

TOPIC: Monitoring and Evaluation

White Paper Group 1

BACKGROUND

The department has been charged by the Wisconsin State Legislature to regulate how aquatic plants are managed while protecting diverse and stable aquatic plant communities (s. 23.24, Wis. Stats.). By monitoring plant communities, managers can evaluate the current conditions and determine when management is warranted based on individual site-specific management goals. Monitoring also allows for the evaluation of management efficacy and non-target impacts. Historically, aquatic plant management (APM) was conducted without monitoring and evaluation with the general goal of achieving short-term reductions of nuisance-causing aquatic plants. In the mid-2000s, the department shifted to a more holistic approach and monitoring became a more important aspect of APM. Currently, the department encourages monitoring and evaluation in order to understand and improve upon future management practices but cannot require it.

Managers can determine how much control effort is needed, if any, by monitoring the aquatic plant community. Monitoring can help understand the natural patterns and trends in the aquatic plant community and help set more realistic and ecologically valid management goals. Since 2005, the department has utilized a monitoring method referred to as a point-intercept (PI) survey which uses a standardized and repeatable aquatic plant monitoring method to study lake plant communities. The method employs a regular grid of points at which species presence-absence and relative abundance observations are made from a boat using a rake sampling tool. Additionally, aquatic invasive species (AIS) early detection surveys can help determine whether AIS are present in a waterbody by using basic survey methods to determine presence. There are also some less common monitoring and evaluation methods available. During PI surveys, plants may be collected, and their biomass measured. This method is uncommon due to the time and labor required. Remote technologies, such as sonar/hydroacoustic devices, may also be used to monitor aquatic plant populations. Heat maps of vegetation density, as well as height of vegetation, may be created using these technologies. These remote methods often require ground truthing to determine what specific species are present.

Monitoring designed to assess control actions is also an important aspect of APM. The target and non-target populations can be monitored before, during, and after management to evaluate the efficacy and selectivity of the control action. It is important that data are collected in a standardized and repeatable way. The use of a standardized method for monitoring aquatic plant communities, such as PI surveys conducted at a lake wide scale, or sub-PI surveys conducted at a localized scale, allows managers to track populations over time and make cross-system comparisons, allowing the better understanding of management outcomes to plan future actions. For example, an herbicide's effectiveness on a target species is dependent on the herbicide product used and the concentration (C) and exposure time (ET) at which that herbicide is in contact with the plants. Measuring the quantity of herbicide in the water during a chemical treatment in conjunction with pre- and post-treatment aquatic plant surveys can help explain treatment outcomes, especially when local conditions create unusual patterns in chemical persistence that lead to unexpected outcomes. For species such as Eurasian watermilfoil, the above methods may also be coupled with genetic monitoring before and after treatments to determine whether repeated treatments are selecting for more hardy strains over time. Monitoring and evaluation can also help determine potential non-target impacts to the aquatic community. It is important to note most control activities affect more than the target species.

Monitoring for effort, efficacy and impacts, is a core component of any lake management effort. The purpose of monitoring is to document system-specific information that can be used to evaluate management outcomes, assess non-target effects, and determine future actions. Management goals, scales, and contexts vary, leading to different monitoring strategies. The department has proposed several monitoring techniques employed in combination as monitoring strategies that are appropriate for three broadly distinct management approaches.

RULE PROPOSAL – SUBMERGED AQUATIC PLANTS ON PUBLIC WATERBODIES

The proposals below address submerged aquatic plant communities on public waterbodies, please refer to the emergent species’ white paper to review relevant monitoring requirements.

Small-Scale Herbicide Management - Water Use Impairment Mitigation or Established Non-native Invasive Species Management	
Every 5 years with plan	*Lake wide PI Survey
Year of Treatment	*Demonstration of water use impairment: bed mapping survey or sub-PI and photo evidence

*A demonstrated water use impairment may be satisfied if the department staff who issued the permit conducts a site visit and determines there is a significant water use impairment in the treatment area.

Small-Scale Herbicide Management - Newly introduced invasive species or new herbicide	
Every 5 years with plan	*Lake wide PI Survey
Year of Treatment	Sub-PI prior to and after treatment, herbicide concentration monitoring if applicable

Large Scale Herbicide Management	
Year Prior to Treatment	*Lake wide PI Survey
Year Of Treatment	Stratified lake- thermocline monitoring
During and Shortly After Treatment	Herbicide concentration monitoring
Year Following Treatment	*Lake wide PI Survey

Large Scale Mechanical Management	
The department may require pre-post PI monitoring, water quality monitoring and/or fish and wildlife surveys	

If the proposed activity is in locations identified by the department as approved or proposed Critical Habitat - Sensitive Areas (subset of critical habitat), Public Rights Features (NR 1.06), ASNRI, Priority Navigable Waterway, Outstanding and Exceptional Resource Waters, the department will require either a full PI Survey or sub PI Survey and any other monitoring which may be necessary, regardless of the scale or intended goal of management, in order to understand the risk to the ecological character of the area.

*Management activities in whole bays, marinas, or channels may be considered a large-scale management activity if the area is designated as protected (see above), the water exchange is low (herbicide management), or the plant assemblage is primarily native aquatic species. In this instance, an appropriately scaled sub-PI would be acceptable in place of a lake wide PI survey.