

Aquatic Invasive Species (AIS) Aquatic Plant Management (APM)

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Bassett Creek Watershed Management Commission
AIS APM Committee Meeting

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What are Aquatic Invasive Species (AIS)?

Plants or animals

Invade ecosystems beyond their natural historic range

Adapted to living in, on, or next to water

Threaten diversity or abundance of native species

Threaten ecological stability of infested waters

Impede recreational activities

Can cause economic harm

Why are AIS a problem?

1. Rapid expansion and increase in density creates problematic conditions

- Fast growth
- High dispersal ability
- Lack of natural predators
- Ability to consume a variety of food resources
- Ability to adapt to changing environmental conditions

Why are AIS a problem?

2. Negatively impact the ecosystem

- Displace native species by using limited resources more efficiently and dominating the ecosystem
- Reduce food supply for native species
- Alter habitat negatively
- Hybridize (e.g. hybrid milfoil)
- Increase mortality of native fish embryos (banded mystery snail - largemouth bass embryos)
- Eat fish eggs and young (round goby and white perch)

Why are AIS a problem?

3. Cause problems for recreation, economy, health

- Impede swimming, boating, and fishing
- Cause decline in tourism and home values
- Clog water intake pipes (zebra/quagga mussels)
- Cut hands or feet (sharp zebra mussel shells)
- Cause taste and odor problems (zebra/quagga mussel fecal material)
- Serve as hosts for parasites (banded and Chinese mystery snails)

AIS Species of Concern



1. Curly-leaf Pondweed (CLP)

- Common throughout MN**
- Unique life cycle: dies off in late June, decays, and adds nutrients to waterbodies; can degrade water quality**
- Reproduces by turions: one plant can produce up to 1,000 turions and each turion is viable for many years**

AIS Species of Concern



2. Eurasian watermilfoil

- Found in 322 MN waterbodies
- Reproduces by seeds, stolons (underground stems), and fragments
- A single fragment of stem and leaves can take root and form a new colony.

AIS Species of Concern



3. Zebra mussel

- Found in 242 MN waterbodies
- Introduced in Great Lakes via ballast water
- Females can produce 100,000-500,000 eggs per year, develop into larvae called “veligers” that attach to any firm surface using tiny fibers (byssal threads)
- Attach to boat motors, boat hulls, rocks, swim rafts, and clog irrigation pipes;
- Adults spread attached to boats or fishing equipment; veligers spread in bait buckets and ballast water

AIS Species of Concern



3. Zebra mussel (cont'd)

- prefer hard substrate and:

Total phosphorus: 25-35 $\mu\text{g/L}$

Chlorophyll a: 2.5-8 $\mu\text{g/L}$

Secchi Disc depth: 2-4 meters

Calcium: > 30 mg/L

Hardness & Alkalinity: 100-280 mg/L

pH: 8.2-8.8

Specific Conductance: >110 $\mu\text{g/L}$

ALS Species of Concern



4. Spiny waterflea

- Introduced into Great Lakes by ballast water
- Found in 66 MN waterbodies in 10 counties, including Aitkin, Crow wing, Mille Lacs and northern areas near Lake Superior
- Prefers temperature range of 14-26 °C and pH range of 5-9
- Causes decline or elimination of some zooplankton species and clogs fishing lines- Spread by fishing equipment or bait buckets

AIS Species of Concern



5. Asian carp (common, silver, bighead, and grass)

- Common carp widespread**
- Silver and bighead found in 43 MN waterbodies, and grass in 11**
- No established populations of silver, bighead, or grass, but have been caught in MN**
- Spread to MN from other states**
- Reduce vegetation and increase phosphorus levels**

ALS Species of Concern



6. Faucet snail

- **Found in 38 MN waterbodies**
- **Intermediate host for 3 intestinal parasites that cause mortality in ducks and coots**
- **Competes with native snails and clogs water intake pipes**
- **Spreads by attaching to aquatic plants, boats, anchors, recreational gear and equipment placed in water, and water birds**

AIS Species of Concern



6. Faucet snail (cont'd)

- Inhabits waters with

Calcium: 5 to 89 mg/L,

Sodium: 4 to 291 mg/L,

pH: 6.6 to 8.4

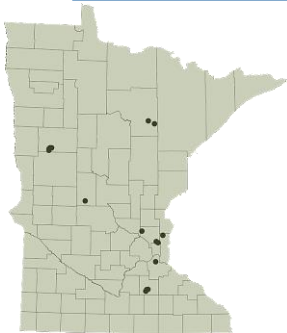
**Specific conductance: 87 to 2,320
µhmos/cm**

AIS Species of Concern



7. Flowering rush

- Found in 35 MN waterbodies
- Inhabited the Detroit Lakes chain of lakes for more than 40 years
- Sold as ornamental garden plant and likely introduced by humans
- Spreads mainly by vegetative means – underground stems, small tubers or buds, or bulblets in the clusters of flowers.



Locations of Flowering Rush in MN – Anoka, Aitkin, Becker, Dakota, Hennepin, Itasca, Le Sueur, Rice, Todd, and Washington Counties

ALS Species of Concern



7. Flowering rush (cont'd)

- **Dense stands interfere with swimming, boating, and fishing**
- **Dense stands adversely impact fish spawning habitat**
- **Displace native vegetation**

AIS Species of Concern



8. Brittle naiad

- Found in 4 MN waterbodies, including Round Lake and Staring Lake in Hennepin County

- Reproduces by seeds and fragments

- Spread by boats and water equipment

- Forms dense mats that outcompete native species and interferes with recreation (boating, swimming, and fishing)

AIS Species of Concern



9. Round goby

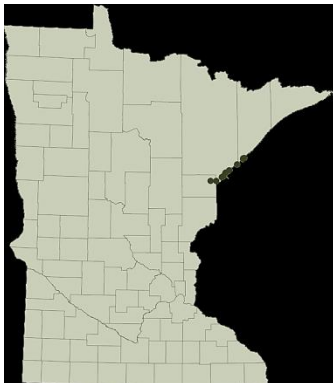
- **Found in 3 MN waterbodies**
- **Introduced in Great Lakes via ballast water**
- **Present in Mississippi River, but not in MN inland waters**
- **Has been found in densities up to 20 per square meter**
- **Eat eggs and young of native fish and compete with native fish for food and habitat**

AIS Species of Concern



10. Ruffe - Introduced in Duluth harbor via ballast water in 1985

- Spread to other rivers and bays in western Lake Superior, including St. Louis River
- Females lay 45,000-90,000 eggs per year
- Explosive population growth causes declines in native fish



Locations of Ruffe in MN

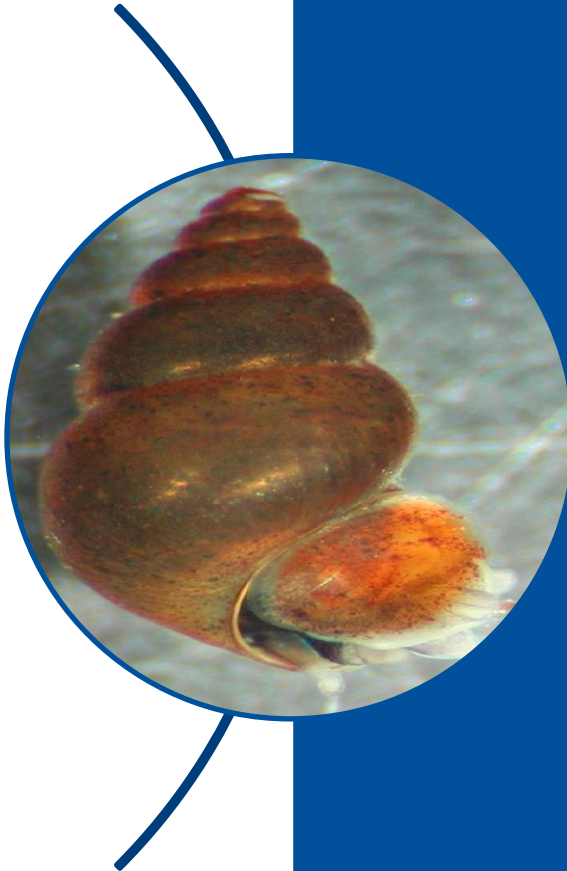
AIS Species of Concern



11. White Perch

- **Found in 3 MN waterbodies**
- **Invaded Great Lakes via Erie and Welland canals; observed in Duluth harbor in 1986; not present in MN inland waters;**
- **Eat the eggs of walleye and other fish species and are competitors of native fish**

ALS Species of Concern



12. New Zealand mud snail

- **Found in 2 MN waterbodies**
- **Introduced in Great Lakes via ballast water; found in Duluth-Superior harbor in 2005;**
- **Densities can reach 100,000-700,000 per square meter**
- **Outcompetes species that are important forage for fish and provide little nutrition to fish who eat them**
- **Spread by fishing gear and water equipment**

ALS Species of Concern



13. Starry stonewort

- **First and only siting in MN was Lake Koronis in August 2015**
- **Reproduces by star shaped bulbils**
- **Spread by transfer of bulbils by boats or other water related equipment that is not properly cleaned**
- **Dense mats interfere with swimming, fishing, and boating**
- **Displaces native species**
- **Adversely impacts fish spawning habitat**

ALS Species of Concern



14. Yellow iris

- Found in Silver Lake (Ramsey County) Lake DeMontreville (Washington County), and Lake Edina and Indianhead Lake (Hennepin County)
- Reproduces by seeds and by horizontal stems (rhizomes)
- Sold commercially for use in garden pools
- All parts of the plant are poisonous and can cause skin irritations when trying to pull it

Other Aquatic Invasive Species of Concern



Brazilian Elodea



Hydrilla



Parrot feather



Other Aquatic Invasive Species of Concern – cont'd



Rusty
crayfish



Quagga
mussels



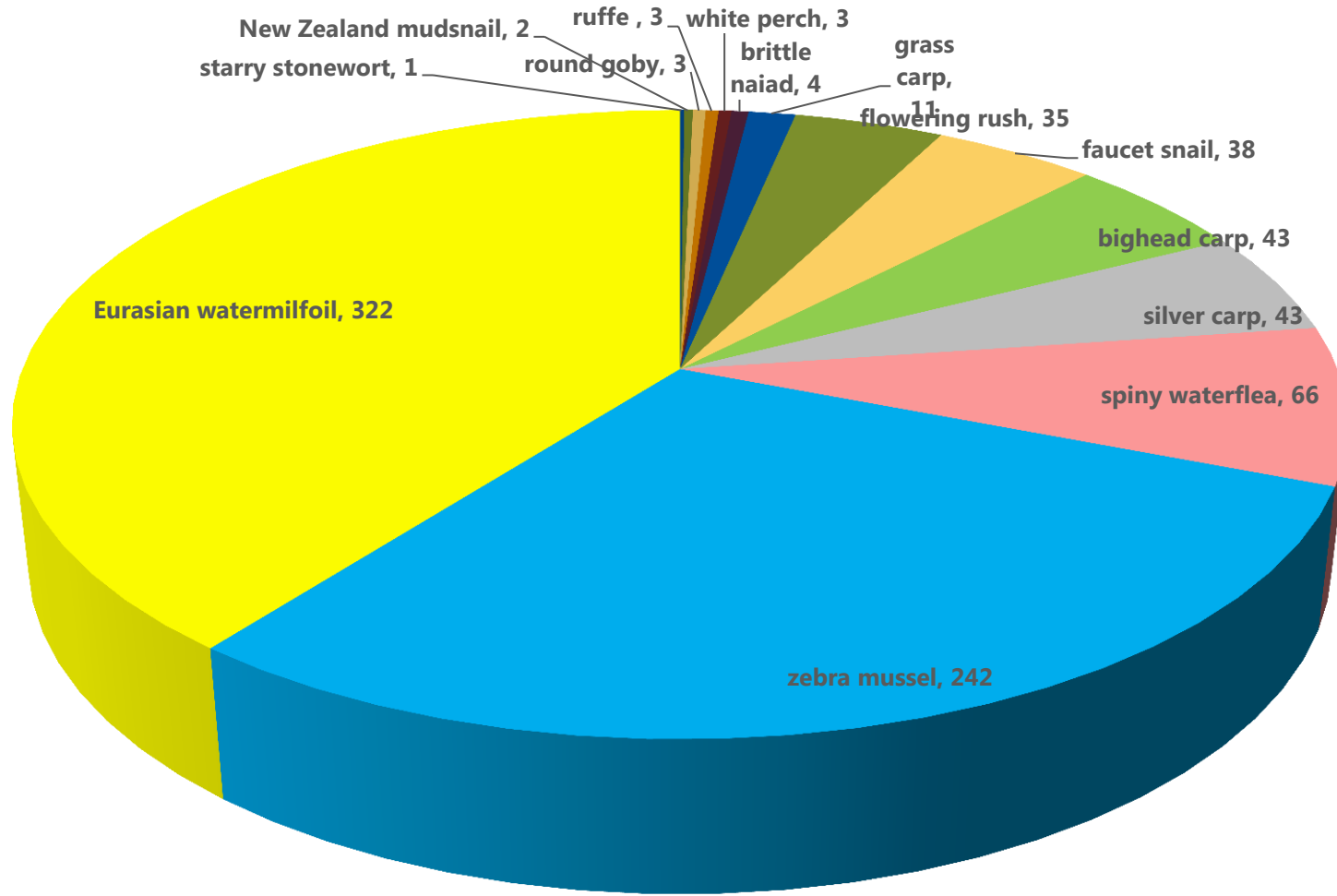
Banded
mystery snail



Chinese
mystery
snail



AIS on DNR Infested Waters List and Number of Waterbodies Infested



Curly-leaf pondweed and common carp are so common in Minnesota waterbodies that the DNR no longer keeps a record of infested waterbodies

What AIS Species are in BCWMC and where are they located*?



Curly-leaf Pondweed

Present in Crane Lake, Lost Lake, Medicine Lake, Northwood Lake, Parkers Lake, Sweeney Lake, Twin Lake, Westwood Lake, Wirth Lake, and Main Stem Bassett Creek at Irving Avenue



Eurasian watermilfoil

Present in Medicine Lake and Parkers Lake

*Does not include carp which are known to exist in BCWMC waters

What AIS Species are in BCWMC and where are they located?

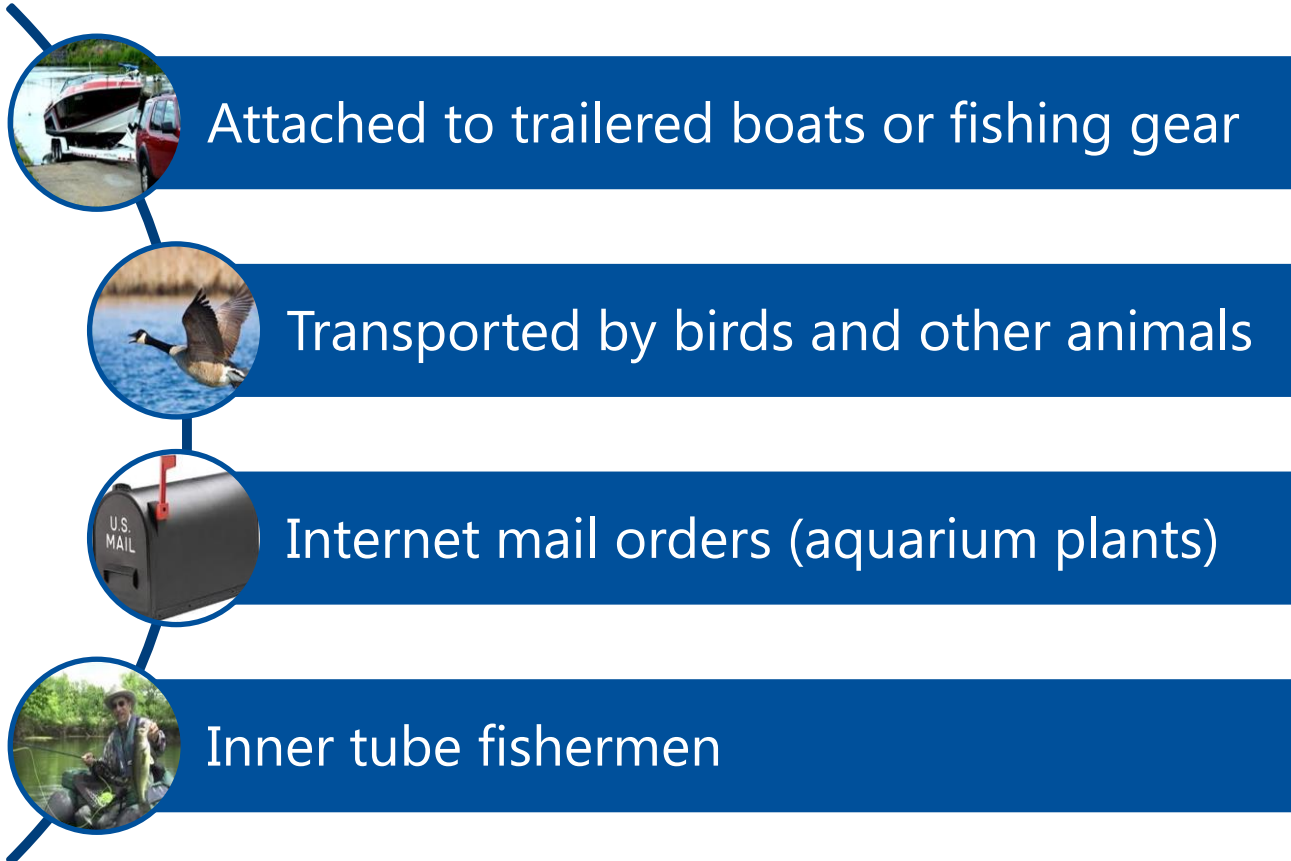


Yellow Iris
Suspected in Sweeney Lake



Chinese Mystery Snails
Observed in Decola Ponds C and F and Honeywell Pond

How are AIS Transported Among Waterbodies?



How are AIS Transported Among Waterbodies?



Dumped ballast water or aquarium water



Used as bait by non-residents
(rusty crayfish)

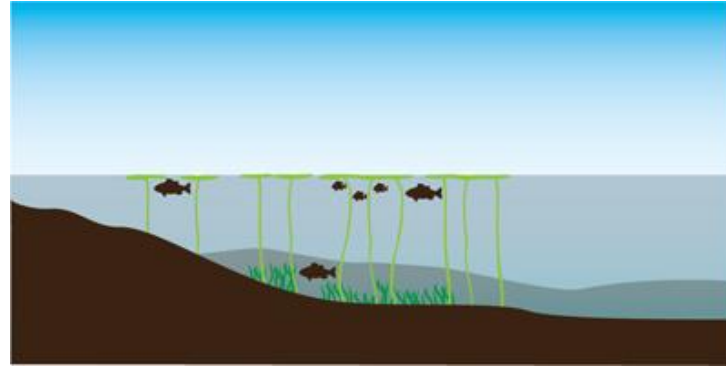


Intentional planting by residents

Benefits of Aquatic Plants



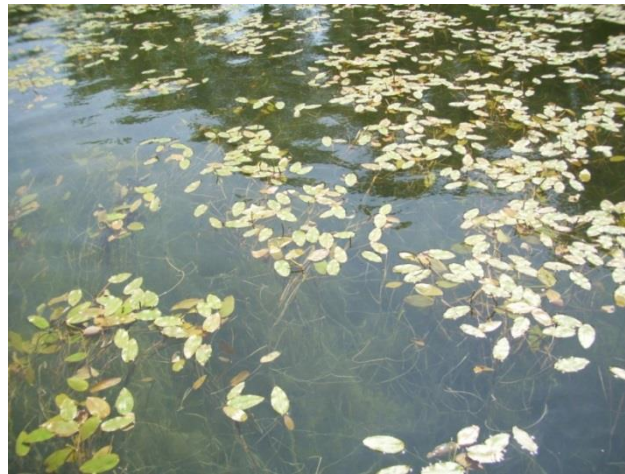
Provide Food



Provide Shade, Shelter, and Spawning Sites



Prevent Erosion



Add Oxygen



Provide Aesthetics

Examples of Beneficial Native Plants in BCWMC Lakes



Chara – food for fish and favorite food for waterfowl; valuable fish habitat; nutrient absorber (Medicine, Sweeney, Twin, Westwood Lakes)



Illinois pondweed – food for ducks, geese, muskrat, beaver, and deer; excellent shade and cover for fish (Medicine and Twin Lakes)

Examples of Beneficial Native Plants in BCWMC Lakes

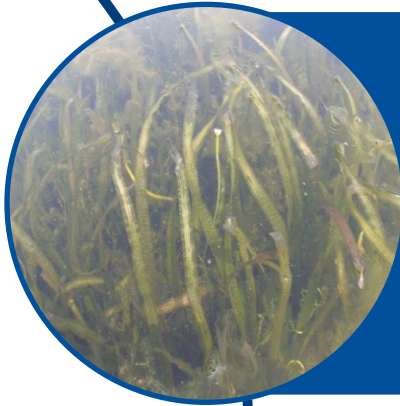


Elodea – food for waterfowl and muskrats; shelter and grazing opportunities for fish (Northwood, Medicine, Twin, Crane, and Westwood Lakes)



Sago pondweed – one of top food producers for waterfowl; food and shelter for juvenile fish (Medicine, Crane, Sweeney, Twin, and Westwood Lakes)

Examples of Beneficial Native Plants in BCWMC Lakes



Wild celery – food for waterfowl, marsh birds, shore birds, and muskrats; good fish habitat, providing shade, shelter, and feeding opportunities (Medicine Lake)



Bottle brush sedge – food source for a wide variety of wildlife including marsh birds, shorebirds, upland game birds, and most waterfowl; food for beaver, deer, and muskrat; provide valuable spawning habitat; prevent erosion (Westwood Lake)

Examples of Beneficial Native Plants in BCWMC Lakes



Coontail – food for waterfowl; bushy stems provide important shelter and foraging opportunities for fish; prime habitat for a host of critters, particularly in winter (Northwood, Crane, Medicine, Sweeney, Twin, and Westwood Lakes)



Water stargrass – food for geese and ducks; offers good cover and foraging opportunities for fish (Crane, Medicine, Sweeney, and Twin Lakes)

Problematic Aquatic Plants: Native Species



Chara



Elodea



Coontail

Dense stands of native plants can:

- obstruct fish movement
- make it difficult for predator fish to capture prey
- interfere with swimming, fishing, and boating
- restrict water movement

Plants add oxygen during the day when they are photosynthesizing, but dense stands of plants deplete the lake of oxygen during the night when they respire.

Problematic Aquatic Plants: Native Species and AIS



Eurasian watermilfoil (AIS)



Curly-leaf pondweed (AIS)



Coontail and white water lily (native species)

Dense stands of plants are problematic, whether native species or AIS

Methods to Control or Manage Aquatic Plants

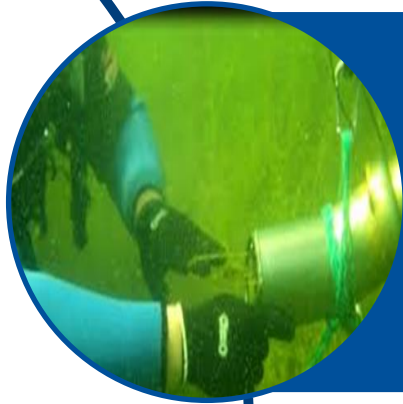


Hand harvesting – feasible for small areas



Mechanical harvesting – (1) Provides seasonal nuisance relief; (2) Not advised for plants that can regrow from fragments (Eurasian watermilfoil and coontail); (3) A DNR permit is needed

Methods to Control or Manage Aquatic Plants



Diver Assisted Suction Harvesting (DASH) – (1) Feasible for small areas (a few acres) in clear water; (2) Generally used for Eurasian watermilfoil; (3) A DNR permit is needed



Herbicide treatment – (1) Small scale “spot” treatments provide seasonal nuisance relief; (2) Large scale treatments can effectively reduce aquatic invasive plant species such as Eurasian watermilfoil and curly-leaf pondweed; (3) A DNR permit is needed

Methods to Control or Manage Aquatic Plants



Biological control – use of milfoil weevils to control Eurasian watermilfoil is plausible, but stocking weevils has generally not been effective due to survival problems over winter due to poor habitat and predation by fish



Dredging – generally not feasible due to cost and unlikely to be permitted by DNR because dredging changes lake depth and destroys habitat

Possible BCWMC Roles in Control/Management of AIS and Aquatic Plants

Provide education

Provide technical guidance and assist with grant applications

Provide project coordination

Provide funding

Complete aquatic plant management projects

Questions?

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