lake will be continued in the southern lobe and endorsed throughout the entire littoral zone.



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