

Waushara County Aquatic Invasive Species Plan

A guide for proactive AIS management in Waushara County

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In partnership with

Waushara County Land Conservation Department



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Introduction

Waushara County has 45 public access lakes, many of which have multiple public access points. Year-round residents are approximately one-third of the lake residents, with the remaining two-thirds being seasonal residents.

Lake group development is at various levels, with some groups being active, funded lake districts, some lakes having only loosely-organized lake groups, and some lakes having no organized group at all. Some lakes groups are already quite capable of actively controlling the AIS present in their lakes, some are not that far yet.

The Waushara County Watershed and Lake Council is a cooperative organization made up of representatives from many of the county's lakes. This council has been active since 1998 and according to the Council bylaws, it provides "a network for communication and sharing resources between and amongst lake organizations in Waushara County". The Council gives the lake groups of Waushara County a collective voice to "advocate for regulatory changes, influence public policy discussions, and partner in discussions regarding future growth and change throughout the community".

With more and more lake groups struggling with AIS issues, in 2007, Waushara County Land Conservation Department (LCD) acknowledged the need for aquatic invasive species management on a county-wide level. The LCD collaborated with Portage and Adams counties, and Golden Sands Resource Conservation and Development Council, Inc. (RC&D), to acquire grant funding from the Department of Natural Resources (DNR) to support a Regional AIS Specialist position. Since then the regional program has grown into a larger collaboration between 8 counties: Marquette, Green Lake, Marathon, Portage, Taylor, Waupaca, Waushara and Wood.

Through the Regional AIS Specialist position, information is gathered about the status of AIS infestations in Waushara County, volunteer activity levels, training and education needs, and other information regarding AIS in Waushara County.

The purpose of this AIS Plan is to identify short-term and long-term goals towards establishing a coordinated, county-wide approach to protecting Waushara County's lakes.

This AIS plan is meant to be a dynamic document, to be updated and changed as new goals and challenges are identified.

Proactive Management Steps

It is in the best interest of any citizen organization or community to initiate actions today in order to avoid AIS problems tomorrow. Take a proactive management approach to lake protection. Proactive management activities need not be costly, but they can make a world of difference.

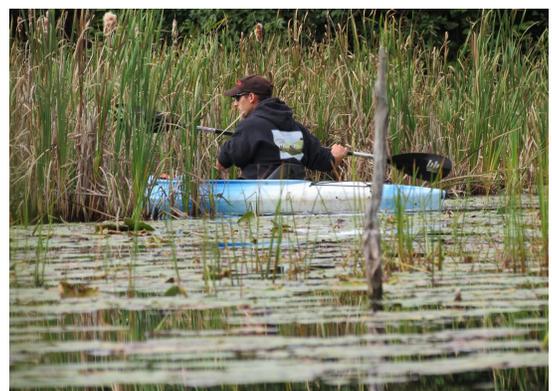
As the old saying goes—an ounce of prevention is worth a pound of cure. The same is true for preventing an invasion of AIS in your favorite lake. If efforts are kept at a “prevention” level, the costs to your group (in time, money, and frustration) will be far lower than the costs involved with dealing with AIS at a “control” level.

Take action today to avoid AIS problems tomorrow. Be prepared & be proactive!

Step 1: Gather Information about Aquatic Invasive Species

Prior to 2008, individual lakes may have known about the aquatic invasive species within their own waters, but not much was known about AIS distribution in Waushara County. In response to this, visual AIS surveys have been completed by Golden Sands RC&D staff, visual surveys have continued as needed to determine population growth, management effectiveness and to look for new AIS. These surveys are conducted from kayaks or boats. All AIS locations were recorded with GPS and maps were created with the assistance of county staff. Surveys covered the littoral zone and the shoreline for the following species:

- Eurasian watermilfoil (*Myriophyllum spicatum*)
- Curly-leaf pondweed (*Potamogeton crispus*)
- Zebra mussels (*Dreissena polymorpha*)
- Rusty crayfish (*Orconectes rusticus*)
- Banded mystery snail (*Viviparus georgianus*)
- Chinese mystery snail (*Bellamya chinensis*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Purple loosestrife (*Lythrum salicaria*)
- Flowering rush (*Butomus umbellatus*)
- Yellow Iris (*Iris pseudacorus*)
- Common reed (*Phragmites australis*)
- Brittle naiad (*Najas minor*)
- Yellow floating heart (*Nymphoides peltata*)
- Starry stonewort (*Nitellopsis obtusa*)



Surveying for AIS
Photo Credit: Chris Hamerla

All AIS detected were mapped, voucher specimens collected and filed to the UWSP Freckmann Herbarium, and recorded with the Wisconsin Department of Natural Resources (WDNR). Appropriate management bodies were notified, including WDNR, Waushara County, and any existing Lake Associations / Districts.

Early detection of these invasive species is essential to minimize effort and cost associated with management. Well established populations of Eurasian watermilfoil or zebra mussels may never be eradicated, even with years of effort. It is impossible to overemphasize the importance of monitoring for aquatic invasive species, whether on a citizen level or local government level.

Eurasian watermilfoil, EWM (*Myriophyllum spicatum*)

Introduced to Wisconsin in the 1960s as an aquarium plant, this species has quickly spread around the lakes and streams of the state. Small fragments of the plant can produce adventitious roots, creating new plants wherever the wind or currents take them. The fragments can be caused by boats, paddles, fish, waves, or other sources of disturbance. EWM tends to grow earlier in the year than most native plant species, and tends to shade out the native species. In addition to reducing biodiversity in the ecosystem, EWM also reduces the recreational value of the water body by reducing water flow, increasing temperature, and encouraging stunted fish populations (Newroth 1985; Engel 1995).



Eurasian watermilfoil
Photo Credit: Paul Skawinski

Containment and possible control is much more likely, and less expensive, if the population is caught early. Hand-removal with a small garden rake, or via snorkeling and hand-pulling by the roots, can be very effective on small populations of EWM. This is why early detection is so crucial for inexpensive management. If the population is allowed to expand for several seasons before it is detected, management options are reduced, and costs rise sharply.

Deeper or more advanced populations may need scuba divers or the DASH system (Diver Assisted Suction Harvesting). DASH uses a water pump suction device mounted on a boat to transport harvested plants from the diver to a collection basin above water. The process saves time and effort of the diver having to periodically transport removed plants to the lake surface for disposal.

For larger populations, chemical herbicide applications are typically used. 2,4-D formulations are most common, which are most effective in spring or early summer, when the plant is actively growing. As 2,4-D is a systemic herbicide, it requires the plant to be actively growing in order to absorb enough of the chemical to destroy the plant.

Biological control is an emerging option that may hold some promise for naturally controlling EWM without chemicals. Euhrychiopsis weevils are aquatic insects that are native to many Wisconsin lakes, and feed on native northern watermilfoil (*Myriophyllum sibiricum*). The adult weevils feed on the leaves and stems of the plant, while the larvae bore into the stem and feed on the vascular tissues within. These activities often stress the plants enough to kill them, or at least prevent flowering. More research is needed on this topic before it will be employed on a widespread basis.

There are seven native watermilfoils in Wisconsin, and at least two of those occur in Waushara County lakes (*Myriophyllum sibiricum*, *M. verticillatum*). Both are likely to be confused with EWM.



Eurasian watermilfoil whorl vs Northern watermilfoil whorl
Photo Credit: Paul Skawinski

Northern watermilfoil (*Myriophyllum sibiricum*) typically has whitish stems, whorled leaves with 11 or fewer pairs of leaflets, and a fairly rigid growth form. EWM has pinkish stems, whorled leaves with 12 or more pairs of leaflets, and a very limp growth form. Whorled watermilfoil (*Myriophyllum verticillatum*) typically has dark green to brown stems, tightly-packed whorls of leaves, and highly divided floral bracts above the water late in the season.

Curly-leaf pondweed (*Potamogeton crispus*)

Curly-leaf pondweed (CLP) arrived in Wisconsin as early as the late 1800s, brought here as an aquarium plant, and possibly introduced accidentally during stocking of the common carp (*Cyprinus carpio*). CLP is still occasionally sold by some internet-based aquarium supply stores.



Curly-leaf pondweed
Photo Credit: Paul Skawinski

CLP has an atypical life cycle, growing to peak biomass in mid-June. At this time, most of the plants die back to the rhizome, and the nutrients contained in these plant tissues are released into the water column. This nutrient release often results in an

algae bloom, sometimes containing blue-green algae (cyanobacteria) like *Microcystis*. Blue-green algae release a neurotoxin that can harm humans and pets that come in contact with the water.

CLP spreads by rhizomes, seeds, and turions, which makes it very difficult to control. Turions are known to remain viable for more than five years, so herbicide applications need to be re-applied for at least five consecutive years to deplete the storage of turions in the substrate (Johnson et al. 2012). Harvesting of CLP can be done in May, before turion production occurs. This can remove the biomass of the CLP and possibly prevent turion and seed accumulation for that season.

There are over thirty species of pondweeds (*Potamogeton* spp.) in Wisconsin, and two of them are commonly confused with CLP. Claspingleaf pondweed (*Potamogeton richardsonii*) has wavy leaves with a smooth margin. Fern pondweed (*Potamogeton robbinsii*) may have very fine serrations on the leaf margins, but the leaves are typically straight, and the plant tends to be dark green to brown. CLP has very wavy leaves with serrations on the margins.

Zebra mussels (*Dreissena polymorpha*)

Zebra mussels are small mollusks that are native to the Black and Caspian Seas of western Asia. They are filter-feeders, straining tiny plankton out of the water column, and therefore remove the base of the aquatic food web. Large zooplankton and small fishes depend on this same food source, so Dreissenid mussels like zebra mussels and the related quagga mussel (*Dreissena rostriformis*) can have detrimental effects on fish populations and sizes in affected lakes.



Zebra mussel (actual size)
Photo Credit: Paul Skawinski

Control of zebra mussels is very difficult and expensive. Power plants and other near-shore businesses often pipe water out of large lakes and rivers to cool their machinery, and these pipes can quickly become clogged with zebra mussels, causing reduced flow and reduced cooling ability. These businesses often inject low doses of chlorine into the pipes to kill the mussels, or they shut off the pumps and send divers into the pipes to manually scrape the walls clean. There is currently no good option to remove zebra mussels on a large scale. A biological control option using a bacterium has been researched, evaluated, and tested in several lakes in Minnesota. This type of control could become an option in the future if it continues to be deemed safe and effective.

Zebra mussels and quagga mussels are usually less than one inch long, with white and black striping across the shell. Zebra mussels tend to be D-shaped, while quaggas are more rounded on both the dorsal and ventral sides. A simple test to differentiate the two species is to stand the entire closed shell on its side—if it can remain standing, it is a zebra mussel. If it falls over, it is a quagga mussel.

Rusty crayfish (*Orconectes rusticus*)

Native to the Ohio River Basin, rusty crayfish were probably introduced here as fishing bait. Rusty crayfish prefer well-oxygenated, flowing water with a rocky substrate for shelter. They are omnivorous, feeding on everything from fish eggs to invertebrates to aquatic plants. When native crayfish are present in the same ecosystem, rusty crayfish will often kill them or simply push them out of the prime habitats, making the native crayfish more susceptible to predation, or less likely to have adequate resources for survival. Rusty crayfish are easily recognized by the rust-colored spot on each side of their carapace ("shell").



*Rusty crayfish, the rusty colored spot gives the crayfish its name.
Photo Credit: Paul Skawinski*

Trapping rusty crayfish can have a localized reduction effect, but nearby rusty crayfish populations in the same body of water are likely to immigrate to the trapping area soon after efforts cease. Natural predation of rusty crayfish occurs by otters, shorebirds, turtles, large fish, raccoons, and other creatures. Despite substantial natural predation, the rusty crayfish's high reproductive rate and tendency to hide under large rocks enable it to easily establish large populations in many waters.

Chinese mystery snail (*Bellamya chinensis*) and Banded mystery snail (*Viviparus georgianus*)

Chinese mystery snails were brought to the United States in the late 1800s as a food source in Asian food markets. Both snails have also been sold as algae-eating pets for water gardens, aquaria, and backyard ponds. A likely method of introduction to the natural environment is through this ornamental trade vector.

Little research has been done on the impact of these snails. Both banded and Chinese mystery snails are known to compete with native snail populations for resources, and may cause decreases in native snail diversity or abundance. Large die-offs have been observed, which can cause foul-smelling messes along shorelines. Both snails are possible vectors of various parasites and viruses (Harried et al. 2015; David et al. 2017).

Control of mystery snails is currently limited to manual removal with small hand tools. Mystery snails have a tough operculum at the opening of the shell, which is able to create a watertight seal. If a chemical pesticide is applied, the mystery snails can



*Top: Chinese mystery snail
Bottom: Banded mystery snail
Photo Credit: Paul Skawinski*

close up their shells and wait for the toxic substance to dissipate. Most native snails do not have this ability, and will be subjected to the chemical.

Chinese mystery snails can grow up to nearly 7cm tall (2.9 inches), which is larger than any of our native snail species. They are typically dark brown, and may have several vertical ridges on the shell near the opening.

Banded mystery snails are commonly about 2cm long, with dark brown bands running horizontally along the shell.

Unlike most snails, which lay gelatinous egg masses on rocks, logs, or vegetation, mystery snails give birth to live young with complete shells.

Japanese knotweed (*Polygonum cuspidatum*)

Japanese knotweed has been planted as an ornamental shrub for decades, due to its tendency to grow in thick, straight rows about 10ft high. The plants light up with bright white flowers in the mid-summer, which originate from the base of each heart-shaped leaf. It can grow in dry sites, but does exceptionally well in moist soils like riverbanks or roadside ditches. Although sold as Japanese bamboo or Mexican bamboo in garden centers, Japanese knotweed is actually a member of the Polygonaceae family, totally unrelated to the true bamboos. A similar species, giant knotweed (*Polygonum sachalinense*), is also invasive and present in Wisconsin.



*Japanese knotweed, pictured here are its leaves and flowers.
Photo Credit: Paul Skawinski*

Controlling Japanese knotweed is very difficult once it is established. The rhizome network is very deep and very extensive. Foliar herbicide applications can be effective, but typically require multiple applications to have any measurable effect on the colony. Cutting the stem near to the ground and pouring herbicide into the hollow stem has proved to be effective. The herbicide will be continuously absorbed by the plant over a short period of time, taken up into the root systems. This can be very effective at killing the plant, sometimes with just one or two applications. Cutting back re-growth is vital to management after herbicide treatments, so as to minimize energy acquired by the roots. Since Japanese knotweed often occurs near water, care should be taken to ensure that the herbicide is safe for use in aquatic habitats. Certain herbicides can be toxic to amphibians, and should be avoided.

Purple loosestrife (*Lythrum salicaria*)

Purple loosestrife was imported to the United States as an ornamental species, and continued to be sold until recently. It is a wetland perennial with woody stems, and commonly reaches a height of 6 feet or more. Leaves are generally opposite, but may be in whorls of threes on older plants. Stems are typically square, but may be six-sided on older plants.

The Purple Loosestrife Biocontrol Program has been very successful in Wisconsin. This program utilizes volunteers to raise *Galerucella* beetles, which feed on the foliage of purple loosestrife. These beetles often stress the plant enough to stunt them, or even prevent flowering. These beetles are native to the same area of Eurasia as purple loosestrife, and were imported here as a natural predator. Testing results suggest that other



Purple loosestrife
Photo Credit: Paul Skawinski



Galerucella beetle on purple loosestrife
Photo Credit: Chris Hamerla

plant species will not be affected by the *Galerucella* beetles. The goal of this program is to allow purple loosestrife to live not invasively, but harmoniously with the other native plants that also have their natural predators present.

Herbicide application can be effective to manage purple loosestrife. Systemic herbicides work best, as they affect the shoots as well as the roots. Applying herbicide in late summer to fall allows the herbicide to be carried down into the roots along with the general downward flow of nutrients for underground storage.

Flowering Rush (*Butomus umbellatus*)

Flowering rush came to the United States from Europe as an ornamental plant for gardens. It has since spread to shorelines and water bodies, able to become invasive in both places, due to its emergent and submergent forms. Flowering rush can form dense stands, crowding out native plants, and interfering with water uses.

It is most easy to identify when in bloom; however, only plants growing in shallow water or along the shoreline produce flowers. Its flower stalks protrude in an umbel formation from a single point on the end of the stem. Each individual flower has three pinkish colored petals and three sepals. When not in bloom, its green stems are easily mistaken for other emergent plants; however, flowering rush stems are triangular in the cross section. The leaves can grow to be about three feet high on shorelines, twisting at the



Flowering rush in bloom
Photo Credit: Paul Skawinski

tip on some plants. Submergent plants have no flowering stalks, and long thin leaves.

Their strong, robust root systems can produce new plants when fragmented. The plants spread primarily by their rhizomes, and can be further spread by boaters, or any animals that fragment these rhizomes. Reproductive structures called bulbils form on the roots and inflorescence, and break off to form new plants. Changing water levels can also influence the spread of submergent or emergent flowering rush.

Control methods of flowering rush have proven difficult to implement. The plants can grow in varying water levels, and have strong root systems that grow from fragments, making it difficult to use consistent methods of removal. Flowering rush has also proven to be resistant to herbicides, prompting scientific studies using multiple herbicides, but these methods are still in experimental stages.

Yellow Iris (*Iris pseudacorus*)

Native to Europe and the Mediterranean region, yellow iris came to the U.S. in the 1950s as an ornamental plant.

They now grow along streambanks, wetlands, lake shorelines, and other wet areas. Yellow iris grows to 5 feet tall, with long, flat narrow leaves that overlap at the base, forming a slightly fanned shape. They have bright yellow flowers that bloom from May to June in Wisconsin, making for easy identification. When not in flower, yellow iris resembles the native blue-flag iris, as well as cattails.

Yellow iris has numerous thick rhizomes. The sap of the plant is toxic, and can cause skin reactions, and stomach trouble if touched or ingested.



*Yellow iris leaves fan out from the base
Photo Credit: Paul Skawinski*



*Yellow iris has a showy,
yellow flower
Photo Credit: Paul
Skawinski*

Yellow iris is harmful, as it displaces native vegetation and reduces habitat needed by waterfowl and fish. It can clog small streams and irrigation systems, and it can dominate shallow wetlands, wet pastures and ditches. Mats formed by the rhizomes can prevent the germination and seedling growth of other plant species.

Mechanical removal of the plants via cutting below the water line to inhibit oxygen intake, thus essentially drowning the plant can be successful, but will most likely have to be repeated. Digging the plants out by the roots can be successful, but it is very

labor-intensive; the rhizomes are also able to re-sprout from the fragments, so the plants may survive if any fragments are left behind.

Chemical treatment with herbicide can be effective; however it is necessary to use an herbicide labeled for use in aquatic habitats.

Phragmites (*Phragmites australis*)

Non-native phragmites was imported to the United States from Europe. Phragmites, also known as common reed, is a tall perennial grass that can reach heights of over 15 feet. Its robust, fluffy seed heads normally lean off to one side. It is present in every U.S. state, and spreads by both seed dispersal and its underground rhizomatous root system.



Phragmites towers over many other wetland plants
Photo Credit: Paul Skawinski

It's incredibly strong, deep roots are the primary way this plant spreads, and adds to the difficulty of its removal. Manual removal is labor-intensive because of the root depth and intricate branching. If even a fragment of the root is left behind, it can re-sprout. Chemical spraying has proven a viable option for removal, but requires repeated treatments. Prescribed burning of the plants also can work, but must be repeated.



Leaves grow to be up to 2 inches wide
Photo Credit: Paul Skawinski

There is both an invasive and a native phragmites in the United States. While invasive phragmites is normally more robust than the native, they can easily be mistaken for each other, so any suspected phragmites should be verified by an expert. Another grass that could also be mistaken for phragmites is reed canary grass. Reed canary grass looks like a smaller version of phragmites but only grows from 3-7 feet tall, and has leaves that grow to half the width of phragmites.

Phragmites has been spreading across Wisconsin from east to west, and is easily spread in road corridors, as mowing it causes fragments to spread and subsequently re-sprout. Water in ditches can also carry the seeds of these hearty plants. Phragmites has been used for bioremediation, roof thatching, and duck blinds. Some plants are not entirely dead when utilized, thus furthering the spread of the invasive plant to other areas.

Brittle naiad (*Najas minor*)

Brittle naiad, also known as brittle water nymph or minor naiad, is native to Europe. Brittle naiad was first reported in the U.S. in 1934. It is thought to have been intentionally introduced from an

aquarium release but was also favored as waterfowl food. From there it has made its way west to Wisconsin where it was found in Storrs Lake, Rock Co. in 2007. More recently it was found in Lake Puckaway, Green Lake/Marquette Co. in 2013 and Buffalo Lake, Marquette Co. in 2014.

Brittle naiad is an annual plant that branches often and has recurved leaves with noticeable teeth. Seeds are formed where the leaves join the stem. The plant breaks apart easily allowing it to spread readily. Seeds and fragments can be transported by boats, trailers, waterfowl and animals.



Brittle naiad
Photo Credit: Chris Hamerla

Brittle naiad is difficult to control once it is established. Manual removal of this plant can be difficult because it easily

fragments. Any leftover fragments could potentially produce new plants, especially if they contain fruits. Mechanical harvesters have been used to remove brittle naiad biomass, but will likely spread the plant further via fragmentation.



Recurved leaves with notable teeth
Photo Credit: Chris Hamerla

Successful chemical control has been achieved with herbicides. These herbicides can have negative impacts on many native aquatic plant species, so proper timing and dosage is crucial. A successful biological control agent is not known at this time.

There are two other naiads commonly found in Waushara County: slender naiad, *Najas flexilis* and southern naiad, *Najas guadalupensis*. Neither have the pronounced recurved leaves, the teeth on the leaves are typically only visible under magnification.

Yellow floating heart (*Nymphoides peltata*)

Yellow floating heart, also known as fringed water lily, is native to Europe and Asia. Since 2006 populations in seven locations throughout Wisconsin have been found. The last finding was Gordon Lake in Forest County in 2013. Although the plant population was well established, manual hand removal was successful and no plants have been observed since.

Yellow floating heart can spread by fragments, rhizomes, and seeds. The seeds are formed in pods formed following flowering. It is a popular water garden plant but prohibited in



Yellow floating heart flower
Photo Credit: Chris Hamerla

many states including Wisconsin. Plants can be spread by boats and people transplanting them.

Chemical applications and mechanical harvesting can be successful. Smaller, early populations can be hand pulled using caution to remove as much of the roots as possible to avoid new growth. Either control plan should include monitoring for missed plants.

Starry stonewort (*Nitellopsis obtusa*)

Starry stonewort is native to Europe and western Asia. Starry stonewort was first reported in the U.S. in 1978. It is thought to have been introduced to the Great Lakes through the ballast waters of trans-oceanic ships. From the Great Lakes it has made its way inland, including Wisconsin where it was first found in Little Muskego Lake, Waukesha Co. in 2014. Since then most of the known starry stonewort locations in Wisconsin have been found in counties near Lake Michigan. However, in 2019 starry stonewort was found further inland in Lake Emery, Marquette County.

Starry stonewort is a macroalgae; it's robust and has the ability to grow to over two meters tall. It is rooted by a colorless filament or rhizoid. The rhizoid has reproductive structures called bulbils, these bulbils are unique star shape that are 4-5mm wide. Starry stonewort typically dies back in fall but may persist during mild winters.

Starry stonewort is a relatively new invasive species to the region. Managers across the Midwest are still learning the long-term impacts and how different management options impact the population. In some situations starry stonewort can form dense mats of vegetation, negatively impacting the diversity of aquatic life, impeding movement of fish and other animals, fish spawning, reduce water flow and recreational activities. However, there are lakes that starry stonewort has not shown to have any negative impact.

Management options are still being researched. Studies include herbicide treatment, algaecides, freezing, desiccation, and manual removal. No biological controls are known at this time.

There are similar looking native species, nitella and chara. However, these species will not have the star-shaped bulbil that starry stonewort has.



Seed pods of yellow floating heart
Photo Credit: Chris Hamerla



Top: Starry stonewort
Bottom: Starry stonewort
bulbil
(not to size)
Photo Credit: Paul Skawinski

AIS Presence for Waushara County Lakes

Every lake has physical, chemical, and biological characteristics that make it a unique ecosystem. All lakes are different, so it is very important to understand what is “normal” for a particular lake under everyday circumstances.

AIS management is only one component of holistic lake management. Updated background data about the lake ecosystem, such as water chemistry, water clarity, and aquatic plant surveys would be helpful to lake groups and DNR lake managers.

Why is a lake inventory important for proactive AIS management?

A lake inventory tells you what is “normal” for a given lake system, and makes it easier to detect changes, such as new AIS infestations, early. The earlier the detection and response, the better your chances of controlling the problem. Treatments for pioneer populations are much more likely to have a successful outcome than if the population is well-established.

In order to receive approval to treat a lake chemically, an aquatic plant management plan (APM plan) is normally required. If a baseline aquatic plant inventory has already been completed as part of a lake inventory, management options to control invasive species may move forward more quickly. Consult the “Guide to an Aquatic Plant Management Plan” for complete information about Wisconsin’s APM plan requirements.

<http://www.uwsp.edu/cnr/uwexplakes/ecology/APMguide.asp>

The following aquatic invasive species have been confirmed in Waushara County, as of December 2019:

Waterbody Name	Waterbody ID Code (WBIC)	Invasive Species
Alpine Lake	245650	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Japanese Knotweed, Ornamental water lilies (non-native Nymphaea sp.) , Purple Loosestrife, Yellow Iris
Auroraville Millpond	244800	Curly-Leaf Pondweed, Eurasian Water-Milfoil, Flowering Rush
Bass Lake	150900	Banded Mystery Snail, Curly-Leaf Pondweed
Beans Lake	101300	Banded Mystery Snail
Bruce Creek	245400	Ornamental water lilies (non-native Nymphaea sp.) , Yellow Iris

Bughs Lake	102100	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil
Carpenter Creek	248800	Rusty Crayfish
Clarks Millpond	256100	Japanese Knotweed
Curtis Lake	156300	Banded Mystery Snail
Deer Lake	102900	Banded Mystery Snail, Eurasian Water-Milfoil
Deer Lake	980300	Banded Mystery Snail
Emerald Lake	246700	Zebra Mussel
Fish Lake	186100	Banded Mystery Snail, Curly-Leaf Pondweed
Fish Lake	985000	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Flynns Quarry	103500	Eurasian Water-Milfoil
Fox River	117900	Chinese Mystery Snail, Eurasian Water-Milfoil
Gilbert Lake	186400	Banded Mystery Snail, Eurasian Water-Milfoil, Purple Loosestrife
Hills Lake	105200	Banded Mystery Snail, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Phragmites (non-native)
Hills Lake	182100	Banded Mystery Snail, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Zebra Mussel
Irogami Lake	103900	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Zebra Mussel
Johns Lake	245800	Banded Mystery Snail, Eurasian Water-Milfoil
Kristine Lake 2	249300	Eurasian Water-Milfoil
Kusel Lake	189600	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Purple Loosestrife
Lake Huron	994900	Banded Mystery Snail, Chinese Mystery Snail, Eurasian Water-Milfoil
Lake Lucerne	104600	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Lake Morris	246500	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Yellow Iris, Zebra Mussel
Lake Napowan	190200	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil
Lake Poygan	242800	Chinese Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Faucet Snail, Flowering Rush, Rusty Crayfish, Viral Hemorrhagic Septicemia, Zebra Mussel
Little Silver Creek	248600	Rusty Crayfish
Long Lake	191100	Banded Mystery Snail, Purple Loosestrife
Marl Lake	105800	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil
Mecan Springs	158600	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Meilke Lake	105900	Chinese Mystery Snail, Yellow Iris
Pearl Lake	195400	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil

Pine Lake	196100	Banded Mystery Snail, Eurasian Water-Milfoil
Pine Lake	1012000	Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil
Pine River	247800	Curly-Leaf Pondweed, Rusty Crayfish
Pine River Millpond	249100	Rusty Crayfish
Plainfield Lake	1012500	Banded Mystery Snail
Pleasant Lake	106900	Banded Mystery Snail, Chinese Mystery Snail, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil
Popple Creek	249200	Rusty Crayfish
Porters Lake	246900	Banded Mystery Snail, Eurasian Water-Milfoil, Purple Loosestrife
Poy Sippi Millpond	248300	Banded Mystery Snail, Curly-Leaf Pondweed, Purple Loosestrife, Rusty Crayfish
Redgranite Quarry	196900	Banded Mystery Snail, Eurasian Water-Milfoil, Freshwater Jellyfish
Round Lake	107100	Curly-Leaf Pondweed, Eurasian Water-Milfoil
Round Lake	197300	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Saxeville Millpond	249600	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Purple Loosestrife
Silver Lake	107900	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Zebra Mussel
Silver Lake	247700	Banded Mystery Snail, Curly-Leaf Pondweed, Flowering Rush
Spring Lake	149000	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Twin Lake	182300	Banded Mystery Snail, Eurasian Water-Milfoil, Phragmites (non-native), Purple Loosestrife
Unnamed	3000446	Banded Mystery Snail, Eurasian Water-Milfoil
Unnamed	5023423	Rusty Crayfish
Unnamed	5023427	Rusty Crayfish
Unnamed	5023440	Rusty Crayfish
Unnamed	5555054	Rusty Crayfish
Wautoma Pond	152700	Curly-Leaf Pondweed
West Branch Mill P.(White River)	152200	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
White River	148500	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Flowering Rush, Ornamental water lilies (non-native Nymphaea sp.) , Purple Loosestrife
White River Fl (Lower Pond)	151500	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Flowering Rush, Ornamental water lilies (non-native Nymphaea sp.)
Wild Rose Pond	251600	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Willow Creek	243700	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil
Wilson Lake	250000	Banded Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Hybrid Eurasian / Northern Water-Milfoil, Purple Loosestrife

Witters Lake	117400	Banded Mystery Snail, Phragmites (non-native)
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Recommended Actions

1. Continue to support AIS monitoring county-wide, and complete AIS surveys for any lakes that have not yet had AIS surveys completed, continually revisit lakes
 - a. Use CLMN-AIS monitoring protocol.
2. Continue to update official AIS occurrences records for all lakes and streams within Waushara County
3. Continue to update official AIS volunteer activity records
 - a. Clean Boats, Clean Waters
 - b. Citizen Lake Monitoring Network
4. Continue to network with the Waushara county lakes to implement any AIS-related elements outlined in each lake plan.
5. Expand AIS monitoring and volunteer assistance to streams and rivers.
6. Survey and monitor for starry stonewort throughout the county

Step 2: Gather Information About Lake Ecosystems

Every lake has physical, chemical, and biological characteristics that make it a unique aquatic ecosystem. Because lakes are all different, it is very important to understand what is “normal” for a particular lake under everyday circumstances.

AIS management is just one component of holistic lake management. Updated background data about the lake ecosystem, such as water chemistry, water clarity, and aquatic plant surveys, would be helpful to lake groups and DNR lake managers. Portage and Adams counties were able to complete county-wide lake surveys with funding support from DNR Lake Grant Program. These surveys have provided valuable information to lake groups and local governments in those counties.

Recommended Actions

1. Conduct county-wide lakes survey:
 - a. Work with UW-Stevens Point to plan a county-wide lakes survey, similar to that of Portage or Adams counties.

Why is a lake inventory important for proactive AIS management?

A lake inventory tells you what is “normal” for a given lake system, and makes it easier to detect changes, such as new AIS infestations, early. The earlier the detection and response, the better off your lake will be in the long run. Treatments for pioneer populations are much more likely to have a successful outcome than if the population is well established. *Know what’s normal for your lake.*

In order to receive approval to treat a lake chemically, an aquatic plant management plan (APMP) is normally required. If a baseline aquatic plant inventory has already been completed as part of a lake inventory, management options to control invasive species may move forward more quickly. Consult the Guide to an Aquatic Plant Management Plan for complete information about Wisconsin’s APMP requirements: <http://www.uwsp.edu/cnr/uwexlakes/ecology/APMguide.asp>

Step 3: Protect and Restore Native Vegetation

Terrestrial and emergent vegetation that grows along the banks of a water body is also known as the “shoreline buffer”. In many ways, this buffer indirectly helps to prevent invasive plant establishment in a lake:

- 1) The buffer protects the lake by reducing soil erosion and diverting nutrients that would otherwise enter the lake and provide fuel for nuisance-level aquatic plant growth.
- 2) A healthy shoreline buffer also provides biologically diverse and healthy habitats that are important to wildlife, including the native Euhrychiopsis weevils that are used for biological control of Eurasian watermilfoil.
- 3) Dense vegetative cover occupies areas that would otherwise be open and available to colonization by invasive species, and provides a degree of privacy to shoreline property owners.

Native Vegetation is the Lake’s “Immune System”

State law prohibits the cutting of trees and shrubs within 35-feet of the high watermark, with the exception of a “viewing corridor” with a width up to 35% of the lot size.

Local governments can protect shoreland buffers through policy and education. Waushara County LCD protects lake health with good enforcement of shoreland zoning ordinances. In Waushara County, the Shoreland Zoning Ordinance is routinely enforced, and with enforcement comes education. The county LCD also provides technical assistance with shoreland restoration or enhancement, and has a cost-sharing program through a DNR Priority Watershed Project that may help finance a shoreland project.

Starting in 2015, the Wisconsin Department of Natural Resources implemented its Healthy Lakes Initiative (<https://healthylakeswi.com/>) which provides technical assistance and information as well as potential funding for rain gardens, shoreline projects, fish sticks, and other related projects. It is meant to be a tiered approach focusing on various areas including nearshore water, shoreline, and land adjacent to the shoreline.

In 2007, a video project by Waushara County documented current shoreland management at some of the public access lakes in the county. These videos can be an excellent educational tool to illustrate to landowners what a healthy shoreland buffer looks like, and how a restoration project can be utilized to accomplish that.



Shoreline in need of restoration
Photo Credit: Tom Littwin, Waushara Co. LCD



Same location after restoration
Photo Credit: Tom Littwin, Waushara Co. LCD

To provide additional education, the County has created an interactive webpage that will allow landowners a chance to develop a basic shoreland restoration protection plan and generate a rough cost estimate for the project. Lake issues are usually included in the annual county newsletter, but the county LCD is considering creating a separate newsletter for lakes, in order to cover the new and evolving issues about lake management.

Educational campaigns can also play a role in promoting healthy shoreland buffers. In Waushara County, the Watershed and Lakes Council provides a packet of information to all new lake property owners.

Native Aquatic Vegetation

Although aquatic plants are commonly thought of as “weeds”, a healthy and diverse population of native aquatic plants is a vital component in the prevention of aquatic invasive species. Research has shown that the abundance of EWM in a lake is inversely related to cumulative native plant cover (Madsen, 1998). For this reason, it is important to maintain healthy and diverse stands of vegetation. A thriving native plant population will compete for nutrients and living space, making it difficult for invasive species to become established.

Other benefits to maintaining native plant populations include:

- Improved health of the sport fishery
- Protection against bank erosion
- Stabilization of the bottom sediment
- Decreased likelihood of algae blooms
- Increased water clarity
- Increased value to desirable wildlife species

State law prohibits the removal of native aquatic plants beyond a 30-foot access corridor. In the same way that local ordinances and educational campaigns can encourage the protection of shoreland buffers, they can also encourage the protection of native aquatic plants.

Recommended Actions

1. **County-wide promotion of native vegetation**
 - a. Enforce shoreland zoning ordinances
 - b. Annual review of shoreland zoning ordinances
 - c. Annual review of funding for cost-sharing incentive programs
 - d. Video of shoreline used to educate lake property owners about shoreland buffers
 - e. Promote native vegetation in news articles, citizen organization newsletters, and press releases

Step 4: Conduct AIS Monitoring

With the growing concern over the spread of aquatic invasive species to Wisconsin’s inland lakes, many concerned citizens are looking for ways to get involved. AIS monitoring and volunteer boat inspection programs are opportunities to take a front-line defense against the spread of AIS.

Professional monitoring occurs on some Waushara County lakes however volunteer monitors are extremely beneficial to the lakes of the county. These volunteers are often lake residents, or

just interested citizens of the county. Free training workshops are available to train volunteers on protocols of the Clean Boats, Clean Waters program and also the Citizen Lake Monitoring Network program. Golden Sands RC&D can provide these trainings by request.

Clean Boats, Clean Waters

Clean Boats, Clean Waters (CBCW) is a watercraft inspection volunteer training program sponsored by DNR, UW-Extension, and Wisconsin Lakes. Upon completion of the three-hour workshop, CBCW participants are equipped with the tools, knowledge, and confidence needed to educate lake users and perform watercraft inspections at boat landings, potentially preventing a new infestation from coming into their lake. An additional benefit of the CBCW program is that the data collected by volunteers is used to support requests for more funding and legislative support for AIS issues.



Citizen Lake Monitoring Network

The Citizen Lake Monitoring Network is a well-established program designed to involve citizens in collection of pertinent lake management data. The program includes the collection of water chemistry, aquatic invasive species, native plants, and water clarity data.



Recent research has developed solid correlations between Secchi readings and many other water quality parameters. Therefore, this one inexpensive, easy-to-operate sampling tool can tell our lake managers a great deal about a lake's condition. To have Secchi monitors on every lake in Wisconsin would be a terrific advantage for managing our state's lakes.



A Secchi disc, which is lowered into the water to measure water clarity

A component of the CLMN program trains volunteers to monitor for eleven aquatic invasive species. The data collected by volunteers in the CLMN-AIS program is used to support requests for more funding and legislative support for AIS issues. Citizens can monitor for any or all of the species included in the program. Monitoring means early detection of new AIS infestations, and can result in huge savings in treatment expenses and a reduction of impacts to the lake. Ideally, every lake would have trained AIS monitors.

The Waushara County Parks Department is also a valuable group that could serve as monitors. Parks staff should be trained to identify and report new AIS sightings, and they could provide valuable assistance with early detection. Annual "refresher" training on AIS is recommended for Parks Department staff each year.

Volunteers and lake organization are essential for early detection of AIS and maintenance of healthy lake ecosystems.

Recommended Actions

1. **Promote CLMN-AIS monitoring activity on all Waushara County lakes**
 - a. Promote the CLMN-AIS monitoring program county-wide, with frequent news articles to promote awareness of the program and the importance of it.
 - b. Offer CLMN-AIS training workshops county-wide through the Regional AIS Program.
2. **Promote CLMN-Secchi and CLMN-Chemistry monitoring activity on all Waushara County lakes**
 - a. Promote the CLMN-Secchi and CLMN-Chemistry monitoring programs county-wide, with news articles to promote awareness of the program and the importance of it.
 - b. Offer CLMN-Secchi and CLMN-Chemistry training workshops county-wide through the Regional AIS Program with assistance from CLMN personal.
3. **Encourage watercraft inspections on all Waushara County lakes**
 - a. Promote the Clean Boats, Clean Waters program county-wide, with frequent news articles to promote awareness of the program and the importance of it.
 - b. Offer CBCW training workshops county-wide through Regional AIS Program.
4. **Train County staff to identify and report AIS sightings**

To Report an Infestation

- Collect a sample, if possible

- Roots, stems, flowers
- Place in a plastic bag with water
- Keep it in the freezer

- Contact DNR

dnraisinfo@wisconsin.gov
<https://dnr.wi.gov/topic/Invasives>
OR Golden Sands RC&D
715-343-6215
info@goldensandsrccd.org
OR Waushara County LCD
920-787-0453

Step 5: Spread the Word about AIS

Increasing public awareness of AIS is an important strategy in minimizing their spread. To facilitate proactive efforts from the general public regarding AIS prevention, people need to be made aware of the problems that AIS can cause.

Youth involvement in AIS management

In Waushara County, the Land Conservation Department (LCD) hosts an annual Conservation Field Day for area 5th graders. This event gives students exposure to a variety of environmental themes, including soil sciences, wildlife management, forestry, watershed management, and AIS. An AIS curriculum is being developed to take into 5th grade classrooms.

Students and youth organizations can get involved in AIS issues through purple loosestrife beetle rearing programs for biological control. This program includes an instructional manual for utilizing the beetle-rearing project as an educational tool.

How else can youth get involved? Kids have a great time at volunteer EWM “pulling parties”, performing watercraft inspections at boat landings, helping with purple loosestrife rearing projects, or participating in the CLMN-AIS monitoring program. These are all great ways for lake groups to include youth in their AIS activities.

Citizen Involvement

Attending workshops and conferences on lake issues and AIS issues is a great way for lake residents to learn about protecting the health of their lake. Citizens county-wide



Samples are discussed and identified

are encouraged to attend events like this. Some lakes host annual Lake Fairs, and the Wisconsin Lakes hosts an annual statewide Lakes Convention, which provides valuable training for both citizens and professionals.



Volunteers collecting aquatic plant samples for a plant ID workshop

Outreach materials

Other methods of public education and outreach include the distribution of written materials, such as AIS pamphlets, videos, brochures, and “watchcards” developed by DNR and

UW-Extension. These can be ordered free or at a minimal cost at <http://dnr.wi.gov/invasives/aquatic/pdfs/PubCatalogue.pdf>. Publications can be distributed through local bait shops, dive shops, boat rental and sales shops, local chambers of commerce, resorts, restaurants, and other local businesses.

News articles in local papers can also be very effective ways to reach lake users. Articles can discuss specific AIS species, laws and ordinances, or volunteer programs. Some counties have also printed AIS placemats (Waushara County) or bar coasters to distribute to restaurants near water bodies.

Signs at the boat landings can be another tool for education and outreach. The DNR had posted all public landings in the state with "Exotic Species Advisory" signs (if the lake had confirmed AIS), or with "Prevent the Spread" signs (if the lake had no confirmed AIS). New AIS signs were developed by the state and have been posted at all Waushara County public boat landings. They replaced the old signs with one comprehensive sign. If any signs are seen to be damaged or missing, this should be reported to DNR or County LCD immediately.



Walk-in access sign



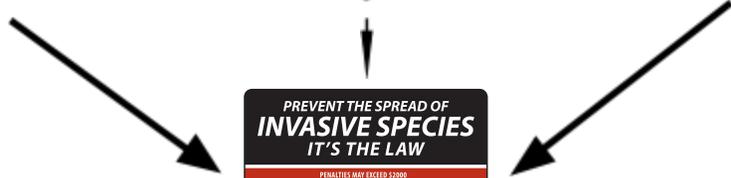
"Prevent the Spread" sign



"Stop and Remove" sign



"Exotic Species Advisory" sign



The three previous DNR boat landing signs relating to AIS are being replaced with one comprehensive sign

Some citizen groups have created additional boat landing signage to reinforce the AIS message to lake users. These projects are eligible for funding assistance from the DNR AIS Grants Program.

A common method for aquatic invasive species to be introduced to water bodies is through water gardening and aquarium practices. Many of the plants that are desirable for water gardens and aquaria are fast growers, can tolerate a wide range of conditions, and are extremely strong competitors. These are exactly the characteristics that describe an invasive species. If these plants are released, they can quickly destroy the balance of our native ecosystems. A possible solution to this important issue would be to work with distributors of water garden plants, and encourage them to insert a “Do not release to waterways” stake into each pot. These stakes could also have a website printed on them for the consumer to visit if they wish to learn more about AIS and the dangers of releasing non-native species. WDNR has some of these stakes available at no cost. One species, water hyacinth, has been found numerous times in nearby counties in recent years.



Example of additional signage some citizen groups have placed at boat landings

Recommended Actions

1. **Promote beetle-rearing projects for biological control of purple loosestrife**
 - a. Promote to schools/4-H/boy & girl scouts
 - b. Promote to citizen groups and other youth groups
 - c. Target lakes and wetlands with reported purple loosestrife infestations
2. **Promote lake fairs, workshops, and conferences to lakeshore residents county-wide**
 - a. Newsletter notices
 - b. Email notices
 - c. Website – Waushara County and the Watershed Lakes Council or Golden Sands RC&D
 - d. Press releases to the media.
3. **Print AIS placemats or coasters for distribution in restaurants that are near lakes**
4. **Submit news articles**
 - a. New AIS species to watch for
 - b. AIS prevention
 - c. Updates in AIS laws
 - d. Volunteer programs available

5. Offer to assist local schools with AIS-related curriculum projects
6. Maintain AIS signage at boat landings and stream access points
 - a. Include reporting procedures for damaged boat landing signs in AIS training to county staff
7. Encourage water garden suppliers to insert “Do not release to waterways” stakes into pots containing a known AIS

Step 6: Distribute the Workload

Managing invasive species, even on a proactive level, can be a tremendous workload. By distributing the workload and allocating tasks per individual interest, a great deal can be accomplished.

In Waushara County, various tasks are being accomplished by the County LCD, the Watershed Lakes Council and individuals. The Regional AIS Program’s role has been to collect information about those activities, to coordinate them, and fill in the gaps. Since the AIS workload is not expected to disappear, this program should be considered a permanent need, and funding secured to keep the position filled.

Recommended Actions

1. Secure funding to continue the Regional AIS Program in Waushara County
 - a. County Land Conservation Department
 - b. Local Lake Associations and Districts
 - c. Local, Regional, State Grants
 - d. Citizens

Step 7: Involve Local Government

Local town or county governments can be wonderful resources to tap into for AIS matters. Below are a few creative ways that local government actions have been beneficial in community AIS efforts.

Town Government

Boat Patrols—town boat patrols are an important resource for volunteers regarding the “Illegal To Launch Law”. CBCW volunteers active in the County may need to submit a violation report

forms to the local boat patrol for enforcement. Good cooperation between local boat patrols and CBCW volunteers is important.

Waushara County Watershed Lakes Council—many town governments in Wisconsin have recognized an increasing need and inherent responsibility to support local lake management efforts. In Waushara County, Town boards can be involved with lake protection by sending a representative to work with the Waushara County Watershed and Lakes Council Working at a municipal level, town government committees may be more effective in some situations than individual lake associations in accomplishing lake management goals.

Grant sponsorship—many town governments in Wisconsin have recognized an increasing need and inherent responsibility to support local lake and stream management efforts. Town governments can take an active role in the sponsorship of state lake grants. Lake or stream associations can work directly with their town boards to support grant applications on AIS-focused projects or other lake management projects. To learn more about the state lake grant programs, visit <http://www.dnr.wi.gov/lakes/grants>.

County Government

Community AIS partnerships—County governments can offer a unique community support system pertaining to AIS efforts. Counties can coordinate and encourage townships to work together in unified lake protection efforts. One method of accomplishing this is by supporting an AIS program to coordinate AIS activities within the county.

Law Enforcement—local Conservation Wardens, and boat patrols are an important resource for volunteers regarding the “Illegal to Transport” law. This law makes it illegal for anyone to transport aquatic vegetation or animals like zebra mussels on a watercraft or associated equipment. CBCW volunteers active in the county may need to submit violation report forms to the local law enforcement for follow up. Good cooperation between local law enforcement and CBCW volunteers is important.

Grant sponsorship—County government can take an active role in the sponsorship of state-administered AIS grants. Counties can help local lake associations seek grants for many types of lake protection projects, including projects focused on AIS issues. County governments can also initiate AIS projects to be completed by County personnel. The AIS program can be funded through the AIS grant program with the DNR to accomplish such projects as AIS partnership coordination, volunteer monitoring support, educational campaigns, and more.

Conservation departments—the actions of Land Conservation Departments (LCDs) are directed by elected county board supervisors. LCD personnel are natural resource management professionals and are often well-versed in all aspects of AIS matters. The LCD is a natural home for county-wide lake protection and AIS initiatives, such as supporting an AIS program, enforcing

and promoting shoreline buffers, and assisting with shoreland restoration or enhancement projects.

Recommended Actions

1. DNR Conservation Warden, and local boat patrol support of AIS program boat inspectors and volunteer boat inspectors
2. Local Police and Sheriff's Department support
3. Town boards send representation to Waushara County Watershed and Lakes Council
4. County LCD continue AIS involvement through support of AIS program
5. Create county ordinances to prevent the spread of AIS

Step 8: Plug in to the Lakes Community Network

Wisconsin is proud of its lake-rich heritage, and is host to hundreds of lake organizations. It is important for lake groups and lake managers to stay well connected with the "lakes community" and to stay up-to-date on local and state lake stewardship issues.

Below are suggestions on networking within the lakes community.

Statewide Lake Organizations

Wisconsin Lakes (formerly Wisconsin Association of Lakes) is a non-profit statewide lake group working to protect Wisconsin's lakes through public policy, education, and local lake group assistance. Through Wisconsin Lakes, the lakes community can stay updated on current public policies that may ultimately affect the health of lakes throughout Wisconsin. They can also attend annual regional workshops that target key lake issues, and gain the support they need for individual lake group projects. For more information about Wisconsin Lakes, log onto their website at <http://www.wisconsinlakes.org>.

Lake managers with the DNR and UW-Extension come together at monthly Lake Team meetings to keep up-to-date with emerging lake issues, policies, and science. County AIS Coordinators have been invited to join this circle to stay in tune with DNR and UW-Extension initiatives. This is a highly recommended network for Waushara County's AIS program staff to stay in touch with.

DNR and UW-Extension AIS staff has begun holding semi-annual meetings for county AIS Coordinators, to update coordinators with regard to state initiatives, new available resources,

policy changes, and to give coordinators around the state a chance to network. This is another highly recommended network for the Waushara County AIS program staff to stay in touch with.

Statewide Lakes Convention

The Wisconsin Lakes Convention is an outstanding educational event that has brought hundreds of lake groups, state leaders, and natural resource professionals together in a celebration of Wisconsin's lakes. The convention is an excellent opportunity for learning, sharing, and discussing issues important to lake management. For more information about the annual Wisconsin Lakes Convention, log onto the UW-Extension Lakes Program website at <http://www.uwsp.edu/cnr/uwexplakes>. This convention is a highly recommended opportunity for the Waushara County AIS Coordinator and representatives of the County LCD or individual lake groups.

County-wide Citizen Organizations

County-wide citizen organizations provide an excellent opportunity to stay connected with the local lakes community, and share resources between citizen organizations in the county. The Waushara County Watershed and Lakes Council provides a network for communication and sharing resources between and amongst lakes organizations in the county. Membership in the Watershed and Lakes Council gives a collective voice for advocating for regulatory changes, influencing public policy discussions, and discussions about the future growth of the community. It is highly recommended the Council reach out to lake groups that are not currently represented on the Council to ensure full representation of the county's lakes.

Individual Citizen Organizations

Citizen groups range from informal social groups to formalized lake associations or districts. An organized, functional citizen group can make a big difference in lake health protection. Citizen groups can be twice as effective when networking with other lake organizations who have struggled with similar issues—lack of funding, lack of volunteer interest or commitment, or lack of information, to give a few examples. Training opportunities like the Lake Leaders Institute, <http://www.uwsp.edu/cnr-ap/UWEXLakes/Pages/programs/lakeleaders/default.aspx>, is another great way for individuals to improve their knowledge, interactions, and involvement with their lakes and other lake residence.

Recommended Actions

1. **Keep AIS program staff networked with the “lakes community”**
 - a. Wisconsin Lakes
 - b. Statewide Lake Team
 - c. AIS Coordinators' meetings

2. **Promote attendance at the Wisconsin Lakes Convention**
 - a. AIS program staff
 - b. Local governments
 - c. Lake groups or other citizen groups
3. **100% representation of county lakes on the Watershed Lakes Council**
4. **100% inclusive county lakes network, with a contact person to disseminate news and information through, even on lakes/streams without organized citizen groups**

Step 9: Be Creative!

Just as each lake is unique, so are the individuals that make up lake organizations. There is no “one size fits all” management criteria made to fit all lake or county situations.

The important similarity between lakes is that they all need a plan of action that is conducive to a healthy lake ecosystem and is realistic in time, money, and commitment. Consider using several of the proactive management steps for the best results.

This plan’s proactive management steps are ideas to help spur thoughts that fit Waushara County’s lake management situation but sitting down with lake residents to brainstorm ideas can be very valuable. The important thing is that the County and the residents DO talk about it. Wisconsin waterways will always be vulnerable to invasions of aquatic invasive plants and animals. Proactive management is the best way of avoiding future AIS infestations.

Creative Kids

“Milfoil Masters” was a creative school project that kids from Minocqua-Hazelhurst-Lake Tomahawk Middle School came up with. Working off of a \$25,000 start-up grant, their idea evolved into the Clean Boats, Clean Waters program, which is now the statewide protocol for slowing the spread of AIS.

Implementation Schedule: Recommended Actions

Proactive Step	Recommended Action	Who	How	When	Progress
1) Gather info about AIS	Continue AIS monitoring county-wide, assist lakes without recent AIS surveys	AIS program with support of LCD	Letters, emails, phone calls	ongoing	√+
	Update official AIS records in SWIMS	AIS Program	Confirm reports with vouchers, enter into WDNR's SWIMS database	ongoing	√+
	Update AIS volunteer activity record	AIS Program	Confirm activity from database, create table in SWIMS	ongoing	√+
	Monitor and survey for starry stonewort	AIS Program	Use point intercept, early detection and boat landing survey protocols	2020+	IP
2) Gather info about lake ecosystems	Conduct county-wide lakes survey	UWSP, LCD	LCD apply for a DNR Lake Planning Grant, UWSP supplies technical support	2010 – 2012	√
3) Protect and Restore Native Vegetation	Enforce shoreline zoning ordinances	Zoning	Established process	ongoing	√+
	Annual review of zoning ordinances	Zoning	Established process	ongoing	√+
	Annual review of cost-sharing incentive programs	Zoning	Established review process	annually	√+
	Video of shoreline used to educate lake property owners about shoreland buffers	LCD	Present at lake group meetings	ongoing	√+
	Promote native vegetation in news articles, annual county newsletter, citizen organization newsletters, and press releases	AIS Program	Write and submit articles and press releases	ongoing	√+
4) Conduct AIS Monitoring	CLMN-AIS monitoring activity on ALL lakes	Citizen groups	AIS Program will train volunteers	2015+	√+
	CLMN-Secchi monitoring activity on ALL lakes	Citizen groups	UWSP-CLMN will train volunteers	2015+	√+
	Watercraft inspectors at landings	AIS Program, citizen groups	AIS Program will train volunteers and hire inspectors	ongoing	√+
	Train County staff to identify and report AIS sightings	AIS Program	AIS Program will train county staff	annually	√+
5) Spread the word about AIS	Promote beetle-rearing projects for biological control of purple loosestrife	LCD, AIS Program	Contact schools and groups, and offer supplies, training, and rearing facility.	ongoing	√+

	Promote lake fairs, workshops, and conferences to County lakeshore residents	AIS Program, LCD	Emails through network maintained by county or RC&D website	ongoing	√+
	Print AIS placemats or coasters	AIS Program, Citizen groups	AIS Program can assist with text/photos	ongoing	√
	News articles	LCD, AIS Program	Write and distribute press releases	ongoing	√+
	Assist local schools with AIS-related curriculum	AIS Program	Take AIS lesson plan into classrooms upon request, assist with projects as requested	ongoing	√+
	Maintain AIS signage at boat landings	AIS Program	Keep record of boat landing signage, train others to collect signage info	ongoing	√+
	Work with water garden suppliers	AIS Program	Offer AIS posters, stakes to suppliers	ongoing	√+
	Staff AIS education table at public outreach venues	AIS Program	Staff table and offer information to public	ongoing	√+
6) Distribute the workload	Secure funding to continue the AIS Program in Waushara County	AIS Program	Apply for DNR grant to continue program	ongoing	√+
7) Involve local government	Conservation Warden and local boat patrol support of AIS program boat inspectors and volunteers	AIS Program	Coordinate with DNR Water Guards and boat patrols to enforce AIS violations	ongoing	√+
	Town boards send representation to Watershed Lakes Council	Watershed Lakes Council	Council solicits town representatives to attend meetings to stay in touch with the lake community	ongoing	√+
	County LCD continue AIS involvement through support of AIS Program	LCD	Continue to place AIS in high priority, and provide County match on AIS grant	ongoing	√+
8) Plug into the lakes community network	Keep AIS Program staff networked with the lakes community	AIS Program	Attend WI Lakes Convention, Lake Team meetings, and AIS Coordinator meetings	ongoing	√+
	Promote attendance at the Wisconsin Lakes Convention	AIS Program	Email notices to contacts	ongoing	√+
	100% inclusive county lakes network	AIS Program	Send emails through distribution list	ongoing	√+

Symbol Key

√ Complete

√+ Complete and ongoing

IP In Progress

LCD Land Conservation Department

Appendix A – Contacts List

County

Waushara County Land Conservation Dept.
209 S. Saint Marie Street
Wautoma, WI 54982
920-787-0453

Region

Anna Cisar, Regional AIS Coordinator
Golden Sands Resource Conservation & Development Council, Inc.
715-343-6215 Anna.Cisar@goldensandsrccd.org

Chris Hamerla, Regional AIS Coordinator
Golden Sands Resource Conservation & Development Council, Inc
1100 Main Street, Suite 150, Stevens Point, WI 54481
715-343-6215 Chris.Hamerla@goldensandsrccd.org

State

Ted Johnson, DNR Lakes Biologist
Wisconsin Department of Natural Resources
625 E County RD Y, Suite 700, Oshkosh, WI 54901
920-424-2104 Tedm.johnson@wisconsin.gov

University of Wisconsin Extension – Lakes Program
College of Natural Resources, University of WI – Stevens Point
800 Reserve St., Stevens Point, WI 54481
715-346-2116 <http://www.uwsp.edu/cnr/uwexplakes>

Paul Skawinski
Citizen Lake Monitoring Network Coordinator
715-346-4853 Paul.Skawinski@uwsp.edu

Erin McFarlane
Clean Boats, Clean Waters Volunteer Coordinator
715-346-4978 Erin.McFarlane@uwsp.edu

Wisconsin Lakes
One Point Place, Suite 101, Madison, WI 53719
608-662-0923 or toll-free (WI only) 800-542-5253 <http://www.wisconsinlakes.org>

Appendix B – Aquatic Plant Management Laws & Regulations

Regulated and Unregulated Aquatic Plant Management Activities in Waters of Wisconsin

Activities	Water Bodies					
	Wetlands (non-navigable) ¹	Streams (navigable)	Flowages	Lakes <10 acres entirely confined on one property	Lakes	Fish farms (s. 95.96) w/ controllable outflow
Manual removal of native plants	No Permit	109 Permit required	109 Permit required if > 30ft wide	No Permit	109 Permit required if > 30ft wide	No Permit
Manual removal of exotic plants ²	No Permit	No Permit	No Permit	No Permit	No Permit	No Permit
Mechanical harvesting	No Permit	109 Permit required	109 Permit required	No Permit	109 Permit required	No Permit
Chemical control	107 Permit required	107 Permit required	107 Permit required	107 Permit required	107 Permit required	No Permit
Biological control ³	Stocking permit required	Stocking permit required	Stocking permit required	Stocking permit required	Stocking permit required	No Permit
Burning	No Permit	Permit required	Permit required	Permit required	Permit required	No Permit
Purple loosestrife control ⁴	107 Permit required	107 Permit required	107 Permit required	107 Permit required	107 Permit required	No Permit
Native planting/stocking	No Permit	No Permit	No Permit	No Permit	Approval of Project	No Permit
Non-native planting/stocking	109 Permit required	109 Permit required	109 Permit required	109 Permit required	109 Permit required	No Permit
Incidental or scientific removal	No Permit	No Permit	No Permit	No Permit	No Permit	No Permit

- All activities must be conducted in an environmentally sound manner.
- All activities on privately owned land or land adjacent to privately owned lakefront property, or lakes confined on the property of one person must have the permission of that property owner.

¹Confirm with DNR Water Management Specialist that wetland is non-navigable to be exempt of permit.

²No native plants may be removed during the process

³Use stocking permit for Eurasian watermilfoil weevils, form 9400-60, pursuant to s. 29.753 and NR 19.05.

⁴Must be a state cooperator if using purple loosestrife beetles for biocontrol.

Excerpted from “Aquatic Invasive Species: A Guide to Proactive and Reactive Management”, Carolyn Scholl, Vilas County LWCD, May 2006. Edits made based on 2017 comments received from Scott Provost, then WDNR Water Resource Specialist.

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