NAME OF SPECIES: New Zealand Mud Snail (Potamopyrgus antipodarum)

A. CURRENT STATUS AND DISTRIBUTION	
1. In Wisconsin?	a. YES ☒ NO ☐
	b. Abundance: not found
	c. Geographic Range: Duluth/Superior Harbor, Lake Superior
	d. Type of Waters Invaded (rivers, ponds, lakes, etc): Lakes, river (also invades streams and estuaries)
	e. Historical Status and Rate of Spread in Wisconsin: Discovered in Fall 2005 in Duluth/Superior Harbor, only known infestation in WI
2. Invasive in Similar Climate Zones	YES ☒ NO ☐ Where: Lake Ontario, Lake Superior, Lake Erie, cold water streams in western U.S.
3. Similar Habitat Invaded Elsewhere	YES ☒ NO ☐ Where: see above, lake Erie populations discovered in 2007 but are likely not new
4. In Surrounding States	YES ☒ NO ☐ Where: MN/WI border, Canada, Other Great Lake states surrounding Lake Erie
5. Competitive Ability	High: Reproduce asexually, so a single snail can establish a new population rapidly. They are also highly competitive due to their ability to survive a wide range of conditions, including water quality fluctuations and desiccation for short periods. Low:
B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS	
1. Temperature:	Range: Can tolerate a wide range of temperatures, from nearly freezing to 90 deg. F; thrive from 65 - 70 deg. F
2. Spawning Temperature:	Range: Can bear young at any time of year in spring habitats in western U.S., but overall will bear young in summer and fall.
3. Number of Eggs:	Range: Reproduction is primarily asexual; females are born with developing embryos in reproductive system, typically 20 - 120 per female
4. Preferred Spawning Substrate:	In rivers, they are found in all habitat substrates.
5. Hybridization Potential:	none found
6. Salinity Tolerance	Fresh: ☒ Marine: ☐ Brackish: ☒
7. Oxygen Regime	Range: Tolerate wide range of DO levels
8. Water Hardness Tolerance	Range: none found

9. Easily confused for Native Species?	List: none found
C. DAMAGE POTENTIAL	
1. Likelihood of Damage	a. Presence of Natural Enemies: Though some fish will eat them, it is thought that native trout may avoid these as prey and that they may pass through the digestive systems of some fish undigested.
	b. How well introductory and expansion pathways can be described and quantified: Were first introduced with shipments of live fish and eggs, now primarily spread by humans via attachement to recreational fishing gear and other equipment placed in the water (nets, boots, pets). Their tiny size increases that chance they will go unnoticed on equipment. Ship ballast water is also a mechanism of spread.
2. Environmental Impacts	a. Alteration of ecosystem composition, structure and function: Densities can reach 100 - 700K per sq. m; can outcompete species that are important forage for native fish, including trout. They aso provide little nutrition to the fish eating them.
	c. Damage to ecosystem resilience/sustainability: Can drastically alter the primary production in some streams.
	d. Loss of biological diversity: Compete for food and space sith native snails, possibly displacing them; in some infested western rivers they comprise >95% of invertebrate biomass.
	e. Abiotic modifications (affects on turbidity, H2O chemistry, etc.): They can essentially become the substrate at great densities.
	f. Biotic effects on other species (loss of cover, nesting sites, forage, changing competitive relationships: See a. - they are a poor substitute food for trout, yielding as little as 2% of the nutritional value of traditional foods.
D. NET SOCIO/ECONOMIC IMPACT	
1. Positive aspects of the species to the economy/society:	Effect:
2. Direct and indirect effects of the invasive species:	Effect: lost recreational fishing opportunities in western U.S.
3. Type of damage caused by organism:	Effect: potential to be biofouler; impact fish populations
Industries affected by invasive:	Effect: power plants and other industries with water intake pipes, recreational fishing industry and associated businesses
4. Loss of aesthetic value affecting recreation and tourism:	Effect:
5. Increased cost to a sector (monitoring, inspection, control, public education, modifying practices, damage repair, lower yield, loss of	Effect:

export markets due to quarantine:	
6. Cost of prevention or control relative to cost of allowing invasion to occur (cost of prevention is borne by different groups than cost of control):	Effect: Cost of prevention education likely borne by natural resource agencies, there is no known control once established
7. Cost at different levels of invasion:	Effect:
E. CONTROL AND PREVENTION POTENTIAL	
1. Costs of Prevention (including Education):	not found
2. Responsiveness to Prevention Efforts:	human activity is primarily responsible for spread, so this is likely a good candidate for public education aiming to prevent the spread
3. Detection Capability:	Small size may make detection less likely, particularly with less dense populations
4. Control Tactics Effective:	Mechanical: ☐ Biological: ☐ Chemical: ☐
5. Efficacy/Feasibility of Control (effort, # of staff):	no known control methods - the snails support a number of parasites in native range, but none found on any North American populations examined, chemical treatments not necessarily selective for snails
6. Cost of Control:	High: ☐ Medium: ☐ Low: ☐
7. Non-Target Effects of Control:	
8. Threshold at which control would be attempted:	
9 Efficacy of Monitoring:	