NAME OF SPECIES: Rhamnus cathartica L. (1)	
Synonyms:	
Common Name: common buckthorn, European buckthorn (1). Carolina buckthorn, European waythorn, Hart's thorn, Rhineberry (6) (11).	
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES ☒ NO ☐
	2. Abundance: 156 reported occurrences (1), however this species is vastly under-reported
	3. Geographic Range: Reported from 34 counties in WI (1), however anecdotal evidence suggests it is more widespread.
	4. Habitat Invaded: Woodland edge, Oak woods, degraded prairie, Shrub carr, Northern Lowland forest (1). Disturbed Areas ☒ Undisturbed Areas ☒
	5. Historical Status and Rate of Spread in Wisconsin: The first recorded sighting is from 1887. There are now 156 reported occurrences in 34 counties in WI. (1). However this species is vastly under-reported.
	6. Proportion of potential range occupied: Since this species is so successful in a wide spectrum of habitat types it has invaded a small portion of its potential range.
II. Invasive in Similar Climate Zones	1. YES ☒ NO ☐ Where (include trends): New England States, NY, Ontario (2) (9)
III. Invasive in Similar Habitat Types	1. Upland ☒ Wetland ☒ Dune ☐ Prairie ☒ Aquatic ☐ Forest ☒ Grassland ☒ Bog ☐ Fen ☒ Swamp ☒ Marsh ☒ Lake ☒ Stream ☒ Other: Lake edges, Streambanks, Old fields, Roadsides, Shrub carr, (9). Open Oak woodlands (5). Natural forests, planted forests, range/grasslands, scrub/shrublands (11). Savannas and prairies (16).
IV. Habitat Effected	1. Soil types favored (e.g. sand, silt, clay, or combinations thereof, pH): Buckthorn can tolerate many soil types and sunny habitats (5). It is tolerant of many soil types, well drained sand, clay, poorly drained calcareous, neutral or alkaline, wet or dry (11).
	2. Conservation significance of threatened habitats: Some of the Savanna and Barrens communities in WI under threat from this species are ranked G1- G2 and S1- S2. Some of the Upland Herbaceous communities in WI under threat from this species are ranked G2 - G3 and S1 - S3. Some of the Wetland Herbaceous communities in WI under threat from this species are ranked S1 - S3. (4).
V. Native Habitat	1. List countries and native habitat types: Northern Africa, Europe and Central Asia (3) (5) (11). R. cathartica is usually found in open areas or forest edges in its native distribution (12).
VI. Legal Classification	1. Listed by government entities? Connecticut: Invasive - Banned; Iowa: Primary Noxious Weed; Massachusetts: Prohibited; Minnesota: Restricted Noxious Weed; New Hampshire: Prohibited Invasive Species; Vermont: Class B Noxious Species. (2)
	2. Illegal to sell? YES ☒ NO ☐ Notes: Connecticut, Massachusetts, Minnesota, New Hampshire,

	Vermont (2). Illinois (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: Reproduction has been reported in shrubs 9–20 years old in North America and four and 11 years old in Europe. However, fruit production and age and size at reproduction may depend on growing conditions, especially open wetlands vs. upland woodlands. (12).
	3. Length of Seed Viability: NA
	4. Methods of Reproduction: Asexual ☐ Sexual ☒ Please note abundance of propagules and and other important information: Natural reproduction is primarily sexual; asexual means are absent or insignificant (11).
	5. Hybridization potential: Possible hybrid produced with R. utilis (17).
II. Climate	1. Climate restrictions: NA
	2. Effects of potential climate change: NA
III. Dispersal Potential	1. Pathways - Please check all that apply: Intentional: Ornamental ☒ Forage/Erosion control ☒ Medicine/Food: ☒ Other: R. cathartica was introduced to North America as an ornamental shrub, for fence rows, shelterbelts, hedges, forestry uses, and wildlife habitat. (11). The fruit is used by some for the cathartic properties they possess. (3) (10) Unintentional: Bird ☒ Animal ☒ Vehicles/Human ☐ Wind ☐ Water ☒ Other: R. cathartica retains fruit into, or throughout, the winter. Because the fruit is retained on the plant longer and is therefore more visible to birds, seeds may be dispersed more frequently over long distances. Mice and wood ducks will also eat the fruit and distribute the seeds. The water dispersal is hypothetical, however the dry fruit of R. cathartica can float six days and seeds float three days before sinking. (5)(11)
	2. Distinguishing characteristics that aid in its survival and/or inhibit its control: The wide habitat tolerance of R. cathartica may contribute to its success (12). An extended growing season likely gives R. cathartica a competitive advantage over native plant species (11). The ability of R. cathartica to both tolerate shady conditions and grow quickly in open conditions may give it an advantage in forest gaps (12). The suppression of understory plants leads to a depletion in fine fuels limiting the effectiveness of using Rx fire to control it (5) (11).
IV. Ability to go Undetected	1. HIGH ☐ MEDIUM ☐ LOW ☒
C. DAMAGE POTENTIAL	

I. Competitive Ability	1. Presence of Natural Enemies: NA
	2. Competition with native species: R. cathartica leaves remain on the tree an average of 58 days longer than its native counterparts, Cornus racemosa and Prunus serotina. Its leaves emerge earlier and senesce later. In both cases, upper canopy foliage is largely absent. Consequently, photosynthesis under high light availability conditions is significantly greater for R. cathartica than for native shrub species. (11)
	3. Rate of Spread: HIGH(1-3 yrs) ☐ MEDIUM (4-6 yrs) ☒ LOW (7-10 yrs) ☐ Notes: Age structures of R. cathartica populations show that once a few plants mature, populations can grow quickly (12).
II. Environmental Effects	1. Alteration of ecosystem/community composition? YES ☒ NO ☐ Notes: Buckthorn can form even-aged, dense thickets shading out natives and often obliterating them. Dense buckthorn seedlings prevent native tree and shrub regeneration. (5) (11) In a study done by the Zoological Society of Milwaukee, fewer arthropods were found on common and glossy buckthorn than on eleven species of native trees and shrubs. Thirty-two samples of red oak branch clippings, for example, contained a total of 328 arthropods while the same number of common buckthorn clippings had only 58 arthropods. (6)
	2. Alteration of ecosystem/community structure? YES ☒ NO ☐ Notes: Buckthorn can form monotypic, even-aged stands. In an open site, R. cathartica establishment is followed by lateral crown spread. This extension continues until branches touch adjacent shrubs. The large leaves and continuous canopy create dense shade. Even-aged thickets are common in both wetlands and in woodland. (5) (11) R. cathartica impacts ecosystems through elimination of the leaf litter layer (12).
	3. Alteration of ecosystem/community functions and processes? YES ☒ NO ☐ Notes: Buckthorn suppresses fire in fire-adapted communities, such as savannas and prairies, because the lack of vegetation under buckthorn prohibits fires (5) (11). The litter of R. cathartica decomposes rapidly, and promotes the rapid decomposition of litter in the forest floor adjacent to where it grows. In addition, soils under R. cathartica have been shown to have modified nutrient cycling – with a higher percent N and C - an impact that may persist after the plant has been physically removed. (11) (12) R. cathartica possibly facilitates earthworm invasions (12).
	4. Allelopathic properties? YES ☐ NO ☐ Notes: Allelopathy is suspected but unsubstantiated (12).
D. SOCIO-ECONOMIC Effects	
I. Positive aspects of the species	Notes: A horticultural and landscaping species (11).

to the economy/society:	
II. Potential socio-economic effects of restricting use:	Notes: An internet search turns up no nurserys currently selling R. cathartica on line. Need ###'s of anyone stocking this species.
III. Direct and indirect effects :	Notes: Buckthorn is a an alternate host of the crown rust of oats, which affects oat yield and quality. It is also a host for the soybean crop pest Aphis glycines, the soybean aphid. (3) (5) (11) The crown rust can also be a threat to lawns (18).
IV. Increased cost to a sector:	Notes: NA
V. Effects on human health:	Notes: The berries contain glycosides whose low toxicity can cause nausea, vomiting, and diarrhea. However it is also used by some for the cathartic properties. (3) (10)
E. CONTROL AND PREVENTION	
I. Costs of Prevention (including education; please be as specific as possible):	Notes: NA
II. Responsiveness to prevention efforts:	Notes: NA
III. Effective Control tactics:	Mechanical ☒ Biological ☐ Chemical ☒ Times and uses: In wetlands, where the water table has been artificially lowered, restoration of water levels often will kill R. cathartica (11). Fire is very effective for control. In the upper Midwest conduct burns as soon as leaf litter is dry; resprouts will be less vigorous due to low carbohydrate levels. Burning every year or every other year in established stands may be required for 5-6 years or more. In dense stands, where leaf litter is limited, seedlings and saplings may be cut and dropped on site, creating fuel for future fires. Buckthorn seedlings appear vulnerable to fire, perhaps due to their poorly established root structure. Fire will top kill a mature plant, but resprouting does occur. (5) (15) Follow-up burning of seedlings and sprouts from root crowns with torches is found to be effective and efficient (14). Careful application of herbicides has been found to effectively control buckthorn in Illinois. Excellent results were achieved using a triclopyr herbicide at the rate of 1:4 herbicide:water with dye on cut stumps during the growing season, from late May to October. The use of a triclopyr herbicide was also applied to cut stumps during winter and was reported to be effective. Frill application (applying herbicide into the cambial layer of fresh cuts on the tree trunk) using the 1:4 rate of triclopyr herbicide with oil and dye was also effective. Experiments at the University of Wisconsin Arboretum report good results using a mixture of 1 part triclopyr herbicide to 7 parts oil on cut stumps, or a 1 part triclopyr herbicide to 16 parts oil mixture applied as a basal bark treatment to stems less than 3 inches across. For fall applications, the Minnesota Department of Natural Resources, Region V State Parks Resource Management has used a 1 part glyphosate herbicide to 5 parts water mixture applied immediately to cut stumps using a hand sprayer. Initial checks indicated over 85 percent control at the test site. (5) (15) Seedlings can be sprayed in fall after the native plants

	have gone dormant with a 1.5%a.i. glyphosate or a 1% a.i. solution of triclopyr with water to the foliage using a long handled wick or low pressure spray. (6) There is current research into biological controls; however none are expected to be available until 2007-2010 (6).
IV. Minimum Effort:	Notes: The most effective is to remove small seedlings when they first occur, easily done by hand-pulling or using a weed wrench. However, care should be taken to avoid excessive disturbance to the soil, which can release buckthorn seeds stored in the soil. (15) (6)
V. Costs of Control:	Notes: TNC has control costs of approximately $500-$700 /acre in forested sites in Southern WI. (13)
VI. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: NA
VII. Non-Target Effects of Control:	Notes: If spraying herbicides after the first killing frost, native forbs can be avaoided (5) (6).
VIII. Efficacy of monitoring:	Notes: Monitoring is very efficacious as it is very easy to remove small seedlings when they first occur (6).
IX. Legal and landowner issues:	Notes: This species is a widely planted and popular ornamental, and is commonly found on private land, so some access issues will arise and cooperation with landowners for management will be necessary.

F. REFERENCES USED:

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