

Section 1

Aquatic Invasive Species Monitoring: Getting Started

Citizen Lake Monitoring Network



Welcome to the Aquatic Invasive Species portion of the Citizen Lake Monitoring Network.

Aquatic Invasive Species (AIS) are one threat to Wisconsin lakes. Wisconsin residents spend several million dollars each year trying to control AIS, and these costs are increasing every year. With early detection of most AIS, the costs to control the AIS are greatly reduced. Each year that many of the AIS are left unchecked, they continue to spread and get a stronger hold on the lake.

Wisconsin's 15,081 lakes are fortunate to have volunteers who monitor water clarity, water chemistry, aquatic plants and AIS. Since 1986, these volunteers have been the eyes and ears for the lake biologists. They have provided data to local and state agencies on what is happening on their lakes. Without the volunteers, we would not have lake data which is necessary to help make decisions to protect the health of our lakes.

Through the AIS monitoring network, volunteers are trained to monitor the "entire" lake for Eurasian water-milfoil, curly-leaf pondweed, purple loosestrife, rusty crayfish, adult zebra mussels, Chinese and banded mystery snails and freshwater jellyfish. They will also learn how to assist the DNR staff in monitoring for the veliger stage of zebra mussels as well as water-fleas.

See Appendix A for a list of common terms used around the lake.



**Slow The Spread Of
Aquatic Exotics**

Why do Aquatic Invasive Species Monitoring?

Monitoring for and mapping aquatic invasive species is essential to the future of our inland lakes. Early detection is the best and cheapest route in the control of invasives. If you detect the invasives early enough, you may be able to prevent them from spreading throughout your lake system. It is cheaper to control small patches of invasives than to pay to control invasives that have taken over an entire lake system. Once invasives are established in your lake, they are nearly impossible to eradicate.

Watch for changes in species diversity or changes in abundance of native species and not just for the presence or absence of exotics. A decrease in diversity or an increase of one particular species may be an early-warning sign of changing water quality. We know that some plants do better in lakes with increased nutrients – so by monitoring these indicator species we can tell when the lakes are becoming more nutrient rich.

Shoreline and lake bottom disturbances that remove native plants eliminate these benefits and make it easier for non-native species, such as Eurasian water-milfoil to become established in our lakes. Excess nutrients carried to a lake by runoff can lead to algal blooms, and overgrowth of some plant species and can result in a decrease of recreational and aesthetic value. Preserving the natural aquatic plant community helps maintain a balance that ultimately protects the lake.

Luckily, with some invasives, water and sediment characteristics may help to prevent the spread and nuisance growth of these Aquatic Invasive Species. We believe this is happening on some lakes with Eurasian water-milfoil and curly-leaf pondweed. On some lakes we think that the hardness and calcium content may not be conducive to zebra mussel invasions while on other lakes we know that if zebra mussels get established, we will have serious problems. We also know that rusty crayfish populations do not do very well on lakes with muck bottoms.

Eurasian water-milfoil starts growing in the early spring before the native plants begin growing. It often reaches nuisance levels in late June and remains at these levels until fall. On some lakes, Eurasian water-milfoil has taken over hundreds of acres of the shallow water areas. It becomes so dense that it makes boating and fishing almost impossible. Swimming in these areas is out of the question. When Eurasian water-milfoil gets so thick, it hinders feeding of larger fish. Small fish are able to “hide” in the Eurasian water-milfoil and the larger fish cannot swim through it easily. This imbalance can change the entire fish community of the lake.

Curly-leaf pondweed is an invasive plant that came to the US from Europe. Once the ice goes off, the plant growth increases. Nuisance levels will be reached in May and June. When the plants die in mid-summer they rot. This rotting process will increase the amount of nutrients in the lake and may promote algal blooms. We still have a lot to learn about curly-leaf pondweed. Some lakes have had curly-leaf pondweed for decades and the levels of curly-leaf never reach nuisance levels. Curly-leaf pondweed is essentially becoming a part of a “balanced” aquatic plant community. In other lakes, the curly-leaf pondweed reaches nuisance levels every year or every few years. We still do not know enough about this plant to determine why the nuisance levels vary. Minnesota DNR has determined that “nuisance growth of curly-leaf pondweed often

occurs in shallow, eutrophic basins, where native submerged aquatic vegetation has been lost due to the loss of water clarity and the presence of carp”.

Purple loosestrife is a beautiful, but aggressive, plant that can grow in upland, wetland and shallow water areas. Each plant has the capability to produce over 2 million seeds each year, making it easy for this plant to take over disturbed areas. Seeds can be moved by wind, water, animals and humans. If excavation is taking place in a purple loosestrife bed, the seeds can be dragged over the excavated site and the plants will grow throughout this area.

Rusty crayfish were introduced from the Ohio River Basin and the states of Ohio, Tennessee and Kentucky. They are considered opportunistic feeders. They feed on aquatic plants, insects, snails, leeches, clams and fish eggs. Rusties have a higher metabolic rate and grow larger than native crayfish. Some studies show that they can consume more than four times the food of a native crayfish, thus they do more damage to the plant community than native crayfish. Rusty crayfish are also messy eaters. They often cut a plant off, then nibble on the plant and let the rest of the plant float away. This can spread plants such as Eurasian water-milfoil.

Zebra mussels' spread and abundance can be linked to their reproductive cycle. A mature female can lay up to 1 million eggs per year. Of these, roughly 20,000 – 40,000 make it to adulthood (within 1 year). Zebra mussels have a tuft of fibers called byssal threads which allows the zebra mussel to attach to aquatic plants, rocks, docks, native clams, native mussels, snails, or any hard surface. An adult mussel is capable of filtering over a liter of water a day, feeding on the phytoplankton and small zooplankton. Phytoplankton is normally eaten by zooplankton which, in turn, is eaten by small fish. It is speculated that the zebra mussels may impact the fishery on the lake because there is less food for forage fish. Zebra mussels do not eat attached blue-green algae, so lakes with zebra mussel often have the slimy masses of algae attached to plants and other hard surfaces. There is concern about the increases in blue green algae on lakes, as the blue green algae can become toxic when they die off.

The **Chinese mystery snail** is native to Asia. The **banded mystery snail** is native to the southeastern US. One of the main identification features of the mystery snails are their size. Adult snails are often over 1 ½ inches in length. Mystery snails have opercula (singular operculum) which are a “trap door” when they are closed. This operculum is darkly colored, solid in consistency with concentric rings. Most native snails do not have opercula. Mystery snails thrive in silt and mud areas although they can be found in lesser numbers in areas with sand or rock substrates. They are found in lakes, ponds, irrigation ditches, and slower portions of streams and rivers. They are tolerant of pollution and often thrive in stagnant water areas.

There are two types of non-native waterfleas, the **spiny waterflea** and **fishhook waterflea**. Both may impact the fisheries of the body of water where these waterfleas are found. The waterfleas are up to ¾ inch in length. Both the spiny and the fishhook waterfleas have sharp spines on their tails. Some small fish have difficulty swallowing these waterfleas. It may take a small fish 8-10% more time to eat a spiny waterflea than other prey. This is energy wasted. Both waterfleas eat small zooplankton, which normally would have been consumed by native zooplankton and fish. An impact on the fisheries is expected, but not well documented.

The **freshwater jellyfish** found in Wisconsin are one of several species of *Craspedacusta* native to China. In some years, especially hot summers in Wisconsin, you will see the medusa form of the jellyfish. The medusa has a nearly transparent body, often called a bell, which dangles long, hairlike tentacles we associate with jellyfish. At this stage, the jellyfish is about the size of a quarter. Jellyfish eat zooplankton and even small fish. Not a lot is known about the life history of jellyfish in Wisconsin lakes.

The future – we know that more than 180 non-native plants and animals have a foot hold in the Great Lakes – The aquatic invasive species monitored through the Citizen Lake Monitoring Network may be only the first of many species that will impact Wisconsin lakes. Getting a plan in place for monitoring will help to prepare for lake users of the future.

Citizen Lake Monitoring Network and Aquatic Invasive Species Monitoring

The Citizen Lake Monitoring Network (CLMN) aquatic invasive species monitoring protocol will help you design a monitoring plan for your lake and set up a monitoring schedule.

You do not need to know how to identify invasive species when you join the program. Training sessions will be held periodically, or you can contact your local Citizen Lake Monitoring Network representative for help setting up a training session.

Goals of the Citizen Lake Monitoring Network aquatic invasive species monitoring are to

- Help you become familiar with some of the more common native aquatic plants in your lake.
- Help you monitor for the more common aquatic invasive species.
- Help you to communicate information to others.

We will discuss each invasive species separately. You may select the Aquatic Invasive Species (AIS) you would like to monitor for. Since each lake is unique, you can tailor the monitoring to fit your individual lake. Your regional Citizen Lake Monitoring Network Coordinator can offer assistance.

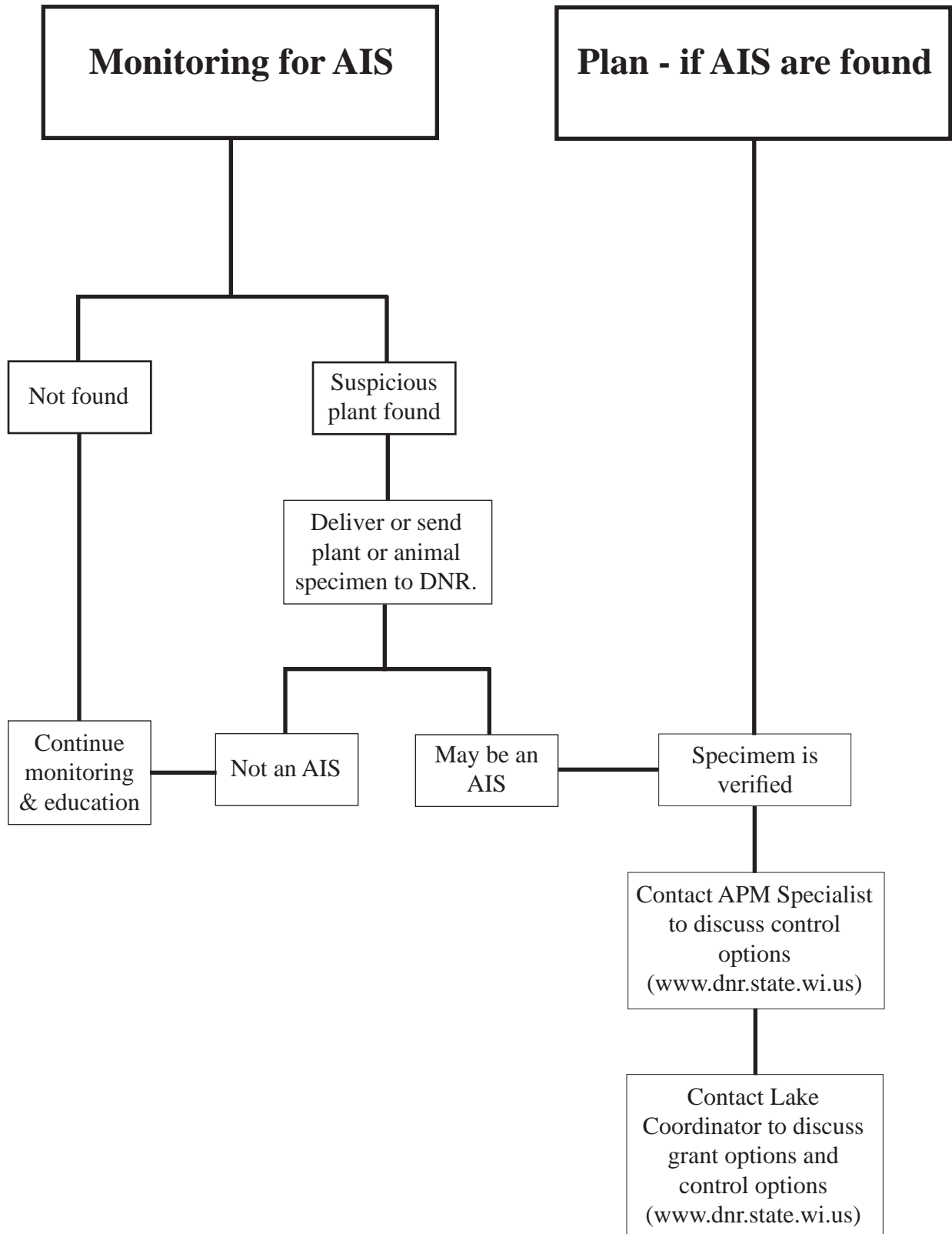
Some volunteers in the CLMN will:

- Collect “suspect” aquatic invasive plants and animals from their lake. If the organism is determined to be an invasive, then further monitoring should be initiated.
- Collect “suspect” aquatic invasive plants and animals from their lake. If the organism is determined to be an invasive, map the beds of the aquatic invasive plant(s) and track the spread of the invasive animals. This will help you to determine the extent of the lake’s surface area covered by this invasive.
- Collect “suspect” aquatic invasive plants and animals from their lake. If the organism is determined to be an invasive, map and track the location of the beds of the aquatic invasive plant(s) or spread of the invasive animals through use of GPS. This will help you to determine the extent of the lake’s surface area covered by this invasive. By

using the GPS information, you can more accurately track the spread and better display the data.

Please refer to the flow chart on page 7 for information on what to do if you do not find an invasive species while monitoring as well as what to do if you do find an invasive species.

You should consider contacting the DNR Aquatic Plant Management and Protection Coordinator to see if there is background aquatic plant data on your lake. Aquatic plant surveys may have already taken place on your lake. This data may help you in the identification of the plants that you find as well as give you background data on what plant species were present in the past. To determine your aquatic plant contact, go to <http://dnr.wi.gov/org/water/wm/dsfm/shore/county.htm> and click on the county of interest.



How to Set Up a Monitoring Team

Often it is easier to **“divide” up the work** than to rely on one volunteer to monitor an entire lake for invasives. Some volunteers may want to monitor for specific invasives while others may want to monitor specific areas of the lake. The first thing to do is find volunteers to assist you in your monitoring effort and find out what their interests and constraints are. Some may not have access to boats, but are willing to look for AIS at beaches or boat landings or some may only have a day a month to give – these folks would work great for Eurasian water-milfoil monitoring. Others will have more time available – these folks can map plant beds and / or monitor for rusty crayfish. Others may have an interest, but not a lot of time. Ask these folks to look for zebra mussels when they pull in their docks. Just remember, the more people who know about aquatic invasive species, the better your chances of finding the invasives early in the infestation cycle.

You may want to **designate a point person** that can keep track of who is monitoring and what areas are being monitored. This person can also be the person the other volunteers can bring suspect organisms to. If assistance in identification is needed, the point person can take the organisms to the DNR, UW-Extension, or the County Land and Water Conservation staff for vouchering. By having the point person take in suspect plants, you will not have every team member tracking down staff to verify the identification of the plant(s), and you will be able to keep a list of what plants have been taken in and identified. By the end of the summer, your point person will be quite familiar with the native plants and will not have to take all plants to be vouchered. Some groups have asked bait dealers to “hold” suspect plants that were bought in by residents. Then the point person would collect the plants from the bait dealers and take them in for identification when necessary. Be creative and most importantly, do not burn out your point person!

Once you have your “team” together, you will want to **print out a map** so that you can mark which areas each volunteer is monitoring. Your team leader / point person should keep a master copy of the map. It may be easiest to have volunteers monitor the areas by their homes or where they fish. Assigning smaller (1/2 or 1-mile) stretches of shoreline per volunteer will be less overwhelming than monitoring 30 miles of shoreline.

You can get maps from your local DNR office, Fishing Hot Spots, etc. or basic lake maps can be found at <http://maps.dnr.state.wi.us/imf/dnrimf.jsp?site=SurfaceWaterViewer>. The easiest way to get where you want to go is to use the Zoom To button. Here is an example. Say you want a map of Bearskin Lake in Oneida County. Use the drop down button at the left of the screen (right now it will say city or village) click on the down arrow and click on County. Then go to the drop down arrow in the next line and click on Oneida. Then click on [Go!]. The Oneida County map will appear on the right. If you move your cursor / mouse on the map and left click, the map will zoom to the area under the cursor. Keep zooming in until you have the lake you want (you can zoom out if you overshoot your target lake). Once you have your lake in the box, click on the purple print button near the top of your screen and then click on ok. To see what you will be printing, click on [open map]. Once you try this a few times, it will get easier. Also, via the Layers tab, you can select what you want to show. Or you might want to consider obtaining a surveyed contour or bathymetric map of the water body. Go to <http://dnr.wi.gov/org/water/fhp/lakes/lakemap/> for these maps. Here is an example of

how to print out a Bearskin Lake, Oneida County map. Click on the down arrow key next to Counties. Select Oneida County. Then page down to Bearskin Lake. Left click on Bearskin Lake. Click on "[For a More Detailed Lake Map](#)". Now just follow the directions. To print this to a letter size paper, right click on the map and "save picture as" a file on your computer. Start Word, then click on the tabs: "File" "Page Setup" "Paper Size" "Landscape" "ok" and "insert" "picture" "from file" and pick the lake map file and then print it. Either map will work. Use the web site that is most convenient for you.

Consider having a **mini-plant training session** for your team. The Citizen Lake Monitoring Network or the Aquatic Plant Management Coordinators for your area may be able to assist with this training. If not, group Aquatic Invasive Species Training sessions will be set up annually. Contact your local Citizen Lake Monitoring Network contact to see if such a session is scheduled for your area. These sessions are often set up in conjunction with Lake Fairs and Conventions.

When to Monitor

- **Native aquatic plant** monitoring normally takes place **mid-June through the end of August** with the earlier months used in the southern part of the state and the later months used in the northern part of the state. These dates are impacted by ice out dates and how hot the spring and summer are.
- Many groups will monitor for **Eurasian water-milfoil** several times a season from **May – October** as Eurasian water-milfoil begins growing early and keeps growing late into the fall. For lakes with known Eurasian water-milfoil this allows you to look for new beds so that these beds can be treated (scuba diving, hand pulling, chemical, etc.) while the beds are still small. Chemical treatment is conducted in the spring, so beds need to be located early. An aquatic plant management plan is often required as a part of a permit for chemical treatment of Eurasian water-milfoil.
- **Curly-leaf pondweed** is often at peak densities in May and June and begins to die back in late June to July. You would want to conduct your monitoring in **May or June**. An aquatic plant management plan is often required as a part of a permit for chemical treatment of Curly-leaf pondweed.
- **Purple Loosestrife** monitoring takes place **mid-July through August** when the plants are in bloom.
- **Rusty crayfish** trapping normally **begins in June and ends in August**.
- **Zebra mussel** monitoring can be done from **ice out to ice on**. One of the best times to look for zebra mussels is when you pull out your dock or even in the spring when you put your dock back in – the zebra mussels can be seen on the pipes and/or they feel like sandpaper. Consider placing an article in your newsletter asking all of your residents to do the same, or mention it at your annual meeting. Think of the shoreline area you can cover by having everyone check their docks and piers for zebra mussels.
- **Chinese and Banded Mystery snail** monitoring can take place anytime from **ice out to ice on**.
- **Waterflea** monitoring normally takes place **June through September**.
- **Freshwater jellyfish** monitoring normally takes place **early August – mid September**.

Refer to the specific aquatic invasive species section for more detailed information on monitoring.

Aquatic Invasive Species – A Guide for Proactive and Reactive Management is excellent resource for planning what to do before an invasive is found in your lake. It also is an excellent guide on what to do if an invasive species is found. This publication can be downloaded at <http://www.uwsp.edu/cnr/uwexlakes>.

If an invasive plant is suspected or found, you should contact your local DNR Aquatic Plant Management Specialist. To determine your Aquatic Plant Management Specialist, go to <http://dnr.wi.gov/org/water/wm/dsfm/shore/county.htm> and click on the county of interest. Your lake organization may want to consider control efforts for these invasives. Your DNR Lake Coordinator can go over grant options at this point. If you find an aquatic invasive animal (rusty crayfish, zebra mussel, etc.) contact your local CLMN Contact (page vii).