



Pocket Field Guide

SAV species list

- Cd** - Hornwort - *Ceratophyllum demersum*
Cal - Water starwort - *Callitriche* sp.
Egd - Brazilian waterweed - *Egeria densa*
Ex - Unknown waterweed - *Elodea* sp.
Ec - Common waterweed - *Elodea canadensis*
En - Western waterweed - *Elodea nuttallii*
Hd - Water stargrass - *Heteranthera dubia*
Hv - Hydrilla - *Hydrilla verticillata*
Mx - Unknown milfoil - *Myriophyllum* sp.
Mh - Low watermilfoil - *Myriophyllum humile*
Ma - Parrot feather milfoil - *Myriophyllum brasiliense/aquaticum*
Ms - Eurasian watermilfoil - *Myriophyllum spicatum*
Nx - Unknown naiad - *Najas* sp.
Nfl - Northern naiad - *Najas flexilis*
Ngr - Slender naiad - *Najas gracillima*
- Ngd** - Southern naiad - *Najas guadalupensis*
Nm - Spiny naiad - *Najas minor*
Px - Unknown pondweed - *Potamogeton* sp.
Pc - Curly pondweed - *Potamogeton crispus*
Pe - Leafy pondweed - *Potamogeton epihydrus*
Pi - Illinois pondweed - *Potamogeton illinoensis*
Pn - American pondweed - *Potamogeton nodosus*
Ppf - Redhead grass - *Potamogeton perfoliatus*
Ppu - Slender pondweed - *Potamogeton pusillus*
Rm - Widgeongrass - *Ruppia maritima*
Sp - Sago pondweed - *Stuckenia pectinata*
Ut - Bladderwort - *Utricularia*
Va - Wild celery - *Vallisneria americana*
Zm - Eelgrass - *Zostera marina*
Zp - Horned pondweed - *Zannichellia palustris*
U - Unknown species

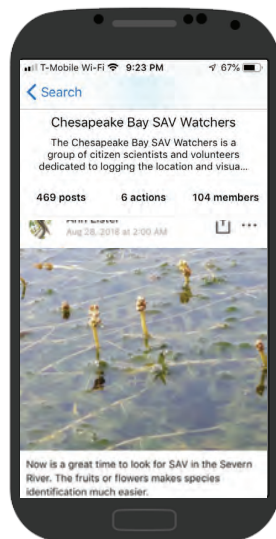
2

Tier 1 monitoring parameters

Basic observer and site information

Photo required (if present)

SAV species



Hornwort

Ceratophyllum demersum

Cd



Location: Freshwater tributaries

General ID: Lacks true roots, but stems can grow up to 3 m long. Brittle, stiff leaves grow in whorls of 9 or 10. Whorls are denser toward the end of the stem. Leaves fork into linear, flat segments. Fine teeth grow on one side of the leaf margin.

Similar morphology: Eurasian watermilfoil

Fun facts:

- Neither a dicot nor a eudicot, but is closely related to eudicots
- Found in all 50 states
- Most often found in slow-moving waters

Order Ceratophyllales • Family Ceratophyllaceae

6

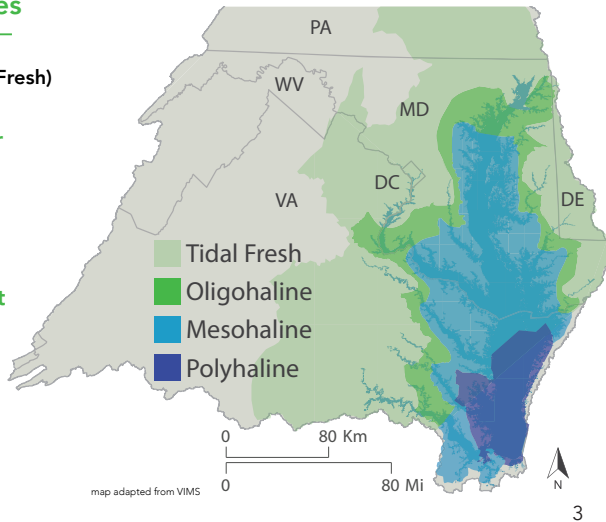
Sampling in the Chesapeake Bay

Salinity Zones & Sampling Guidelines

■ Oligohaline (and Tidal Fresh)
&
August and September

■ Mesohaline
&
Mid-July to mid-August

■ Polyhaline
&
May



3

Field packing list



Tier 1

On-site reporting

- Smartphone equipped with the *Water Reporter* app
- SAV species guide

Off-site reporting

- Paper
- Pencil
- Watch or Clock
- Camera
- GPS-enabled device
- SAV species guide

Optional items

- Binoculars
- Hand lens
- Dry bag
- Waterproof camera
- Mask and snorkel
- Boat
- Life jacket
- Trash bag

1

Hornwort

Ceratophyllum demersum

Cd



Oligohaline

Order Ceratophyllales • Family Ceratophyllaceae

7

Tier 2 monitoring parameters

Basic observer and site information

- Secchi depth
- Water depth
- Total SAV density
- Epiphytes
- SAV at surface
- Bottom sediment

Sampling ranges

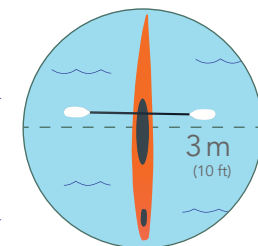
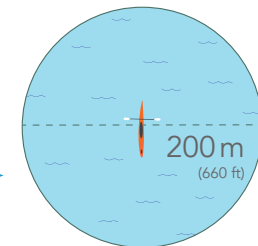


Photo Required (if present)

- SAV species
- Other macrophytes
- SAV flowers and seeds

Long-range data

- Shoreline type
- Visible shoreline erosion
- Marine debris
- Other human impact



5

Water starwort

Callitriche sp.

Cal



Location: Fresh waters throughout Bay
General ID: Egg-shaped leaves are bright green and about 2 cm long and up to 8 mm wide. Each joint of the stem has two leaves, which may float on or emerge above surface of the water.

Similar morphology: Common waterweed

Fun facts:

- Multiple species occur in the Bay; *C. stagnalis* is shown at the left
- Provides habitat for insects
- Food source for ducks

Oligohaline

Eudicot • Order Callitrichales • Family Callitrichaceae

8

Brazilian waterweed

Egeria densa

Egd



Location: Not common in the Bay; found in fresh waters

General ID: Forms thick mats at the surface of the water. Stems are highly branched. Leaves form in whorls of four and are densest near the top of the stem. Leaves are dark or bright green, serrated, long, and narrow (up to 2.5 cm long and 0.75 cm wide). Small white flowers form in the spring and the fall.

Similar morphology: *Hydrilla*, common waterweed

Fun facts:

- Native to South America
- Introduced to U.S. waters by aquarium owners emptying their aquaria in rivers and ponds

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

10

Common waterweed

Elodea canadensis

Ec



Location: Freshwater tributaries; occasionally in saltier waters where freshwater springs are found

General ID: Oval leaves grow directly on thin, branched stems (no leaf stalks). Leaves grow in whorls, with 3 per node. Tips of leaves are blunt and margins have fine teeth that are only visible using a hand lens. Leaves are densest toward stem tip.

Similar morphology: *Hydrilla*, western and Brazilian waterweeds

Fun facts:

- Food for beavers, muskrats, and ducks
- Can grow in deep or shallow waters
- Habitat for invertebrates, small fishes, and amphibians

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

12

Western waterweed

Elodea nuttallii

En



Location: Fresh waters and upper reaches of Bay tributaries

General ID: Long, slender, branched stems grow up to 1 m long. Whorled leaves grow directly on stems (in threes or fours) and are evenly spaced along stem. Leaves are short (up to 16 mm) and narrow. Leaves are pale green in color. Flowers are white.

Similar morphology: *Hydrilla*, common waterweed

Fun facts:

- Native to North America
- Invasive in Europe and Asia

Oligohaline

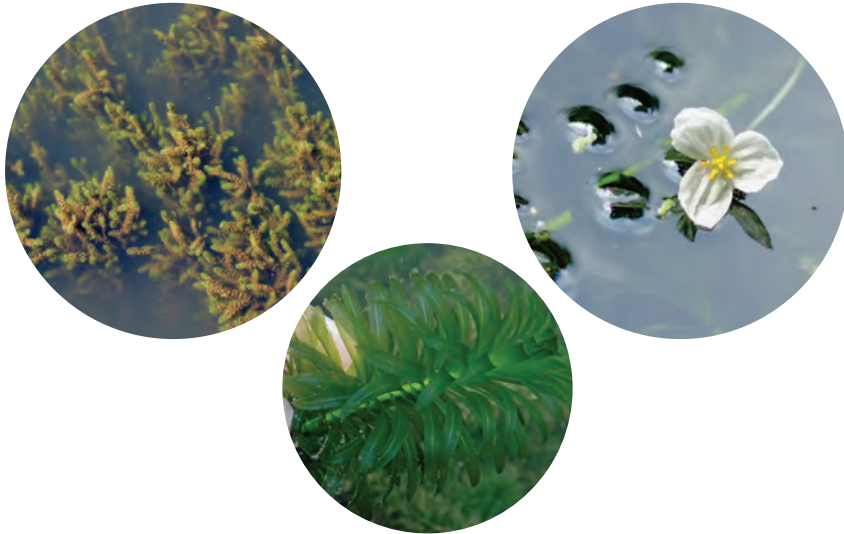
Monocot • Order Alismatales • Family Hydrocharitaceae

14

Brazilian waterweed

Egeria densa

Egd



Monocot • Order Alismatales • Family Hydrocharitaceae

11

Oligohaline

Water starwort

Callitriche sp.

Cal



Eudicot • Order Callitrichales • Family Callitrichaceae

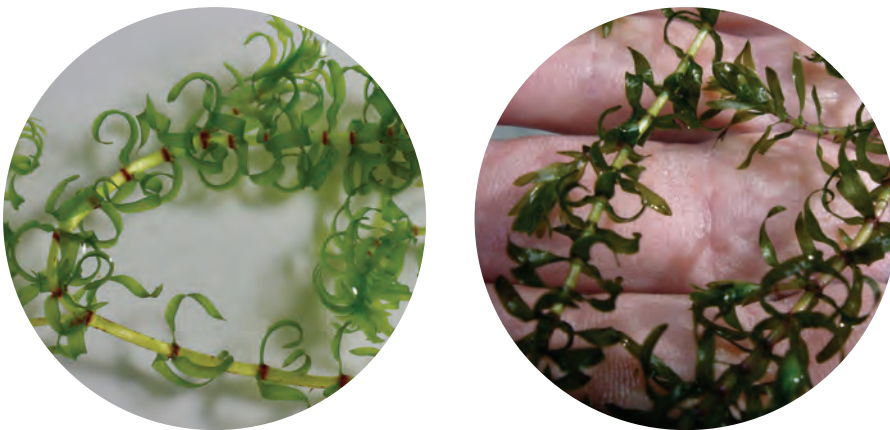
9

Oligohaline

Western waterweed

Elodea nuttallii

En



Monocot • Order Alismatales • Family Hydrocharitaceae

15

Oligohaline

Common waterweed

Elodea canadensis

Ec



Monocot • Order Alismatales • Family Hydrocharitaceae

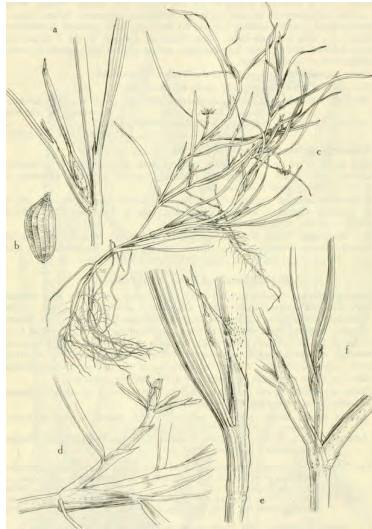
13

Oligohaline

Water stargrass

Heteranthera dubia

Hd



Location: Freshwater tributaries

General ID: Tall, somewhat bushy plant with grass-like leaves that grow on branching stems. The bottom of each leaf wraps around the stem like a sheath. Leaves are arranged alternately. Yellow, 6-petaled flowers may grow above water in the summer.

Similar morphology: Naiads

Fun facts:

- Flowers only open above the surface of the water
- There is also a terrestrial form of this species

Oligohaline

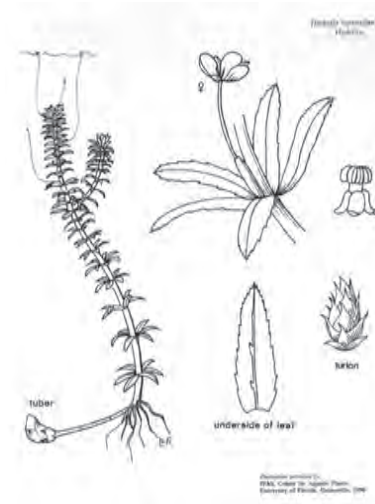
Monocot • Order Commelinales • Family Pontederiaceae

16

Hydrilla

Hydrilla verticillata

Hv



Location: Fresh and brackish waters of the Bay, in areas with muddy substrate

General ID: Stems are long and branching. Leaves grow in whorls of 3-5, and can be straight, lance shaped, or very small. Leaves are linear and serrated. Flowers are white and very small.

Similar morphology: Common waterweed

Fun facts:

- Non-native in the Chesapeake Bay
- Can live in lower light conditions than other SAV species
- Food source for migratory birds

Oligohaline

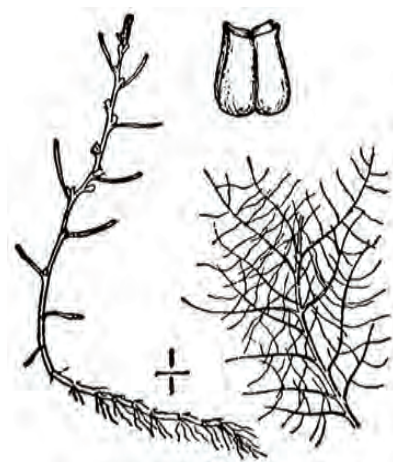
Monocot • Order Alismatales • Family Hydrocharitaceae

18

Low watermilfoil

Myriophyllum humile

Mh



Location: Freshwater coastal ponds, lakes, and reservoirs along shoreline

General ID: Morphology is extremely variable depending on water level. Leaves are very fine and grow sub-oppositely or scattered along stems. Each leaf has up to 20 hair-like segments (up to 10 per side) that make this plant appear fuzzy.

Similar morphology: Eurasian watermilfoil

Fun facts:

- Not common in Chesapeake Bay

Oligohaline

Eudicot • Order Saxifragales • Family Haloragaceae

20

Parrot feather milfoil

Myriophyllum brasiliense (or *aquaticum*)

Ma



Location: Fresh waters of the Bay

General ID: Stems are stout, with leaves occurring in whorls of five. Each side of the leaf has up to 25 hair-like protrusions that give it a feather-like appearance. Stems sometimes appear reddish.

Similar morphology: Eurasian watermilfoil

Fun facts:

- Can grow out of water and onto land
- No male plants exist outside of South America
- Native to the Amazon
- Introduced to the U.S. in Washington, D.C.

Oligohaline

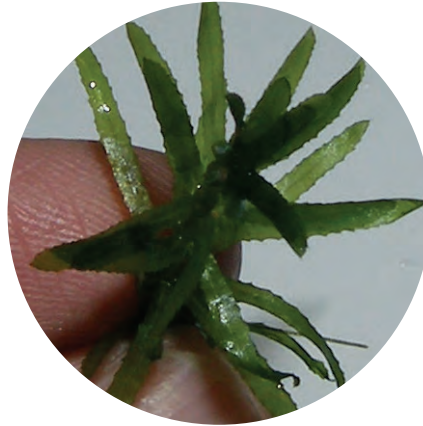
Eudicot • Order Saxifragales • Family Haloragaceae

22

Hydrilla

Hydrilla verticillata

Hv



Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

19

Water stargrass

Heteranthera dubia

Hd



Oligohaline

Monocot • Order Commelinales • Family Pontederiaceae

17

Parrot feather milfoil

Myriophyllum brasiliense (or *aquaticum*)

Ma



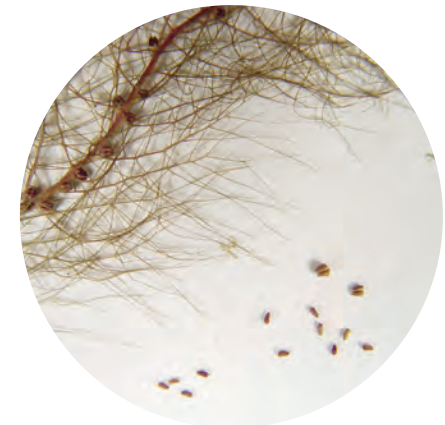
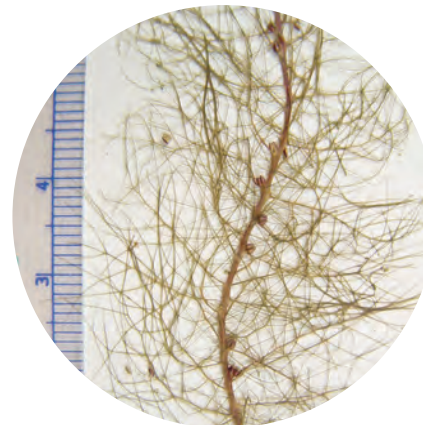
Oligohaline

Eudicot • Order Saxifragales • Family Haloragaceae

23

Low watermilfoil

Myriophyllum humile



Oligohaline

Eudicot • Order Saxifragales • Family Haloragaceae

21

Eurasian watermilfoil

Myriophyllum spicatum

Ms



Myriophyllum spicatum L.

Location: Widely distributed in fresh and brackish waters of the Bay and its tributaries

General ID: Delicate leaves resemble feathers and grow in whorls of 4 (usually) or 5. Leaves are pinnate and lose their shape when removed from the water. In the summer, reddish flowers grow in spikes above the water.

Similar morphology: Parrot feather milfoil, hornwort

Fun facts:

- Is an introduced species in the Bay
- Provides habitat for insects and aquatic species

Mesohaline

Oligohaline

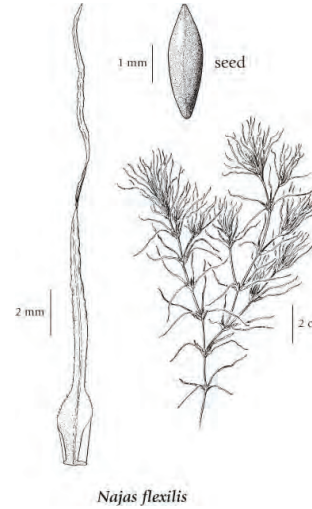
Eudicot • Order Saxifragales • Family Haloragaceae

24

Northern naiad

Najas flexilis

Nfl



Najas flexilis

Location: Rivers and fresh and brackish Bay waters, in areas with sandy substrate

General ID: Narrow leaves are slightly broader at the base and grow up to 6 mm long. Leaves are opposite or in whorls, and curve out from the stem. Stem is slender and branching.

Similar morphology: Slender, southern, and spiny naiads

Fun facts:

- Also known as the "nodding water nymph"
- Sensitive to pollution
- Food source for water birds

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

26

Slender naiad

Najas gracillima

Ngr



Source: Wisconsin Lakes Partnership
University of Wisconsin

Location: Rivers and fresh and brackish Bay waters, in areas with sandy substrate

General ID: Leaves are narrower than those of southern and northern naiads. Tiny teeth are very difficult to see on leaf edges. Leaves are opposite or whorled and grow up to 28 mm in length. Leaves grow more densely near the top of the slender, branching stem.

Similar morphology: Northern, southern, and spiny naiads

Fun facts:

- Also called the "thread-like water nymph"

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

28

Southern naiad

Najas guadalupensis

Ngd



Location: Rivers and fresh and brackish Bay waters, in areas with sandy substrate

General ID: Narrow, flat, straight leaves grow up to 33 mm long. Leaves are opposite or whorled on slender, branching stems.

Similar morphology: Slender, northern, and spiny naiads

Fun facts:

- Found across the Americas
- Considered a weed in some areas
- Food source for water birds and fish
- Also called "bushy pondweed"

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

30

Northern naiad

Najas flexilis

Nfl



Oligohaline

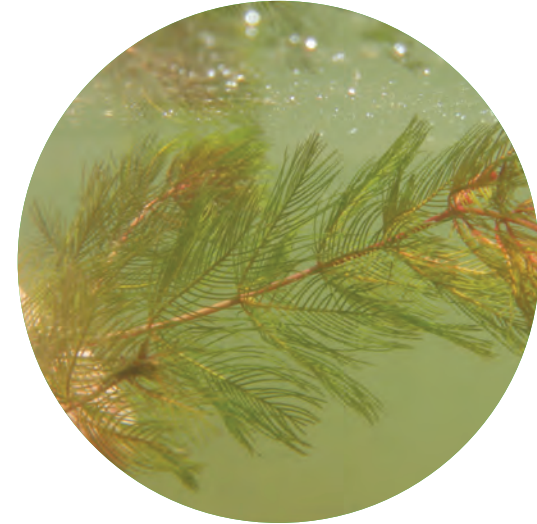
Monocot • Order Alismatales • Family Hydrocharitaceae

27

Eurasian watermilfoil

Myriophyllum spicatum

Ms



Mesohaline

Oligohaline

Eudicot • Order Saxifragales • Family Haloragaceae

25

Southern naiad

Najas guadalupensis

Ngd



Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

31

Slender naiad

Najas gracillima

Ngr



Oligohaline

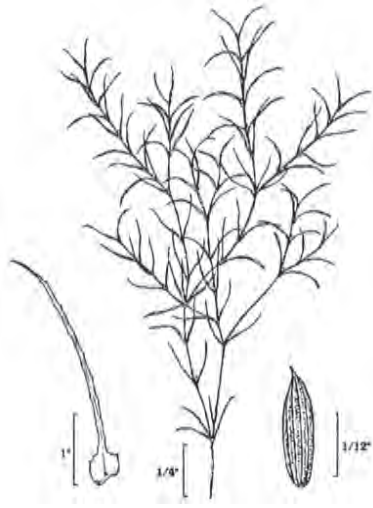
Monocot • Order Alismatales • Family Hydrocharitaceae

29

Spiny naiad

Najas minor

Nm



Location: Rivers and fresh and brackish Bay waters, in areas with sandy substrate

General ID: Leaves are narrower than those of Southern and Northern naiads. Tiny teeth on leaf edges are visible to the naked eye. Stiff, recurved leaves grow oppositely or whorled on slender, branching stems.

Similar morphology: Slender, southern, and northern naiad

Fun facts:

- Also called the "brittle water nymph"
- Introduced species from Europe

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

32

Curly pondweed

Potamogeton crispus

Pc



Location: Widely distributed in fresh and slightly brackish waters of the Bay

General ID: Stems are flat and branching, with alternate or opposite leaves. Leaves are long and broad, with wavy edges and fine teeth. In the winter, leaves appear blue-green and flat; spring and summer leaves are curlier and reddish brown.

Similar morphology: Redhead grass

Fun facts:

- Introduced to the Chesapeake Bay in the 1800's
- Winter and summer forms look very different from one another
- Leaves appear crimped

Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

34

Leafy pondweed

Potamogeton epihydrus

Pe



Location: Slow moving, fresh waters less than 2 m deep

General ID: Has both floating and submerged leaves, which are bright green with a light-colored stripe down the center. Floating leaves are paddle-like. Stems are flat and grow up to 18 cm long. Flowers are small and brownish green.

Similar morphology: Other pondweeds

Fun facts:

- Eaten by waterfowl
- Provides habitat for aquatic animals

Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

36

Illinois pondweed

Potamogeton illinoensis

Pi



Location: Rare in the Bay, may be found in freshwater areas

General ID: Long stems support ellipse-shaped leaves. Leaves grow submerged and floating. Submerged leaves are longer than floating ones, and have pointed tips. Floating leaves are paddle-like. Stems are long, cylindrical, slim, and branching. Small green flowers grow on spikes.

Similar morphology: Other pondweeds

Fun facts:

- Also known as "shining pondweed"

Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

38

Curly pondweed

Potamogeton crispus

Pc



Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

35

Spiny naiad

Najas minor

Nm



Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

33

Illinois pondweed

Potamogeton illinoensis

Pi



Oligohaline

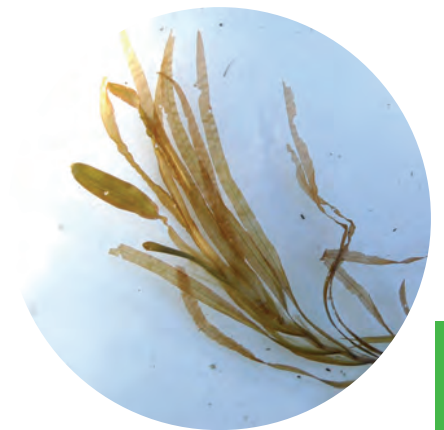
Monocot • Order Alismatales • Family Potamogetonaceae

39

Leafy pondweed

Potamogeton epihydrus

Pe



Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

37

American pondweed

Potamogeton nodosus

Pn



Location: Rivers, ponds, and tidal fresh and brackish waters of the Bay

General ID: Floating leaves may appear dense at the surface. Stems can be up to 2 m long. Floating leaves are oval and are 10-18 cm long and up to 2-5 cm across. Underwater leaves are sparse, and are smaller and blade-like. Flower stalks grow above water.

Similar morphology: Other pondweeds

Fun facts:

- Also called "longleaf pondweed"
- Food source and shelter for turtles, fishes, ducks, and invertebrates
- Has submerged and floating leaves

Oligohaline

Monocot • Order Alismatales • Family Potamogetonaceae

40

Redhead grass

Potamogeton perfoliatus

Ppf



Location: Brackish waters with muddy substrate and slow currents

General ID: Flat, oval leaves are arranged alternately or oppositely. Leaf bases attach directly to the stems. Leaves are up to 7 cm long and 4 cm across, and have curled edges. Stems may be whitish or reddish, and branched near the top.

Similar morphology: Curly pondweed

Fun facts:

- Named for the redhead ducks that consume it
- Also a food source for other waterfowl

Mesohaline

Monocot • Order Alismatales • Family Potamogetonaceae

42

Slender pondweed

Potamogeton pusillus

Ppu



Source: Crow and Hellquist © 2000

Location: Upper and middle Bay and fresh to brackish tributaries

General ID: Long, thin, grass-like leaves have pointed tips and may be purplish in color. Leaves are arranged alternately and have prominent mid-veins. Stems are slender and branching. Flowers grow in whorls on spikes.

Similar morphology: Sago pondweed, horned pondweed, and widgeongrass

Fun facts:

- Also called "small pondweed"
- Eaten by waterfowl

Oligohaline

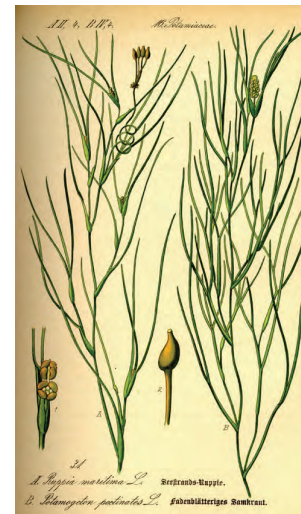
Monocot • Order Alismatales • Family Potamogetonaceae

44

Widgeongrass

Ruppia maritima

Rm



Location: Widely distributed in Bay

General ID: Long, narrow, threadlike leaves grow alternately on narrow stems. A sheath grows at the base of each leaf. Leaves grow up to 10 cm long and 0.5 mm wide. During the late summer, flower stalks grow and branch upwards.

Similar morphology: Horned and sago pondweed (when not flowering)

Fun facts:

- May be found growing with eelgrass
- Most common in sandy substrate
- Important food source for ducks, geese, and other waterfowl

Polyhaline

Mesohaline

Monocot • Order Alismatales • Family Ruppiceae

46

Redhead grass

Potamogeton perfoliatus

Ppf

Mesohaline



Monocot • Order Alismatales • Family Potamogetonaceae

43

American pondweed

Potamogeton nodosus

Pn

Oligohaline



Monocot • Order Alismatales • Family Potamogetonaceae

41

Widgeongrass

Ruppia maritima

Rm

Polyhaline

Mesohaline



Monocot • Order Alismatales • Family Ruppiaceae

47

Slender pondweed

Potamogeton pusillus

Ppu

Oligohaline



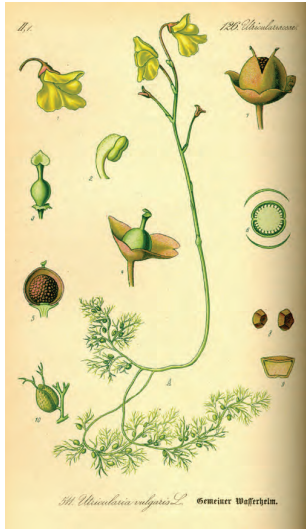
Monocot • Order Alismatales • Family Potamogetonaceae

45

Bladderwort

Utricularia

Up



Location: Freshwater ponds and ditches

General ID: Typically found floating, with stems and leaves submerged. Stems are branching and grow horizontally. Leaves are alternate, stem-like, linear, and may grow oppositely or whorled. Bladders grow on stems and leaves. True roots are absent. Flowers grow on leafless stems when present.

Fun facts:

- Several species inhabit the Chesapeake Bay
- Are carnivorous; they trap and digest organisms in bladders
- Free-floating and rootless
- Often called "ditch grass"

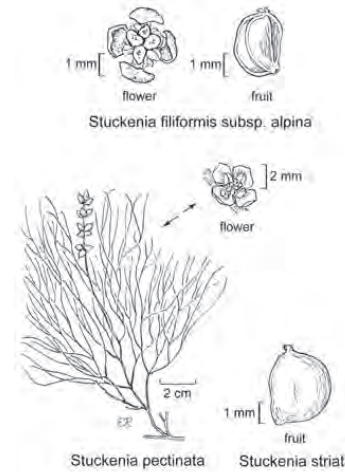
Oligohaline

Eudicot • Order Lamiales • Family Lentibulariaceae

Sago pondweed

Stuckenia pectinata

Sp



Location: Fresh to brackish waters throughout the Bay

General ID: Stems are slender and branching. Leaves are arranged alternately, and are long, threadlike, and tapered to a point. The basal sheath may be pointed. Stems and leaves may appear fan-like.

Similar morphology: Horned pondweed and widgeongrass

Fun facts:

- This species was formerly classified as *Potamogeton pectinatus*
- Inhabits the Americas, Europe, Africa, and Asia
- Easiest to differentiate from widgeongrass when seeds are present

Mesohaline

Monocot • Order Alismatales • Family Potamogetonaceae

Eelgrass

Zostera marina

Zm



Location: Saltier waters of the Bay

General ID: Leaves are ribbon-like and alternate, spaced at nodes up to 3.5 cm apart. Leaves have rounded tips and are wrapped at the base by a sheath up to 20 cm long. Leaves can grow up to 1.2 m in length, and may be long and wide (deep, muddy areas) or short and narrow (shallow, sandy areas).

Similar morphology: Wild celery

Fun facts:

- Eelgrass beds provide refuge for many species including seahorses, pipefish, juvenile fishes, blue crabs, and scallops.
- Eelgrass is the only true seagrass found in the Chesapeake Bay.

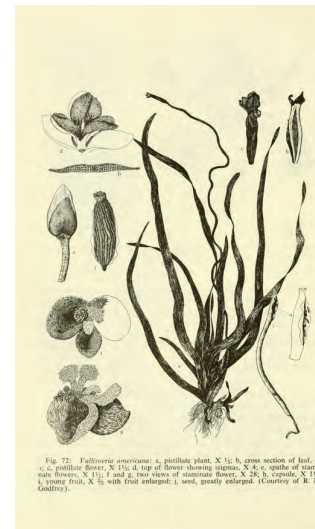
Polyhaline

Monocot • Order Alismatales • Family Zosteraceae

Wild celery

Vallisneria americana

Va



Location: Fresh to slightly brackish tidal waters of the Bay

General ID: Ribbon-like leaves grow in clusters from the base of the plant. Leaves are long and flat with blunt, rounded tips and a light green center stripe. They grow up to 1.5 m long and 1 cm wide.

Similar morphology: Eelgrass

Fun facts:

- Provides food for migratory and overwintering birds

Oligohaline

Monocot • Order Alismatales • Family Hydrocharitaceae

Sago pondweed

Stuckenia pectinata

Sp

Mesohaline



Monocot • Order Alismatales • Family Potamogetonaceae

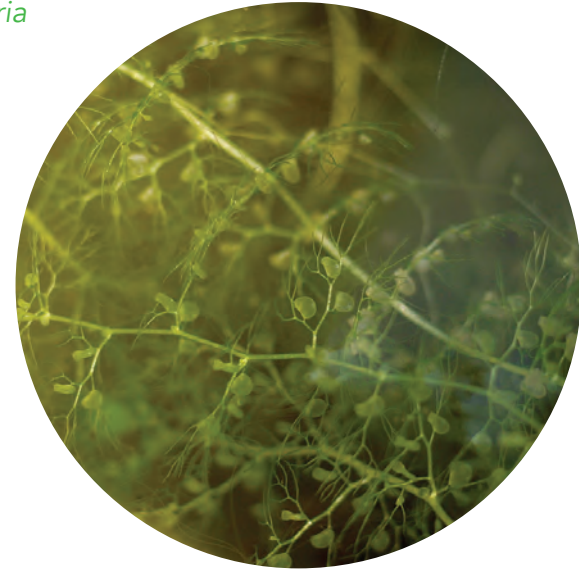
49

Bladderwort

Utricularia

Up

Oligohaline



Eudicot • Order Lamiales • Family Lentibulariaceae

51

Wild celery

Vallisneria americana

Va

Oligohaline



Monocot • Order Alismatales • Family Hydrocharitaceae

53

Eelgrass

Zostera marina

Zm

Polyhaline



Monocot • Order Alismatales • Family Zosteraceae

55

Horned pondweed

Zannichellia palustris

Zp

Polyhaline

Mesohaline

Oligohaline



A. STORSÄRV. ZANNICHELLIA MAJOR BOENK.
B. SMÅSÄRV. Z. REPENS BOENK. C. SKAFTSÄRV. Z. PEDUNCULATA RICH.

Location: Widely distributed in the Bay

General ID: Stems are slender and branching. Long, linear, threadlike leaves are arranged oppositely or in whorls. Leaf tips are pointed and the basal sheath of the leaves is thin. This plant can be distinguished by its horn-like seeds that appear in pairs or sometimes in a set of four.

Similar morphology: Sago pondweed, widgeongrass

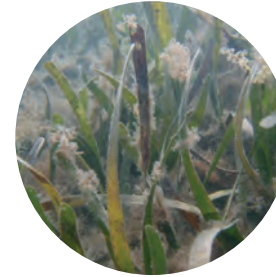
Fun facts:

- Multiple variations of this species exist; several are shown on this page
- Two forms are found in the Bay: one grows upwards, the other grows along the bottom sediment with stems and roots together

Monocot • Order Alismatales • Family Potamogetonaceae

56

Epiphytes



What are they? Epiphytes are algal species that grow on SAV. In terrestrial systems, epiphytic plants may grow on other plants, such as trees.

Are they parasites? No. Epiphytes use SAV and other plants as a substrate on which to grow, and do not necessarily impact their host negatively. However, when nutrients are overly abundant, epiphytic algae may cover too much of the host SAV surface, blocking light and inhibiting photosynthesis.

Location: Often found growing on SAV in and around the Bay.

General ID: Varies immensely depending on species of epiphyte. May grow on stem or base of SAV.

58

Green freshwater algae



Genera: *Chara*, *Nitella*

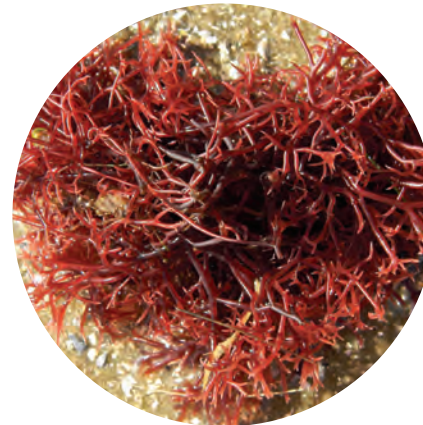
Common Name: Muskgrass

General ID: Resemble some SAV species, but these are algae, not vascular plants. Leaves branch, and grow off branching stems in whorls.

Green freshwater macroalgae

60

Red saltwater algae



Genera: *Gracilaria*, *Agardiella*

Common Name: Red algae

General ID: Red in color, highly branched structure.

Red saltwater macroalgae

62

Lyngbya



What is it? Lyngbya is a freshwater cyanobacteria.

Location: Lyngbya has been found in the northern Bay covering SAV beds, and in fishing gear during the summer.

General ID: Grows in strands that clump together and form mats in warm, fresh waters.

Impacts on SAV species: Can grow over SAV beds and inhibit photosynthesis.

Warnings: Associated toxins may cause skin and gastrointestinal inflammation; avoid direct contact with Lyngbya. Wash your skin with soap if contact occurs!

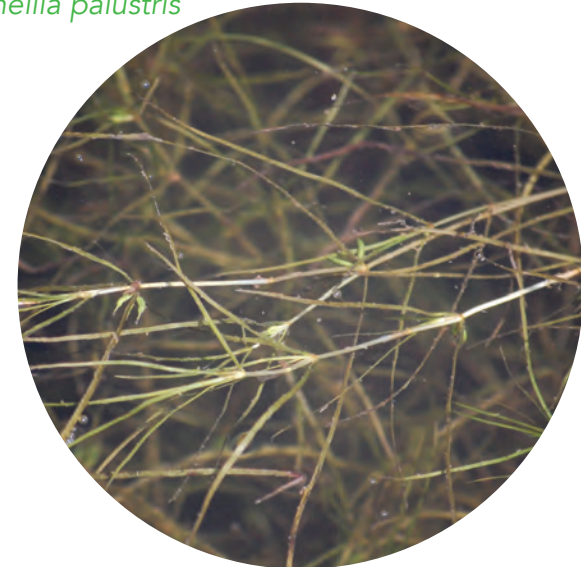
Bacteria • Phylum Cyanobacteria

59

Horned pondweed

Zannichellia palustris

Zp



Monocot • Order Alismatales • Family Potamogetonaceae

57

Polyhaline

Mesohaline

Oligohaline

Brown saltwater algae



Genus: *Ascophyllum*

Common Name: Knotted wrack

General ID: Long fronds with rounded tips and air bladders.

Brown saltwater macroalgae

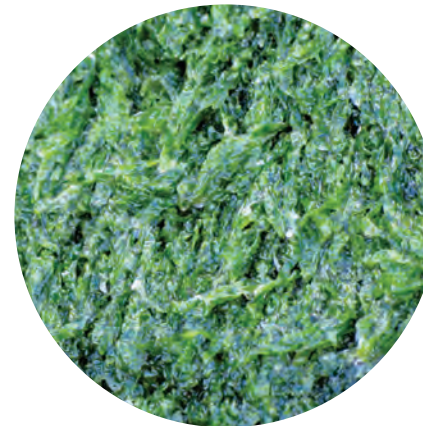
Genus: *Fucus*

Common Name: Bladder wrack

General ID: Long, branching fronds with air bladders.

63

Green saltwater algae



Species: *Ulva lactuca*

Common Name: Sea Lettuce

General ID: Bright green in color, with thin, leaf-like fronds.

Green saltwater macroalgae

Genus: *Ulva*

Common Name: Enteromorpha

61

Water chestnut

Trapa natans



What is it? Water chestnut is an invasive floating aquatic plant that is actively managed in the Chesapeake Bay.

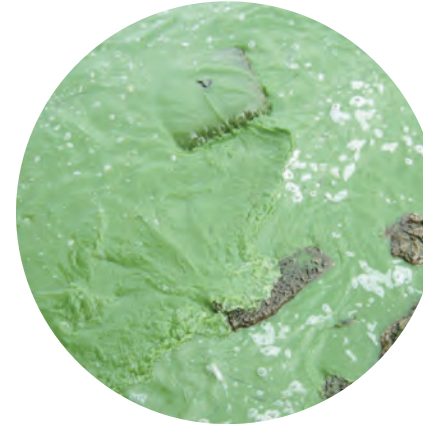
Location: Has been found in upper Chesapeake Bay tributaries and in the Potomac River.

General ID: Triangle-shaped leaves form rosettes that float on the surface of the water. The plant itself is bulky but the flowers are small and white.

Impacts on SAV species: Leaves can block sunlight from reaching SAV, competes for space.

What to do if you see it: If you see water chestnut while sampling SAV, alert MD DNR at (410) 260-8630.

Harmful algal blooms



What is it? Certain algae species can produce toxins dangerous to humans and aquatic species. When these species reproduce very quickly, or "bloom", they can form a harmful algal bloom, or "HAB".

General ID: May look like thick mats or clumps are growing on or near the water surface. May be red, green, or brown in color.

What should you do? It is difficult to distinguish a harmful algal bloom from a non-harmful one, so it is best not to sample in areas with an algal bloom. Instead, report suspicious algal blooms to the Chesapeake Bay Safety and Environmental Hotline at (877) 224-7229.

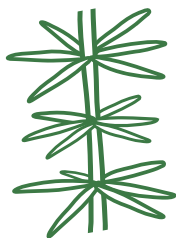
Leaf arrangement vocabulary

These four diagrams introduce you to terminology that is used throughout this pocket guide to denote leaf arrangement.

Basal



Whorled



Alternate



Opposite



Note: Do not determine leaf arrangement based on where the stem divides, as this will likely reflect an atypical arrangement from the majority of the plant.

Quick conversions: 1 cm = 0.4 in 1 m = 3 ft

Photo attribution

Organized by page number from left to right

- | | | |
|---------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------|
| 7 - Chesapeake Bay Program (CBP)
Andreas Rockstein, Jon Sullivan | 31 - Robert H. Mohlenbrock | 55 - Jon Lefcheck |
| 9 - Dr. Mary Gillham Archive
Project, Richard Place | 33 - Robert H. Mohlenbrock, MD
DNR | 57 - CBP |
| 11 - CBP, T. Pennington | 35 - Kristian Peters | 58 - Mark Rodrique, Brooke Landry |
| 13 - Andreas Rockstein, Merike
Linnamägi | 36 - Britton & Brown | 59 - MD DNR, Wikimedia Commons |
| 15 - Christian_Fischer, Radio Tonleg | 37 - Edward G. Voss, Barre Hellquist | 60 - Mary Kleim, Texas AquaPlant |
| 17 - Fritzflohreynolds, jillllybean | 39 - Dick Culbert, Na. J. Pilla,
Fernando Arcas | 61 - Katia Schulz, Ria Tan |
| 19 - USFWS, Darkmax | 41 - jillllybean | 62 - Bob Peterson, Peter
Southwood |
| 21 - Donald Cameron | 43 - Kristian Peters, Natural
Resources Wales | 63 - Henry Hemming, Ansgar
Gruber |
| 23 - André Karwath, Evelyn Simak | 45 - all by ChristianFisher2 | 64 - all by MD DNR |
| 25 - burita2012 | 47 - Brooke Landry, Tim Carruthers | 65 - Allen Gathman, DennisM2,
Carnat Joel |
| 27 - Robert H. Mohlenbrock,
SERNEC | 49 - CBP, Brooke Landry | 66 - Ohio Sea Grant |
| 29 - Donald Cameron, Show Ryu | 51 - Himeji Science Museum | 67 - Luke McGuff, CBP, Hans
Hillewaert, CBP, NOAA's National
Ocean Sciences, Georgia DNR |
| | 53 - all by Annie Carew | |

Creatures you may see near SAV



Snails



Amphipods



Seahorses



Crustaceans



Bivalves



Fishes

67

Lily pads

Genus *Nuphar* • Genus *Nymphoides* • *Nelumbo lutea*



What is it? Various species of lily pad that inhabit the Chesapeake Bay.

Location: Fresh waters in the Chesapeake Bay watershed.

General ID: Rounded leaves with waxy coatings float on water surface.

Impacts on SAV species: Can block sunlight from reaching SAV.



65

Site ID:

(YYMMDD.hhmm.FL)

Image description:

71

Contact list

- To report suspicious algal blooms, call the Chesapeake Bay Safety and Environmental Hotline at (877) 224-7229.
- To report a stranded marine mammal or sea turtle, call the Maryland Marine Mammal and Sea Turtle Stranding Response Program at 1-800-628-9944.
- For a natural resources emergency or to request assistance, call the Maryland Department of Natural Resources at 1-800-628-9944 or (410) 260-8888.
- To report a fishing or wildlife violation, contact Maryland Wildlife Crimestoppers at (443) 433-411.

69