

A GUIDE TO  
**MONTANA'S**  
**FRESHWATER**  
**AQUATIC PLANTS**

## TABLE OF CONTENTS

TABLE OF CONTENTS .....	2
ACKNOWLEDGMENTS .....	3
INTRODUCTION .....	6
PLANT-LIKE ALGAE	
<i>Chara</i> spp.-Muskgrass .....	8
<i>Nitella</i> spp.-Brittlewort .....	10
FLOATING LEAVED, ROOTED PLANT	
<i>Brasenia schreberi</i> -Water-shield .....	12
<i>Nuphar polysepala</i> -Spatterdock .....	14
<i>Nymphaea odorata</i> -Fragrant waterlily .....	16
<i>Potamogeton amplifolius</i> -Largeleaf pondweed .....	18
<i>Potamogeton gramineus</i> -Grass-leaved pondweed.....	20
<i>Potamogeton illinoensis</i> -Illinois pondweed .....	22
<i>Potamogeton natans</i> -Floating-leaved pondweed.....	24
<i>Potamogeton nodosus</i> -American pondweed.....	26
SUBMERGED PLANTS	
<i>Callitriche hermaphroditica</i> -Autumnal water-starwort.....	28
<i>Callitriche heterophylla</i> -Large water-starwort.....	30
<i>Callitriche palustris</i> -Vernal water-starwort.....	30
<i>Ceratophyllum demersum</i> -Coontail.....	32
<i>Egeria densa</i> -Brazilian elodea .....	36
<i>Elodea canadensis</i> -Common elodea .....	34
<i>Elodea nuttallii</i> -Western waterweed.....	34
<i>Heteranthera dubia</i> -Water star-grass .....	38
<i>Hydrilla verticillata</i> -Hydrilla (INVASIVE).....	40
<i>Myriophyllum quitense</i> -Andean water-milfoil .....	42
<i>Myriophyllum sibiricum</i> -Northern watermilfoil.....	44
<i>Myriophyllum spicatum</i> -Eurasian watermilfoil (INVASIVE).....	46
<i>Myriophyllum verticillatum</i> -Whorled water-milfoil .....	48
<i>Najas flexilis</i> -Slender water-nymph .....	50
<i>Najas guadalupensis</i> -Common water-nymph.....	50
<i>Potamogeton crispus</i> -Curlyleaf pondweed (INVASIVE).....	52
<i>Potamogeton filiformis</i> -Slender-leaved pondweed .....	56
<i>Potamogeton foliosus</i> -Leafy pondweed.....	54
<i>Potamogeton obtusifolius</i> -Blunt-leaved pondweed.....	58
<i>Potamogeton pectinatus</i> -Sago pondweed .....	56
<i>Potamogeton praelongus</i> -White-stemmed pondweed .....	60
<i>Potamogeton pusillus</i> -Small pondweed .....	54
<i>Potamogeton richardsonii</i> -Richardson's pondweed .....	62
<i>Potamogeton robbinsii</i> -Flat-leaf pondweed.....	64
<i>Potamogeton vaginatus</i> -Sheathing pondweed .....	56
<i>Potamogeton zosteriformis</i> -Flatstem pondweed.....	66
<i>Ruppia maritima</i> -Widgeongrass .....	70
<i>Utricularia minor</i> -Lesser bladderwort .....	72
<i>Utricularia macrorrhiza</i> -Common bladderwort.....	72
<i>Zannichellia palustris</i> -Horned pondweed .....	74

## TABLE OF CONTENTS

FREE FLOATING PLANTS	
<i>Lemna</i> spp.-Duckweed.....	76
<i>Spirodela polyrrhiza</i> -Duck-meal .....	78
<i>Wolffia</i> spp.-Watermeal .....	80
SHORELINE PLANTS	
<i>Alisma plantago-aquatica</i> -Northern water plantain .....	82
<i>Butomus umbellatus</i> -Flowering rush (INVASIVE).....	86
<i>Elatine rubella</i> -Southwestern waterwort.....	88
<i>Hippuris vulgaris</i> -Common mare's tail.....	90
<i>Iris pseudacorus</i> -Yellowflag iris (INVASIVE) .....	92
<i>Lythrum salicaria</i> -Purple loosestrife (INVASIVE).....	94
<i>Megalodonta beckii</i> -Water marigold.....	96
<i>Nasturtium officinale</i> -Common watercress .....	98
<i>Polygonum amphibium</i> -Water smartweed.....	100
<i>Sagittaria cuneata</i> -Northern arrowhead.....	102
<i>Sagittaria latifolia</i> -Common arrowhead.....	102
<i>Tamarix ramosissima</i> -Salt cedar (INVASIVE).....	104
GLOSSARY .....	106
INDEX (Scientific names).....	110
INDEX (Common names) .....	111
REFERENCES .....	115

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Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database/USDA NRCS. 1995. Northeast wetland flora: Field office guide to plant species. Northeast Technical Center, Chester. *Najas flexilis*

USDA-NRCS PLANTS Database/Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. *Alisma triviale* (Vol. 1:94), *Elodea nuttallii* (Vol. 1:105), *Heteranthera dubia* (Vol. 1:464), *Hippuris vulgaris* (Vol. 2:612), *Megalodonta beckii* (Vol. 3:500), *Potamogeton illinoensis* (Vol. 1:79), *Potamogeton filiformis* (Vol. 1:86), *Potamogeton foliosus* (Vol. 1:82), *Potamogeton natans* (Vol. 1:75), *Potamogeton nodosus* (Vol. 1:77), *Potamogeton obtusifolius* (Vol. 1:82), *Potamogeton pectinatus* (Vol. 1:87), *Potamogeton pusillus* (Vol. 1:84), *Potamogeton robbinsii* (Vol. 1:87), *Potamogeton vaginata* (Vol. 1:87), *Potamogeton zosteriformis* (Vol. 1:81), *Ruppia maritima* (Vol. 1:88), *Sagittaria cuneata* (Vol. 1:99), *Sagittaria latifolia* (Vol. 1:99), *Utricularia minor* (Vol. 3:228), *Utricularia vulgaris* (Vol. 3:229).

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Arthur Haines, New England Wild Flower Society. *Alisma triviale*, *Callitriche stagnalis*, *Iris pseudacorus*, *Nasturtium officinale*, *Potamogeton natans* (plant form), *Utricularia macrorhiza* (flower), *Wolffia spp.* (cover photo)

Peter Lesica. *Nuphar lutea* spp. *polysepala* (plant form), *Nymphaea odorata* (plant form), *Tamarix ramosissima*

Campbell & Lynn Loughmiller, Lady Bird Johnson Wildflower Center. *Nuphar lutea* spp. *polysepala* (flower)

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Montana Department of Agriculture. *Butomus umbellatus*, file photo

Jenifer Parsons, State of Washington Department of Ecology. *Myriophyllum quitense*

Tony Rodd. *Nitella spp.*

R.W. Smith, Lady Bird Johnson Wildflower Center. *Potamogeton nodosus* (fruits), *Potamogeton nodosus* (plant form)

## PLANT CATEGORIES:

### Plant-Like Algae

Plant-like algae lack stems and leaves, although sometimes they have structures that can be mistaken for stems and leaves. Plant-like algae are green with cylindrical, whorled branches. They lack roots, but some species attach to the sediment. Plant-like algae tend to lie on or just above the sediments. They are found from shallow water to very deep areas (20-30 meters) in clear water.



### Floating Leaved, Rooted Plants

These plants are rooted in the sediment and have leaves that float on the water surface. They may also have underwater leaves. Often the stems of these plants are not firm enough to keep them upright when removed from the water and at low water they may be found collapsed on the lake bottom. They often form a bed along a lake margin in water 1-3 meters deep.



### Submerged Plants

The entire plant is usually underwater, but the flowers and fruits may rise above the water surface. Submerged species are rooted in the sediment and have underwater leaves. They can grow from shallow water to depths greater than 10 meters in very clear water.



## Free Floating Plants

Free-floating plants float in the water column, on the surface of the water, or lie on the bottom. This category includes some of the smallest members of the plant kingdom, such as watermeal plants, which look like green specks on the water surface. These plants do not root in the sediment, although some species have roots that dangle in the water. They sometimes form extensive green mats on the water surface.



## Shoreline Plants

Shoreline plants grow along edges of lakes, rivers, streams, and ponds or on wet ground away from open water. They have at least part of their stems, leaves, and flowers emerging above the water surface and are rooted in the sediments. Some plants that typically grow in deep water may be found along the shoreline in late summer when water levels are low.



# PLANT-LIKE ALGAE

Species: *Chara* spp., muskgrass, stonewort, muskwort

Family: Characeae

## NATIVE

**Leaf:** Algae lack true leaves. Six to 16 leaf-like branchlets of equal length grow in whorls around the stem, and are never divided. These branchlets often bear tiny thorn-like projections, which give the plant a rough or prickly appearance when magnified. Produces foul, musty almost garlic-like odor if crushed.

**Stem:** Algae lack true stems. Round, stem-like structure varies from 5 cm to over 1 m in length.

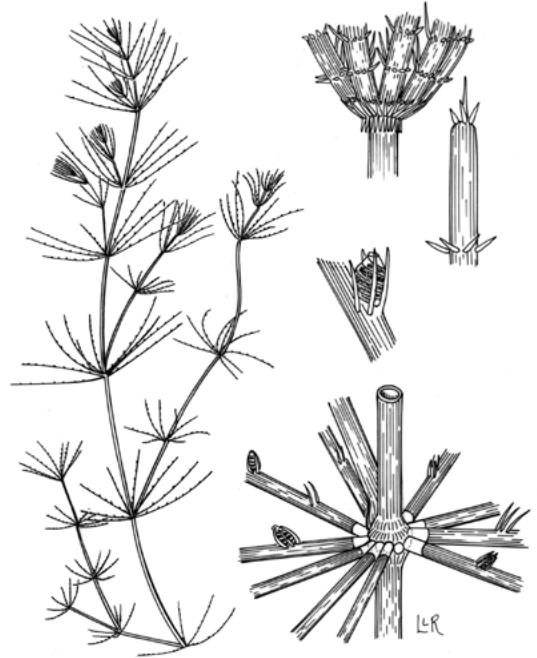
**Flower:** Algae do not produce flowers; microscopic one-celled sex organs called oogonia are formed. These tiny organs and patterns in the cases that surround them are used to distinguish between species.

**Fruit:** Algae do not produce fruits. Tiny spores are produced in fruiting bodies. In some muskgrass species the fruiting bodies are orange and very conspicuous.

**Root:** Muskgrasses may be attached to the bottom by root-like structure called holdfasts.

**Propagation:** Spores carried by water and waterfowl; plant fragments.

**Habitat:** Fresh to brackish water, inland and coastal, in both shallow and deep water. In Montana, this spp. is always found in calcareous water. Some species found in alkaline lakes and slow-moving streams. Muskgrasses will often grow in deeper water than vascular aquatic plants.



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# PLANT-LIKE ALGAE

Species: *Nitella* spp., nitella, brittlewort

Family: Characeae

## NATIVE

**Leaf:** No true leaves. 6-8 evenly forked branchlets grow in whorls at regularly spaced intervals along the 'stem'. Branchlets have a smooth texture.

**Stem:** No true stems. Hollow, stem-like structures have whorls of forked branches along their entire length. No odor when crushed.

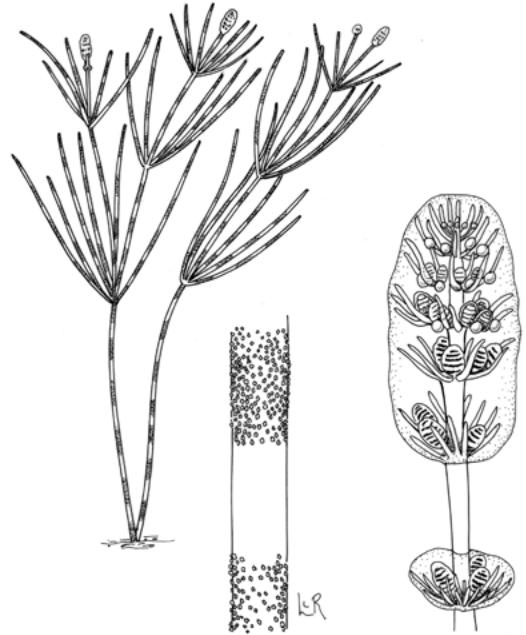
**Flower:** Does not bear flowers. Has microscopic spore-producing organs. Male organs grow at the base of the branchlets. Female organs are in a cluster on the sides of the branchlets below the male organs.

**Fruit:** Produces spores rather than fruits.

**Root:** Lacks roots. May be attached to the bottom by root-like structures called holdfasts or floating free above the sediment.

**Propagation:** Spreads by spores transported by wildlife and will also form new plants from vegetative fragments.

**Habitat:** Grows in shallow to deep waters of soft water or acid lakes and bogs. Often grow in deeper water than flowering plants and frequently form a thick carpet or grow in clumps along the bottom.



Tony Rodda, Flickr

# FLOATING LEAVED, ROOTED PLANT

Species: *Brasenia schreberi*, water-shield, dollar bonnet, water target

Family: Cabombaceae

## NATIVE

**Leaf:** Oval leaves (4-12 cm long and 3-8 cm wide) float on the water surface. Leaves have purple undersides with long, centrally attached leaf stalks up to 2 m long. A slimy gelatinous substance usually covers the stalks and underside of young leaves and stems.

**Stem:** Arise from submerged, branching, reddish creeping rhizomes.

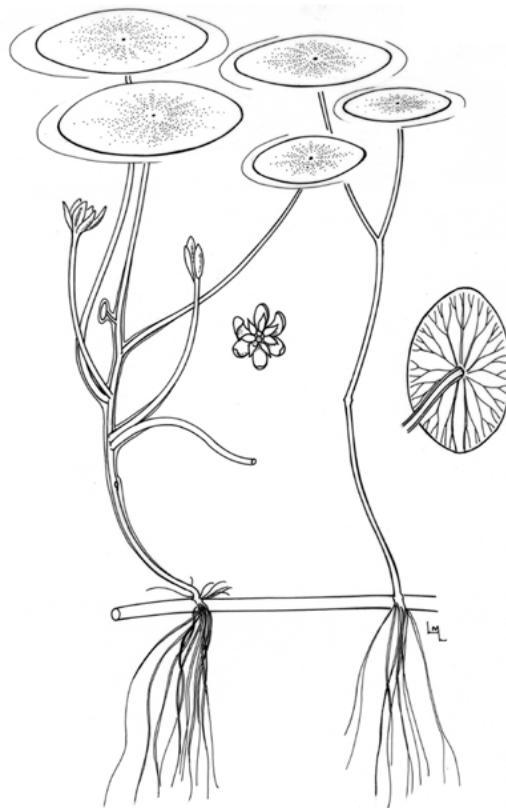
**Flower:** 5-20 cm long flower stalks each bear a single purplish flower with 3 sepals and 3 (4) similar-looking petals. Each flower measures up to 2.5 cm across and is elevated slightly above the water surface. Blooms from May to September.

**Fruit:** Each flower produces 4-18 separate narrowly egg-shaped, leathery fruits between 6-8 mm long. Each fruit usually contains 2 seeds. They ripen underwater and decay to release seeds.

**Root:** Slender, branched, creeping rhizomes.

**Propagation:** Rhizomes, seeds, winter buds.

**Habitat:** Shallow ponds, lakes, and slow moving streams; grows in water 0.5-3 m deep. This plant is rare in Montana.



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# FLOATING LEAVED, ROOTED PLANT

Species: *Nupar polysepala* (Synonym: *Nyphar lutea* subsp. *polysepala*), spatterdock, yellow cow-lily, yellow pond-lily

Family: Nymphaeaceae

## NATIVE

**Leaf:** Large (10-45 cm long and 7-30 cm wide) green, heart-shaped leaves have a notched base, blunt tip, prominent midvein, and leathery surface. They rise directly from the rhizome and float on or extend above the water. In early summer, spatterdock has large, delicate underwater leaves that resemble lettuce or cabbage leaves.

**Stem:** Flower and round leaf stalks arise directly from the rhizome. Green “stems” are actually leaf and flower stalks.

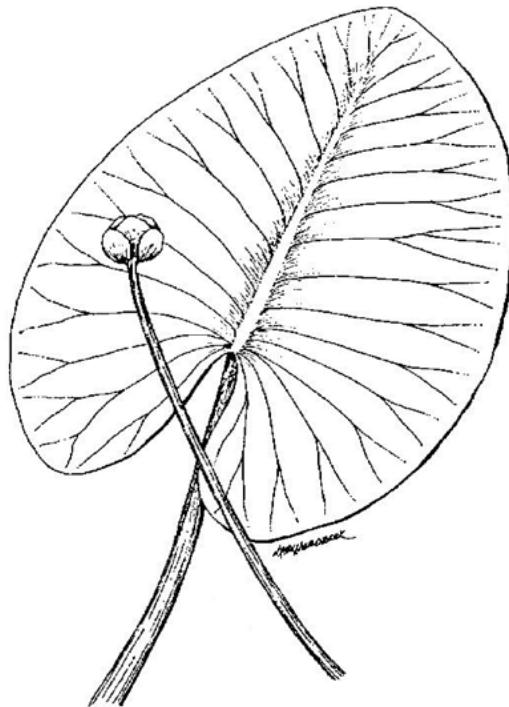
**Flower:** Waxy and greenish-yellow globes (5-10 cm across) open to form bright yellow cup-shaped flowers that rise above the water. This plant typically has nine petals, but can range between 8 and 17 in number. Petals are actually sepals. Stamens are reddish. Flowers have a sweet fragrance on the first day the flower is open, but after that the odor is less pleasant. Blooms from May to August.

**Fruit:** One urn-shaped fruit develops from each flower and contains numerous brown seeds (3-5 mm long).

**Root:** Fibrous roots anchor the massive, scaly, log-like rhizomes to the sediment. Rhizomes are up to 20 cm in diameter and 5 m long.

**Propagation:** Rhizomes, seeds.

**Habitat:** Shallow lakes and ponds, sluggish streams, and canals. Always occurs in fresh rather than saline or calcareous water.



Peter Lesica



Campbell and Lynn Loagmiller, Lady Bird Johnson Wildflower Center

# FLOATING LEAVED, ROOTED PLANT

Species: *Nymphaea odorata*, fragrant waterlily, white waterlily, American water-lily

Family: Nymphaeaceae

## INTRODUCED

**Leaf:** Round, smooth, green, leathery leaves are up to 30 cm in diameter and have a slit on one side. Underside is often red or purplish with numerous veins. Leaf stalk is attached to the leaf center and the base of the slit.

**Stem:** No true upright stem is present. Straight, flexible stalks attach leaves and flowers to thick, submerged rhizomes.

**Flower:** Large, fragrant flowers, 6-12 cm across, are at the ends of long stalks. Flowers have numerous (20-30) white, pink, or purple petals with yellow centers. After fertilization, the flower stalk

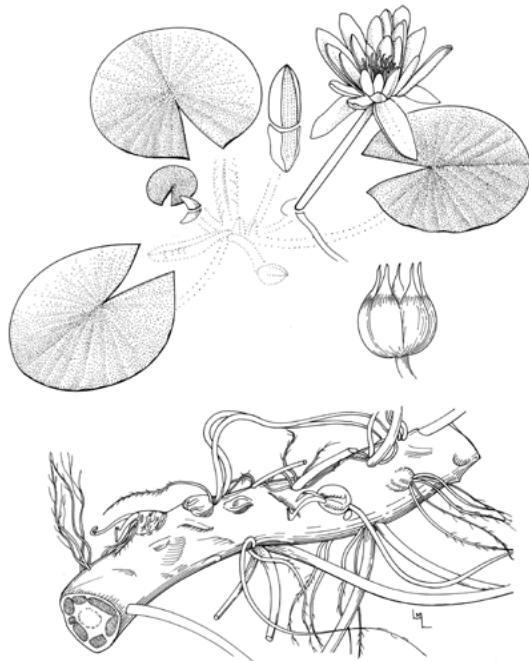
furls like a corkscrew, drawing the flower underwater. Blooms June through October.

**Fruit:** Leathery, berry-like capsules, to 3 cm across, with numerous small seeds (2mm).

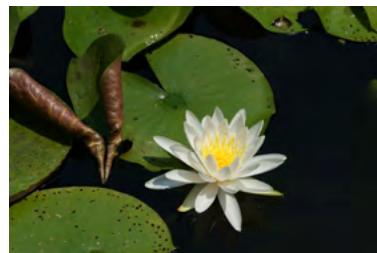
**Root:** Thick rhizomes, 2-3 cm in diameter.

**Propagation:** Seeds, rhizomes.

**Habitat:** Shallow ponds, lakes, and slow streams in water 3-6 feet deep. *N. odorata* is thought to be introduced into Montana, but the related *N. leibergii* with smaller flowers is native but uncommon.



Peter Leica



Ray Matthews, Lady Bird Johnson Wildflower Center

## FLOATING LEAVED, ROOTED PLANT

Species: *Potamogeton amplifolius*, largeleaf pondweed, big-leaf pondweed

Family: Potamogetonaceae

### NATIVE

**Leaf:** Two types of leaves; submersed & floating.

**Submersed:** bright to dark green, translucent, 8-20 cm long and 2-7.5 cm wide, folded along the midrib, curved backwards into a banana-shape, and sometimes with wavy margins; have short stalks (1-2 cm) and 19-45 lengthwise veins. These leaves often decay in late summer.

**Floating leaves:** often absent; opaque, leathery, oval leaves taper at both ends and are 5-10 cm long and 2.5-5 cm wide. They have 25-45 veins and 3-10 cm long stalks that are generally longer than the floating leaves.

Sheaths (stipules) are up to 10 cm long, whitish, translucent, occur at leaf bases, but are not attached to

the leaves. They become stringy with age.

**Stem:** Few or unbranched stem (to 3 mm thick) to 5 m long.

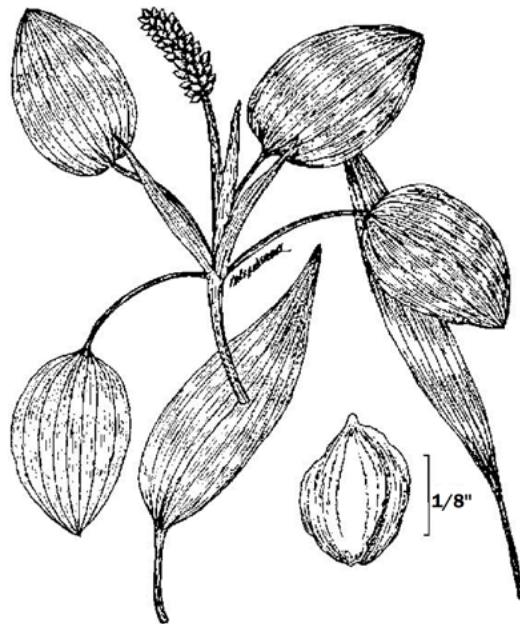
**Flower:** Small flowers have 4 petal-like lobes. Up to 16 whorls of tightly clustered flowers are arranged into a spike up to 5 cm long on stalks rising above the water. Flower stalks are thicker than the stem and are 5-15 cm long.

**Fruit:** Seed-like achene is 3-5 mm long, has flattened sides, and a 0.5-1 mm beak, and is orange to pinkish when ripe. Back is rounded or keeled when dry.

**Root:** Fibrous, from creeping underground rhizomes.

**Propagation:** Seeds, fragments, rhizomes.

**Habitat:** Lakes and ponds. Will grow in clear water as deep as 6 m. Found in fresh rather than saline or calcareous water.



Donald Cameron, Maine Natural Areas Program

# FLOATING LEAVED, ROOTED PLANT

Species: *Potamogeton illinoensis*,  
Illinois pondweed

Family: Potamogetonaceae

## NATIVE

**Leaf:** Alternate. When floating leaves are present, the submerged leaves are often decomposed. Submerged leaves: 6-20 cm long to 5 cm wide have 9-19 parallel veins with many cross-veins and are on short (0.5-2 cm) stalks. Sometimes transitional leaves are present. Floating

leaves: sometimes absent, 4-13 cm long, 2-6 cm wide, have 13-29 longitudinal veins. Leaf is longer than the stalk. Sheaths (stipules) 2.5-7 cm long are free from the leaf base and persistent.

**Stem:** Simple or branched, cylindrical.

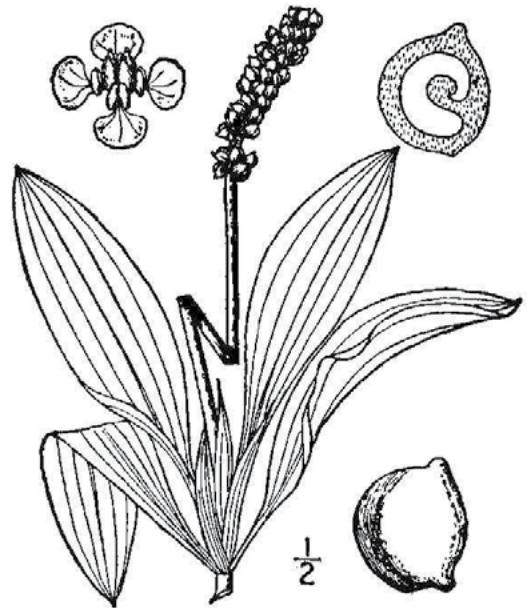
**Flower:** Small, greenish, whorled, in spikes to 6 cm long, on stalks thicker than the plant stem. Stalks up to 15 cm tall.

**Fruit:** Achenes. 4 mm long, ridged, beak attached slightly below tip.

**Root:** Fibrous, from slender rhizomes, forms thickened overwintering rhizomes.

**Propagation:** Rhizomes, seeds, tubers.

**Habitat:** Shallow to fairly deep water of lakes, ponds and rivers. Prefers alkaline water. This species occurs in Flathead Lake and other bodies of fresh water.



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# FLOATING LEAVED, ROOTED PLANT

Species: *Potamogeton natans*, floating-leaved pondweed, floating pondweed

Family: Potamogetonaceae

## NATIVE

**Leaf:** Submerged leaves: alternate, stiff, to 50 cm long, up to 2 mm wide; almost always decayed later in the growing season. Floating leaves: alternate, dark green to copper-colored, 6-11 cm long, to 6 cm wide, have slightly heart-shaped bases and stalks longer than the leaf blade. Leaf blade and the stalks form an acute angle. Persistent sheaths (stipules) 6-8 cm long, free from leaf base.

**Stem:** Generally unbranched, nearly cylindrical, to 2 mm thick.

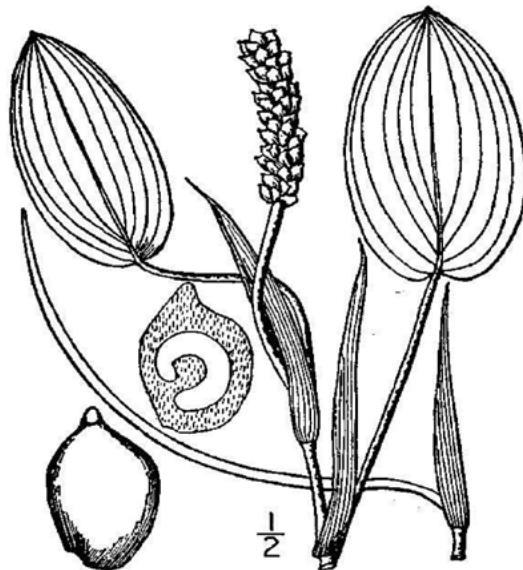
**Flower:** Compact spikes less than 5 cm long on stalks to 12 cm long.

**Fruit:** Achene, 3.5-5 mm, back rounded or fairly ridged with a 0.5-1mm beak.

**Root:** Fibrous from rhizomes.

**Propagation:** Seeds, sometimes by large winter buds and sometimes produces tubers.

**Habitat:** Ponds, lakes, or slowly flowing waters 0.5-3 m deep and tolerates brackish water.



Arthur Haines, New England Wild Flower Society



Donald Cameron, Maine Natural Areas Program



## FLOATING LEAVED, ROOTED PLANT

Species: *Potamogeton nodosus*, American pondweed, long-leaf pondweed

Family: Potamogetonaceae

### NATIVE

**Leaf:** Alternate. When floating leaves are present, the submerged leaves are often decomposed.

**Submerged leaves:** 2-15 cm long, 1-4 cm wide, have tapered ends, 7-15 longitudinal veins, and are on long stalks (2-12cm). **Floating leaves:** 5-13 cm long and 5cm wide are on long stalks (5-20cm). Sheaths (stipules) are 3-9 cm long, free from the leaf base, and often decomposed.



**Stem:** Simple or branched, cylindrical.

**Flower:** Small, greenish, whorled, in spikes to 6 cm long, on stalks thicker than the plant stem. Stalks to 15 cm.

**Fruit:** Achenes. 3-5 mm long, back rounded, short beaked.

**Root:** Fibrous, from slender rhizomes, forms chains of tubers.

**Propagation:** Rhizomes, seeds, tubers.

**Habitat:** Shallow to fairly deep water of lakes, ponds and rivers.



R.W. Smith, Lady Bird Johnson Wildflower Center



R.W. Smith, Lady Bird Johnson Wildflower Center

# FLOATING LEAVED, ROOTED PLANT

Species: *Potamogeton gramineus*, grass-leaved pondweed, grassy pondweed, variableleaf pondweed

Family: Potamogetonaceae

## NATIVE

Extremely variable in appearance and may look different depending on whether it is growing in deep or shallow water or stranded along shorelines by receding water.

**Leaf:** Submerged leaves: green to reddish, to 13 cm long by 1.2 cm wide, have pointed tips, 3-9 veins and no stalks. Floating leaves: 1.5-7 cm long and 1-3 cm wide and on stalks usually longer than the blades. Sheaths (stipules) to 3 cm long are persistent and free of the leaf base.



**Stem:** Long, forms rhizomes, many short branches.

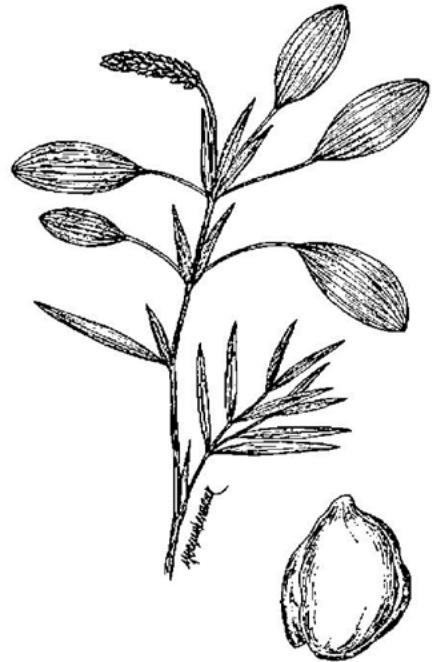
**Flower:** Small, clustered on emergent spikes, each with 4 petal-like lobes. Spikes to 4 cm long on long stalks to 20 cm.

**Fruit:** Achene. 1.5-3 mm, back slightly ridged, straight to slightly curved beak.

**Root:** Fibrous, from rhizomes; forms long tubers.

**Propagation:** Seeds, creeping rhizomes, tubers.

**Habitat:** Shallow to deep water; variable appearance depending upon growing conditions. Tolerant of alkaline water.



Donald Cameron, Maine Natural Areas Program



# SUBMERGED PLANTS

Species: *Callitriche hermaphroditica*, autumnal water-starwort, northern water-starwort

*Callitriche stagnalis*, Pondwater water-starwort

Family: Callitrichaceae

## NATIVE

**Leaf:** Opposite. Pond: narrow submerged leaves (up to 10 mm wide) with one rounded leaf tip are sometimes present. Oval or spoon-shaped floating leaves are up to 10mm wide and are joined by tiny ridges at the base. Autumnal: all leaves are submerged, narrow and flat, 5 to 20 mm long, with inconspicuous white margins.

Leaf tips have two lobes forming a U-shape; leaf bases clasp the stem but are not joined by ridges.

**Stem:** Usually branched, rising to surface or sprawling.

**Flower:** Tiny flowers lack sepals and petals and are located at leaf bases on minute stalks. Pond: 2-4 tiny, whitish bracts emerge from the flower base. Autumnal: bracts absent.

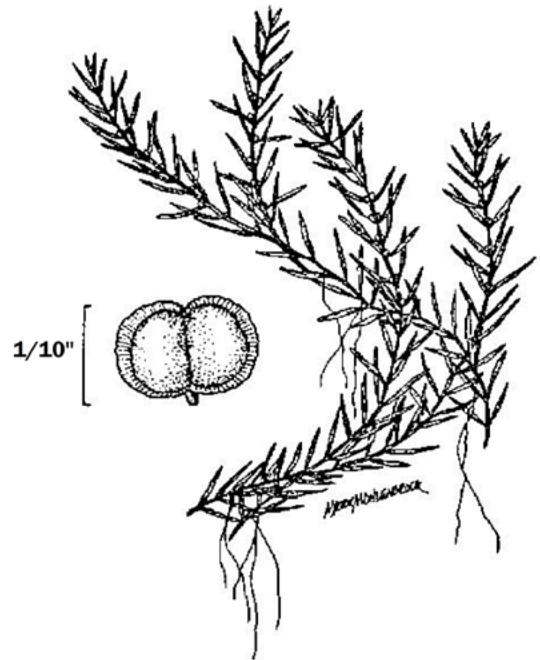
**Fruit:** Small, locate at leaf bases. Four compartments, each containing one seed. Pond: oval, 1.2-1.8 mm long, 1.2-1.7 mm wide, narrow margin all around (wing), bracts at base.

Autumnal: 1.1 to 1.6 mm long, 1.2 to 1.8 mm wide, no margin, fruit without bracts.

**Root:** Fibrous, from plant base or sprouting from stem joints.

**Propagation:** Plant fragments, seeds.

**Habitat:** Shallow water of lake margins and streams.



C. STAGNALIS



Arthur Haines, New England Wild Flower Society

C. HERMAPHRODITICA



Gerald D. Carr, University of Oregon

# SUBMERGED PLANTS

Species: *Callitriche heterophylla*, large water-starwort, different leaved water-starwort, twoheaded water-starwort

*Callitriche palustris*, (Synonym: *Callitriche verna*), vernal water-starwort

Family: Callitrichaceae

## NATIVE

**Leaf:** Opposite. 2 types: submersed and floating. **Large:** Narrow submersed leaves are 0.5-2.5 cm long with two rounded leaf tip lobes; oval floating leaves (to 1 cm wide) are sometimes present and form rosettes on the water surface; leaf bases are joined by a wing-like ridge. **Vernal:** Narrow, pale-green, submersed leaves are 0.5-2 cm long and to 1 mm wide with a slight indentation at the tip; spoon-shaped floating, emergent, or terrestrial leaves are sometimes present, up to 4 mm wide, one rounded tip per leaf, with the leaf bases jointed by a wing-like ridge.

**Stem:** Thread-like, branched, vertical-to-trailing stem is usually less than 50 cm long.

**Flower:** Small flowers are located at leaf bases. They lack sepals or petals; instead, 2 small whitish bracts serve as 'petals'.

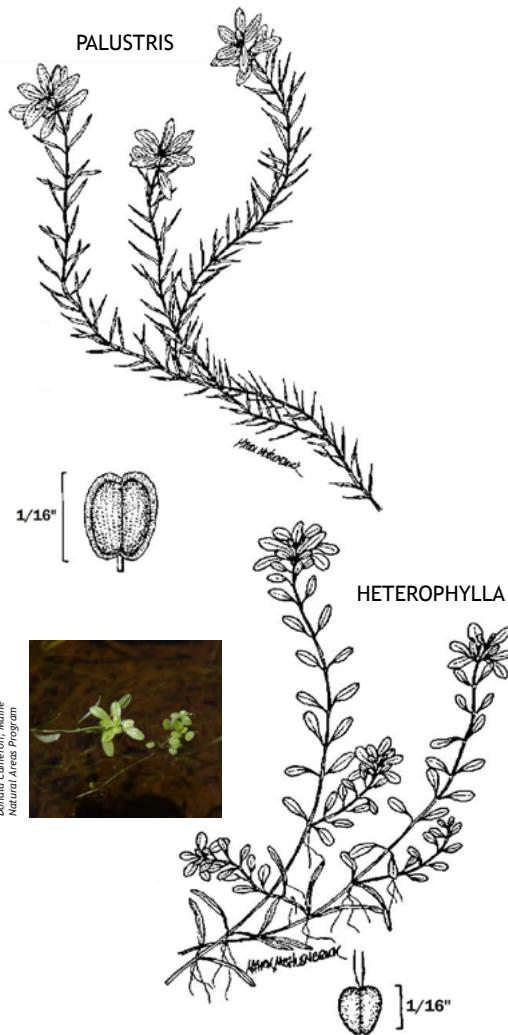
**Fruit:** Four tiny, nut-like fruits per flower; each containing one seed. **Large:** Heart shaped, with no narrow margin, 0.6-1.4 mm across. **Vernal:** Narrow margin all around, tiny pits create vertical line on surface, 0.9-1.4 mm long, 0.8-1.3 mm wide, generally wider above middle.

**Root:** Fibrous, from plant base, and loosely anchoring plants to the bottom.

**Propagation:** Plant fragments, seeds.

**Habitat:** Lake margins and slow streams. May carpet the mud when water levels drop.

Donald Cameron, Maine  
Natural Areas Program



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## SUBMERGED PLANTS

**Species:** *Ceratophyllum demersum*, coontail, common hornwort, coon's tail

**Family:** Ceratophyllaceae

### NATIVE

**Leaf:** Leaves are forked into 2 (sometimes 4) flattened or linear segments with small teeth along one margin. Olive green to almost black leaves are 1.5-4 cm long and are often stiff or crunchy. Leaves are arranged in whorls of 5-12 leaves with the whorls becoming dense toward the stem tip.

**Stem:** Easily broken, freely branching stem is up to 3-4 m long.

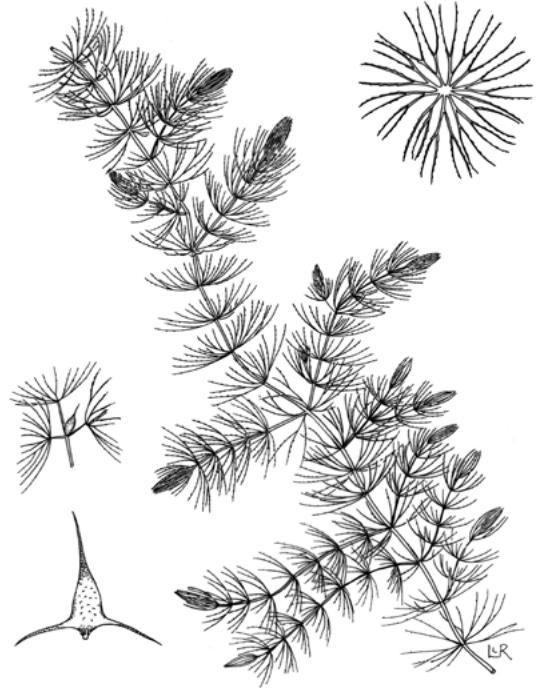
**Flower:** Tiny, submerged flowers are located at leaf bases. Petals are tiny green scales. Male and female flowers occur separately on the same plant. Male flowers occur in pairs on opposite sides of the stem while female flowers are solitary. Flowering occurs from June through September.

**Fruit:** Small (4-7 mm), hard, one seeded, egg-shaped fruit has 3 long spines (to 12 mm): 1 spine at the fruit tip and 2 at the base.

**Root:** Lacks roots. Floats freely below the surface, or is sometimes anchored to the bottom by modified leaves, especially in flowing water.

**Propagation:** Seeds, plant fragments.

**Habitat:** Ponds, lakes, and slow moving streams and rivers. Tolerant of hard water (high calcium content) and low light levels.



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## SUBMERGED PLANTS

Species: *Elodea canadensis*, common elodea, broad waterweed, common waterweed, Canadian waterweed

*Elodea nuttallii*, Nuttall's waterweed, western waterweed

Family: Hydrocharitaceae

### NATIVE

**Leaf:** Mostly arranged in whorls of 3 (occasionally 4), but sometimes opposite on the lower portions of the stems. Leaves very finely toothed along the edges, but evident only with magnification. **Common:** 6-15 mm long and 1.5-4 mm wide; leaf tip tapered to a blunt point. **Western:** 6-13 mm long and less than 1.5 mm wide; leaf tip tapered to a slender point.

**Stem:** Long, slender, generally branched. Common waterweed is more sparingly branched than Western waterweed.

**Flower:** Often does not produce flowers. Small (8 mm across), white flowers occur at the ends of long, thread-like stalks and have 3 petals and usually 3 sepals. Male and female flowers occur on separate plants, but male flowers are rarely produced. Blooms from July to September. **Common:** sepals to 5 mm long, petals only on male flowers to 5 mm. **Western:** sepals to 2 mm long, petals tiny (0.5 mm) or absent. Male flowers detach and become free-floating.

**Fruit:** Capsules approximately 6 mm long, seeds about 4 mm long, but because of a shortage of male plants, seeds are seldom produced.

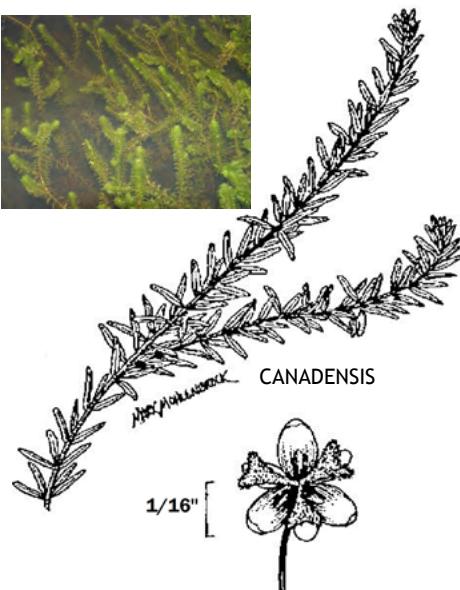
**Root:** Tufts of fibrous roots from nodes along the stem.

**Propagation:** Stem fragments, overwintering buds, and rarely by seeds.

**Habitat:** Lakes, rivers, ponds, and ditches.

**Common:** most Montana waters. **Western:** fresh to slightly brackish water.

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## SUBMERGED PLANTS

Species: *Egeria densa* (Synonym: *Elodea densa*),  
Brazilian elodea, anacharis, giant elodea

Family: Hydrocharitaceae

### INVASIVE - NOT CURRENTLY FOUND IN MONTANA

**Leaf:** Bright to dark green leaves, 2-4 cm long and 2-5 mm wide, have minutely toothed edges and are closely spaced in whorls of 4-6 in the upper part of the plant, becoming more widely spaced whorls of 3 at the stem base.

**Stem:** Up to 3 m in length. Leaves occur along the entire length of the stem.

**Flower:** Fragrant white flowers have a yellow center with three, 7-9 mm long petals. Flowers float on the water surface and are attached at the base of leaf whorls by long slender stalks (to 6 cm). Two to three flower stalks may arise from the same whorl. Male and female flowers are produced on separate plants, but only male plants are found in the U.S. Plant flowers from late spring to early fall.

**Fruit:** Fruits and seeds have not been observed outside of its native range.

**Root:** Fibrous. Can produce white adventitious roots along the stem.

**Propagation:** Because only male plants are found in the U.S., propagation is from stem fragment and by collapsed stems that sprout roots and form the base of new plants. Dormant shoots develop in fall and overwinter in the sediment.

**Habitat:** Lakes, ponds, sloughs, streams.



Center for Aquatic Invasive Plants,  
Institute of Food & Agricultural Sciences  
University of Florida



Center for Aquatic Invasive  
Plants, Institute of Food  
& Agricultural Sciences  
University of Florida



## SUBMERGED PLANTS

Species: *Heteranthera dubia*, water star-grass, grassleaf mudplantain

Family: Pontederiaceae

### NATIVE

**Leaf:** Narrow (2-6 mm wide), 10-15 cm long, deep green, grass-like leaves lack a distinct midvein. Base of the leaf is joined to a tubular sheath that wraps around the stem. Sheath has a membranous extension, rounded at first, but becoming divided with age.

**Stem:** Slender, branching stem is rounded or slightly flattened in cross section. Stem grows to 2 m, is more or less limp, and often forms profuse roots at the nodes.

**Flower:** Bright yellow, tubular flowers have 6 'petals' (tepals) that form a star and rise just above the water surface. Flower tube is long and narrow, and the tepals are 5 mm long. Flowers sometimes do not open, self-pollinating in the bud instead. Water star-grass flowers infrequently in the Pacific Northwest.

**Fruit:** Fruits are oval capsules up to 1 cm long, containing several longitudinally ridged seeds.

**Root:** Roots are fibrous and grow from rhizomes. Stems often form roots at the nodes.

**Propagation:** Spreads from seeds dispersed by water and from rooted stem fragments.

**Habitat:** Grows in shallow water up to 1 m deep, including slow streams, rivers, lakes and ponds. It can survive on mud banks and is tolerant of alkaline water. This plant is rare in Montana, and may not flower in Montana.



*Heteranthera dubia*, by Donald Cameron, Maine Natural Areas Program



# SUBMERGED PLANTS

Species: *Hydrilla verticillata*, caspary, hydrilla

Family: Hydrocharitaceae

## INVASIVE - NOT CURRENTLY FOUND IN MONTANA

**Leaf:** Bright green leaves are 1-5 mm wide and 6-20 mm long with sharply toothed margins (visible without magnification). Reddish midrib often has small spines. Leaves grow in whorls of 3-10 along the stem, although 5 leaves per whorl is most common. Whorls can be closely spaced and bushy, or spaced widely apart along the stem.

**Stem:** Monoecious variety of hydrilla has a delicate sprawling growth form that freely branches at the lake bottom. Dioecious variety branches more at the water's surface.

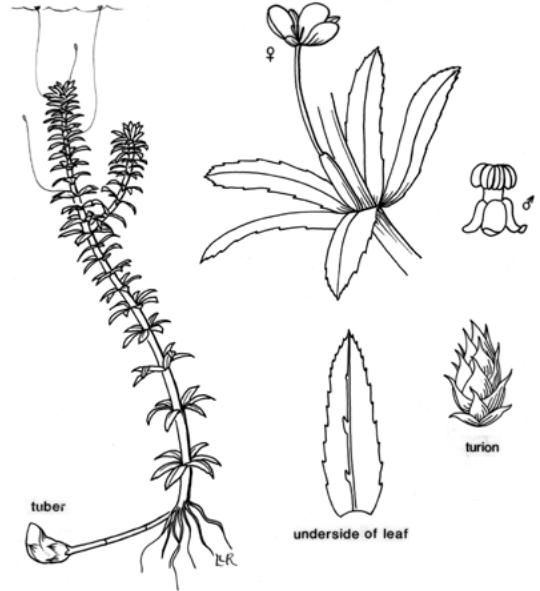
**Flower:** Monoecious hydrilla has male and female flowers on the same plant. Female has 3 small, translucent, white petals, 4-8 mm wide and 1-5 mm long, and is attached to the stem tip by a slender stalk. Male flowers are produced in the leaf axils, but detach and become free-floating. Blooms mid to late summer.

**Fruit:** Small, spindle-shaped fruits, 5-6 mm long.

**Root:** Fibrous rhizomes and above ground stolons. Peanut-sized tubers on the roots.

**Propagation:** Fragments, tubers, seeds (rarely), and scaly overwintering buds called turions.

**Habitat:** Lakes, river, ponds and ditches.



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## SUBMERGED PLANTS

**Species:** *Myriophyllum quitense* (Synonym: *M. elatinoides*), Andean water-milfoil, waterwort water-milfoil, elatine watermilfoil

**Family:** Haloragaceae

### NATIVE

**Leaf:** Two types. Submerged leaves: feather-like and arranged in whorls of 2-4 (occasionally 5) around the stem. Leaves are 1.5-4 cm long to 2 cm wide with 5-10 leaflet pairs per leaf. First submerged leaves at the stem base of new shoots are small, entire, and opposite.

Emergent leaves: blue-green to reddish-tinted leaves are arranged in whorls of 3-4 leaves around the flower spike. Each is 0.5-1 cm long; oval to triangular shaped, and toothed along the leaf to halfway to the midrib, becoming less toothed toward the leaf tip.

**Stem:** Cylindrical stem is 1-4 m long and is 2-4 mm in diameter at the base. Each stem sometimes bears multiple flower stalks.

**Flower:** Tiny flowers (0.7-1.2 mm long) have 4 sepals and 4 petals and are located at the base of emergent leaves. Male flowers are near the top of the flower stalk; female flowers are near the base. Andean milfoil often flowers in August and

September, later than other aquatic milfoils.

**Fruit:** Olive brown, squarish fruit is 1.7 mm long and seldom found.

**Root:** Numerous whitish rhizomes form roots at the joints. Roots are very branched.

**Propagation:** Seeds and plant fragments. Andean milfoil will also produce winterbuds, although it overwinters in an evergreen condition.

**Habitat:** Freshwater lakes, rivers, and streams. Usually in cold nutrient-poor water. This plant is rare in Montana.



Jennifer Parsons, State of Washington Department of Ecology



## SUBMERGED PLANTS

**Species:** *Myriophyllum sibiricum* (Synonym: *Myriophyllum exalbescens*), Northern watermilfoil, common watermilfoil, shortspike watermilfoil

**Family:** Haloragaceae

### NATIVE

**Leaf:** Two types, submerged and emergent.

**Submerged:** feather-like olive-green, arranged in whorls of 3-4 with fewer than 14 leaflet pairs per leaf, each leaf to 4 cm long. Leaves usually do not collapse when removed from water. Leaflet pairs at the base of the leaf are much longer than those at the tip, giving the leaf a lance shape. **Emergent:** located beneath the flowers on the flower stalk and tiny (1-3 mm long). They are smooth edged to coarsely toothed and are shorter than the flowers.

**Stem:** Up to 3 m long stem is often reddish when fresh and usually is visible through the widely spaced leaves. Surface branching is sparse in water more than 1 m deep.

**Flower:** Tiny flowers occur on often red or reddish-purple emergent spikes up to 15 cm long. Female flowers lack petals; male flowers have 4 petals and 8 anthers.

**Fruit:** Nut-like, up to 3 mm in diameter, separating into 4 chambers, 1 seed per chamber.

**Root:** Fibrous, will sprout from fragments.

**Propagation:** From winter buds (turions), plant fragments, and seeds.

**Habitat:** Lakes, ponds, and rivers. Tolerant of nutrient-rich, alkaline, and brackish waters.



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## SUBMERGED PLANTS

Species: *Myriophyllum spicatum*, Eurasian watermilfoil, Eurasian water-milfoil

Family: Haloragaceae

### INVASIVE

**Leaf:** Two types. **Submerged leaves:** 2-4 cm long, feather-like, arranged in whorls of 4 around the stem. Leaves are often square at the tip and typically have greater than 14 leaflet pairs per leaf. On mature plants the leaflets are closely crowded along the midrib. **Emergent leaves:** tiny (1-3 mm long), smooth edged to toothed, located on the flower spikes with one leaf beneath each flower, leaves shorter than flowers.

**Stem:** Long, often abundantly branched stems form a reddish or olive-green surface mat in summer.

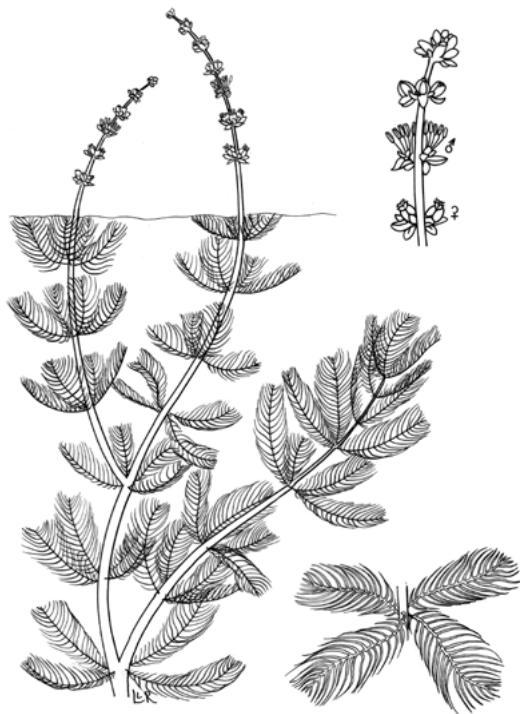
**Flower:** Tiny. On reddish emergent spikes 4-8 cm long. Female flowers lack petals, 4 petals on male flowers, 8 anthers.

**Fruit:** Up to 3 mm in diameter, divided into 4 chambers, with 1 seed per chamber.

**Root:** Many, fibrous, from the plant base. Roots often develop from plant fragments.

**Propagation:** Plant fragments; rhizomes. Sprouting from seed is rare.

**Habitat:** Lakes, rivers, and ponds. Tolerates a wide range of water conditions.



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# SUBMERGED PLANTS

Species: *Myriophyllum verticillatum*, whorled water-milfoil, whorl-leaf watermilfoil

Family: Haloragaceae

## NATIVE

**Leaf:** Two types: submerged and emergent.

**Submerged:** feather-like, 0.5-5 cm long and arranged in whorls around the stem with 4-5 leaves per whorl. Thread-like, paired leaflets are up to 10 mm long and range from 7-17 leaflets per leaf. **Emergent:** deeply-divided (on the flower stalk), arranged in whorls around the stalk and 2-10 mm long with the lower leaves usually larger than the leaves near the tip of the stalk. **Emergent:** longer than the flowers.

**Stem:** Stem is not highly branched and grows to 3 m long.

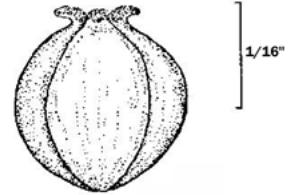
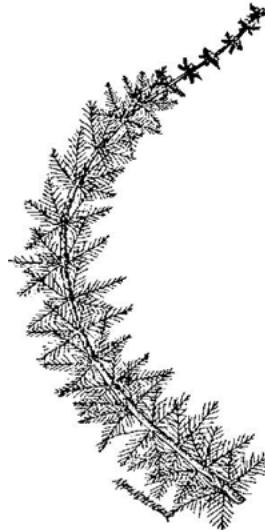
**Flower:** Tiny flowers have 4 petals and occur in the leaf bases on emergent stalks. Emergent flower spikes (stalks) are 5-12 cm long with male flowers located at the top of the spike, bisexual and female flowers below.

**Fruit:** Small fruit splits into 4 chambers with each chamber containing one seed.

**Root:** Rhizomes give rise to numerous, smaller, thinner roots.

**Propagation:** Plant fragments, rhizomes, seeds, and club shaped winter buds.

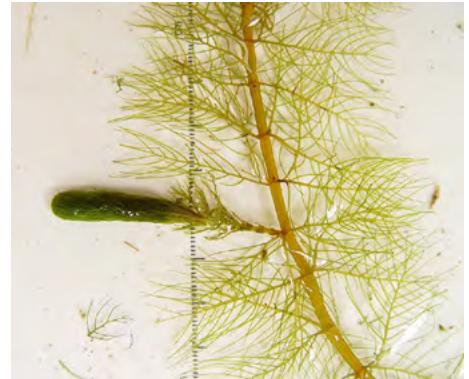
**Habitat:** Lakes, ponds, ditches, and small streams.



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## SUBMERGED PLANTS

Species: *Najas flexilis*, slender water-nymph, nodding water-nymph

*Najas guadalupensis*, common water-nymph, southern water-nymph

Family: Najadaceae

### NATIVE

**Leaf:** Glossy, green, and finely toothed leaves are oppositely arranged, but appear to be whorled near ends of the stems. Leaves are long and narrow with broad bases that clasp the stem. **Slender:** leaves taper to a long point and are 1-3 cm long and 1-2 mm wide. **Common:** the blunt-tipped leaves are generally shorter and narrower (1-2.5 cm long and 0.5-1 mm wide) than slender water-nymph leaves.

**Stem:** Slender, limp and branched stem is up to 2 m long and easily broken.

**Flower:** Inconspicuous, tiny (2-3 mm) flowers are located in clusters at the base of leaves. Male and female flowers occur separately on the same plant. Water-nymph pollen is transported by water currents.

**Fruit:** Small, oval-shaped fruit is located in the leaf bases. Each fruit contains one seed that is about 3 mm long. Fruit surface is smooth and flossy in slender water-nymph and is dull and pitted in common water-nymph. Fruits are present in late summer.

**Root:** Fibrous.

**Propagation:** Seeds, plant fragments.

**Habitat:** Ponds, lakes, and sluggish streams to depths of 4 m. **Slender:** water-nymph tolerates brackish conditions.

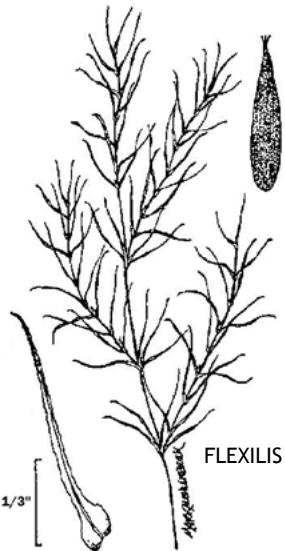
GUADALUPENSIS



Donald Cameron, Maine Natural Areas Program



1/16"



FLEXILIS

Donald Cameron, Maine Natural Areas Program



1/3"

## SUBMERGED PLANTS

Species: *Potamogeton crispus* , curlyleaf pondweed, curly pondweed

Family: Potamogetonaceae

### INVASIVE

**Leaf:** Alternate, all submerged no leaf stalks. Oblong, stiff, translucent leaves (4-10 cm long, 5-10 mm wide) have distinctly wavy edges with fine teeth and 3 main veins. Sheaths (stipules) up to 1 cm long are free of the leaf base and disintegrate with age. This spp. looks similar to *P. richardsonii*.

**Stem:** Branched, up to 90 cm long, somewhat flattened.

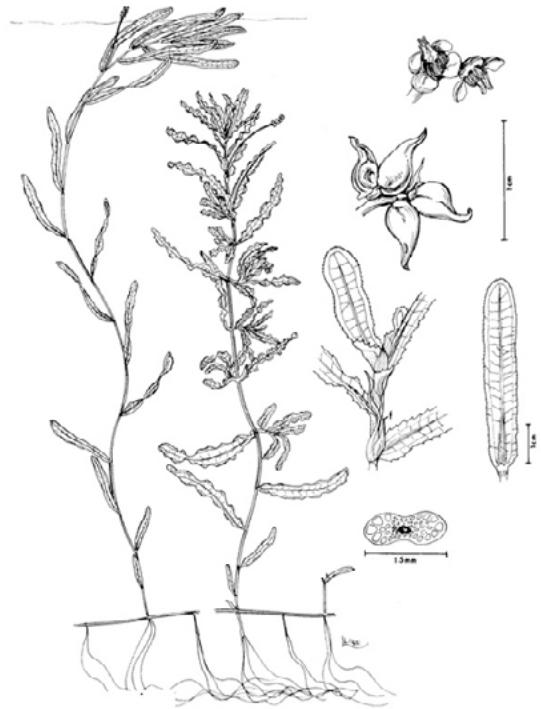
**Flower:** Tiny, with 4 petal-like lobes. In spikes 1-3 cm long on stalks up to 7 cm long.

**Fruit:** Seed-like achene, 4-6 mm long, including 2-3 mm beak, back ridged.

**Root:** Fibrous, from slender rhizomes.

**Propagation:** Seeds and creeping rhizomes, turions are hard, brown, bur-like buds with crowded, small holly-like leaves; produced in the spring and sprout in autumn.

**Habitat:** Shallow to deep still or flowing water, tolerant of disturbance.



Donald Cameron, Maine Natural Areas Program



Donald Cameron, Maine Natural Areas Program



## SUBMERGED PLANTS

Species: *Potamogeton foliosus*, leafy pondweed

*Potamogeton pusillus* (Synonym:  
*Potamogeton berchtoldii*), small pondweed

Family: Potamogetonaceae

### NATIVE

**Leaf:** Submerged, alternate, stalk-less. Leafy: linear leaves, 2-10 cm long, 1-2.5 mm wide, have pointed tips and 1-5 veins. Sheaths (stipules) are free of the leaf-base with the lower portion forming a tube that eventually ruptures as new branches emerge. Small: linear leaves, 2-7 cm long, 0.5-2 mm wide, have pointed to rounded tips and 3 veins. Membranous tubular or open sheaths (stipules) are 1-3 cm long, free of the leaf base, and usually disintegrate before the leaves.

**Stem:** Slender and profusely branched. Leafy: slightly flattened, paired glands lacking. Small: often with small paired yellowish glands at leaf base.

**Flower:** Leafy: In 2-4 whorls on an initially crowded spike (1 cm) that elongates as the season progresses; stalk 1-3 cm long. Small: in 1-4 whorls on spikes measuring 3-15 mm long; spikes not always above the water; on stalks to 5 cm long, often curved at the base.

**Fruit:** Achenes. Leafy: to 2 mm long, with distinctively wavy ridged achene, beak 0.5 mm long. Small: 1.5-3 mm long, rounded

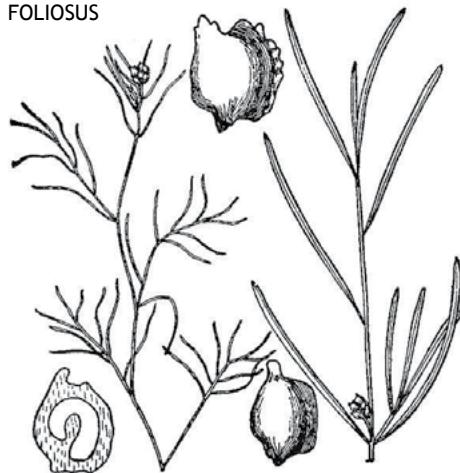
back, straight beak to 0.5 mm long.

**Root:** Leafy: fibrous, emerging from thread-like rhizomes. Small: fibrous, from base of plant; often non-rhizomatous.

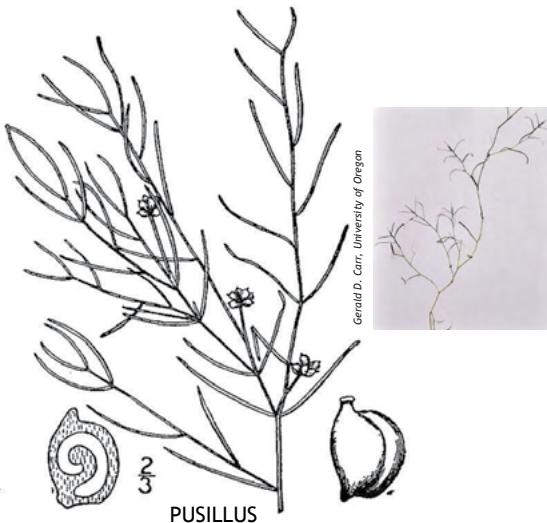
**Propagation:** Seeds and winter buds form at lateral branch tips and near leaf bases, also has rhizomes.

**Habitat:** Leafy: Marshes and shallow standing water. Small: wide tolerance of habits, including brackish conditions.

### FOLIOSUS



Donald Cameron, Maine  
Natural Areas Program



Gerald D. Carr, University of Oregon



## SUBMERGED PLANTS

**Species:** *Potamogeton pectinatus*, (Synonym: *Stuckenia pectinata*), sago pondweed

*Potamogeton filiformis* (Synonym: *Stuckenia filiformis*), slender-leaved pondweed, slender pondweed, fineleaf pondweed

*Potamogeton vaginatus* (Synonym: *Stuckenia vaginata*), sheathing pondweed, sheathed pondweed

**Family:** Potamogetonaceae

### NATIVE

**Leaf:** Alternate, thin, submerged with stipules fused to leaf base for most of their length. **Sago:** 2-15 cm long, to 1mm wide leaves have pointed tips and 1 (sometimes 3) veins. Sheath (stipules) 2-5 cm long. **Slender:** brownish leaves, to 12 cm long, 0.5-1.5 mm wide, have pointed tips and 1 vein. Sheath (stipules) to 3 cm are tubular when young, later splitting. **Sheathing:** often dark-brown leaves, to 10 cm long, 1-2 mm wide, have rounded tips and 1-3 veins. Sheaths (stipules) on main stem leaves are twice as wide as the stem, margins free.

**Stem:** **Sago & Slender:** thread-like, branched. **Sheathing:** stout below, slender above, can have 2-3 branches emerging at each node.

**Flower:** **Sago:** 2-7 whorls in spikes 1-3 cm long, usually float horizontally just beneath the water. Stalk 3-12 sm. **Slender:** 2-5 whorls on open 2.5 cm spikes; the lowest whorl sometimes remote from the others. Stalk to 15 cm. **Sheathing:** 5-9 evenly spaced whorls on long-stalks to 12 cm.

**Fruit:** Achenes. **Sago:** 3-5 mm long, plump, back rounded, reddish-brown when ripe, beak to 0.7 mm long. **Slender:** 2-3 mm long, broad oval, back rounded, tiny beak (0.3 mm). **Sheathing:** 3-4 mm long, broad oval, rounded or slightly ridged, no beak.

**Root:** Fibrous, from plant base and rhizomes. Sago and Slender produce tubers from rhizome tips.

**Propagation:** Seeds and rhizomes. **Sago & Slender:** also from tubers.

**Habitat:** **Sago:** tolerates a wide range of conditions, including brackish, alkaline, or nutrient-rich water. **Slender:** often in shallows of hard water lakes. **Sheathing:** cold, often deep water.



VAGINATA



FILIFORMIS



PECTINATA



Donald Cameron, Maine Natural Areas Program



Donald Cameron, Maine Natural Areas Program

## SUBMERGED PLANTS

Species: *Potamogeton obtusifolius*,  
blunt-leaved pondweed

Family: Potamogetonaceae

### NATIVE

**Leaf:** Submerged, alternate, linear, stalkless.  
Green to reddish translucent leaves to 10 cm long, 4 mm wide, have 3 veins and rounded or sometimes pointed tips. Translucent sheaths (stipules) to 3 cm long are open to the base, free of the leaf base, and shred into fibers.

**Stem:** Branching. Pairs of bump-like glands occur at leaf bases. Cylindrical to flattened, to 2 m long, slightly zigzag, with irregularly shaped glands.

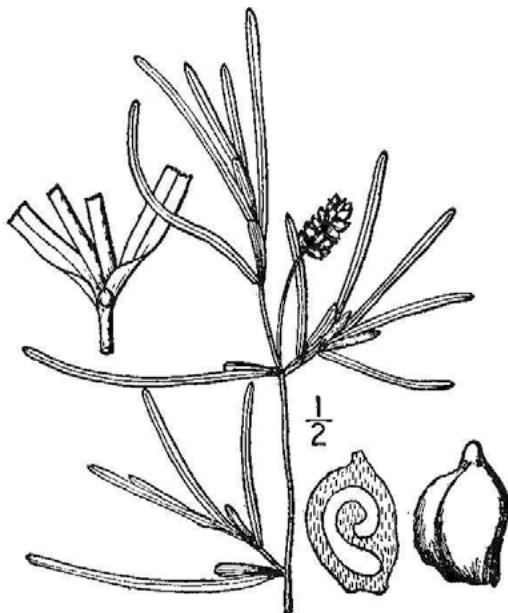
**Flower:** Small, densely packed on spikes 1-2 cm long; straight, short stalks to 2 cm.

**Fruit:** Achene. 3-4 mm long, round or slightly ridged straight beak to 0.7 mm long.

**Root:** Fibrous.

**Propagation:** Seeds; dense, leafy winter buds (turions).

**Habitat:** Shallow lakes and ponds. Occurs in fresh water, not saline or alkaline water.



Donald Cameron, Maine Natural Areas Program



## SUBMERGED PLANTS

Species: *Potamogeton praelongus*, white-stemmed pondweed, whitestem pondweed

Family: *Potamogetonaceae*

### NATIVE

**Leaf:** Submerged, alternate, stalk less, with heart shaped bases clasping the stem. Shiny leaves, 5-35 cm long, 1.5-2.5 cm wide, often appear wavy or twisted, with hooded or prow-shaped leaf tips. Leaves are widest below the middle of the leaf with 5 or more distinct veins. Sheaths (stipules) are stiff, whitish, 3-10 cm long, and arise from leaf bases.

**Stem:** Whitish, zigzag branching toward the top, to 3 m long, 2-3 mm thick.

**Flower:** Small, clustered on whorls on emergent spikes. In 6-12 whorls on spikes up to 5 cm long; flower stalks to 0.5 m long.

**Fruit:** Achene 0.4-6 mm long, including stout beak, ridged on the back.

**Root:** Fibrous, from stout rhizomes. Rhizomes of white-stemmed pondweed are brown-spotted with numerous air cavities.

**Propagation:** Seeds, rhizomes, forms winter buds.

**Habitat:** Deep, clear lakes, in up to 6 m of water.



Donald Cameron, Maine Natural Areas Program

# SUBMERGED PLANTS

Species: *Potamogeton richardsonii*,  
Richardson's pondweed, redheadgrass,  
red-head pondweed

Family: Potamogetonaceae

## NATIVE

**Leaf:** Submerged, alternate, stalk less, with heart-shaped bases clasping the stem. Densely spaced, lance-shaped leaves, 2-13 cm long, 1-3 cm wide, have wavy or crinkled margins often curved backwards, with 7 or more veins. Membranous sheaths (stipules) less than 2 cm long arise from leaf bases, disintegrating or becoming fibrous early in the growing season. This plant can be confused with *P. crispus* because of the wavy margined leaves.

**Stem:** Often branched, rarely zigzagged, to 1 m long.

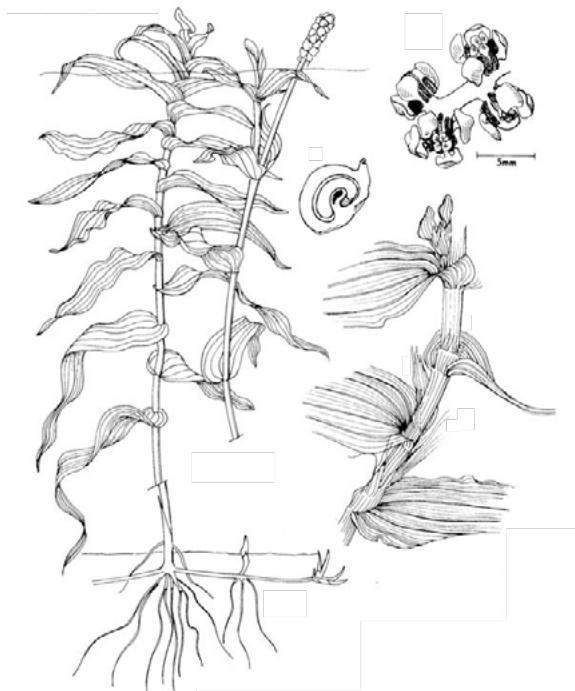
**Flower:** 4-12 whorls on short spikes 2-4 cm long; flower stalks generally just longer than the spike, but sometimes much longer.

**Fruit:** Achene. 2.5-4 cm long, including 0.5-1 mm long beak, usually not ridged.

**Root:** Fibrous from stout rhizomes.

**Propagation:** Seeds, rhizomes.

**Habitat:** Shallow to deep (0.5-3.5 m) water, often in alkaline lakes and marl encrusted.



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## SUBMERGED PLANTS

**Species:** *Potamogeton robbinsii*, flatleaf pondweed, fern-leaf pondweed, Robinson's pondweed, Robbins' pondweed, flat-leaved pondweed

**Family:** Potamogetonaceae

### NATIVE

**Leaf:** All submerged leaves. Olive green to brown stiff leaves are linear, minutely toothed, and are attached about halfway along the stipular sheaths, which are then attached to the stem. Leaves measure up to 12 cm long and 6 mm wide and have many parallel veins. Leaves form a rigid flattened spray that resembles the leaf arrangement of a palm frond or a sword fern. White sheaths (stipules) are less than 3 cm long with the lower 10-15 mm fused to the blade; the sheath tip shreds into fibers.

**Stem:** Fern-leaf pondweed has stout stems up to 3 m long that often creep along the bottom and will root at the lower nodes.

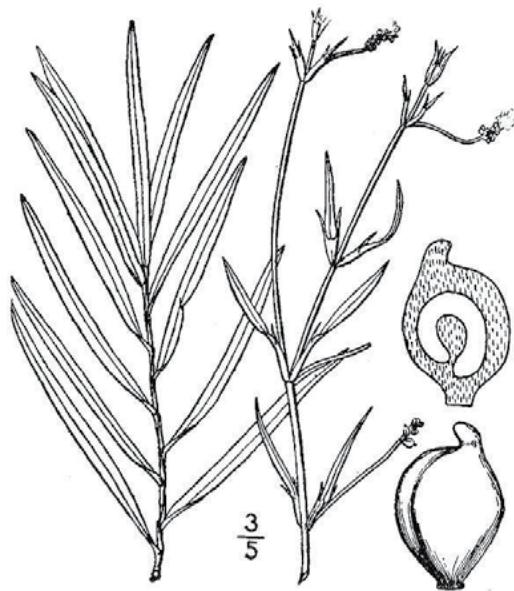
**Flower:** Small flowers with 4 petal-like lobes occur on spikes near the water surface. Up to 2 cm long spikes occur on flat, stiff stalks with widely spaced leaves.

**Fruit:** Achenes are up to 4 mm long, are keeled, and have a curved beak to 1 mm long.

**Root:** Fibrous roots emerge from slender rhizomes and the lower stem.

**Propagation:** Seeds, rhizomes, winter buds.

**Habitat:** Shallow to deep water, usually with low alkalinity.



Donald Cameron, Maine Natural Areas Program



## SUBMERGED PLANTS

**Species:** *Potamogeton zosteriformis*,  
flatstem pondweed, flat-stem  
pondweed, eelgrass pondweed

**Family:** Potamogetonaceae

### NATIVE

**Leaf:** Alternate, all submerged no leaf stalks. Smooth edged leaves (5-20 cm long, 2-5 mm wide) have many veins. Sheaths (stipules) 2-6 cm long are free of the leaf base and become fibrous with age.

**Stem:** Few branched, up to 2 m long, 0.7-4 mm wide, flattened, with sharp edges.

**Flower:** Tiny with 4 petal-like lobes, in spikes up to 3 cm long on stalks up to 10 cm long.

**Fruit:** Seed-like achene, approximately 5 mm long, sharp ridge on back, short beak (to 1 mm).

**Root:** Fibrous, from slender rhizomes.

**Propagation:** Seeds and creeping rhizomes. Overwinters as leafy buds.

**Habitat:** Ponds, lakes, 1-2.5 m deep.



Donald Cameron, Maine Natural Areas Program



## SUBMERGED PLANTS

**Species:** *Ranunculus aquatilis* (Synonyms: *R. longirostris*, *R. subrigidus*, *R. circinatus*, *R. trichophyllus*), white water-buttercup, white water buttercup, water crowfoot

**Family:** Ranunculaceae

### NATIVE

**Leaf:** Leaf form is variable depending on the season and growing conditions, but leaves are always alternately arranged on the stem. Submerged leaves are branched into more than 20 thread-like segments. These fan-shaped leaves are 1-4 cm wide and are attached to the stem by 1-2 cm long leaf stalks. These underwater leaves generally collapse when removed from the water. When growing on mud, more compact versions of the submerged leaf will form. Floating leaves are often absent. When present, these scalloped leaves (0.5-2 cm long) are flat and have 3 to 5 main lobes.

**Stem:** Long, smooth, or slightly hairy stem can grow to 1 m and is weak, branched, and rooting at the lower nodes.

**Flower:** Single flowers on stalks (1-6 cm long) rise above the water surface. Each flower is 1-2 cm across, has a yellow center, and 5 white petals. As the fruit matures, the petals detach and the flower stalks tend to curve away from the stem. A more commonly found plant that can be confused with this species is *Ranunculus gmelinii*, which is

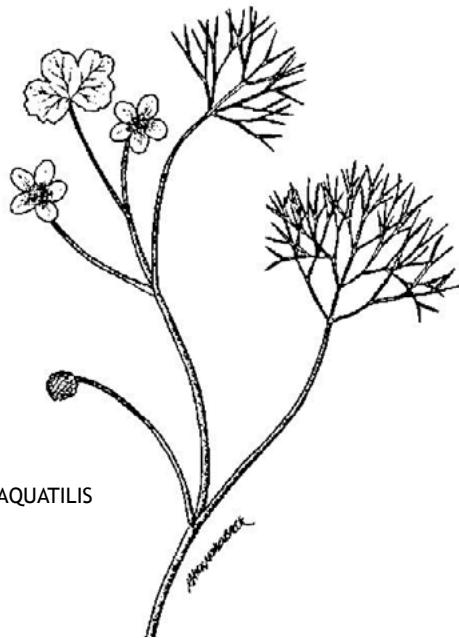
a floating buttercup species that has yellow flowers.

**Fruit:** Clusters of 10 to 20 achenes per flower. Each achene is 1.5 to 2.5 mm long, has a pointed end, and often has cross ridges.

**Root:** Fibrous roots often emerge from nodes on lower portions of the stems.

**Propagation:** Seeds and stem fragments.

**Habitat:** Ponds, lake margins, rivers, slow-moving streams or ditches.



Donald Cameron, Maine Natural Areas Program



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## SUBMERGED PLANTS

Species: *Ruppia maritima*, (Synonyms: *R. cirrhosa*, *R. spiralis*) widgeongrass, ditch-grass

Family: Potamogetonaceae

### NATIVE

**Leaf:** Long, narrow, alternate leaves are less than 1 mm wide. Stipular sheaths, less than 7 cm long, are completely fused to the leaf and often broadly clasp the stem.

**Stem:** Many branched stems, to 0.5 m long, less than 1 mm wide, root at the nodes and often have a zigzag appearance. Produces slender horizontal rhizomes.

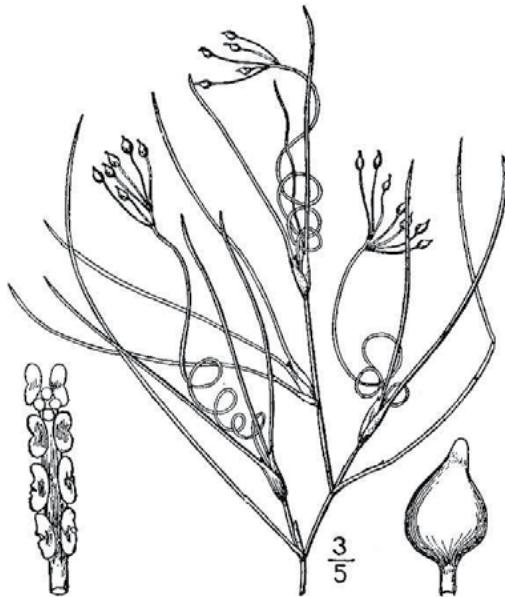
**Flower:** Tiny flowers (3-5 mm across) lack petals and sepals, and occur in pairs on stalks. Pollination often occurs underwater or at the water surface. Once pollinated, the flower stalk coils.

**Fruit:** Dark colored, egg to pear-shaped, symmetrical to highly asymmetrical achene is 1.5-2 mm long and occurs in a cluster. Each fruit is on individual stalks, but all are connected to a long flowering stalk (peduncle).

**Root:** Fibrous. From lower nodes of erect stems and shallowly buried rhizomes.

**Propagation:** Seeds, fragments, rhizomes; occasionally produces overwintering buds.

**Habitat:** Alkaline lakes.



Donella Cameron, Maine Natural Areas Program

# SUBMERGED PLANTS

Species: *Utricularia minor*, lesser bladderwort

*Utricularia macrorhiza* (Synonym: *U. vulgaris*), common bladderwort, greater bladderwort

Family: Lentibulariaceae

## NATIVE

**Leaf:** No true leaves. Green, highly branched, finely divided underwater leaf-like stems with small seed-like bladders are present. Bladderworts often appear dense and bushy underwater. **Lesser:** leaves are 3-30 mm long, 3-parted at the base and are irregularly forked into 1-3 forks. Maximum number of leaf segments is less than 16, leaves are flat and linear.

**Stem:** Branched stem is up to 2 m long and can be floating, submersed, or partly creeping on the sediment, sometimes anchored at the base by root-like structures. **Lesser:** floating stems with leaves that contain bladders, creeping stems have fewer leaves and contain less bladders.

**Flower:** Yellow, snapdragon-like flowers occur above the water. **Common bladderwort:** flowers to 25 mm wide on stout stalks, with a prominent spur projecting below the lower lip of the flower. Flower often have faint purple-brown stripes. Flowers July to August. **Lesser:** flowers are 5-8 cm long with two lips, lower lip is twice the length of the upper lip.

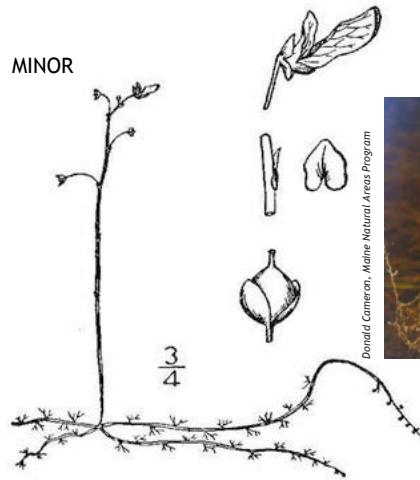
**Fruit:** Capsule contains many seeds. **Common bladderwort:** pedicel to 20 mm long. **Lesser:** Seed is not winged.

**Root:** Absent.

**Propagation:** Fragments, seeds. **Common bladderwort:** may form very large (4-5 cm across) bright green winterbuds.

**Habitat:** Floating freely in shallow water or loosely attached to sediment. **Lesser:** low nutrient lakes.

MINOR



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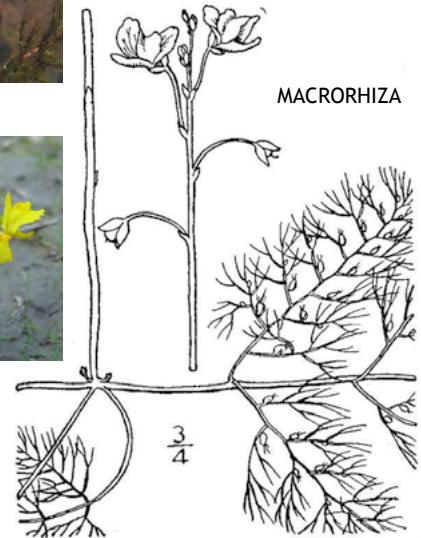
Donald Cameron, Maine Natural Areas Program



Arthur Haines, New England Wild Flower Society



MACRORHIZA



## SUBMERGED PLANTS

**Species:** *Zannichellia palustris*, horned pondweed

**Family:** *Zannichelliaceae*

### NATIVE

**Leaf:** Submerged thread-like, smooth edged leaves are oppositely arranged (occasionally appearing whorled), and each leaf has a central vein. Leaves are 2-10 cm long and less than 1 mm wide. A flared, transparent, membranous sheath surrounds the stem at the leaf base.

**Stem:** Completely submerged weak stems are branched, thin and thread-like.

**Flower:** Flowers are small, lack sepals and petals, and are solitary or clustered at the leaf bases. Male and female flowers are separate, but grow on different parts of the same plant, although often both occur together in the leaf bases. Female flowers are surrounded by a sheathing bract. Because the flowers remain entirely underwater, pollination occurs in the water. Flowers from June through August.

**Fruit:** Tiny banana-shaped achenes occur in clusters. Each achene is 2 to 4 mm long and has a conspicuous hooked beak measuring 1-1.5 mm long. A distinctive toothed ridge develops along the outer edge of the achene.

**Root:** Roots from slender creeping rhizomes.

**Propagation:** By seeds and rhizomes.

**Habitat:** Shallow freshwater, alkali, or brackish lakes, ponds, ditches, and streams.



Donald Cameron, Maine Natural Areas Program

## FREE FLOATING PLANTS

Species: *Lemna* spp., duckweed

Family: Lemnaceae

### NATIVE

**Leaf:** No true leaves. Leaf-like body is called a thallus.

**Stem:** None.

**Flower:** Tiny, rarely seen. Arises from a pouch in the thallus.

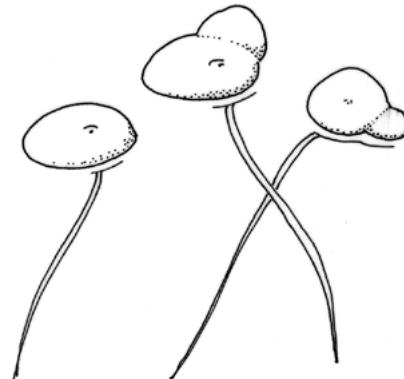
**Fruit:** Inconspicuous, usually 1 seeded.

**Root:** Single short rootlet hangs from the underside of each plant.

**Propagation:** New plants bud from pockets on either side of the parent plant and eventually break apart. Overwinters as winterbuds on the lake bottom, but rarely reproduces from seeds.

Distributed by wind and on the bodies of birds and aquatic animals. A single lesser duckweed plant can reproduce itself about every 3 days under ideal conditions in nutrient-rich waters.

**Habitat:** Still and slow-moving waters in many freshwater habitats. Often found along the shoreline after water levels have dropped.



Donald Cameron, Maine Natural Areas Program

## FREE FLOATING PLANTS

**Species:** *Spirodela polyrrhiza*, duck-meal, giant-duckweed, great duckweed, duckmeat

**Family:** Lemnaceae

### NATIVE

**Leaf:** No true leaves. Plant body (thallus) is actually an expanded 'stem' that functions as a leaf. It is oval to oblong, has 7-16 distinct veins, and is 4-10 mm long. Thallus is glossy green and smooth on the upper surface and reddish purple below. It may occur alone or in clusters of 2-5.

**Stem:** No stems.

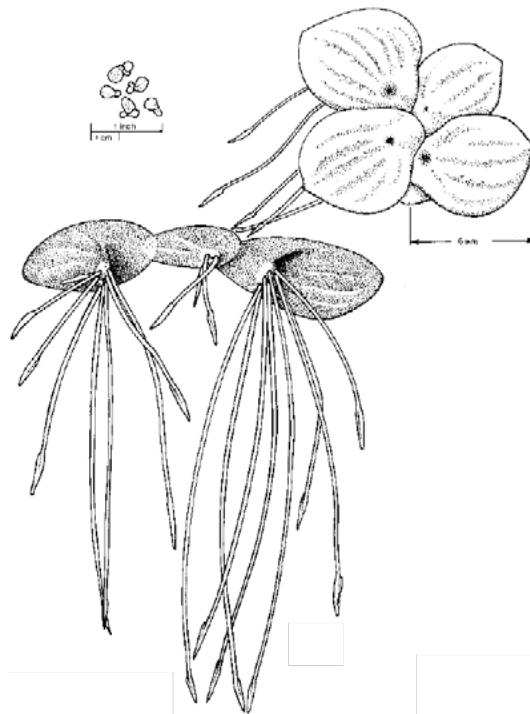
**Flower:** Tiny and rarely produced, occur in 2 pouches, usually 2 male flowers and 1 female flower in each pouch.

**Fruit:** A ribbed seed develops in a balloon-like bag (utricle).

**Root:** Clusters of 7 to 21 slender fibrous roots hang below the surface of the water from each plant. Each root ends with a pointed rootcap.

**Propagation:** Reproduces quickly by asexual budding, seeds, and overwinters as dark-green or brown buds on the sediments.

**Habitat:** Occurs in freshwater: lakes, ponds, marshes and slow streams in areas sheltered from wind. Often grows with other members of the duckweed family.



## FREE FLOATING PLANTS

Species: *Wolffia* spp., watermeal

Family: Lemnaceae

### NATIVE

**Leaf:** No true leaves. Leaf-like body is called a thallus. Roundish, thick, thallus up to 1.3 mm in diameter.

**Stem:** None.

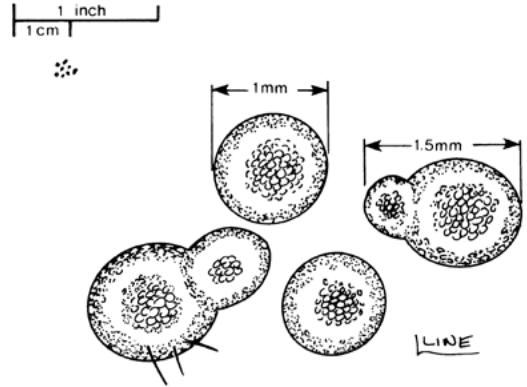
**Flower:** Tiny, rarely seen. Arises from a cavity on the upper surface of the thallus.

**Fruit:** Balloon-like fruit (utricle) contains a tiny (0.5 mm) smooth seed.

**Root:** None.

**Propagation:** Seeds. Forms winder buds on the lake bottom. New plants can bud from a pocket on the basal end of the parent plant and eventually the plants break apart. Plants are distributed by wind and on the bodies of birds and other animals.

**Habitat:** Marshes, ponds, shallow edges of lakes, slowly moving streams, and ditches. Often found on wet soil when water levels drop. This plant is rare and only occurs west of the Continental Divide.



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## SHORELINE PLANTS

**Species:** *Alisma triviale* Pursh (Synonym: *Alisma plantago-aquatica*), northern water plantain, American water-plantain, large water-plantain, broad-leaved water plantain

**Family:** Alismataceae

### NATIVE

**Leaf:** Leaves with parallel-looking veins arise from the plant base and are stiff when growing above the water. Submerged leaves may be ribbon-like and flexible. To 45 cm long including the stalk, oval-shaped blade to 15 cm long, 10 cm wide.

**Stem:** What appear to be stems are actually stalks of the inflorescence (peduncle). Stem is a bulb-like fleshy corm, usually buried in sediment.

**Flower:** White to pinkish individual flowers to 7 mm across; each has 3 sepals and 3 petals. They occur in whorls on slender branches arranged around a central flower stalk. Whorls form a cone-shaped outline. Stalks to 1.2 m long, much longer than leaves.

**Fruit:** Dry, brown, flattened, oval-shaped achenes are arranged in a ring on small, flat receptacles. Edge of achene with 1 groove.

**Root:** Fibrous, arising from the corm. Moose and ducks will often dig up the roots for food.

**Propagation:** Seeds or division of corms.

**Habitat:** Marshy areas and along shorelines; occasionally completely submerged.



Arthur Haines, New England Wild Flower Society



## SHORELINE PLANTS

Species: *Limosella aquatica*, water mudwort, northern mudwort

Family: Scrophulariaceae

### NATIVE

**Leaf:** Leaves arise from the plant base with transparent stipules located at the base of the leaf stalks. Spoon-shaped to oval blades are 5-30 mm long and 2-8 mm wide; leaf stalks (70-100 cm long) are generally distinct from the blade. Submersed leaves are narrower than the emergent leaves.

**Stem:** An upright stem is lacking. Stolons connect individual clumps of plants. Leaf stalks may look like stems to an untrained person.

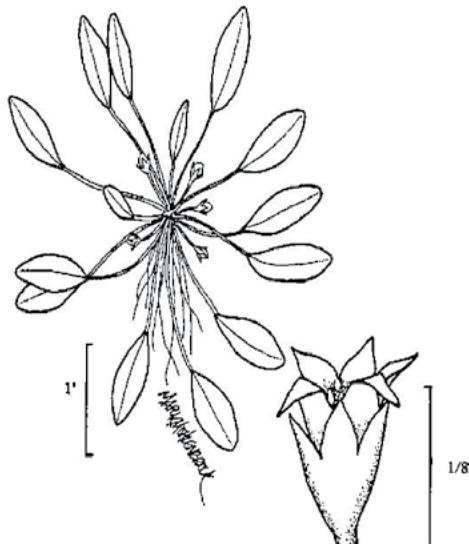
**Flower:** Flowers occur singly on stalks much shorter than the leaves and have 5 small sepals and petals that are fused together at the base. Dull white or purplish petals (about 2 mm long) with pointed tips.

**Fruit:** Ball-shaped or oval capsule is 3-5 mm long and contains many tiny seeds.

**Root:** Many fibrous roots emerge from the plant base and sometimes rise above the lower bases giving the plant a woven appearance.

**Propagation:** Seeds, stolons.

**Habitat:** Shallow still or slowly flowing waters. Muddy or sandy shores and areas with fluctuating water levels. Lakeshores subject to daily water-level fluctuations.



## SHORELINE PLANTS

Species: *Butomus umbellatus*, flowering rush

Family: Butomaceae

### INVASIVE

**Leaf:** Linear with triangular cross-section; up to 3ft long; can be twisting or spiraling.

**Stem:** Occurs as rhizomes beneath the soil surface.

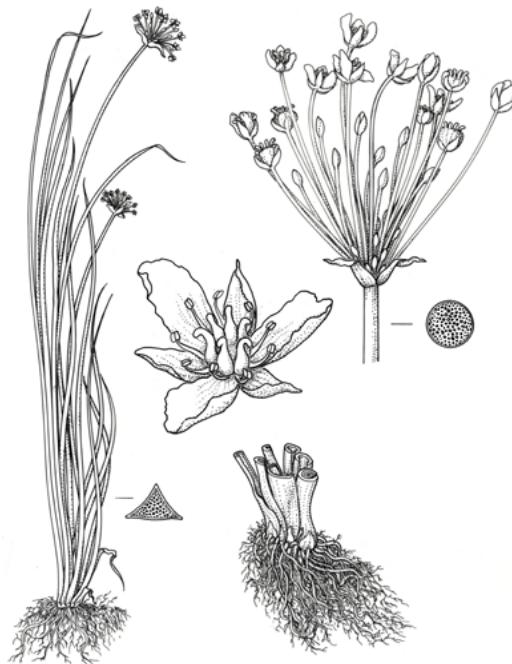
**Flower:** Large umbrella shaped inflorescences, which bears numerous pink to whitish-pink flowers on round leafless stalk. Flowers 2-2.5cm wide with three petals and three similar colored sepals, which persist after flowering.

**Fruit:** Numerous seeds formed in rounded fruit.

**Root:** Extensive network of friable rhizomes.

**Propagation:** In Montana, plants are sterile variety that spread through fragmentation of fragile rhizomes as well as small bulblets arising from the rhizomes. Fragments can float and disperse by water currents.

**Habitat:** Riparian, but can occur as a submerged plant in depths up to 20 feet of water. Requires wet soil and full sun; shade intolerant.



Montana Department of Agriculture, File Photo



## SHORELINE PLANTS

Species: *Elatine rubella*, southwestern waterwort

Family: Elatinaceae

### NATIVE

**Leaf:** Opposite, glabrous and often have a reddish tint, 2-8 mm long, the blade is linear-oblong to narrowly elliptic with blunt or notched tips.

**Stem:** 2-6 cm.

**Flower:** 1-2 mm across, 3 opposite sepals, 3 petals, 3 stamen, membranous, very pale greenish white.

**Fruit:** Round in shape, 3-celled capsule.  
Seeds are straight or gently curved with 18-27 pits in 8-10 rows.

**Propagation:** Seed.

**Habitat:** Shallow vernal pools and pond edges, tolerant of saline and alkaline soil. This spp. maybe mistaken for *E. triandra*.



Barry Breckling



## SHORELINE PLANTS

Species: *Hippuris vulgaris*, common  
mare's-tail, mare's tail

Family: Hippuridaceae

### NATIVE

**Leaf:** Arranged in whorls; 6-12 stalkless, smooth-edged leaves per whorl. **Submerged leaves:** soft, pale green, and measure up to 5 cm long and 3 mm wide. **Emergent leaves:** dark green, stiffer, and smaller. In deeper water only the submerged leaf form may be present.

**Stem:** Unbranched stem is hollow, up to 1 m long, and forms roots at the nodes. Stem is erect when emergent; limp when submerged; and can form creeping rhizomes.

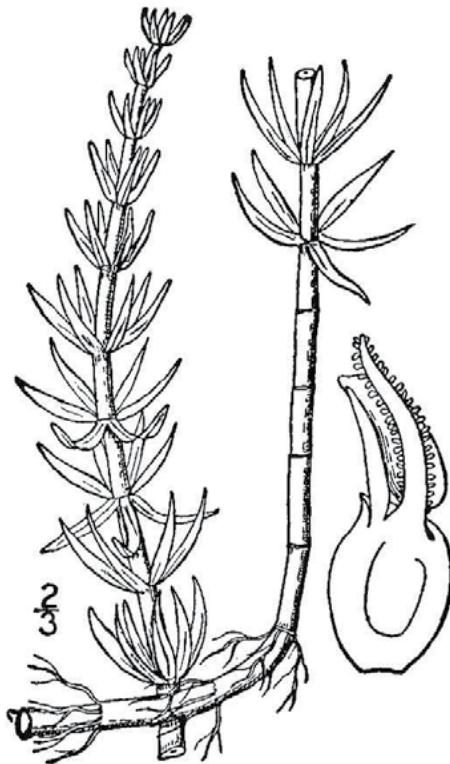
**Flower:** Small, inconspicuous flowers are at the leaf bases. Flowers, which lack petals and sepals, are reduced to a tiny rim.

**Fruit:** Tiny, 2mm long nutlike fruit (mature fruit about 2 mm long), nut-like, and located at leaf bases.

**Root:** Fibrous. Arising from lower portion of stems and rhizomes.

**Propagation:** Seeds, rhizomes. Will regrow from stem cuttings.

**Habitat:** At the edges of lakes, ponds, and streams in fresh, usually shallow water, though it will grow in water up to 2 m deep.



Donald Cameron, Maine  
Natural Areas Program



Donald Cameron, Maine  
Natural Areas Program



# SHORELINE PLANTS

Species: *Iris pseudacorus*, yellowflag iris, yellow iris, water-flag, paleyellow iris

Family: Iridaceae

## INVASIVE

**Leaf:** Dark green, flat leaves up to 3cm wide; sword-like 3-4 feet in height. Leaves resemble cattails but arise in a fan shape from soil.

**Stem:** Stem bearing flowers branches once; solid.

**Flower:** Bright yellow, showy flower 10-12 cm across that flower from June to August.

**Fruit:** Green, three-parted capsule (2.5-8 cm long); triangular-shaped. Pod splits open when dried and releases numerous round, brown seeds.

**Root:** Stout rhizomes, 1-4 cm in diameter; roots 10-30 cm long.

**Propagation:** Rhizomes; seeds.

**Habitat:** Thrives in full sun with moist to saturated soils; can survive submersion in water and periods of dry conditions. Found along shorelines, ditches, banks, and wetlands.



Arthur Haines, New England Wild Flower Society



Center for Aquatic Invasive Plants,  
Institute of Food & Agricultural  
Sciences University of Florida



# SHORELINE PLANTS

Species: *Lythrum salicaria*, purple loosestrife, lythrum

Family: Lythraceae

## INVASIVE

**Leaf:** Narrow leaves are stalkless, lance-shaped, 3-14 cm long, heart-shaped at the base, and sometimes covered with fine white hairs. They are opposite or whorled, and sometimes alternate on the upper portion of the stem.

**Stem:** Erect stem is usually square in cross-section, 0.5-2 m tall, and often branched. May be covered with fine whitish hairs.

**Flower:** Showy purple-pink flowers occur in erect spikes at the stem tops. Stalkless flowers have 5 sepals and 5-7 delicate wrinkled petals (7-14 mm Long).

**Fruit:** Egg-shaped capsule (3-4 mm) has many tiny seeds. A single plant may produce up to 2.7 million seeds a year.

**Root:** Strong rhizomes.

**Propagation:** Tiny, lightweight seeds are readily spread by waterfowl and other animals. Vegetative reproduction by shoots and rhizomes.

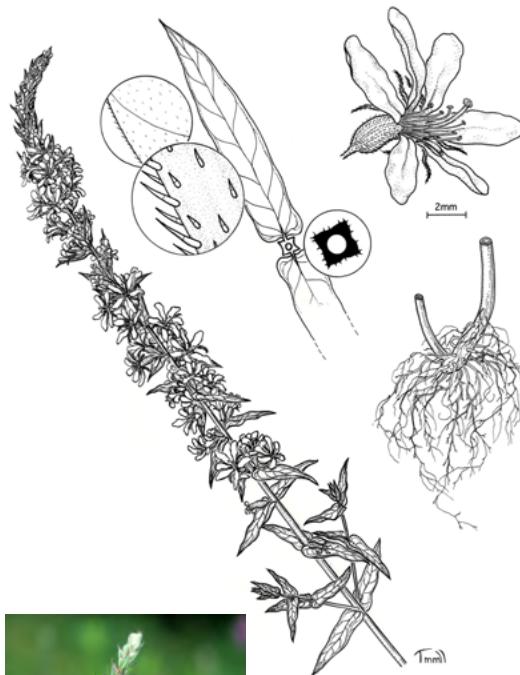
**Habitat:** Marshes, lake shores, ponds, stream banks, and ditches. Occasionally grows in upland areas.



Center for Aquatic Invasive Plants, Institute of Food & Agricultural Sciences University of Florida



Arthur Haines, New England Wild Flower Society



## SHORELINE PLANTS

Species: *Megalodonta beckii*. (Synonym: *Bidens beckii*), water marigold, Beck water marigold, Beck's water-marigold

Family: Asteraceae

### NATIVE

**Leaf:** Oppositely arranged and of two types.

**Submerged leaves:** finely dissected, on short stalks, have a fan-like shape, and appear to be whorled around the stem. **Emergent leaves:** if present, are simple, toothed leaves that measure 2-4 cm in length and are sometimes seen floating on or rising above the water surface.

**Stem:** Mostly submerged stem is up to 7 m long; 8-10 cm usually extends above the water when mature.

**Flower:** Yellow and sunflower-like. As with all members of the sunflower family, each flower head actually consists of numerous tiny flowers, with the disk flowers forming the center of the head, and each "petal" actually representing an individual ray flower. Disk flowers are clustered in a head about 1 cm wide. Bordering ray flowers are each 1-2 cm long. This plant rarely flowers in Montana, and when it does, it only flowers in the northwest counties of the state.

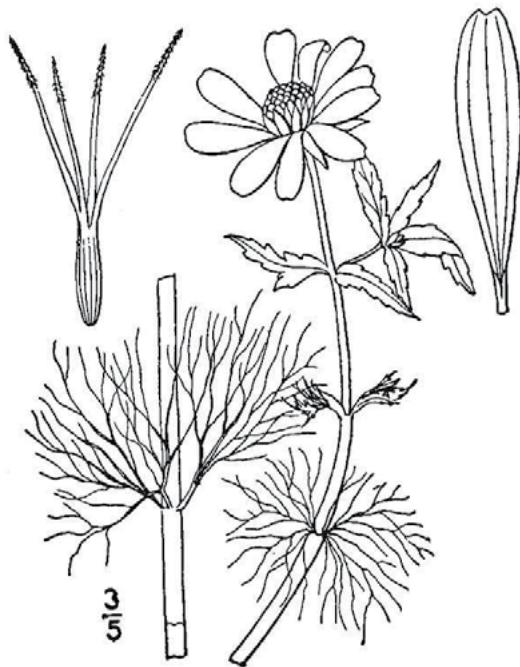
**Fruit:** Long (to 12 mm) and narrow, round to oval in cross section. Dark brown achenes have 3-6 needle-like bristles at the base.

Numerous achenes form on each flower head.

**Root:** Thin and fibrous, emerging in clusters from the lower nodes of the stem.

**Propagation:** Seeds dispersed by water or animals.

**Habitat:** Lakeshores, ponds, and slow-flowing streams.



Donald Cameron, Maine Natural Areas Program

## SHORELINE PLANTS

Species: *Nasturtium officinale* (Synonym: *Rorippa nasturtium-aquaticum*), common watercress, water cress

Family: Brassicaceae

### NATIVE

**Leaf:** Older leaves are compound, with each leaf consisting of 3-11 smooth or wavy-edged, oval of lance-shaped leaflets growing from a central stalk. Entire leaf measures 4-12 cm long, with the end leaflet usually larger than the others. Young leaves are simple, not compound.

**Stem:** Trailing, fleshy stem is 10-60 cm long, breaks easily, and is upright at the ends. It forms roots at the lower nodes.

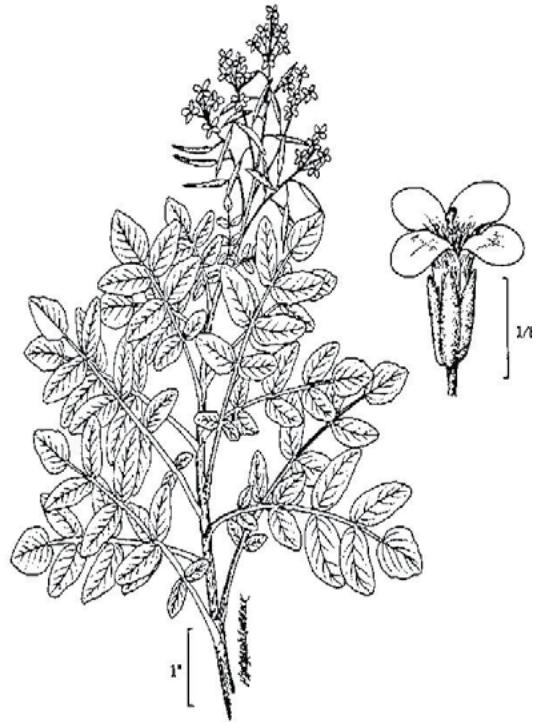
**Flower:** White flowers appear above the water from March through October. Flowers are clustered at the ends of the stems on short stalks. The 3-5 mm long flowers have 4 white petals.

**Fruit:** Thin, slightly curved, cylindrical pods are 10-25 mm long and about 2 mm wide, on stalks 8-12 mm long. Seeds are small (1 mm), round, and arranged in four rows inside the pods.

**Root:** Thin and fibrous. Roots often grow from the nodes of trailing stems.

**Propagation:** Rooting stem fragments and seeds.

**Habitat:** Flowing streams and other shallow freshwater; prefers cold slow-moving water; common in highway ditches. Almost always associated with springs or spring-fed streams.



Arthur Haines, New England Wild Flower Society

## SHORELINE PLANTS

Species: *Polygonum amphibium* (Synonym: *Persicaria amphibia*, *Polygonum coccineum*), water smartweed

Family: Polygonaceae

### NATIVE

**Leaf:** Floating or upright with papery sheaths (stipules) at the base. Alternately arranged. Large, up to 35 mm long, 6 cm wide with a rounded or pointed tip. Leaf stalk is up to 5 cm long.

**Stem:** Jointed, to 2 m long, with an underground rhizome and an aboveground stem that sometimes sprawls on or just below the water surface. Stout (to 1 cm across), usually lying flat, but sometimes erect.

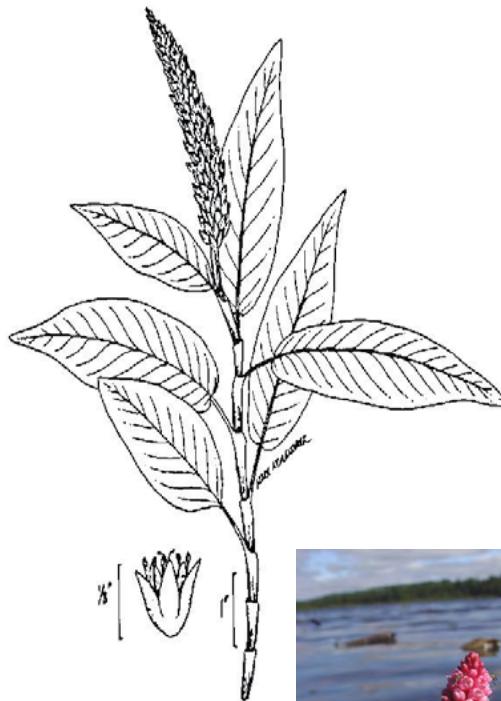
**Flower:** Small, each flower 4-5 mm long. Clustered to form oblong spikes at the tips of flower stalks. Pink flowers form dense clusters, 1-15 cm long.

**Fruit:** Dry, hard, shiny brown achene contains one seed, 2.5-3 mm, round and flattened.

**Root:** Fibrous, arising from rhizomes and stem joints in contact with ground water.

**Propagation:** Seeds; roots from trailing stems.

**Habitat:** Shallow water along the margins of lakes, ponds, and streams; water smartweed may also form extensive mats well offshore in deep water.



Donald Cameron, Maine Natural Areas Program



Donald Cameron, Maine Natural Areas Program



## SHORELINE PLANTS

Species: *Sagittaria cuneata*, Northern arrowhead, wapato, duck potato, arum-leaf arrowhead

*Sagittaria latifolia*, common arrowhead, wapato, duck potato, broadleaf arrowhead

Family: Alismataceae

### NATIVE

**Leaf:** *S. cuneata*: emergent arrowhead-shaped leaves, 5-15 cm long; may also have long, narrow, oval-to-heart-shaped floating leaves, and long, narrow submerged leaves. Stalks usually triangular in cross section. *S. latifolia*: variable leaf shapes, but usually has emergent 5-30 cm long arrowhead-shaped leaves when mature. Leaf stalks usually angular in cross section.

**Stem:** Short, at plant base (stem-like leaf stalks arise from plant base).

**Flower:** Usually in whorls of 3, each with 3 white petals and 3 green sepals (1-2 cm long). *S. cuneata*: flowers to 2.5 cm across. *S. latifolia*: flowers to 4 cm across. When in fruit the stalks spread outwards.

**Fruit:** Achenes approximately 2 mm long, crowded on globe-shaped heads. *S. cuneata*: beak at achene tip >0.5 mm. *S. latifolia*: beak to 1-2 mm, horizontal.

**Root:** Rhizomes with thick, round, white or bluish tubers that may grow as large as chicken eggs.

Moose and ducks dig the roots for food.

**Propagation:** Tubers, rhizomes, seeds.

**Habitat:** Shorelines and marshy areas up to 1.5 m deep.



Arthur Haines, New England Wild Flower Society



Donald Cameron, Maine Natural Areas Program



Donald Cameron, Maine Natural Areas Program

LATIFOLIA



Donald Cameron, Maine Natural Areas Program



## SHORELINE PLANTS

Species: *Tamarix ramosissima*, salt cedar, tamarisk

Family: Tamaricaceae

### INVASIVE

**Leaf:** Slender branches covered with small scale-like green leaves (1-2 mm long) that overlap each other.

**Stem:** Smooth reddish brown bark in main branches; forming ridges or furrows with age. Smaller branches covered in scale-like leaves

**Flower:** Dense inflorescences containing many white to pink flowers in 2 inch spikes. Flowers 1.5mm across with 5 petals.

**Fruit:** Capsules containing many seeds. Mature plant can produce up to 500,000 seeds annually

**Root:** Deep-penetrating taproot and lateral rhizomes. Mature plants can absorb and transpire over 200 gallons of water per day.

**Propagation:** Seeds with a tuft of hair on one end aids in dispersal by wind and water.

**Habitat:** Along streams, waterways, banks, & drainage washes. Any moist areas where seeds are exposed to extended periods of saturation periods. This spp. needs wet, disturbed soils to establish.



Peter Lesica



## GLOSSARY

**Achene:** A hard, dry, one-seeded fruit that does not split open when mature. Often looks like a seed.

**Alkaline:** Containing soluble mineral salts (alkaline waters are considered to be hard water).

**Alternate:** A leaf arrangement where each leaf occurs singly at each node.

**Anther:** A male flower part. The pollen bearing structure at the top of the stamen.

**Beak:** A hardened projection often seen on the edge of pondweed achenes.

**Blade:** The broad usually flat part of a leaf or petal.

**Brackish:** Slightly salty or having a high concentration of dissolved minerals.

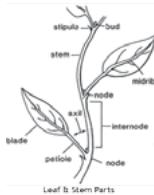
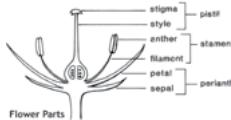
**Bract:** A reduced or modified leaf associated with a flower or flower cluster.

**Capsule:** A dry, usually many-seeded fruit that splits open at maturity.

**Compound:** Divided into similar smaller parts united in one common whole such as leaves composed of two or more distinct leaflets.

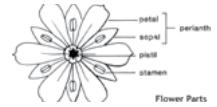
**Corm:** A solid bulb-like stem usually found underground.

**Dioecious:** Having male and female flowers on separate plants of the same species.



## GLOSSARY

**Flower:** The reproductive part of the plant. Plants may have male only flowers, female only flowers, or both male and female flowers on the same plant.



**Freshwater:** Non-salty water.

**Fruit:** The ripened ovary bearing the ripened seeds.

**Gland:** A bump, depression, or appendage on a plant's surface that produces a sticky or greasy viscous fluid.

**Habitat:** The environment in which a plant lives.

**Invasive:** Tending to spread and then dominate the new area.

**Keel:** The ridge of any structure formed by a fold, alluding to its resemblance to the keel of a boat.

**Leaflet:** A part or division of a compound leaf.

**Margin:** Edge - as in the edge of a lake or the edge of a leaf.



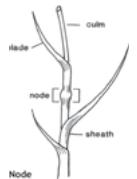
**Midvein:** The main central vein of a leaf.

**Monoecious:** Having male flowers and female flowers together on the same plant.

**Non-native:** Nonindigenous to a region or county; an introduced species.

**Node:** The place on the stem where a leaf, branch, or root is attached (or has been attached).

**Nut:** A hard, dry, usually one seeded fruit that does not open at maturity. Harder and thicker sided than an achene.



## GLOSSARY

**Opposite:** Leaves arranged directly opposite of each other on each side of a node.

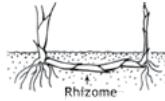


**Pedicel:** The stalk that supports one flower only when there are several on a peduncle.

**Petals:** The inner ring of the flower. Often white or brightly colored to attract pollinators. (see sepal)

**Pod:** A dry fruit that splits open at maturity.

**Rhizome:** A horizontal underground stem that is distinguished from the root by the presence of nodes or scale-like leaves.



**Rosette:** A cluster of leaves arranged in a circle usually at ground level (like a dandelion).

**Saline:** Salty or brackish

**Scale:** A small thin or flat outgrowth, often associated with underground parts, though leaves or bracts may be scale-like.

**Sepals:** The outermost ring of the flower; often green and leafy in structure. (see petal)

**Sheath:** A tubular part surrounding another part, often papery. In pondweeds the portion of the leaf that surrounds the stem.

**Spike:** A flower cluster with sessile flowers arranged along an unbranched stalk, blooming from the bottom upwards.

**Spores:** The reproductive body of ferns and other non-seed plants - analogous to a seeds.

**Stalk:** A stem or similar structure that supports a flower, flower cluster, or a leaf.

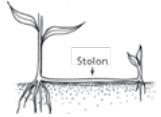
**Stamen:** The male part of a flower usually consisting of the stalk-like filament and the pollen-bearing anther.

## GLOSSARY

**Stem:** The part of the plant bearing leaves and flowers and composed of nodes and internodes (space between the nodes). Sometimes also below ground (see rhizome, corm, stolon, tuber).

**Stipules:** A pair of wing or scale-like structures often found at the base of leaves. Sometimes joined into a sheath.

**Stolons:** A stem that trails along the sediment or soil surface that forms roots at the nodes (strawberries spread by stolons).



**Submerged:** Growing underwater (submerged).

**Tepals:** Petals and sepals that are almost indistinguishable from each other, as in rushes (*Juncus* spp.).

**Thallus:** A main plant body not differentiated into stems and leaves as in duckweeds and liverworts.

**Toothed:** Saw-edged.

**Tubers:** An enlarged, fleshy, reproductive and food-storage structure produced on an underground stem (a potato is a tuber).

**Turion:** An overwintering structure that is scaly or often thick and fleshy that detaches, and then geminates or starts growth in the spring.



**Vascular:** Refers to the circulatory system in plants or to plants with veins.

**Vein:** A circulatory structure often prominent in leaves.



**Whorls:** A ring of 3 or more similar structures radiating from a common point (a whorl of leaves around a node).



**Winter buds:** Structures that form on the plant in the fall, detach, and then germinate in the spring to form a new plant. Often look like compact bundles of small leaves.

## SPECIES INDEX: SCIENTIFIC NAMES

<i>Alisma plantago-aquatica</i> .....	82
<i>Alisma triviale</i> .....	82
<i>Bidens beckii</i> .....	96
<i>Brasenia schreberi</i> .....	12
<i>Butomus umbellatus</i> (INVASIVE) .....	86
<i>Callitriche hermaphroditica</i> .....	28
<i>Callitriche heterophylla</i> .....	30
<i>Callitriche palustris</i> .....	30
<i>Callitriche stagnalis</i> .....	28
<i>Ceratophyllum demersum</i> .....	32
<i>Chara</i> spp. ....	8
<i>Egeria densa</i> .....	36
<i>Elatine rubella</i> .....	88
<i>Elodea canadensis</i> .....	34
<i>Elodea nuttallii</i> .....	34
<i>Heteranthera dubia</i> .....	38
<i>Hippuris vulgaris</i> .....	90
<i>Hydrilla verticillata</i> (INVASIVE).....	40
<i>Iris pseudacorus</i> (INVASIVE) .....	92
<i>Lemna</i> spp. ....	76
<i>Limosella aquatica</i> .....	84
<i>Lythrum salicaria</i> (INVASIVE).....	94
<i>Megalodonta beckii</i> .....	96
<i>Myriophyllum quitense</i> .....	42
<i>Myriophyllum sibiricum</i> .....	44
<i>Myriophyllum spicatum</i> (INVASIVE) .....	46
<i>Myriophyllum verticillatum</i> .....	48
<i>Najas flexilis</i> .....	50
<i>Najas guadalupensis</i> .....	50
<i>Nasturtium officinale</i> .....	98
<i>Nitella</i> spp. ....	10
<i>Nuphar polysepala</i> .....	14
<i>Nymphaea odorata</i> .....	16
<i>Persicaria amphibian</i> .....	100
<i>Polygonum amphibium</i> .....	100
<i>Polygonum coccineum</i> .....	100
<i>Potamogeton amplifolius</i> .....	18
<i>Potamogeton berchtoldii</i> .....	54
<i>Potamogeton crispus</i> (INVASIVE).....	52
<i>Potamogeton filiformis</i> .....	56
<i>Potamogeton foliosus</i> .....	54
<i>Potamogeton gramineus</i> .....	20
<i>Potamogeton illinoensis</i> .....	22

## SPECIES INDEX: SCIENTIFIC NAMES (CONT.)

<i>Potamogeton natans</i> .....	24
<i>Potamogeton nodosus</i> .....	26
<i>Potamogeton obtusifolius</i> .....	58
<i>Potamogeton pectinatus</i> .....	56
<i>Potamogeton praelongus</i> .....	60
<i>Potamogeton pusillus</i> .....	54
<i>Potamogeton richardsonii</i> .....	62
<i>Potamogeton robbinsii</i> .....	64
<i>Potamogeton vaginatus</i> .....	56
<i>Potamogeton zosteriformis</i> .....	66
<i>Ranunculus aquatilis</i> .....	68
<i>Ranunculus circinatus</i> .....	68
<i>Ranunculus longirostris</i> .....	68
<i>Ranunculus subrigidus</i> .....	68
<i>Ranunculus trichophyllus</i> .....	68
<i>Rorippa nasturtium-aquaticum</i> .....	98
<i>Ruppia cirrhosa</i> .....	70
<i>Ruppia maritima</i> .....	70
<i>Ruppia spiralis</i> .....	70
<i>Sagittaria cuneata</i> .....	102
<i>Sagittaria latifolia</i> .....	102
<i>Spirodela polyrrhiza</i> .....	78
<i>Stuckenia filiformis</i> .....	56
<i>Stuckenia pectinata</i> .....	56
<i>Tamarix ramosissima</i> (INVASIVE).....	104
<i>Utricularia vulgaris</i> .....	72
<i>Utricularia macrorhiza</i> .....	72
<i>Wolffia</i> spp.....	80
<i>Zannichellia palustris</i> .....	74

## SPECIES INDEX: COMMON NAMES

American pondweed.....	26
American water-lily .....	16
American water-plantain .....	82
Anacharis.....	36
Andean water-milfoil.....	42
Arum-leaf arrowhead.....	102
Autumnal water-starwort.....	28
Beck water marigold .....	96
Beck's water-marigold .....	96
Big-leaf pondweed.....	18
Blunt-leaved pondweed.....	58

## SPECIES INDEX

### SPECIES INDEX: COMMON NAMES (CONT.)

Brazilian elodea .....	36
Brittlewort .....	10
Broad waterweed .....	34
Broadleaf arrowhead .....	102
Broad-leaved water plantain.....	82
Canadian waterweed .....	34
Chara spp. ....	8
Common arrowhead .....	102
Common bladderwort .....	72
Common elodea .....	34
Common hornwort .....	32
Common mare's-tail .....	90
Common watercress .....	98
Common water-milfoil .....	44
Common water-nymph .....	50
Common waterweed .....	34
Coon's tail.....	32
Coontail .....	32
Curly pondweed .....	52
Curlyleaf pondweed .....	52
Different leaved water-starwort .....	30
Ditch-grass .....	70
Dollar bonnet .....	12
Duck potato.....	102
Duck-meal.....	78
Duckmeat .....	78
Duckweed spp. ....	76
Eelgrass pondweed .....	66
Elatine water-milfoil .....	42
Eurasian watermilfoil .....	46
Eurasian water-milfoil .....	46
Fern-leaf pondweed .....	64
Fine leaf pondweed .....	56
Flatleaf pondweed.....	64
Flat-leaved pondweed .....	64
Flatstem pondweed .....	66
Flat-stem pondweed .....	66
Floating pondweed .....	24
Floating-leaved pondweed .....	24
Flowering-rush .....	86
Fragrant waterlily .....	16
Giant elodea .....	36
Giant-duckweed.....	78

## SPECIES INDEX

### SPECIES INDEX: COMMON NAMES (CONT.)

Grassleaf mudplantain .....	38
Grass-leaved pondweed.....	20
Grassy pondweed .....	20
Great duckweed.....	78
Greater bladderwort .....	72
Horned pondweed .....	74
Hydrilla .....	40
Illinois pondweed .....	22
Large water-plantain .....	82
Large water-starwort.....	30
Largeleaf pondweed.....	18
Leafy pondweed.....	54
Lesser duckweed.....	80
Longleaf pondweed.....	26
Long-leaf pondweed.....	26
Lythrum.....	94
Mare's tail.....	90
Mudwort .....	84
Muskgrass.....	8
Muskwort .....	8
Nitella spp. ....	10
Nodding water nymph.....	50
Northern arrowhead.....	102
Northern mudwort .....	84
Northern watermilfoil.....	44
Northern water-plantain .....	82
Northern water-starwort .....	28
Nuttall's waterweed.....	34
Pale yellow iris .....	92
Pondwater water-starwort .....	28
Purple loosestrife .....	94
Redhead grass .....	62
Red-head pondweed.....	62
Richardson's pondweed .....	62
Robbins' pondweed .....	64
Robinson's pondweed .....	64
Sago pondweed.....	56
Salt cedar .....	104
Sheathed pondweed .....	56
Sheathing pondweed .....	56
Shortspike milfoil .....	44
Slender leaved pondweed .....	56
Slender pondweed .....	56

## SPECIES INDEX: COMMON NAMES (CONT.)

Slender water-nymph .....	50
Small pondweed.....	54
Southern waternymph.....	50
Southwestern waterwort .....	88
Spatterdock.....	14
Stonewort .....	8
Tamarisk .....	104
Twoheaded water-starwort.....	30
Variable leaf pondweed.....	20
Vernal water-starwort.....	30
Wapato .....	102
Water cress .....	98
Water crowfoot.....	68
Water marigold.....	96
Water mudwort.....	84
Water smartweed .....	100
Water star-grass.....	38
Water target .....	12
Water-flag .....	92
Watermeal .....	80
Watershield .....	12
Waterwort water-milfoil.....	42
Western waterweed .....	34
White water buttercup.....	68
White water-buttercup .....	68
White waterlily.....	16
Whitestem pondweed .....	60
White-stemmed pondweed.....	60
Whorled water-milfoil.....	48
Whorl-leaf watermilfoil.....	48
Widgeongrass .....	70
Yellow cow-lily .....	14
Yellow pond-lily .....	14
Yellowflag iris.....	92

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