

NAME OF SPECIES: <i>Lespedeza cuneata</i> (Dum.Cours.) G.Don (1)	
Synonyms: • <i>Lespedeza juncea</i> (L.f.) Pers. var. <i>sericea</i> Forbes & Hemsl. • <i>Lespedeza sericea</i> (Thunb.) Miq. (1). <i>Aspalathus cuneata</i> D. Don (3). • <i>Anthyllis cuneata</i> Dum. Cours. (basionym) • <i>Hedysarum sericeum</i> Thunb. • <i>Lespedeza juncea</i> f. <i>latissima</i> Matsum. [= <i>Lespedeza cuneata</i> var. <i>serpens</i>] • <i>Lespedeza juncea</i> subsp. <i>sericea</i> (Maxim.) Steenis • <i>Lespedeza juncea</i> var. <i>sericea</i> Maxim. • <i>Lespedeza latissima</i> (Matsum.) Nakai [= <i>Lespedeza cuneata</i> var. <i>serpens</i>] • <i>Lespedeza serpens</i> Nakai [= <i>Lespedeza cuneata</i> var. <i>serpens</i>] (6)	
Common Name: Chinese lespedeza, <i>sericea</i> , silky bush-clover (1). Chinese bush-clover (6)	
A. CURRENT STATUS AND DISTRIBUTION	
I. In Wisconsin?	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
	2. <u>Abundance</u> : One occurrence reported from Green County, 1956. (1) This species is probably under-reported.
	3. <u>Geographic Range</u> : Green County, south of Brodhead.
	4. <u>Habitat Invaded</u> : Roadside (1). Disturbed Areas <input checked="" type="checkbox"/> Undisturbed Areas <input type="checkbox"/>
	5. <u>Historical Status and Rate of Spread in Wisconsin</u> : First reported in 1956 (1). Recorded again in 2006 in Waukesha County.
	6. <u>Proportion of potential range occupied</u> :
II. Invasive in Similar Climate Zones	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
	<u>Where (include trends)</u> : Chinese lespedeza now occurs from southern New England and Ontario, west to southern Wisconsin, Iowa and Nebraska, and south to Texas and Florida. A "range of adaptation" was identified from southern New Jersey, west through the southern portions of Pennsylvania, Ohio, Indiana, and Illinois, into eastern Kansas, and south to eastern Texas and Florida. While this "range" was originally meant to indicate where Chinese lespedeza might be successfully cultivated in the U.S., it could also describe a general range where it is likely to be invasive. (4). In Polk Country, IA, species is spreading rapidly and is very difficult to control. (9)
III. Invasive in Similar Habitat Types	1. Upland <input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Dune <input type="checkbox"/> Prairie <input checked="" type="checkbox"/> Aquatic <input type="checkbox"/> Forest <input checked="" type="checkbox"/> Grassland <input checked="" type="checkbox"/> Bog <input type="checkbox"/> Fen <input type="checkbox"/> Swamp <input checked="" type="checkbox"/> Marsh <input checked="" type="checkbox"/> Lake <input type="checkbox"/> Stream <input checked="" type="checkbox"/> Other: open woodlands, thickets, stream valleys, around lakes and ponds, waste places and roadsides, prairies and prairie remnants, tallgrass prairie within oak savanna, abandoned pastures, meadows, and pine savannas. (4)
	IV. Habitat Effected
	1. <u>Soil types favored or tolerated</u> : Chinese lespedeza grows on a variety of soil types, with soil textures ranging from clays to sands. Roots can penetrate heavy clay subsoils, and it will grow over hardpan, provided there is a minimum 18 inches (46 cm) of permeable surface soil for root development. Chinese lespedeza will also grow in deep sands that are well supplied with organic matter. It is also apparently somewhat flood tolerant, especially in winter and if flood waters are cool and flowing. Deep, well-developed root systems allow <i>sericea</i> lespedeza to grow on droughty or infertile sites, and it grows relatively well on

	<p>infertile soils where many other plants do not thrive and is probably less competitive on fertile soils. <i>Sercia lespedeza</i> grows on soils ranging from strongly acid to alkaline (pH ranges of 4.0 - 6.5). <i>Sericea lespedeza</i> is relatively tolerant of high levels of soil-soluble aluminum, typical in acidic soils. It appears that aluminum binds with phosphate groups in the DNA of growing root tips, accumulating on root cell walls. <i>Sericea lespedeza</i> thereby can avoid uptake of aluminum at levels that might otherwise be toxic. (4) Can grow in very eroded and sterile soils (2).</p> <p>2. <u>Conservation significance of threatened habitats:</u> In Kansas and Oklahoma, lespedeza has spread to Conservation Reserve Program (CRP) lands from nearby rangelands that used grass seed mixes containing lespedeza (4). Some of the prairies and grasslands in WI that could be threatened by hound's tongue are ranked G2-G3 and S1-S3. Some of the savannas and woodlands in WI that could be threatened by hound's tongue are ranked G1-G2 and S1-S2. (8)</p>
V. Native Habitat	<p>1. <u>List countries and native habitat types:</u> Native in Asia: China; Japan; Korea; Taiwan; Bhutan; India; Nepal; northern Pakistan; Myanmar; Indonesia - Java; Papua New Guinea; Philippines; Also in Australia (6). In its native range in Asia, it grows on exposed ground and grassy lowlands (3).</p>
VI. Legal Classification	<p>1. <u>Listed by government entities?</u> Listed as noxious weeds in CO, KA, MO, NE, OK (5).</p> <p>2. <u>Illegal to sell?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Notes: Colorado, Kansas (5).</p>
B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS	
I. Life History	<p>1. <u>Type of plant:</u> Annual <input type="checkbox"/> Biennial <input type="checkbox"/> Monocarpic Perennial <input type="checkbox"/> Herbaceous Perennial <input checked="" type="checkbox"/> Vine <input type="checkbox"/> Shrub <input type="checkbox"/> Tree <input type="checkbox"/></p> <p>2. <u>Time to Maturity:</u> Flowers in late summer - early fall, seeds in mid to late fall. (4)</p> <p>3. <u>Length of Seed Viability:</u> The data are inconclusive reports suggest 4 -20 years (4). Scarification is necessary for the germination of seeds (3).</p> <p>4. <u>Methods of Reproduction:</u> Asexual <input checked="" type="checkbox"/> Sexual <input checked="" type="checkbox"/> <u>Notes:</u> Seed production rates of 150 million to 300 million seeds/acre have been recorded on agricultural sites specifically cultivated for Chinese lespedeza. Seed production in most natural areas and other uncultivated sites is likely to be less than in agricultural sites but still significant. <i>Sericea lespedeza</i> can resprout after damage from cutting or burning. (4)</p> <p>5. <u>Hybridization potential:</u> Chinese lespedeza does NOT hybridize with the native North American species - creeping lespedeza (<i>L. repens</i>), tall lespedeza (<i>L. stueveii</i>), or slender lespedeza (<i>L. virginica</i>). (4)</p>
II. Climate	<p>1. <u>Climate restrictions:</u> Chinese lespedeza is adapted to the southern portions of Ohio, Pennsylvania, and central New Jersey southward into the southeast states. It is best suited to areas receiving at least 30 inches of rainfall annually. It can survive short periods of subzero temperatures when fully established, but prolonged freezing will contribute to winter kill. (5)</p>

	<p>Young seedlings are relatively cold tolerant and can withstand freezes severe enough to kill early-season sprouts on established plants. A late-spring freeze can damage plants once winter-dormant buds have commenced growth and are exposed. Best growth in habitats with greater than 30 inches precipitation per year. (4)</p> <p>2. <u>Effects of potential climate change:</u></p>
III. Dispersal Potential	<p>1. <u>Pathways - Please check all that apply:</u></p> <p><u>Unintentional:</u> Bird <input type="checkbox"/> Animal <input checked="" type="checkbox"/> Vehicles/Human <input checked="" type="checkbox"/> Wind <input type="checkbox"/> Water <input type="checkbox"/> Other: Haying activities will spread Chinese seed, and livestock can disperse seed in manure. It has spread westward in Kansas and Oklahoma on Conservation Reserve Program (CRP) lands via contaminated native grass seed mixtures collected from Chinese lespedeza-infested rangelands. No Studies have been done to determine if viable seed is spread by birds, wind or water. (4)</p> <p><u>Intentional:</u> Ornamental <input type="checkbox"/> Forage/Erosion control <input checked="" type="checkbox"/> Medicine/Food: <input type="checkbox"/> Other: Chinese lespedeza is used for hay, pasture, erosion control, cover crops, and wildlife food and cover. Commercially available cultivars adapted to the northeast include 'Interstate', 'Serala', 'Caricea', and 'Appalow' (Japan). 'Appalow' is a prostrate form developed at the Quicksand Plant Materials Center in Kentucky. (5) Seed sold for wildlife plantings (7).</p> <p>2. <u>Distinguishing characteristics that aid in its survival and/or inhibit its control:</u> After Chinese lespedeza has crowded out native species, it is able to create a highly productive seed bank. It has a deep tap root and extensive root system, and can tolerate drought, shallow and low fertility soils. Young seedlings can survive freezes that are cold enough to kill other plants, however, this ability is short-lived and decreases as the plant matures. (2) (4).</p>
IV. Ability to go Undetected	<p>1. HIGH <input type="checkbox"/> MEDIUM <input checked="" type="checkbox"/> LOW <input type="checkbox"/></p> <p>Notes: Plants are difficult to identify in the first year of growth and can develop into large stands before they are noticed. (3)</p>
C. DAMAGE POTENTIAL	
I. Competitive Ability	<p>1. <u>Presence of Natural Enemies:</u> Preliminary investigations indicate potential for lespedeza webworm (Tetralopha scortealis) as a biological control agent. (4)</p> <p>2. <u>Competition with native species:</u> At the Hempstead Plains Grassland, Long Island, New York, invasive sericea lespedeza and Cypress spurge (Euphorbia cyparissias) are threatening to displace "the best population" of the federeally endangered sandplain false foxglove (Agalinis acuta). Sandplain false foxglove is also state listed as endangered in New York, Massachusetts, Maryland, Connecticut, and Rhode Island. (4)</p> <p>3. <u>Rate of Spread:</u> -changes in relative dominance over time:</p>

	<p>-change in acreage over time: HIGH(1-3 yrs) <input checked="" type="checkbox"/> MEDIUM (4-6 yrs) <input type="checkbox"/> LOW (7-10 yrs) <input type="checkbox"/> Notes: It was initially planted in the U.S. in 1896 by the North Carolina Agricultural Experiment Station, and has since been widely planted in the U.S. Stands of sericea lespedeza, planted in research plots in coal mine overburden at a rate 9 kilograms of seed per hectare, formed 100% aerial cover within 3 years. (4)</p>
<p>II. Environmental Effects</p>	<p>1. <u>Alteration of ecosystem/community composition?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Communities dominated by sericea lespedeza have fewer native plant and macroinvertebrate species. In a study of sericea lespedeza invasion of tallgrass prairie "clearings" within a Kansas oak savanna researchers found sericea lespedeza had a negative effect on native vegetation. Stem densities in invaded plots ranged from 141/m² to 466/m², with a mean value of 352/m². Invasion resulted in reduced native plant cover and species diversity. Native grasses represented 5% and native forbs 10% of canopy coverage in invaded plots, compared with 79% and 28%, respectively, where sericea lespedeza was not present. Invaded plots contained 4 species of native grasses and 8 species of native forbs, while uninvaded plots contained 12 grass and 24 forb species. In addition to effects on native plants, sericea lespedeza invasion reduced macroinvertebrate diversity from 65 species representing 30 families, to 24 species and 14 families. (4)</p> <p>2. <u>Alteration of ecosystem/community structure?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Forms a dense monotypic herb layer which can prevent forest regeneration (7). The tall, upright growth habit, multiple branches, and dense foliage typical of established sericea lespedeza plants confers considerable competitive advantage for light in grassland habitats. Cool-season grasses are more likely to withstand shading from invasive sericea lespedeza than warm-season grasses. (4)</p> <p>3. <u>Alteration of ecosystem/community functions and processes?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Sericea lespedeza-dominated areas (>60% coverage) exhibited significantly (p<0.01) less woody plant encroachment than areas dominated by grasses. Inhibition of woody plant succession in sericea lespedeza-dominated areas was attributed, in part, to constraints on woody plant seed germination due to substantial sericea lespedeza leaf litter. (4)</p> <p>4. <u>Allelopathic properties?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes: Sericea lespedeza is thought to be allelopathic, it can suppress forest regeneration. (4) (7)</p>
<p>D. SOCIO-ECONOMIC Effects</p>	
<p>I. Positive aspects of the species to the economy/society:</p>	<p>Notes: Sericea lespedeza has been used for revegetation, erosion control, and soil improvement in many areas of the eastern U.S. It has been planted on disturbed soils in areas such as highway embankments, utility rights-of-way, and disposal areas associated with construction sites. It has been used for reclamation of surface coal mine sites in the eastern U.S. For revegetation purposes,</p>

	sericea lespedeza can provide long-term cover with little to no maintenance requirements. Sericea lespedeza has also been planted as a cover species around borders of agricultural fields, and it is considered a good honey plant. (4) Lespedeza is used for the following medical conditions: Ache(Tooth); Alexiteric; Ascariasis; Bite(Dog); Bite(Snake); Caries; Dysentery; Enteritis; Hernia; Kidney; Marasmus; Refrigerant; Skin; Sore; Testicle; Tuberculosis; Vermifuge. (6)
II. Potential socio-economic effects of requiring controls: Positive: Negative:	Notes: Not sold in the upper Midwest.
III. Direct and indirect socio-economic effects of plant:	Notes: Tannins and woodiness of mature plant make it an undesirable forage crop. Because it is generally not palatable to cattle for much of the growing season and is of doubtful worth to wildlife, invasion can degrade forage quality in rangelands, pastures, and other plant communities. (4)
IV. Increased cost to sectors caused by the plant:	Notes: Chinese lespedeza invasion can degrade forage quality in rangelands, and pastures (4), which may increase costs to farmers and ranchers to rotect forage.
V. Effects on human health:	Notes: NA
VI. Potential socio-economic effects of restricting use: Positive: Negative:	Notes: Positive: Prevent future expenses due to habitat loss and conservation failures. Negative: Use alternative species for erosion control.
E. CONTROL AND PREVENTION	
I. Costs of Prevention (including education; please be as specific as possible):	Notes:
II. Responsiveness to prevention efforts:	Notes: In the USA, the increasing range of <i>L. cuneata</i> can be slowed if it is no longer sold or planted as erosion control along highways or around reservoirs. Its use as a forage plant should also be halted. Listing of <i>L. cuneata</i> as a noxious species will facilitate stopping its spread. (3).
III. Effective Control tactics:	Mechanical <input checked="" type="checkbox"/> Biological <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Times and uses: The best control method combines both mechanical and chemical treatments. Hand pulling is impractical due to its extensive perennial root system, but mowing plants at the flower bud stage for two to three consecutive years can significantly thin these stands as well as control further spread, this plant cannot survive with repeated defoliation. Mowing followed by an herbicide treatment is likely the most effective option for the successful control. Prescribed burning, by itself, does not control populations of <i>L. cuneata</i> . Spring burns actually stimulate resprouting and encourage seed germination. Even so, prescribed burns applied late in the season and in combination with other control methods can help control <i>L. cuneata</i> . Late season burns decrease mature plant vigor, remove that year's seeds, and decrease seedling survival. Following a late season burn, herbicide can be applied,

	then mowed for good control results. A 0.5% clopyralid solution is effective in controlling <i>L. cuneata</i> during the vegetative stage prior to branching or during flowering. In wet sites, a 2% solution of an aquatic-approved glyphosate formulation is effective from early summer until seed set (3)
IV. Minimum Effort:	Notes: Controlling populations of invasive sericea lespedeza will likely require multiple treatments, perhaps over several seasons. Established plants may sprout in response to mechanical damage of aboveground tissue. A seed bank may be present, with the potential for establishment of new seedlings for many subsequent years. (4)
V. Costs of Control:	Notes: Spot spraying 640 acres-\$2000, REmedy-\$15.75 per acre in July, Ally-\$10.25 per acre in September.
VI. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes: Despite reports of invasive potential, escaped populations of sericea lespedeza may not always be strongly competitive. Seedlings are weak and compete poorly with spring and summer weeds. Even once established, it can maintain at low population levels. (4)
VII. Non-Target Effects of Control:	Notes: Initial impacts on non-target species from herbicide and mowing/burning, but these have quick recovery (7)
VIII. Efficacy of monitoring:	Notes:
IX. Legal and landowner issues:	Notes: Still planted by some land owners because of its presence in grazing seed mixtures.

F. REFERENCES USED:

- 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	Remaley, T. 1997. Chinese Lespedeza, <i>Lespedeza cuneata</i> . Plant Conservation Alliance's Alien Plant working Group Least Wanted. http://www.nps.gov/plants/alien/fact/lecu1.htm (Accessed 9 May 2007).
3	Global Invasive Species Database, 2007. <i>Lespedeza cuneata</i> . http://www.issg.org/database/species/ecology.asp?si=270 [Accessed 9 May 2007].
4	Munger, Gregory T. 2004. <i>Lespedeza cuneata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2007, May 8].
5	USDA, NRCS. 2007. The PLANTS Database (http://plants.usda.gov , 8 May, 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA
6	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?21856 (8 May 2007)
7	NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer . (Accessed: May 9, 2007).
8	WDNR Natural Heritage Inventory Working List. http://www.dnr.state.wi.us/org/land/er/wlist/
9	Loren Lown, Polk County, IA. Land Stewardship Coordinator
10	Tomr Eddy from Kansas has done a lot of research on <i>Lespedeza</i> and biocontrols

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