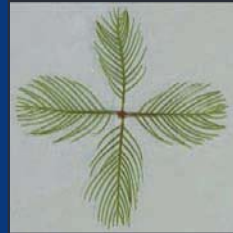
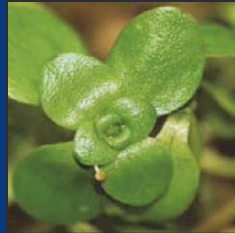


Connecticut's Invasive Aquatic and Wetland Plants

Identification Guide



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Introduction to Aquatic Plants

Aquatic plants are essential components of healthy ecosystems in lakes and ponds. They cleanse water and provide habitat for rich communities of aquatic organisms. Because invasive species are not native, they have few natural enemies. Their dramatic growth rates can clog water intakes, decrease recreational opportunities, reduce local real estate values, and alter native ecosystems (Connecticut Aquatic Nuisance Species Working Group, 2006, Fishman et al. 1998). Recent vegetation surveys of 162 lakes and ponds, by the Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP), found one or more invasive plants in nearly two-thirds of the water bodies (CAES IAPP, 2010).

Approximately three-quarters of the invasive aquatic plant species in southern New England were introduced as cultivated plants (Les and Mehrhoff, 1999). These introductions come from recreational boating (Couch and Nelson, 1985), dumping of unwanted plants in aquariums, water gardening, and plant fragments mixed with live bait used by fishermen. Spread of invasive plants from one lake to another also occurs naturally by wildlife and downstream flow. Once established, eradication of invasive aquatic plants is extremely difficult. Preventing introductions by inspections, early detection and rapid response is critically important.

This guide is intended to provide information on the identification and distribution of the 22 aquatic plants listed as invasive or potentially invasive (Table 1) by the Connecticut General Statute (Sec. 22a-381d). The sale of these plants, with the exception of common waterhyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*), is also banned by State Statute and their transport is limited to activities associated with control and education. Fines of up to one hundred dollars can be imposed for each violation.

How to Use This Guide

Identifying of many of Connecticut's freshwater aquatic plants is challenging. CAES IAPP surveys have found nearly 100 native species and 13 invasive species (Figure 1). These do not include many of the wetland plants in this guide because our surveys are limited to lakes and ponds. We use many resources when plant identification is questionable including; books by Crow and Hellquist (2000) and Fassett (1957), other recognized experts and molecular identification using DNA sequencing. Some of the potentially invasive plants discussed here have never been documented in Connecticut and may be unfamiliar to readers. Certain invasive aquatic plants can be easily confused with native or other invasive plants so care must be taken to ensure accuracy. The places where plants are found are often related to their means of dispersal (Table 1) and sometimes this gives a clue to their identification.

Table 1. Invasive and potentially invasive aquatic plants listed in the Connecticut General Statutes (Sec. 22a-381d).

#	COMMON NAME	SCIENTIFIC NAME	DISPERSAL
1	American water lotus	<i>Nelumbo lutea</i>	Water Gardening
2	Brazilian water-weed, Anacharis, Egeria	<i>Egeria densa</i>	Aquariums, Boats/Trailers, Bait
3	Brittle water-nymph, Minor naiad	<i>Najas minor</i>	Boats/Trailers
4	Common water-hyacinth*	<i>Eichhornia crassipes</i>	Water Gardening
5	Curly leaf pondweed, Crispy-leaved pondweed	<i>Potamogeton crispus</i>	Boats/Trailers
6	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	Aquariums, Boats/Trailers, Bait
7	European waterclover, Water shamrock	<i>Marsilea quadrifolia</i>	Water Gardening, Boats/Trailers
8	Fanwort	<i>Cabomba caroliniana</i>	Aquariums, Boats/Trailers
9	Flowering rush	<i>Butomus umbellatus</i>	Water Gardening
10	Forget-me-not, Water scorpion-grass	<i>Myosotis scorpioides</i>	Water Gardening
11	Giant salvinia	<i>Salvinia molesta</i>	Water Gardening
12	Hydrilla	<i>Hydrilla verticillata</i>	Aquariums, Boats/Trailers, Bait
13	Onerow yellowcress	<i>Rorippa microphylla</i>	Water Gardening
14	Parrotfeather	<i>Myriophyllum aquaticum</i>	Water Gardening, Boats/Trailers
15	Pond water-starwort	<i>Callitriche stagnalis</i>	Water Gardening
16	Purple loosestrife	<i>Lythrum salicaria</i>	Nursery Stock, Water Gardening
17	Variable-leaf watermilfoil	<i>Myriophyllum heterophyllum</i>	Aquariums, Boats/Trailers
18	Water chestnut	<i>Trapa natans</i>	Water Gardening, Boats/Trailers
19	Water lettuce, American water lotus*	<i>Pistia stratiotes</i>	Water Gardening
20	Watercress	<i>Rorippa nasturtium-aquaticum</i>	Water Gardening
21	Yellow floating heart	<i>Nymphoides peltata</i>	Water Gardening
22	Yellow iris, Yellow flag iris	<i>Iris pseudacorus</i>	Nursery Stock, Water Gardening

*plants that are not banned

This guide has three main parts to help identify aquatic invasive plants. First, each plant has a summary page containing pictures, a list of key features, and a map of where the plant has been found by either CAES IAPP or the Invasive Plant Atlas of New England (IPANE, 2009). Other sources have found some of the plants elsewhere, and the maps are not meant to suggest the plants are limited to the locations shown. Second, there is a series of comparative pictures that help differentiate the invasive species from similar native plants. Third, there is a plant identification key that provides a step-by-step method for narrowing plants to their species. This key also includes native plants that are commonly mistaken for invasive species.

What to do if You Find a Plant Discussed in This Guide

Before taking action, it is important that the plant be positively identified and the location of the plant is noted. Latitude and longitude coordinates taken with a global positioning system (GPS) are best. Plant samples requiring further identification need to be mailed or taken to the CAES IAPP, 123 Huntington Street, New Haven, CT 06511, or another qualified entity such as the Connecticut Department of Environmental Protection. You can call CAES IAPP at (203) 974-8512 with questions.

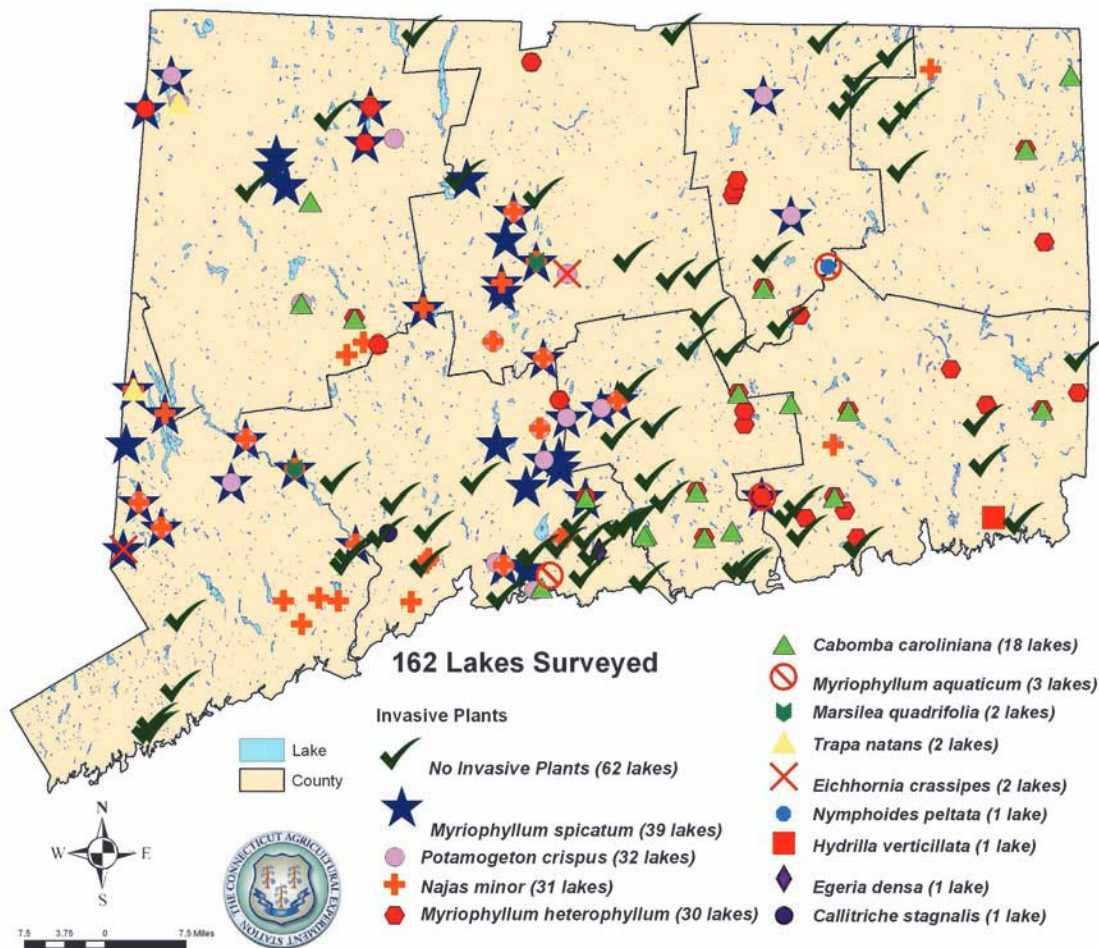


Figure 1. Locations of invasive aquatic plants found by CAES IAPP surveys from 2004-2009.

Additional Resources for Plant Identification

CAES IAPP web page, aquatic plant survey requests and reprints of this guide

<http://www.ct.gov/caes/IAPP>

The Invasive Plant Atlas of New England

<http://nbii-nin.ciesin.columbia.edu/ipane/>

Invasive Plants of the Eastern United States: Identification and Control

<http://www.invasive.org/eastern/>

State of Washington Department of Ecology Non-native Freshwater Plants

<http://www.ecy.wa.gov/programs/wq/plants/weeds/exotic.html>

Center for Aquatic and Invasive Plants, University of Florida

<http://plants.ifas.ufl.edu/>

USDA National Invasive Species Information Center

<http://www.invasivespeciesinfo.gov/>

DEFINITIONS OF PLANT TERMS

Alternate: leaves not directly across from each other on the stem

Dissected: leaf divided into many narrow segments; appear feathery, branched or forked

Entire: leaf not divided and margins not toothed

Forked: leaf divided into two or more equal segments

Lanceolate: lance-shaped, long, wider in the middle foliage

Leaflet: one of many leaf-like structures that make up a leaf

Margin: the edge or border of a leaf

Opposite: leaves are directly across from each other on the stem

Petiole: leaf stalk; stem-like structure that attaches a leaf to the stem

Pinnately compound: leaf containing many leaflets

Rhizome: underground stem often sending out roots and shoots from its nodes

Stolon: above ground stem often sending out roots and shoots at nodes, also termed “runner”

Rosette: a dense cluster of leaves that are all at a single height, like petals of a rose

Spike: unbranched continuation of the stem where flowers are located, usually located above the water

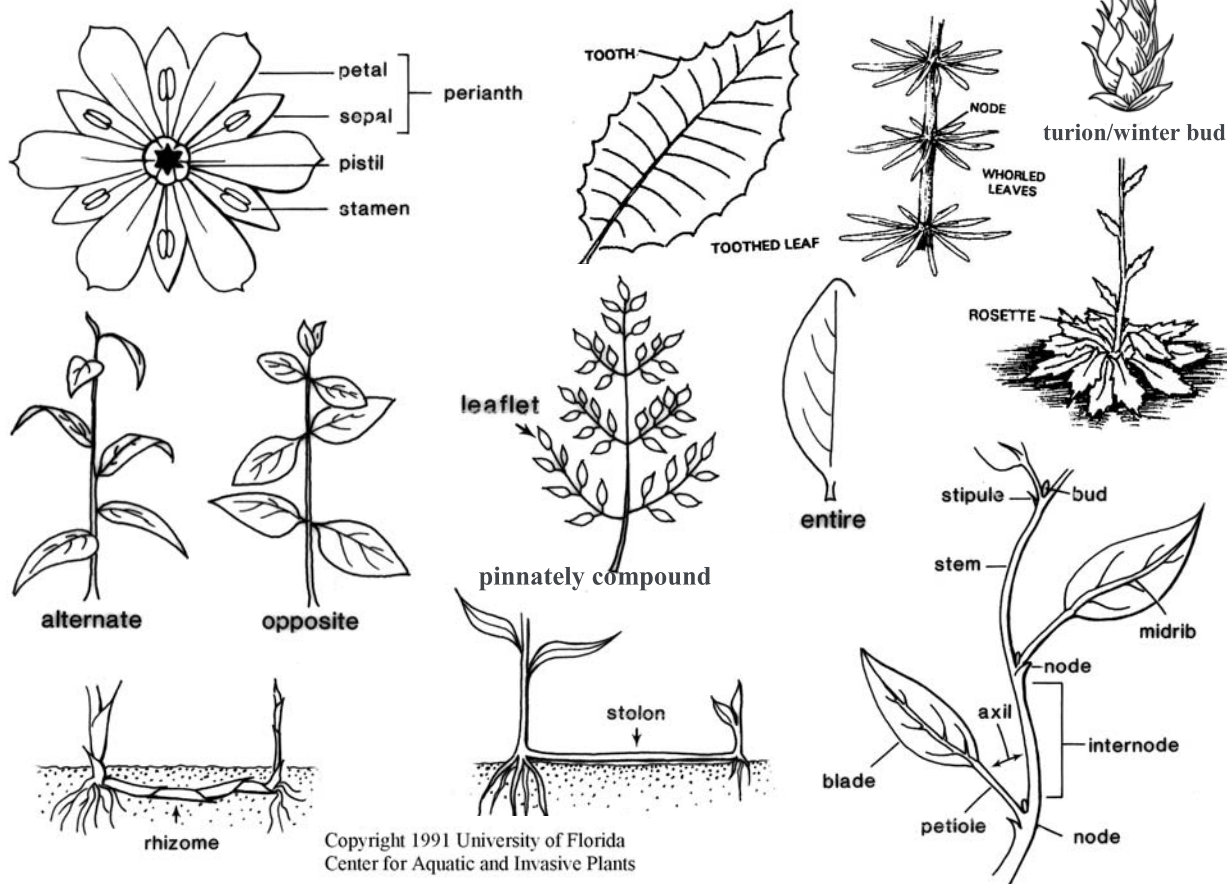
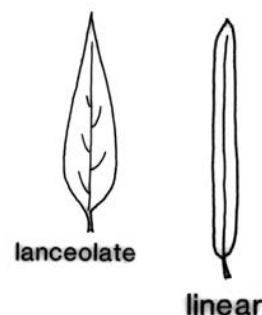
Tooth: points or lobes along a leaf margin

Tuber: modified, underground stem for starch storage and a form of vegetative reproduction

Turion: a modified leaf bud on a stem or shoot, a form of vegetative reproduction

Whorled: three or more leaves at the same node, forming a ring-like arrangement

Winter bud: a modified leaf bud that survives the winter and facilitates vegetative reproduction



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Butomus umbellatus

Common name:
Flowering rush

Origin:
East Asia

Key features:

Stems: Can be found along shorelines and into water 9 feet (3 m) deep

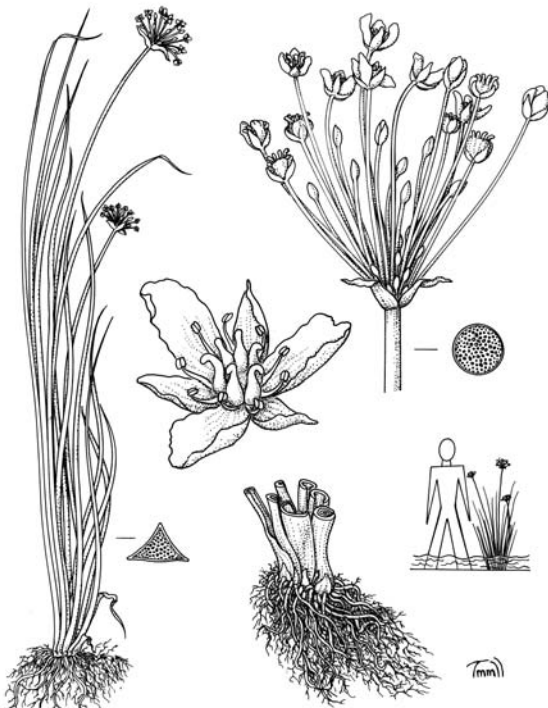
Leaves: Long, narrow, sword shaped leaves up to 3 feet (1 m) tall that originate at base. Leaves are fleshy with twisted ends, grass-like, cross section of leaves are triangular

Flowers: Inflorescence contains pink to white flowers 0.8-1.2 inches (2-3 cm) across with 3 petals and 3 sepals on a stalk that can be 3 feet (1 m) tall

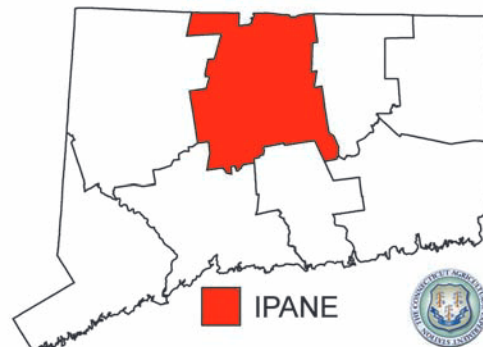
Fruits/Seeds: Fruit is a follicle

Reproduction: Seeds and rhizomes

Easily confused species:
Bur-reeds: *Sparganium* spp.



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Cabomba caroliniana

Common names:

Fanwort

Carolina fanwort

Origin:

Southeast United States

South America

Key features:

Plants are submersed

Stems: Can be 6 feet (2 m) long

Leaves: Dissected, opposite leaves 0.8-2 inches (2-5 cm) are fan-like and made up of forked leaflets attached to the stem by a petiole. Floating leaves 0.2-0.8 inches (6-20 mm) wide are oblong and produced on flower shoots

Flowers: Small, solitary flowers are usually white to pinkish

Fruits/Seeds: Flask shaped

Reproduction: Seed and fragmentation

Easily confused species:

Watermilfoils: *Myriophyllum* spp.

White water crowfoot: *Ranunculus longirostris*

Water marigold: *Megalodonta beckii*



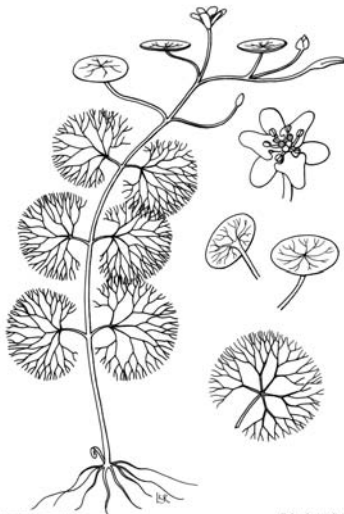
Photo by CAES IAPP



Opposite leaves

Photo by CAES IAPP

A.



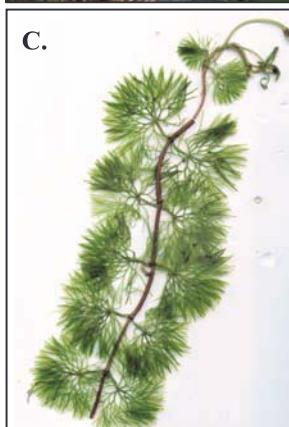
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Cabomba caroliniana
Fanwort

B.



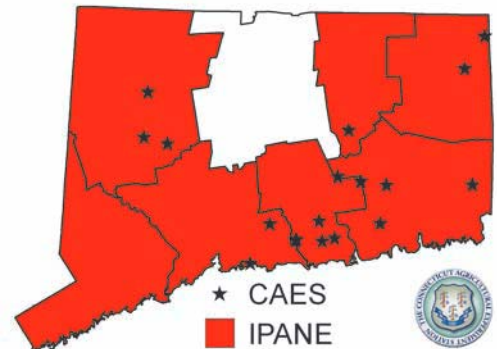
C.



A. Copyright 1991 Univ. of Florida, Center for Aquatic and Invasive Plants

B. Copyright 2002 Univ. of Florida, Photo by A. Murray

C. Photo by A. Smagula



Callitriche stagnalis

Common name:

Pond water-starwort

Origin:

Europe and North Africa

Key features:

Plants are submersed with floating rosettes

Stems: 4-12 inches (10-30 cm) long

Leaves: Floating leaves are opposite and oval or spoon shaped 0.8 × 0.1-0.3 inches (2 cm × 3-8 mm), submerged leaves are narrower and tend to be smaller

Flowers: Small with 2 small bracts at their base, flowers are close to each other at leaf bases for self pollination

Fruits/Seeds: Round 0.06-0.08 inches (1.5-2 mm) thick forming 4 mericarps that have thin winged margins

Reproduction: Cloning and seeds

Easily confused species:

Other *Callitriche* spp. (can only distinguish them by their fruit)



Photo by CAES IAPP



Photo by Gordon Leppig & Andrea J. Pickart



Photo by Clayton Anticau

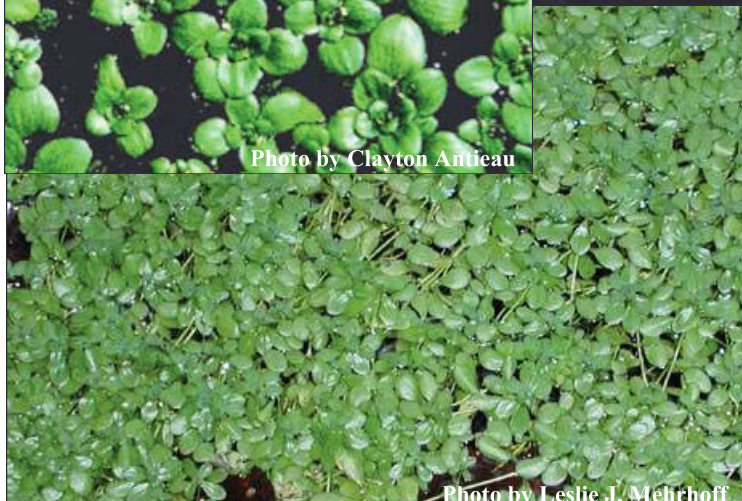
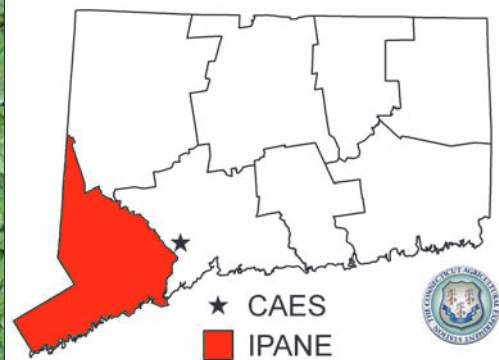


Photo by Leslie J. Mehrhoff



Egeria densa

Common names:

Brazilian waterweed
Brazilian elodea
South American waterweed

Origin:

South America

Key features:

Plants are submersed

Stems: Plant stems green, soft and typically 1-2 ft (0.3-0.6 m) long

Leaves: Leaves entire 0.4-1.2 inches (1-3 cm) long by 0.2 in (5 mm) wide, leaves toothed (need magnification), leaves are whorled with typically 4 leaves per whorl

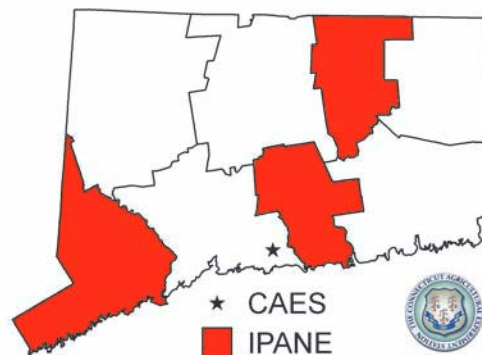
Flowers: Small white flowers with three petals, only staminate (male) flowers found in the US

Reproduction: Fragmentation

Easily confused species:

Waterweeds (Native): *Elodea nuttallii* and
Elodea canadensis

Hydrilla: *Hydrilla verticillata*



Eichhornia crassipes

Common names:

Common water-hyacinth

Floating water-hyacinth

Origin:

Brazil

Key Features:

Stems: Free floating plant

Leaves: Leaves are oval 1.6-4.7 inches (4-12 cm), thick, waxy and form a rosette, petioles are inflated which helps with floatation

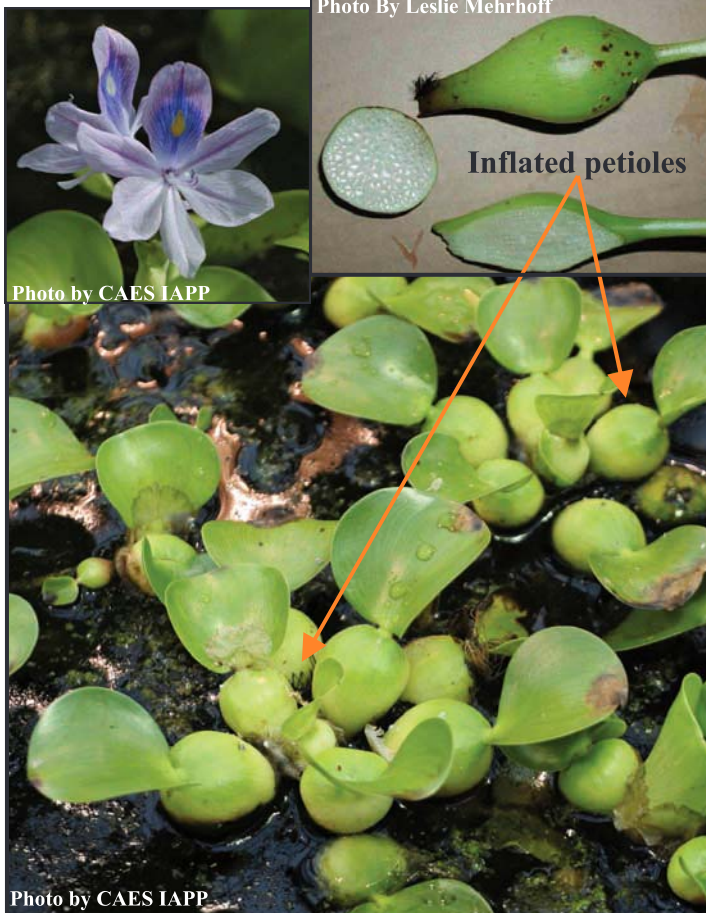
Flowers: Flowers are light purple with one petal having a darker blotch with a yellow center 2.0-2.8 inches (5-7 cm)

Fruits/Seeds: Fruit is a capsule with ribbed seeds

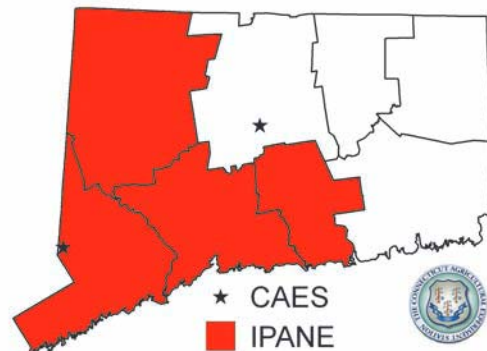
Reproduction: Seeds and stolons

Easily confused species:

None



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Hydrilla verticillata

Common name:

Hydrilla

Origin:

Asia

Key features:

Plants are submersed

Stems: Slender, branched and up to 25 feet (7.5 m) long

Leaves: Whorled leaves approx. 0.7 inches (1.5 cm) long, whorls often have 5 leaves (range 4-8); leaf margins are visibly toothed

Flowers: Female flowers have three translucent petals that have reddish streaks, male flowers have three petals and can be white to red in color

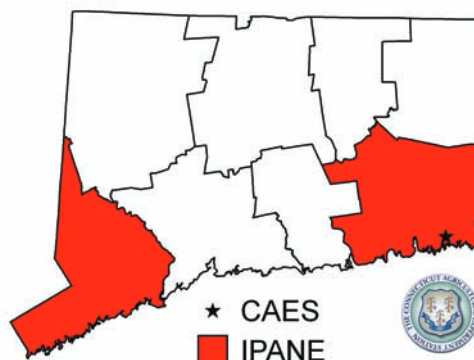
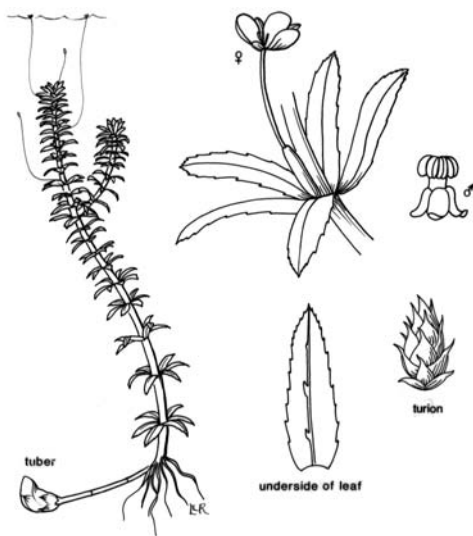
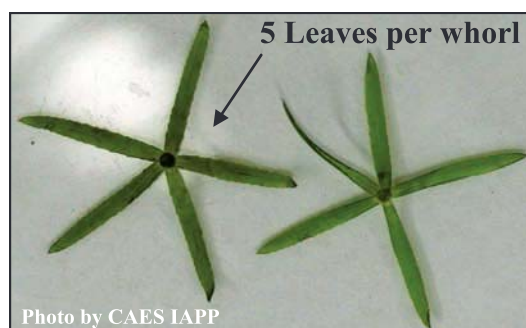
Fruits/Seeds: Small tubers (key feature) can be found in the sediment, turions form along the stem

Reproduction: Fragmentation, turions, tubers and seeds

Easily confused species:

Waterweeds (Native): *Elodea nuttallii* and *Elodea canadensis*

Brazilian waterweed: *Egeria densa*



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Hydrilla verticillata
Hydrilla

Iris pseudacorus

Common names:

Yellow iris

Yellow flag

Origin:

Europe, western Asia, and northwest Africa

Key features:

Leaves: Sword shaped leaves are flattened with a raised mid rib and rise out of the soil, the tips of the leaves are pointed and arch over

Flowers: Flowers are on peduncles 3-4 feet (1-1.3 m) tall. Several light to dark yellow flowers are on each stem with 3 small erect petals and 3 large downward sepals

Fruits/Seeds: Fruit is a capsule, seeds are brown

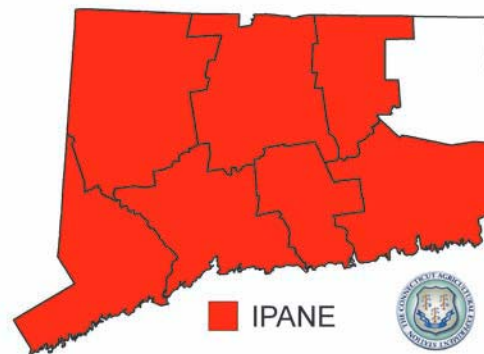
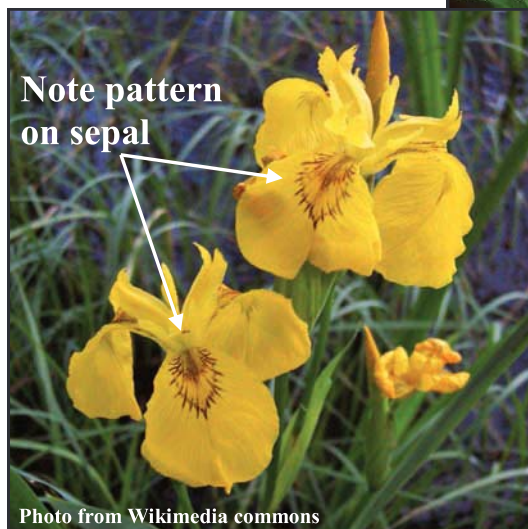
Reproduction: Seeds and rhizomes

Easily confused species:

Northern blue flag iris: *Iris versicolor*



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Lythrum salicaria

Common name:
Purple loosestrife

Origin:
Europe

Key features:

Stems: Plants have herbaceous stems and can grow 1.5-5 feet (0.5-1.5 m) tall

Leaves: Opposite, or in whorls of 3, 1-4 inches (3-10 cm) long, linear, or lanceolate in shape, leaves can be smooth or hairy

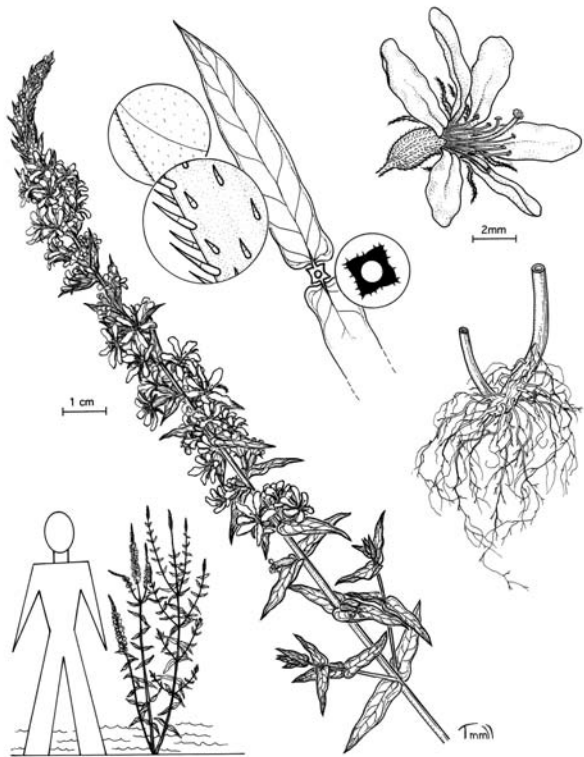
Flowers: Large, pink-purple flowers clustered on long terminal spikes 4-16 inches (10-40 cm) long, floral tube is twice as long as it is wide and typically has 6 petals

Fruits/Seeds: Fruit is a two cavity capsule with numerous reddish-brown seeds

Reproduction: Seed

Easily confused species:

Winged loosestrife: *Lythrum alatum*



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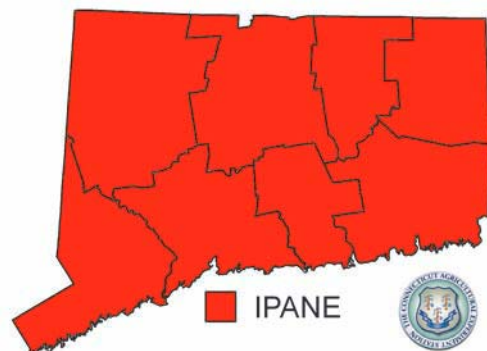
Lythrum salicaria
Purple loosestrife



Purple loosestrife
Lythrum salicaria
Photo by Vic Ramsey
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Photo by
Leslie J. Mehrhoff



Marsilea quadrifolia

Common names:

European waterclover

Water shamrock

Origin:

Europe

Key features:

Floating leaf plant

Stems: Smooth petioles 2-12 inches (5-30 cm)

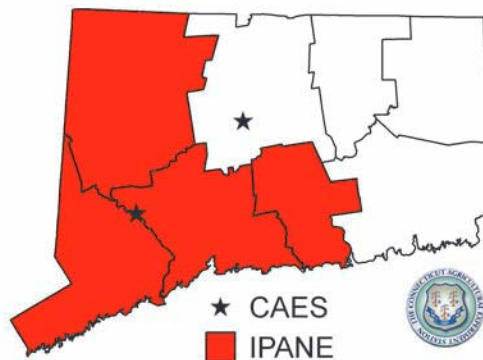
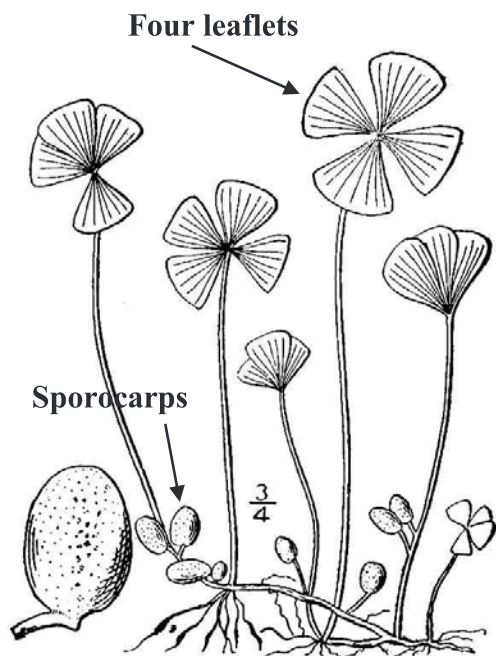
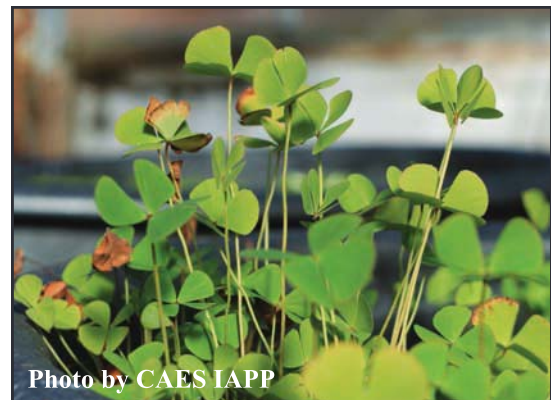
Leaves: Comprised of 4 fan-shaped leaflets (similar to a four-leaf clover)

Fruits/Seeds: 2 or 3 dark brown sporocarps 0.2 inches × 0.2 inches (4-5.5 mm × 3-4 mm)

Reproduction: Cloning and sporocarps

Easily confused species:

None



Myosotis scorpioides

Common names:

Forget-me-not

Yellow eye forget-me-not

Water scorpion-grass

Origin:

Europe and western Asia

Key features:

Plants grow 8-24 inches (20-60 cm) in height

Stems: Stems are angled, often creeping

Leaves: Lower leaves are tapered to the base while the upper leaves are more oblong, leaves are alternate, with short hairs

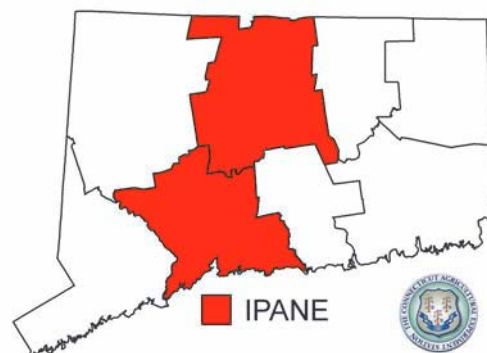
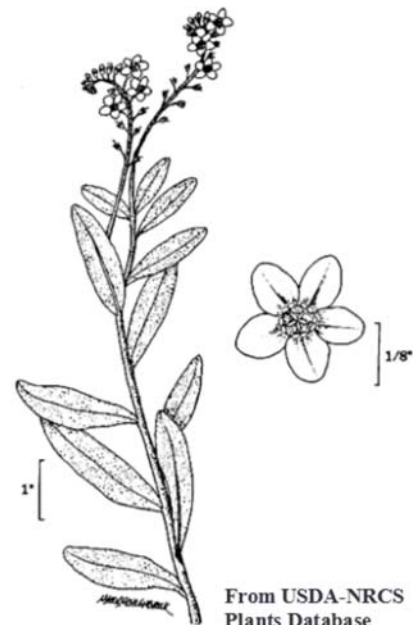
Flowers: Flowers are flat and are typically blue with a yellow center, 0.2-0.4 inches (6-9 mm) wide, along a simple inflorescence with a common axis

Fruits/Seeds: Seeds are contained in a nutlet that is angled and keeled on the inner side

Reproduction: Seeds

Easily confused species:

Bay forget-me-not: *Myosotis laxa*



Myriophyllum aquaticum

Common names:

Parrotfeather

Brazilian watermilfoil

Origin:

Amazon River basin

Key features:

Plants occur mostly above the water's surface

Stems: Thick green stems

Leaves: Leaves are a blue-green color and have a feathery appearance, leaves are whorled, dissected with rounded tips

Flowers: Flowers have white sepals and no petals (only females found in the US)

Fruits/Seeds: 0.06-0.08 inches (1.5-2 mm) long

Reproduction: Fragmentation



Easily confused species:

Eurasian watermilfoil: *Myriophyllum spicatum*

Variable-leaf watermilfoil: *Myriophyllum heterophyllum*

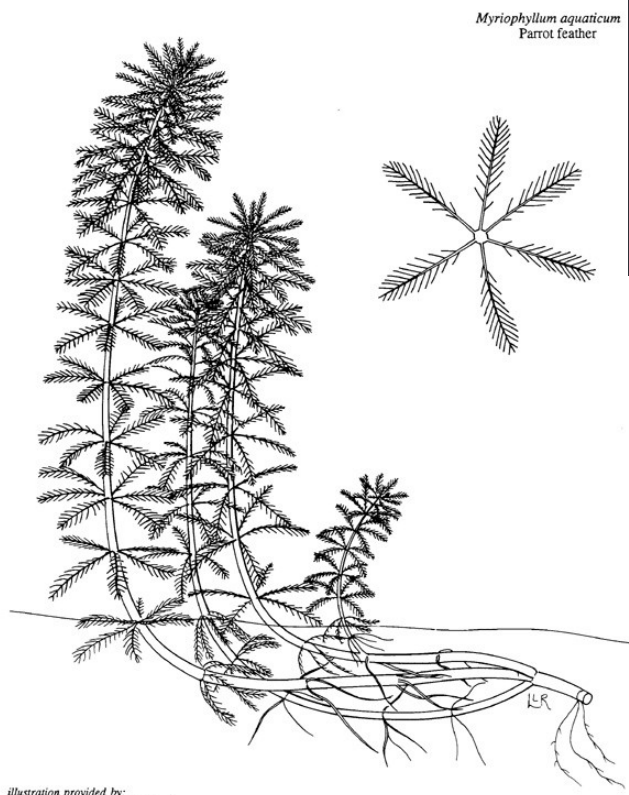
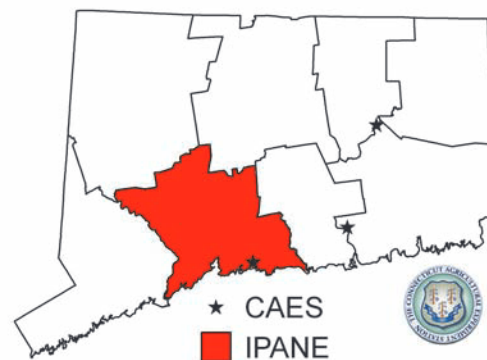


illustration provided by:
IFAS, Center for Aquatic Plants
University of Florida, Gainesville, 1990



Myriophyllum heterophyllum

Common names:

Variable-leaf watermilfoil
Variable watermilfoil
Two-leaf watermilfoil

Origin:

Southern United States

Key features:

Plants are submersed

Stems: Dark brown stems extend to the water's surface and spread to form large mats

Leaves: Triangular with 1 pairs of leaflets. Leaves are dissected and whorled (4-6 leaves/whorl) resulting in a feathery appearance with leaf whorls < 1 inch apart giving it a ropy appearance

Flowers: Inflorescence spike 2-14 inches (5-35 cm) long extend beyond the water's surface with flowers in whorls of four with reddish petals

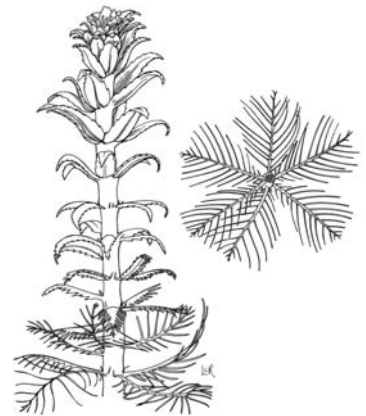
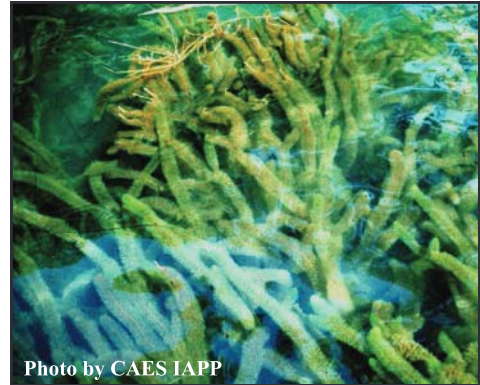
Fruits/Seeds: Fruits are almost round, with a rough surface

Reproduction: Fragmentation and seeds

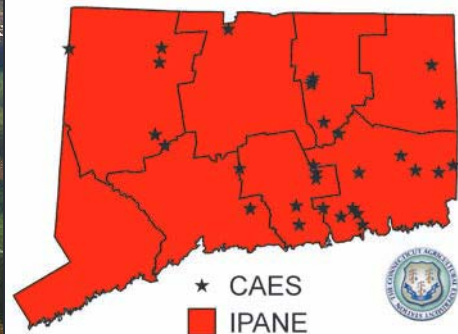
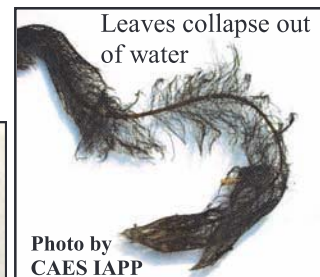
Easily confused species:

Eurasian watermilfoil: *Myriophyllum spicatum*

Low watermilfoil: *Myriophyllum humile*



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Myriophyllum spicatum

Common name:

Eurasian watermilfoil

Origin:

Europe and Asia

Key features:

Plants are submersed

Stems: Stem diameter below the inflorescence is greater with reddish stem tips

Leaves: Leaves are rectangular with feathery appearance, arranged in a whorl, whorls are 1 inch (2.5 cm) apart

Flowers: Small pinkish male flowers that occur on reddish spikes, female flowers lack petals and sepals and have 4 lobed pistil

Fruits/Seeds: Fruit are round 0.08-0.12 inches (2-3 mm) and contain 4 seeds

Reproduction: Fragmentation and seeds



Photo by CAES IAPP

Easily confused species:

Variable-leaf watermilfoil: *M. heterophyllum*

Low watermilfoil: *M. humile*

Northern watermilfoil: *M. sibiricum*

Whorled watermilfoil: *M. verticillatum*

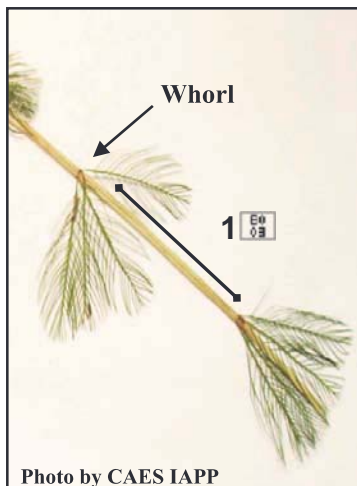


Photo by CAES IAPP

Rectangular leaf tips

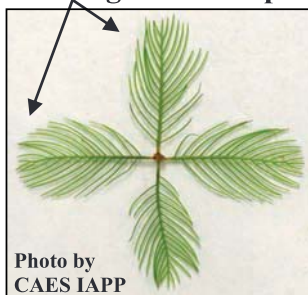


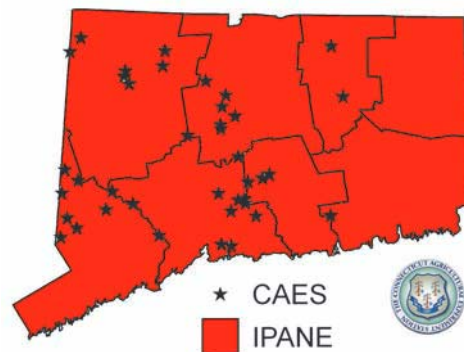
Photo by CAES IAPP



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Photo by CAES IAPP



Najas minor

Common names:

Minor naiad

Brittle waternymph

Spiny leaf naiad

Eutrophic waternymph

Origin:

Europe

Key features:

Plants are submersed

Stems: Branched stems can grow up to 4-8 inches (10-20 cm) long

Leaves: Opposite and lance shaped on branched stems with easily visible toothed leaf edges and leaves appear curled under, basal lobes of leaf are also serrated, 0.01-0.02 inches (0.3-0.5 mm)

Flowers: Monoecious (male and female flowers on same plant)

Fruits/Seeds: Fruits are purple-tinged and seeds measure 0.03-0.06 inches (1.5-3 mm)

Reproduction: Seeds and fragmentation

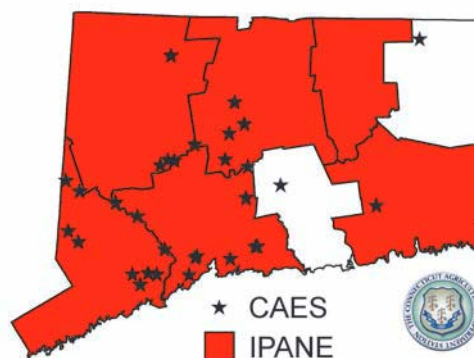
Easily confused species:

Other naiads (native): *Najas* spp.



Toothed leaf edges

Basal lobe



Nelumbo lutea

Common name:

American water lotus

Origin:

Southeastern United States, Mexico, Honduras, and the West Indies

Key features:

Plants are on or above the water

Stems: Stiff stalk attaches to the center of the leaf

Leaves: Large, bluish-green, circular leaves with no “slit” like water lilies

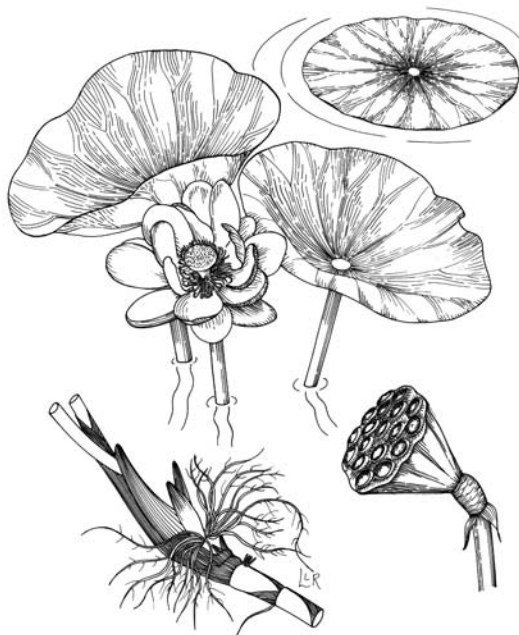
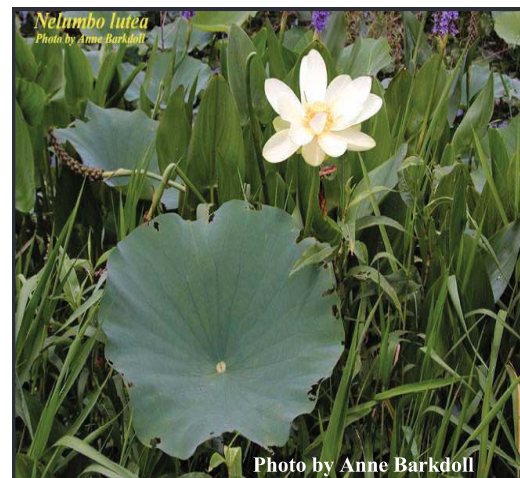
Flowers: White to yellowish flowers measure up to 8 inches (20 cm) wide

Fruits/Seeds: Seeds are nut-like and contained in a structure that resembles the top of a watering can

Reproduction: Seed

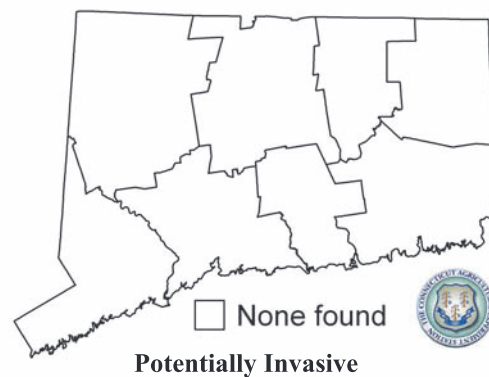
Easily confused species:

None



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Nelumbo lutea
american lotus



Nymphoides peltata

Common name:

Yellow floating heart

Origin:

Europe, Japan, China, and India

Key features:

Floating leaf plant

Stems: Branching stems spread over water's surface

Leaves: Floating leaves are round and heart-shaped at base, paired at each node

Flowers: Flowers are bright yellow on long peduncles with 5 fringed petals

Fruits/Seeds: Seeds are flat and oval and are in capsules

Reproduction: Seeds and rhizomes

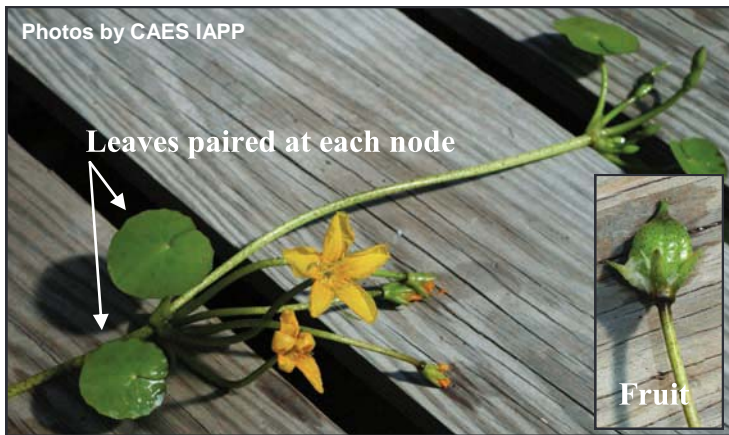


Photo by CAES IAPP

Easily confused species:

Little floating heart: *Nymphoides cordata*

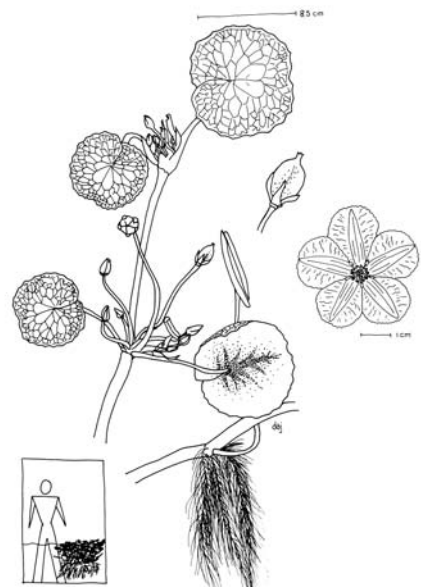
Yellow water lily: *Nuphar variegata*



Photos by CAES IAPP

Leaves paired at each node

Fruit

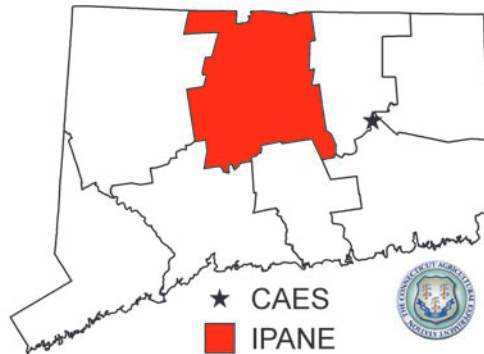


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Nymphoides peltata
yellow floating heart



Photo by CAES IAPP



Pistia stratiotes

Common names:

Water lettuce

Tropical duckweed

Origin:

Nativity unknown, but possibly South America, Africa, Southeastern US

Key features:

Free floating plant that resembles a head of lettuce

Stems: Roots are long and feathery

Leaves: Leaves are fleshy and covered with dense white hairs and have parallel venation

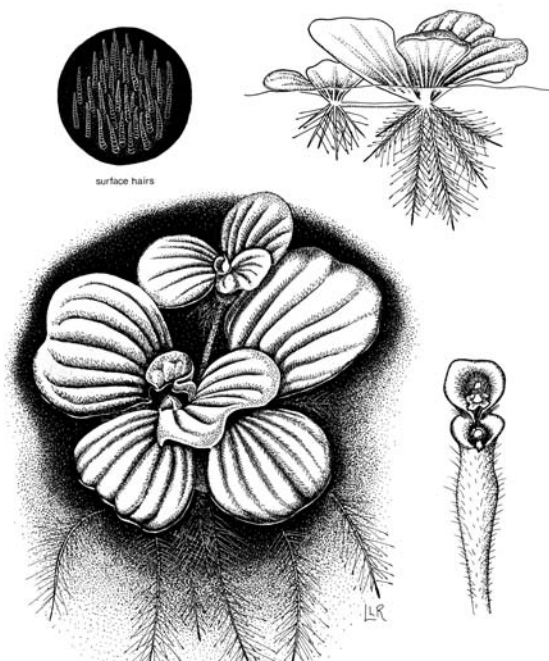
Flowers: Several male flowers form a whorl around a spike with one female flower below them

Fruits/Seeds: Fruit are light green berries that produce 0.04 inch (1 mm) brown seeds

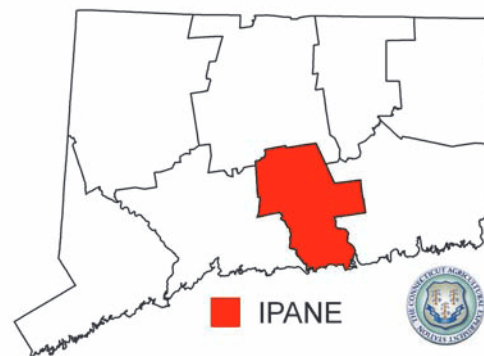
Reproduction: Seeds and stolons

Easily confused with:

None



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Potamogeton crispus

Common names:

Curly leaf pondweed
Crispy-leaved pondweed
Crisped pondweed

Origin:

Asia, Africa, and Europe

Key features:

Plants are submersed

Stems: Stems are flattened, can form dense stands in water up to 15 feet (5 m) deep

Leaves: Alternate leaves 0.3-1 inches (3-8 cm) wide with wavy edges (similar to lasagna) with a prominent mid-vein

Flowers: Brown and inconspicuous

Fruits/Seeds: Fruit is oval 0.1 inches (3 mm) long

Reproduction: Turions (right) and seeds

Easily confused species:

None

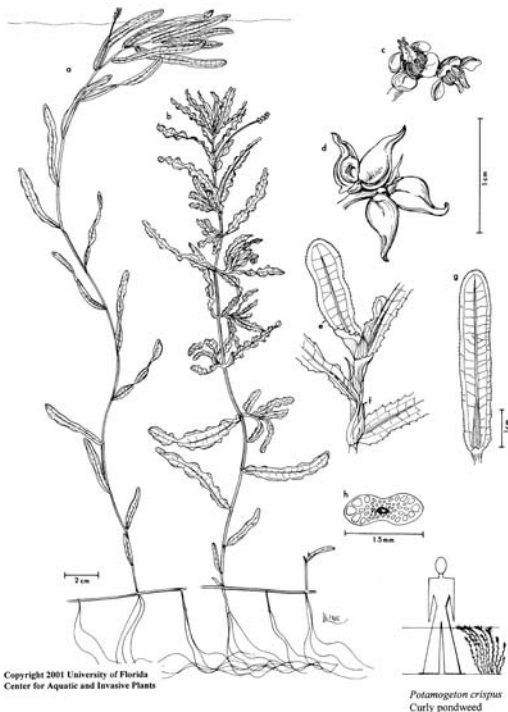


Photo by Leslie McElroy



Turion

Photo by CAES IAPP

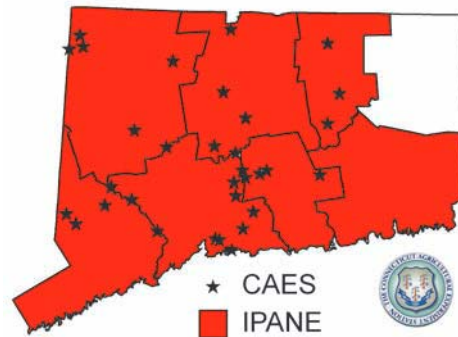


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Potamogeton crispus
Curly pondweed



Photo by CAES IAPP



Rorippa microphylla

Common name:

Onerow yellowcress

Origin:

North Africa, Europe, and the Middle East

Key features:

Stems: Grow flatly across the ground and root at nodes and forms large mats, can be fully to partially submerged

Leaves: Pinnate leaves with 3-9 segments and the terminal leaf is the largest

Flowers: White petals with 4 part perianth

Fruits/Seeds: Fruit is a long and slender silique, up to 1 inch (25 mm) long, with seeds in one row on each side

Reproduction: Seed

Easily confused species:

Watercress: *Rorippa nasturtium-aquaticum*



Photo by Carl Farmer

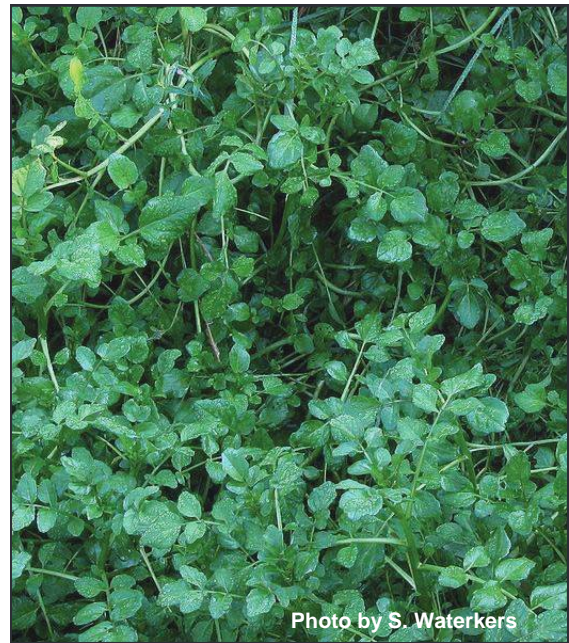


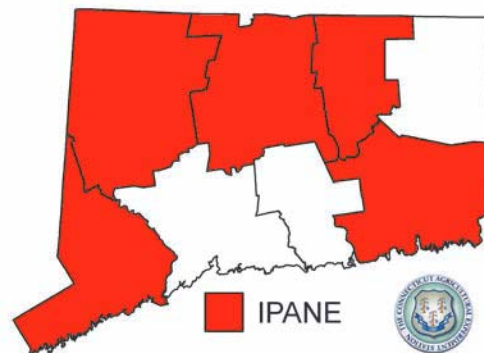
Photo by S. Waterkers



Fig. 129. *Nasturtium microphyllum*: a. habit, flowering and fruiting; b. habit, vegetative; c. flower; d. fruit; e. seed (G&W).

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Crow and Hellquist 2000



Rorippa nasturtium-aquaticum

Common name:
Watercress

Origin:
North Africa, the Middle East, and Europe

Key features:

Stems: Hollow stems can grow flat on mud or be fully or partially submersed

Leaves: Leaves are pinnately compound have 3-9 segments and vary in shape, the terminal leaf is the largest in each segment

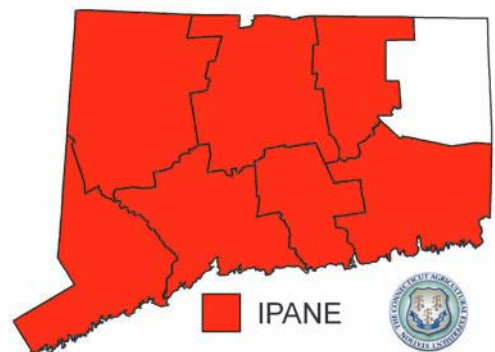
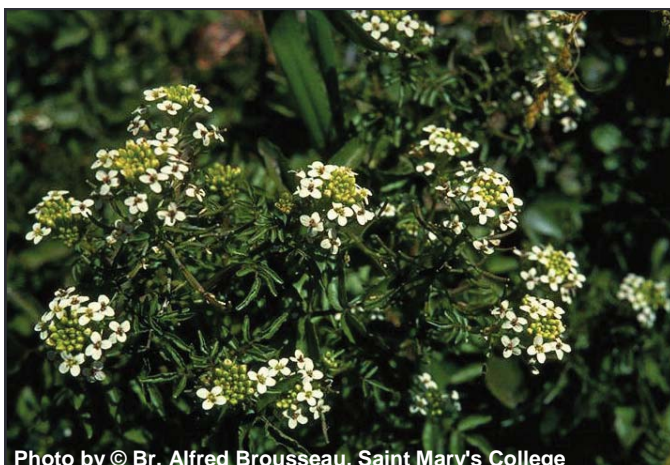
Flowers: Small white and green flowers; four white petals with four long and 2 short stamens

Fruits/Seeds: Fruit is pod-like silique, 0.4-0.6 in. (10-15 mm) long, with seeds in two rows per side

Reproduction: Fragmentation and seed

Easily confused species:

Onerow yellowcress: *Rorippa microphylla*



Salvinia molesta

Common names:

Giant salvinia
Water fern
Salvinia
Kariba weed
Aquarium watermoss

Origin:

Brazil

Key features:

Free floating plant with no roots

Stems: Horizontal stems float below the surface

Leaves: Submersed leaves are brown and feather-like; surface leaves are folded at midrib and covered with many water repellent hairs that are split in the middle but rejoin at the tips; leaves become tightly packed into long chains as the plant grows

Fruits/Seeds: Egg shaped sporocarps

Reproduction: Fragmentation

Easily confused species:

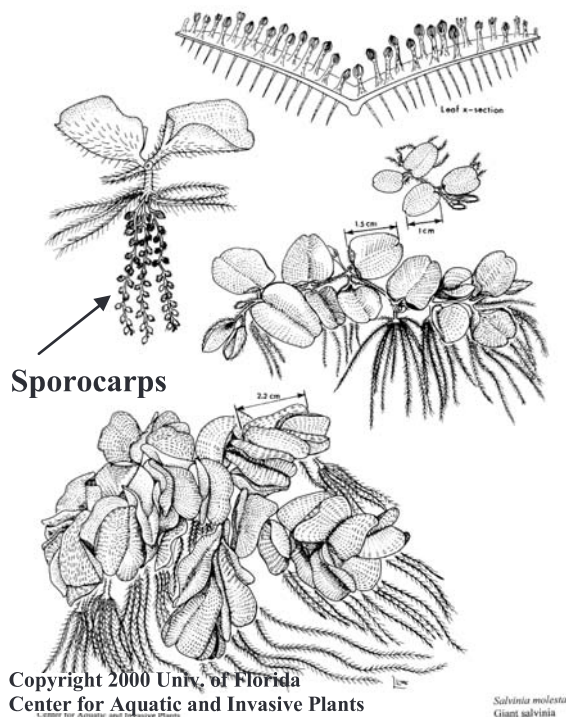
None



Photo by CAES IAPP

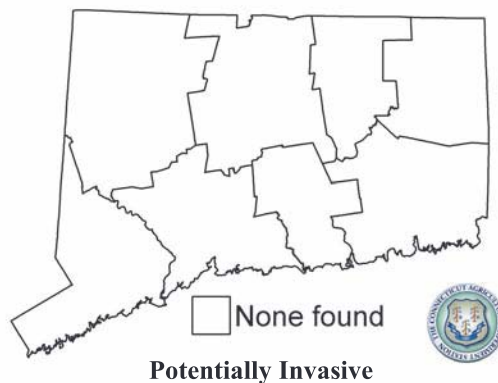


Photo credit A: Mic Julien, Commonwealth Scientific And Industrial Research Org., Bugwood.org



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Salvinia molesta
Giant salvinia



Trapa natans

Common names:

Water chestnut

European water chestnut

Origin:

Asia and Europe

Key features:

Plants are rooted to substrate and float

Stems: Stem is submersed, flaccid and can be up to 15 feet (5 m) long

Leaves: Leaves 0.8-0.16 inches (2-4 cm) long are triangular and toothed along the front edge with inflated petioles, leaves float in a rosette pattern

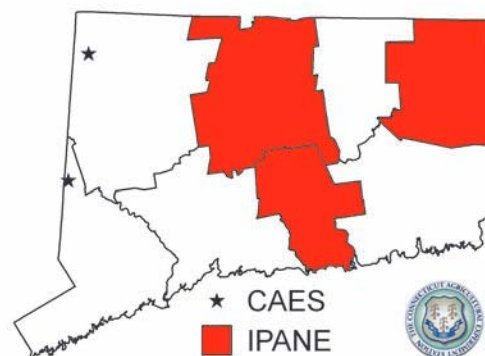
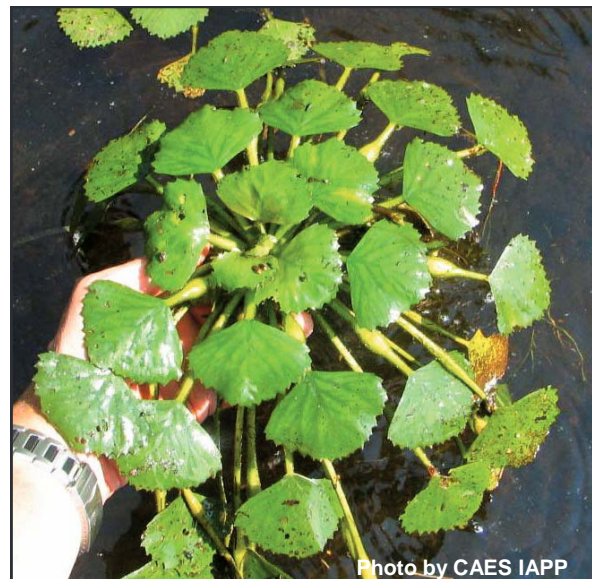
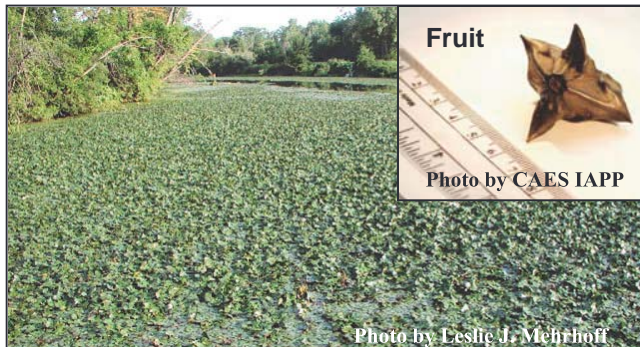
Flowers: Flowers are located in the center of the rosette and have four white petals

Fruits/Seeds: Fruit is hard and has four sharp spines

Reproduction: Seeds and fragmentation

Easily confused species:

None



Commonly confused aquatic plants

Submersed plants with non-dissected leaves

(all photos CAES IAPP)



Egeria densa
Brazilian water-weed
INVASIVE

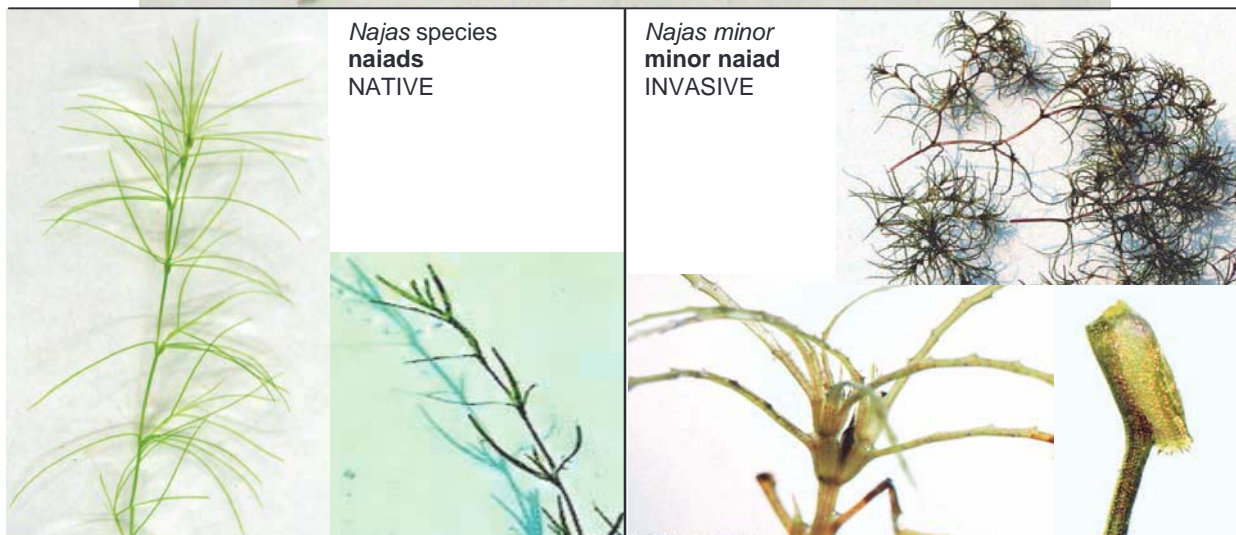
Elodea species
waterweeds
NATIVE

Hydrilla verticillata
hydrilla
INVASIVE

Egeria densa
Brazilian water-weed
INVASIVE

Elodea species
waterweeds
NATIVE

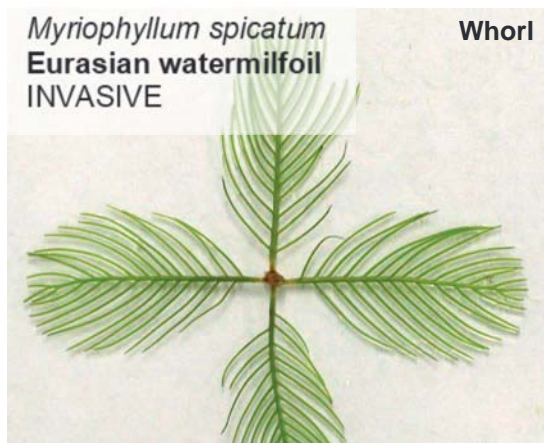
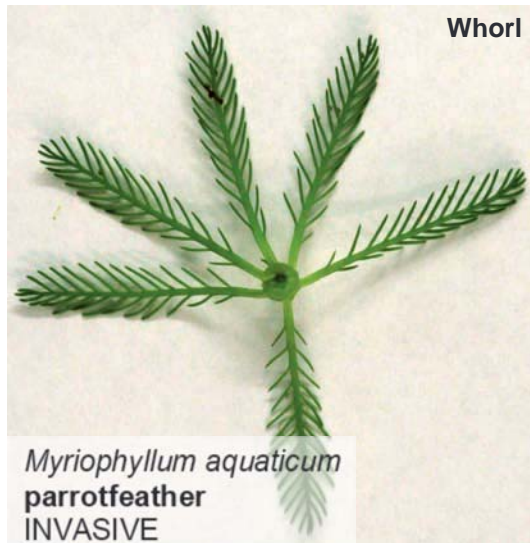
Hydrilla verticillata
hydrilla
INVASIVE



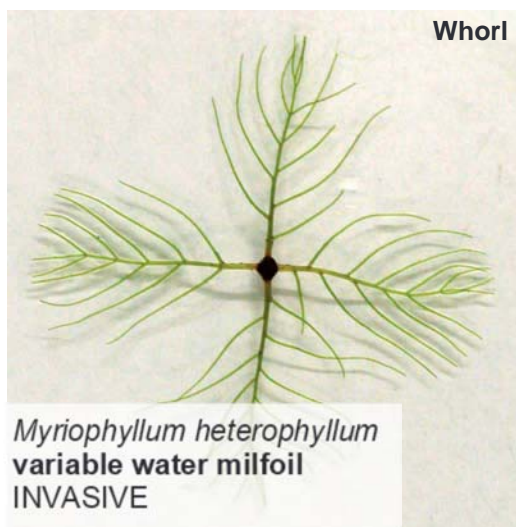
Najas species
naiads
NATIVE

Najas minor
minor naiad
INVASIVE

Submersed plants with feathery dissected leaves
(all photos CAES IAPP)

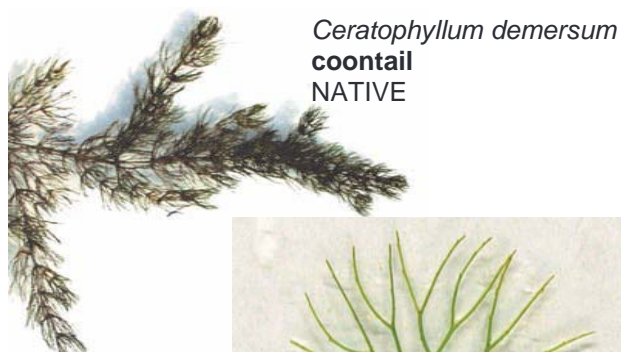


Note: *Myriophyllum sibiricum*, northern watermilfoil, is a threatened native species that is easily confused with Eurasian watermilfoil. Distinguishing features include; less than 12 leaflet pairs per leaf, winter buds and stem tips that are usually green instead of red.

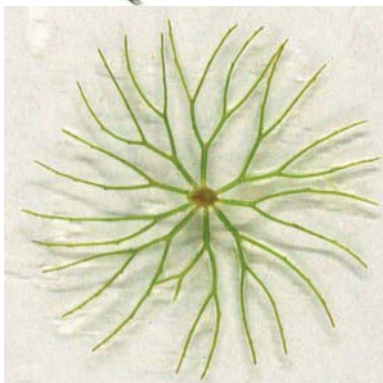


Submersed plants with forked and branched dissected leaves

(all photos CAES IAPP except where noted)



Ceratophyllum demersum
coontail
NATIVE



Utricularia species
bladderworts
NATIVE



Megalodonta beckii
water marigold
NATIVE

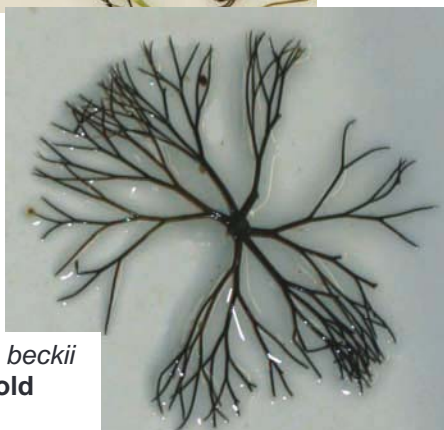
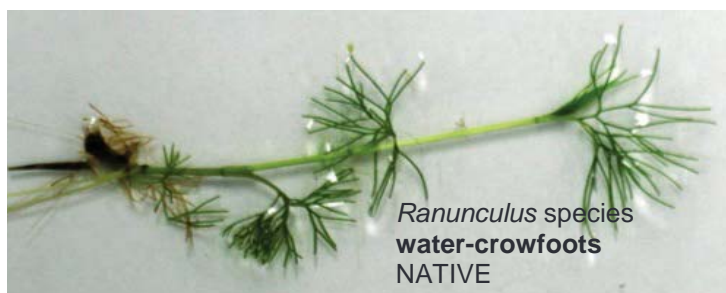


Photo by Amy Smagula

Cabomba caroliniana
fanwort
INVASIVE



Ranunculus species
water-crowfoots
NATIVE



Key to Invasive or Potentially Invasive Aquatic Plants of Connecticut



Floating-Leaf Plants (field characteristics)

1. Plants free-floating on water's surface, not rooted to the substrate*
 2. Leaves folded along midrib, surface covered with hairs.....*Salvinia molesta* (**Giant Salvinia**)
 2. Leaves not folded, surface smooth
 3. Petioles inflated; oval leaves in a rosette; light purple flowers*Eichhornia crassipes* (**Water Hyacinth**)
 3. Petioles not inflated; broad, fleshy leaves in a rosette, covered with dense white hairs.....*Pistia stratiotes* (**Water Lettuce**)
1. Plants rooted in substrate
 4. Leaves forming a rosette; leaves triangular, toothed; petioles inflated; spiny fruit.....*Trapa natans* (**Water Chestnut**)
 4. Leaves not forming rosette
 5. Leaves compound, cut into several leaflets
 6. Leaves comprised of four leaflets, like a four-leaf clover.....*Marsilea quadrifolia* (**European Watercress**)
 6. Leaves pinnately compound with 3-9 leaflets, terminal leaflet is largest; hollow stems floating; small white and green flowers in clusters
 7. Pod-like fruit 0.4-0.6 inches (10-15 mm) long, 2 rows of seeds per side.....*Rorippa nasturtium-aquaticum* (**Watercress**)
 7. Pod-like fruit 0.7-1 inches (17-26 mm) long, 1 row of seeds per side.....*Rorippa microphylla* (**Onerow Yellowcress**)
 5. Leaves entire or lobed
 8. Leaves entire (no slit), circular, bluish green, on stiff stalk above water.....*Nelumbo lutea* (**Water Lotus**)
 8. Leaves lobed, heart shaped
 9. Yellow flowers
 10. Flowers with five, fringed petals.....*Nymphoides peltata* (**Yellow Floating Heart**)
 10. Flowers ball shaped, petiole flattened.....*Nuphar variegata* (**Yellow Water Lily**) (native)
 9. White flowers with five, fringed petals; roots close to the floating leaves, near the surface of the water.....*Nymphoides cordata* (**Little Floating Heart**) (native)

*Plants such as yellow and little floating heart and water chestnut can become free-floating when dislodged from sediment or detached from a rooted plant.

Submersed Plants (field characteristics)

1. Leaves entire, sometimes toothed
 2. Leaves alternate, with wavy edges (lasagna-like); turions may be present; prominent leaf mid-vein..... *Potamogeton crispus* (**Curly Leaf Pondweed**)
 2. Leaves whorled, opposite, or clustered
 3. Leaf bases wider than the leaf blade, appearing opposite, whorled or clustered
 4. Toothed leaf edges visible without magnification; leaves appear curled under..... *Najas minor* (**Minor Naiad**)
 4. Magnification needed to see toothed edges..... *Najas* species (**Other Naiads**) (native)
 3. Leaf base not distinct from rest of leaf blade, leaves strictly whorled
 5. Whorls of 3 leaves; leaf margins not toothed..... *Elodea* species (**Waterweeds**) (native)
 5. Whorls of 4 or more leaves; leaf margins toothed (magnification sometimes needed)
 6. Leaves 4 per whorl (rarely up to 6 leaves/whorl), 0.5-1.5 inches (1.2-4 cm) long, toothed leaf margins (need magnification)..... *Egeria densa* (**Brazilian Waterweed**)
 6. Leaves 5 per whorl (rarely 2-6 leaves/whorl), 0.2-0.7 inches (0.6-1.7 cm) long, toothed leaf margins; mid-vein may be toothed; tubers present; may have turions..... *Hydrilla verticillata* (**Hydrilla**)
1. Leaves dissected
 7. Leaves feathery in appearance (pinnate)
 8. Leaves concentrated above the water; thin, rounded-tipped, blue-green leaves..... *Myriophyllum aquaticum* (**Parrotfeather**)
 8. Leaves concentrated below the water, except for emergent flower spikes
 9. Leaf whorls less than 1 inch (2.5 cm) apart, giving the plant a ropy look; triangular shaped leaves, with less than or equal to 11 pairs of leaflets; thick spike with entire to toothed leaves..... *Myriophyllum heterophyllum* (**Variable Watermilfoil**)
 9. Leaf whorls 1 inch (2.5 cm) apart; rectangular shaped leaves, with greater than or equal to 12 pairs of leaflets; thin spike with leaves smaller than flowers..... *Myriophyllum spicatum* (**Eurasian Watermilfoil**)
 9. Leaves rounded in whorls with less than 12 pairs of leaflets; winter buds *Myriophyllum sibiricum* (**Northern Watermilfoil**) (native, threatened)
 7. Leaves forked
 10. Leaves with numerous small bladders, not rooted..... *Utricularia* species (**Bladderworts**) (native)
 10. Leaves lacking bladders
 11. Leaves alternate; petioles sheathing stem; flowers usually solitary..... *Ranunculus* species (**Water-crowfoots**) (native)
 11. Leaves opposite or whorled
 12. Leaves whorled; leaf divisions fork in pairs, forking a total of 1-4 times, leaves often toothed; no roots or flower spike..... *Ceratophyllum* species (**Hornworts**) (native)
 12. Leaves opposite, fan-shaped; leaf divisions fork into either 2 or 3 segments
 13. Leaves attached to the stem with petioles; small floating leaves; flowers white..... *Cabomba caroliniana* (**Fanwort**)
 13. Leaves not attached to the stem by a petiole, leaves opposite but appearing whorled; emersed leaves on spike entire to toothed; flowers yellow..... *Megalodonta beckii* (**Water Marigold**) (native, threatened)

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Notes: