

A Field Guide to Common Aquatic Plants of Pennsylvania



PENNSTATE



**College of
Agricultural Sciences**

CONTENTS

Introduction.....	2
Algae	8
Emergent.....	20
Submerged	48
Floating.....	82
Index	102



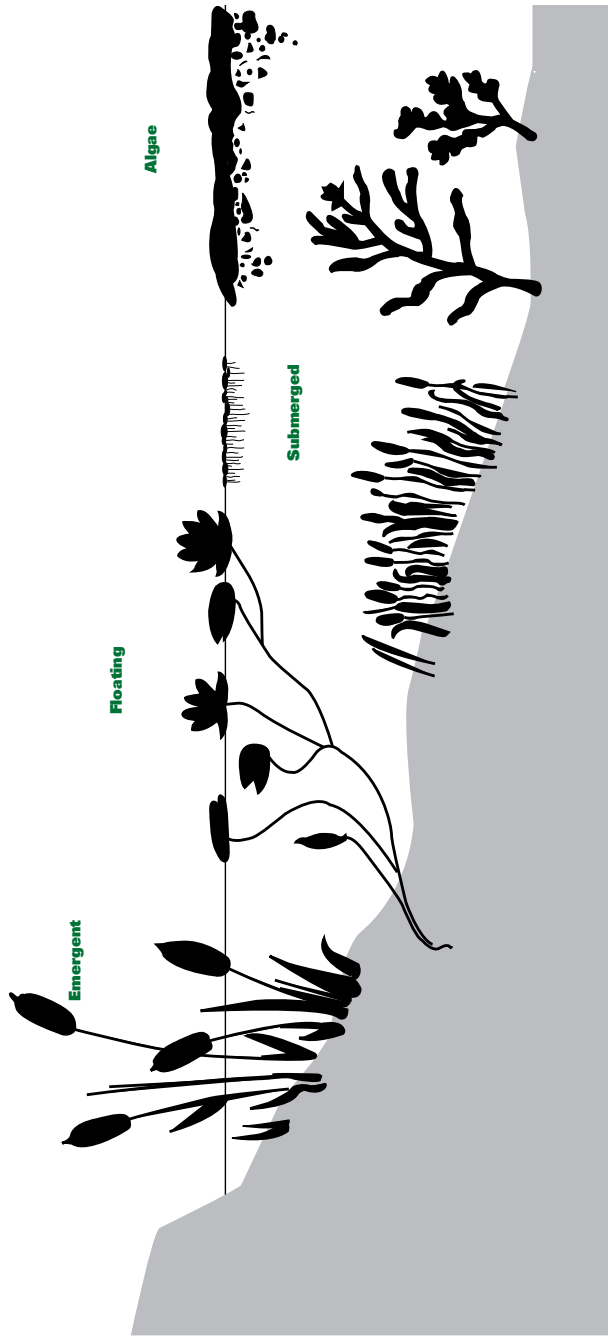
INTRODUCTION

Pennsylvania's ponds and lakes support a diverse array of aquatic plant life. Although there are many more aquatic plant species in Pennsylvania than will be found in this publication, *A Field Guide to Common Aquatic Plants of Pennsylvania* was designed to aid you in identifying and managing the most commonly occurring aquatic plants throughout the Commonwealth.

Depending on a water body's intended use, aquatic plants can be looked upon as either a beneficial part of the aquatic ecosystem or a frustrating nuisance. Certain aquatic plants provide ideal habitat for a variety of fish, other aquatic species, and migratory birds; some have beautiful flowers at certain times of the year. Yet some of these same aquatic plants can choke off boating, fishing, or swimming areas.

Alternatives for managing aquatic plants include physical and mechanical control, biological control, and chemical control. A vital point to remember is that *proper identification* of aquatic vegetation is critical to its management.

There are four categories of aquatic plants—algae, emergent plants, submerged aquatic vegetation, and floating plants. *Algae* are primitive, simple plants without true roots, leaves, or flowers. They are found either free floating in water or attached to other plants, bottom sediments, rocks, or other solid structures. *Emergent* plants grow along water body edges, with only short portions of their stems and roots submerged. *Submerged* plants grow in deeper water and usually are attached to the pond bottom. They remain under water until flowers and seeds form out of the water. *Floating* plants are rooted, with much of their structure, especially leaves, floating on the surface. They can also be unattached, obtaining nutrients through small rootlets that dangle in the water.



Invasive Plants

A concern in Pennsylvania and throughout the United States is the influx of invasive plants. It is important to note that not all nonnative plants are invasive. Species escaping cultivation or that are accidentally introduced most often have no negative impact in their new landscape. Aquatic invasive plants are defined as:

nonnative species that threaten the diversity or abundance of native species, the ecological stability of infested waters, human health and safety, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters. Aquatic invasive plants within Pennsylvania interfere with water uses (drinking water, water intakes, recreation), affect the ability of our lakes and streams to support native fisheries and wildlife, lower water quality, and alter riparian conditions. Aquatic invasive plants are responsible for significant annual financial losses to the Commonwealth's economy.

—Commonwealth of Pennsylvania, *Pennsylvania Invasive Species Council Aquatic Invasive Species Management Plan*, October 2006

Nonnative plant species did not originate in our region; they may be invasive, meaning that they grow quickly and overtake areas where native vegetation typically grew. Some of the aquatic plants listed in this field guide are noted as invasive plants. The best way to prevent nonnative invasive species from taking over our water bodies is to prevent their introduction and transfer. Many species are transferred as “hitchhikers” on boats, in bilge water, and on waders, fishing tackle, and boat trailers. Proper inspection and cleaning of these items when moving from one body of water to another will help prevent the transfer of nonnative invasive species. They can also hitchhike as contaminants in aquatic plant purchases.

More information on general pond maintenance and management of aquatic plants can be found in the Penn State College of Agricultural Sciences publication *Management of Aquatic Plants* (see “Information Resources” at the end of this guide).

Aquatic Plant Control

Proper identification of a plant is critical for determining the appropriate treatment. Also, because some plants create ideal habitat, certain plants may be encouraged or controlled but not eliminated.

NUTRIENT MANAGEMENT—Overabundant plant growth is usually caused by excessive nutrients (nitrogen and phosphorus). Phosphorus especially may enter the pond attached to sediment that erodes from nearby landscapes. Erosion can also cause sediment to build up in the water body, which decreases the depth and possibly the surface area. Nutrient management efforts should focus on limiting the amount of runoff from agricultural areas, sewage systems, and managed turf areas (e.g., lawns, golf courses). Long-term control of overabundant plants is best accomplished by reducing sources of nutrients and sediment or by directing them away from the pond.

PHYSICAL AND MECHANICAL CONTROL—Physical removal is most effective for small quantities of plants near the shoreline. This technique consists of cutting, mowing, raking, digging, or pulling. Pulling or cutting must be repeated several times to eliminate new growth. One thing to keep in mind is that certain types of plants can spread by fragmentation, and improper physical or mechanical removal can cause the plants to spread further. It is critical to remove the harvested plant matter from the pond shoreline to keep any nutrients stored in the plant from reentering the pond as the plants decompose.

Drawdown, or reducing the water level, during the fall is another method of physical control for some aquatic plants. Drawdown during the winter exposes aquatic plant roots to freezing temperatures, which reduce or eliminate plant growth the following summer. Drawdown usually requires a permit from the Pennsylvania Fish and Boat Commission.

BIOLOGICAL CONTROL—Biological plant control may be achieved by introducing a vegetation-eating fish such as triploid grass carp. Their preferred food is submerged aquatic plants.


CHEMICAL CONTROL—Herbicides are widely used to control vegetation, but they should be handled with care. Select the correct chemical for the identified problem plant, and read and follow the product label carefully. Using the wrong chemical will result in failure to control the target plant. Excessive application can damage nontarget plants and animals, and may also kill fish, because oxygen is consumed by the rapid decay of dead plants.


Use of an aquatic pesticide is a regulated activity, even in private ponds. A joint Pennsylvania Fish and Boat Commission–Pennsylvania Department of Environmental Protection “Application and Permit for Use of an Algaecide, Herbicide, or Fish Control Chemical in the Waters of the Commonwealth” must be submitted and approved by both agencies before the pesticide can be used. Pond owners can also hire various state-certified aquatic herbicide applicators as consultants to apply aquatic herbicides professionally.

For more information on pond management and aquatic plant control, refer to the Penn State College of Agricultural Sciences Water Resources Extension Web site (water.cas.psu.edu/). You can also contact your county Penn State Cooperative Extension office, where personnel can assist you and direct you to more detailed pond management publications, such as *Management of Aquatic Plants* (see “Information Resources”).

Tools For Using This Guide

Each identified plant includes any known alternate names, a brief description, any known values, possible special control considerations, and common look-alikes. Photos and line drawings are included to aid in identification.

 When you see this symbol, it indicates the plant on that page is **invasive** in Pennsylvania and should be eradicated if possible.

 When you see this symbol, it indicates the plant on that page can become more of a nuisance when you are trying to control it physically or mechanically because it reproduces quickly through fragmentation.

General guide to suitability of treatments, by plant group.

	Emergent	Submerged	Floating leaf	Free floating	Filamentous algae	Planktonic algae
Nutrient control	●	●	●	●	●	●
Skimming/raking	○	◐	○	●	◐	○
Dredging	●	●	◐	○	○	○
Mowing/cutting	●	◐	◐	○	○	○
Bottom barriers	●	◐	◐	○	○	○
Shades/dyes	○	◐	◐	○	◐	◐
Grass carp	○	◐	◐	○	○	○
Insects	◐	◐	○	○	○	○
Water drawdown	●	◐	◐	○	○	○
Barley straw	○	○	○	○	◐	◐
Herbicides/algaecides	●	●	●	●	●	●

● = Effective control ◐ = Partial control—proper technique required
○ = Little or no control

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Blue-Green Algae

Cyanobacteria

DESCRIPTION—Blue-green algae are photosynthetic bacteria. Commonly referred to as “pond scum,” they are too small to be seen with the naked eye and, instead, cause pond water to become murky or colored. Blue-green algae can sometimes turn pond water a blue green, but more often they make the water appear green, reddish purple, or brown. These algae generally grow in lakes, ponds, and slow-moving streams. Warm, nutrient-rich water encourages their growth.

Blue-green algae can reduce light penetration, create taste and odor problems, cause a depletion of oxygen during die-off (see below), and produce toxins. These toxins can cause illness. If animals such as dogs and cattle consume large quantities of blue-green algae while drinking the water, they may become very ill, and even die. Humans may also become sick if the water is ingested. Symptoms of blue-green algal toxin poisoning may include lethargy, loss of appetite, seizures, vomiting, and convulsions.

VALUE—Most algae are microscopic and serve as the main supply of “high-energy” food for larger organisms like zooplankton, which in turn are eaten by small fish.

COMMON LOOK-ALIKE—phytoplankton

SPECIAL CONTROL CONSIDERATION—Aeration is the recommended method for controlling blue-green algae. Chemical treatment should be undertaken with great caution. When chemicals are applied, there could be a high volume of dead and dying algae, which release large quantities of toxins into the pond all at one time.

Humans may be exposed to these toxins through contact with the skin or by swallowing contaminated water while swimming or participating in other water-related activities.



Chara

Chara spp.



ALTERNATE NAMES—stoneworts, muskgrass, brittlewort, candelabra plant

DESCRIPTION—Chara is classified as algae despite looking very much like a rooted aquatic plant. It may also be classified as macro algae, non-microscopic algae that can be easily seen with the naked eye. Around the stem are whorls of six- to eight-inch “leaves,” which are often encrusted with calcium carbonate. Chara grows in dense mats and feels grainy or crunchy to the touch and when crushed. It produces a musty garlic or skunklike odor. It prefers soft sediment and is usually found in hard-water ponds in limestone areas of Pennsylvania.

VALUE—Chara is an excellent food source for many species of waterfowl and various fish species. It is home to many micro- and macroinvertebrates and provides good cover for small fish. Salamanders and newts lay eggs in Chara beds. Generally considered a beneficial plant, Chara can become a nuisance especially in shallow ponds in hard-water regions of the state.

COMMON LOOK-ALIKE—Nitella



Didymo*Didymosphenia geminata*

**ALTERNATE NAME**—rock snot

DESCRIPTION—Didymo blooms can occur in nutrient-rich streams and rivers but generally do not occur in ponds or lakes. Blooms form thick mats of gray, white, or brown cottony material resembling balls of slime on the bottoms of rivers and streams. The mats can form to over eight inches thick. They may smother aquatic plants and small aquatic insects, reducing fish habitat and food sources.

SPECIAL CONTROL CONSIDERATION—The only sure way to control didymo's spread is to “check, clean, and dry.” Anglers, kayakers, and boaters should always check their equipment and boots before leaving a waterway. Remove any obvious clumps of algae and leave them at the site. Dispose of all material found later in the trash. Soak and scrub all equipment for at least one minute in hot, soapy water.



Filamentous Algae

Various filamentous spp.

DESCRIPTION—Filamentous algae probably pose the most common aquatic plant problem in Pennsylvania ponds. They begin growth on pond bottoms in shallow water or attached to structures in the water (like rocks, branches, pylons, or other aquatic plants). The algae can rise to the surface and form long strands that float together in mats resembling thick stringy hair or cloudlike or cotton candylike masses.

There are many species of filamentous algae. More than one species may be present at the same time. Under ideal growing conditions, filamentous algae may completely cover a pond. Mass die-offs can cause an overabundance of algal material, which can result in a fish kill. This happens when bacteria at the bottom of the water body work to break down the decaying algae, consuming oxygen in large quantities. The result is a limited amount of oxygen available for fish and other aquatic organisms.

VALUE—Filamentous algae serve as an important source of food and habitat for protozoa and small fish in a pond. They are present at some level in all ponds and are generally harmless.

SPECIAL CONTROL CONSIDERATION—Barley straw has been shown in some instances to reduce filamentous algae growth in *some* ponds. Barley straw does not actively kill existing algae. It must be added to the pond prior to the growing season to prevent the algae from growing.



Nitella

Nitella spp.

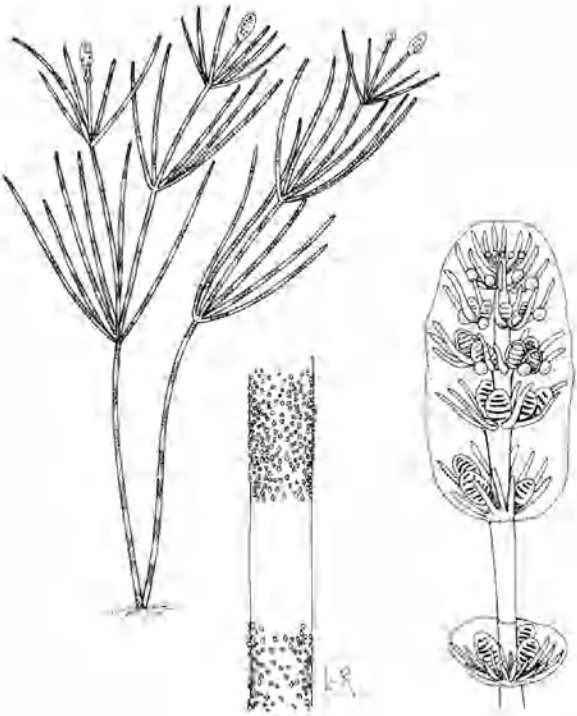


ALTERNATE NAME—stonewort

DESCRIPTION—Nitella looks like Chara but tends to form in deeper waters. Nitella can be classified as macroalgae—nonmicroscopic algae that can be seen easily with the naked eye. Branches are arranged in whorls around the main stem. Unlike Chara, Nitella has very smooth stems and branches that are a translucent green without any hard encrustation. Also, Nitella has no odor and is soft to the touch. It is most common in soft-water ponds, especially in northeastern Pennsylvania. It is usually considered a beneficial plant.

VALUE—Waterfowl may feed on Nitella. It is also home to many microscopic algae and invertebrates that are eaten by small fish. It is an excellent source of food and habitat for small fish.

COMMON LOOK-ALIKE—Chara



Planktonic Algae

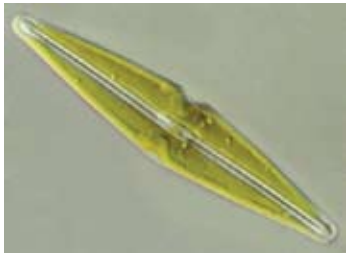
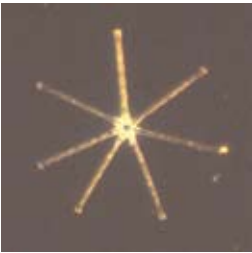
Various planktonic spp.

DESCRIPTION—Planktonic algae are very small plants that can only be seen under a microscope. Some are present in all ponds, and their presence is necessary for maintaining a healthy pond food chain. Under ideal conditions (sunlight and nutrients) they may grow rapidly (called a “bloom”), which can turn the pond water green or brownish. Some rare species of plankton algae can produce toxins that can make humans or animals sick if the water is ingested.

These algae tend to exhibit seasonal trends throughout the year and are often present under the ice and into the spring. Golden brown algae and green algae may increase through the summer, and cyanobacteria may bloom late in the summer or early in the fall. These algae may color the water from brown to green to bluish green as the summer progresses.

VALUE—Planktonic algae are an important source of food for protozoans and small fish in a pond. They are considered the beginning of the pond food chain.

SPECIAL CONTROL CONSIDERATION—Aerating the pond may be helpful for reducing blooms of some plankton algae.



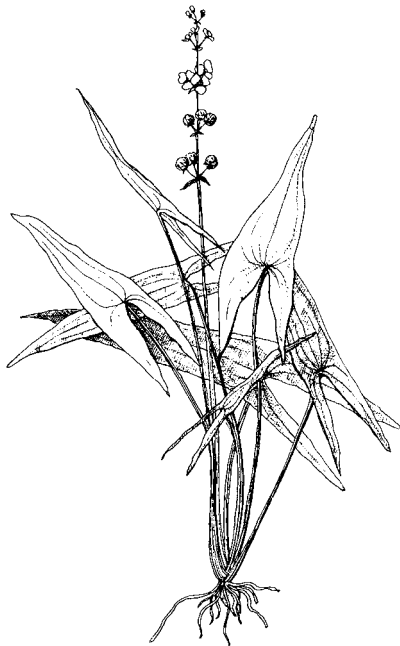
Arrowhead

Sagittaria spp.

ALTERNATE NAMES—duck potato, wapato, swamp potato, tule

DESCRIPTION—Arrowhead can grow one to one and one-half feet high. The leaves can be broadly or narrowly arrow shaped, lance shaped, or tapelike. The leaf veins originate from the point where the stem connects to the leaf, and radiate outward. The flowers are white, three petaled, and whorled, and grow on the tip of a flower stalk. Fruits are tightly packed balls of seeds. Plants reproduce by rootstocks and seeds. They grow in shallow water or wet areas around pond perimeters.

VALUE—Arrowhead roots produce tubers that are often eaten by beavers, muskrats, ducks, and geese.

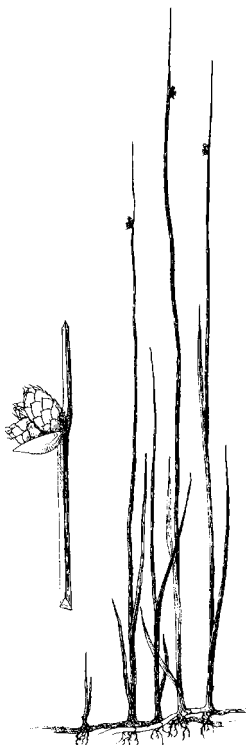




Bulrush*Scirpus spp.*

DESCRIPTION—Bulrush has unique stems that are revealed to be triangular when cross-sectioned. Plants usually grow two to three feet tall with flowers on spikes near the tips. Some species of bulrush can grow to ten feet in height. Plants may form very dense stands after being established for several years. They grow in wet areas or in water up to three feet deep. They sprout each spring from buds on rhizomes. Flowers usually occur just below the tip of the stem.

VALUE—Bulrushes provide habitats for many micro- and macroinvertebrates, which are eaten by fish and other wildlife. Ducks and other birds eat the seeds, while geese and muskrats consume the rhizomes and early shoots.





Bur-reed

Sparganium spp.

ALTERNATE NAMES—ox-tongue, bur-flag

DESCRIPTION—Bur-reed has long, erect, swordlike leaves that usually reach one to three feet tall. It may also have ribbonlike leaves and be submerged in up to four feet of water. A cross-section of the soft leaf shows it to be triangular. The stems bear male flowers at the tip and female flowers below. Fruiting heads are one-inch-round balls with many spiky seeds. When in fruit, the burlike seed head is distinctive. The plant reproduces from seeds or rootstocks. It may grow from the shore and in up to three feet of water.

VALUE—Bur-reed protects the shoreline from erosion. Plants are eaten by a variety of wildlife and provide habitat for many insects. They also make good nesting sites for some animals and birds. Humans can consume the plant tuber as a starch substitute.





Cattail

Typha spp.

ALTERNATE NAMES—cat-o'-nine-tails, flag, marsh beetle, candlewick, Cossack asparagus

DESCRIPTION—Cattails are a common wetland and pond plant in Pennsylvania. They grow up to six feet tall, with ribbonlike leaves that taper to a point. Dark brown, cigarlike flowers occur on stalks, which are taller than the leaves. Male flowers form at the tip, female flowers form below. Cattails grow at the water's edge but are commonly found at depths of three to four feet. They reproduce from seeds or rootstocks.

VALUE—Cattails support a diverse wildlife community. They provide food and shelter for insects and some aquatic mammals such as muskrats, as well as perches for birds and colorful dragonflies. The underwater plant portions also serve as excellent cover for young fish. Parts of the plant are edible by humans throughout the year. Native Americans used cattails in a variety of ways, including as poultices for wounds and as downlike fill in their blankets and pillows. Cattails make an excellent buffer plant around pond perimeters because of their ability to take up nutrients and metals from the water, thereby cleaning runoff before it enters the water body. They are also good for erosion control and for filtering out sediment suspended in flowing water.

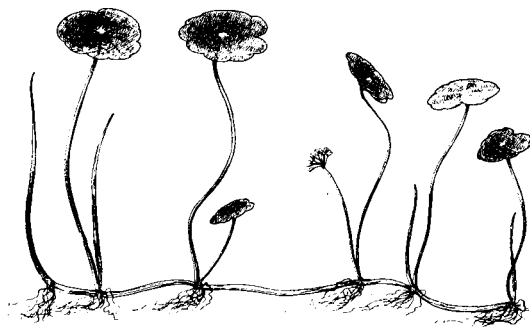
SPECIAL CONTROL CONSIDERATION—Cutting cattails off below water level causes them to “drown.” Cutting may have to be repeated if there is regrowth.



Pennywort*Hydrocotyle spp.*

DESCRIPTION—Pennywort has rounded leaves that are slightly notched and attached at their middles. Leaves are shiny and thick. The stems creep along the ground or underwater, with leaves rising vertically away from the stem. The flowers are tiny and white, sometimes greenish white, growing on stalks similar to leaf stems. Pennywort may be found on moist soil as well as in water. It reproduces from fragments and seeds and can spread across the soil or water in large mats.

VALUE—Pennywort's very dense mats provide food and shelter for various animals. The underwater stems create habitat for young fish. Pennywort is also an aesthetically pleasing plant.





Phragmites

Phragmites australis



ALTERNATE NAMES—giant reed, common reed

DESCRIPTION—Phragmites can grow very tall (six to fifteen feet). Grasslike leaves form alternately along the stem. The stem is topped with a spike similar to that of corn stalks and forms broad purple-colored seeds. Plants may grow onshore or in pond water. They reproduce from seeds and from creeping rhizomes. Phragmites is often found growing in wet areas along highways, especially in eastern Pennsylvania.

VALUE—Phragmites may quickly colonize disturbed areas around a pond. It grows so dense that it is often considered a nuisance plant. It has little wildlife or fish value besides affording cover. Birds use the dense stands for shelter. Muskrats may also feed on this plant.





Pickerelweed*Pontederia cordata*

ALTERNATE NAME—tuckahoe

DESCRIPTION—Pickerelweed has elongated, heart-shaped, waxy leaves. Each leaf has curving veins that follow the margin to a rounded tip. The plant produces violet-blue, bluish, or (rarely) white flowers on spikes to six inches long. Reproduction is by creeping rootstocks or seeds. Pickerelweed is prolific and can cover a large part of the pond perimeter. It generally grows in shallow water, typically one to two feet tall, rarely reaching four feet tall.

VALUE—The flowers of pickerelweed are beautiful, adding aesthetic appeal to the pond perimeter. The plant protects the shoreline from erosion and provides cover for fish. Insects use the flowers for pollination, and waterfowl feed on the seeds.

COMMON LOOK-ALIKE—arrowhead



Purple Loosestrife

Lythrum salicaria

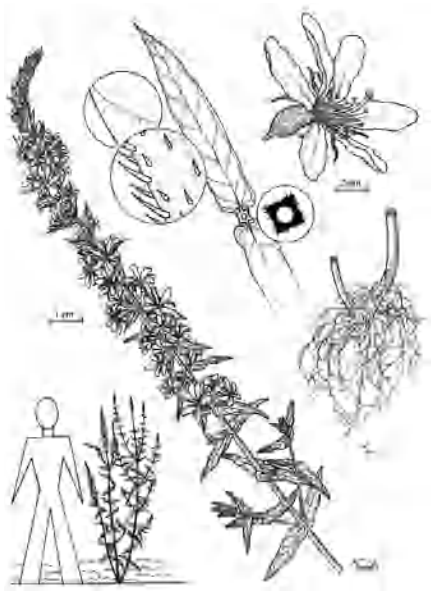


ALTERNATE NAMES—spiked loosestrife, black blood

DESCRIPTION—This exotic plant from Europe and Asia spreads quickly, out-competing native plants and eliminating open water habitats. It can grow up to seven feet but is usually three to four feet tall. It has long, square stems with leaves in whorls of two to four. The narrow leaves are about one to four inches long and end in a point. Loosestrife produces clusters of purple flowers in a terminal spike. The plants germinate from seed and often first appear in disturbed areas around a pond. One mature purple loosestrife plant can produce up to 2.5 million seeds per season.

VALUE—Pond owners attracted by this plant's beauty may be unaware of its invasive nature; they often dig it up and plant it, thereby spreading purple loosestrife. It has little or no benefit for wildlife or fish in ponds.

SPECIAL CONTROL CONSIDERATION—Purple loosestrife should be removed as soon as it first appears. Fragments left over from physical removal can resprout, so be careful to remove the entire plant. If the plant is in flower, cut off the flower stalks and put them in black plastic trash bags to prevent the release of any seeds.

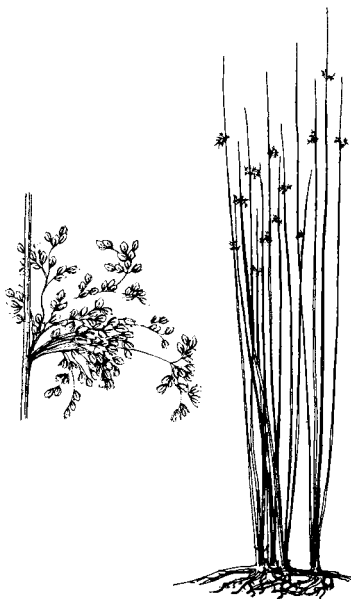


Rush, Common*Juncus effuses*

ALTERNATE NAME—soft rush

DESCRIPTION—Rushes can be difficult to identify without a detailed botanical key because there are many species. Common rush has smooth, tubelike stems (remember, “rushes are round”) that grow three to four feet tall, resembling grasses and sedges. Clumps of stems arise from stout rootstocks. Greenish brown flowers are borne near the tip of the stem and peak in July. Common rush is usually found in moist areas and in very shallow portions of a pond. It reproduces from rootstocks and seeds.

VALUE—Common rush benefits the pond ecosystem in a variety of ways. It provides good shoreline protection and filters out solids suspended in the water. Its seeds are an important source of food for many birds and muskrats. Colorful insects, also a source of wildlife food, perch on rush stems around the pond. The underwater bases of rush stems growing in the water provide cover and habitat for fish.





Sedge

Cyperaceae family

DESCRIPTION—There are many species of sedges. Typically, they are grasslike, triangular-shaped stems (remember, “sedges have edges”) growing in clumps approximately two feet tall and two feet wide, with flower spikes. As leaves die they build up along the bottom of the plant, making a “tussock,” or little hill.

VALUE—The seeds are an important food for wildlife, and the tussocks provide nesting sites for birds or small animals. Many insects feed on sedges. Both the seeds and the feeding insects are a major food source for many bird species. Livestock were grazed on sedge meadows through the early twentieth century.



Smartweed

Polygonum spp.

ALTERNATE NAMES—water pepper, willow weed, sickle weed, water persicaria

DESCRIPTION—The leaves of water smartweed are long, linear, pointed at the tip, and up to four inches long. There are no submerged leaves. Leaves are alternate and the plants have swollen stem joints. Stems are upright or sprawling, growing in shallow water or on muddy banks. Light or deep pink or white flowers form in spikes at the end of stems after starting out greenish or whitish. The fruits of smartweed are triangular, flat, and dark brown to black. Water smartweed reproduces by rootstocks and seeds. It is found mostly in quiet inlets of a pond.

VALUE—The seeds are eaten by a variety of wildlife, including many birds. Floating leaves offer cover for fish.



Spike Rush

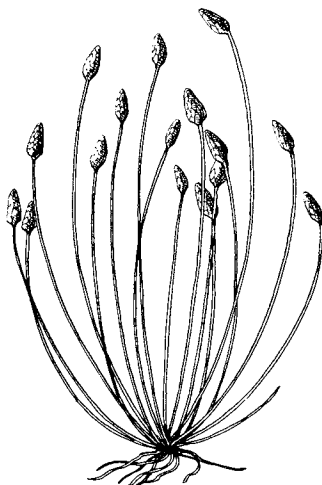
Eleocharis spp.

ALTERNATE NAME—creeping spike rush

DESCRIPTION—Spike rushes can be difficult to identify without a detailed botanical key because there are many species. Stems of this small plant are hollow and rise in clumps from relatively shallow roots. The stems are four to twenty-seven inches tall and terminate in an oval fruiting spike that is yellow to brown. Spike rush reproduces from rootstocks and seeds. It grows very near pond margins. Plants can also form submerged, grasslike stands.

VALUE—The root systems help to stabilize pond margins and prevent erosion. Spike rush is also used in wetland restoration projects. Stems are eaten by wildlife, and spikes are consumed by many birds. The plant's underwater structure provides habitat for fish and snail species.

COMMON LOOK-ALIKES—grasses and sedges





Water Plantain

Alisma triviale (Northern)

Alisma subcordatum (Southern)

ALTERNATE NAME—mad-dog weed

DESCRIPTION—Water plantain is a group of hardy aquatic plants that grow one to three feet high and flourish in shallow water or mud, although they will grow in water up to eighteen inches deep. Plants produce rosettes of long-stalked, rounded to heart-shaped leaves. The large leaves are smooth, broad at the base but tapering to a point; they grow directly from the root on long, triangular stalks and are nearly erect. The leaves are also strongly veined.

In June through September, the plant produces pinkish white flowers. The flowers of northern or “large” plantain are $\frac{1}{4}$ inch across, whereas flowers of southern or “small” plantain are $\frac{1}{16}$ to $\frac{1}{8}$ inch across. The flower stalk, which rises directly from the tuber, is three cornered and from one to three feet in height. The roots are fibrous, but the base of the stem is tuberous with a tuft of numerous whitish hairs.

VALUE—This aesthetically appealing plant is often sold for use in water gardens.

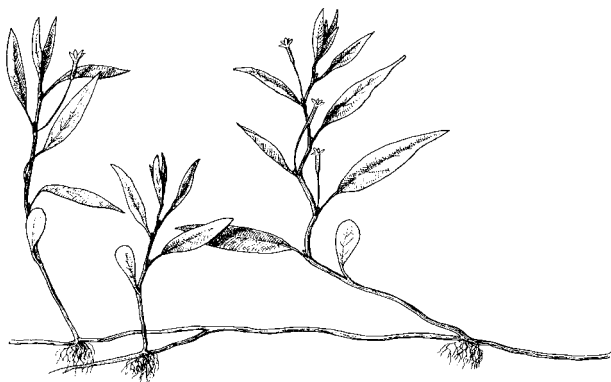
COMMON LOOK-ALIKE—arrowhead



Water Primrose*Ludwigia spp.*

DESCRIPTION—Water primrose leaves are oval to lance shaped, up to three inches long. Plants stand erect along the shoreline but also form long runners (up to sixteen feet) and sprawl or partly float in shallow water. They reproduce by rootstocks and seeds. Leaves can be green to reddish depending on the species. The single flowers are yellow, with four or five petals depending on the species. Flowers vary in size from one inch to two inches in diameter.

VALUE—Water primrose makes a beautiful addition to a pond margin. There is some limited wildlife value. Ducks and other waterfowl consume the seeds.





Bladderwort

Utricularia spp.

ALTERNATE NAMES—hooded watermilfoil, pop-weed

DESCRIPTION—A fairly common aquatic plant in Pennsylvania, bladderwort lacks true roots and often floats freely beneath the water surface. It has characteristic tiny oval bladders near the bases of finely divided leaves. It is usually found in cold ponds with acidic and soft water most prevalent in northeastern Pennsylvania. Reproduction is by winter buds. Emergent flowers are typically yellow or purple but may range to white and green. Bladderwort is especially interesting because it is carnivorous, digesting organisms such as insect larvae and zooplankton that are sucked into a trap door on each bladder. The bladders have hairs that the tiny organisms trigger as they swim.

VALUE—Bladderwort provides food and cover for fish. It is especially valuable because it is able to grow in acidic ponds with loose sediment where few other aquatic plants will grow.





Coontail*Ceratophyllum spp.*

**ALTERNATE NAME**—hornwort

DESCRIPTION—The dark olive-green leaves of coontail are whorled around the stem. Each leaflet is forked with toothed edges. The leaflets are more densely crowded around the tip of the stem, giving the appearance of a raccoon tail. The purplish green flowers form where the leaf attaches to the stem and remain submerged. The plant may be anchored to the bottom or, more likely, free-floating beneath the surface. Coontail prefers ponds with hard water, although one species can be found more commonly in softer, acidic waters. Coontail can tolerate low light conditions in deep water. Plants have been described as having a very coarse or “plastic” feeling. Coontail spreads by seeds and by fragmentation.

VALUE—Coontail foliage is a favorite of many species of waterfowl and muskrats in Pennsylvania. It is also home to many invertebrates such as snails, crustaceans, and insect larvae, thus providing a great source of food for fish. Coontail inhibits the growth of blue-green algae on its stems by secreting sulfur-based toxins.





Elodea*Elodea canadensis*



ALTERNATE NAMES—waterweed, native *Elodea*, Canadian waterweed

DESCRIPTION—Elodea is one of the most common plants in Pennsylvania ponds. It has densely whorled, dark-green leaves. The leaves usually occur in whorls of two to three that become more crowded toward the top of the stem. The dense tops can produce very thick growth near the water surface. This plant is typically rooted but can survive and grow as floating fragments. Elodea may act more like an evergreen and survive throughout the winter on a pond bottom. The flowers have three petals and are green or white. Plants reproduce from fragments.

VALUE—Elodea is commonly used as an aquarium plant. Its thick stems provide cover for young fish and are home to many invertebrates that serve as a food source. The stems are also fed upon by muskrats and waterfowl. As long as it does not grow too abundantly, elodea is one of the most beneficial pond plants for its value as habitat and wildlife food, especially since it often remains green during the winter. This plant is an excellent oxygenator.

COMMON LOOK-ALIKES—Brazilian elodea, hydrilla, egeria





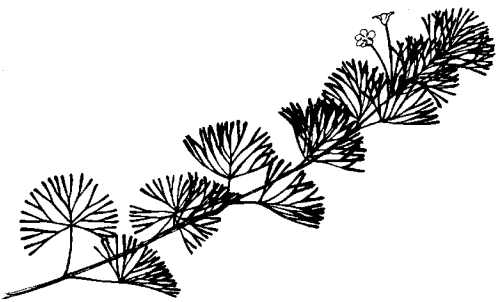
Fanwort*Cabomba caroliniana*

**ALTERNATE NAME**—cabomba

DESCRIPTION—Fanwort is a common aquarium plant that was introduced in Pennsylvania from the South and has adapted to our winter conditions. Its opposite leaves branch or fork into fan-shaped leaflets. Forked leaflets are wider at the tip than at the base. Some plants have small, floating, lilylike leaves that form at the water surface during flowering. The inconspicuous flowers, $\frac{1}{2}$ to $\frac{3}{4}$ inch wide, are white to lavender. This species reproduces by plant fragments and seeds.

VALUE—Fanwort stems are home to many invertebrates that serve as food for young fish. They also provide habitat for fish. The benefits, however, are outweighed by fanwort's invasive nature.





Hydrilla*Hydrilla verticillata*

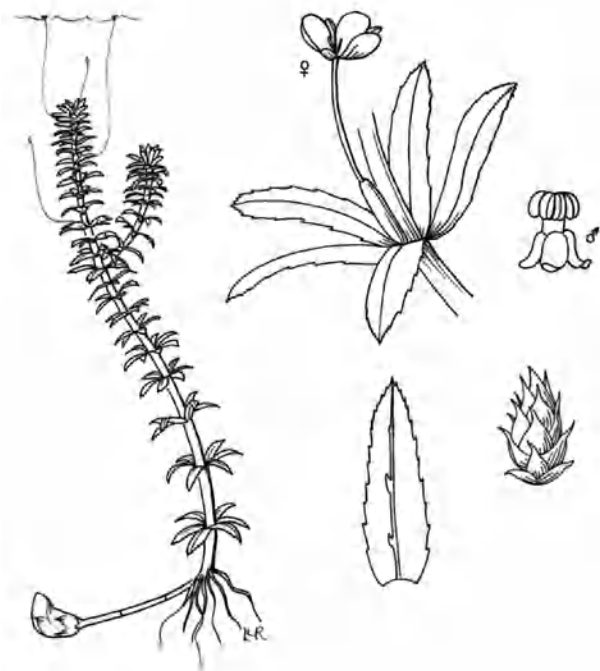
**ALTERNATE NAMES**—anachris, waterthyme

DESCRIPTION—Native to Africa, hydrilla is a submerged aquatic that resembles native elodea. It has finely toothed leaves coming off stems in whorls of three to eight. The plant roots in the bottoms of ponds, lakes, and canals. Stems grow to the surface up to twenty-five feet in length, where they can branch and extend horizontally. Plant fragments are capable of regenerating the plant.

This exotic plant is extremely prolific in the warmer southeastern United States, choking many waterways as it out-competes and replaces native pond plants. Hydrilla has spread up the East Coast and is found in the Lower Delaware and Susquehanna drainages, as well as in the Youghiogheny drainage and Bradford County. Since hydrilla is new to Pennsylvania, its identity should be confirmed by an expert before treatment measures are implemented. There is significant risk of introducing hydrilla accidentally from the potted stock of other plants coinhabited by hydrilla, particularly from the southeastern United States.

VALUE—The habitat hydrilla creates for invertebrates and fish is usually outweighed by its invasive nature. This is the most aggressive invasive submerged plant in the United States. It can grow up to a half-inch per day in favorable conditions. It frequently becomes thick enough that it inhibits the growth of other plants as well as the use of habitat by larger species of fish; it can even interfere with recreational uses of the water body.

COMMON LOOK-ALIKES—native elodea, Brazilian elodea



Naiad

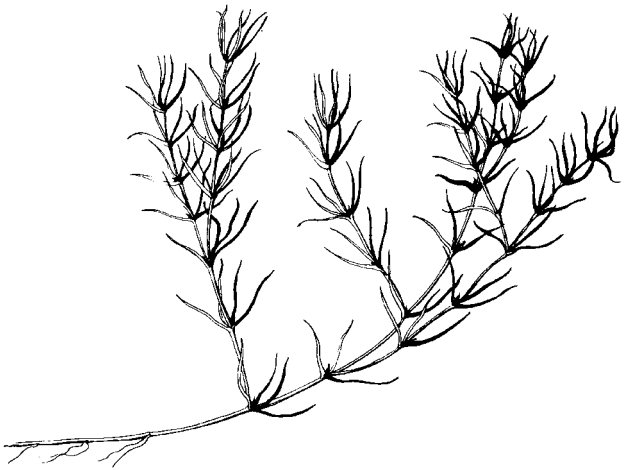
Najas spp.



DESCRIPTION—Naiad has whorled leaves that are narrow and toothed on the edges. Each stem has numerous branches. The plant is brittle and breaks apart easily when handled. It is often found in ponds with good water quality. It completely dies off during the dormant season and regrows from seeds the following spring. Because these plants need less light than most other aquatic plants, they can grow in deep water though they are most commonly found at a depth of one to four feet. Naiad reproduces mostly by seed, although it will reproduce from fragments during the growing season. The appearance of naiad can vary tremendously from sparse, paired leaves to crowded bunches of leaves depending on growing conditions.

Two nonnative and aggressive species of naiads can become problematic in water bodies: *Najas minor* and *N. guadalupensis*. Care should be taken when identifying these species.

VALUE—Naiad is a common aquatic plant in Pennsylvania ponds. It provides excellent habitat for fish and food for waterfowl.



Parrotfeather

Myriophyllum aquaticum

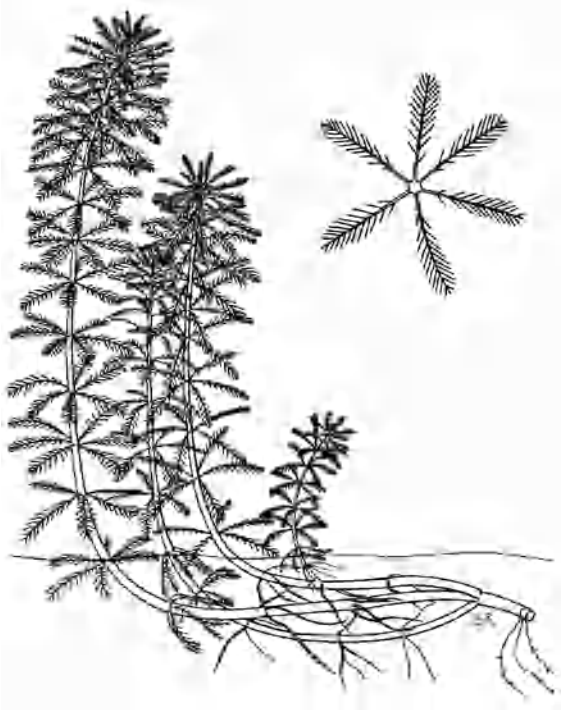


DESCRIPTION—An exotic milfoil species originally from South America, parrotfeather is closely related to Eurasian watermilfoil. It has green, featherlike leaves that often grow above the water surface for up to twelve inches. The leaves remaining below the water line often turn brown late in the summer. The stems are fairly stiff. Parrotfeather can grow in deeper waters and up to the shoreline. It has been popular among backyard pond owners, leading to its spread into larger ponds throughout the state. The plant is believed to have been brought to the United States by the aquarium industry and likely was released by an aquarium owner.

VALUE—Parrotfeather has little known food value for wildlife. Because this plant is not native, it should not be spread.

COMMON LOOK-ALIKE—milfoils





Pondweed, Curly-Leaf*Potamogeton crispus*



DESCRIPTION—Introduced from Europe, curly-leaf pondweed has a very distinctive appearance. The curly-edged leaves are alternate and finely toothed. Their wavy or rippled appearance has been likened to the edges of a lasagna noodle. These plants are most often found in ponds with nutrient-rich hard water. The flower spikes often stick up above the water during spring. Curly-leaf pondweed grows aggressively, can tolerate low light, and may grow in deep water. It often persists throughout the winter but most frequently dies back in late summer.

VALUE—Curly-leaf pondweed is of unique value to a pond because it grows through the winter and spring when most plants are absent from the pond. Thus, it provides food and habitat during these times. Curly-leaf pondweed does tend to crowd out native submerged plant species. Also, its invasive nature may outweigh any values.

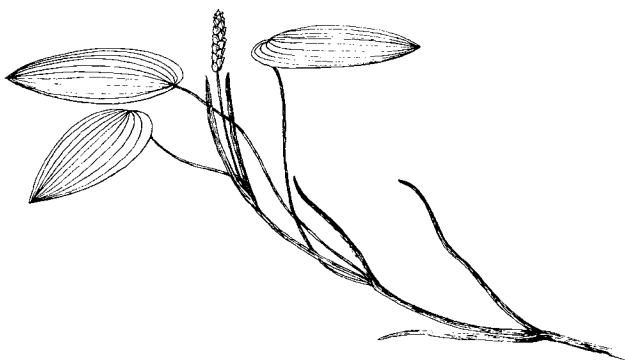


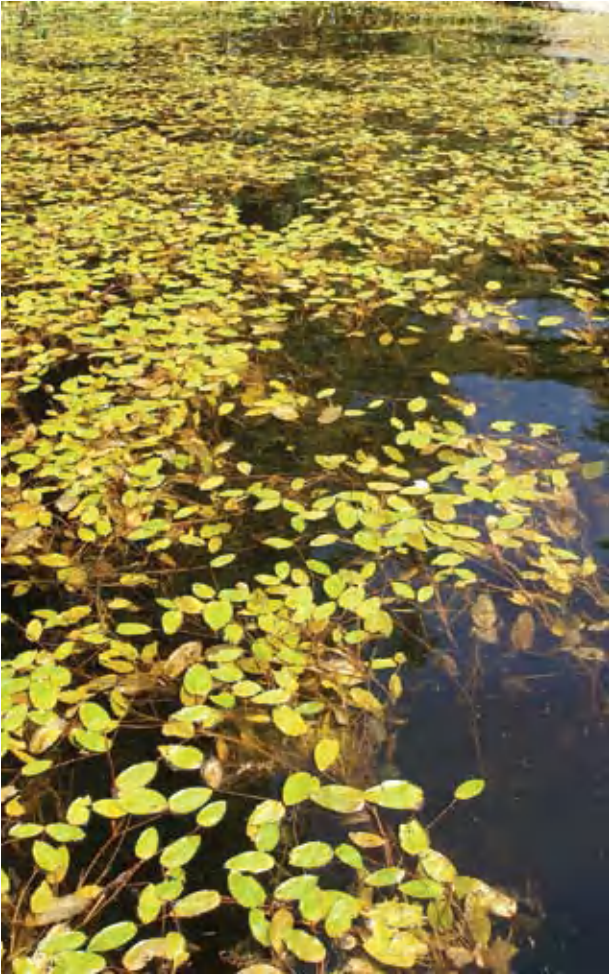


Pondweed, Floating Leaf*Potamogeton natans*

DESCRIPTION—Floating leaf pondweed has two types of leaves. The underwater leaves are narrow and grasslike, while the floating leaves are oval to heart shaped with a notched base. Fruits appear on a terminal spike and stick out above the water surface. This pondweed can tolerate many different growing conditions in ponds and reproduces by tubers and seeds.

VALUE—Like all other submerged aquatic plants, floating leaf pondweed is beneficial for fish and wildlife. The floating leaves create cover and shade for fish, while the fruit and other plant portions supply food for a variety of wildlife, especially waterfowl.





Pondweed, Leafy*Potamogeton foliosus*

DESCRIPTION—Leafy pondweed has narrow (about $\frac{1}{16}$ inch wide), grasslike leaves. The sides of each leaf are generally parallel but form a pointed tip. There are no floating leaves. Leafy pondweed grows in many pond environments but is common in deep sediments in shallow portions of a pond, typically to a depth of four feet. Plants can grow very dense and may interfere with swimming, fishing, and boating.

VALUE—Leafy pondweed provides a large amount of plant material that supplies immense quantities of invertebrate food for young fish. The fruit is also eaten by many waterfowl species.

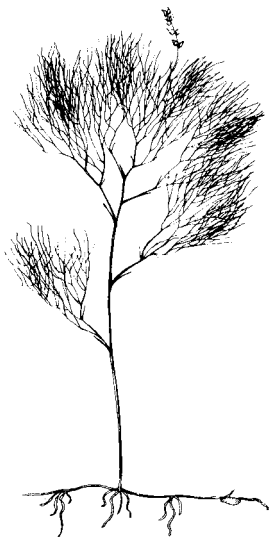




Pondweed, Sago*Potamogeton pectinatus*

DESCRIPTION—Sago pondweed has very fine, threadlike leaves, about $\frac{1}{16}$ inch wide and two to over twelve inches long, with sharp points that spread like a fan away from the main stem. There are no floating leaves. The fruit (or nutlet) is $\frac{1}{8}$ to $\frac{1}{4}$ inch long and $\frac{1}{10}$ to $\frac{1}{8}$ inch wide. Sago pondweed grows in a wide variety of sediments and water conditions. Plants reproduce by tubers and seeds.

VALUE—Sago pondweed is an extremely important food source for waterfowl. Like other submerged plants, it is also a good source of food and cover for young fish.





Pondweed, Variable-Leaf*Potamogeton diversifolius*

DESCRIPTION—Variable-leaf pondweed has two kinds of leaves. Floating leaves are small, oval, and leathery in texture, $\frac{3}{8}$ to $1\frac{1}{2}$ inches long and $\frac{3}{8}$ to $\frac{3}{4}$ inch wide. Submerged leaves are thin, with an obvious midvein and a pointed tip. These submerged leaves are less than $\frac{1}{8}$ inch wide and $\frac{3}{4}$ to $2\frac{1}{4}$ inches long. The flat fruits are about $\frac{1}{8}$ inch wide and arise from the axis of the floating leaves.

VALUE—Submerged portions of this plant provide habitat for many micro- and macroinvertebrates. Seeds are consumed by waterfowl.

SPECIAL CONTROL CONSIDERATION—Variable-leaf pondweed can be removed by raking or seining but will reestablish from any remaining roots and seeds.



Water Stargrass*Heteranthera dubia*



DESCRIPTION—Water stargrass resembles some of the narrow-leaved pondweeds. A close examination of the leaves shows that they have several veins but no obvious midvein. The plant can also be easily identified by a yellow, starlike flower on a terminal stem. Water stargrass can grow under many pond conditions. Found generally in still water, it can grow up to six feet long and can form floating colonies. It reproduces from seeds and through fragmentation.

VALUE—Water stargrass has minimal value as wildlife food. It provides some habitat of value for fish and serves as a source of macroinvertebrates for fish.





Watercress*Nasturtium officinale*



DESCRIPTION—Watercress grows in tangled masses. It has compound leaves with three or more segments, and the terminal leaflet is usually the largest. It produces clusters of white flowers. Watercress is common in cold-water springs and occasionally occurs in shallow margins of cold-water ponds, but it prefers moving water. It does not like pond waters where summer temperatures exceed 70°F.

VALUE—Watercress is an excellent food source for both waterfowl and terrestrial wildlife like deer. It is also a great food for trout since it sometimes grows in cold-water ponds.

SPECIAL CONTROL CONSIDERATION—Watercress very rarely grows to the point of needing control. Since this plant likes moving water, using aquatic herbicides to control it is not advisable. For watercress that occurs in moving water, you will probably not be granted a permit to apply an herbicide.





Watermilfoil, Eurasian*Myriophyllum spicatum*



DESCRIPTION—Eurasian watermilfoil has gray-greenish, featherlike leaves in whorls of three to five around the stem. Leaves generally have twelve or more pairs of leaflets. This exotic plant usually has a dark, reddish appearance with very long multibranched stems. Plants may reach ten feet or more and can form dense colonies. Reddish flowers develop on leafless spikes with very short leaves surrounding them. The flowers may rise above the water surface a few inches.

The plant can reproduce through seeds or fragmentation. It grows in a variety of conditions and can quickly grow to intolerable levels in a pond. It is one of the most aggressive plants in the United States and often out-competes and replaces native pond plants. Native milfoil species look similar but usually have more delicate leaf structures.

Eurasian watermilfoil was accidentally introduced into North America from Europe. It most likely reached eastern North America through the aquarium trade, when people released the contents of their aquariums into local waterways.

VALUE—Eurasian watermilfoil is of limited benefit. It frequently becomes so thick that it interferes with other plants' growth and with habitat use by larger fish. It is not a favored food by waterfowl or other wildlife. It attracts invertebrates and serves as a food source for fish but to a lesser extent than most other submerged plants. Native milfoil species do not tend to grow as densely and are frequently found with bladderwort in acidic, stained water.



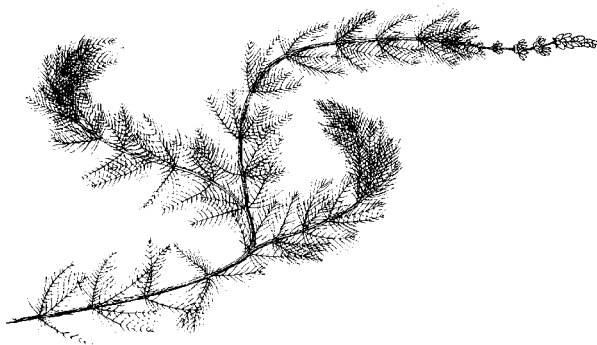
Watermilfoil, Northern*Myriophyllum sibiricum*



DESCRIPTION—Northern watermilfoil is native to Pennsylvania and is most common in the northeastern counties. Leaves are dark green, feathery, and grouped in fours around a hollow stem. They are comprised of five to ten pairs of leaflets. The stem is usually buff or pinkish colored. The plant grows entirely under water in depths of one to twenty feet. Northern watermilfoil leaves are rigid when out of the water and form winter buds of small, dark, brittle leaves.

VALUE—This plant provides cover for fish and other invertebrates, which also eat the insects and other organisms that use the plant as habitat. Waterfowl may eat the foliage and fruit.

COMMON LOOK-ALIKES—Eurasian watermilfoil, coontail





Wild Celery

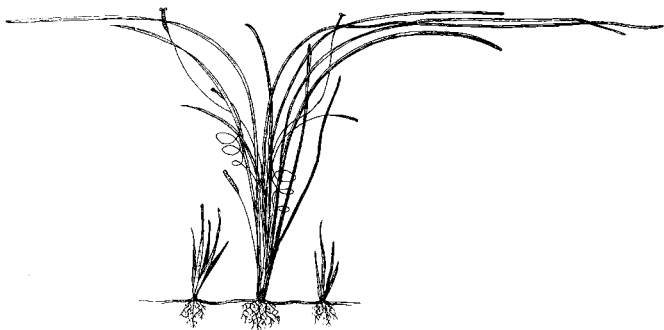
Vallisneria americana

ALTERNATE NAMES—eelgrass, tapegrass, water celery

DESCRIPTION—Wild celery has ribbonlike leaves that can reach three to six feet in length. The leaves grow to the pond surface then bend and float on the surface. Each leaf is mildly serrated, with a band down the middle. Flowers bloom on long, spiraling stalks that float at the surface. Wild celery generally does not like to grow in deep sediment but can be found amid many pond conditions. It reproduces mainly by buds on rootstocks.

VALUE—Wild celery is a premier aquatic plant with very high value for waterfowl, wildlife, and fish. It is a favorite food of many waterfowl species. It also provides good habitat for fish. It is not typically a plant that needs to be controlled in the pond.

SPECIAL CONTROL CONSIDERATION—Wild celery can be harvested by mechanical means, but it has hardy rhizomes and tubers that allow it to quickly regrow.





Duckweeds

Lemna spp. and Spirodela spp.

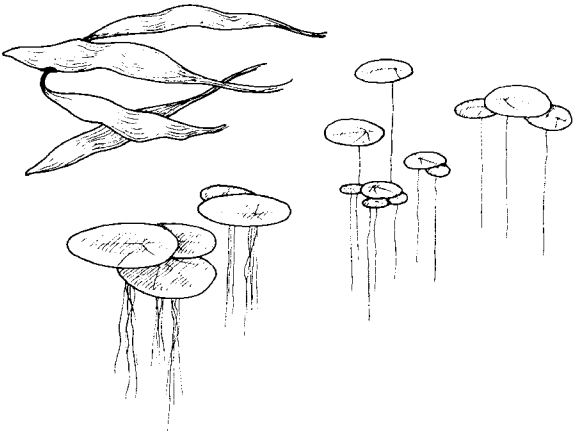
ALTERNATE NAMES—duck's meat, duck meal

DESCRIPTION—Duckweed is common in still areas on pond surfaces. These plants have only a flat, green body called a *thallus* (frond). There are no true leaves or stems. The plant bodies of the *Lemna* variety are only about $\frac{1}{16}$ inch in diameter, with a short root dangling in the water. *Spirodela* is slightly larger at $\frac{1}{8}$ inch and has more trailing roots. Duckweed rarely flowers. The plants often cluster together in groups of three or more and reproduce quickly by division.

Under optimal conditions duckweed can cover areas of a pond within a few days and can resemble algal scum from afar. Even after removal it often again covers a pond quickly. It obtains nutrients directly from the water through the dangling root. As a result, it is normally found in stagnant ponds with high nutrient levels. Plant colonies may also eliminate algae and submerged plants by blocking sunlight. When duckweed covers a pond's surface for an extended period, it can deplete oxygen levels, potentially affecting fish and other pond life. This plant is notorious for being spread between ponds on the feathers and feet of waterfowl.

VALUE—Duckweed is an important food source for a variety of waterfowl. It is also eaten by some wildlife and fish. Fish use the shade from mats of duckweed for cover. It has also been reported to reduce mosquito reproduction in ponds.

SPECIAL CONTROL CONSIDERATIONS—Duckweed can be harvested with nets from the pond surface. Usually it must be harvested frequently because it multiplies rapidly. Aeration may also limit duckweed's growth by agitating the water surface. Reducing waterfowl access to a pond may help prevent the plant from becoming established.



Lotus, American

Nelumbo lutea

DESCRIPTION—American lotus floating leaves are round and entire, growing to twenty-four inches and with a depression in the center where the stem attaches. Leaf veins radiate from the center. Flowers are yellow, large, and showy. The plant can be found in muddy, shallow waters such as lake margins, or in water as deep as six feet. The lotus leaf sits on a long, stiff stalk that is connected to the leaf at its very center, umbrellalike. Lotus reproduces by rootstocks and seeds.

VALUE—This plant's beautiful appearance and its flowers make it a common aquascape choice that is frequently planted as an ornamental. The seedpods are also sold as ornamental items. American lotus creates excellent cover and habitat for fish because it attracts small and large fish and their prey (insects, frogs, etc.). However, the stems make fishing very difficult. **The American lotus is listed as Endangered and is protected within the Commonwealth of Pennsylvania.**





Spatterdock

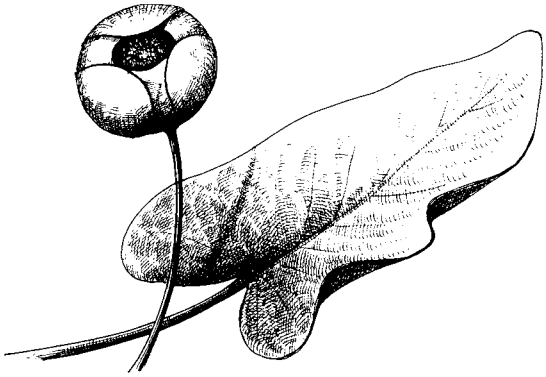
Nuphar lutea

ALTERNATE NAMES—yellow pond lily, cow lily, bullhead pond lily

DESCRIPTION—Spatterdock is common to Pennsylvania ponds, especially acidic, soft-water ponds in northern regions. It has large, twelve-inch leaves that are round to heart shaped, with a distinct midrib. Most leaves extend above the water. Flowers are large and yellowish outside and reddish inside. Spatterdock tolerates fluctuating water levels and reproduces by rootstocks and seeds.

VALUE—Spatterdock is an excellent plant from a wildlife and fisheries perspective. It supports a high density of fish and insect life below the water surface, providing good food and cover for fish. Large bass can often be found cruising through spatterdock looking for small fish and insects. Spatterdock is also a food source for many animals and plants.

COMMON LOOK-ALIKE—water lily



Water Chestnut

Trapa natans



ALTERNATE NAMES—devil's hat, devil's sled, bull nut

DESCRIPTION—Water chestnut features a rosette of floating, toothed, triangular leaves. Feathery leaves are found along the submerged stem. The roots are fine, long, and profuse. The small, four-petal flower is white and most often hidden under the leaf rosettes. The fruit is a large nut with four sharp spines or barbs. The plant may have been released from a water garden.

The leaves or stems of water chestnut do not fragment or regenerate the plant; but the fruit is very viable and can remain so for up to ten or twelve years in bottom sediments before giving rise to a new plant. These spiky seeds are commonly found attached to the carpeted bunks of boat trailers, under feathers of waterfowl, and possibly in the fur of animals.

SPECIAL CONTROL CONSIDERATIONS—Manual or mechanical control is a viable option if done before the plant flowers and goes to seed each season. The key to water chestnut control is early detection. It is vital to spot small populations while they are easy to remove by hand.



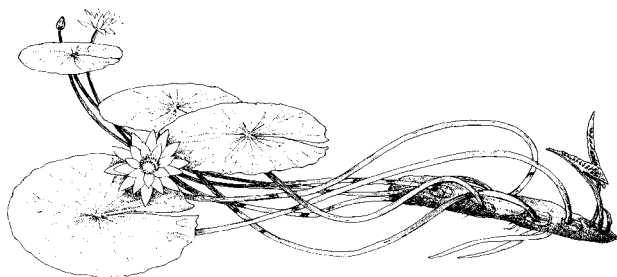
Water Lily, White

Nymphaea spp.

ALTERNATE NAME—fragrant water lily

DESCRIPTION—Floating round leaves grow up to twelve inches across, are split to the stem in a V shape at the center, and are often purple underneath. Flowers of native water lilies are large, showy, and white, and have a sweet smell. Water lilies bearing other colored flowers are nonnative, tropical plants often sold for backyard water gardens. Flowers remain open from morning until shortly after midday. Commonly planted as an ornamental, this plant reproduces by rootstocks and seeds. It prefers to grow in quiet water less than six feet deep.

VALUE—This plant's beautiful appearance and its flowers make it a commonly used item in aquascapes. In addition, water lily creates excellent habitat for fish as it attracts small and large fish and their prey (insects, frogs, etc.). Despite this benefit, however, water lily's tangled stems make fishing very difficult. Waterfowl eat parts of the plant, as do a variety of wildlife, including deer. Water lily is also a favorite of honeybees.





Watermeal

Wolffia spp.

DESCRIPTION—Watermeal looks like small, light-green seeds floating on a pond. It has no true roots and is often found with duckweed in the pond's calm backwaters. Watermeal obtains its nutrients directly from the water, so it is more common in fertile ponds with high nutrient levels. When completely covering a pond, these plant colonies may also eliminate algae and submerged plants by blocking sunlight penetration. When watermeal covers pond surfaces for an extended time it can deplete oxygen levels, killing fish and affecting other pond life. This plant, along with duckweed, can be transported from one water body to another on the feathers and feet of waterfowl.

VALUE—Watermeal's value is similar to that of duckweed. It is not known as an important food, but many ducks may consume it and often transport it to other bodies of water. Watermeal has been shown to limit mosquito reproduction.



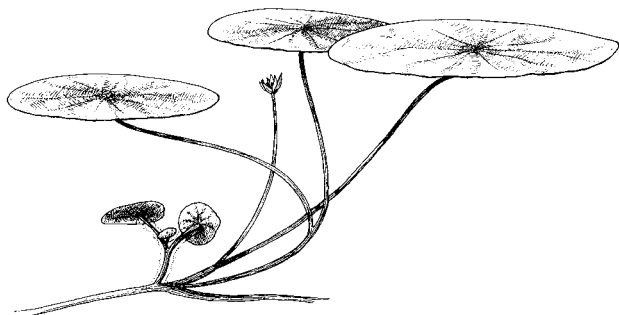
Watershield

Brasenia schreberi

ALTERNATE NAMES—dollar bonnet, dollar tag, water target

DESCRIPTION—Floating leaves are oval to elliptical (football shaped) and have an elastic stem that attaches at their centers. Leaves are green on top and purple underneath and grow two to five inches in length. A gelatinous coating on stems and the undersides of leaves protects them from herbivores. Flowers are dull red to purple. Plants prefer acidic and soft-water ponds and reproduce by rootstocks and seeds. Watershield can quickly take over a pond surface and severely limit recreational uses. Plants can grow in water up to six feet deep.

VALUE—Watershield offers good cover and habitat for fish, but the stems make fishing difficult. The leaves make a great landing spot for insects.





Yellow Floating Heart*Nymphoides peltata*



DESCRIPTION—A relative newcomer to Pennsylvania, yellow floating heart was introduced as an ornamental aquatic plant from eastern Asia and is becoming widespread owing to its popularity among backyard pond enthusiasts. This plant looks like water lily, but its leaves are slightly more heart shaped and leathery. The leaves are one to five inches long and purplish underneath, with slightly wavy margins. The flowers are bright yellow with five petals and 1 to 1¼ inches in diameter. Yellow floating heart is generally larger than native floating hearts.

Plants are rooted to a pond bottom at depths of two to thirteen feet. The roots run along an underwater stem. This plant grows more quickly than water lily and can reach nuisance levels. Reproduction is by seed and by rooting at leaf nodes. Yellow floating heart regrows from plant fragments.

VALUE—This plant may provide habitat for fish, but its invasive nature outweighs any value.



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LINKS TO EXTENSION AND WATER RESOURCES WEB SITES

AQUAPLANT, Texas Agrilife Extension Service, Texas
A&M University
aquaplant.tamu.edu/

The Aquatic Plant Management Society
www.apms.org/

Maine Volunteer Lake Monitoring Program
www.mainevolunteerlakemonitors.org/

New Hampshire Department of Environmental Services
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INDEX

ALGAE

Blue-green algae (<i>Cyanobacteria</i>).....	8,9
Chara (<i>Chara spp.</i>)	10,11
Didymo (<i>Didymosphenia geminata</i>).....	12,13
Filamentous algae (<i>various filamentous spp.</i>).....	14,15
Nitella (<i>Nitella spp.</i>).....	16,17
Planktonic algae (<i>various planktonic spp.</i>).....	18,19

EMERGENT

Arrowhead (<i>Sagittaria spp.</i>).....	20,21
Bulrush (<i>Scirpus americanus</i>).....	22,23
Bur-reed (<i>Sparganium spp.</i>).....	24,25
Cattail (<i>Typha spp.</i>).....	26,27
Pennywort (<i>Hydrocotyle spp.</i>)	28,29
Phragmites (<i>Phragmites australis</i>)	30,31
Pickerelreed (<i>Pontederia cordata</i>).....	32,33
Purple loosestrife (<i>Lythrum salicaria</i>).....	34,35
Rush, common (<i>Juncus effuses</i>).....	36,37
Sedge (<i>Cyperaceae family</i>)	38,39
Smartweed (<i>Polygonum spp.</i>).....	40,41
Spike rush (<i>Eleocharis spp.</i>)	42,43
Water plantain (<i>Alisma triviale</i> —Northern) (<i>Alisma subcordatum</i> —Southern).....	44,45
Water primrose (<i>Ludwigia spp.</i>).....	46,47

SUBMERGED

Bladderwort (<i>Utricularia spp.</i>).....	48,49
Coontail (<i>Ceratophyllum spp.</i>).....	50,51
Elodea (<i>Elodea canadensis</i>).....	52,53
Fanwort (<i>Cabomba caroliniana</i>).....	54,55
Hydrilla (<i>Hydrilla verticillata</i>).....	56,57
Naiad (<i>Najas spp.</i>)	58,59
Parrotfeather (<i>Myriophyllum aquaticum</i>).....	60,61
Pondweed, curly-leaf (<i>Potamogeton crispus</i>).....	62,63
Pondweed, floating leaf (<i>Potamogeton natans</i>).....	64,65
Pondweed, leafy (<i>Potamogeton, foliosus</i>).....	66,67
Pondweed, sago (<i>Potamogeton pectinatus</i>)	68,69
Pondweed, variable-leaf (<i>Potamogeton diversifolius</i>)	70,71
Water stargrass (<i>Heteranthera dubia</i>).....	72,73
Watercress (<i>Nasturtium officinale</i>).....	74,75

Watermilfoil, Eurasian (<i>Myriophyllum spicatum</i>)	76,77
Watermilfoil, Northern (<i>Myriophyllum sibiricum</i>).....	78,79
Wild celery (<i>Vallisneria americana</i>)	80,81

FLOATING

Duckweeds (<i>Lemna spp. and Spirodela spp.</i>).....	82,83
Lotus, American (<i>Nelumbo lutea</i>)	84,85
Spatterdock (<i>Nuphar lutea</i>).....	86,87
Water chestnut (<i>Trapa natans</i>).....	88,89
Water lily, white (<i>Nymphaea spp.</i>)	90,91
Watermeal (<i>Wolffia spp.</i>).....	92,93
Watershield (<i>Brasenia schreberi</i>).....	94,95
Yellow floating heart (<i>Nymphoides peltata</i>)	96,97

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