2nd Edition

Aquatic Plants of Alberta

A COLLECTION OF NATIVE AND INVASIVE SPECIES

ALMS
Alberta Lake Management Society

Graphic Design: intrinsicdesign.ca

Acknowledgements

The Alberta Lake Management Society is a charitable organization which strives to educate lake users about aquatic environments, encourage public involvement in lake management, and facilitate cooperation and partnership between government, industry, the scientific community, and lake users.

Since 2014, the Alberta Lake Management Society, alongside citizen scientist volunteers, has been collecting aquatic plant specimens from across Alberta. This book is the result of those efforts and we would like to thank everyone who has assisted with this work, especially: our numerous volunteers for their time, interest, and patience; past and present ALMS staff including Alicia Kennedy, Alyssa Cloutier, Arin MacFarlane Dyer, Bradley Peter, Caleb Sinn, and Sarah Davis Cornet; the University of Alberta Vascular Plant Herbarium; and Kate Wilson and Nicole Kimmel of Alberta Environment and Parks.

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Alberta Government

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About This Guide

The purpose of this guide is to highlight the often overlooked biodiversity which exists in Alberta's aquatic plant community and to assist individuals in distinguishing between invasive species and their similar-looking native counterparts. This book is not comprehensive of all native or invasive aquatic plants. Few of the invasive species highlighted in this guide have been reported in Alberta, and we hope to limit their occurrences through education, awareness, and early detection. Unless otherwise cited, all photos in this book are of ALMS or Alberta Environment and Parks specimens.

Why Are Aquatic Plants Important?

Aquatic plants have the ability to impact the physical, chemical, and biological characteristics of a lake. For example, macrophytes may stabilize lake sediments and shorelines, limiting the re-suspension of sediments and shoreline erosion. Submerged macrophytes may increase oxygen concentrations in a lake, whereas emergent macrophytes may remove oxygen from a lake system. Macrophytes may also directly impact a lake's food web by creating habitat that supports biodiversity, providing refuge for fish, or acting as food for birds. Like cyanobacteria and algae, macrophytes require phosphorus and nitrogen to grow — many rooted macrophytes will obtain the nutrients they require from the sediment, but the water column may act as an important source of nutrients for non-rooted species such as Coontail. Macrophytes are an integral part of our aquatic ecosystems and it is important to recognize their biodiversity and the significant roles they play in our lakes.

Invasive Threats to Species at Risk

Alberta is home to a large diversity of wild species. Unfortunately, due to pressures like loss of habitat, many of these species are considered at-risk for extinction or extirpation. At-risk species that depend on aquatic environments for survival include the Northern Leopard Frog, the Western Grebe, the Piping Plover, the Lake Sturgeon, and the Western Silvery Minnow. Limiting the spread of invasive species can help to protect the aquatic habitats that are crucial for the survival of these wild species.

What Is An Invasive Plant?

Invasive plants are non-native species, often introduced by humans through boating activities, which have the potential to harm an aquatic ecosystem. Invasive plants have few natural predators, reproduce quickly, and can convert open-water areas into dense meadows. Such infestations may make a lake unsuitable for recreation, reduce biodiversity, destroy fisheries, and clog infrastructure. To limit the spread of invasive species, you should clean, drain, and dry your boat between waterbodies. If you spot an invasive species in your lake, call 1-855-366-BOAT. The improper removal of invasive aquatic plants may cause these species to spread more widely.

Should I Remove Native Plants?

Some lakes naturally have dense growth of aquatic plants, and this may be influenced by many factors such as a lake's size, depth, and nutrient status. Removing aquatic plants may make your lake susceptible to negative changes in water quality. A permit from the Government of Alberta is required to remove aquatic plants from the bed and shore of a lake.

Glossary

Note: Common and scientific names for plants in this book are variable, and we made our best efforts to include as many aliases as possible. For more information, check out the following resources:

- Alberta Conservation Information Management System
- Alberta Native Plant Council
- Alberta Invasive Species Council
- Database of Vascular Plants of Canada

TERM		DEFINITION	
Macrophyte		An aquatic plant, either submerged, floating, or emergent, large enough to be seen by the naked eye	
Stipule		Scale-like tissue at the base of the leaf (sometimes in pairs)	
Leaf Arrangement	Opposite	Pairs of leaves that are directly across from each other on the stem	
	Alternate	Only one leaf occurs per node, and each side alternates	
	Whorled	Leaves occur all the way around the stem at each node in groups of 3 or more	
Axils		Where the leaf meets the stem	
Submergent		The plant grows completely underwater, with the exception of floating leaves or flower stalks	
Emergent		The plant has a base underwater, but parts grow above the water's surface	

If you think you have discovered an invasive species, call the invasive hotline:

1 855 336 BOAT (2628)

Alberta's Prohibited Invasive Aquatic Plants

The 2020 *Fisheries (Alberta) Act* identifies 52 species as prohibited, meaning they are illegal to import, transport, sell, or possess. Sixteen of these species are aquatic or riparian zone plants, including:

- Flowering Rush (*Butomus umbellatus*)
- Fanwort (*Cabomba caroliniana*)
- Brazilian Elodea (*Egeria densa*)
- Hydrilla (*Hydrilla verticillata*)
- European Frogbit (*Hydrocharis morsus-ranae*)
- Himalayan Balsam (*Impatiens glandulifera*)
- Yellow Flag Iris (*Iris pseudacorus*)
- Purple Loosestrife (*Lythrum salicaria*)
- Variable-leaf Watermilfoil (*Myriophyllum heterophyllum*)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)
- Yellow Floating-Heart (*Nymphoides pelata*)
- Curly Leaf Pondweed (*Potamogeton crispus*)
- Phragmites (*Phragmites australis subsp. australis*)
- Giant Salvinia (*Salvinia molesta*)
- Water Soldier (*Stratiotes aloides*)
- European Water Chestnut (*Trapa natans*)

While not all of these species are featured in this book, it is important to familiarize yourself with their names to aid with their early detection. Resources such as the Government of Alberta's *Aquatic Invasive Species Pocket Guide* can be used to learn about all 52 prohibited aquatic species in detail.

Table of Contents

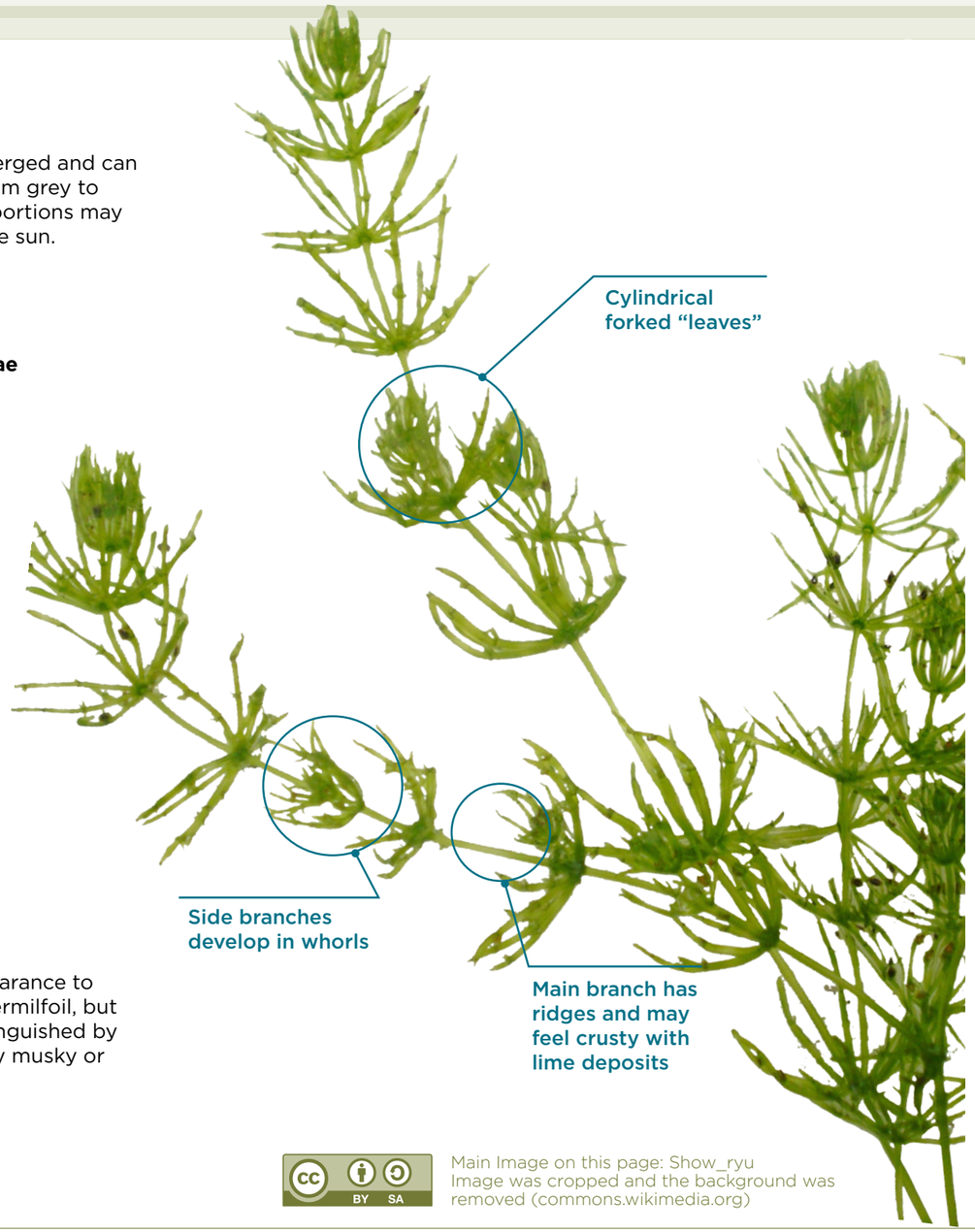
Chara

Chara spp.

Also known as: **Stonewort**

Completely submerged and can range in colour from grey to green. Emergent portions may be bleached by the sun.

This plant-like **algae** can vary in size, from only a few centimetres to a metre

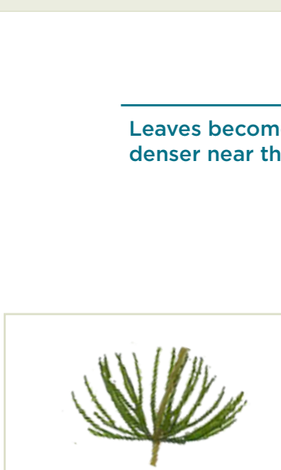


Has a similar appearance to Coontail and Watermilfoil, but can be easily distinguished by its odour — usually musky or garlicky

Coontail

Ceratophyllum demersum

Also known as: **Common Hornwort**



Leaves are forked with small teeth on the edge

Tiny flowers may be present at the leaf bases in early summer

Does not form roots, but anchors into the substrate

SUBMERGED

Eurasian Watermilfoil

Myriophyllum spicatum

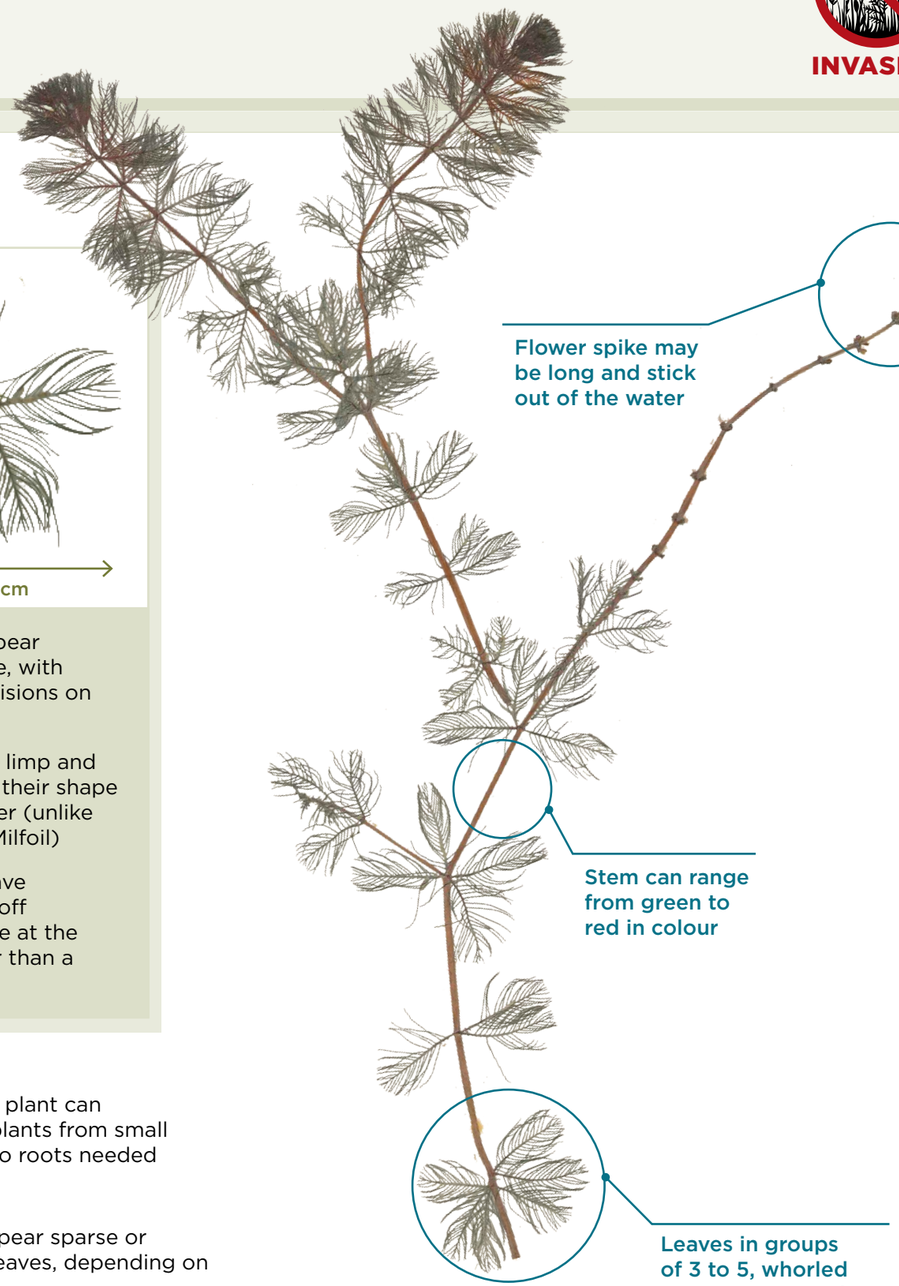
INVASIVE

4-8 cm

- Leaves appear feather-like, with 14 – 20 divisions on either side
- Leaves are limp and don't hold their shape out of water (unlike Northern Milfoil)
- Leaflets have a squared off appearance at the end, rather than a point

This invasive plant can create new plants from small fragments, no roots needed

Plant can appear sparse or dense with leaves, depending on the season



Northern Watermilfoil

Myriophyllum sibiricum

SUBMERGED

4-8 cm

- Leaves appear feather-like with less than 12 divisions on either side
- Leaves are stiff and retain their shape out of water (unlike Eurasian Milfoil)
- Leaflet length gives leaves an overall pointed appearance

Plant can appear sparse or dense with leaves, depending on the season

Can hybridize with Eurasian Watermilfoil

BE ON THE LOOKOUT FOR THIS INVASIVE LOOK-ALIKE

Variable-leaf Watermilfoil

Myriophyllum heterophyllum

The variable leaf watermilfoil looks similar to northern watermilfoil, however the emergent stalk has leaves which can measure up to 3 cm long

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

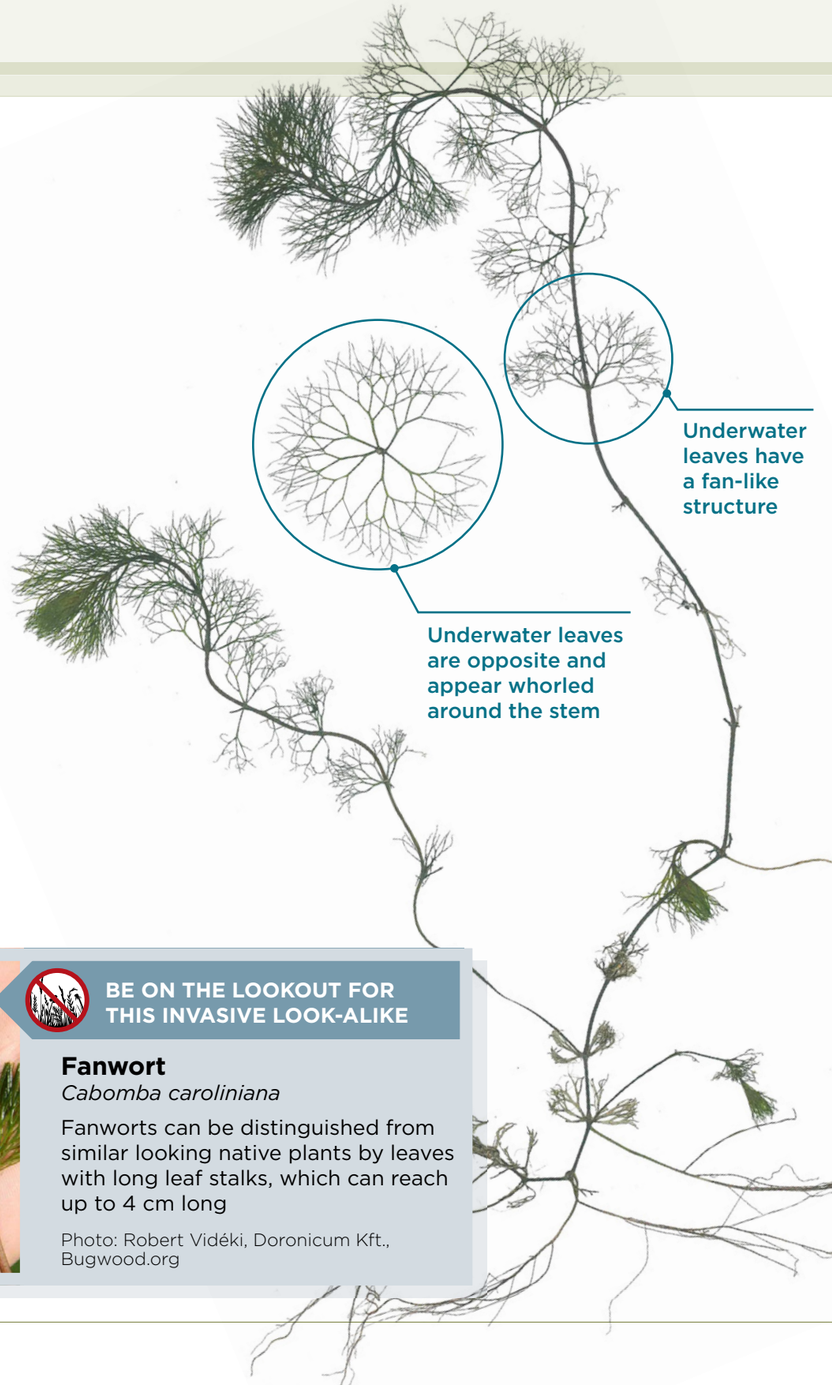
SUBMERGED

Water Marigold

Bidens beckii

Emergent leaves appear as simple toothed leaves

A yellow, sunflower-like flower is displayed just above the water's surface



The thin leaves of Water Marigold can help to distinguish it from Coontail, which has hard and rigid leaves

BE ON THE LOOKOUT FOR THIS INVASIVE LOOK-ALIKE

Fanwort

Cabomba caroliniana

Fanworts can be distinguished from similar looking native plants by leaves with long leaf stalks, which can reach up to 4 cm long

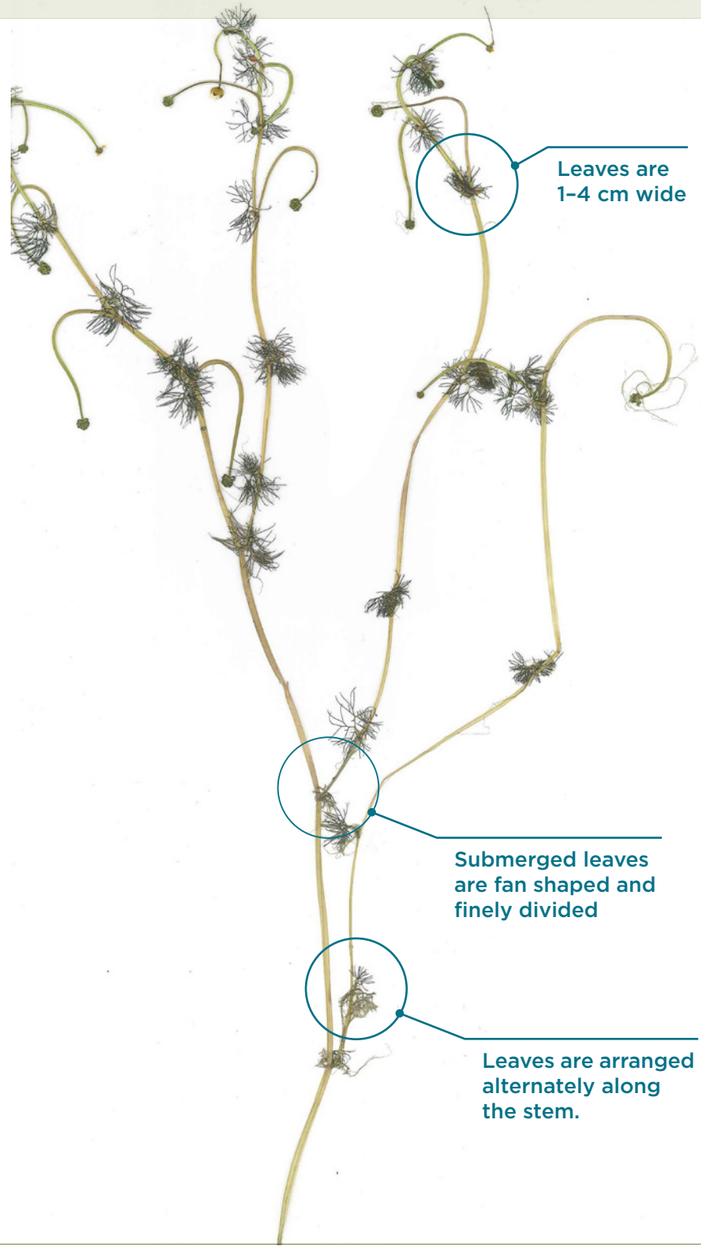
Photo: Robert Vidéki, Doronicum Kft., Bugwood.org

Water Buttercup

Ranunculus spp.

Also known as: **Water Crowfoot**

SUBMERGED



The genus Ranunculus contains many species which can be difficult to distinguish

Flowers are 1–2 cm across with five white petals and a yellow centre

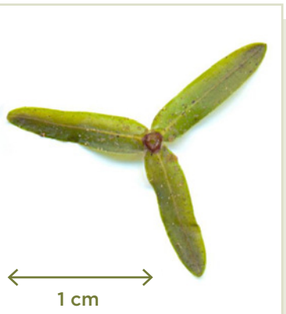
If emergent leaves are present, they appear as scalloped with 3-5 lobes

May form dense patches near springs or shallow sandbars

SUBMERGED

Canada Waterweed

Elodea canadensis



- Leaves are mostly arranged in whorls of 3 (occasionally 4)
- Leaves on the lower stem may be oppositely arranged

This rare plant looks very similar to Hydrilla, but can be distinguished by its **smooth leaves**

INVASIVE

Hydrilla

Hydrilla verticillata

Also known as: **Water-thyme**

SUBMERGED

Looks very similar to Canada Waterweed, but can be distinguished by the **serrated leaves, prickly leaf "hairs,"** and **root tubers**

Mats of this plant can block light, obstruct waterfowl habitat and impede activities like boating, swimming and fishing

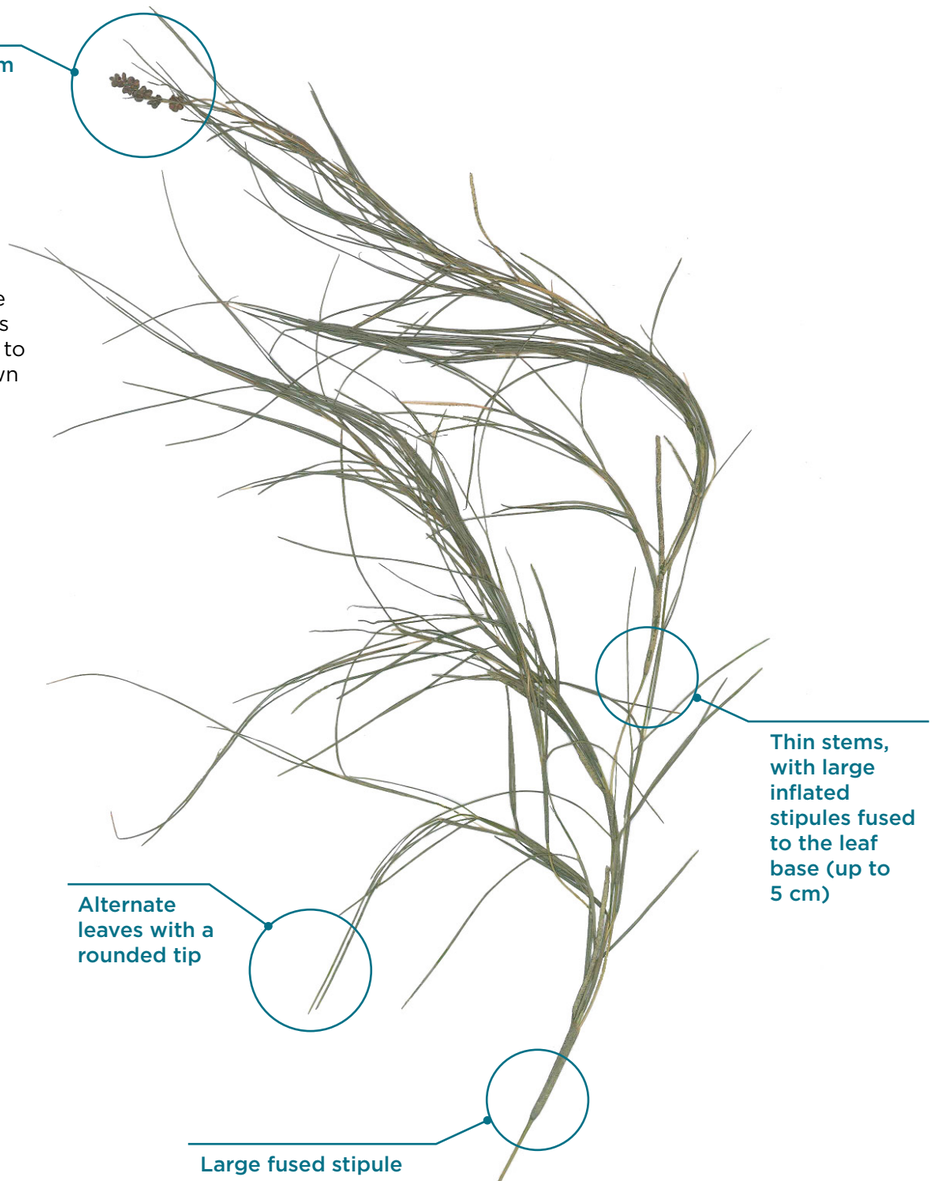
Roots have potato-like tubers

All images on this page: New York State Federation of Lake Associations (www.nysfola.org)
Photographer: Jon Reis

Sheathed Pondweed

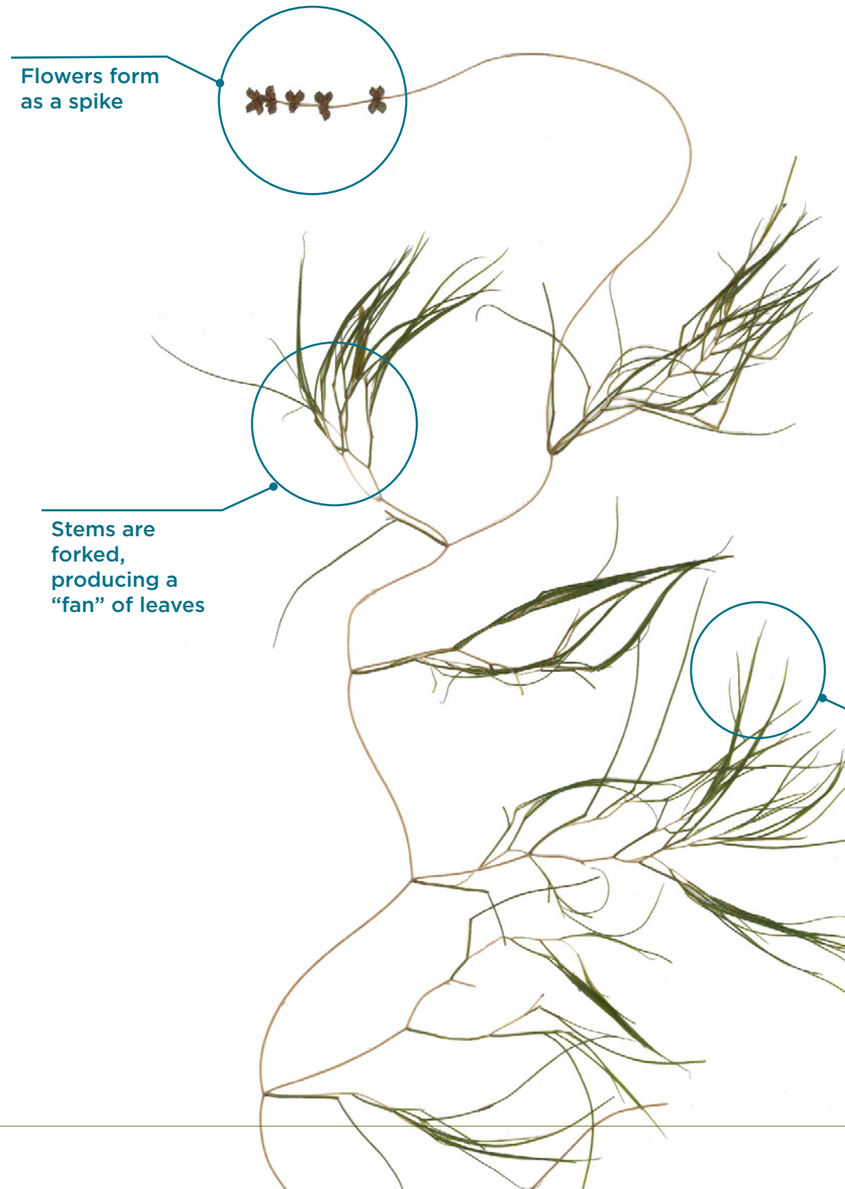
Stuckenia vaginata

Also known as: **Large-Sheath Pondweed**



Sago Pondweed

Stuckenia pectinata



Members of the stuckenia genus can be difficult to distinguish down to the species level

Stipules fused to the leaf, becoming free at the top

Tuber forming roots

SUBMERGED

Curly Leaf Pondweed

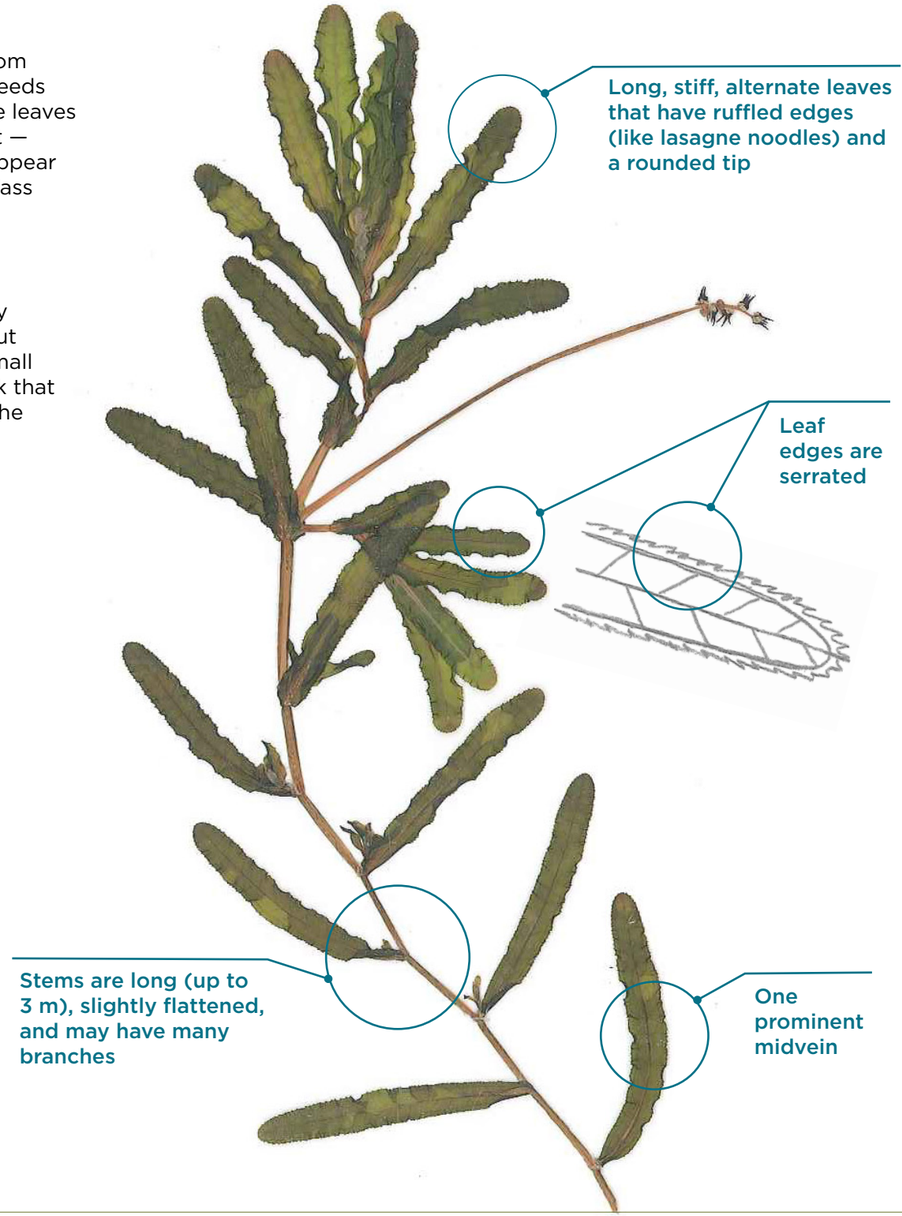
Potamogeton crispus

Also known as: **Crisp Pondweed**

INVASIVE

Tell it apart from native pondweeds by holding the leaves up to the light — they almost appear like stained-glass windows

Plants are fully submersed, but may have a small flowering stalk that sticks above the water

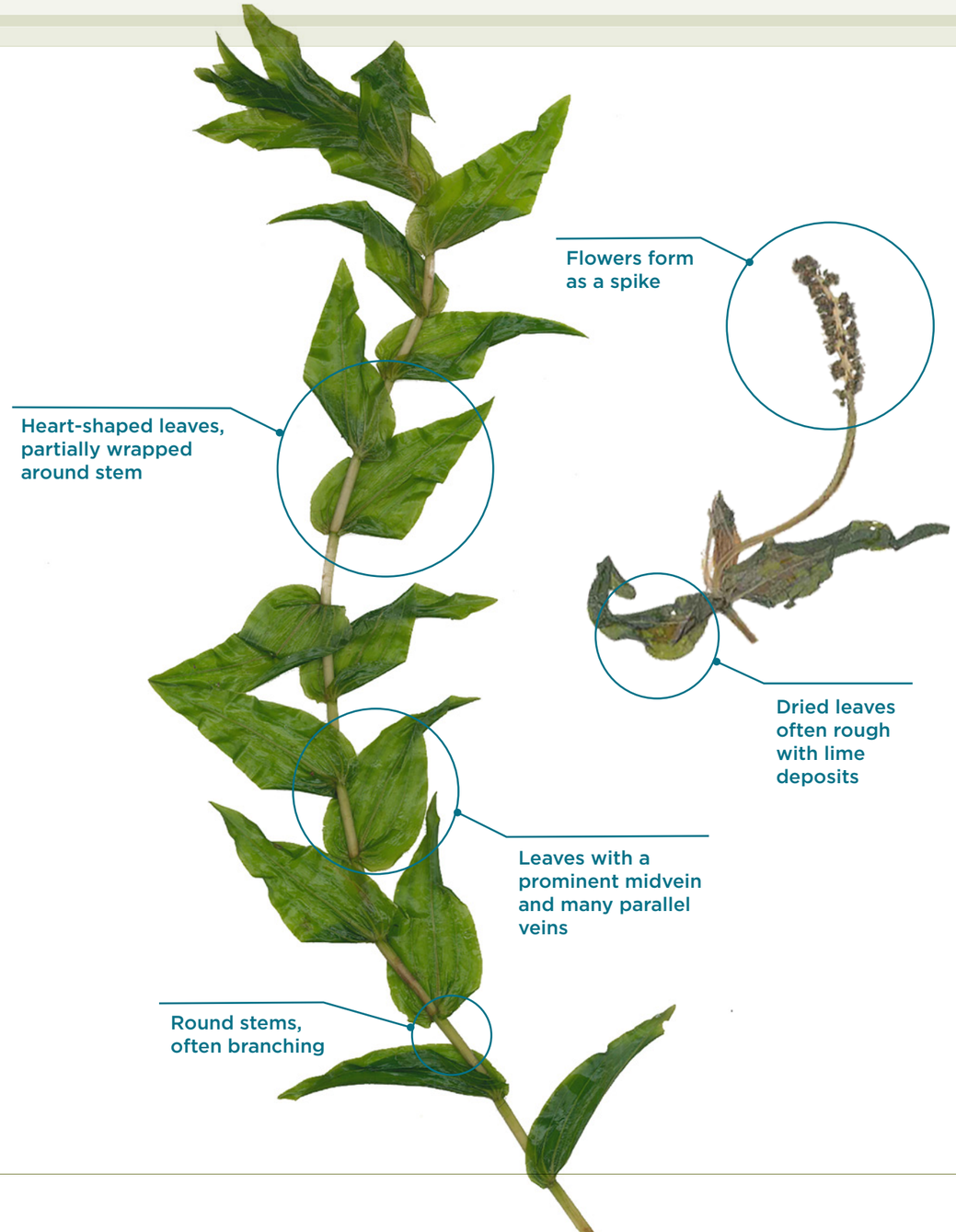


SUBMERGED

Richardson's Pondweed

Potamogeton richardsonii

Also known as: **Clasping-Leaf Pondweed**



SUBMERGED

White-stemmed Pondweed

Potamogeton praelongus

Can be mistaken for Richardson's Pondweed, but the leaves of the White-stemmed Pondweed are longer, up to 35 cm long

The white, zig-zagged stem of the white-stemmed pondweed can be up to 3 m long

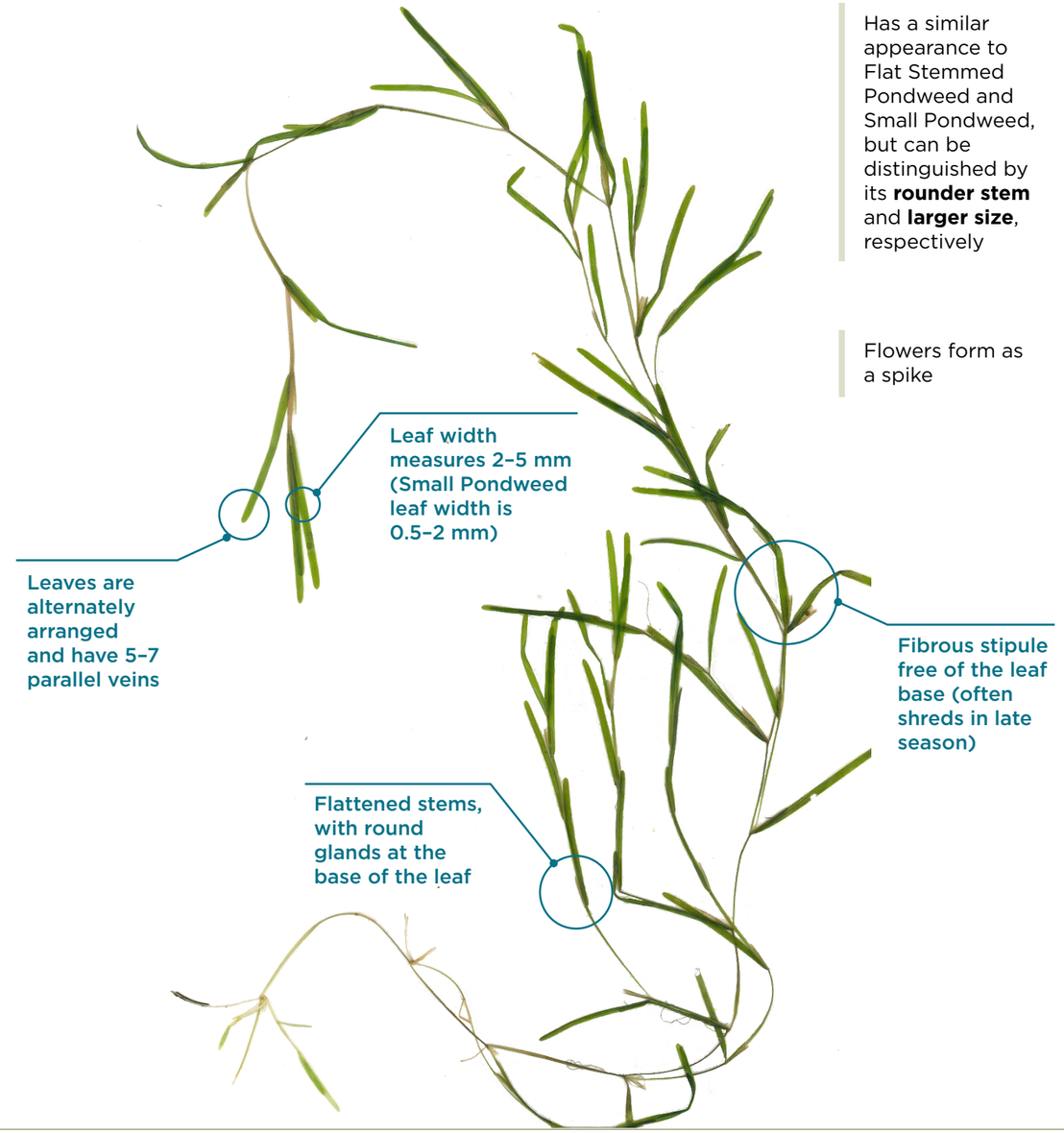
SUBMERGED

Fries' Pondweed

Potamogeton friesii

Has a similar appearance to Flat Stemmed Pondweed and Small Pondweed, but can be distinguished by its **rounder stem** and **larger size**, respectively

Flowers form as a spike



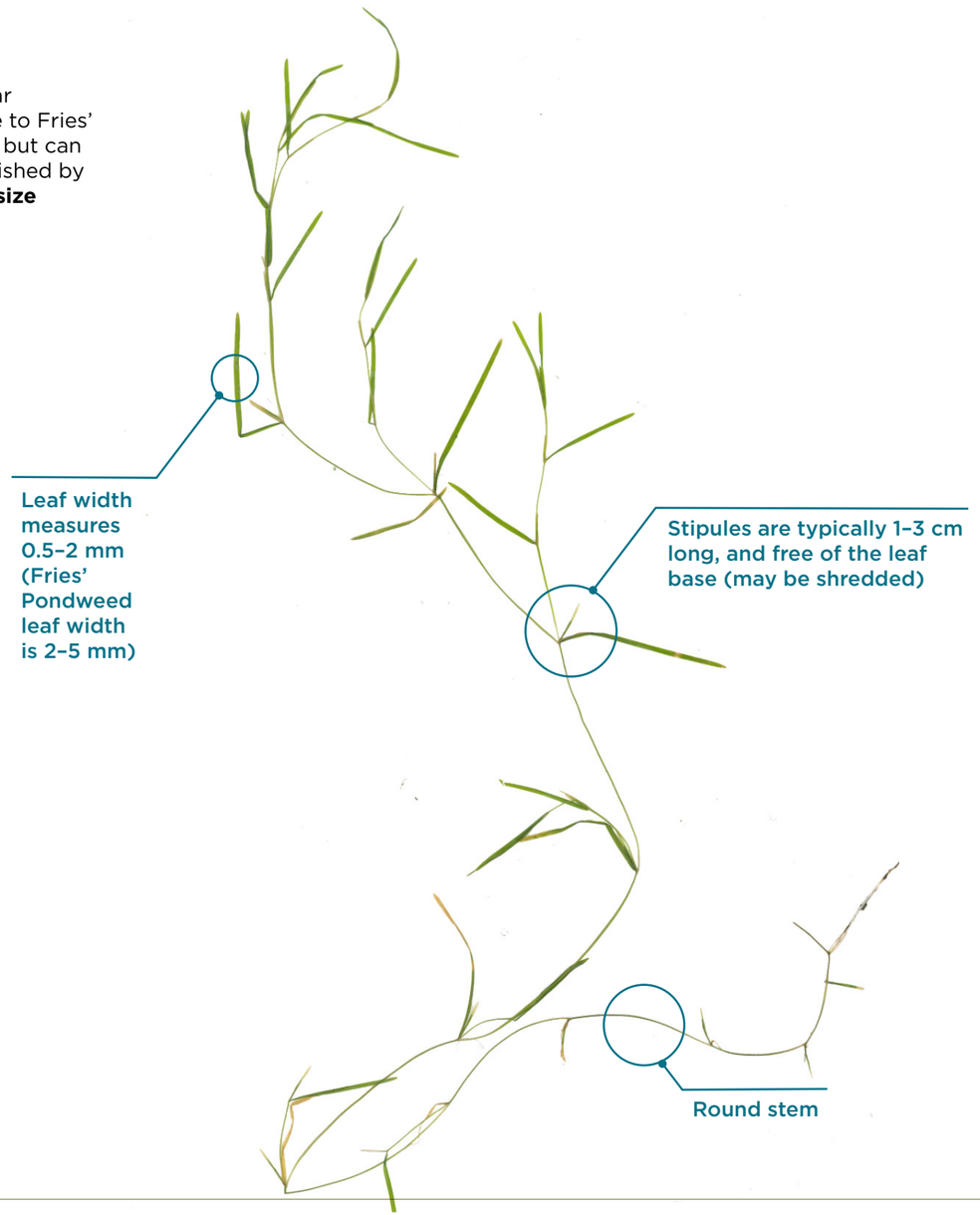
SUBMERGED

Small Pondweed

Potamogeton pusillis

Also known as: **Small-Leaf Pondweed**

Has a similar appearance to Fries' Pondweed, but can be distinguished by its **smaller size**



Flat-Stemmed Pondweed

Potamogeton zosteriformis

SUBMERGED

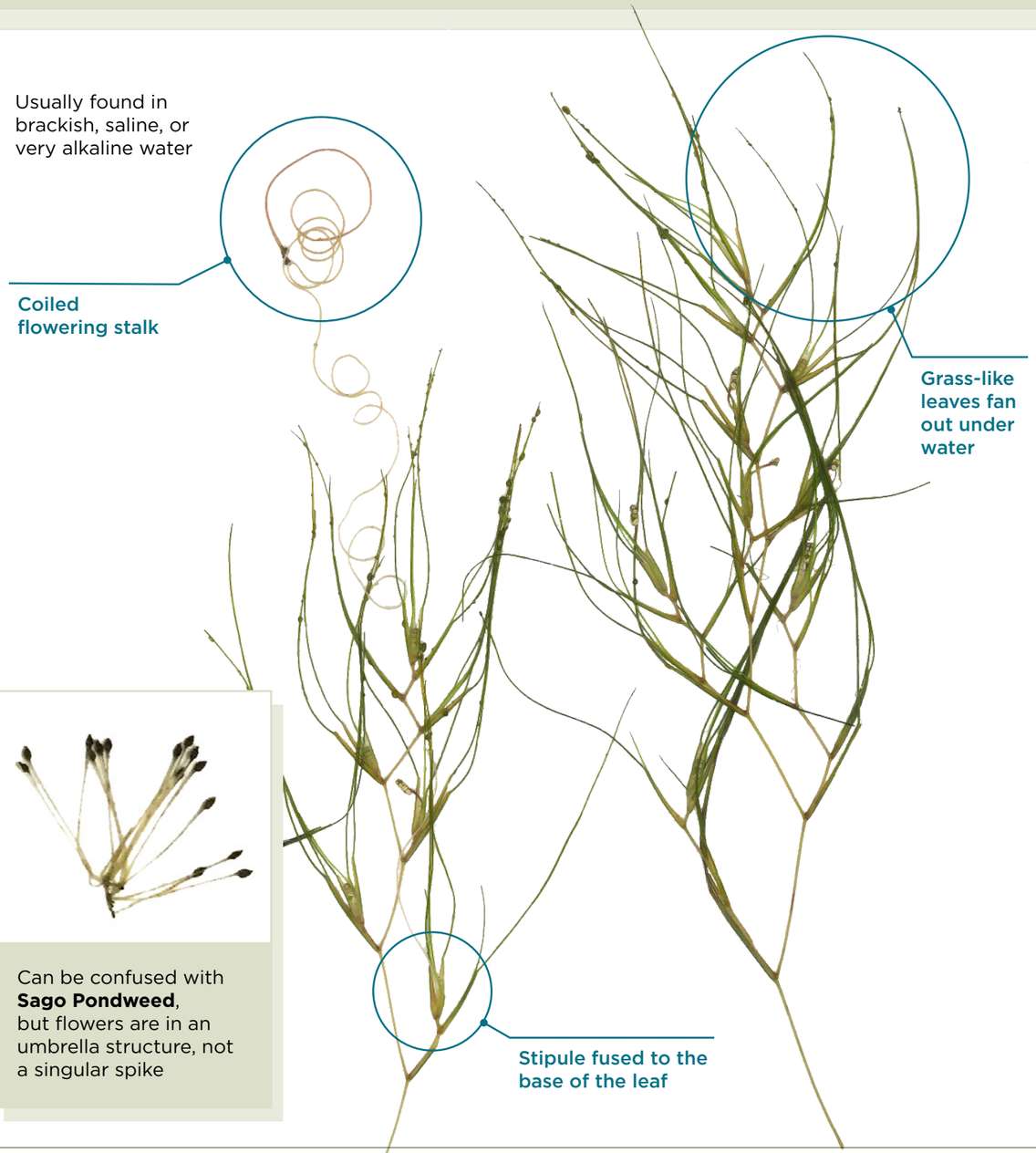
Has a similar appearance to Fries' Pondweed, but can be distinguished by its **flattened stem**

Winter buds comprised of many leaves

Spiral Ditchgrass

Ruppia cirrhosa

Usually found in brackish, saline, or very alkaline water

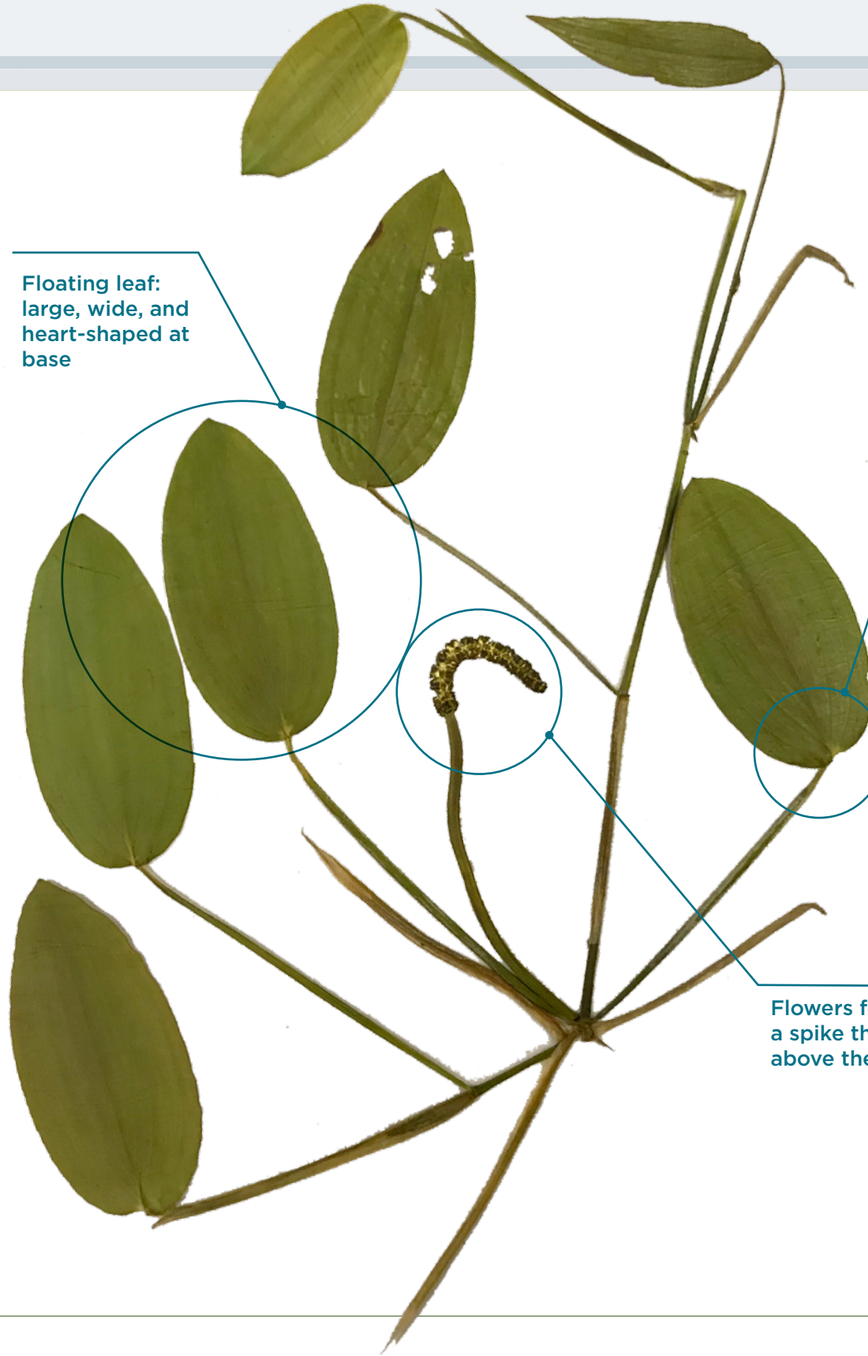


Can be confused with **Sago Pondweed**, but flowers are in an umbrella structure, not a singular spike

Floating-Leaf Pondweed

Potamogeton natans

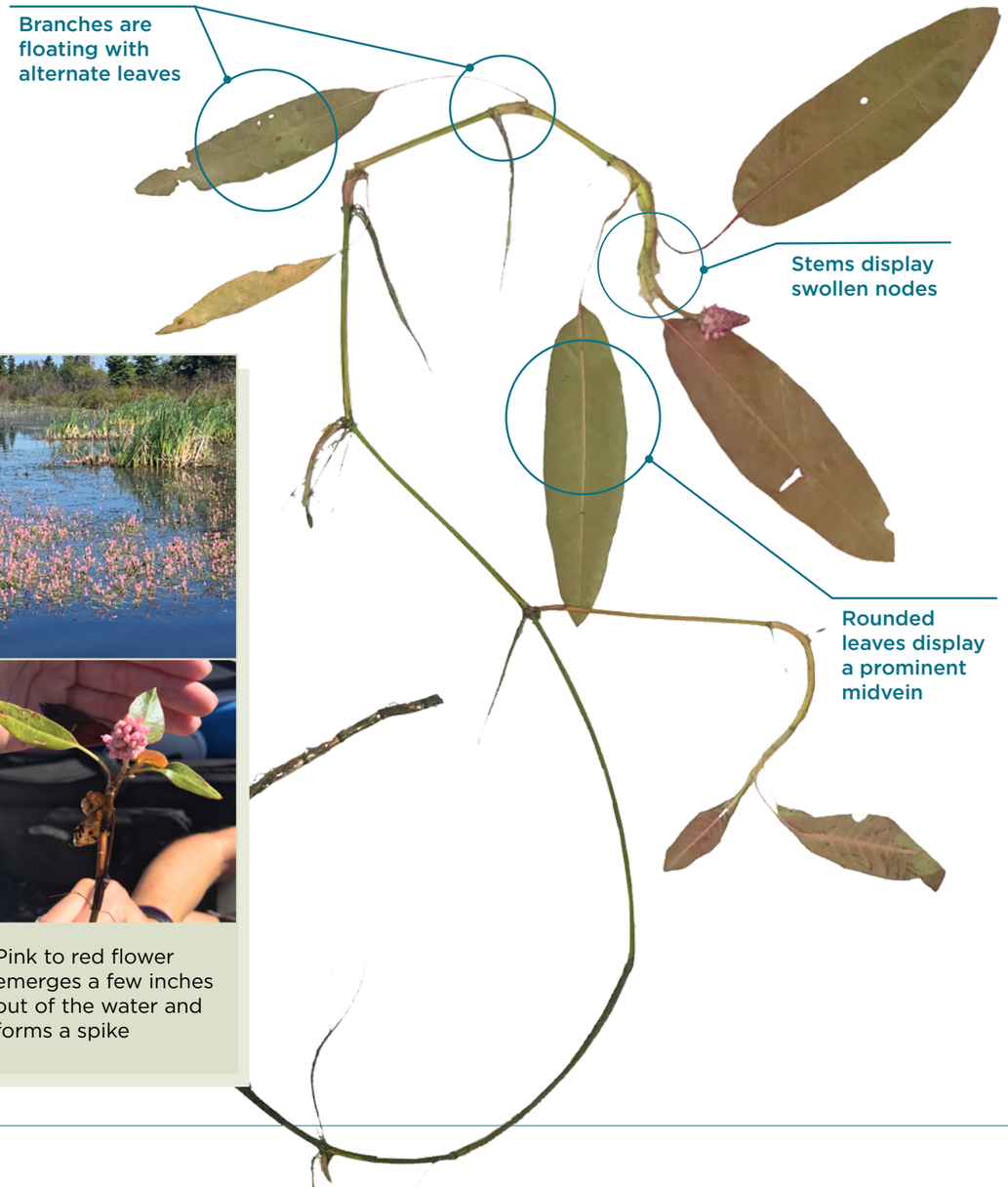
Submerged leaf: long, narrow, and grass-like



FLOATING

Water Smartweed

Persicaria amphibia



Pink to red flower emerges a few inches out of the water and forms a spike

Variegated Pond-Lily

Nuphar variegata

Also known as: **Yellow Pond-Lily**

Large, heart-shaped leaves (20–40 cm long)

Leaves lie flat along the water's surface or at a slight angle

Yellow flowers about the size of a ping pong ball

Photo: Marsha Hayward

BE ON THE LOOKOUT FOR THIS INVASIVE LOOK-ALIKE

Yellow Floating Heart

Nymphoides peltata

The leaves of yellow floating-heart can appear similar to the variegated pond-lily, however the leaves are only 3–10 cm in diameter, have slightly wavy edges, and may appear purple underneath. The flowers have five fringed yellow petals.

Photo: David Cappaert, Bugwood.org

FLOATING

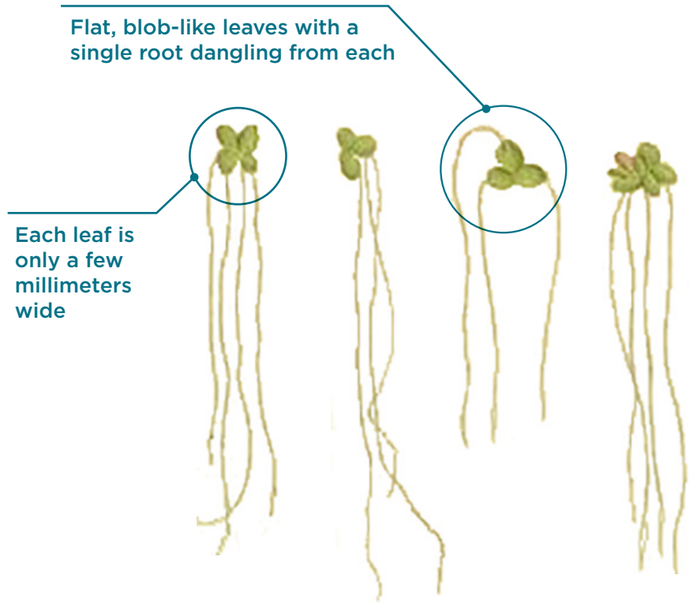
FLOATING

Duckweed

Lemna spp.

A small, free-floating colonial species that exists in different shapes and sizes depending on the species

Some species produce **turions:** wintering buds that can detach and lie dormant at the bottom of a waterbody



Found in quiet areas of water bodies that are undisturbed by wave action

Photo: Christian Fischer (commons.wikimedia.org)

Lesser or Common Duckweed
Lemna turionifera

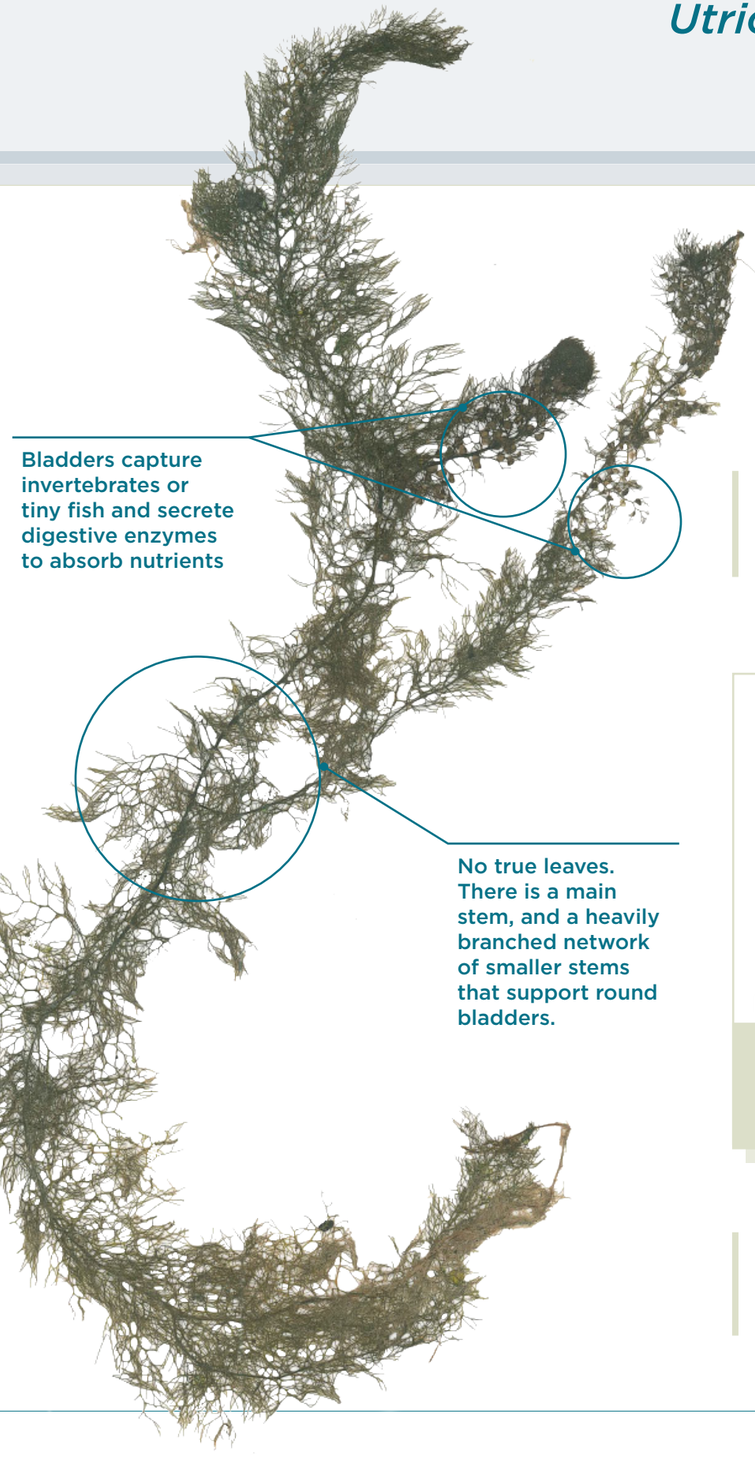
Ivy-Leaved or Star Duckweed
Lemna trisulca

All images on this page from: ArtsCult.com (www.flickr.com) unless otherise noted

Bladderwort

Utricularia spp.

FLOATING



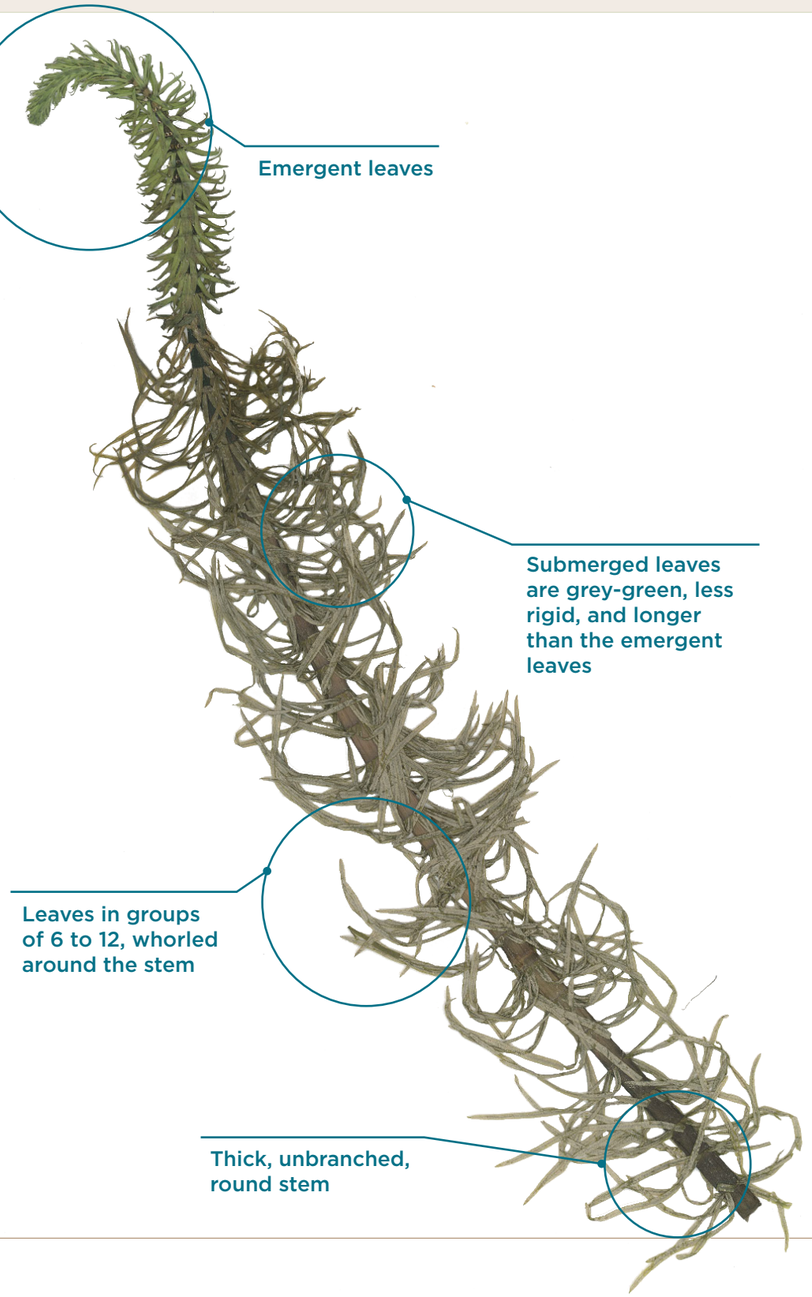
This is a free-floating, carnivorous aquatic plant

Produces bright yellow emergent flowers

Alberta is home to 4 or 5 species of Bladderwort

Common Mare's Tail

Hippuris vulgaris



Arrowhead

Sagittaria cuneata

Also known as: **Arum-Leaved Arrowhead, Duck Potato, Wapato**

Each individual flower has 3 main petals and 3 smaller petals (sepals)

Photo: born1945 (www.flickr.com)

Flowering Rush

Butomus umbellatus

INVASIVE

Pinkish-white flowers grow in umbrella-like structures

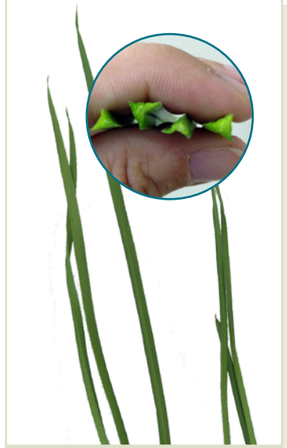
Individual flowers have 3 main petals and 3 smaller petals (sepals)

Can grow along the shoreline as an emergent plant, or be partially submerged

Round stem that supports the flower can grow as high as 1 metre

Flowering Rush in seed

DO NOT PULL OR DIG:
Root clusters can break into new plants if disturbed



Early in the season, this plant can be identified by its sword-shaped leaves, which are triangular in cross section

Photo: Nicole Kimmel

Himalayan Balsam

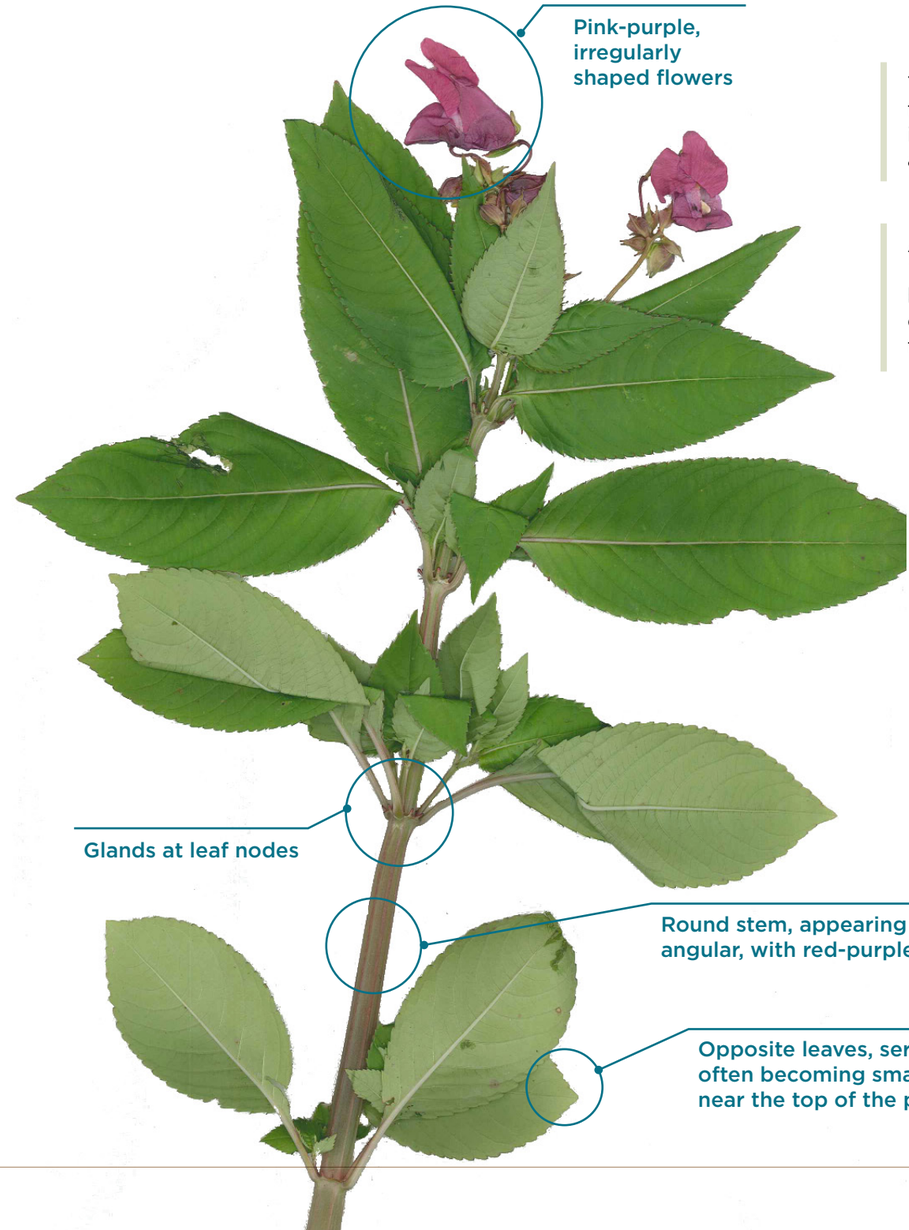
Impatiens glandulifera

INVASIVE

Pink-purple, irregularly shaped flowers

This is actually a terrestrial plant, and is found in riparian areas near lakeshores

Also called “Touch-Me-Not” as seeds burst from the capsule when touched



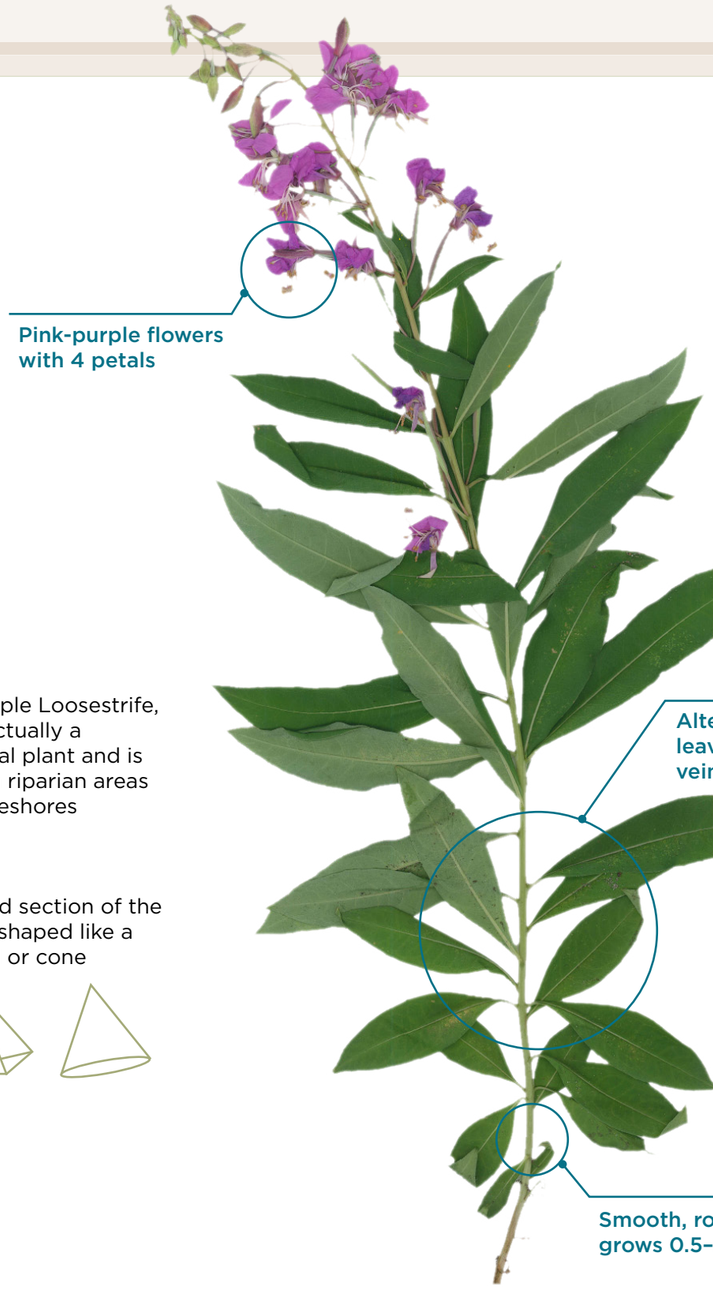
Glands at leaf nodes

Round stem, appearing slightly angular, with red-purple colouration

Opposite leaves, serrated, often becoming smaller near the top of the plant

Common Fireweed

Chamaenerion angustifolium

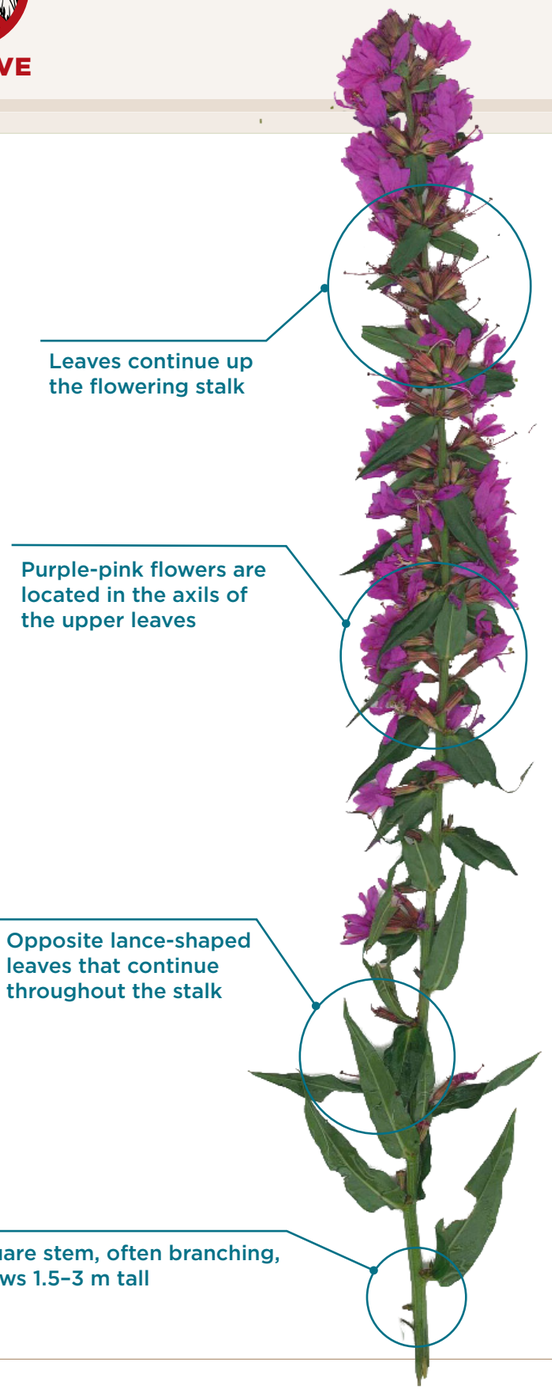


Like Purple Loosestrife, this is actually a terrestrial plant and is found in riparian areas near lakeshores

Flowered section of the plant is shaped like a pyramid or cone

Purple Loosestrife

Lythrum salicaria



This is actually a terrestrial plant, and is found in riparian areas near lakeshores. Looks very similar to Fireweed.

Flowered section of the plant is shaped like a cylinder

Flowers have 4-8 petals (commonly 6)

Leaves and stems may have fine hair

Alberta Lake Management Society

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