Fire risk report for *Eragrostis curvula*

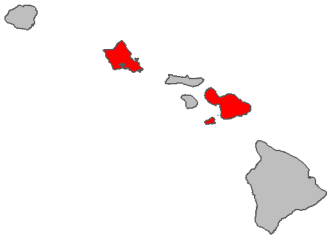
Full Species Name
Eragrostis curvula (Schrad.) Nees

Family: Poaceae

Common names:
lovegrass

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1989

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 26.

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 **high** fire risk in Hawai'i with a fire risk score of **0.72**.

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	Fire-prone
Fire promoting plant in its native range	Yes
Fire promoting plant in its introduced range*	Yes
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	High
Relative is flammable*	Yes

*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?)	Fire-prone	"Fire is rare in semi-arid eastern Karoo dwarf shrublands, South Africa, and responses to fire are largely unknown. [paper later lists E. curvula as fire adapted]" https://doi.org/10.2989/10220119.2014.913077 Du Toit, J. C., van den Berg, L., & O'Connor, T. G. (2014). Fire effects on vegetation in a grassy dwarf shrubland at a site in the eastern Karoo, South Africa. African Journal of Range & Forage Science, 32(1), 13–20. --- "The region has a long evolutionary history under regular fires and grazing by native cattle and ungulates (Stuart-Hill & Mentis 1982; Tainton & Mentis 1984). Additional detail of the study area is given in Fynn et al. (2004). [lists E. curvula as part of the community]" https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1654-109X.2005.tb00623.x Fynn, R. W., Morris, C. D., & Edwards, T. J. (2005). Long-term compositional responses of a South African mesic grassland to burning and mowing. Applied Vegetation Science, 8(1), 5-12.
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?)	Yes	"Postfire response in native habitats: In South Africa, weeping lovegrass plants may be partially damaged by fire [97], but plants generally survive repeated and even annual fire, although abundance may be reduced [42]. After an accidental fire on 27 August 2000 in a perennial grassland in Zastron, South Africa, substantial damage to weeping lovegrass bunches was rare. Two months after the fire, 83.3% of weeping lovegrass tufts suffered 0 to 25% dieback and 16.7% of tufts had 25% to 50% dieback [97]. Four months after the fire, density of weeping lovegrass averaged 15.8 plants/m² on unburned and 13.6 plants/m² on burned plots. By the 8th postfire month, densities were even more similar on burned and unburned plots [99]." #very likely flammable if it burns annually https://www.fs.fed.us/database/feis/plants/graminoid/eracur/all.html#42
Fire promoting plant in its introduced range (Same as Fire Promoting Native but	Yes	"There is also concern that African lovegrass (Eragrostis curvula) could invade lucerne and summer cropping areas in Queensland, where it may contaminate these commodities. Because it is highly flammable, particularly

within the species introduced range)		during the dry season, dense infestations also create an increased fire hazard for people and property." https://keyserver.lucidcentral.org/weeds/data/media/Html/eragrostis_curvula.htm#:~:text=There%20is%20also%20concern%20that,hazard%20for%20people%20and%20property.
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"Fire adaptations and plant response to fire: Established weeping lovegrass plants typically sprout following fire; even small seedlings established in the previous growing season often survive fire [74]. Seedling establishment on burned sites is likely. Weeping lovegrass seedlings emerged from soils collected on burned sites in Arizona [45,77], and when it was intentionally seeded on a burned site in Arizona's Tonto National Forest, a near monoculture of weeping lovegrass established [78]. Removal of litter by fire may increase seedling establishment, which is restricted by thick litter; however, some litter benefits established plants by reducing evaporation [74]." https://www.fs.fed.us/database/feis/plants/graminoid/eracur/all.html#42
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Fire adaptations and plant response to fire: Established weeping lovegrass plants typically sprout following fire; even small seedlings established in the previous growing season often survive fire [74]. Seedling establishment on burned sites is likely. Weeping lovegrass seedlings emerged from soils collected on burned sites in Arizona [45,77], and when it was intentionally seeded on a burned site in Arizona's Tonto National Forest, a near monoculture of weeping lovegrass established [78]. Removal of litter by fire may increase seedling establishment, which is restricted by thick litter; however, some litter benefits established plants by reducing evaporation [74]." https://www.fs.fed.us/database/feis/plants/graminoid/eracur/all.html#42
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"There is also concern that African lovegrass (Eragrostis curvula) could invade lucerne and summer cropping areas in Queensland, where it may contaminate these commodities. Because it is highly flammable, particularly during the dry season, dense infestations also create an increased fire hazard for people and property." https://keyserver.lucidcentral.org/weeds/data/media/Html/eragrostis_curvula.htm#:~:text=There%20is%20also%20concern%20that,hazard%20for%20people%20and%20property.
Relative is flammable (Does a plant in the	Yes	"Plant adaptations to fire: Lehmann lovegrass is a seed-banking species. Following fire, soil-stored seeds germinate

same genus meet the Reported Flammable criteria?)		when moisture conditions become favorable. Within a few months after fire seedling establishment is typically abundant, resulting in replacement stands even after hot fires that kill mature plants. Fire promotes germination because (1) heat from the fire scarifies the hard seed coat and (2) removing the grass canopy results in greater soil temperature fluctuations and greater irradiance of red light, which increase germination [25,27]." https://www.fs.fed.us/database/feis/plants/graminoid/ereleh/all.html#FIRE%20ECOLOGY

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

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

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