



WATER RESOURCES DIVISION POLICY AND PROCEDURE

WRD-PS-006 – Procedure for Aquatic Vegetation Surveys

Original Effective Date: Unknown
Revision Date: November 16, 2022

PROCEDURE

These aquatic vegetation survey procedures have been designed to ensure easily replicable surveys of aquatic plant communities. The methods are easy to use and flexible enough to be used on many different types of lakes, regardless of the extent of littoral zone and shoreline sinuosity. Individuals using these methods should be proficient in the identification of aquatic plants. For a listing or recommended aquatic plant identification resources, contact the Water Quality and Aquatic Nuisance Control Permits Unit.

A survey is carried out by at least two people sampling individual Aquatic Vegetation Assessment Sites (AVAS) throughout a lake's littoral zone. For assessment purposes, the littoral zone is considered to extend to the 5-foot depth contour. For some waterbodies it may be more appropriate to extend this area out to the 10-foot depth contour. For these waterbodies, the difference should be noted in the survey comments. The locations of AVAS are determined by dividing up a lake's shoreline into segments approximately 100 to 300 feet in length. Each AVAS is sampled by using visual observations, dependent upon water clarity, and weighted rake tows (see additional links section at end of document for guidance on rake specifications). Each plant species found in each AVAS is recorded along with an estimate of each species' density. Plant species are identified by numbers designated on the survey map's plant species list, and densities are recorded by using the following code:

- (a) = **found**: one or two plants of a species found in an AVAS, equivalent to **less than 2%** of the total AVAS surface area.
- (b) = **sparse**: scattered distribution of a species in an AVAS, equivalent to **between 2% and 20%** of the total AVAS surface area.
- (c) = **common**: common distribution of a species where the species is easily found in an AVAS, equivalent to **between 21% and 60%** of the total AVAS surface area.
- (d) = **dense**: dense distribution of a species where the species is present in considerable quantities throughout an AVAS, equivalent to **greater than 60%** of the total AVAS surface area.

AVAS should not be confined solely to a lake's shoreline. In cases where a lake possesses an extensive littoral zone, whether due to wide swaths of shallow depth contours or isolated pockets of littoral zone (such as islands), additional AVAS should be drawn out near the extent of submergent vegetation growth in these areas. This can be done by drawing transect lines divided in proportion to the shoreline AVAS or by inserting individually drawn boxes with their dimensions proportional to the shoreline AVAS (see attached sample map).

STANDARDS FOR SURVEY MAP

- A. Maps with depth contours are preferred.
- B. Sample segments of equal length designated with lines perpendicular to lake shoreline every 100 to 300 feet.
- C. Plant species list with number code as defined by the department (see appendix).
- D. Recording space for name of survey crew, date of survey, start and end time of survey, weather and water conditions, and Sechi depth.
- E. To maintain consistency with repeated surveys in future, consider maintaining created maps as templates.

FIELD SURVEY PROCEDURES

- A. Survey each-AVAS by documenting the presence and density of both emergent and submergent aquatic plants. Navigate the survey boat in a zig-zag (or meander) pattern through each AVAS so that a majority of each AVAS can be effectively surveyed. It is important to make use of rake tows even in clear water, since many low-growing species of submergent plants are not readily noticeable by visual observation alone. A minimum of 4 rake throws per AVAS is recommended though more may be needed, depending on site conditions, to sufficiently document the plant community.
- B. Document each species found utilizing the corresponding plant species list number and the appropriate density code. Repeat this for each AVAS until all AVAS have been surveyed. If an AVAS is found to be void of any vegetation, record "none" in the respective location on the survey map. Include these AVAS in the final AVAS count when summarizing the survey data. If an AVAS is dominated by vegetation to the point that boat access is impossible, document the observable plant species present. If an AVAS area is unnavigable and no species can be identified, mark as such on data sheet and remove section from AVAS total count when using summary sheet.

SURVEY DATA SUMMARY PROCEDURES

- A. Number each AVAS sequentially from beginning to end on the survey map. Record the density codes for each species found on the Standard Aquatic Vegetation Assessment Site Species Density Sheets. Each AVAS number corresponds to the column numbers found on the Standard Aquatic Vegetation Assessment Site Species Density Sheets.
- B. Sum the numbers of each of the separate density codes for each of the plant species found on the Standard Aquatic Vegetation Assessment Site Species Density Sheets and transfer these totals to the appropriate columns 1 through 4 (A, B, C, and D) on the Standard Aquatic Vegetation Summary Sheet.
- C. Multiply these totals by the appropriate constants ($A = 1$, $B = 10$, $C = 40$, and $D = 80$) and transfer the calculations to the calculation columns 5 through 8.
- D. Add the results of the calculated columns (5, 6, 7, and 8) for each species and transfer the totals to column 9.
- E. Divide the values to column 9 by the total number of AVAS surveyed (column 10) and transfer these values to column 11. These values represent the cumulative cover values for each of the plant species found in the survey. Make sure that you use the total number of AVAS surveyed on the lake for column 10 and not the total number of AVAS where each individual plant species was found.
- F. Write a summary of the notes recorded during the field survey and attach it to the completed species density and summary sheets, along with the survey map and any other survey documentation.

LINKS TO ADDITIONAL INFORMATION

- Standard Aquatic Vegetation Assessment Site Species Density Sheets
[Michigan.gov/EGLE/About/Organization/Water-Resources/Aquatic-Nuisance-Control/Whole-Lake-Treatments](https://www.michigan.gov/EGLE/About/Organization/Water-Resources/Aquatic-Nuisance-Control/Whole-Lake-Treatments)
- Guidance on Plant Rake Specifications
<https://micorps.net/wp-content/uploads/2017/12/CLMP-AqPlant-SamplingRake.pdf>

APPENDICES

Sample Map

APPROVING AUTHORITY



Christine Alexander, Manager
Permits Section, Water Resources Division

HISTORY

Policy No.	Action	Date	Title
None	Original	Unknown	Procedures for Aquatic Vegetation Surveys
None	Revised	October 2005	Procedures for Aquatic Vegetation Surveys
WRD-PS-006	Revised	November 16, 2022	Procedure for Aquatic Vegetation Surveys

CONTACT/UPDATE RESPONSIBILITY

Any questions or concerns regarding this policy and procedure should be directed to the Aquatic Nuisance Control Program.

An EGLE policy and procedure cannot establish regulatory requirements for parties outside of EGLE. This document provides direction to EGLE staff regarding the implementation of rules and laws administered by EGLE. It is merely explanatory, does not affect the rights of or procedures and practices available to the public, and does not have the force and effect of law. EGLE staff shall follow the directions contained in this document.

Appendix -Sample Map

Site Name:

Survey Date:

Survey Crew:

Start Time:

End Time:

Wind Speed:

Weather:

Secchi Depth:

A = Found - < 2% coverage per AVAS
 B = Sparse - 2-20% coverage per AVAS
 C = Moderate - 21-60% coverage per AVAS
 D = Dense - 61-100% coverage per AVAS

- 1 Eurasian milfoil
- 2 curly leaf pondweed
- 3 Chara
- 4 Thinleaf pondweed
- 5 Fluctem pondweed
- 6 Robbins pondweed
- 7 Variable pondweed
- 8 Whitestem pondweed
- 9 Richardsons pondweed
- 10 Illinois pondweed
- 11 Large leaf pondweed
- 12 American pondweed
- 13 Potomageton natans
- 14 Water stargrass
- 15 Wild celery
- 16 Sagittaria
- 17 Native milfoil
- 18 M. verticillatum (green)
- 19 M. heterophyllum
- 20 Coontail
- 21 Elodea
- 22 Utricularia vulgaris
- 23 Bladderwort - mini
- 24 Buttercup
- 25 Southern naiad
- 26 Brittle naiad
- 27 Sago pondweed
- 28
- 29
- 30 Nymphaea
- 31 Nuphar
- 32 Brasenia
- 33 Lemna minor
- 34 Spirodella
- 35 Watermeal
- 36 Arrowhead
- 37 Pickerelweed
- 38 Arrow arum
- 39 Cattails
- 40 Bulrushes
- 41 Iris
- 42 Swamp loosestrife
- 43 Purple loosestrife

