NAME OF SPECIES: Glyceria maxima (Hartm.) Holmb.	
Synonyms: Molina maxima Hartm.; Glyceria spectabilis Mert. & W.D.J. Koch	
Common Name: Tall Manna Grass, Reed Manna Grass, English Water Grass, Tall Glyceria, Reed Sweetgrass.	
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES ☒ NO ☐
	2. Abundance: Scattered populations.
	3. Geographic Range: Found in four counties in SE Wisconsin (1).
	4. Habitat Invaded: Wetlands Disturbed Areas ☒ Undisturbed Areas ☒
	5. Historical Status and Rate of Spread in Wisconsin: First herbarium specimen was collected in 1975, in Racine County, in 1997 in Wood County, and Door County in 2003 (1).
	6. Proportion of potential range occupied: Has the potential to aggressively invade additional sites; Flora of North America (2) reports this species is expanding its range.
II. Invasive in Similar Climate Zones	1. YES ☒ NO ☒ Where (include trends): Reportedly invasive in Massachusetts, Alaska, Washington, Newfoundland, Ontario, British Columbia, New Zealand, and Australia (3), but not as aggressive in its native range; DeBecker et al. (4) reported that Glyceria maxima never attained a density greater than 20% in Belgian wetlands.
III. Invasive in Similar Habitat Types	1. Upland ☐ Wetland ☒ Dune ☐ Prairie ☐ Aquatic ☐ Forest ☐ Grassland ☐ Bog ☐ Fen ☒ Swamp ☐ Marsh ☒ Lake ☐ Stream ☒ Other: Semi-aquatic or shallow water habitats, wet ditches, margins of rivers and streams. Full sun to part shade.
IV. Habitat Effected	1. Soil types favored (e.g. sand, silt, clay, or combinations thereof, pH): Wet but well-aerated soils.
	2. Conservation significance of threatened habitats: Wetlands provide billions of dollars annually in ecosystems services. Simplified and homogenized systems do not exhibit congruent magnitude of nutrient and carbon sequestration and retention.
V. Native Habitat	1. List countries and native habitat types: Native to temperate Europe and Asia, from Britain to Japan (2) (3).
VI. Legal Classification	1. Listed by government entities? No.
	2. Illegal to sell? YES ☐ NO ☒ Notes: A cultivated variety, G. maxima 'Variegata' is sold commercially in the U.S. (3). Freckmann and Reed (5) mention that Glyceria maxima has the potential to become invasive in Wisconsin. Considered a Category 1 Invasive Exotic Species in Ontario (6).
B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS	
I. Life History	1. Type of plant: Annual ☐ Biennial ☐ Monocarpic Perennial ☐ Herbaceous Perennial ☒ Vine ☐ Shrub ☐ Tree ☐
	2. Time to Maturity:
	3. Length of Seed Viability:
	4. Methods of Reproduction: Asexual ☒ Sexual ☒ Please note abundance of propagules and and other important information: Main form of spread appears to be from rhizomes

	5. Hybridization potential: Possibly high. Flora of North America (2) reports that several species of Glyceria intergrade, and three known hybrids are described.
II. Climate	1. Climate restrictions:
	2. Effects of potential climate change: Unknown.
III. Dispersal Potential	1. Pathways - Please check all that apply: Intentional: Ornamental ☒ Forage/Erosion control ☒ Medicine/Food: Other: Unintentional: Bird ☐ Animal ☐ Vehicles/Human ☐ Wind ☐ Water ☐ Other:
	2. Distinguishing characteristics that aid in its survival and/or inhibit its control: Taller and more robust than native Glycerai species (7). Spreads vegetatively. Can produce up to 1.5 kg/m2 biomass per growing season (8). Can form very dense mats and outcompete all vegetation, including cattails and reed canary grass. Can suppress woody tree and shrub saplings from becoming established.
IV. Ability to go Undetected	1. HIGH ☒ MEDIUM ☐ LOW ☐
C. DAMAGE POTENTIAL	
I. Competitive Ability	1. Presence of Natural Enemies:
	2. Competition with native species: Aggressive clonal invader; rhizomes constitute 40 - 55% of total plant biomass (8). Competitive ability is enhanced by nutrient enrichment. Begins growth early in the spring, before native species (3).
	3. Rate of Spread: HIGH(1-3 yrs) ☐ MEDIUM (4-6 yrs) ☒ LOW (7-10 yrs) ☐ Notes: At present, G. maxima appears to be expanding (2).
II. Environmental Effects	1. Alteration of ecosystem/community composition? YES ☒ NO ☐ Notes: G. maxima reduces plant species diversity (9). Can form monoculture
	2. Alteration of ecosystem/community structure? YES ☒ NO ☐ Notes: Glyceria maxima stands are taller than the native communities they replace.
	3. Alteration of ecosystem/community functions and processes? YES ☒ NO ☐ Notes: G. maxima displaces native species that provide seed for wildlife, and is a poor food-plant and nesting substrate for wildlife (9).

F. REFERENCES USED:

	4. Allelopathic properties? YES ☐ NO ☐ Notes:
D. SOCIO-ECONOMIC Effects	
I. Positive aspects of the species to the economy/society:	Notes: Ornamental variety, Varigata, is commerically grown and provides revenue for nursery and landscaping industries. Varigate stays short and seems to spread rhizomatically.
II. Potential socio-economic effects of restricting use:	Notes: Probably negligible; not widely used in landscape architecture and not a major component of nursery sales.
III. Direct and indirect effects :	Notes: N/A
IV. Increased cost to a sector:	Notes: Glyceria maxima is palatable to grazers, but can cause cyanide poisoning in cattle (2) (10) (11).
V. Effects on human health:	Notes: N/A
E. CONTROL AND PREVENTION	
I. Costs of Prevention (including education; please be as specific as possible):	Notes:
II. Responsiveness to prevention efforts:	Notes: Active monitoring and rapid intervention prevented spread in Massachusetts natural areas (3).
III. Effective Control tactics:	Mechanical ☒ Biological ☐ Chemical ☒ Times and uses: Grazing is not recommended. Herbicide treatments during early summer or late summer months are effective if repeated over consecutive growing seasons. Tarping is very effective on small clones (3). Mowing in autumn may deplete carbohydrate reserves required for spring regrowth (12), particularly if stubble is flooded (11).
IV. Minimum Effort:	Notes: Depends on the degree of infestation. Small, scattered populations require management for a minimum of two growing seasons (3).
V. Costs of Control:	Notes: N/A
VI. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: N/A
VII. Non-Target Effects of Control:	Notes: Control may require the use of herbicides and additives.
VIII. Efficacy of monitoring:	Notes: Probably very useful, as this species is not yet widespread.
IX. Legal and landowner issues:	Notes: DNR approval and permitting may be required for control in some wetland projects.

☒ UW Herbarium
☐ WI DNR
☒ TNC
☐ Native Plant Conservation Alliance
☐ IPANE
☒ USDA Plants

Number	Reference
1	Wisconsin State Herbarium. 2007. WISFLORA: Wisconsin Vascular Plant Species (http://www.botany.wisc.edu/wisflora/). Dept. Botany, Univ. Wisconsin, Madison, WI 53706-1381 USA.
2	Flora of North America (2007) volume 24, Poaceae, part 1.
3	TNC website.
4	DeBecker, P., M. Hermy, and J. Butaye. 1999. Ecohydrological Characterization of a Groundwater-fed Alluvial Floodplain Mire. Applied Vegetation Science 2:215-228.
5	Freckmann, R.W., and D.M. Reed. 1979. Glyceria maxima, a New, Potentially Troublesome Weltand Weed. Bulletin of the Botanical Club of Wisconsin 11:30-35.
6	Washington State Noxious Weed Control Board (www.nwcb.wa.gov). Reed Sweetgrass Factsheet.
7	Crow, G.E., and C.B. Hellquist. 2000. Aquatic and Wetland Plants of Northeastern North America, vol. 2, Angiosperms: Monocotyledons. University of Wisconsin Press.
8	Westlake, D.F. 1966. The Biomass and Productivity of Glyceria maxima: I. Seasonal Changes in Biomass. The Journal of Ecology 54(3):745-753.
9	Anderson, J.E., and Reznicek, A.A. 1994. Glyceria maxima (Poaceae) in New England. Rhodora 96:97-101.
10	Sundblad, K., and H.B. Wittgren. 1989. Glyceria maxima for Wastewater Nutrient Removal and Forage Production. Biological Wastes 27(1):29-42.
11	Barton, N.J., S. McOrist, D.S. McQueen, and P.F. O'Connor. 1983. Poisoning of Cattle by Glyceria maxima. Australian Veterinary Journal 60(7):220-221.
12	Sundblad, K., and K. Robertson. 1988. Harvesting Reed Sweetgrass (Glyceria maxima, Poaceae): Effects of Growth and Rhizome Storage of Carbohydrates. Hydrobiologia 340:259-263.

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