


Fire risk report for *Lespedeza cuneata*

Full Species Name <i>Lespedeza cuneata</i> (Dum.Cours.) G.Don
Family: Fabaceae
Common names: Chinese lespedeza
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 2012
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 17.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

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Lowest risk ⇔ Highest risk

This species is likely a **low** fire risk in Hawai'i with a fire risk score of **0.16**.

This species was ranked by our machine learning algorithm using the data presented on the next page. A predicted score of > .34 suggests the plant is a high fire risk.

Summary of Fire ecology	
Native habitat fire proneness	No Data
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	No Data
Relative is flammable*	No

*These values were used by the model to predict fire risk

Detailed summary of Fire Ecology

Native habitat fire proneness (In any part of the plant's native range is its habitat described as fire prone due to natural or human caused fires?)	No Data	<p>Mountain slopes, roadsides; below 2500 m" #in china http://efloras.org/florataxon.aspx?flora_id=2&taxon_id=200012191 ----- "Lespedeza cuneata has a native distribution to temperate and tropical Asia and Australasia....Weber (2017) and Gucker (2010) report that typical invaded habitats include grassland, woodland, forests, edges of wetlands, pastures and disturbed sites. " https://doi.org/10.1111/epp.12529 "Lespedeza Cuneata (Dum.Cours.) G.Don." EPPO Bulletin 49, no. 2 (2019): 280–84.</p>
Fire promoting plant in its native range (Does the species act as a major fuel source, increase fire severity, frequency, or modify fuel bed characteristics within its native range?)	No	
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	<p>"Sericea is being seeded less on disturbed lands because it has little value for wildlife, and pure stands often become a fire hazard in the fall" #little other data corroborate this and there is a lot of data regarding this species as a fuel Skousen, Jeff. "Species for Revegetation: Legumes." Green Lands 17, no. 4 (1988): 35–39.</p>
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeder, and recruiters which dispersed into the area within approximately one year post fire)	Yes	<p>"Fire has a neutral to positive effect on L. cuneata once the plant is established, which is facilitated by L. cuneata's ability to re-sprout following top kill and enhanced germination rates via scarification and seed bank exposure (Wong 2012)." https://shareok.org/bitstream/handle/11244/14892/Howard_okstate_0664D_13099.pdf?sequence=1 Howard, J. M. (2013). Sericea lespedeza (Lespedeza cuneata) invasion: implications for a small mammal community and the influence of local fire history (Doctoral dissertation, Oklahoma State University).</p>

<p>Promoted by fire (Does the plant increase in abundance after a fire?)</p>	<p>Yes</p>	<p>"Mean fire return interval (MFI) alone explained 75% of the variation in <i>L. cuneata</i> cover and the relationship was negative." https://shareok.org/bitstream/handle/11244/14892/Howard_okstate_0664D_13099.pdf?sequence=1 Howard, J. M. (2013). <i>Sericea lespedeza</i> (<i>Lespedeza cuneata</i>) invasion: implications for a small mammal community and the influence of local fire history (Doctoral dissertation, Oklahoma State University).</p> <p>-----</p> <p>"Seed germination and seedling establishment may be increased in burned environments" https://www.fs.fed.us/database/feis/plants/forb/lescun/all.html#FireEffectsAndManagement</p> <p>-----</p> <p>"Fire has a neutral to positive effect on <i>L. cuneata</i> once the plant is established, which is facilitated by <i>L. cuneata</i>'s ability to re-sprout following top kill and enhanced germination rates via scarification and seed bank exposure (Wong 2012)." https://shareok.org/bitstream/handle/11244/14892/Howard_okstate_0664D_13099.pdf?sequence=1 Howard, J. M. (2013). <i>Sericea lespedeza</i> (<i>Lespedeza cuneata</i>) invasion: implications for a small mammal community and the influence of local fire history (Doctoral dissertation, Oklahoma State University).</p> <p>-----</p> <p>"Spring burning removes the old dead growth of <i>sericea</i>, but has no negative effect on established <i>sericea</i>. ...Fire in any season can increase seed germination by scarifying (cracking the seed coat) the seed, thus promoting the establishment of new plants. Fire may also reduce the germination of <i>sericea</i> if the seed are exposed to high enough temperatures brought on by a high fuel load. ...But if the burn is poorly timed or implemented without other control measures, spring burning will likely result in denser stands of <i>sericea</i>." https://shareok.org/bitstream/handle/11244/50054/oksd_nrem_2874_2013-02.pdf?sequence=1 Cummings, Chad, Terrence Bidwell, Case Medlin, Samuel Fuhlendorf, R Elmore, and John Weir. "Ecology and Management of <i>Sericea Lespedeza</i>." Oklahoma State University, 2007.</p>
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Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	<p>"Sericea lespedeza drastically decreases flammability characteristics as a result of decreased oxygen availability and increased moisture retention. . . .Sericea lespedeza's leaves are individually small with a large total surface area per plant, and we suspect that high total surface area increases fuel moisture content and decreases oxygen availability for fire through dense packing ratios. The net result is sericea lespedeza biomass does not burn thoroughly and rarely does the fire burning through dense sericea lespedeza infestations reach sufficient temperatures to make seeds"</p> <p>#This paper only examined litter flammability, not whole plant</p> <p>https://search.proquest.com/docview/2389626212/?pq-origsite=primo</p> <p>Barnes, Alexander. "Lespedeza Cuneata: How an Invasive Legume Is Altering Fire Ecology in Tallgrass Prairie." Master of Science Degree, Emporia State University, 2019. ProQuest Number: 27737838.</p> <p>-----</p> <p>"As of 2010, there was little information about sericea lespedeza fuel characteristics. A southern silvicultural management guide reports that sericea lespedeza is not a fire hazard [52], and Mooers and Odgen [114] report that fire spread may be limited in pure sericea lespedeza stands even when the previous year's dead stems are present."</p> <p>https://www.fs.fed.us/database/feis/plants/forb/lescun/all.html</p> <p>-----</p> <p>"Sericea is being seeded less on disturbed lands because it has little value for wildlife, and pure stands often become a fire hazard in the fall"</p> <p>#No other data corroborate this</p> <p>Skousen, Jeff. "Species for Revegetation: Legumes." Green Lands 17, no. 4 (1988): 35–39.</p>
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	No	<p>"An index of integrated flammability was calculated for the examined species, and the relative flammability was ranked in the order: Medicago ruthenica>Suaeda corniculata>Lespedeza davurica>Lathyrus quinquenervius>Chloris virgata>Hemarthria japonica>Puccinellia chinampoensis>Phragmites communis>Calamagrostis epigejos>Aneurolepidium chinense. The flammability ranking of these natural fuels</p>

		<p>can be used in grassland fire management planning, fire behaviour modelling and fire hazard assessment."</p> <p>#flammability in the lab may not correlate into the field.</p> <p>https://doi.org/10.1016/j.firesaf.2011.03.004</p> <p>Zhang, Zhengxiang, Hongyan Zhang, and Daowei Zhou.</p> <p>"Flammability Characterisation of Grassland Species of Songhua Jiang-Nen Jiang Plain (China) Using Thermal Analysis." <i>Fire Safety Journal</i> 46, no. 5 (July 2011): 283–88.</p>
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Text in quotes are direct quotes from the source

Text in square brackets was added by the assessor to clarify something or to summarize from a figure.

Text preceded by a "#" is comment from the assessor

The data presented were assembled from literature and database searches for each species using as much data as could be collected regarding the plant's fire ecology under natural conditions. Searches aimed to be exhaustive and consist of as much data as could be located in 2020. Our machine learning algorithm was trained on 49 species of plants which had their fire risk ranked by 49 managers in Hawai'i in November 2020. The model used a conditional random forest regression algorithm to predict scores for each species using the manager score as the response variable and the fire ecology traits of each plant as the predictor variables to generate a fire risk score. This trained model was then used to predict the fire risk for all species which were not ranked by managers. The model was calibrated such that it is 90% accurate at predicting high fire risk plants and 79% accurate at predicting low fire risk plants. This research and the resulting fire risk model has been published in the journal [Biological Invasions](#) by [Kevin Faccenda](#) and [Curt Daehler](#) (both at the University of Hawai'i at Mānoa).

Note that the analysis doesn't account for a plant species' spatial distribution, population density, or distinct climate and ecosystem conditions (which can also influence fire risk). The fire risk of these species are mostly under "worst case" environmental conditions where the climate is dry enough to maintain fire, but wet enough to allow for plant growth and fuel accumulation. The fire risk ranking should not be taken as a stand-alone risk metric in prioritizing weed control efforts. Rather, this information may also be useful for determining if a newly discovered species poses a potential fire threat in wildland areas.

More general information on the weed risks and ecology of non-native plants in Hawai'i is available from the Hawai'i Invasive Species Committee's [Weed Risk Assessment database](#).

View more fact sheets at <https://www.pacificfireexchange.org/weed-fire-risk-assessments>

Fact sheet prepared by Kevin Faccenda (faccenda@hawaii.edu) in November 2021. Data were prepared by Ronja Steinbach and Kevin Faccenda in 2020.

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