

# Appendix C - Aquatic Invasive Species of Concern

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Past invasive species monitoring efforts have identified several different non-native, plant and animal, invasive species in the Minong Flowage. Most of these species are considered aquatic, although some are also considered shoreland or wetland type invasive species.

## **Non-native, Aquatic Invasive Plant Species**

Eurasian watermilfoil is currently the most problematic non-native, aquatic invasive species in the Minong Flowage. Curly-leaf pondweed is present but does not cause the issues that EWM does. Both are submerged vegetation species (rooted to the bottom of the lake and growing under the surface of the water) that have the potential to outcompete more desirable native aquatic plants. Purple loosestrife, yellow iris, Japanese knotweed, non-native cattails, and reed canary grass are shoreland or wetland plants not generally problematic within the Flowage but can be problematic on the shores and in the wetlands adjacent to the Flowage. More information is given for each non-native species in the following sections.

### Eurasian Watermilfoil (EWM)

EWM is a submersed aquatic plant native to Europe, Asia, and northern Africa (Figure 1). It is the only non-native milfoil in Wisconsin. Like the native milfoils, the Eurasian variety has slender stems whorled by submersed feathery leaves and tiny flowers produced above the water surface. The flowers are located in the axils of the floral bracts, and are either four-petaled or without petals. The leaves are threadlike, typically uniform in diameter, and aggregated into a submersed terminal spike. The stem thickens below the inflorescence and doubles its width further down, often curving to lie parallel with the water surface. The fruits are four-jointed nut-like bodies. Without flowers or fruits, EWM is difficult to distinguish from Northern water milfoil. EWM has 9-21 pairs of leaflets per leaf, while Northern milfoil typically has 7-11 pairs of leaflets (Figure 2). Coontail is often mistaken for the milfoils but does not have individual leaflets.

EWM grows best in fertile, fine-textured, inorganic sediments. In less productive lakes, it is restricted to areas of nutrient-rich sediments. It has a history of becoming dominant in eutrophic, nutrient-rich lakes, although this pattern is not universal. It is an opportunistic species that prefers highly disturbed lake beds, lakes receiving nitrogen and phosphorous-laden runoff, and heavily used lakes. Optimal growth occurs in alkaline systems with a high concentration of dissolved inorganic carbon. High water temperatures promote multiple periods of flowering and fragmentation.

Unlike many other plants, EWM does not rely on seed for reproduction. Its seeds germinate poorly under natural conditions. It reproduces by fragmentation, allowing it to disperse over long distances. The plant produces fragments after fruiting once or twice during the summer. These fragments develop

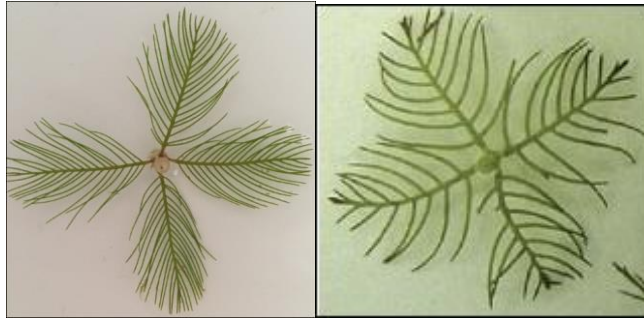
adventitious roots (Figure 3) and may then be carried downstream by water currents or inadvertently picked up by boaters. EWM is readily dispersed by boats, motors, trailers, bilges, live wells, and bait buckets; and can stay alive for weeks if kept moist.

Once established in an aquatic community, milfoil reproduces from shoot fragments and stolons (runners that creep along the lake bed). As an opportunistic species, EWM is adapted for rapid growth early in spring. Stolons, lower stems, and roots persist over winter and store the carbohydrates that help milfoil claim the water column early in spring, photosynthesize, divide, and form a dense leaf canopy that shades out native aquatic plants. Its ability to spread rapidly by fragmentation and effectively block out sunlight needed for native plant growth often results in monotypic stands. Monotypic stands of EWM provide only a single habitat and threaten the integrity of aquatic communities in a number of ways; for example, dense stands disrupt predator-prey relationships by fencing out larger fish and reducing the number of nutrient-rich native plants available for waterfowl.

Dense stands of EWM also inhibit recreational uses like swimming, boating, and fishing. Some stands have been dense enough to obstruct industrial and power generation water intakes. The visual impact that greets the lake user on milfoil-dominated lakes is the flat yellow-green of matted vegetation, often prompting the perception that the lake is "infested" or "dead". Cycling of nutrients from sediments to the water column by EWM may lead to deteriorating water quality and algae blooms in infested lakes.



**Figure 1: Eurasian Watermilfoil from the Minong Flowage**



**Figure 2: EWM leaflets (left) and Northern watermilfoil leaflets (right)**



**Figure 3: EWM – whole plant and a fragment with adventitious roots**

EWM is abundant in the Flowage and is the focus of most of the AIS management actions implemented.

#### Curly-leaf Pondweed (CLP)

CLP is an invasive aquatic perennial that is native to Eurasia, Africa, and Australia (Figure 4). One theory is that it was accidentally introduced to United States waters in the mid-1880s by hobbyists who used it as an aquarium plant. The leaves are reddish-green, oblong, and about 3 inches long, with distinct wavy edges that are finely toothed. The stem of the plant is flat, reddish-brown and grows from 1 to 3 feet long. The plant usually drops to the lake bottom by early August. CLP is commonly found in alkaline and high nutrient waters, preferring soft substrate and shallow water depths. It tolerates low light and low water temperatures. It has been reported in all states but Maine.

CLP spreads through burr-like winter buds (turions), which are moved among waterways. These plants can also reproduce by seed, but this plays a relatively small role compared to the vegetative reproduction through turions. New plants form under the ice in winter, making curly-leaf pondweed one of the first nuisance aquatic plants to emerge in the spring. It becomes invasive in some areas because of its tolerance for low light and low water temperatures. These tolerances allow it to get a head start on and out compete native plants in the spring. In mid-summer, when most aquatic plants are growing, CLP plants are dying off. Plant die-offs may result in a critical loss of dissolved oxygen. The decaying

plants can increase nutrients which contribute to algal blooms, as well as create unpleasant messes on beaches. CLP can form surface mats that interfere with aquatic recreation.



**Figure 4: Curly-leaf pondweed in the Minong Flowage and turions (not from the Minong Flowage)**

CLP is common in the Flowage, but generally not problematic.

#### Purple Loosestrife

Purple loosestrife (Figure 5) is a perennial herb 3-7 feet tall with a dense bushy growth of 1-50 stems. The stems, which range from green to purple, die back each year. Showy flowers that vary from purple to magenta possess 5-6 petals aggregated into numerous long spikes, and bloom from August to September. Leaves are opposite, nearly linear, and attached to four-sided stems without stalks. It has a large, woody taproot with fibrous rhizomes that form a dense mat. By law, purple loosestrife is a nuisance species in Wisconsin. It is illegal to sell, distribute, or cultivate the plants or seeds, including any of its cultivars.

Purple loosestrife is a wetland herb that was introduced as a garden perennial from Europe during the 1800's. It is still promoted by some horticulturists for its beauty as a landscape plant, and by beekeepers for its nectar-producing capability. Currently, more than 20 states, including Wisconsin have laws prohibiting its importation or distribution because of its aggressively invasive characteristics. It has since extended its range to include most temperate parts of the United States and Canada. The plant's reproductive success across North America can be attributed to its wide tolerance of physical and chemical conditions characteristic of disturbed habitats, and its ability to reproduce prolifically by both seed dispersal and vegetative propagation. The absence of natural predators, like European species of herbivorous beetles that feed on the plant's roots and leaves, also contributes to its proliferation in North America.

Purple loosestrife was first detected in Wisconsin in the early 1930's, but remained uncommon until the 1970's. It is now widely dispersed in the state, and has been recorded in 70 of Wisconsin's 72 counties. Low densities in most areas of the state suggest that the plant is still in the pioneering stage of establishment. Areas of heaviest infestation are sections of the Wisconsin River, the extreme southeastern part of the state, and the Wolf and Fox River drainage systems.

This plant's optimal habitat includes marshes, stream margins, alluvial flood plains, sedge meadows, and wet prairies. It is tolerant of moist soil and shallow water sites such as pastures and meadows, although established plants can tolerate drier conditions. Purple loosestrife has also been planted in lawns and gardens, which is often how it has been introduced to many of our wetlands, lakes, and rivers.

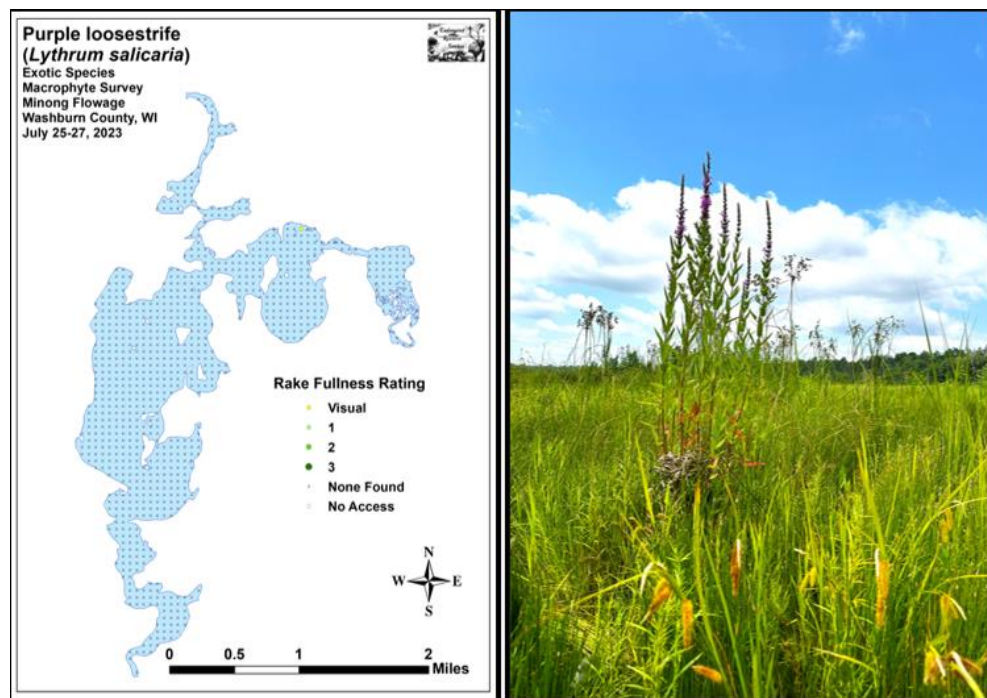
Purple loosestrife can germinate successfully on substrates with a wide range of pH. Optimum substrates for growth are moist soils of neutral to slightly acidic pH, but it can exist in a wide range of soil types. Most seedling establishment occurs in late spring and early summer when temperatures are high.

Purple loosestrife spreads mainly by seed, but it can also spread from root or stem segments. A single stalk can produce from 100,000 to 300,000 seeds per year. Seed survival is up to 60-70%, resulting in an extensive seed bank. Mature plants with up to 50 shoots grow over 2 meters high and produce more than two million seeds a year. Germination is restricted to open, wet soils and requires high temperatures, but seeds remain viable in the soil for many years. Even seeds submerged in water can live for approximately 20 months. Most of the seeds fall near the parent plant, but water, animals, boats, and humans can transport the seeds long distances. Vegetative spread through local disturbance is also characteristic of loosestrife; clipped, trampled, or buried stems of established plants may produce shoots and roots. Plants may be quite large and several years old before they begin flowering. It is often very difficult to locate non-flowering plants, so monitoring for new invasions should be done at the beginning of the flowering period in mid-summer.

Any sunny or partly shaded wetland is susceptible to purple loosestrife invasion. Vegetative disturbances such as water drawdown or exposed soil accelerate the process by providing ideal conditions for seed germination. Invasion usually begins with a few pioneering plants that build up a large seed bank in the soil for several years. When the right disturbance occurs, loosestrife can spread rapidly, eventually taking over the entire wetland. The plant can also make morphological adjustments to accommodate changes in the immediate environment; for example, a decrease in light level will trigger a change in leaf morphology. The plant's ability to adjust to a wide range of environmental conditions gives it a competitive advantage; coupled with its reproductive strategy, purple loosestrife tends to create monotypic stands that reduce biotic diversity.

Purple loosestrife displaces native wetland vegetation and degrades wildlife habitat. As native vegetation is displaced, rare plants are often the first species to disappear. Eventually, purple loosestrife can overrun wetlands thousands of acres in size, and almost entirely eliminate the open water habitat. The plant can also be detrimental to recreation by choking waterways.

Purple loosestrife has been identified and removed from several locations on the Minong Flowage including Sand Island and Sawdust Island in the DNR Bay.



**Figure 5: Purple Loosestrife in the Minong Flowage (Berg, 2023)**

### Reed Canary Grass

Reed canary grass (Figure 6) is a large, coarse grass that reaches 2 to 9 feet in height. It has an erect, hairless stem with gradually tapering leaf blades 3 1/2 to 10 inches long and 1/4 to 3/4 inch in width. Blades are flat and have a rough texture on both surfaces. The lead ligule is membranous and long. The compact panicles are erect or slightly spreading (depending on the plant's reproductive stage) and range from 3 to 16 inches long with branches 2 to 12 inches in length. Single flowers occur in dense clusters in May to mid-June. They are green to purple at first and change to beige over time. This grass is one of the first to sprout in spring and forms a thick rhizome system that dominates the subsurface soil. The seeds are shiny brown in color.

Both Eurasian and native ecotypes of reed canary grass are thought to exist in the U.S. The Eurasian variety is considered more aggressive, but no reliable method exists to tell the ecotypes apart. It is believed that the vast majority of our reed canary grass is derived from the Eurasian ecotype. Agricultural cultivars of the grass are widely planted.

Reed canary grass also resembles non-native orchard grass (*Dactylis glomerata*), but can be distinguished by its wider blades, narrower, more pointed inflorescence, and the lack of hairs on glumes and lemmas (the spikelet scales). Additionally, bluejoint grass (*Calamagrostis canadensis*) may be mistaken for reed canary in areas where orchard grass is rare, especially in the spring. The highly

transparent ligule on reed canary grass is helpful in distinguishing it from the others. Ensure positive identification before attempting control.

Reed canary grass is a cool-season, sod-forming, perennial wetland grass native to temperate regions of Europe, Asia, and North America. The Eurasian ecotype has been selected for its vigor and has been planted throughout the U.S. since the 1800's for forage and erosion control. It has become naturalized in much of the northern half of the U.S. and is still being planted on steep slopes and banks of ponds and created wetlands.

Reed canary grass can grow on dry soils in upland habitats and in the partial shade of oak woodlands, but does best on fertile, moist organic soils in full sun. This species can invade most types of wetlands, including marshes, wet prairies, sedge meadows, fens, stream banks, and seasonally wet areas; it also grows in disturbed areas such as berms and spoil piles.

Reed canary grass reproduces by seed or creeping rhizomes. It spreads aggressively. The plant produces leaves and flower stalks for 5 to 7 weeks after germination in early spring and then spreads laterally. Growth peaks in mid-June and declines in mid-August. A second growth spurt occurs in the fall. The shoots collapse in mid to late summer, forming a dense, impenetrable mat of stems and leaves. The seeds ripen in late June and shatter when ripe. Seeds may be dispersed from one wetland to another by waterways, animals, humans, or machines.

This species prefers disturbed areas but can easily move into native wetlands. Reed canary grass can invade a disturbed wetland in just a few years. Invasion is associated with disturbances including ditching of wetlands, stream channelization, and deforestation of swamp forests, sedimentation, and intentional planting. The difficulty of selective control makes reed canary grass invasion of particular concern. Over time, it forms large, monotypic stands that harbor few other plant species and are subsequently of little use to wildlife. Once established, reed canary grass dominates an area by building up a tremendous seed bank that can eventually erupt, germinate, and recolonize treated sites.

Reed canary grass is in many locations along the shoreland of the Minong Flowage.



**Figure 6: Reed canary grass (not from the Minong Flowage)**

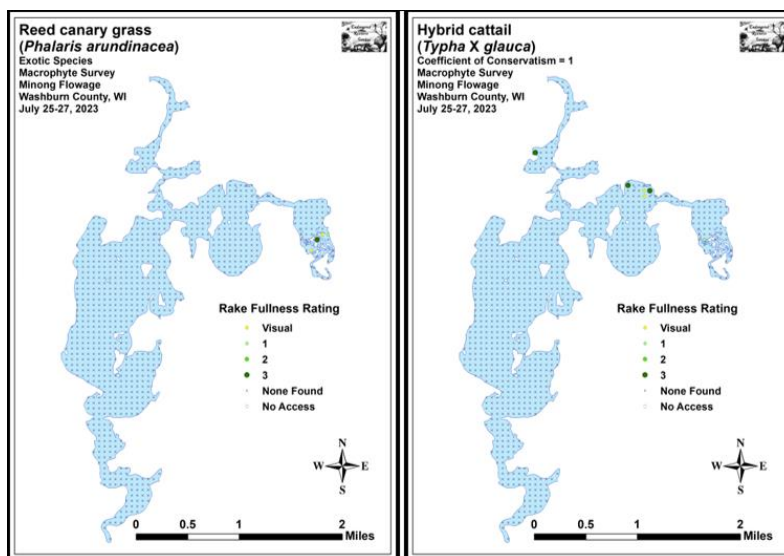
#### Hybrid/Narrow-leaf Cattail

Native to southern but not northern Wisconsin, Narrow-leaved cattail and its hybrids with Broad-leaved cattail are becoming increasingly common on the Minong Flowage where they also tend to be invasive (Figure 7). Besides having narrower leaves, the exotics can be told from native cattails by having a relatively narrower and longer “hotdog-shaped” tan female cattail flower, whereas the native species tends to produce a fatter and shorter “bratwurst-shaped” dark chocolate colored female flower. Narrow-leaved cattail and its hybrids also have a male flower that is separated from the female flower by a thin green stem while the native Broad-leaved cattail has its male and female flowers connected (Figure 7).



**Figure 7: Exotic hybrid and native broad-leaved cattail identification**

Both reed canary grass and narrow-leaf cattails were found in the Minong Flowage during the 2023 summer PI survey (Figure 8).



**Figure 8: 2023 Reed canary grass and hybrid cattail density and distribution**

### Yellow Flag Iris

Yellow flag iris (Figure 9) is a showy perennial plant that can grow in a range of conditions from drier upland sites, to wetlands, to floating aquatic mats. A native plant of Eurasia, it can be an invasive garden escapee in Wisconsin's natural environments. Yellow flag iris can produce many seeds that can float from the parent plant, or plants can spread vegetatively via rhizome fragments. Once established it forms dense clumps or floating mats that can alter wildlife habitat and species diversity. All parts of this plant are poisonous, which results in lowered wildlife food sources in areas where it dominates. This species can escape water gardens and ponds and grow in undisturbed and natural environments. It can grow in wetlands, forests, bogs, swamps, marshes, lakes, streams, and ponds. Dense areas of this plant may alter hydrology by trapping sediment and/or blocking flow.

Yellow iris has broad, sword-shaped leaves that grow upright, tall, and stiff. They are green with a slight blue-grey tint and are very difficult to distinguish from other ornamental or native iris species. Flowers are produced on a stem that can grow 3-4 feet tall among leaves that are usually as tall or taller.

The flowers are showy and variable in color from almost white to a vibrant dark yellow. Flowers are between 3-4 inches wide and bloom from April to June. Three upright petals are less showy than the larger three downward pointing sepals, which may have brown to purple-colored streaks.

Seeds are produced in fruits that are 6-angled capsules, 2-4 inches long. Each fruit may have over 100 seeds that start pale before turning dark brown. Each seed has a hard outer casing with a small air space underneath, which allows the seeds to float.

The roots are thick, fleshy, pink-colored rhizomes spread extensively in good conditions, forming thick mats that can float on the surface of the water.

When not flowering, yellow flag iris could be easily confused with the native blue flag iris (*Iris versicolor*) as well as other ornamental irises that are not invasive. Blue flag iris is usually smaller and does not tend to form as dense clumps or floating mats. When not flowering or showing fruiting bodies, yellow flag iris may be confused with other wetland plants such as cattails (*Typha* spp.) or sweet flag (*Acorus* spp.) species.

Small populations may be successfully removed using physical methods. Care should be taken if hand-pulling plants as some people show skin sensitivity to plant sap and tissues. All parts of the plant should be dug out – particularly rhizomes and disposed of in a landfill or by burning. Cutting the seed heads may help decrease the plant spreading.

Aquatic formulas of herbicides may be used to control yellow flag iris; however, permits may be needed. Foliar spray, cut stem/leaf application and hand swiping of herbicide have all shown effectiveness. It is unknown if there is any yellow flag iris on the shores of the Flowage, but monitoring for it should occur.



**Figure 9: Yellow flag iris (not from the Minong Flowage)**

Yellow flag iris has not been identified in the Flowage.

#### Japanese Knotweed

Japanese knotweed (Figure 10) is an herbaceous perennial, growing up to 10-ft tall. Hollow reddish, arching, bamboo-like stems are smooth and stout, and they can persist after the plant dies back each year. The base of the stem above each joint is swollen and surrounded by a membranous sheath. It has alternate, egg-shaped to almost triangular 4-6" long, 3-4" wide leaves that are dark green on the upper surface and pale green on the lower. Numerous tiny, creamy white or greenish flowers that are highly branched and found where the leaf attaches to the stem bloom in late summer. Small, winged, triangular fruits carry very small shiny seeds. Plants growing from seed have a taproot up to 6-ft deep. Stout rhizomes can reach 65-ft or more from the parent plant, and give rise to new stalks.

Japanese knotweed invades upland and lowland sites that are disturbed and undisturbed, often posing significant threat to riparian areas where it can rapidly spread. It tolerates shade, high temperatures, high salinity, and drought. It can be transported to new sites as a contaminant in fill dirt or on

equipment. During floods, it can spread downstream by shoot fragments, rhizomes, or seeds. Escapees from neglected gardens and discarded cuttings are common routes of dispersal from more urban areas.

Although it is very hard to kill, consistent management over five or more years can eradicate it. Management includes both non-chemical and chemical control. Non chemical controls include physical removal, mowing, prescribed burning, grazing, and manipulation of the growing environment. Chemical control includes application of a pre-emergent herbicide directly to the soil, and foliar application applied directly to individual plants. Cut stump application of herbicide has also been effective. If a combination of all these management options is used, control/eradication may be possible in 3-5 years.



**Figure 10: Japanese Knotweed (not from the Minong Flowage)**

Japanese knotweed has not been identified in the Minong Flowage.

### **Non-native Aquatic Invasive Animal Species**

Several non-vegetative, aquatic, invasive species are also present in the Minong Flowage. Common carp, Chinese mystery snails, and rusty crayfish are listed by the WDNR as having been identified in the Flowage.

#### **Common Carp**

The common carp (Figure 11) is a large omnivorous fish. It has large scales, a long dorsal fin base, and two pairs of long barbels (whiskers) in its upper jaw. Native to Europe and Asia, it was intentionally introduced into Midwest waters as a game fish in the 1880s. Common carp may cause many negative impacts in a lake. Common carp are one of the most damaging aquatic invasive species due to its wide distribution and severe impacts in shallow lakes and wetlands. Their feeding disrupts shallowly rooted plants muddying the water, which in turn releases phosphorus that may increase algae abundance, which can cause water quality to deteriorate, and cause a loss of aquatic plants needed by other fish and waterfowl.



**Figure 11: Common Carp, MN DNR**

### Chinese Mystery Snails

The Chinese mystery snails and the banded mystery snails (Figure 12) are non-native snails that have been found in a number of Wisconsin lakes. There is not a lot yet known about these species, however, it appears that they have a negative effect on native snail populations. The mystery snail's large size and hard operculum (a trap door cover which protects the soft flesh inside), and their thick hard shell make them less edible by predators such as rusty crayfish.

The female mystery snail gives birth to live crawling young. This may be an important factor in their spread as it only takes one impregnated snail to start a new population. Mystery snails thrive in silt and mud areas although they can be found in lesser numbers in areas with sand or rock substrates. They are found in lakes, ponds, irrigation ditches, and slower portions of streams and rivers. They are tolerant of pollution and often thrive in stagnant water areas. Mystery snails can be found in water depths of 0.5 to 5 meters (1.5 to 15 feet). They tend to reach their maximum population densities around 1-2 meters (3-6 feet) of water depth. Mystery snails do not eat plants. Instead, they feed on detritus and in lesser amounts algae and phytoplankton. Thus removal of plants in your shoreline area will not reduce the abundance of mystery snails.

Lakes with high densities of mystery snails often see large die-offs of the snails. These die-offs are related to the lake's warming coupled with low oxygen (related to algal blooms). Mystery snails cannot tolerate low oxygen levels. High temperatures by themselves seem insufficient to kill the snails as the snails could move into deeper water.

Many lake residents are worried about mystery snails being carriers of the swimmer's itch parasite. In theory they are potential carriers, however, because they are an introduced species and did not evolve as part of the lake ecosystem, they are less likely to harbor the swimmer's itch parasites.



**Figure 12: Chinese Mystery Snails (not from the Minong Flowage)**

### Rusty Crayfish

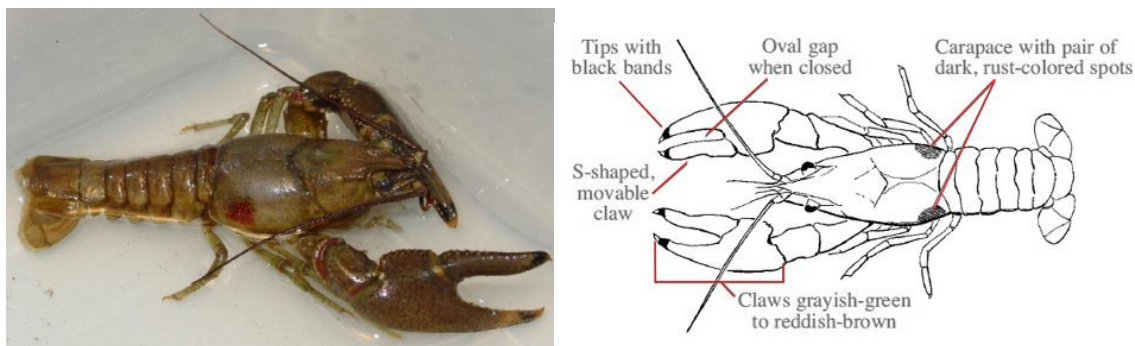
Rusty crayfish (Figure 13) live in lakes, ponds and streams, preferring areas with rocks, logs and other debris in water bodies with clay, silt, sand or rocky bottoms. They typically inhabit permanent pools and fast moving streams of fresh, nutrient-rich water. Adults reach a maximum length of 4 inches. Males are larger than females upon maturity and both sexes have larger, heartier, claws than most native crayfish. Dark “rusty” spots are usually apparent on either side of the carapace, but are not always present in all populations. Claws are generally smooth, with grayish-green to reddish-brown coloration. Adults are opportunistic feeders, feeding upon aquatic plants, benthic invertebrates, detritus, juvenile fish and fish eggs.

The native range of the rusty crayfish includes Ohio, Tennessee, Kentucky, Indiana, Illinois and the entire Ohio River basin. However, this species may now be found in Michigan, Massachusetts, Missouri, Iowa, Minnesota, New York, New Jersey, Pennsylvania, Wisconsin, New Mexico and the entire New England state area (except Rhode Island). The rusty crayfish has been a reported invader since at least the 1930’s. Its further spread is of great concern since the prior areas of invasion have led to severe impacts on native flora and fauna. It is thought to have spread by means of released game fish bait and/or from aquarium release. Rusty crayfish are also raised for commercial and biological harvest.

Rusty crayfish reduce the amount and types of aquatic plants, invertebrate populations, and some fish populations--especially bluegill, smallmouth and largemouth bass, lake trout and walleye. They deprive native fish of their prey and cover and out-compete native crayfish. Rusty crayfish will also attack the feet of swimmers. On the positive side, rusty crayfish can be a food source for larger game fish and are commercially harvested for human consumption.

Rusty crayfish may be controlled by restoring predators like bass and sunfish populations. Preventing further introduction is important and may be accomplished by educating anglers, trappers, bait dealers and science teachers of their hazards. Use of chemical pesticides is an option but does not target this species and will kill other aquatic organisms.

It is illegal to possess both live crayfish and angling equipment simultaneously on any inland Wisconsin water (except the Mississippi River). It is also illegal to release crayfish into a water of the state without a permit.



**Figure 13: Rusty Crayfish and identifying characteristics**

### Zebra Mussels

Zebra Mussels (Figure 14) are an invasive species that have inhabited Wisconsin waters and are displacing native species, disrupting ecosystems, and affecting citizens' livelihoods and quality of life. They hamper boating, swimming, fishing, hunting, hiking, and other recreation, and take an economic toll on commercial, agricultural, forestry, and aquacultural resources. The zebra mussel is a tiny (1/8-inch to 2-inch) bottom-dwelling clam native to Europe and Asia. Zebra mussels were introduced into the Great Lakes in 1985 or 1986, and have been spreading throughout them since that time. They were most likely brought to North America as larvae in ballast water of ships that traveled from fresh-water Eurasian ports to the Great Lakes. Zebra mussels look like small clams with a yellowish or brownish D-shaped shell, usually with alternating dark- and light-colored stripes. They can be up to two inches long, but most are under an inch. Zebra mussels usually grow in clusters containing numerous individuals.

Zebra Mussels feed by drawing water into their bodies and filtering out most of the suspended microscopic plants, animals, and debris for food. This process can lead to increased water clarity and a depleted food supply for other aquatic organisms, including fish. The higher light penetration fosters growth of rooted aquatic plants which, although creating more habitat for small fish, may inhibit the larger, predatory fish from finding their food. This thicker plant growth can also interfere with boaters, anglers and swimmers. Zebra mussel infestations may also promote the growth of blue-green algae, since they avoid consuming this type of algae but not others.

Once zebra mussels are established in a water body, very little can be done to control them. It is therefore crucial to take all possible measures to prevent their introduction in the first place. Some of the preventative and physical control measures include physical removal, industrial vacuums, and back flushing.

Washburn County has an active zebra mussel monitoring program and working with MFA volunteers have spent time on the Minong Flowage.



**Figure 14: Zebra Mussels from Big McKenzie Lake, Washburn County**

Zebra mussels have not been identified in the Minong Flowage; however they are in nearby waters including the McKenzie chain of lakes.

#### **AIS Prevention Strategy**

The Minong Flowage already has several established AIS. However there are many more that could be introduced to the lake. The MFA will implement a watercraft inspection and AIS Signage program at the three public access points on the lake (East Basin, DNR Bay, and County Park). Information will be shared with lake residents and users in an effort to expand the watercraft inspection message. In addition to the watercraft inspection program, an in-lake and shoreland AIS monitoring program will be implemented. Both programs will follow UW-Extension Lakes and WDNR protocol through the Clean Boats, Clean Waters program and the Citizen Lake Monitoring Network Aquatic Invasive Species Monitoring program.

Additionally, having an educated and informed lake constituency is the best way to keep non-native aquatic invasive species at bay in the Minong Flowage. To foster this, the MFA will host and/or sponsor lake community events including AIS identification and management workshops; distribute education and information materials to lake property owners and lake users through the newsletter, webpage, and general mailings.