

# Aquatic Invasive Plant Surveillance for Citizen Scientists on Lakes



Hydrilla

How to hunt for  
new aquatic  
invasive plants in  
your lake



Curly-leaf pondweed



NYS Department of  
Environmental Conservation  
&  
NYS Federation of Lake  
Associations



2016

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## Introduction and Objective

Aquatic plants are an important part of the lake ecosystem and are a large part of a healthy lake environment. Invasive plants can disrupt ecosystems and interfere with recreational use of lakes. Early detection and rapid response (ED-RR) are critical to slowing the spread and enabling control efforts. Citizen scientists are important in that effort. Lake volunteers can bring more eyes to more places, and know and can access important places to search on a lake.

This protocol is intended to provide an uncomplicated approach to monitor for aquatic invasive plants from the lake shoreline or by wading. Some people may choose to use a boat but a boat is not required. This document contains the monitoring protocol and a list of recommended equipment. A monitoring form is included, which should be printed and submitted after each survey, whether or not any suspicious plants are found.

This goal is to search for the presence of some species, or to verify that they are not found. This is called presence / absence sampling. This approach will not provide a perspective on biodiversity or plant density.

Some of the most significant invasive species for New York State are described. A list of some of our favorite reference books are also included.

## Where to search for invasive species

While it might be a great idea to search the entire shoreline, we don't all have that time. So strategize where you will spend time looking. Smart searching is more time efficient than trying to cover all of the shoreline. Respect private property and get permission from landowners before going on to their property. Take appropriate precautions to avoid unsafe conditions under foot or in the water.

### Boat launches.

Invasive species are often spread by people, so it's important to know where people may be visiting the lake, especially if they might be bringing boats or gear from a different lake. If you only have time to look in one spot, look at the area around boat launches. Boat launches are often where many invasive species are first found on a lake.

Marinas are also likely areas for boats to congregate, so if it is safe, consider searching for invasive species near any marinas on your lake.

### Fishing access

Sometimes invasive species travel on fishing gear, so also consider searching fishing spots like docks or areas near roads, or where waders might be used.



## Public access

Invasive species can enter lakes when people dump unwanted aquariums, so that's a reason to look at bridges or locations where it's an easy walk from the road to the shore. Public access areas and beaches are also places where invasive species might enter on water toys and gear.

## Inflows or outflows.

People sometimes unknowingly plant invasive species in water gardens, so look carefully at any streams that enter from a water garden. Input areas for streams that come from other lakes can also be a priority because plants can be carried by currents and streams from one place to another. Plant fragments may also move with the flow of water toward the outlet and can collect there.

## Downwind

Many invasive plants spread by fragmentation. A great way to get an idea of the plants on the lake is to look in places where fragments collect, for example on downwind shores and beaches. If any of the hotspots mentioned above are also areas where "seaweed" piles up, that's a good spot to check carefully.

## Weedbeds

Finally, if some invasive species are located in one place in your lakes, that might be a good place to search. Other invasive plants are apt to travel the same path that the earlier plants took. More generally, look in "weedbeds" where plants are growing. Invasive plants are like all other plants in that they grow where habitat, light, sediment, and wave action is optimal. If other plants grow well here, invasives can thrive here as well. This can be especially important if you are searching for a floating plant, like water chestnut. If you are searching for a new arrival, it is probably going to be located where other floating plants grow.

Remember, you know your lake best. Prioritize your effort for the best results.

## Maps

You probably know one section of your lake better than another. Reference to a map will help you see if launches, public access, or road crossings that should be considered. Print out a map of your lake so that you can mark where you searched and where you found any suspicious plants. A Google or Bing map is fine for this. NYS DEC also has contour maps for some lakes which can be used, see <http://www.dec.ny.gov/outdoor/9920.html> Printouts made on ink-jet cartridges may run when wet, so if possible, print the map and form using a laser printer.

## When to search

There's no bad time to search. It's a great excuse to walk along the lake shoreline. The best times are when the invasive plants are growing and are large enough to see. Most plants are most identifiable in August, and the water's warmer then too. Plants are easiest to identify if they are mature, with flowers and floating leaves. This is more likely to be seen in late summer.

However, if your lake suffers from algae blooms late in the summer, you might want to look earlier in the season when the water is clearer and you can see more plants. Plants are easier to identify if they don't have algae growing on them.

While August is a good general rule, as always, exceptions exist. Some species have different life cycles. For example, if you know that you are concerned about curly-leafed pondweed or water chestnut, you will want to look earlier in the season. Curly-leaf pondweed grows early in the season and senesces when the water gets warmer. And you'll want to remove water chestnut before the nutlets – the seeds - drop off the plants in mid to late August. On the other hand, some plants in some locations don't flower until September. As long as the plants are visible, there's really not a bad time to look.

## How to search for plants

### Get acquainted with the plants

When you are looking for specific plants, it is helpful to have their appearance in mind. This is appropriate if you are participating in a specific invasive project like a "hydrilla hunt" or "water chestnut chase". If you are just out to see what you might find, you should look at photos and descriptions of the invasive plants that are found nearby. Those are more likely to be the threats to your lake. The [key plant species](#) and the [quick plant reference section](#) which are found further in this document can provide a start. You can also use the [recommended references](#). Some locations have aquatic invasive plant training sessions that will be helpful. Or you can document whatever plants you find, and build a "reference library" of the plants found in your lake.

It will be helpful to know what invasive species, if any, are already known to be in your lake. A listing of known AIS for waterbodies in each NYS county is posted at the website <http://nysfola.org/> under the lake management and then invasive sections. You can find the AIS known to be in lakes in your county in Appendix E of your CSLAP report if your lake participates in CSLAP.

Unfortunately, Invasive plants keep spreading, so even if you looked throughout your lake a few years ago for invasive plants, it is good to take another look. This protocol has been produced partly because we know that our listings of aquatic invasive plants is incomplete.

### Gather your monitoring equipment.

The recommended equipment for searching for plants is listed under the heading Survey equipment. A bucket may be useful to carry the materials, especially the plastic bags containing plant samples.

### How to survey at the lake shore

To survey along the lake shore, walk along the shoreline or wade in the water, looking for samples of plants. Examine floating and rooted plants, and look at the fragments that are floating near shore. Polarized sunglasses may help you see submersed plants. Carry a rake or garden weeder to help pull plants to you. If you have a double-sided sampling rake (weed rake, weed anchor), you can throw it out into deeper water and drag it in slowly to gather plants from deeper water or less accessible areas.

A small boat may be helpful to travel to some search locations, but is not required to perform a useful search. A canoe or kayak may provide best maneuverability in shallow water. You should always use appropriate safety equipment.

### Collect and sort samples

When you are gathering plants, if any of the plants or plant fragments are unfamiliar or suspicious, put the plants into a plastic bag. Put a number on a piece of paper in the bag (ink may run; consider a pencil or a sharpie) and put that number on your map of the lake. That number will show the location where you collected those samples. If you have a GPS, put either the coordinates or the waypoint of the collection location on the paper that you put into the resealable bag. Label the map with the date and time. If you have different plants, use more bags. When you are done, draw a line on the map to show the area that you covered in your search, and make sure all the numbers for the collected plants are on the map.



*Robynn Shannon searching- J. Andersen*

### Identify and / or photograph

Rinse the plants in water to clean mud and algae off so that the leaves and stems are visible. Use one or more of the reference guidebooks to identify the plants that you collected. If you are not sure, or if you want your assessment confirmed, take a photograph. Identification of aquatic plants can be tricky, and many invasive aquatic plants have similar “look alike” native plants. A photograph of the samples is very helpful. See the section on sample photography for tips on making good aquatic plant photographs.

If the samples might be invasive plants, put the plant in a plastic bag with a damp paper towel and put it in the refrigerator. If the plant is too wet it may rot. You may also freeze the sample. Make sure it’s well labeled and clear that this plant is not to be consumed!

### Make a voucher specimen (optional)

Plants vary from location to location, and aquatic plants are especially “plastic” or variable in appearance. Making a voucher specimen may allow future scientists to look at the shape or even the DNA of your plants. If you have a plant press and patience, you can dry your plant and preserve it. The proper use of a plant press is beyond the scope of this protocol. If you are experienced at pressing plants and making plant specimens, please consider doing so for any aquatic plants that you collect.

### Fill out the report form

Remember, if it’s not reported, it is as if the survey didn’t happen. Get credit for your work! Fill out a report of the search area even if you didn’t find an invasive because it is good to know that nothing was found.

## Survey equipment

### Usual equipment

Map of the lake and pencil or pen or sharpie

Gallon size plastic resealable or locking bags

Pieces of paper to record numbers and stick in the bags with the plants

Weeding tool or cultivating fork

You might find that it's easier to carry all this in a bucket.

Consider wearing water shoes or waterproof boots if you will wade. Also consider gloves if you may encounter broken glass, rough stones, or sharp mussel shells.

GPS – optional – for marking locations

Polarized sunglasses – optional - may help see into the water



### Special equipment (optional)

#### Sampling rake – aka weed rake

This tool can reach plants in deeper water. While you might be able to buy one, it's easy to make. The double tines mean that it won't matter which side lands down in the water.

- Get two ordinary garden rakes.
- Remove or cut off the handles at the metal.
- Zip tie the handles and tines together back to back
- Duct tape the two handles for more comfort.
- Attach 10 meters of rope to the handle.

To do a rake toss sample, just toss the rake. Secure the free end of the rope, swing the rake and let its weight carry it out into the water. Let it sink and then pull it towards you with a steady motion. Take the plants off the tines carefully and separate them. The tines are sharp so be careful.



*Weed rake - J. Andersen*

#### Hand lens

A hand lens or magnifying glass may help identify species.



#### Kayak or canoe

Optional but useful for getting around to different areas of the shore or out among floating plants.

## How to photograph aquatic plants

### Equipment

- Digital camera
- Clean water
- Shallow clear or white container. If using a clear container, have a white background, towel, or paper under the container
- Plastic ruler for scale – or a coin. Many plants look similar and size can help identify the plant.

### Pose the plant

Take several photos. Take one of the whole plant, and then one of flowers, seeds, and a close-up of leaves.

Take a photo of the plant in the lake if it gives a good idea of the setting – whether emergent, floating, or submersed. Then take more photos of the plant when you get away from the lake. Take an overall photo, then ones that zoom in on leaves, flowers, and seeds.



*Brazilian elodea- J. Andersen*



*Native Nuphar with ruler- J. Andersen*



*EWM in and out of water - C. Doyle, SOL*

Take a photo on a light background, such as a plain white paper towel. Avoid patterned backgrounds.

Submersed plants with fine or limp leaves look very different in and out of water, so it's good to take a photo of them in water if you can. If it's clearer out of water, take one that way too.

## Photograph the plant as a whole and the details

- Select a representative portion of the plant. Include identifying portions, including leaves, flowers, and roots
- Place plant in a container of water, and use multiple changes of water if necessary to clean off sediment and algae. Try to collect a sample that is free of algae if possible
- Place plant in a small amount of water in a white container or a clear container over white paper
- Float the plant in the water and spread it out for visibility
- Include a ruler or coin for scale
- Take the photo in a well-lit setting but not in direct sunlight. Typically, a flash does not work because it reflects off the water.
- Consider using the macro setting for close-ups of features
- If the leaves are whorled or hard to see in the photo, cut a cross section of the stem and lay the leaves out flat. See pictures for examples.
- Take multiple photos until you feel you have the “character” of the plant and its details
- If you numbered the location on the map, include the number in the photo
- Consider changing the photo file name to add lake name and sample number



EWM - C. Doyle, SOL



## Reporting

Detail - Curly-leaf turion -  
C. Doyle



Curly-leaf pondweed with pencil - C. Doyle

Scan and email or send in the map of the lake and the AIS survey form. Submit the forms even if you didn't find any suspicious plants to document where and when an area was searched.

Reports will get in faster if you can scan the forms. Then email both the scans and the photos to Scott Kishbaugh: [scott.kishbaugh@dec.ny.gov](mailto:scott.kishbaugh@dec.ny.gov) Some photos are very large, so you may need to email photos in batches.

If you can't scan the map and form, email the photos and then send the paper documents to:

Scott Kishbaugh, Plant Survey  
NYSDEC Division of Water  
625 Broadway, 4th Floor  
Albany, NY 12233-3502

Some PRISMs may prefer you to send the information directly to them. Check the PRISM information at the end of this document.

If you are a CSLAP volunteer who enters CSLAP data online, you can also fill out this AIS survey form online at the same site. You still have to email photographs, however.

## What happens next?

Finding a potentially invasive plant is just the first step. Experts will review the photographs. Three things could happen.

- It could be identified as a known plant, but not an invasive, and not of concern. That's the most likely result, and it's a great thing. It means someone's looked, and a problem plant wasn't found. Never be concerned about sending in a "false alarm". It's really great to be able to tell someone good news.
- It could be identified as an invasive plant. The first thing that the expert will do is see if that invasive species has been previously reported in the lake. In that case, the sample is a valuable confirmation that the prior identification was correct and may indicate its spread. Alternatively, this may be a new report. In that case, someone is most likely to want to visit to look at the plant in the lake, collect some samples, and perhaps to determine the extent of the infestation. While finding new invasives isn't good news, it's the purpose of this protocol.
- The plant identification could be inconclusive. Many invasive plants look a lot like native plants, even if they behave very differently. In this case, depending on the circumstance, you may be asked to send in more photographs, or a plant sample, or someone may ask to visit your site.

## Report Form

The AIS report form is on the next page. Early detection gives the best chance for control of an invasive. A report that no invasives were found is important data.

Participants in NYS CSLAP program can also enter their results through the online data collection process that they can use for CSLAP data.

## AIS Survey Report Form

Surveyor Information			
Names of participants:			Date:
Contact Email:		Contact Phone:	
Are search area and collection numbers marked on map? <input type="checkbox"/> Yes <input type="checkbox"/> No		Total people hours:	
Monitoring Location			
Lake Name:		County:	
How was this survey conducted? Mark all that apply			
<input type="checkbox"/> Walking <input type="checkbox"/> Boating			
Where did you look? Mark on map and check all that apply:			
<input type="checkbox"/> Boat Launch <input type="checkbox"/> Public access or road <input type="checkbox"/> Shoreline <input type="checkbox"/> Inflow <input type="checkbox"/> Outflow <input type="checkbox"/> Dock <input type="checkbox"/> Weedbed			
<input type="checkbox"/> Other:			
Were you looking for a specific species (for example, hydrilla hunt)? If so, what?			
What did you find? Fill in the information below for each different item collected			
<input type="checkbox"/> Check this box if no invasives were found during the survey. Else fill in items below If an invasive is known to be present in your lake, and you are sure of the identification, a photo is not needed			
Species found (or unknown)	Describe location	Specimen #	Comments (eg: habitat, depth, rooted or floating, density)
Email photos and, if possible, scan forms and send both to: <a href="mailto:scott.kishbaugh@dec.ny.gov">scott.kishbaugh@dec.ny.gov</a> Or, send the paper forms to: Scott Kishbaugh, NYSDEC Division of Water, 625 Broadway, 4th Floor, Albany, NY 12233-3502			

## Key Invasive Plants in NYS

NYS DEC has identified three invasive plants as key search targets for volunteers. The three are Eurasian watermilfoil, hydrilla, and water chestnut. Eurasian watermilfoil is considered one of the most widespread invasive plants in New York, and we probably do not know the full extent of its presence. Knowing its extent in NYS lakes is an indicator of the potential for dispersal of other invasives. Hydrilla is one of the newer and more significant invasives in New York State, although it has severely affected other parts of the US. Finding early infestations of hydrilla may help to limit its negative impact in NY. Water chestnut is a key plant because it is easy to identify and, when found early, can be successfully controlled by volunteers. If not controlled, water chestnut can greatly change the ecosystem.

### Eurasian watermilfoil (EWM)

Eurasian watermilfoil (*Myriophyllum spicatum*) is extremely adaptable and will thrive in a wide range of environmental conditions. A submersed plant, EWM grows in water up to 10 meters deep (33 feet). At the surface, it can form a dense canopy and send up flower spikes. EWM survives under ice and so it can be visible early in the season.



Eurasian watermilfoil has finely dissected feather-like leaves. The leaves are arranged in whorls of 4 (rarely 5) around the stem at each node. A common identifier is the blunt edge of the leaflets, as if it was snipped straight across with a scissors. Each Eurasian watermilfoil leaf generally has 12 or more leaflet pairs, although this number can vary.

The growing stem tips of Eurasian

watermilfoil are tassel-like and often red, especially early in the growing season.



EWM - NYS DEC



EWM canopy on surface - Robert L. Johnson

Tiny pinkish flowers occur on reddish spikes that stand several inches above the water. The inflorescence ("pipe cleaner") is a definitive identifier, but it is seen only when the plants are flowering.

A photo of EWM that include a whorl of leaves cut from the stem will be very helpful for identification.



## Hydrilla

Hydrilla (*Hydrilla verticillata*), also commonly called water thyme, is a submersed plant which roots on the lake bottom. The long stems branch when they reach the surface and form dense mats.

Hydrilla has pointed, bright green leaves about 5/8 inches long. The leaves grow in whorls of 3 - 10 along the stem, 5 being most common.



The margins of the leaves are serrated (toothed). If the serrations are visible to the naked eye, it is very likely to be hydrilla. The hydrilla serrations will always be visible with a hand lens.



Hydrilla - Jon Reis for NYSFOLA

Hydrilla - Jon Reis for NYSFOLA

When it flowers, thin stalks from the stem end in a single, small, floating white flower at the water's surface. Not all plants will flower.



Hydrilla - Jon Reis for NYSFOLA

A key identifying feature is the presence of small (up to half inch long), dull-white to yellowish, potato-like tubers which grow 2 to 12 inches below the surface of the sediment at the ends of white rhizomes or underground stems. These tubers form at the end of the growing season and store food to allow Hydrilla to overwinter. Since tubers are in the sediment, they may not be seen in plant fragments that are found along the shore or pulled up by a rake.



Hydrilla: Jon Reis for NYSFOLA

## Water chestnut



Water chestnut (*Trapa natans*) is a rooted, aquatic plant with both floating and submersed leaves. The floating leaves form a rosette which is its most recognizable feature. The floating leaves are green, glossy and triangular with toothed edges. The submersed leaves are feathery, and are found whorled around the stem. Plant stems are cord-like and can attain lengths of up to 16 feet.

Water chestnut is an annual plant, and so relies on a seed bank to grow each year. The seeds, called nuts or nutlets, are produced starting in July. These nuts have sharp, spiny protrusions which help transport and

distribute the seeds. Nutlets can attach to waterfowl and deer. The sharp nutlets can also injure people and pets.

The goal is to find the plants and harvest them before the nutlets drop in August. Once the seeds are produced, they can be viable in the substrates for up to 20 years.

This plant is often found mixed among other floating leaf plants. For that reason, it might not be easy to find in a shore based survey. This plant is less likely to fragment than other aquatic plants, although the nutlets may wash up on the shore, since they also disperse by floating before they settle to the sediment.



*Water chestnut nutlets*



Our floating leaf plants generally have smooth edges, so the key is to look for a rosette or a floating plant with jagged edges.



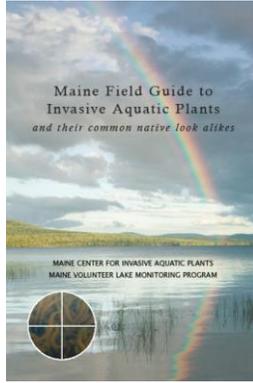
*Water chestnut with natives - C. Doyle*

## Recommended references

NYS DEC identifies common aquatic invasive species at this website:

<http://www.dec.ny.gov/animals/50272.html>

### Maine Field Guide to Invasive Aquatic Plants



Maine's Vounteer Lake Monitoring Program has a good set of resources on their monitoring page, including some plant identification pages.

<http://www.mainevlmp.org/volunteer-info/invasive-plant-monitors/ipp-resources/>

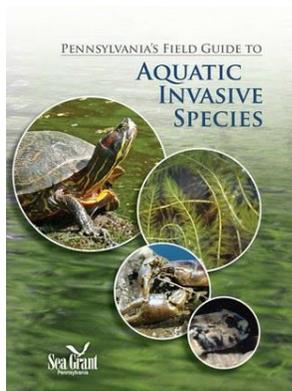
Maine Field Guide to Invasive Aquatic Plants has invasive plants and their native "look alikes", and is available for free download:

<http://mainevolunteerlakemonitors.org/mciap/FieldGuide.pdf>

### Connecticut's Aquatic and Wetland Invasive Plant Identification Guide

This online reference has a **description** of the invasive plants and shows the counties in Connecticut in which they were discovered. It's useful and scary to see what's so close to us. Find it here:

<http://1.usa.gov/1grrqdg>



### Pennsylvania's Field Guide to Aquatic Invasive Species

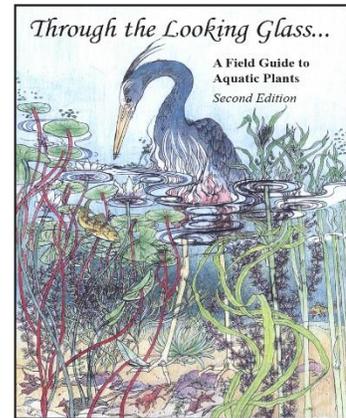
This field guide is available for an online download for free, and contains information about aquatic and wetland plants, fish, algae, invertebrates, and reptiles, how to distinguish the invasive from native species, and maps of where they are found in Pennsylvania.

This is the link for the download:

[http://anstaskforce.gov/Documents/AIS\\_Field\\_Guide\\_Finalweb.pdf](http://anstaskforce.gov/Documents/AIS_Field_Guide_Finalweb.pdf)

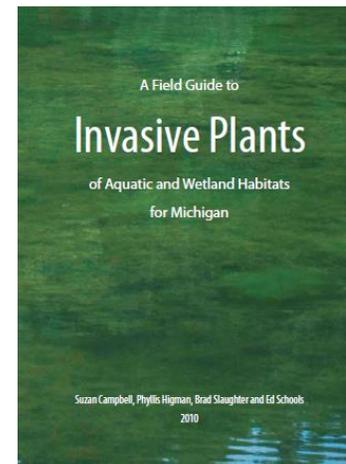
## Through the Looking Glass

The second edition is revised and has an expanded discussion of aquatic invasive species. Most of these are described under a section called Similar Species to point out key differences between native species and similar looking non-native plants with the potential for invasive growth. This book can be purchased from NYS FOLA at PO Box 84, LaFayette, NY 13084, (800)-796-3651, at the NYS FOLA website [www.nysfola.org](http://www.nysfola.org), or at this link: <http://www.uwsp.edu/cnr-ap/UWEXLAKES/Pages/resources/bookstore/TTLG.aspx>



## A Field Guide to Invasive Plants of Aquatic and Wetland Habitats for Michigan

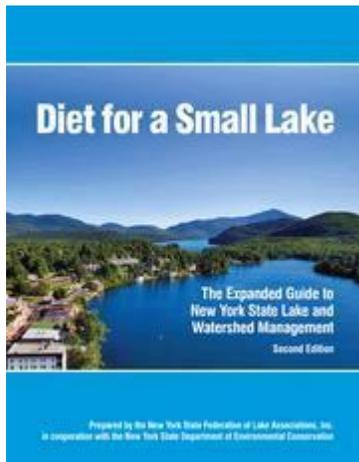
This field guide includes photos and descriptions of 47 invasive plant species. A downloadable pdf of this guide is available at <http://mnfi.anr.msu.edu/invasive-species/AquaticsFieldGuide.pdf>



## APIS

The Army Corps of Engineers has a website that provides the Aquatic Plant Identification System (APIS). Find help with plant identification at this site: <http://el.ercd.usace.army.mil/apis/IDSystem/idsystemintro.aspx>

## Diet for a Small Lake



This book contains much more than aquatic invasive species information, but no list of favorite lake references would be complete without it. The go to lake reference book in New York State – and beyond.

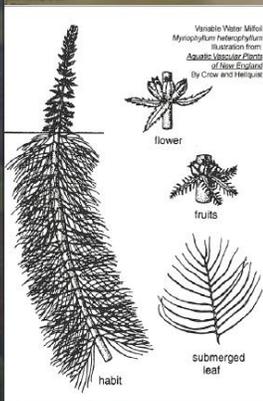
Hardcopy versions of the book are available from NYS FOLA at their website [www.nysfola.org](http://www.nysfola.org) or by contacting NYS FOLA, PO Box 84, LaFayette, NY 13084, (800)-796-3651

## Quick Plant Reference

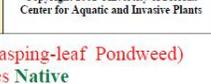
Many aquatic invasive plants present threats. It's good to know their general appearances and to be on the lookout for them. While the three top species of concern in NYS were described earlier, we want to know if you find anything else that looks suspicious. If in doubt, send in photos!

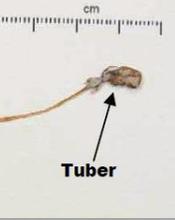
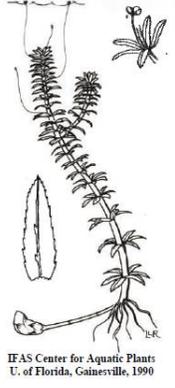
This set of “most unwanted” plants was developed by Ryan Burton of Maine Department of Environmental Protection for Maine’s Courtesy Boat Inspectors.

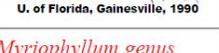
<http://www.mainevlmp.org/volunteer-info/invasive-plant-monitors/ipp-resources/>

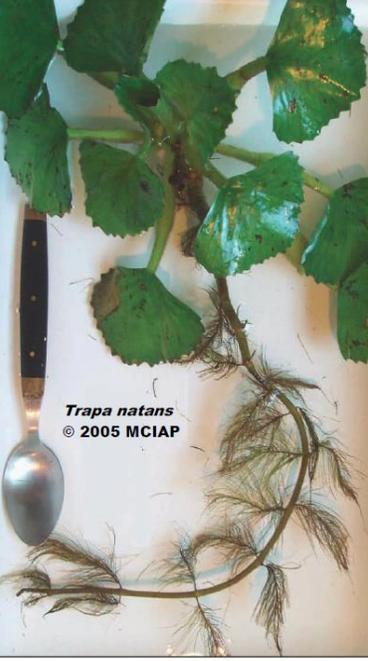
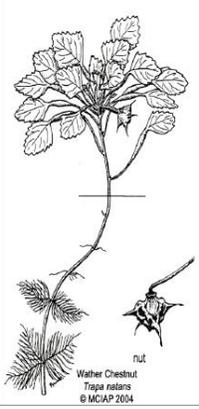
<p><b>Variable Water-milfoil</b> <i>Myriophyllum heterophyllum</i></p>	<p><b>Invasive</b></p>
	 <p>Photo by Ann Murray University of Florida / IFAS Used with permission</p>  <p>Variable Water Milfoil <i>Myriophyllum heterophyllum</i> Illustration from <i>Aquatic Invasive Plants of New England</i> by Crow and Helquist</p> <p>Variable Water Milfoil <i>Myriophyllum heterophyllum</i> By Roberta Hill © 2004 MCIAP</p>
<p><b>Look Alikes:</b> <i>Utricularia</i> sp. (Bladderwort) <b>Native</b>  <i>Ceratophyllum demersum</i> (Coontail) <b>Native</b>            Other <i>Myriophyllum</i> species</p>	

<p><b>Eurasian Water-milfoil</b> <i>Myriophyllum spicatum</i></p>	<p><b>Invasive</b></p>
	 <p>Eurasian Water Milfoil <i>Myriophyllum spicatum</i> Collected and photographed by Don Cameron © 2004 MCIAP</p> <p>Photo Courtesy New Hampshire DES</p>  <p>IFAS Center for Aquatic Plants University of Florida, Gainesville, 1990</p>
<p><b>Look Alikes:</b> <i>Utricularia</i> sp. (Bladderwort) <b>Native</b>  <i>Ceratophyllum demersum</i> (Coontail) <b>Native</b>            Other <i>Myriophyllum</i> species</p>	

<p><b>Curly-leaved Pondweed</b> <i>Potamogeton crispus</i></p>	<p><b>Invasive</b></p>
<p>Photos by Maine DEP Invasive Species Program</p>	
	 <p><b>Turion</b></p>
	 <p>Copyright 2001 University of Florida Center for Aquatic and Invasive Plants</p>
<p><b>Look Alikes:</b> <i>Potamogeton richardsonii</i> (Clasping-leaf Pondweed) <b>Invasive</b> and other <i>Potamogeton</i> species <b>Native</b></p>	

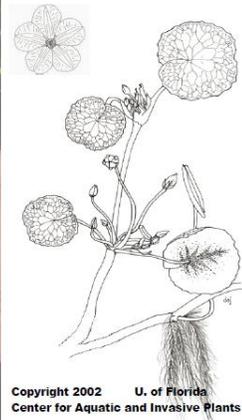
<p><b>Hydrilla</b> <i>Hydrilla verticillata</i></p>	<p><b>Invasive</b></p>
<p>Photos by Don Cameron</p>	
	 <p><b>Tuber</b></p>
	 <p>IFAS Center for Aquatic Plants U. of Florida, Gainesville, 1990</p>
<p><b>Look Alikes:</b> <i>Egeria densa</i> (Brazilian Elodea) <b>Invasive</b> <i>Elodea canadensis</i> (American Waterweed) <b>Native</b></p>	

<p><b>Parrot Feather</b> <i>Myriophyllum aquaticum</i></p>	<p><b>Invasive</b></p>
<p>Photo by Vic Ramey University of Florida / IFAS Used with permission</p> 	<p>Photo by Don Cameron</p> 
	 <p>IFAS, Center for Aquatic Plants U. of Florida, Gainesville, 1990</p>
<p><b>Look Alikes:</b> Other members of the <i>Myriophyllum</i> genus</p>	

<p><b>Water Chestnut</b> <i>Trapa natans</i></p>	<p><b>Invasive</b></p>
 <p><i>Trapa natans</i> © 2005 MCIAP</p>	<p>Photo by Vic Ramey University of Florida / IFAS Used with permission</p> 
 <p>nut Water Chestnut <i>Trapa natans</i> © MCIAP 2004</p>	
<p><b>Look Alikes:</b> None</p>	

**Yellow Floating Heart**  
*Nymphoides peltata*

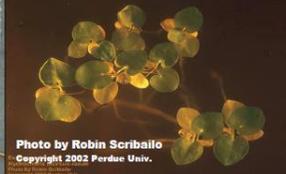
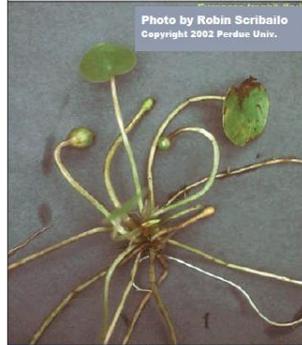
**Invasive**



**Look Alikes:** *Nuphar variegata* (Spatterdock) **Native**  
*Hydrocharis morsus-ranae* (European Frogbit) **Invasive**  
*Nuphar microphylla* (Yellow Waterlily) **Native**

**European Frogbit**  
*Hydrocharis morsus-ranae*

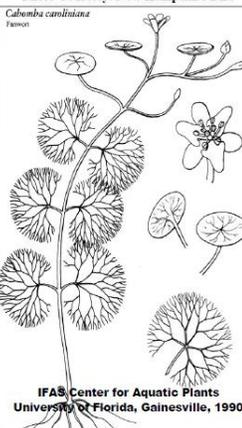
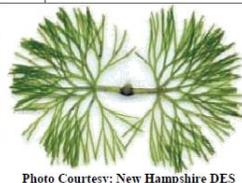
**Invasive**



**Look Alikes:** *Nymphoides Cordata* (Little Floating Heart) **Native**  
*Nymphoides peltata* (Yellow Floating Heart) **Invasive**  
*Nuphar microphylla* (Yellow Waterlily) **Native**

**Fanwort**  
*Cabomba caroliniana*

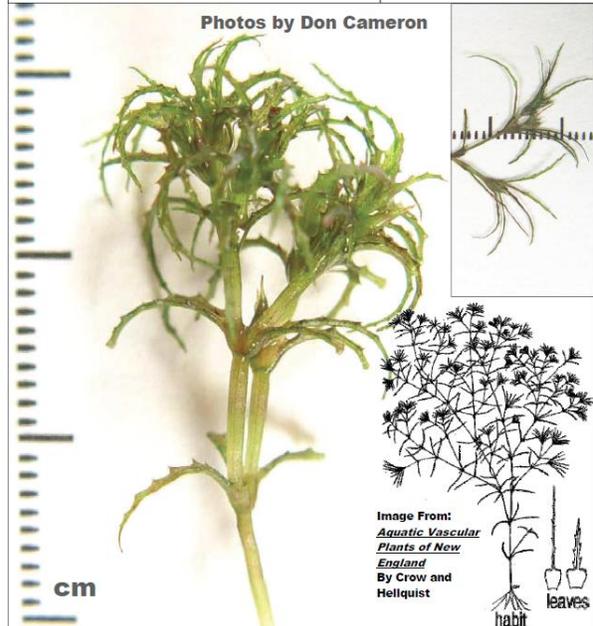
**Invasive**



**Look Alikes:** *Bidens beckii* (Water Marigold) **Native**  
*Ranunculus flabellaris* (Yellow Water Crowfoot) **Native**  
*Utricularia* sp. (Bladderwort) **Native**

**European Naiad**  
*Najas minor*

**Invasive**



**Look Alikes:** *Najas flexilis* (Slender Naiad) **Native**  
Other *Najas* species **Native**

**Water Hyacinth**  
*Eichhorn crassipes*

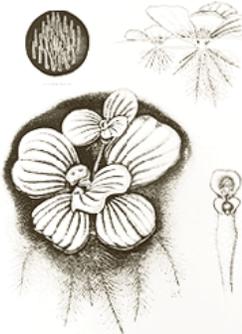
**Invasive**



Look Alikes: none

**Water Lettuce**  
*Pistia stratiotes*

**Invasive**



Look Alikes: none

**Starry Stonewort**  
*Nitellopsis obtusa*

**Invasive**



Look Alikes: *Nitella* (*Nitella* spp.) Native  
*Muskgrass* (*Chara* spp.) Native

**Water Primrose**  
*Ludwigia peploides*

**Invasive**



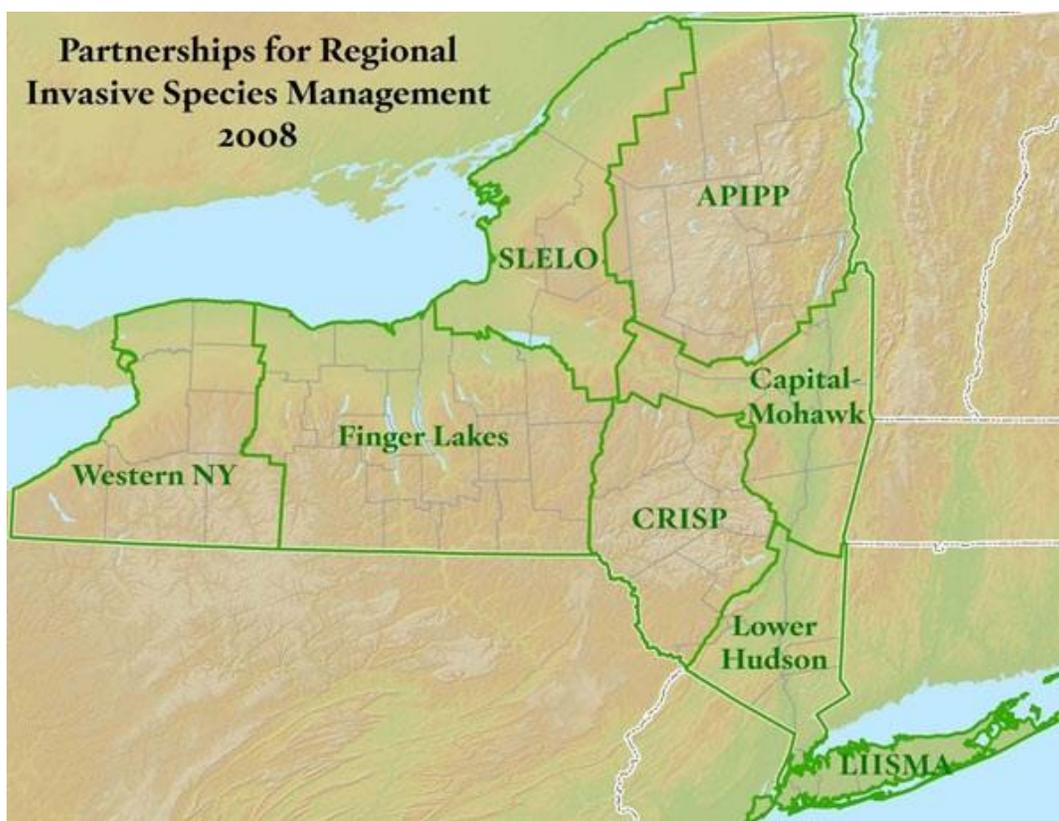
Look Alikes: other water primrose species Native

<p><b>Brazilian Elodea</b> <i>Egeria densa</i></p>	<p><b>Invasive</b></p>
 <p>Photo by Maine DEP Invasive Species Program</p>	 <p>Photo Courtesy NH DES</p>  <p>IFAS Center for Aquatic Plants University of Florida, Gainesville, 1999</p>
<p><b>Look Alikes:</b> <i>Hydrilla verticillata</i> (Hydrilla) <b>Invasive</b> <i>Elodea canadensis</i> (American Waterweed) <b>Native</b></p>	

## Acknowledgements.

Photos, approaches, and ideas came from many sources. Thanks in particular to Scott Kishbaugh of NYSDEC, Robynn Shannon of NEAPMS, and Chris Doyle of SOLitude, formerly ABI. The websites and approaches of Maine Volunteer Lake Monitoring Program, Maine's Courtesy Boat Program, and the State of Wisconsin – Department of Natural Resources, Wisconsin Lakes Partnership were also a source of ideas, inspiration, and photos.

## NYS PRISMS



<b>NYS Partnerships for Regional Invasive Species Management</b>			
<b>APIPP (Adirondack Park Invasive Plant Program)</b>			
Contact:	Brendan Quirion	518-576-2082	<a href="mailto:bquirion@TNC.ORG">bquirion@TNC.ORG</a>
<b>Capital Mohawk PRISM</b>			
Contact:	Laurel Gailor	518-623-3291	<a href="mailto:lrg6@cornell.edu">lrg6@cornell.edu</a>
<b>CRISP (Catskill Regional Invasive Species Partnership)</b>			
Contact:	Molly Marquand	845-586-2611	<a href="mailto:mmarquand@catskillcenter.org">mmarquand@catskillcenter.org</a>
<b>Finger Lakes PRISM</b>			
Contact:	Hilary Mosher	315-781-4385	<a href="mailto:mosher@hws.edu">mosher@hws.edu</a>
<b>LIISMA (Long Island Invasive Species Management Area)</b>			
Contact:	Steve Young	518-402-8951	<a href="mailto:steve.young@dec.ny.gov">steve.young@dec.ny.gov</a>
<b>Lower Hudson PRISM</b>			
Contact:	Linda Rohleder	201-512-9348	<a href="mailto:LRohleder@NYNJTC.ORG">LRohleder@NYNJTC.ORG</a>
<b>SLELO (St. Lawrence &amp; Eastern Lake Ontario)</b>			
Contact:	Rob Williams	315-387-3600	<a href="mailto:rwilliams@TNC.ORG">rwilliams@TNC.ORG</a>
<b>Western New York PRISM</b>			
Contact:	Andrea Locke	716-878-4708	<a href="mailto:lockeas@buffalostate.edu">lockeas@buffalostate.edu</a>

## APIPP specific directions

APIPP (Adirondack Park Invasive Plant Program) has an active aquatic invasive species program and would prefer any suspected invasive plant photos and the forms and maps to be sent to their offices rather than NYS DEC.

APIPP offers training in invasive species. The training schedule is posted on our website at <http://adkinvasives.com/calendar/trainings-workshops/> In the Adirondack region, people can find what AIS have been reported in their lake at the website: [www.adkinvasives.com](http://www.adkinvasives.com)

The protocol steps and the contact information for lakes in that region are:

1. Collect samples of the plant, including stems, leaves, and flowers if present.
2. Take a high quality photo of the samples and include an object in the photo for scale (e.g. ruler or penny).
3. If possible, please note on a map where you found the plant.
4. Contact APIPP's AIS Project Coordinator (Erin Vennie-Vollrath, [evennie-vollrath@tnc.org](mailto:evennie-vollrath@tnc.org) or 518-576-2082) as soon as possible and submit photos and map upon request.
5. Wrap the collected plant material in a slightly damp paper towel and place in a sealed plastic baggie.
6. Label baggie with the lake/pond name, Town/County name, your contact information, and date.
7. Keep the samples refrigerated until requested by APIPP's AIS Project Coordinator.

Requested samples can be mailed or brought to:

Aquatic Invasive Species Project Coordinator  
Adirondack Park Invasive Plant Program  
c/o Adirondack Chapter of The Nature Conservancy  
P.O. Box 65h  
8 Nature Way  
Keene Valley, NY 12943