

PI (Point Intercept) Survey Overview

Introduction to HWM/EWM PI Survey using 2019 as an example:

A PI Survey uses a sampling technique to determine how frequently HWM/EWM occurs throughout the lake's aquatic plant bed. The steps in a survey are:

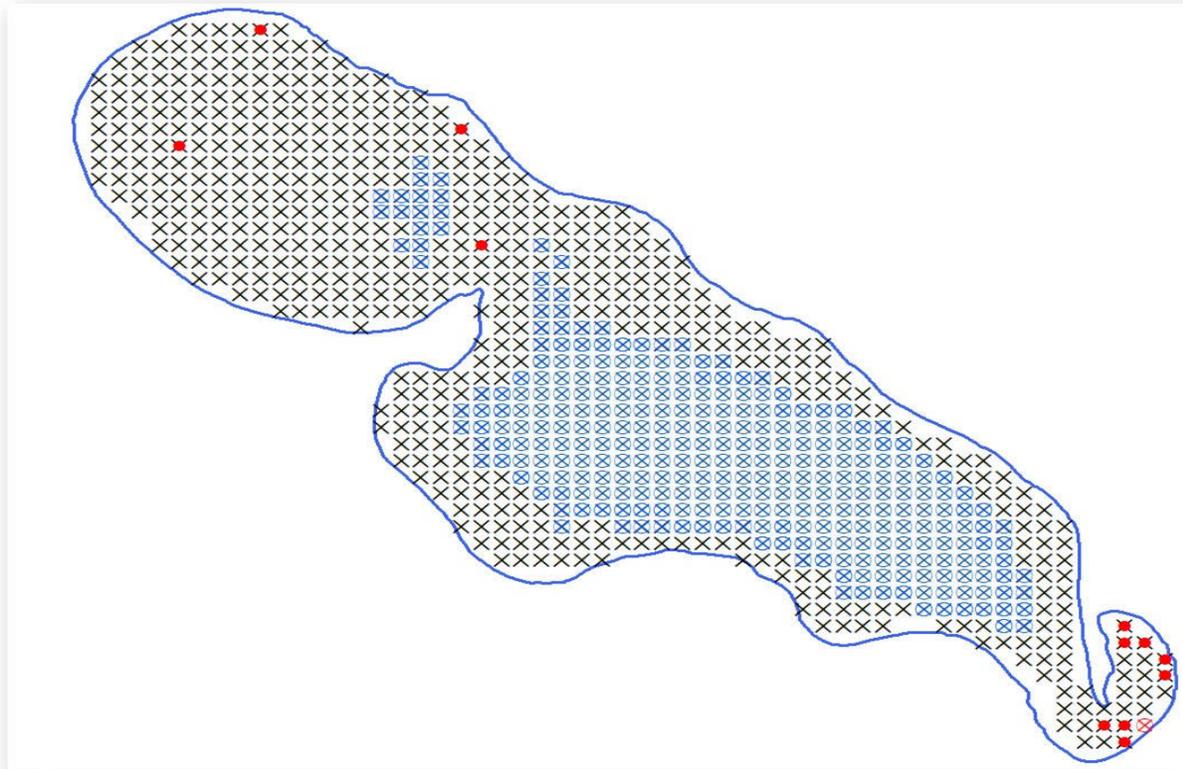
1. WDNR determines the set of sampling points throughout the lake bed. These points remain the same each year. If the lake shrinks, there are fewer sampling points in the lake's water. If the lake expands there are more sampling points. Each sampling point is identified by its GPS coordinates.
2. The PI Survey team determines the maximum depth to which plants are growing in the lake on the day of the sample. That area of the lake is called the littoral zone.
3. The PI Survey team determines which sampling points lie in the littoral zone.
4. The PI Survey team then visits each site in the littoral zone and determines if there is HWM/EWM growing there.

Let's look at how this worked at Silver Lake in 2019.

1. See the picture below that illustrates all the points in the lake, the points in the littoral zone, and the points at which HWM/EWM was found.
2. The PI Survey team arrived at Silver Lake, one morning in the month of July, with the sampling points that spread across the entire lake bed. Recall these points were predetermined by the WDNR and are re-used for each PI Survey. The team determined there were 826 sampling points underwater throughout the entire lake.
3. The PI Survey team determined that plants grew to a depth of 32 feet at the time of the survey. The littoral zone for 2019 is that area of the lake water in which plants are growing.
4. HWM/EWM was found at 12 of the sampling points (red dots) out of 525 points in the littoral zone. The blue dots are sampling points that are ignored because the water is too deep for plants to grow. I.E. The points are not in the littoral zone.
5. The PI Survey calculation is:
12 sample points had HWM/EWM out of 525 sample points.
($12/525 \approx 2.3\%$).

Onterra, LLC is the Lake Management Planning company hired by the SLMD Board to give it technical advice and lake management data.

Point Intercept layout of (Big) Silver Lake compliments of Onterra, LLC



While the point-intercept survey is a valuable tool to understand the overall plant population of a lake, it does not offer a full account (census) of where a particular species exists in the lake. This is why Onterra, LLC also conducts the EWM mapping surveys. While these surveys are highly accurate in their location data, the density designations and how Onterra “maps” the EWM is subjective and is based upon a methodology it created. If the SLMD Board hired a different firm, it likely would have a different way of mapping the EWM within Silver Lake. Overall, each survey has its strengths and weaknesses, which is why both are utilized.

PI Number uses

The point-intercept survey is the most consistent way to evaluate an EWM/HWM population from year to year. And yes, it indicates successful control of EWM/HWM as of 2019 on Silver Lake.

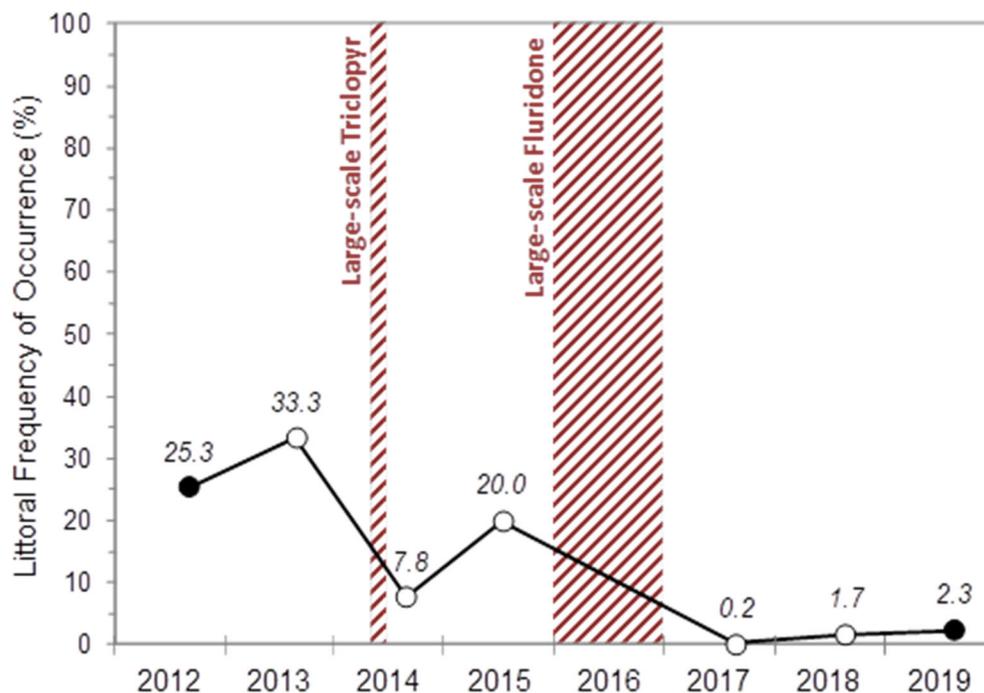
The point-intercept survey is also used to define lake-wide goals or serve as trigger/threshold information for the SLMD Board. For instance, Onterra, LLC’s experience with EWM/HWM populations like that found in Big Silver Lake indicates:

- A population below 15% is probably a good goal. Below 15%, there is probably minimal navigation/recreation impediment and that level would be too low for detectable ecological impacts.

- When the population exceeds 20% or more, perhaps consider/plan that another whole-lake treatment may be warranted.

The SLMD Board has adopted a strategy to keep the EWM/HWM population as low as practical so that another whole lake herbicide treatment can be delayed for as long as possible. The DASH technique is being used to implement this goal. DASH was used for 40 days in 2019 which likely accounts for the low PI number of 2019. More information can be found in the [2019 HWM Monitoring and Control Strategy Report](#) produced by Onterra, LLC on this same website.

The graph below shows the PI Ranges on Silver Lake for 2012 – 2019 as published in the [2019 HWM Monitoring and Control Strategy Report](#).



Wisconsin Standard Method to Collect Aquatic Plant Data

Around 2010, there was little agreement on how to collect data on aquatic plant communities. The use of different survey methods meant that results were impossible to compare from one region to the next. This prevented consistent reporting on lake ecology statewide and made it difficult to assess the outcomes of plant management. DNR Science Services developed and tested a sampling

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protocol to use across the whole state to describe the distribution and abundance of aquatic plants. The protocol uses a point-intercept sampling design, with sites located on a geo-referenced sampling grid laid out on the surface of lakes. The method returns comparable estimates of aquatic plant abundance and useful in making comparisons among lakes and assessing the efficacy of management actions. This is the current standardized sampling technique used in Wisconsin.

The above paragraph was taken from the dnr.wi.gov website. For more information search for "Wisconsin Standard Method to Collect Aquatic Plant Data. See links to:

- [Survey Tools and Training](#)
- [Learning from Aquatic Plant Data](#)
- [Etc.](#)

Note that when a PI Survey team works a lake they identify all plants located at each survey point. That gives the WDNR and lake management data on invasive plants in the lake as well as native aquatic plants. Reports then show plant diversity in the lake, and whether each plant type is increasing, holding, or decreasing in density.