Hydrilla 101:
Everything you wish you didn’t have to know about Hydrilla
Michael R. Martin, CLM
Cedar Eden Environmental, LLC
& LakeStewardship.org
What is hydrilla?

*Hydrilla verticillate* is a submersed, rooted, aquatic, perennial herb native to southeast Asia.

Frog’s-Bit Family (*Hydrocharitaceae*)

- *Egeria, Elodea, Hydrilla, Hydrocharis, Limnobium, Najas, Vallisneria*

Aquarium plant Introduced to North America in 1950s

- Grows in depths up to 20 ft (6.1 m)
- Can survive in 40 ft (12 m) in non-turbid water
- Grows up to 2.5 cm/day
- Forms dense mats at surface
What is hydrilla?

- Monoecious and Dioecious forms
  - Only female flowers found in US
  - No viable seeds in US
- Readily spreads by fragmentation
- Produces turions on stems which survive freezing & drought
  - Up to 3,000 turions / m²
- Produces tubers on rhizomes for reproduction
  - Up to 6,000 tubers / m²
  - Viable several days out of water
  - Viable 4 years in undisturbed sediment
  - Viable after ingestion & regurgitation by waterfowl
What is hydrilla?

- Invades slow-moving or still water systems
- Restricts native plants, recreation, hydroelectric production, irrigation and water flow
Turions

Tubers

David Sutton, University of Florida

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

Source: W. T. Hall, UFL, Center for Aquatic and Invasive Plants, Gainesville, Florida.
Hydrilla mats

Tim Murphy, University of Georgia, Bugwood.org

Tim Murphy, University of Georgia, Bugwood.org
Hydrilla mats

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org
Hydrilla

Tim Krynak, Cleveland Metroparks, Bugwood.org

Robert Vidéki, Doronicum Kft., Bugwood.org
US Distribution of *Hydrilla verticillata*

Early Detection and Distribution Mapping System
NE Distribution of *Hydrilla verticillata*
NYS Distribution of *Hydrilla verticillata*

New York — First sighted at Creamery Pond in Sugar Loaf in 2008

(L. Surprenant, NY DEC, pers. comm. 2008; King 2008) – NOAA GLANSIS
NYS Distribution of *Hydrilla verticillata*
Hydrilla is similar to . . .

- *Elodea canadensis*, Common elodea – native
- *Egeria densa*, Brazilian waterweed – invasive
  - Albany County, Orange County, Rockland County, Westchester County, Nassau County, Suffolk County
- Najas, Water naiad – some native, some invasive
Characteristics of hydrilla

Hydriella (*Hydrilla verticillata*)

**Origin:** Non-native (Korea)

**Leaf Type:** Ribbon

**Leaf Arrangement:** Whorled

**Number Leaves in Whorl:** 4-8

**Leaf Shape:** Strap

**Leaf Margin:** Saw or Hook Toothed (Visible with naked eye)

**Tubers and Turions?** Yes
## Common lookalikes and how to distinguish Brazilian Elodea *(Egeria densa)*

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Origin:</strong></td>
<td>Non-native (S America)</td>
</tr>
<tr>
<td><strong>Leaf Type:</strong></td>
<td>Ribbon</td>
</tr>
<tr>
<td><strong>Leaf Arrangement:</strong></td>
<td>Whorled</td>
</tr>
<tr>
<td><strong>Number of Leaves in Whorl:</strong></td>
<td>4-7</td>
</tr>
<tr>
<td><strong>Leaf Shape:</strong></td>
<td>Strap</td>
</tr>
<tr>
<td><strong>Leaf Margin:</strong></td>
<td>Very Finely Serrated</td>
</tr>
<tr>
<td></td>
<td>(Visible with hand lens)</td>
</tr>
<tr>
<td><strong>Tubers and Turions?</strong></td>
<td>No</td>
</tr>
</tbody>
</table>

*Photo credit: NYSFOLA, Jon Reis Photography*
Hydrilla v. Egeria
### Common lookalikes and how to distinguish Common Elodea (*Elodea sp*)

<table>
<thead>
<tr>
<th>Origin:</th>
<th>Native (two species)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf Type:</td>
<td>Ribbon</td>
</tr>
<tr>
<td>Leaf Arrangement:</td>
<td>Whorled</td>
</tr>
<tr>
<td>Number of leaves in whorl:</td>
<td>3, rarely 4</td>
</tr>
<tr>
<td>Leaf Shape:</td>
<td>Strap</td>
</tr>
<tr>
<td>Leaf Margin:</td>
<td>Smooth</td>
</tr>
<tr>
<td></td>
<td>(Fine serration under scope)</td>
</tr>
<tr>
<td>Tubers and Turions?</td>
<td>No</td>
</tr>
</tbody>
</table>
Hydrilla v. Elodea

Hydrilla

Elodea

Robert Vidéki, Doronicum Kft., Bugwood.org

Robert Vidéki, Doronicum Kft., Bugwood.org
Common lookalikes and how to distinguish
Naiads (*Najas sp*)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin:</td>
<td>Native (except brittle naiad)</td>
</tr>
<tr>
<td>Leaf Type:</td>
<td>Thread</td>
</tr>
<tr>
<td>Leaf Arrangement:</td>
<td>Opposite (2 leaves per node)</td>
</tr>
<tr>
<td>Leaf Shape:</td>
<td>Varied: needle-like to strap</td>
</tr>
<tr>
<td>Leaf Margin:</td>
<td>Minutely serrated (prominent in brittle naiad)</td>
</tr>
<tr>
<td>Tubers and Turions?</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Hydrilla webinar, 7/26/13

- **Hydrilla:**
  - Leaf whorls in 4-6
  - Leaf margins serrate (“hook” under scope)
  - Tuber as “foot” of plant
  - Turion near growing tip in late fall
  - White rhizomes (roots)

- **Egeria:**
  - Leaf whorls in 4-6
  - Leaf margins smooth (“saw” under scope)
  - No tubers, turions or rhizomes

- **Elodea:**
  - Leaf whorls in 3 (usually)
  - Smooth margin
  - No tubers, turions or rhizomes

- **Naiads:**
  - Leaves not in whorls (opposite or nearly so)
  - No tubers, turions or rhizomes

Source: Hydrilla webinar, 7/26/13
Methods of Control

Mechanical/Physical
- Cutting & raking (does not remove roots, tubers, tyrions)
- Benthic barriers
- Suction Harvesting

Biological
- Grass carp
- Leaf-mining flies / tuber feeding weevil – non-native
Methods of Control

Herbicides

- Fluridone (Sonar, Avast, Whitecap) – broad spectrum, systemic
- Diquat (Reward) - contact
- Penoxsulam (Galleon) – broad spectrum, systemic
- Flumioxazin (Clipper) – contact
- Imazamox (Clearcast) – broad spectrum, systemic
- Endothall (Aquathol, Hydrothol) – contact

KEEP IT OUT!
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Questions?

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