Fire risk report for *Miscanthus floridulus*

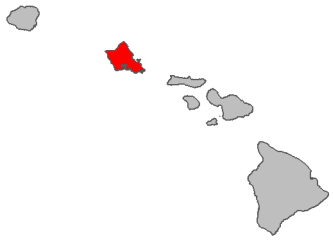
Full Species Name
Miscanthus floridulus (Labill.) Warb. ex K.Schum. & Lauterb.

Family: Poaceae

Common names:
Pacific island silvergrass
giant miscanthus

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1951

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 18.

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 **0.38**.

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*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	Low
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	"Miscanthus floridulus dominates certain habitats, some natural, some influenced by humans, where fire is a normal or frequent factor." Fosberg, F. R. (1992). Vegetation of the Society Islands. Pacific Science (1992), vol. 46, no. 2: 232-250
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	"The old burnt site is dominated by the grass Miscanthus floridulus which is a prolifc root and foliage producer. The annual dieback of this grass adds a large quantity of organic matter to the soil, which paves for the invasion of tree species (Marafa, 1997)." ... "Before the occurrence of fire in February 1994, the new burnt site was dominated by grasses, ferns and herbs that had regenerated after the 1991 fire. The dominant species included Arundinella nepalensis, Centella asiatica, Dicranopteris linearis, Ischaemum aristatum, Miscanthus ¯oridulus, and Veratrum maackii" #since this one was of the dominant grasses before the 1994 fire, it is likely fire promoting Marafa, L. M., & Chau, K. C. (1999). Effect of hill fire on upland soil in Hong Kong. Forest Ecology and Management, 120(1-3), 97-104.
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	
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	"In burned areas Casuarina saplings were killed by the fire, but the Miscanthus recovered" 1998. Mueller-Dombois, D./Fosberg, F. R.. Vegetation of the tropical Pacific islands. Springer-Verlag, New York
Promoted by fire (Does the plant increase in	Yes	"Leeward areas below 300 m have relict patches of Sapindus-Xylosma dry forest and some remnants of

abundance after a fire?)		Leptochloa grassland and Pisonia dry forest in the coastal regions. In leeward areas from 300 to 1000 m anthropogenic grasslands of Miscanthus [floridulus], Paspalum, and Rhynchelytrum have been induced by fires and overgrazing" Florence, J., & Lorence, D. H. (1997). Introduction to the flora and vegetation of the Marquesas Islands. Allertonia, 226-237. ---------- "Miscanthus floridulus (Poaceae) is much more abundant in burned than comparison sites in our study, as are Paraserianthes falcataria and Lantana camara. Miscanthus floridulus is a Polynesian-introduced grass which is considered a noxious weed in Hawai'i, although not in French Polynesia, and is considered native on Guam and the northern Mariana Islands, where it is a dominant component of fire-prone anthropogenic savannas (Minton, 2006)." https://doi.org/10.7717/peerj.5114. Newman EA, Winkler CA, Hembry DH. Effects of anthropogenic wildfire in low-elevation Pacific island vegetation communities in French Polynesia. Peerj. 2018 ;6:e5114.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	Low	"Due to larger diamter and higher moisture content, the shrubs are less flammable. ... Miscanthus floridulus, which is a grass and an important element of the understory of Masson's pine fores, has similar burning properties to shurbs due to its high moisture content." Wu, D., Yi, S., Liu, A., Liu, S., & Cai, M. (2003). Understory Burning In Stands Of Masson's Pine. Fire Safety Science, 7, 545-556.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Invasive plant publications from southeastern United States indicate that Chinese silvergrass [Miscanthus sinensis] is considered highly flammable and a fire hazard" https://www.fs.fed.us/database/feis/plants/graminoid/missin/all.html#FireEffectsAndManagement

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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