NAME OF SPECIES: *Ulmus pumila* L.		
Synonyms: *Ulmus manshurica* Nakai;		
Common Name: Siberian Elm, dwarf elm, littleleaf elm	**Cultivars?** YES ☒ NO ☐	
A. CURRENT STATUS AND DISTRIBUTION		
I. In Wisconsin?	1. YES ☒	NO ☐
	2. Abundance: Widespread throughout Wisconsin	
	3. Geographic Range: 25 counties from all over the state have UW-Madison herbarium records for this species.	
	4. Habitat Invaded: Disturbed woods; edge of ponds; lowlands; fields; Disturbed Areas ☒ Undisturbed Areas ☒	
	5. Historical Status and Rate of Spread in Wisconsin: Introduced and naturalized. Often cultivated by landowners for use as windbreaks and lumber. Siberian elm is a fast-growing tree that was introduced to the United States in the 1860's. (1,4)	
	6. Proportion of potential range occupied: Moderate	
II. Invasive in Similar Climate Zones	1. YES ☒ NO ☐ Where (include trends): Minnesota, Illinois, Michigan, Pacific NW, plains states (1). AZ, IA, ID, IL, IN, KS, KY, MA, MD, MI, MN, MO, NE, NM, NV, OH, OK, OR, PA, TX, UT, VA, WA, WI, WV (2)	
III. Invasive in Which Habitat Types	1. Upland ☒ Wetland ☐ Dune ☐ Prairie ☒ Aquatic ☐ Forest ☒ Grassland ☒ Bog ☐ Fen ☐ Swamp ☐ Marsh ☐ Lake ☐ Stream ☐ Other: Dry and mesic prairies, areas along stream banks in Minnesota and forested areas and high elevations in Arizona. (2)	
IV. Habitat Affected	1. Soil types favored or tolerated: Prefers well-drained, fertile soil, full sun, and succeeds well in arid regions. The tree also grows in moist soils along streams. (4)	
	2. Conservation significance of threatened habitats: Fast growing seedlings of Siberian elm quickly overtake native vegetation, especially shade-intolerant species. This often leads to invasion by additional weedy species, compounding the problem. (2)	
V. Native Range and Habitat	1. List countries and native habitat types: Native to Central Asia, eastern Siberia, Mongolia, northern China, India and Korea.	
VI. Legal Classification	1. Listed by government entities? New Hamsphire has it listed as a Watch Species. (8) Listed in AZ (9). New Mexico: Class C noxious Weed	
	2. Illegal to sell? YES ☐ NO ☒ Notes: Sold at commercial retailers such as Walmart, seeds available from many online retailers as well.	
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: Very rapidly growing seedlings (As much as 5' of growth per year). (6)	
	3. Length of Seed Viability: Evidence for viability of seeds in storage up to eight years; no evidence for longer than 10 (10).	
	4. Methods of Reproduction: Asexual ☒ Sexual ☐ Notes:	

	5. Hybridization potential: Can hybridize with other elm species to produce viable offspring.
II. Climate	1. Climate restrictions: Prefers full sun, is very hardy to cold temperatures and grows well in arid soil.
	2. Effects of potential climate change:
III. Dispersal Potential	1. Pathways - Please check all that apply: Unintentional: Bird ☐ Animal ☐ Vehicles/Human ☐ Wind ☒ Water ☒ Other: Fruits are readily dispersed long distance by water and wind (10). Intentional: Ornamental ☐ Forage/Erosion control ☐ Medicine/Food: Other: They are planted and cultivated to protect livestock, enhance production, and control soil erosion. (4)
	2. Distinguishing characteristics that aid in its survival and/or inhibit its control: The trees are very drought and cold resistant allowing it to grow in areas where other trees cannot. (1) Germination rate is high and seedlings soon establish in the bare ground found early in the growing season. (2) Thousands of seeds produced per individual in spring. Unlike other elms. U. pumila is self-compatible (10).
IV. Ability to go Undetected	1. HIGH ☐ MEDIUM ☐ LOW ☒
C. DAMAGE POTENTIAL	
I. Competitive Ability	1. Presence of Natural Enemies: Common diseases include Tubercularia canker, Botryodiplodia canker and wetwood. Common insect pests include cankerworm. Very sensitive to phenoxy herbicides. (3)
	2. Competition with native species: Siberian elm forms dense thickets that close open areas and displace native vegetation, thereby reducing forage for wild animals and livestock. (1)
	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: Germination rate is high and seedlings soon establish in the bare ground found early in the growing season. (2)
II. Environmental Effects	1. Alteration of ecosystem/community composition? YES ☒ NO ☐ Notes: Invasion by other non-native species often follows invasion by *Ulmus pumila*. Seedlings may form dense thickets. (6)
	2. Alteration of ecosystem/community structure? YES ☒ NO ☐ Notes: Seedlings will grow fast (up to 20 m (~60 feet) tall, overtaking and shading out native vegetation. (6) Species can increase density in the tree understory layer (10).
	3. Alteration of ecosystem/community functions and processes? YES ☐ NO ☐ Notes: No studies known on impacts of U. pumila to natural

	ecosystem processes or systemwide parameters (10)
	4. Allelopathic properties? YES ☐ NO ☒ Notes:
D. SOCIO-ECONOMIC EFFECTS	
I. Positive aspects of the species to the economy/society:	Notes: There are many commercial growers of this species and has agricultural value to some farmers. (7) Based on the 2011 WNA Economic Impact Survey, the following information was reported for this plant. Out of the 204 nurseries responding, 4 reported selling this plant. 0 reported it comprised <1% of their gross plant sales. 1 reported it comprised 1 – 2.9% of their gross plant sales. The estimated total dollar amount contributed to Wisconsin's economy by this plant is $317,500 (2 growers disclosed). It ranks 7th among the 63 taxa surveyed. The estimated wholesale value of plants in production is $92,500. The majority of respondents said it took over 5 years to produce this plant. The trend for the 2011 season was to remain unchanged (11).
II. Potential Socio-Economic Effects of Requiring Controls:	Positive: Negative:
III. Direct and indirect Socio-Economic Effects of Plant :	Notes:
IV. Increased Costs to Sectors Caused by the Plant::	Notes:
V. Effects on human health:	Notes:
VI. Potential socio-economic effects of restricting use:	Positive: Negative:
E. CONTROL AND PREVENTION	
I. Costs of Prevention (please be as specific as possible):	Notes: Species is already widely present in Wisconsin. Prevention would require regular controlled burns to prevent the wind-spread seeds from germinating.
II. Responsiveness to prevention efforts:	Notes:
III. Effective Control tactics: (provide only basic info)	Mechanical ☒ Biological ☐ Chemical ☒ Times and uses: Girdling trees is the preferred management technique where practical. Girdle large trees in late spring to mid-summer when sap is flowing and the bark easily peels away from the sapwood. Girdled trees die slowly over the course of one to two years and do not resprout. When girdling a tree, the bark and phloem must be removed from a band around the tree trunk and the xylem must remain intact. If girdled too deeply, the tree will respond as if it had been cut down and will resprout from the roots. Girdling can be done with an ax, saw, or chainsaw. Two parallel cuts 3-4 inches apart, cutting through the bark slightly deeper than the cambium are needed. The bark is knocked off

	using a blunt object like the head of an ax. The girdles should be checked every several weeks at first to make sure they are good and bark does not develop over the cut area. If girdling is not an option, trees can be cut, and any resprouts that occur subsequently should also be cut. (3) *For long term management of Siberian elm, reduction of seed sources is essential.* Glyphosate may be used as a cut-stem application for large trees and resprouts. A 10-20% active ingredient concentration has proven to be effective, and should be applied in the fall or winter. If herbicide is used, care should be taken to prevent contact with nontarget species. (3)
IV. Costs of Control:	Notes:
V. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: Already widespread throughout the US, removal cost for adult trees is high, seeds spread readily by wind and must be controlled by burning. Has a moderate to high impact on ecological community composition and structure.
VI. Non-Target Effects of Control:	Notes: Herbicide use can result in non-target damage, digging roots can increase disturbance and risk invasion from other non-native species. (6)
VII. Efficacy of monitoring:	Notes: Trees girdled in mid-May to early July will die over 1-2 years without sprouting if cut properly. Resprouts readily from root fragments. (3,6)
VIII. Legal and landowner issues:	Notes: They are planted and cultivated to protect livestock, enhance production, and control soil erosion. (4)
F. HYBRIDS AND CULTIVARS AND VARIETIES	
I. Known hybrids? YES ☒ NO ☐	Name of hybrid: *U.* x 'Green King *U.* x 'Vanguard *U.* x 'Sapporo Autumn Gold' *U.* x 'Cathedral' *U.* x 'New Horizon'
	Names of hybrid cultivars:
II. Species cultivars and varieties	Names of cultivars, varieties and any information about the invasive behaviors of each: Dropmore Sapporo Autumn Gold Elm Cathedral Elm New Horizon Elm Green King Hybrid Elm All resistant to Dutch Elm Disease, making them more viable and capable of invasive growth. Nursery survey respondents reported growing Regal, Princeton, Pioneer, Homestead. They reported varying degrees of invasiveness; two reported distaste or lack of need for tree. (11)

	Notes: Subordinate taxa (10): U. pumila var. arborea; syn: *Ulmus turkestanica* Regel U. pumila var. pilosa

G. REFERENCES USED:

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

Number	Reference
1	http://www.invasiveplantatlas.org/subject.html?sub=3479
2	http://www.dcnr.state.pa.us/forestry/invasivetutorial/siberian_elm.htm
3	http://www.dcnr.state.pa.us/forestry/invasivetutorial/siberian_elm_M_C.htm
4	http://www.invasive.org/eastern/other/pg_ulpu.pdf
5	http://www.ag.ndsu.edu/trees/handbook/th-3-117.pdf
6	http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=137202&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=137202&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=137202
7	http://www.in.gov/dnr/files/Official_Siberian_Elm_Assessment.pdf
8	http://www.nashuarpc.org/LMRLAC/documents/invasiveplants.pdf
9	http://sbsc.wr.usgs.gov/research/projects/swepic/SWVMA/InvasiveNon-NativePlantsThatThreatenWildlandsInArizona.pdf
10	Jordan, M.J., G. Moore and T.W. Weldy. 2008. Invasiveness ranking system for non-native plants of New York. Unpublished. The Nature Conservancy, Cold Spring Harbor, NY; Brooklyn Botanic Garden, Brooklyn, NY; The Nature Conservancy, Albany, NY. http://www.newyorkinvasivespecies.org/PlantAssessments/Ulmus.pumila.NYS.pdf
11	Wiegrefe, Susan. 2011. Wisconsin Nursery Association Survey of the Economic impact of potentially invasive species in Wisconsin

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