NAME OF SPECIES: *Digitalis lanata* Ehrh.	
Synonyms:	
Common Name: Grecian foxglove, woolly digitalis, woolly foxglove, digitalis	**Cultivars?** YES ☒ NO ☐
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES ☒ NO ☐
	2. Abundance: There have been 6 herbarium specimens of D. lanata collected in Wisconsin. The more recent records indicate a large established stand (1).
	3. Geographic Range: Older record in Dane, 2 in Milwaukee, most recent in Portage (1, 2). Large and numerous populations just on W. (MN) side of St. Croix river
	4. Habitat Invaded: grasslands, oak openings, forest, river edges and bluffs, roadsides, yards. Disturbed Areas ☒ Undisturbed Areas ☒
	5. Historical Status and Rate of Spread in Wisconsin: The first recorded herbarium specimen is from 1955 (1).
	6. Proportion of potential range occupied: Probably only occupies a fraction of its potential range.
II. Invasive in Similar Climate Zones	1. YES ☒ NO ☐ Where (include trends): Minnesota (6) and Kansas (8). There are >150 reports of D. lanata in Minnesota, all occuring near the Mississippi River east of Mnpls and at Kellogg (6).
III. Invasive in Which Habitat Types	1. Upland ☒ Wetland ☐ Dune ☐ Prairie ☒ Aquatic ☐ Forest ☒ Grassland ☒ Bog ☐ Fen ☐ Swamp ☐ Marsh ☐ Lake ☐ Stream ☒ Other: Savanna (6), open roadsides, residential yards, river bluffs, and forest margins (7).
IV. Habitat Affected	1. Soil types favored or tolerated: D. lanata grows best in well-drained, loamy sand soils (5).
	2. Conservation significance of threatened habitats: D. lanata grows in single-species stands and is a threat to prairie and savanna communities (6).
V. Native Range and Habitat	1. List countries and native habitat types: D. lanata is native to temperate Asia and Europe, particularly Turkey, Hungary, Moldova, Ukraine, Albania, Bulgaria, Greece, and Romania (4).
VI. Legal Classification	1. Listed by government entities? Listed in Minnesota as a prohibited noxious weed – eradicate (7). Kansas enacted a permanent quarantine on Grecian foxglove in 2001 (8).
	2. Illegal to sell? YES ☒ NO Notes:
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: Grecian foxglove forms a rosette its first year then bolts and sends up a single flowering stem its second and subsequent years (7).
	3. Length of Seed Viability: "Grime et al. (1988) state that the cogener D. purpurea forms a persistent seed bank; no studies regarding D. lanata seed banking located. The genus is generally

	known to have seeds that remain viable for longer than a year; no evidence greater than 10 years" (9).
	4. Methods of Reproduction: Asexual ☐ Sexual ☒ Notes: Each plant produces dozens of capsules, each capsule with copious seed. (9).
	5. Hybridization potential: Multiple species of Digitalis can hybridize, but no hybrids have been reported in Minnesota (7).
II. Climate	1. Climate restrictions:
	2. Effects of potential climate change:
III. Dispersal Potential	1. Pathways - Please check all that apply: Unintentional: Bird ☐ Animal ☒ Vehicles/Human ☒ Wind ☒ Water ☒ Other: Moving soil containing D. lanata seeds (7). Intentional: Ornamental ☒ Forage/Erosion control ☐ Medicine/Food: ☒ Other: Cultivated for medicinal purposes. Cultivated as an ornamental, available on garden web sites (9).
	2. Distinguishing characteristics that aid in its survival and/or inhibit its control: Prolific seed production (7).
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: Outcompetes most native species where found in MN
	2. Rate of Spread: -changes in relative dominance over time: -change in acreage over time: HIGH(1-3 yrs) ☒ MEDIUM (4-6 yrs) ☐ LOW (7-10 yrs) ☐ Notes: Produces large numbers of seed in 2nd and subsequent years
II. Environmental Effects	1. Alteration of ecosystem/community composition? YES ☒ NO ☐ Notes:
	2. Alteration of ecosystem/community structure? YES ☒ NO ☐ Notes: Often will establish in existing layer without influencing its structure, but in sparsley vegetated areas, it can increase the density of the herb layer (9).
	3. Alteration of ecosystem/community functions and processes? YES ☐ NO ☐ Notes:
	4. Allelopathic properties? YES ☐ NO ☐ Notes:

D. SOCIO-ECONOMIC EFFECTS	
I. Positive aspects of the species to the economy/society:	Notes: Cultivated for medicinal (purpleglycosides, gytoxine, and digitoxine, glycosides used in heart diseases) purposes. Cultivated as an ornamental, available on garden web sites (9). Based on the 2011 WNA Economic Impact Survey, the following information was reported for this plant. Out of the 204 nurseries responding, 8 reported selling this plant. 7 reported it comprised <1% of their gross plant sales. The estimated total dollar amount contributed to Wisconsin's economy by this plant is $11,403. It ranks 42nd among the 63 taxa surveyed. The estimated wholesale value of plants in production is $3,000. The majority of respondents said it took <6 months to produce this plant. The trend for the 2011 season was to remain unchanged (10).
II. Potential Socio-Economic Effects of Requiring Controls:	Positive: minimize the spread and impacts on pastures, hay fields and natural areas Negative: some costs of controls
III. Direct and indirect Socio-Economic Effects of Plant :	Notes: D. lanata contains digitalis and digoxin, which can be fatal to horses and cattle if small amounts of fresh or dried plant material is ingested (5). Spreads abundantly in hay meadows in KS
IV. Increased Costs to Sectors Caused by the Plant::	Notes: Dead and sick cattle and other animals, Loss of productive hay fields and pastures. Ecological costs to natural areas.
V. Effects on human health:	Notes: Extremely toxic, even a small amount ingested can cause death. D. lanata contains chemicals that are used in effective heart medicines for heart failure. There are reports of human sensitivity and reaction from bare skin contact with the plant (5).
VI. Potential socio-economic effects of restricting use:	Positive: Minimizing the spread into ag lands and natural areas. Negative: Some nurseries would have to stop sales and possibly destroy stock.
E. CONTROL AND PREVENTION	
I. Costs of Prevention (please be as specific as possible):	Notes: Monitoring and control to prevent seed production. Not allowing movement of infested hay.
II. Responsiveness to prevention:	Notes:
III. Effective Control tactics: (provide only basic info)	Mechanical ☒ Biological ☐ Chemical ☒ Times and uses: According to a study conducted by the Minnesota DOT, the herbicide that worked most effectively was Metsulfron methyl (Msm) (5). Frequent mowing during the growing season for multiple years may control it if flowering is prevented (7).
IV. Costs of Control:	Notes:
V. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: Still feasible to locate and control in early detection phase. Once widespread the cost of control and loss of ag lands will be high
VI. Non-Target Effects of Control:	Notes: Applying Msm too heavy results in high mortality of cool-season grasses (5).
VII. Efficacy of monitoring:	Notes: For all management methods, it is important to monitor several years after treatment due to germination from the Grecian foxglove seedbank (7). Easy to monitor when flowering.
VIII. Legal and landowner issues:	Notes: Since D. lanata has been planted as an ornamental, control of this species would require landowner cooperation.
F. HYBRIDS AND CULTIVARS AND VARIETIES	

I. Known hybrids? YES ☒ NO ☐	Name of hybrid: *Digitalis × rhodopaea* Toman & Stary *Digitalis × sibirica* Lindl. *Digitalis × ujhelyii* B.Augustin & Szathm. *Digitalis × velenovskyana* B.Augustin & Szathm. (3).
	Names of hybrid cultivars:
II. Species cultivars and varieties	Names of cultivars, varieties and any information about the invasive behaviors of each: 'Café Crème', 'Herbaria', 'Oxfordi', 'Spice Island' (D. lanata x grandiflora) (9) One of the twelve respondents to the nursery survey reported growing Camelot cultivars. No one commented on the invasiveness of *D. lanata*. (10)
	Notes:

G. REFERENCES USED:

☒ UW Herbarium (Madison or Stevens Point)
☐ WI DNR
☐ Bugwood (Element Stewardship Abstracts)
☐ Native Plant Conservation Alliance
☐ IPANE
☐ USDA Plants

Number	Reference
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4	USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN).* National Germplasm Resources Laboratory, Beltsville, Maryland. Accessed 03-08-2011. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?13979.
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10	Wiegrefe, Susan. 2011. Wisconsin Nursery Association Survey of the Economic impact of potentially invasive species in Wisconsin

Author(s), Draft number, and date completed: Emily St. Aubin

Reviewer(s) and date reviewed: Kelly Kearns, 10/18/2011

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