

EYES ON THE WATER

*Keeping Invasive Aquatic Plants from the
Ponds & Lakes of the Kezar Lake Watershed*



Eyes on the Water is an educational outreach initiative of the
Kezar Lake Watershed Association (KLWA) & the
Town of Lovell Invasive Plant Prevention Committee (LIPPC).

Help Us Fight Invasive Aquatic Plants!

What Are 'Invasive Aquatic Plants'?

- Invasive aquatic plants are non-native plants that hitchhike from an infested lake or pond on boats & trailers, fishing gear, and wildlife.
- Once introduced, these invasive plants are practically impossible to eradicate. They can spread quickly and form dense mats, doubling or tripling the area of infestation each year.
- Invasive aquatic plants significantly disrupt the natural balance and health of the ecosystem.

Why Should I Care?

- **Managing invasive species is expensive & long-term!** Management involves manual harvesting, the laying of benthic (pond- bottom) barriers, or using herbicides. Treatment is expensive and takes years.
- **Invasive species are in nearby lakes!** As of March 2011, 33 bodies of water in Maine were infested with invasive aquatic plants, including our own Cushman Pond where Variable Watermilfoil was found in 1995. We are lucky those local paddlers had their eyes on the water! Careful professional management since then has kept that infestation to a minimum, with only a few plants found in 2010.
- **There's a local price to pay!** Real estate values for waterfront properties decline when invasive aquatic plants become established. As the values of waterfront properties erode, taxes of off-lake properties will increase. Local businesses and tourism are also negatively impacted.

What Can I Do to Help?

- **Keep your EYES ON THE WATER!** Early detection of invasive aquatic plants is critical!
 - Bring this field guide with you and check suspicious plants. As of 2010, the first five species in this guide had already found their way into Maine's waters. Help us stop the spread!
 - **IF YOU THINK YOU FOUND AN INVASIVE AQUATIC PLANT**, please call the **Maine Center for Invasive Aquatic Plants** at 207-783-7733. If you do not reach a person, call the **Maine Dept of Environmental Protection** at 800-452-1942. Also please call the Lovell Town Office.
 - Report what you find and what you don't find on the **Vital Signs** website, www.vitalsignsme.org. Upload data & photos. Become a citizen scientist!
- **The Courtesy Boat Inspection (CBI) program needs VOLUNTEERS** at public landings. Visual inspection is the most effective tool to prevent the introduction of invasive aquatic plants. Even a few hours twice a season is a big help!
- **SPREAD THE WORD!!** Get involved! Volunteer! Come to a program! Tell your friends and neighbors!!

For more information about *EYES ON THE WATER*, how to volunteer, or what to do if you find an invasive aquatic plant, visit www.lovellmaine.us or www.klwa.us. Or call the Lovell Town office: 207-925-6272. Thank you!!

Hydrilla verticillata

Invasive to Maine

Hydrilla













Freshwater
Ponds, Lakes, Rivers, and Streams

Leaves



Karen Hahnel, DEP

Look for small leaves 5 to 20 mm long that look like knife blades with finely toothed edges. Leaves are arranged in whorls (see leaf chart). Whorls near the top of the stem have 4 to 8 leaves but whorls do not always form at the bottom.

PLANT COMMUNITY	LEAF ARRANGEMENT	LEAF SHAPE	LEAF EDGE
 EMERGENT	 ALTERNATE	 ELLIPTICAL	 FEATHER DIVIDED
 FLOATING LEAF	 OPPOSITE	 BLADE	 TOOTHED
 SUBMERSED	 WHORLED	 OVAL	 SMOOTH

Plant



Karen Hahnel, DEP

Look for a plant growing completely underwater with lots of branches. Hydrilla is found in both shallow and deep water.

Stem



Karen Hahnel, DEP

Look for stems that grow up to 3 m long. Long stems grow toward the water surface where the stems branch and form dense mats.

Seasonal Change



IFAS, Center for Aquatic Plants

In July and August look for flowers that are small and white with 3 petals. They rise above the surface on very thin stems.

Similar Species

Hydrilla can be confused with many of the native waterweeds. All of these species have similar-shaped leaves that form whorls, BUT the native waterweeds have only 3 leaves per whorl. Hydrilla can have up to 8 leaves per whorl.

Fun Fact

Hydrilla can reproduce 4 different ways!: (1) seeds, (2) fragmentation (broken pieces of plant that can make their own plant), (3) storage roots called tubers (like potatoes), and (4) a special bud called a turion that stays alive in winter and in unfavorable conditions.

If you think you found this species, call Maine's
Volunteer Lake Monitoring Program: 207-783-7733 OR Department of
Environmental Protection: 1-800-452-1942

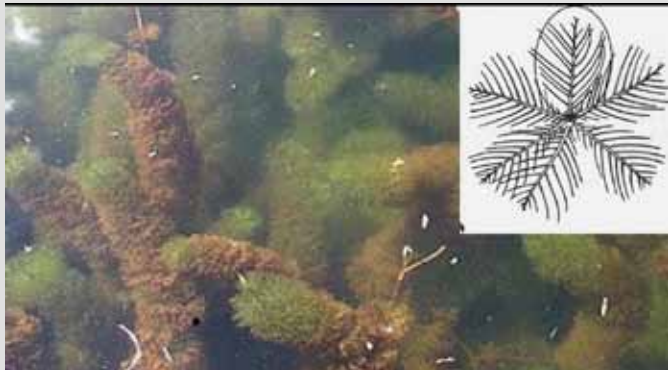
Myriophyllum heterophyllum

Invasive to Maine

Variable Watermilfoil

Freshwater
Ponds and Lakes

Leaves



Leslie J. Mehrhoff UC, www.invasive.org

Look for submerged leaves that are divided like feathers. Each whorl has 4 to 6 feather-divided leaves that are spaced less than 5 mm apart. There are 5 to 14 pairs of thread-like leaflets per leaf (see diagram).

PLANT COMMUNITY	LEAF ARRANGEMENT	LEAF SHAPE	LEAF DIVISION
 EMERGENT	 ALTERNATE	 ELLIPTICAL	 FEATHER DIVIDED
 FLOATING LEAF	 OPPOSITE	 BLADE	 TOOTHED
 SUBMERGED	 WHORLED	 OVAL	 SMOOTH

Plant



Sue Donaldson

Look for a plant with submerged leaves that look like bottle brushes. Variable watermilfoil grows underwater up to 5 m deep with flower spikes emerging from June through August.

Stem



Maine DEP

Look for stems that are often thick and reddish in color.

Seasonal Change



Ann Murray CFAP/Leslie J. Mehrhoff UC

From late June through August look for flowers that are tiny and white. They appear in whorls (see chart above) on spikes that rise above the water.

Similar Species

Variable watermilfoil and 2 native species, Farwell's and Low watermilfoils, have a very small space between the whorls of leaves (less than 5 mm). Variable watermilfoil always forms whorls and has flowers above the surface. The native species do not always form whorls and have underwater flowers.

Fun Fact

Variable watermilfoil grows well in all conditions: still and flowing waters, under ice, at depths of 1 to 5 meters, in mud, silt, sand, and gravel. When lakes dry up, it can even change into a land plant and survive until the water comes back.

If you think you found this species, call Maine's
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Environmental Protection: 1-800-452-1942

Myriophyllum spicatum

Eurasian Watermilfoil,

Invasive to Maine

Freshwater
Ponds and Lakes

Leaves



Vic Ramey, University of Florida

PERMITTED USE

Look for leaves that look like feathers. The feather-divided leaves are in whorls (see leaf chart). There are 3 to 6 whorls on each stem and a 1 to 3 cm space separating each whorl.

PLANT COMMUNITY	LEAF ARRANGEMENT	LEAF SHAPE	LEAF EDGE
EMERGENT	ALTERNATE	ELLIPTICAL	FEATHER DIVIDED
FLOATING LEAF	OPPOSITE	BLADE	FORK DIVIDED
SUBMERSED	WHORLED	OVAL	BRANCH DIVIDED

Plant



Ann Murray, University of Florida

PERMITTED USE

Look for a plant growing completely underwater with lots of feathery branches. Eurasian watermilfoil is most often found in water close 3.5 to 5 m deep.

Stem



Ann Murray, University of Florida

PERMITTED USE

Look for stems with lots of branches. Stems are reddish-brown to pinkish-white and grow up to 3 m in length.

Seasonal Change



Permission by IFAS, Center for Aquatic Plants

PERMITTED USE

In July and August look for flower spikes with whorls (see diagram above) of tiny red flowers rising above the water.

Similar Species

Eurasian watermilfoil has up to 24 pairs of leaflets per leaf! None of our native milfoils have more than 14 pairs of leaflets. If you count more than 14, you have probably found an invasive milfoil. If you count more than 18, you have probably found Eurasian watermilfoil! Best bet, look for flowers!!

Fun Fact

Eurasian watermilfoil - like many aquatic plants - has the incredible ability to grow a whole new plant from tiny pieces that have broken off (fragmentation)! If these tiny pieces get caught in boat propellers, they can easily travel to new places. Not so fun for Maine lakes.

If you think you found this species, call Maine's
Volunteer Lake Monitoring Program: 207-783-7733 OR Department of
Environmental Protection: 1-800-452-1942

Najas minor

European Naiad,

Invasive to Maine

Freshwater
Ponds and Lakes

Leaves



Leslie J. Mehrhoff, www.bugwood.org, Diagram USDA

Look for leaves (2 to 3 cm) that are thin, pointed, and have toothed, spiny edges. The leaf base that wraps around the stem is jagged and square, not round (see "Similar Species"). Leaves can be alternate, opposite, or whorled!

PLANT COMMUNITY	LEAF ARRANGEMENT	LEAF SHAPE	LEAF EDGE
EMERGENT	ALTERNATE	ELLIPTICAL	FEATHER DIVIDED
FLOATING LEAF	OPPOSITE	BLADE	TOOTHED
SUBMERSED	WHORLED	ELONGATE	SMOOTH

Plant



Troy Evans, www.bugwood.org, Diagram USDA

Look for an underwater plant with lots of thin branches and leaves. European naiad is found growing at depths of 15 cm to 2 m.

Stem



Leslie J. Mehrhoff, www.bugwood.org

Look for stems that are thin and flexible. They grow up to 3 m long and have many branches at the upper end of the stem.

Seasonal Change



Hippolyte Coste

From July to August look for green flowers that are as small as a grain of sand, growing in the crevices between the leaves and stem.

Similar Species

With a hand lens or microscope, you can tell invasive European naiad apart from native Slender naiad by looking at the base of the leaves (where they attach to the stem). The European naiad has a jagged, square-shaped leaf base. The Slender naiad has a smooth rounded leaf base.

Fun Fact

The European naiad's stem is easy to break. Because of its fragile stem it is sometimes called the Brittle naiad. It can grow a whole new plant from tiny pieces that break off (fragmentation.) These pieces can get caught on boats and travel to new places. Not so fun for our lakes!

If you think you found this species, call Maine's
Volunteer Lake Monitoring Program: 207-783-7733 OR Department of
Environmental Protection: 1-800-452-1942

Potamogeton crispus

Curly Leaf Pondweed,

Invasive to Maine

Freshwater
Ponds, Lakes, Rivers, and Streams

Leaves



fabelfroh, www.flickr.com



Look for leaves that are long (4 to 10 cm) and thin (1 cm or less) with finely toothed edges, that are also ruffled (like a lasagne noodle). The leaves alternate on the stem.

PLANT COMMUNITY	LEAF ARRANGEMENT	LEAF SHAPE	LEAF EDGE
 EMERGENT	 ALTERNATE	 ELLIPTICAL	 FEATHER DIVIDED
 FLOATING LEAF	 OPPOSITE	 BLADE	 TOOTHED
 SUBMERSED	 WHORLED	 ELONGATE	 SMOOTH

Plant



Vic Ramey, University of Florida



Look for a plant with lots of wavy branches growing mostly underwater. They sometimes form dense mats on the surface when fully grown.

Stem



fabelfroh, www.flickr.com



Look for stems that are long (up to 3 m) and slightly flattened with lots of branches.

Seasonal Change



CFAP, University of Florida



In May and June, look for flowers that are tiny, and tightly bunched on a thin (often curving) stalk that rises above the water.

Similar Species


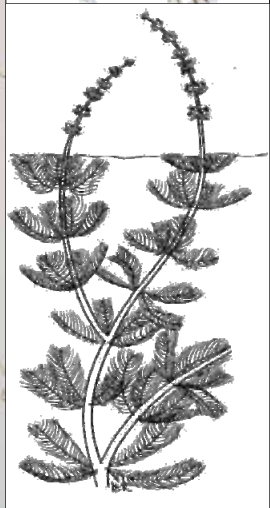
You can tell the leaves of Curly leaf pondweed apart from other species in the pondweed group if you look at them in the light. They look like stained-glass windows (little rectangles inside a border). The toothed, ruffled edges of the leaf also set Curly leaf pondweed apart from others in the pondweed group.

Fun Fact




Curly leaf pondweed sprouts from rhizomes (underground stems) and turions (special buds) in the late fall and grows under the ice throughout the winter. By June Curly leaf pondweed is full grown!


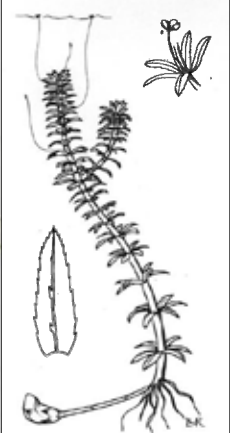

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Volunteer Lake Monitoring Program: 207-783-7733 OR Department of
Environmental Protection: 1-800-452-1942

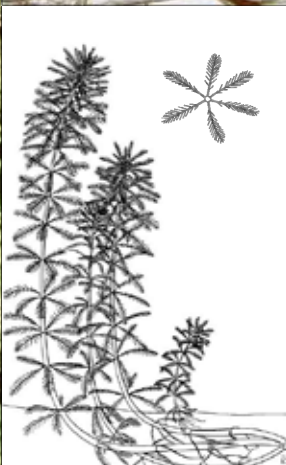
Variable Water-milfoil <i>Myriophyllum heterophyllum</i>	Invasive
 <p style="text-align: center;">Variable Water Milfoil <i>Myriophyllum heterophyllum</i> By Roberta Hill © 2004 MCIAP</p>	 <p style="text-align: center;">Photo by Ann Murray University of Florida / IFAS Used with permission</p>  <p style="text-align: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




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




As of 2008, these four invasive plants have been documented in one or more Maine lakes.



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


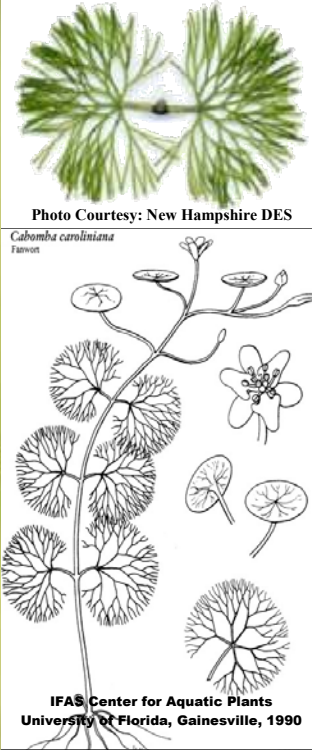
Hydrilla <i>Hydrilla verticillata</i>	Invasive
 <p style="text-align: center;">Tuber</p>	 <p style="text-align: center;">IFAS Center for Aquatic Plants U. of Florida, Gainesville, 1990</p>
Photos by Don Cameron	
	
<p>Look Alikes: <i>Egeria densa</i> (Brazilian Elodea) Invasive <i>Elodea canadensis</i>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


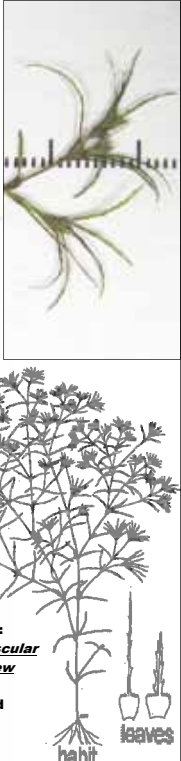
<p>Parrot Feather <i>Myriophyllum aquaticum</i></p>	<p>Invasive</p>
<p>Photo by Vic Ramey University of Florida / IFAS Used with permission</p> 	<p>Photo by Don Cameron</p>   <p>IFAS, Center for Aquatic Plants U. of Florida, Gainesville, 1990</p>
<p>Look Alikes: <i>Other members of the Myriophyllum genus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



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

<p>Yellow Floating Heart <i>Nymphoides peltata</i></p>	<p>Invasive</p>
<p>Photo by Vic Ramey University of Florida / IFAS Used with permission</p> 	<p>Photo by M. Malchoff Lake Champlain Sea Grant / VTDEC</p>   <p>Copyright 2002 U. of Florida Center for Aquatic and Invasive Plants</p>
<p>Look Alikes: <i>Nuphar variegata</i> (Spatterdock) Native <i>Hydrocharis morsus-ranae</i> (European Frogbit) Invasive <i>Nuphar microphylla</i> (Yellow Waterlily) Native</p>	

<p>European Frogbit <i>Hydrocharis morsus-ranae</i></p>	<p>Invasive</p>
<p>Photo by Robin Scribailo Copyright 2002 Perdue Univ.</p>  <p>Photo by M. Malchoff L.C. Sea Grant / VTDEC</p> 	<p>Photo by Robin Scribailo Copyright 2002 Perdue Univ.</p>   <p>Copyright 2002 U. of Florida Center for Aquatic and Invasive Plants</p>
<p>Look Alikes: <i>Nymphoides Cordata</i> (Little Floating Heart) Native <i>Nymphoides peltata</i> (Yellow Floating Heart) Invasive <i>Nuphar microphylla</i> (Yellow Waterlily) Native</p>	

<p>Fanwort <i>Cabomba caroliniana</i></p>	<p>Invasive</p>
 <p>Photo by Maine DEP Invasives Species Program</p>	 <p>Photo Courtesy: New Hampshire DES</p> <p><i>Cabomba caroliniana</i> Fanwort</p> <p>IFAS Center for Aquatic Plants University of Florida, Gainesville, 1990</p>
<p>Look Alikes: <i>Bidens beckii</i> (Water Marigold) Native <i>Ranunculus flabellaris</i> (Yellow Water Crowfoot) Native <i>Utricularia sp.</i> (Bladderwort) Native</p>	

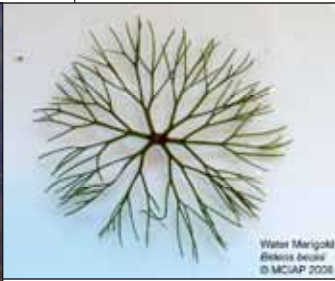
<p>European Naiad <i>Najas minor</i></p>	<p>Invasive</p>
<p>Photos by Don Cameron</p>	
 <p>cm</p>	 <p>Image From: <i>Aquatic Vascular Plants of New England</i> By Crow and Hellquist</p> <p>habit leaves</p>
<p>Look Alikes: <i>Najas flexilis</i> (Slender Naiad) Native Other <i>Najas</i> species Native</p>	

<p>Brazilian Elodea <i>Egeria densa</i></p>	<p>Invasive</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, 1990</p>
<p>Look Alikes: <i>Hydrilla verticillata</i> (Hydrilla) Invasive <i>Elodea canadensis</i> (American Waterweed) Native</p>	

<p>American Waterweed <i>Elodea canadensis</i></p>	<p>Native</p>
 <p><i>Elodea canadensis</i> © MCIAP 2006</p>	 <p>American Water Weed <i>Elodea canadensis</i> By Don Cameron © 2004 MCIAP</p>
<p>From <i>Through the Looking Glass... A Field Guide to Aquatic Plants</i> © 1997</p>	

Water Marigold
Bidens beckii

Native

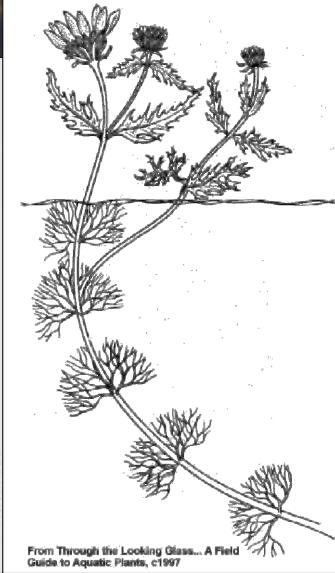


Water Marigold
Bidens beckii
© MCIAP 2008

Photo by Don Cameron



Water Marigold
Bidens beckii
Photo by Don Cameron
© 2004 MCIAP



From *Through the Looking Glass... A Field Guide to Aquatic Plants*, c1997

Yellow Water Crowfoot
Ranunculus flabellaris

Native



Photos by Don Cameron

Coontail
Ceratophyllum demersum

Native



Photo by Vic Ramey
University of Florida / IFAS
Used with permission



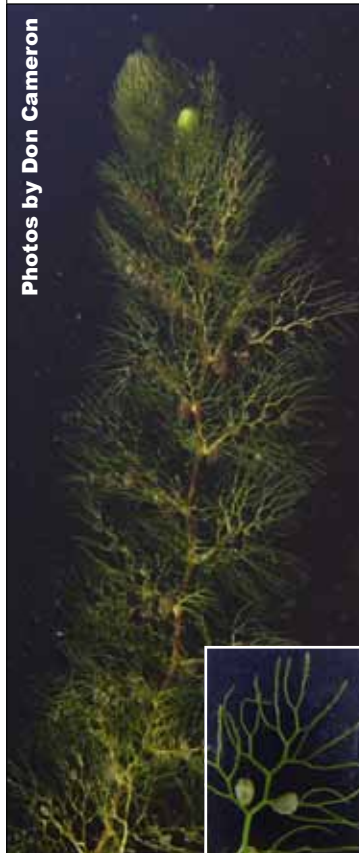
Photo by Ann Murray
University of Florida / IFAS
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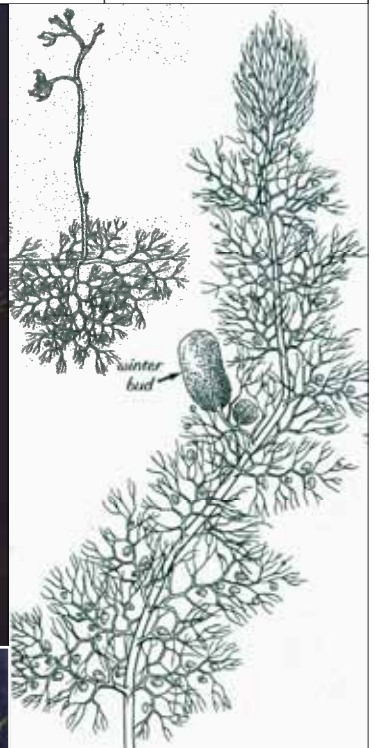
IFAS Center for Aquatic Plants
University of Florida, Gainesville, 1990

Common Bladderwort
Utricularia macrorhiza

Native



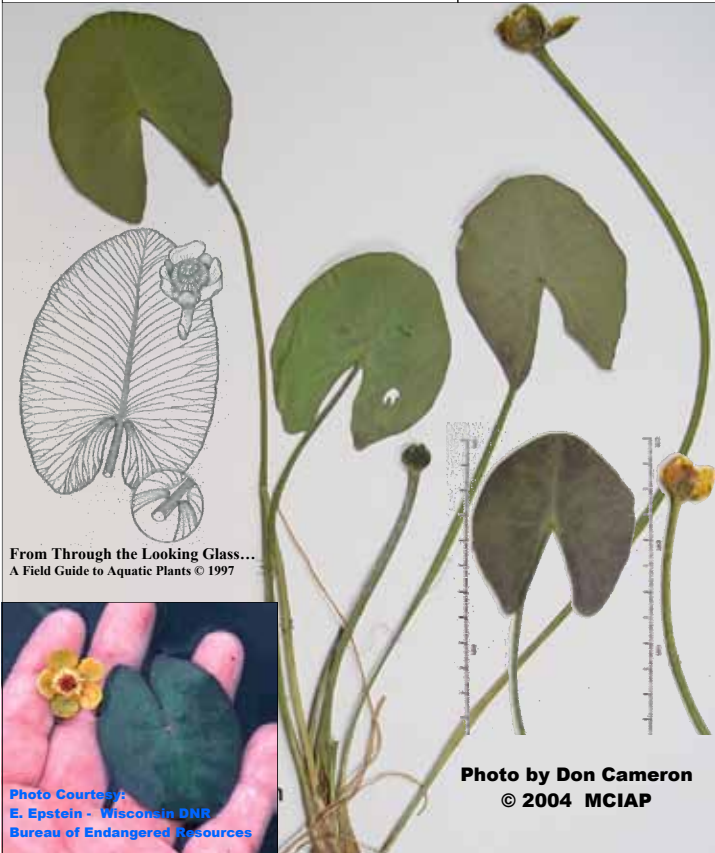
Photos by Don Cameron



From *Through The Looking Glass... A Field Guide to Aquatic Plants* © 1997

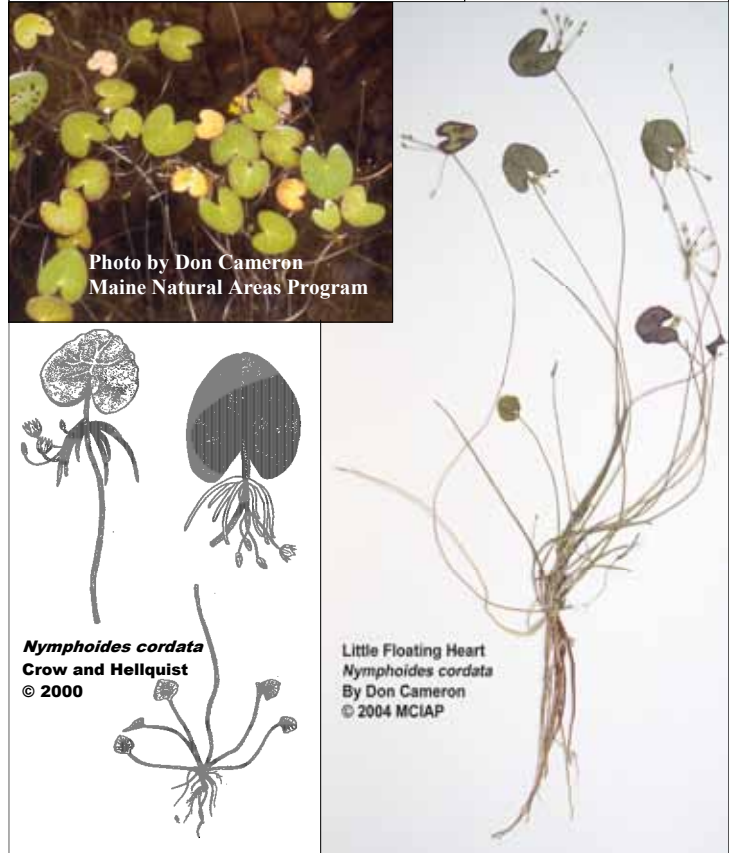
Yellow Waterlily
Nuphar microphylla

Native



Little Floating Heart
Nymphoides cordata

Native



Clasping Leaf Pondweed
Potamogeton richardsonii

Native



Slender Naiad
Najas flexilis

Native

