CLEAN BOATS
CLEAN WATERS

# Aquatic Invasive Species Overview

# What are Aquatic Invasive Species?

- Plants and animals not native to this region
- Adapted to living in a variety of environments
- Commonly known as:
  - Nuisance Species
  - Exotic Species
  - Non Indigenous Species
  - Non Native Species

# Aquatic Invasive Species Threats

- **Ecologic:**
  - Compete for food and space with native species
  - Prey upon native species
  - Import diseases
  - Decrease biodiversity
  - Dominate landscapes

- **Economic:**
  - Eliminate economically profitable plants and animals in region
  - Eradication and restoration efforts are costly
  - Hybridize with native species
  - Reduce recreational prospects
  - Negatively impact sport and commercial fisheries industries

# How did they get here?

- Ballast water from ocean going ships
- Household aquariums
- Accidental release of aquaculture species
- Inland lake water sports (fishing, hunting, etc.)
- Migratory waterfowl

# Common Characteristics

- Environmentally tolerant
- Rapid growth
- Short reproduction time
- Generalists
- Lack predators
- High reproductive capacity
- Early sexual maturity
- Rapid dispersal rate
- Broad diet

# Common Aquatic Invasive Species of the Great Lakes Region

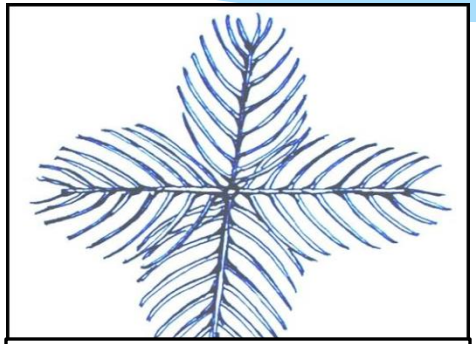
- Eurasian Water-milfoil
- Starry Stonewort
- Curly Leaf Pondweed
- Hydrilla
- Purple Loosestrife
- Zebra & Quagga Mussels
- Spiny & Fishhook Water Fleas
- Round Goby

# Eurasian Water-milfoil

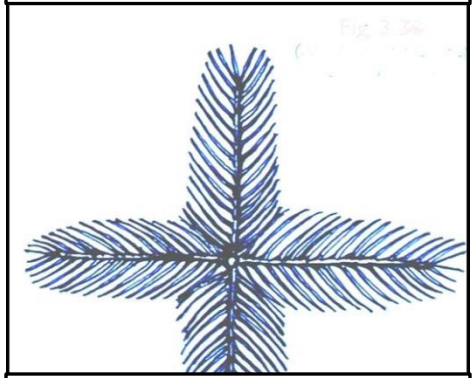
- What is it?
  - Aquatic plant
- Problem:
  - Forms thick mats on water surface
  - Displaces native plants and fish
  - Interferes with recreational activities
  - Almost impossible to eradicate
- How does it spread?
  - Naturally through stem fragments
  - Boats!
- Prevention:
  - Wash your boat!

# Eurasian Water-milfoil

- Physical Characteristics:
  - 3-5 feather like leaves arranged around central stalk
  - 12+ pairs of leaflets
  - Leaves collapse around the stem when removed from the water



Native



Invasive

# Starry Stonewort

- What is it?
  - Invasive algae
- Problems
  - Can grow up to 8 feet tall
  - Covers lake bottom, preventing other plant growth
  - Reduces fish spawning habitat
  - Grows throughout winter
- How does it spread?
  - Fragmentation, recreational watercraft, and waterfowl

# Starry Stonewort

- Physical Characteristics:
  - Tiny, star-shaped, tan-colored bulbils
  - Can grow in water 20 ft deep
  - Does not fare well in turbid waters
  - “Swiss cheese” mat pattern

# Curly Leaf Pondweed

- What is it?
  - Aquatic plant, introduced in the 1800's for fish habitat
- Problems:
  - Grows earlier than native plants
  - Dies off in mid-summer; leading to an oxygen deficiency in the water
  - Not an issue to all water bodies
- How does it spread?
  - Turions (burr-like winter buds)
  - Seed
  - Recreational equipment

# Curly Leaf Pondweed

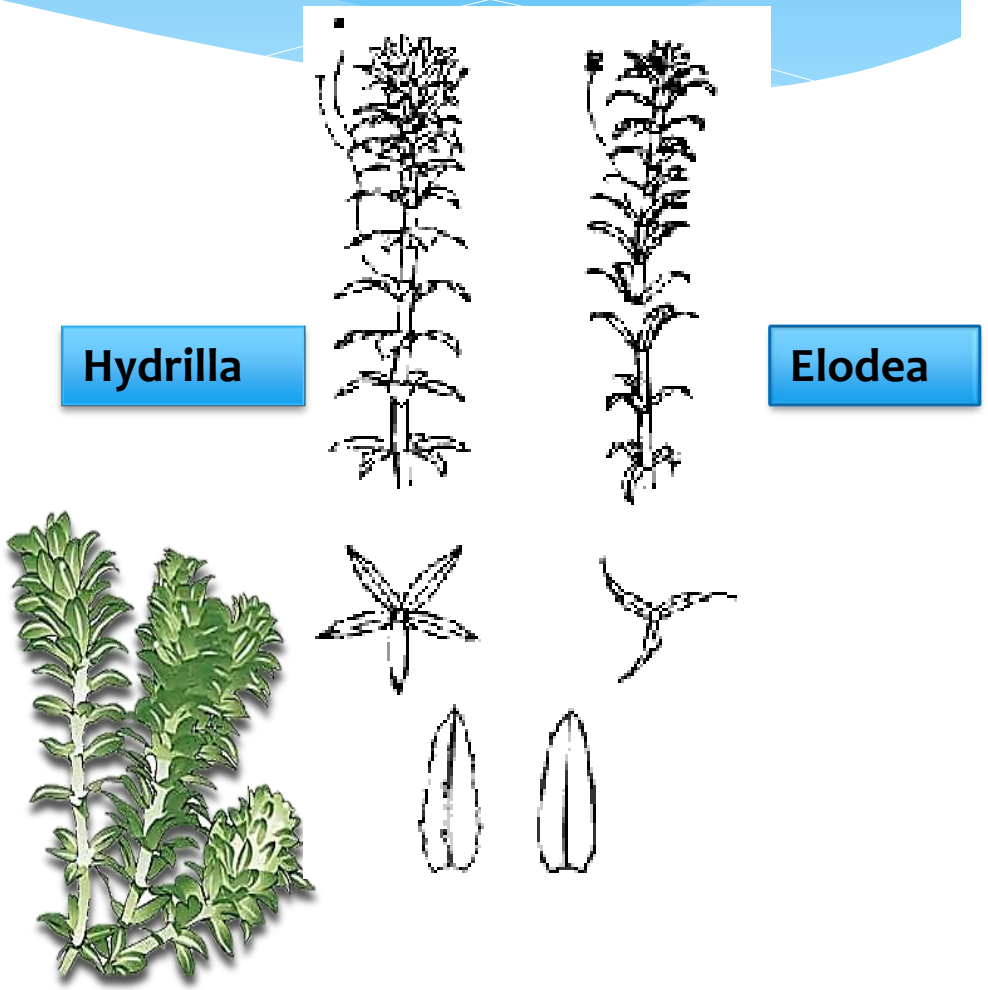
- Physical Characteristics:
  - Appears reddish-brown in water
  - Wavy, stiff and crinkled leaves
  - “Crispy” texture
  - Serrated edges
  - Flower stalks in June
  - Tolerates low water clarity
  - Will readily invade disturbed areas

# Hydrilla

- What is it?
  - Very invasive aquatic plant (not currently in Michigan)
- Problems:
  - Slows water flow
  - Eliminates native plants
  - Highly environmentally tolerant
  - Forms thick mats on surface of water
  - Alters water quality and oxygen levels
- How does it spread?
  - Recreational equipment
  - Fragmentation
  - Seed

# Hydrilla

- Physical Characteristics:
  - Stems are slender
  - Branched up to 25 feet long
  - Leaves have visible teeth
  - Leaves are strap-like and pointed
  - Can lie dormant for 4+ years out of the water
  - Produces tiny white flowers on long stalks



# Purple Loosestrife

- What is it?
  - Perennial wetland plant
- Problem:
  - No native predators
  - Thick stands block access to water
  - Overtakes native wetland plants
  - Reduces food and habitat of wildlife
- How does it spread?
  - Reseeding
  - Vegetatively from fallen stems that re-root

# Purple Loosestrife

- Physical Characteristics:
  - Each plant has many stems
  - Height of plant is 3-7 feet
  - Stalk has many flowers at top
  - 6 petals per flower
  - Peak bloom is late June

# Zebra Mussel

- What is it?
  - Small, freshwater mollusks (relatives to clams and oysters)
- Problem:
  - Consumes algae/phytoplankton
  - Reproduces rapidly
  - Interferes with recreational enjoyment
  - Fouls water intake pipes and boats
  - Outcompetes/encrusts native mussels
- How does they spread?
  - One Zebra Mussel produces 1 million fertilized eggs per year!

# Zebra Mussel

- Physical Characteristics:
  - Yellow & brown “D” shaped shell
  - Dark and light colored stripes
  - Grow in clusters
  - On smooth surfaces, young zebra mussels feel like fine sandpaper
  - Most under 1 inch in size but can reach 2 inches

# Quagga Mussel

- What is it?
  - Small, freshwater mollusks
- Problem:
  - Very similar to zebra mussels
  - Remove phytoplankton
  - Light penetration increases causing increase in plants and algae
- How do they spread?
  - First arrived in ballast water
  - Currently from recreational boating

# Quagga Mussel

- Physical Characteristics:
  - Rounded shell without ridges
  - Commonly found in waters 90+ ft deep
  - Does not require hard surface to attach to
  - Dark rings & pale in color near hinge
  - Usually slightly larger than zebra mussels

Quagga Mussel

Zebra Mussel

# Spiny and Fishhook Water Flea

- What are they?
  - Predatory zooplankton
- Problem:
  - Competes with fish for zooplankton
  - Difficult for fish to eat
  - Reproduce asexually
  - Accumulate on fishing lines and nets
- How do they spread?
  - Recreational equipment that has not been properly cleaned


# Spiny and Fishhook Water Flea

- Physical Characteristics:
  - Extremely small: 1/4-5/8 inch
  - Clumps feel like gelatin or cotton batting with tiny black spots
  - Prefer deep lakes
  - Abundant during summer (June-September)
  - Barbed tail spine makes up half of total length

Fishhook Waterflea

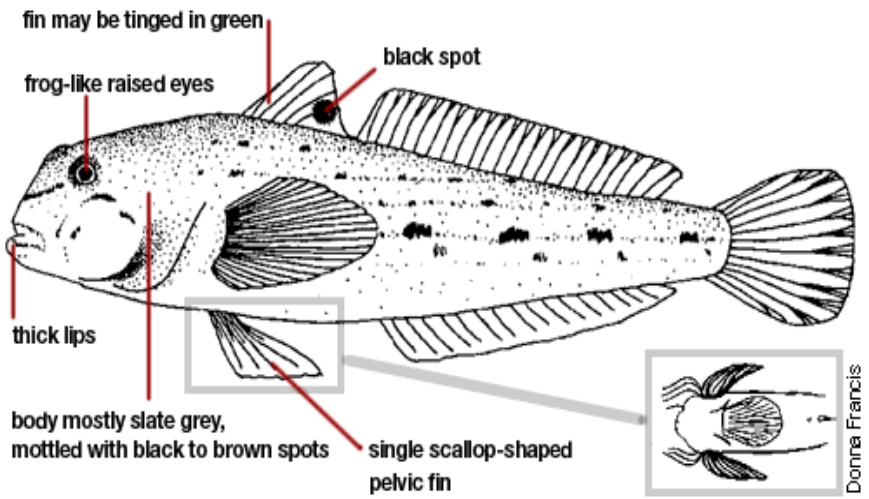
Spiny Waterflea

# Round Goby

- What is it?
  - Invasive fish
- Problems:
  - Very aggressive
  - Can feed in total darkness
  - Preys upon fish, fry and eggs of smaller fish
  - Suctorial disk allows them to attach to rocks and remain fixed in fast currents
- How does it spread?
  - Use of round goby as bait
  - Dumping live bait in uninfected waterways

# Round Goby

- Physical Characteristics:
  - Usually 3-6 inches long
  - Single pelvic fin
  - Young are solid slate gray

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# Preventing Their Spread

1. Learn to identify common invasive species
2. Inspect and remove all plants and animals from boat, motor and trailer
3. Drain live-well and bilge before leaving boat launch
4. Dispose unwanted bait into trash
5. Promote Clean Boats, Clean Waters in your community