

## MAISRC Priority Species

2022-2023

The Minnesota Aquatic Invasive Species Research Center (MAISRC) undertakes an annual process to prioritize the aquatic invasive species that may be targeted for its research. The high priority species are those that are in Minnesota or likely to be in the state or areas immediately adjacent and that are likely to cause significant damage. The species are also those for which key uncertainties exist that impede understanding risks or developing effective prevention or management/control programs. On a biennial basis, MAISRC systematically identifies research needs related to these high-priority aquatic invasive species to direct research efforts and investments on the state's greatest needs.

Species prioritization is conducted by the eleven-member inter-organizational MAISRC Technical Committee (MTC), with input from the Center's Advisory Board and the Center Faculty Group. MTC recommendations and updates from its 2022 review of emerging threats are outlined below.

### Priority AIS Fish Species (10)

Justification (species that fall into one of the following categories): Species present in MN, widespread, known to have high impact (A); Species localized in MN but spreading and known to have high impact elsewhere (B-H); Species not known to occur in MN but presumed high risk to occur here and have high impact (I-J).

|                                       |                        |
|---------------------------------------|------------------------|
| A. <i>Cyprinus carpio</i>             | Common carp/Koi        |
| B. <i>Hypophthalmichthys nobilis</i>  | Bighead carp           |
| C. <i>Hypophthalmichthys molitrix</i> | Silver carp            |
| D. <i>Ctenopharyngodon idella</i>     | Grass carp             |
| E. <i>Gymnocephalus cernua</i>        | Ruffe                  |
| F. <i>Neogobius melanostomus</i>      | Round goby             |
| G. <i>Carassius auratus/gibelio</i>   | Goldfish/Prussian carp |
| H. <i>Scardinius erythrophthalmus</i> | Common Rudd            |
| I. <i>Sander lucioperca</i>           | Zander                 |
| J. <i>Mylopharyngodon piceus</i>      | Black carp             |

Species evaluated but not selected: Alewife (*Alosa pseudoharengus*), Fourspine stickleback (*Apeltes quadracus*), Three-spined stickleback (*Gasterosteus aculeatus*), White perch (*Morone americana*), Sea lamprey (*Petromyzon marinus*), Tubenose goby (*Proterorhinus marmoratus*), Yellow Bass (*Morone mississippiensis*), Tench (*Tinca tinca*), Swamp eel (*Monopterus albus/Amphipnous cuchia*), Rainbow smelt (*Osmerus mordax*), Northern snakehead (*Channa argus*).

### Priority AIS Harmful Microbes (7)

Justification (Species that fit into one or more of the following categories): Species that generally harm multiple species; Pathogens that cause high mortality or morbidity; Species with high economic impact; Species that can transform ecosystems.

- A. Viral Hemorrhagic Septicemia virus (VHSV)
- B. Whirling disease (*Myxobolus cerebralis*)
- C. Bacterial kidney disease (*Renibacterium salmoninarum*)
- D. *Didymosphenia geminata*
- E. Asian Fish Tapeworm (AFT)
- F. Largemouth Bass Virus (LMBV)
- G. Chytrid fungus

Species evaluated but not selected: *Aeromonas salmonicida*, Bass tapeworm, *Clostridium botulinum*, *Cylindrospermopsis raciborskii*, Dermal sarcoma, Lymphocytis, Lymphosarcoma, Myofibrogranuloma, Neascus, Tilapia Lake Virus, *Piscirickettsia salmonis*, carp edema virus (CEV), Spring viremia of carp virus (SVCV), Cyprinid Herpes Virus-3 (CyHV-3), Rickettsia-like organisms (RLOs), *Oviplleistophora ovariae* (Ovi-O), *Heterosporis*, Novel *Aipenserid herpesvirus*

### Priority AIS Invertebrate Species (11)

Justification (species that fit into one of the following categories): Species established or identified in MN with known high risk of spread and high impact (A-D); Species established or identified in MN but with uncertain likelihood of spread and/or level of impact (E-I); Species not known to be present in MN, pathway risk unknown, but with high impact elsewhere (J-K).

|   |                          |
|---|--------------------------|
| A. <i>Bythotrephes longimanus</i><br>( <i>cederstroemii</i> ) | Spiny water flea         |
| B. <i>Dreissena polymorpha</i>                                | Zebra mussel             |
| C. <i>Dreissena rostriformis</i>                              | Quagga mussel            |
| D. <i>Bithynia tentaculata</i>                                | Faucet snail             |
| E. <i>Orconectes rusticus</i>                                 | Rusty crayfish           |
| F. <i>Potamopyrgus antipodarum</i>                            | New Zealand mudsnail     |
| G. <i>Echinogammarus ischnus</i>                              | A Ponto-Caspian amphipod |
| H. <i>Procambarus clarkii</i>                                 | Red Swamp Crayfish       |
| I. <i>Corbicula fluminea</i>                                  | Golden clam              |
| J. <i>Hemimysis anomala</i>                                   | Bloody red shrimp        |
| K. <i>Dikerogammarus villosus</i>                             | Killer shrimp            |

Species evaluated but not selected: Fishhook waterflea (*Cercopagis pengoi*), Chinese mysterysnail (*Cipangopaludina chinensis malleata*), Chinese mitten crab (*Eriocheir spp.*), Common waterfleas (*Daphnia lumholtzi*), Banded mysterysnail (*Viviparus georgianus*), Caspian mud shrimp (*Chelicorophium curvispinum*).

### Priority AIS Plants (12)

Justification (Species that fit into one of the following categories):

A: Species widely distributed in MN, that cause high impacts and with control potential (A1-5); Species localized in MN but that have spread and caused high impacts nearby (A6-8); Species not yet in MN but arrival is likely imminent and impacts likely to be very high (A9). B: Species not likely to be in MN but have spread and caused impacts in inland waters of other cold- temperate regions (likelihood of establishment in MN uncertain) (B1-3).

|   |  |
|---|--|
| A1. <i>Potamogeton crispus</i>                                      | Curly-leaf pondweed                            |
| A2. <i>Myriophyllum spicatum</i> ,<br><i>M.spicatum x sibiricum</i> | Eurasian water milfoil,<br>hybrid watermilfoil |
| A3. <i>Typha x glauca</i> , <i>T. angustifolia</i>                  | Hybrid/narrow leaf cattail                     |
| A4. <i>Lythrum salicaria</i>  | Purple loosestrife                             |
| A5. <i>Phragmites australis subsp. australis</i>                    | European haplotype-common reed                 |
| A6. <i>Iris pseudacorus</i>   | Pale yellow iris                               |
| A7. <i>Butomus umbellatus</i>                                       | Flowering rush                                 |
| A8. <i>Nitellopsis obtusa</i>                                       | Starry stonewort                               |
| A9. <i>Hydrilla verticillata</i>                                    | Hydrilla                                       |
| B1. <i>Nymphoides peltata</i>                                       | Yellow-floating heart                          |
| B2. <i>Cabomba caroliniana</i>                                      | Cabomba  |
| B3. <i>Hydrocharis morsus-ranae</i>                                 | European frog-bit                              |

Species evaluated but not selected: Water hyacinth (*Eichhornia crassipes*), Brazilian waterweed (*Egeria densa*), Dwarf hygrophila (*Hygrophila polysperma*), African elodea (*Lagarosiphon major*), Water clover (*Marsilea*), Watercress (*Nasturtium officinale*), non-native water lilies, Reed canary grass (*Phalaris arundinacea*), Giant salvinia (*Salvinia*), Water soldier (*Stratiotes aloides*), Water chestnut (*Trapa natans*), Parrot feather (*Myriophyllum aquaticum*), Brittle naiad (*Najas minor*)