Introduction to aquatic plants and weeds

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Noxious Weeds in Washington

• Legally defined as non-native plants that are highly destructive, competitive with native plants, and difficult to control;

• Classes A, B & C (descending priority) are assigned by current plant abundance, geographical distribution, perceived threat, and eradication potential;

• WA Weed Law (RCW 17.10) requires landowners to control listed species, depending on Class designation.
“Noxious” vs. “Nuisance”

- Nuisance weeds are native plants that are creating problems in particular situations;
- Eradication is not a goal for nuisance plants, they may need control when they greatly impact beneficial uses of lakes;
- When controlling, it is important to designate “conservancy” areas to preserve natural habitat providing refuge and food web support.
Invasive Aquatic Weeds:

- Degrade habitat quality;
- Reduce recreational opportunities;
- Alter water quality;
- Block or clog intakes and water control structures;
- Reduce biodiversity; affect aquatic food web.
Important plant terms:
leaf arrangements

- opposite
- alternate
- whorled
- compound
- basal

leaf axil

leaflet → leaf
Some Aquatic Noxious Weeds

- Hydrilla
- Eurasian watermilfoil
- Brazilian elodea
- Fragrant water lilies
- Garden and purple loosestrife
- Yellow flag iris
Hydrilla

(*Hydrilla verticillata*)

**Class A Weed: eradication required by law**

- Only one infestation found to-date in Washington State – Pipe and Lucerne Lakes.
- First identified in 1994, treatment started in 1995 and 2007 was when the last plant was found in the lake; now considered eradicated.
- Native plants are beginning to return to Pipe and Lucerne after years of extensive chemical treatment. This is good for fish and other aquatic animals!
Hydrilla
(*Hydrilla verticillata*)

**Key characteristics:**

- Bright green leaves about 1-5mm wide and 6-20mm long;
- Leaves grow in whorls of 5 along the stem;
- Leaves have toothed edges;
- WA has the monoecious variety with sprawling growth that freely branches from the bottom;
- Peanut sized tubers on the roots that hold energy.
Brazilian elodea (*Egeria densa*)

Class B: Control and containment required by Law

- Brazilian elodea is native to South America;
- Found in lakes, ponds, pools, ditches, and quiet streams;
- Forms very dense stands that can cover hundreds of acres and crowd out other plants;
- Currently in lakes Fenwick, Dolloff, Sammamish, the Sammamish River and Lake Washington.
Brazilian elodea (*Egeria densa*)

**Key characteristics:**

• Submersed, freshwater perennial;

• Can root in water up to 20’ deep;

• Bushy plant with dense whorls of bright green leaves (2cm long), arranged usually in 4 leaves per whorl (often 3 at the base);

• Leaves sparse toward bottom of plant, bunched together toward top;

• Branching stem fragments.
Brazilian elodea vs. our native American waterweed \textit{Elodea canadensis}

- Brazilian elodea has 4 leaflets
- Native has 3 leaflets
Eurasian watermilfoil
*(Myriophyllum spicatum)*

**Class B Weed: control strongly encouraged**

- Native to Eurasia, first introduced to North America through the aquarium industry; there are native species of milfoil in the PNW.
- First identified as problem here in the 1970s in Lake Washington;
- Forms dense mats of vegetation just below the water’s surface;
- Propagates by fragments that can float around and establish colonies in new areas.
Eurasian watermilfoil

**Key characteristics:**

- 14 or more leaflet pairs per leaf;
- Leaves whorled around stem;
- Usually reddish stem, often branched;
- Leaves collapse against stem when pulled from water;
- Inconspicuous flower spike held above water.
Eurasian watermilfoil – *Myriophyllum spicatum* vs. the native northern watermilfoil *Myriophyllum sibiricum*

Eurasian watermilfoil has 14 or more leaflet pairs. The native has fewer than 14 leaflet pairs.

Collapses out of water. Holds shape out of water.
Ceratophyllum demersum

Coontail – Native

Key characteristics:
• leaves narrow, forked and whorled on the stem;
• inconspicuous flowers;
• plant is stiff and holds its shape out of water.
Fragrant water lily (*Nymphaea odorata*)

**Class C Weed:** widespread; control strongly encouraged

*Key characteristics:*

- floating perennial;
- flowers white to pink on separate flexible stalks;
- thick fleshy rhizomes;
- round leaves;
- a planted rhizome can cover 15ft diameter area with lily pads in just a few years;
- “Hitchhiker” plants can come along with a planted rhizome and add more invasive species to the lake.
Native look-alike “Water lilies”

*Nuphar polysepalum* - Yellow water lily, spatterdock

*Brasenia schreberi* - Water-shield

Rarely as invasive and offers good fish habitat!
Garden loosestrife (*Lysimachia vulgaris*)

Class B: Control and containment required by Law

Description: 3-5 ft perennial, invades wetlands and stream banks, shorelines.

*Key characteristics:*

- perennial emergent with rhizomes up to 15 feet long
- showy yellow flowers clustered at top of plant
- leaves opposite or whorled (3-6)
- leaves sometimes have small orange or black glands
- stems round, occasionally fasciated (flattened)
- flowers July and August
Purple loosestrife (*Lythrum salicaria*)

Class B: Control and containment required by Law

**Key characteristics:**
- Perennial rhizomatous emergent with showy magenta flower spikes
- Branched stems are square, can root at nodes
- Leaves opposite, lanceolate
- Up to 2.5 million tiny seeds/plant
- Blooms July – September, spreads by seeds, runners and plant fragments.
Yellow Flag Iris (*Iris pseudacorus*)

**Class C: Control and containment highly encouraged**

**Key characteristics:**
- Perennial monocot to 1.5 meters tall
- Thick rhizomes form solid mats
- Showy yellow flowers
- Green seed pods with flat seeds like corn kernels that float
- Mid-rib in leaves
- Blooms in May – June; reproduces by seeds and by rhizome offsets forming tight clumps;
Submerged

- Leaves divided
  - Leaves feather-like
    - More than 14 leaflets per leaf, leaves collapse against stem when removed from water
      - Eurasian water milfoil
  - Leaves not feather-like
    - Fewer than 14 leaflets per leaf, plant holds its shape when removed from water
      - Native milfoils
      - Leaves have bladders
        - Bladderwort
    - No bladders
      - Leaves in a whorl all the way around the stem
        - Coontail or aquatic plant-like algae (Chara or Nitella sp.)
      - Leaves paired and opposite
        - Fanwort
      - Leaves alternate on stem
        - Leaf margins smooth
          - Leaves more evenly distributed on stem
            - Leaves clasp stem, tend to bunch at stem ends
              - Water-nymph
        - Leaf margins visibly toothed, leaves in whorls of five
          - Hydrilla
    - Leaves in whorls around stem
      - Leaves paired
      - Native pondweeds
      - Leaves thin, leaf margins wavy
        - Curly-leaf pondweed
      - Leaves elliptical to thread-like, sometimes have floating leaves
        - Native pondweeds
      - Leaves scaly, rather rigid and overlapping along entire length of stem
        - Water moss
      - Leaves mostly in whorls of three
        - American waterweed
      - Leaves in whorls of four (up to six)
        - Brazilian elodea

Gray boxes = invasive plant
White boxes = native plant
Some leaves on stalks above water (emergent)

Leaves feather-like and in whorls around stem
Parrotfeather

Submerged leaves present along stem, usually different from floating leaves
Pondweeds, Water star-worts

Stem attached in center of leaf, lower leaf surfaces and buds covered in slime
Water shield

Leaf small (<10cm), leaf edge wavy, yellow flowers with ruffly petals borne in groups of 2-5 per stalk
Yellow floating-heart

Leaf edge smooth, flowers white to pink and borne singly on separate stalks
Fragrant water-lily

One flower per stalk

Leaves tiny
Duckweeds, watermeals, water-fern, Riccia

Leaves alternate on stem, flowers yellow, showy
Floating primrose-willow

Leaves bulbous at base
Water hyacinth

No emergent leaves

Stem attached in slit at leaf edge

Gray boxes = invasive plant
White boxes = native plant
TIP: There are NO submerged class A or B noxious weeds with ALTERNATE LEAVES
Some commonly found native plants in King County Lakes

- **Big-leaf pondweed**
- **Fern-leaf pondweed**
- **Flat-stem pondweed**
- **Floating-leafed pondweed**
Some commonly found native plants in King County Lakes – 2

Chara (and Nitella)

Quillwort

Common bladderwort

Slender water-nymph
For more information on Aquatic Noxious Weeds and control strategies, please contact King County Noxious Weeds Program (206) 477-9333 or the Lake Stewardship Program at (206)477-4605