Prevent the Spread!

STOP

Remember to clean off your shoes, boots, waders, clothing, and equipment before leaving each sampling site! Try and remove all mud, debris, seeds, etc. from your shoes! Help stop the spread!
Guide developed by: Chris Acy, Aquatic Invasive Species Coordinator, Winnebago Waterways Program, Fox-Wolf Watershed Alliance

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Photo Credit: Paul Skawinski, Tim Campbell, Bradley Steckart, Jeff Hoagland

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Questions? Contact Chris Acy, Aquatic Invasive Species Coordinator for Calumet, Fond du Lac, and Winnebago counties at (920) 460-3674 or chris@fwwa.org
Curly-leaf pondweed
Description

• Wavy leaves (like bacon)
• Finely toothed/serrated leaf edges
• Blunt leaf tips
• Leaf base does **not** wrap around the stem

Impacts

• Outcompetes native plants
• Forms large, dense beds at surface of water
  o Inhibits recreational activities
  o Reduces water flow
  o Shades out native vegetation
Eurasian watermilfoil
Description

- 12+ pairs of leaflets per leaf
  - Native milfoil has fewer than 12 pairs of leaflets per leaf
- Stems weak and limp, reddish-brown to pink color
- Whorls of 4-6 leaves along stem
- Leaves at tip of branches often red

Impacts

- Outcompetes native plants
- Populations spread by fragmentation
  - Fragments of the plant break off and can produce roots and continue growing
- Forms large, dense beds at surface of water
  - Inhibits recreational activities
    - Difficult, if not impossible, for boats to navigate through dense patches
  - Reduces water flow
  - Shades out native vegetation
Hydrilla
Description

- Whorls of 4-8 leaves around the stem
- Leaf edges have teeth/serrations
- Spines on underside of leaf along centerline

Impacts

- Outcompetes native plants
- Forms large, dense beds
  - Inhibits recreational activities
  - Shades out native vegetation
  - Restricts fish passage
  - Dense beds can create areas of stagnant water: perfect for mosquito breeding habitat
- Populations spread by fragmentation
  - Fragments of the plant break off and can produce roots and continue growing
Brazilian waterweed
Description

- Whorls of 4-8 leaves around the stem
- Fine serrations on leaf edges
- No teeth underneath leaves

Impacts

- Outcompetes native plants
- Forms large, dense beds
  - Inhibits recreational activities
  - Shades out native vegetation
  - Restricts fish passage
Water chestnut
Description
- Triangular, serrated leaves
- Very waxy leaves
- Inflated leaf bases
- Mostly free-floating
- Fruits with sharp spines formed underneath the leaves
- Entire plant can be over 1 foot in diameter

Impacts
- Rapidly covers bays of lakes and rivers
  - Shades out native plants
  - Reduces dissolved oxygen levels
- Large, barbed fruits are extremely sharp
  - Can puncture feet if stepped on
European frog-bit
Description

- Free-floating, roots hang below plant
- Small, heart-shaped leaves (2-3”)
- Small, white flower, 3 petals
- Looks like cluster of tiny lily pads

Impacts

- Forms large, dense mats at water surface
  - Inhibits recreational activities
  - Impedes water flow
    - Creates areas of stagnant water: perfect for mosquito breeding habitat
Parrot feather
Description

- 6-30 pairs of short leaflets
- Whorls of 4-6 widely spaces leaves
- Emerges up to 8” from the water
- Bright green and soft leaves

Impacts

- Outcompetes native plants
- Populations spread by fragmentation
  - Fragments of the plant break off and can produce roots and continue growing
Yellow floating heart
Description

- Heart-shaped leaves (up to 4” long)
- Leaves have wavy edges
- Yellow flowers have five fringed petals
- Flowers on stock above the water
- Plant is rooted to the bottom

Impacts

- Completely covers the water’s surface in shallow areas
- Outcompetes native plants
- Inhibits recreational activities
- Impedes water flow
  - Creates areas of stagnant water: perfect for mosquito breeding habitat
Water lettuce
Description

- Free-floating
- Roots hang below plant
- Leaves are thick, ridged, fuzzy, and light green
- Forms dense, interconnected colonies
- Resembles a floating head of lettuce

Impacts

- Forms floating mats of inter-connected plants
  - Impedes recreational use
  - Causes navigational problems for boats
  - Impedes water flow
    - Creates areas of stagnant water: perfect for mosquito breeding habitat
Water hyacinth
### Description

- Leaves are very waxy and shiny
- Inflated leaf base
- Lavender flower with a purple/yellow spot
- Roots hang below the plant
- Forms interconnected colonies

### Impacts

- Each plant can produce thousands of seeds
- Forms floating mats of inter-connected plants
  - Impedes recreational use
  - Causes navigational problems for boats
  - Impedes water flow
    - Creates areas of stagnant water: perfect for mosquito breeding habitat
Flowering Rush
<table>
<thead>
<tr>
<th>Description</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cluster of pink/red flowers held above the plant</td>
<td>• Populations spread quickly, crowd out native species</td>
</tr>
<tr>
<td>• Can be in or out of the water</td>
<td>• Can grow 3-6 feet tall and form large, dense colonies</td>
</tr>
<tr>
<td>• Tall, dark green leaves are triangular in cross-section and often twisted near the top</td>
<td>o Dense colonies can prevent passage of boats</td>
</tr>
<tr>
<td>• Produces small, onion-like growths on the roots called bulbils</td>
<td></td>
</tr>
</tbody>
</table>
Purple loosestrife
### Description
- Pink-purple flowers with 6 petals that bloom in a tall spike
- Leaves have smooth edges
- Stem most often has 4 sides, but can have 6 sides
- Leaves are opposite or arranged in whorls of 3

### Impacts
- Each fruit capsule contains thousands of seeds
  - Plant can rapidly spread to new areas and displaces native plants
- Reduces nesting habitat quality
  - Waterfowl and shorebird communities can decrease in number
Phragmites
Description

- Often more than 10 feet tall
- Large, fluffy seedheads
- Dark green leaves
- Distinct ridges on stem (ridges can be felt with fingernail)
- Leaf sheaths stay attached to stems year-round

Impacts

- Forms very dense populations
  - Prevents access to lakes and rivers for humans and wildlife
- Shades out native vegetation
- Abundant dead stems can increase risk of marsh fires
Japanese knotweed
Description

- Hollow, woody stems
- Grows up to 12 feet tall
- Leaves alternate on stalk
- Leaves vary from heart-shaped to lance-shaped
- Creamy white flowers

Impacts

- Forms dense stands that excludes native vegetation
- Increases soil erosion when the plant dies back in fall and exposes large areas of soil
Faucet snails
Description

- Small, 12-15 mm long (1/2 inch)
- Light brown to black
- 4-6 spirals (whorls) in shell
- Shell opening is on right side and teardrop-shaped
- Operculum (a small covering or lid) covers the shell opening

Impacts

- Host to parasites that can kill waterfowl
- Compete with native snails
- Clog water intake screens and pipes
- Can survive in dry mud up to one month
  - Easily transported to new areas
Banded mystery snails
Description

- 1-1.5 inches tall
- Horizontal brown bands on shell
- Bands can be hidden by sediment or algae

Impacts

- Eats green algae, fish eggs
- High densities
  - 864 individuals per square meter
- Host to multiple trematode parasites that can kill waterfowl if consumed
- Competes for food and resources with native snails
Chinese mystery snails
**Description**

- Up to 3 inches tall
- Dark, brown shell
- Often has dark vertical ridges near the shell opening
- Operculum covers the shell opening

**Impacts**

- Competes for food and resources with native snails
- Host to multiple trematode parasites that can kill waterfowl if consumed
New Zealand mudsnails

New Zealand mudsnail
Potamopyrgus antipodarum
Paul Skrwinski 2017
Description

- Very small, 4-6 mm long (1/8-1/4 inch)
- 7-8 spirals in shell separated by deep grooves
- Gray to brown
- Shell opening is on the right side
- Typically found in cold streams

Impacts

- Can survive out of water for 26 days
  - Easily transported to new areas
- Reproduce asexually
  - Quickly forms large populations
  - Densities up to 800,000 per square meter
- Consume large amounts of phytoplankton
- Displaces and out competes native snails
- Many birds and fish cannot digest these snails
- Can clog intake pipes and screens
Quagga mussels
Description

- Teardrop-shaped shell
- Does not sit flat on its side
  - Zebra mussels will sit flat on side
- Light-brown to white with brown stripes
- Can grow up to 1.5” in length
- Can attach to hard and soft surfaces

Impacts

- Drastically changes aquatic ecosystem by filter-feeding
- Clog water intake pipes and underwater screens
- Attach to boats, piers and shells pile up on beaches
  - Limits recreational usage
Red Swamp Crayfish
<table>
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<tr>
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<tbody>
<tr>
<td>• Dark red</td>
<td>• Omnivores, eating aquatic plants, snails,</td>
</tr>
<tr>
<td>• Raised bright red spots on body and claws</td>
<td>fish eggs, amphibian young and eggs</td>
</tr>
<tr>
<td>• Black-wedge stripe on top of abdomen</td>
<td>• Reduces amphibian populations</td>
</tr>
<tr>
<td>• 2-5 inches long</td>
<td>• Outcompetes native crayfish for habitat</td>
</tr>
</tbody>
</table>
Asian Clam
Description

- Distinctly raised ridges on shell
- Up to 2” across
- Shell is yellow-brown, often blue or polished white interior
- Three large hinge teeth on each shell

Impacts

- Can self-fertilize, each individual can release 70,000 juveniles in one year
  - Densities of 20,000 per square meter
- Outcompetes native mollusks
- Reduces fish spawning habitat
- Damages water intake systems
Zebra mussels
Description

- D-shaped shell
- Sits flat on side
- Light brown to white with brown/black stripes
- Can grow up to 1.25” length
- Attaches to hard surfaces

Impacts

- Drastically changes aquatic ecosystem by filter-feeding
  - Less food for other animals
  - Clearer water results in blooms of algae
- Clog water intake pipes and underwater screens
- Attaches to boats and piers, shells pile up on beaches
  - Limits recreational usage
- Reproduces quickly
  - 1 million eggs per female