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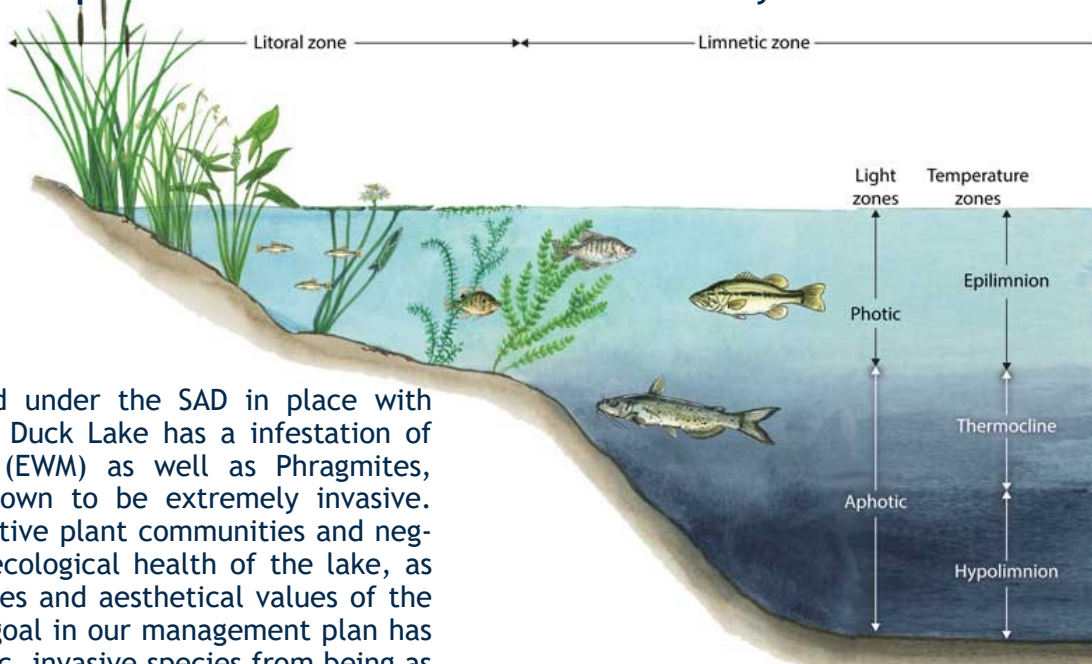
Lake Evaluation Record

Lake Name: Duck Lake

County: Grand Traverse

Evaluated by: Casey Shoaff **Reviewed by:** Bre Grabill **Date:** Aug. 25, 2021

Purpose of evaluation: End of Season Survey



Duck Lake is managed under the SAD in place with Green Lake Township. Duck Lake has a infestation of Eurasian watermilfoil (EWM) as well as Phragmites, both of which are known to be extremely invasive. EWM can crowd out native plant communities and negatively impacted the ecological health of the lake, as well as recreational uses and aesthetical values of the waterbody. The main goal in our management plan has been to keep the exotic, invasive species from being as dominate in the water column, from spreading and hurting the native plant community. As part of this program, numerous surveys occur annually on Duck Lake, including the end of year AVAS Survey. Throughout the summer, recommendations for management are provided for spot treatment of EWM. Promoting overall plant diversity is the goal of the program as native plants are vital to the overall health of the lake. Native plants promote a healthy fishery, stabilizing sediments and improving water clarity and should be promoted when possible. Phragmites has been managed on Duck Lake, as needed and where permissions are granted for access to private property. Phrag has been currently kept to very low levels and active management can keep this plant from crowding out desirable native species such as Cattails.

2021 Service Timeline:

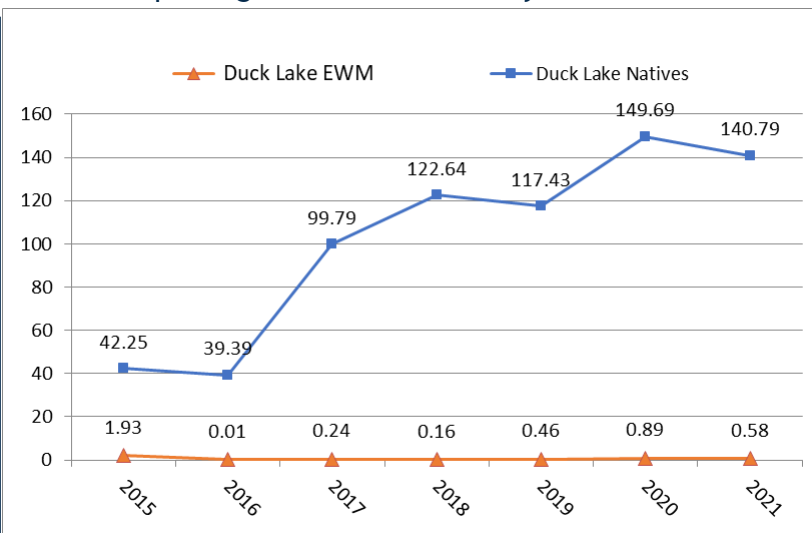
Service	Date
Brief Survey, channel treatment*	4/29
Survey, channel treatment*	6/3
Survey	6/30
EWM, channel treatment*	7/19
Channel treatment*	8/16
AVAS Survey	8/25
EWM Treatment	9/15
Phragmites Treatment	10/1

*Channel treatments are contracted through a separate program and not the Green Lake Township SAD



Exotic Plant Species (above left to right: Phragmites, Eurasian watermilfoil and Starry stonewort) cause most of the serious weed problems in Michigan's lakes. Exotic plants (or nonnative) are plants that are not native to this geographical area, which have been brought to the region inadvertently. Because they often have few natural enemies (their pests, pathogens, etc. may not have come over with them) therefore, they grow out of control. When exotic aquatic plants such Eurasian watermilfoil, Starry stonewort or Phragmites invade a lake, they often form extensive dense populations, crowd out native species, negatively impact fisheries, reducing the quality of habitat for other organisms and impacting the entire lake ecosystem.

Over the last few seasons, PLM has been monitoring the plant growth in Duck Lake. The 2021 season found similar density and diversity of plants as the last few years, which is an increase from the start of the monitoring program. Seasonal variance is expected and can be impacted by many factors including seasonal weather pattern changes, natural plant biological tendencies, surveyor and/or weather impacts to name a few. The goal of tracking plants long term is to be able to 1) identify plants for early detection and rapid response 2) review long term trends for lake health. The more dominant species' in Duck Lake are Chara, Illinois pondweed, and Wild celery. Chara is a number 1 species to have within a waterbody. Chara is a natural filter to help clean the water and provides excellent habitat as well as stabilizing the sediments. As this is a great plant to have, it poses no concern. If native plants start impacting recreational uses of the lake, limited management can be discussed however, typically native plants can be managed by raking beaches. Continuing to survey the lake in 2022 and future years is recommended to track all plants in the lake and see seasonal and long term changes within the plant community. Over time, plant trends can help determine the overall health of a plant community in more depth than just a single survey.



Graph 1 shows the cumulative coverage of EWM and Native plants in Duck Lake. EWM populations have substantially decreased since the management program began, a clear sign of the program's success. EWM negatively impacts the native plant community and is a main reason for its management need. The native plant diversity and density has increased since the program began. Some native plants are at densities that could cause nuisance conditions in beach areas, however the overall community is healthy, thriving and should continue to be monitored and promoted for overall lake health.

Final Recommendations

- A spring vegetation survey (to evaluate conditions in the lake and direct management efforts)
- EWM Treatments, as needed
- Mid summer surveys for monitoring
- Water Quality monitoring, optional
- Phragmites Treatments, as needed
- End of summer AVAS Survey