



On-Site Lake Evaluation Record

Lake Name: Duck and Green Lakes

County: Grand Traverse

Evaluated by: Bre Grabill, Jason Broekstra, Casey Shoaff

Reviewed by: Bre Grabill

Date: August/September/October 2016

Purpose of evaluation: End of season Survey

Evaluations Performed

Aquatic Vegetation Evaluation

- Aquatic vegetation survey
- Aquatic vegetation brief check

Water quality sampling

- On-site (Temperature, DO, Secchi disk)
- Water samples collected for _____ analysis

Vegetation evaluation methods

- Visual evaluation
- Sample collection with rake
- Sonar profiling
- GPS-mapped sample locations

GPS data collection

- Depth survey
- Shoreline mapping
- Reference point location

Other _____

Overall Condition of Lake

- excellent (no problems or developing problems noted)
- very good (no immediate action required)
- fair (management required soon)
- poor (management needed as soon as possible)
- very poor (management action past due—IMMEDIATE response required)

Problems Noted

- Growth of exotic plants
 - Eurasian watermilfoil - Duck Lake, Phragmites
 - Curlyleaf pondweed
 - Starry stonewort
- Excessive growth of native plants (note plant species and mark locations on map)
- Excessive filamentous algae growth (mark location on map)
- Poor water clarity
- Blue-green algal blooms



PLM Lake & Land Management Corp.

Northern Division

P.O. BOX 424 Evart, MI 49631
800-382-4434 ext. 2200 (o) 231-372-5900(f)
www.plmcorp.net

RECOMMENDATIONS

- X Monitoring Program:
Continue monitoring program next season: Yes, No
- X Herbicide application: Continue Program Next Season
Need for herbicide treatments next season: urgent, serious, moderate, slight

SUMMARY

Duck Lake was surveyed throughout 2016 for controlling Eurasian watermilfoil. The initial survey in June found isolated areas with EWM and treatment followed. The end of summer survey showed that treatment was very successful. EWM was identified in only a few areas on the lake during the end of summer survey and those areas will be a treatment focus in 2017. An updated spring survey will be done to help determine if any additional treatment areas will require early season management.

Management of EWM is an annual requirement and using systemic herbicides to attack the root system of the EWM can assist in providing longer term control. Previous infestation beds need to be monitored regularly for annual new growth, in addition to surveying the entire lake for any new infestations. EWM can pop up quickly and spread quickly, so it is important to stay on top of the plants within Duck Lake. Now that the SAD is formed, treatments can take place quickly after infestations are found and the lake can be managed aggressively for exotic plants.

Phragmites was found in a few areas on the lake as well. Invasive Phragmites should be targeted for control in the future. Chemical spraying is known as the most appropriate control measure for Phrag.

Native plants were abundant throughout the lake and diversity was good. The treatment areas were heavily infested with native plant growth, evidence of the selectivity of EWM treatments. It is recommended to promote native plant diversity throughout the lake. Native plants are required for a healthy and thriving lake ecosystem and are encouraged as part of this management program. If natives do become a nuisance, management efforts should include raking beaches when possible or very isolated, minimal herbicide treatments can also be an option. There are a few areas on Duck Lake with native plants at nuisance levels.

Green Lake was surveyed in October 2016. This annual survey was done to identify any exotic plants in the lake as well as to track native plants. The survey found no EWM or other submersed exotic plants, but did find a few areas of Phragmites as well. The native plant community was thriving and numerous species were found throughout the lake. It is recommended to survey Green Lake annually to stay on top of any new introduction. In addition to the annual AVAS, it is recommended to have riparian eyes keep a look out on Green Lake and Duck Lake!

Please feel free to contact me with questions on your survey results of Green & Duck Lakes. Thank you for choosing to work with PLM!

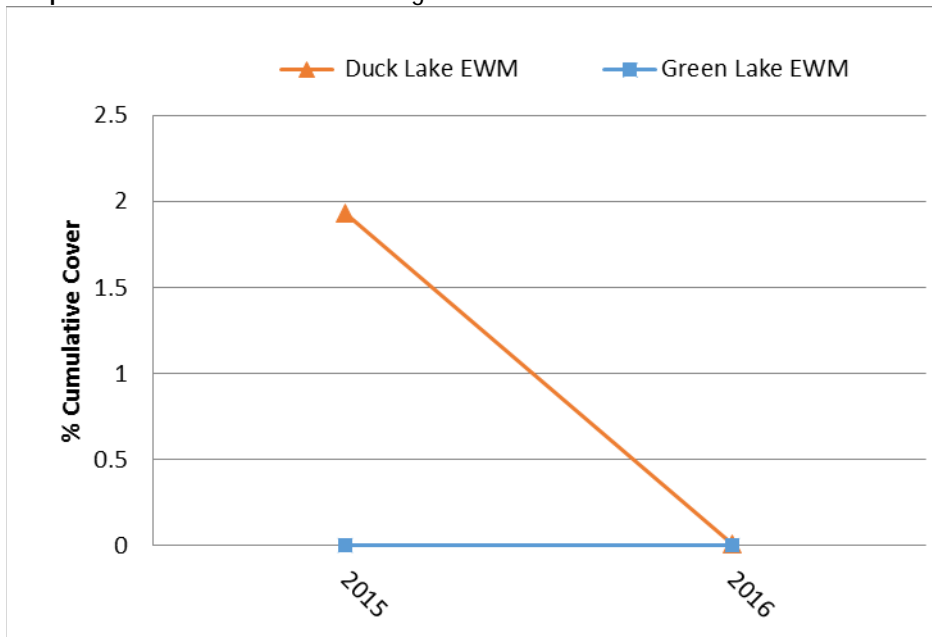
Respectfully,

A handwritten signature in cursive script that reads "BreAnne Grabill".

BreAnne Grabill, Environmental Scientist
Northern Lakes Manager
PLM Lake & Land Management Corp. North
breg@plmcorp.net

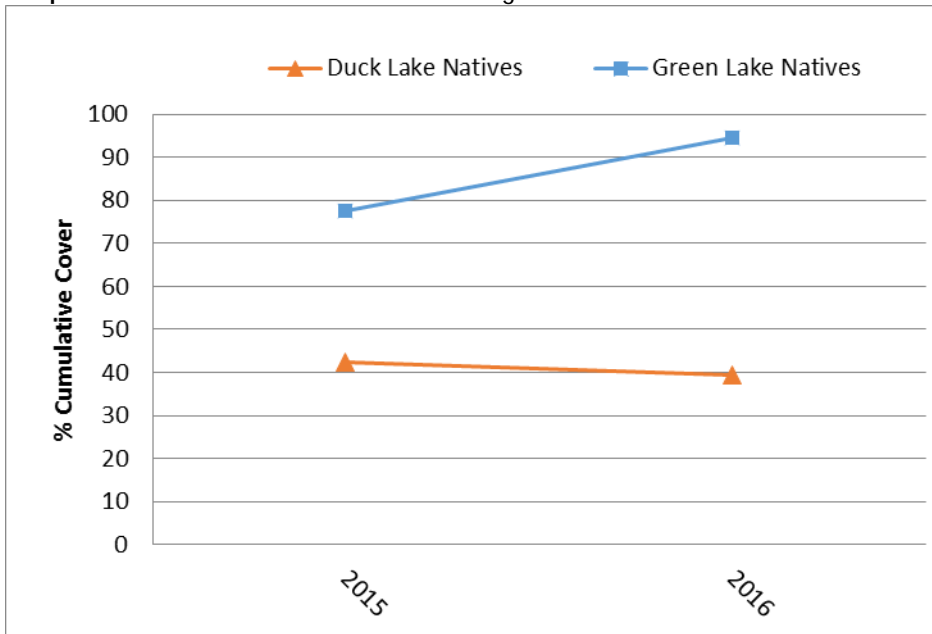


Graph 1: EWM Cumulative Coverage of Duck and Green Lakes



EWM control on Duck Lake was successful in 2016, reducing the amount of coverage. No EWM was found on Green Lake in either 2015 or 2016.

Graph 2: Native Plant Cumulative Coverage of Duck and Green Lakes



Native Plant populations are healthy and thriving in both lakes. Successful EWM treatments remove exotic species while promoting and maintaining native plant communities, which was successfully done in 2016.