

A Guide to Selected Invasive Non-native Aquatic Species in Massachusetts

**C. Barre Hellquist
Department of Biology
Massachusetts College of
Liberal Arts
North Adams, Massachusetts 01247**



**James Straub
Massachusetts Department of
Environmental Management
Lakes and Ponds Program
131 Barnum Road, Bldg 3701
Devens, MA 01432**

Non-native species are a problem in many Massachusetts lakes, ponds, and rivers. Once in a water body, many of these organisms can spread aggressively, out-competing and frequently eliminating native species. They reduce the health of our water bodies by disrupting natural ecosystems and altering fish and wildlife habitats. Frequently, they make swimming, boating, and fishing difficult or dangerous. Many plant species produce a dense vegetative cover on lakes, and the large amount of decomposing organic matter accelerates eutrophication in the lake system.

Often, non-native aquatic species spread to new water bodies when they are transferred by boats, motors, bait buckets, fishing tackle and trailers. These infestations can be prevented if everyone remembers to completely clean their boats, motors, fishing equipment and trailers before leaving a site. Dispose of all organisms and drain water from your boat on dry land before leaving a water body.

YOU CAN HELP!!! Learn how to identify these organisms and help prevent their spread throughout Massachusetts. For more information, or to report an infestation, please contact:



**Massachusetts Department of
Environmental Management**
Lakes and Ponds Program
(508) 792-7716 ext 170
www.state.ma.us/dem/



**Massachusetts Department of
Environmental Protection**
Office of Watershed Management
(508) 767-2877
www.state.ma.us/dep/



**Massachusetts Division of Fisheries
and Wildlife**
Natural Heritage and Endangered Species Program
(508) 792-7270 ext. 163
www.state.ma.us/dfwele/dpt_toc.htm



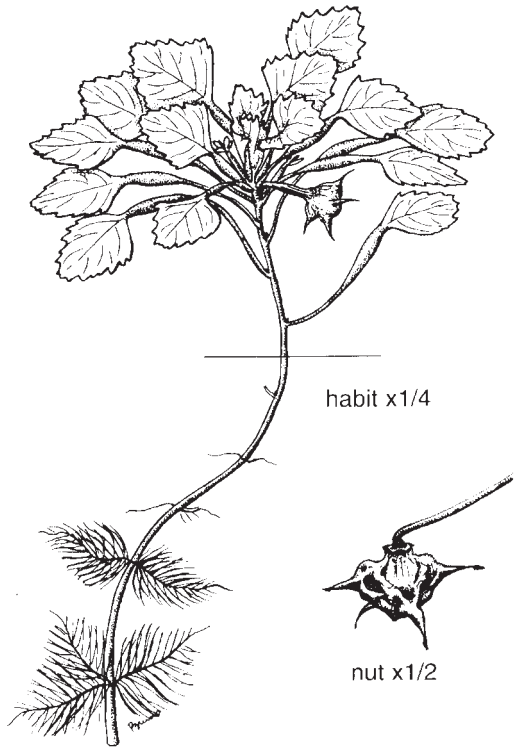
**Massachusetts Congress of Lakes and
Ponds Association (COLAP)**
(508) 429-5085
www.colap.com

WATER CHESTNUT

Trapa natans



Water chestnut is a major nuisance in the Concord River and Charles River systems of eastern Massachusetts, and it appears to be spreading rapidly elsewhere in the State. Large populations have been noted in the Connecticut River, and it has been found in Berkshire County. It is believed that ducks and geese may be the major means of dispersal. Canada geese have been observed with the spiny nuts attached to their feathers.



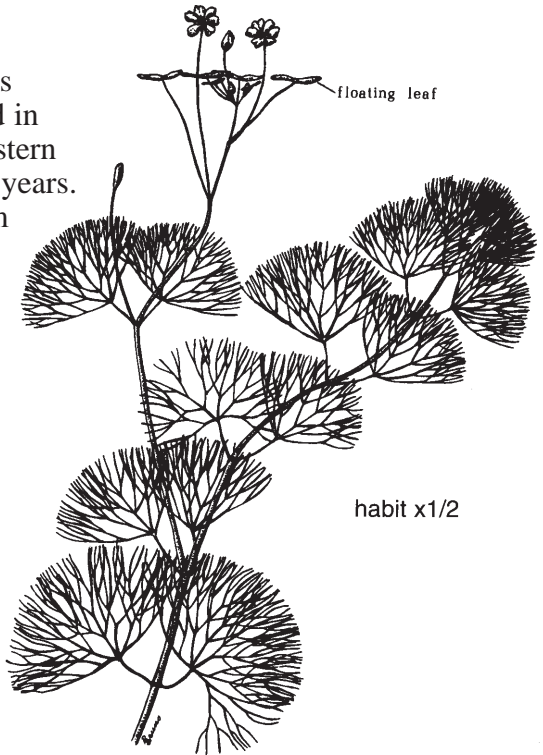
ESTABLISHED

FANWART

Cabamba caroliniana



This southern United States native has been established in the acid water ponds of eastern Massachusetts for over 50 years. The plant is separated from the small white flowers and leaves that arise from a small stem. This gives the leaves a fan-like appearance.



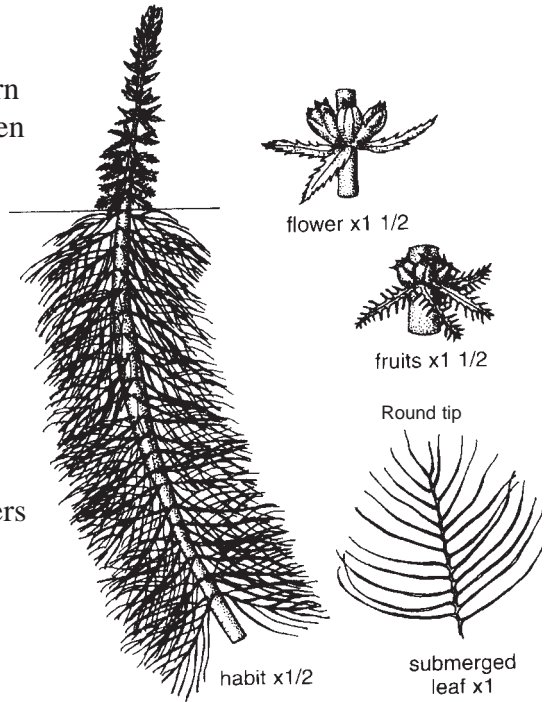
ESTABLISHED

VARIABLE WATERMILFOIL

Myriophyllum heterophyllum



This southern and western U.S. species has long been established in the acidic waters of eastern Massachusetts. This species is identified by the leaf-whorls being located closely together along the stem and with large leaf-like bracts on the emergent stems that are longer than the flowers or fruits.



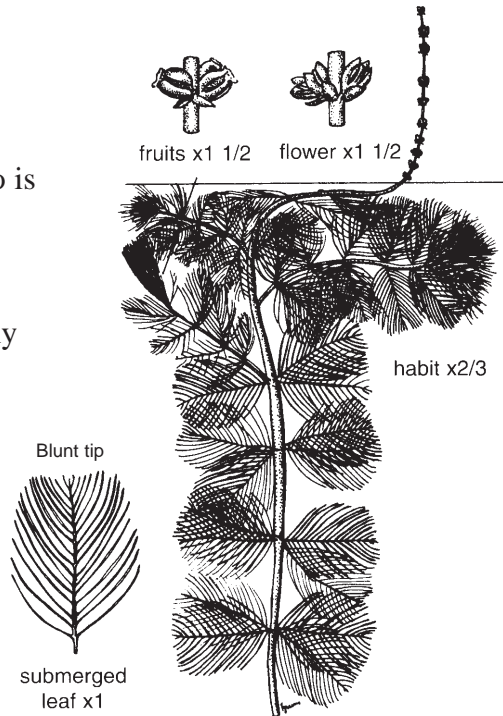
ESTABLISHED

EURASIAN WATERMILFOIL

Myriophyllum spicatum



This Eurasian species is extremely abundant in the alkaline waters of Berkshire County, but also is aggressive in the eastern counties. It is identified by the widely-spaced whorled leaves and the tiny emersed bracts that are much shorter than the flowers and fruit.

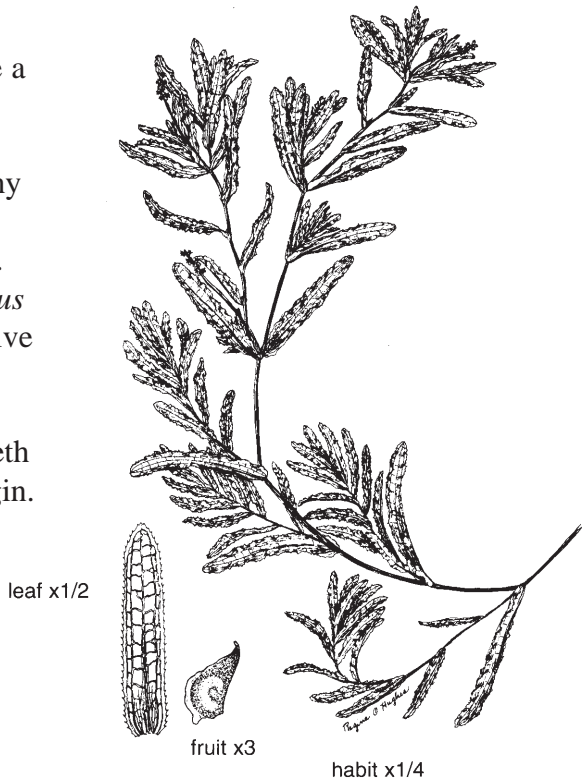


CURLY-LEAVED PONDWEED

Potamogeton crispus



The pondweeds are a very common and diverse group of aquatic plants. Many native species may become a nuisance. *Potamogeton crispus* is the only non-native pondweed and is easily identified by the conspicuous teeth along the leaf margin.



ESTABLISHED

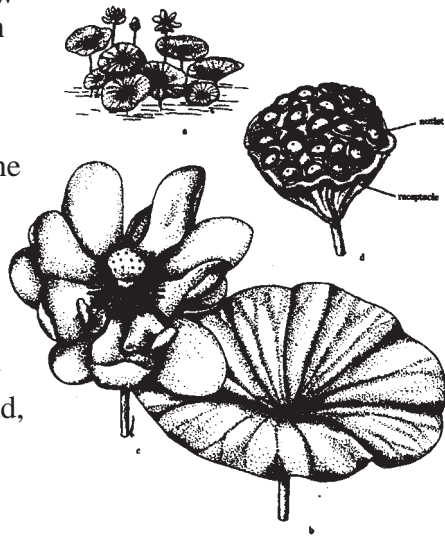
YELLOW WATER LOTUS

Nelumbo lutea



This species is native to New England and often is used in private water gardens.

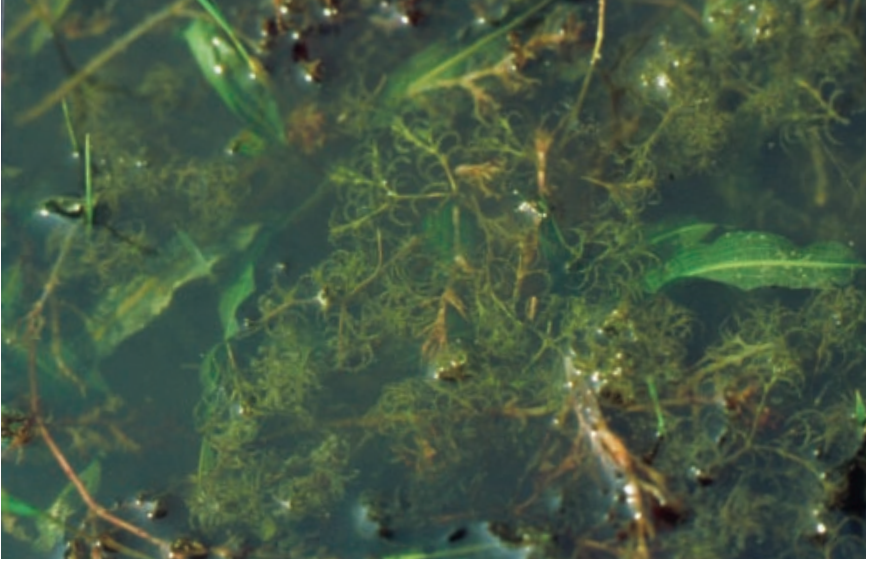
Care should be take not to introduce this species into the environment. These plants reproduce by tuber and seed and can overpopulate shallows of a pond. The Yellow lotus forms large dense mats that are virtually impenetrable. Look for broad, flat leaves floating on the surface with a large, bright yellow flower. The flowers can be 2 to 3 inches wide.



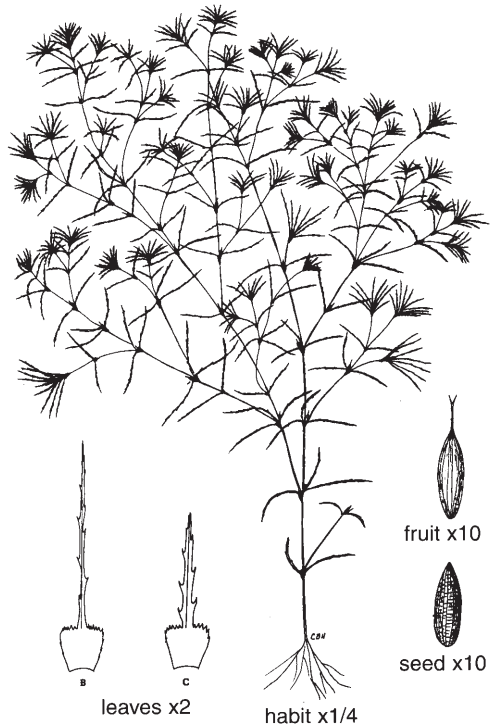
ESTABLISHED

EUROPEAN NAIAD

Najas minor



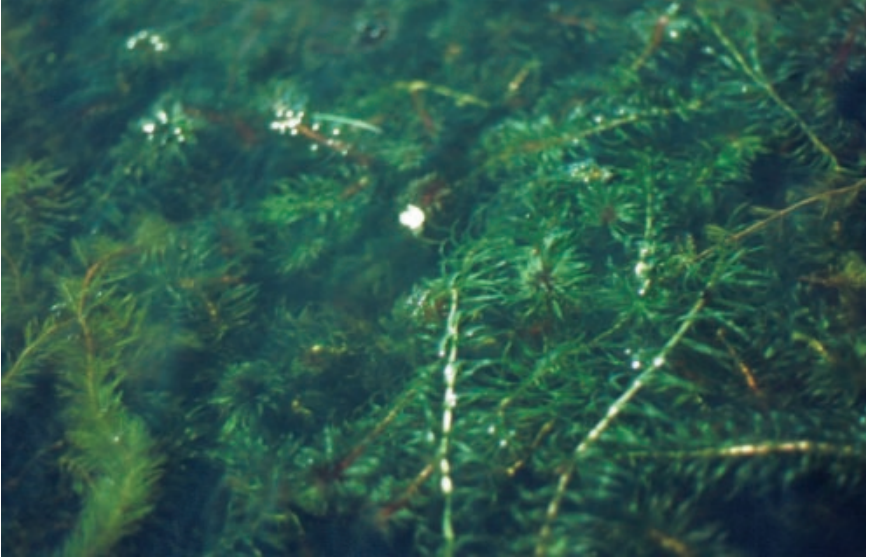
This species is naturalized in some of the alkaline lakes of Berkshire County. It is identified by the lobed leaf bases and the conspicuous leaf serrations. Dense growth can crowd out native vegetation and impede swimming and boating.



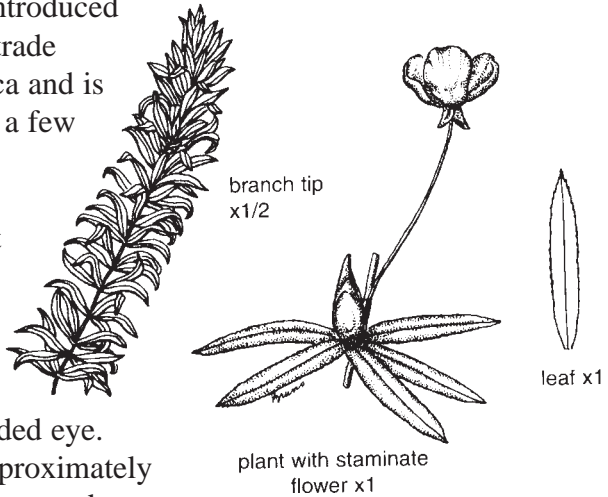
ESTABLISHED

SOUTH AMERICAN WATERWEED

Egeria densa



This species was introduced into the aquarium trade from South America and is now naturalized in a few areas of eastern Massachusetts. It appears as a robust *Elodea canadensis*. The leaves are whorled and the margins appear smooth to the unaided eye. The flowers are approximately 1 inch across as compared to the much smaller *Elodea*.

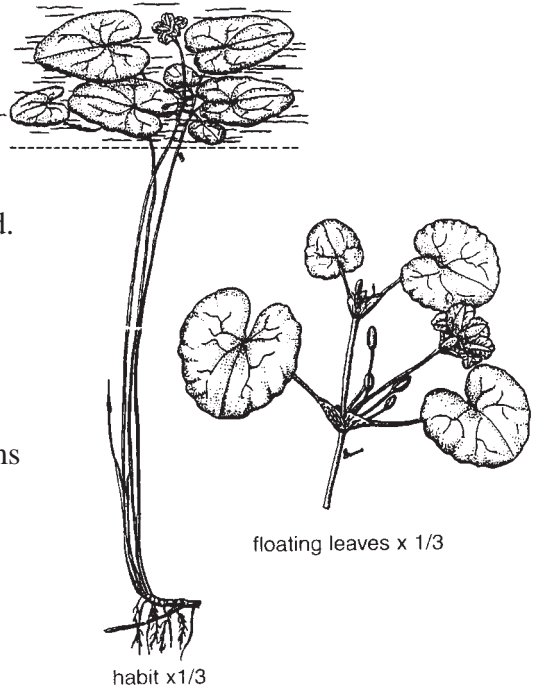


YELLOW FLOATING HEART

Nymphoides peltata



This extremely hardy Eurasian species spreads rapidly from seed. The leaves appear similar to small waterlily leaves, but the yellow flowers are more showy than the native yellow waterlilies. The long stems can impede swimming and boating.



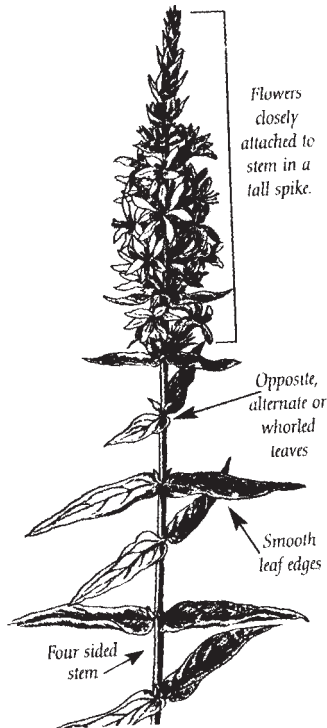
ESTABLISHED

PURPLE LOOSESTRIFE

Lythrum salicaria



Purple Loosestrife is an invasive non-native plant from Europe and Asia that was introduced almost 200 years ago. When purple loosestrife is introduced into wetlands, it outcompetes native plants such as cattails, sedges, bulrush and ferns. As these wetlands become infested with purple loosestrife, desirable food and nesting sites for wildlife are lost, there are fewer stopover sites for migrating birds, and key habitat is lost for other wetland organisms.



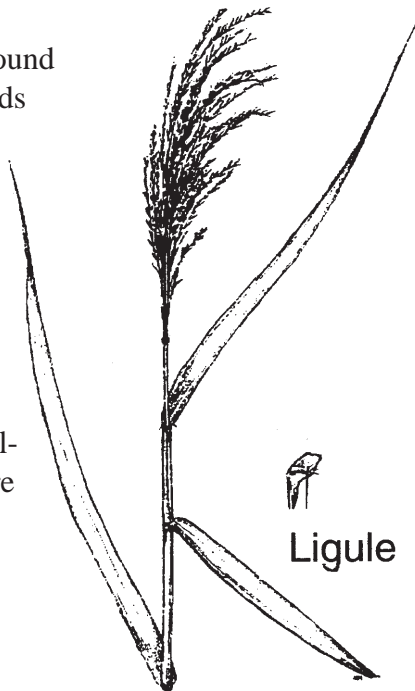
ESTABLISHED

COMMON REED

Phragmites australis



The Common Reed is often found along roadsides and in wetlands areas. The reed is able to grow in freshwater, brackish water and saline marshes. It grows in large dense stands that can reach 15 or more feet high. This reed out-competes native wetland species in the competition for resources, creating a mono culture. Stands of *Phragmites* are poor habitat for most wetland animals.



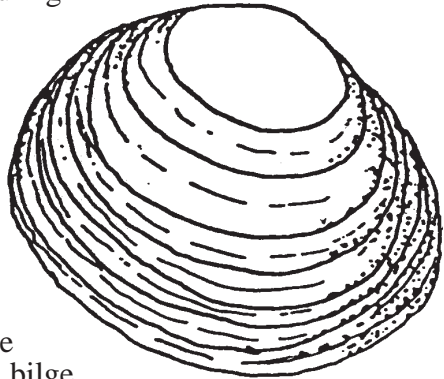
ESTABLISHED

ASIAN CLAM

Corbicula



This clam is usually less than 0.5cm wide and is a dark beige to brown color. The major impact of the clam in freshwater systems is befouling of equipment. Power plants, boat motors, water intake pipes, etc. are all places the Asian Clam prefers to settle. Eventually they will cut off the flow of water through that structure. The clam can also out-compete native bivalves for resources.



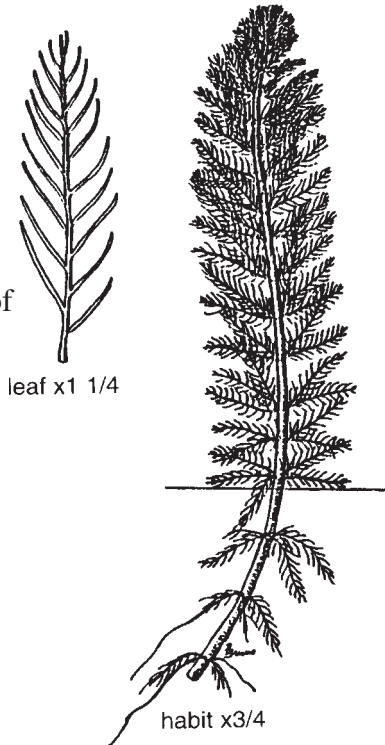
Juvenile forms of the clam are microscopic and can travel in bilge water, bait buckets or on boat trailers. Care should be taken to remove and RINSE all equipment when leaving a water body and before entering another.

PARROT-FEATHER

Myriophyllum aquaticum

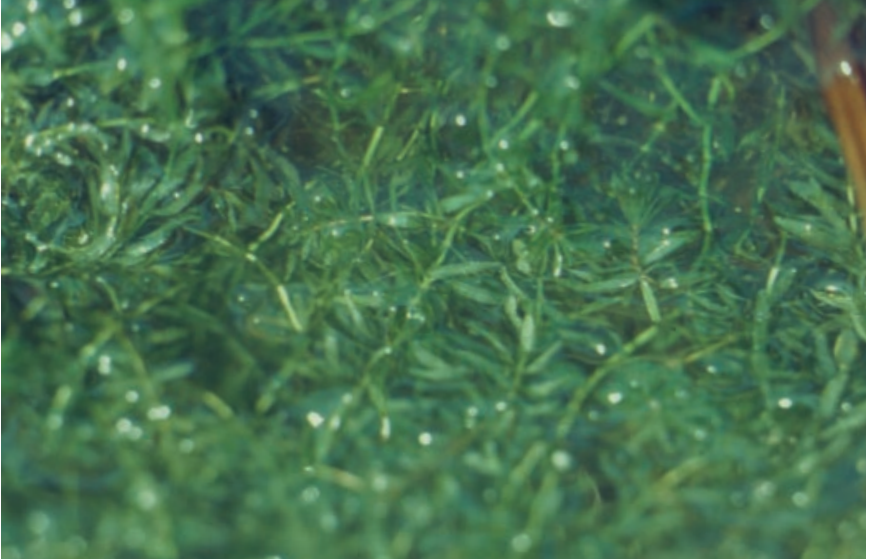


This South American species is established on Long Island, New York. Parrot-feather is common in the aquarium and water-garden trade, and can tolerate the harsh conditions of New England winters. It is separated from all the other watermilfoils by the presence of conspicuous emergent feathery leaves.



HYDRILLA

Hydrilla verticillata



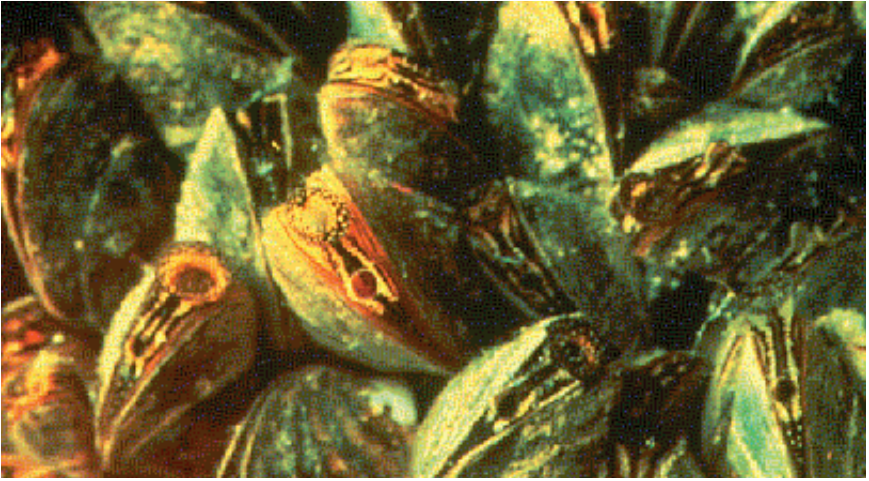
Hydrilla has the potential to become a serious problem in Massachusetts. A population has been verified on Cape Cod. This species is often confused with the native Elodea. Elodea leaves have very fine teeth that are not easily seen with the unaided eye and the leaves are in whorls of 3 as compared to 4-6 on Hydrilla. If found please report it to one of the agencies listed on the inside cover of this booklet.



* Established in one pond on Cape Cod.

ZEBRA MUSSEL

Dreissena polymorpha



Zebra mussels get their name from the "zebra-like" stripes that are found on their shells. Usually less than 5cm long, zebra mussels can proliferate at an alarming rate. They clog water intake pipes for factories, water treatment plants, boat intakes, nuclear facilities, etc. They can grow to densities of around 500,000 per m² + and reduce flows through pipes.

Zebra mussels out compete other bivalves for food, space and other resources. Dead mussel shells are very sharp and can create a swimming hazard.

The weight from large numbers of mussels has been known to sink channel markers. Young zebra mussels (veligers) are microscopic and can easily be transported. These young have been found in or attached to boat hulls, bait buckets, boat motors, boat trailers, and fishing tackle. Great care should be taken when leaving a lake known to be infested with zebra mussels. Wash all equipment that may have come in contact with water.



SPINY WATERFLEA

Bythotrephes cederstroemi



The spiny water flea, a small planktivorous crustacean, averages about 0.25 to 0.50 cm in length, of which 70% is a long, sharp, barbed tail spine. Native to parts of Eurasia, it was first introduced into the Great Lakes ecosystem in 1984 via ballast water. It has spread to all of the Great Lakes. Large numbers of these organisms form huge cotton-like mats in a waterbody. They foul fishing gear, boat motors, and can impede swimming. The spiny waterflea can also dramatically alter the food webs. It will out-compete small fish for food. It has few predators due to its sharp spines.

FISH HOOK FLEA

Cercopagis pengoi



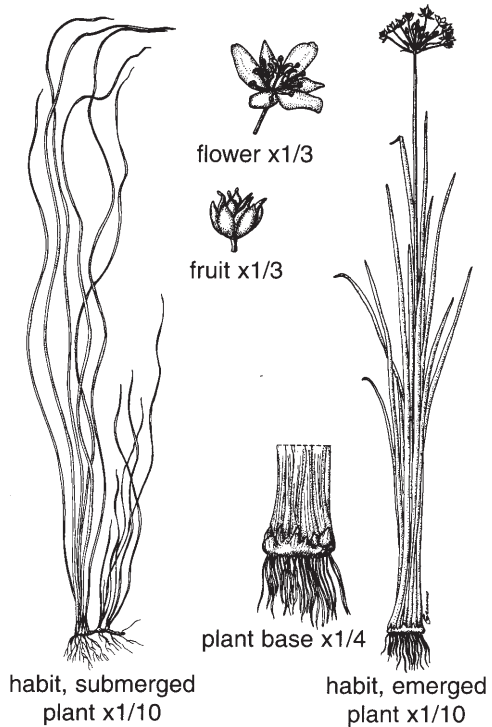
Both *Cercopagis* and *Bythotrephes* have long caudal processes with up to three pairs of barbs along the proximal end of the process. Both species occur in brackish and pure freshwater environments. *Cercopagidids* most commonly reproduce parthenogenically, which allows them to quickly establish new populations with a relatively small seed population. Caution should be used when transferring bait and fishing tackle from infested waterbodies to outside systems. Never keep bait bucket water from contaminated lakes. Always flush bilge water before entering a different lake.

FLOWERING RUSH

Butomus umbellatus

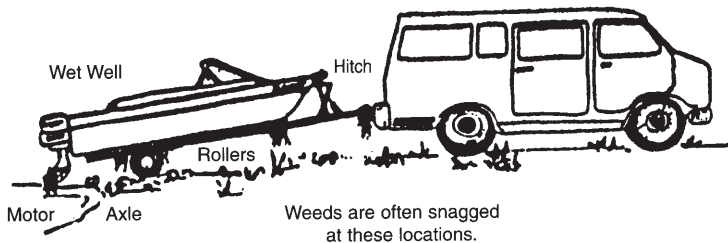


This plant is well established in the Lake Champlain drainage and along the Connecticut River in Connecticut. In the water, it appears much like the native water-celery, but the leaves arise from a fleshy rhizome. The emergent form is much more common and produces showy large pink inflorescences.



STOP

The Spread of Nuisance Fresh Water Organisms



Clean All Organisms off Boats, Anchors, Motors and Trailers

BEFORE LEAVING AN ACCESS AREA

Illustrations & excerpts are from the Aquatic Vascular Plants of New England series with the exception of those noted below:

Crow, G.E. & C.B. Hellquist. 1982, 1983. Aquatic vascular plants of New England. New Hampshire Agr. Exp. Stat. Bulls. 520, 524, Durham, N.H.

Crow, G.E. & C.B. Hellquist. 2000 . Aquatic and wetland plants of northeastern North America. Univ. Wisconsin Press, Madison. (*Myriophyllum aquaticum*, *Nymphoides peltata*).

Godfrey, R.K. & J. W. Wooten. 1959. Aquatic and wetland plants of southeastern United States: Monocotyledons. U. Georgia Press, Athens. 712 pp. (*Hydrilla*).

Hellquist, C.B. & G.E. Crow. 1981, 1983, 1984. Aquatic vascular plants of New England. New Hampshire Agr. Exp. Stat. Bulls. 515, 518, 527. Durham, N.H.

Reed, C. 1970. Selected weeds of the United States. Agr. Handb. No. 366. Agr. Res. Serv., U.S. Dept. of Agr. (*Najas guadalupensis*, *Potamogeton crispus*).

Catling, P.M. & Porebski, Z.S. 1995. The spread and current distribution of European Frogbit, *Hydrocharis morsus-ranae*L., in North America. The Canadian Field - Naturalist 109(2):236-241.

Straub, J.R. 2002. Selected text on *Dreissena polymorpha* and *Corbicula*. Department of Environmental Mangement; Lakes & Ponds Program

Jane Swift, Governor • Bob Durand, Secretary, EOE
Peter C. Webber, Commissioner, DEM