Fire risk report for *Flemingia macrophylla*

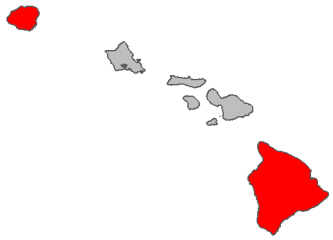
Full Species Name
Flemingia macrophylla (Willd.) Merr.

Family: Fabaceae

Common names:

Synonyms:
Flemingia congesta

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2010

This species has been ranked by the Hawai'i Weed Risk Assessment program as Evaluate with a score of 5.

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	Uncertain
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	no data
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?)	Uncertain	"F. macrophylla is a light-demanding species that readily colonizes on exposed fertile soil. Full overhead light is necessary for vigorous growth, however, it will survive in light shade. F. macrophylla is relatively drought tolerant, and develops a good root system with a deep and dominant primary root up to 1 m long after 3 years (Zheng and Li, 1989). This species also fixes nitrogen, and coppices well." https://www.cabi.org/isc/datasheet/24227 --- "[NAPO association containing F. macrocarpa was rated as a high fire/grazing disturbance community, but it is not explicitly stated whether fire or grazing is the most important natural disturbance in this system]" Lehmkuhl, J. F. (1994). A classification of subtropical riverine grassland and forest in Chitwan National Park, Nepal. Vegetatio, 111(1), 29-43. https://www.jstor.org/stable/pdf/20046396.pdf
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	
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders, and recruiters which dispersed into the area	Yes	"[described as resistant to fire; pg 207]" https://www.researchgate.net/profile/Arvind-Kumar-13/publication/313024943_GENETIC_IMPROVEMENT_OF_FLEMINGIA_FUTURE_PROSPECTS/links/588cee86aca272fa50df543e/GENETIC-IMPROVEMENT-OF-FLEMINGIA-FUTURE-PROSPECTS.pdf Kumar, A., Kumar, A., & Das, R. (2017). GENETIC IMPROVEMENT OF FLEMINGIA: FUTURE PROSPECTYS.

within approximately one year post fire)		Prospects of scientific lac cultivation in India. https://www. researchgate. net/publication/313024943, 274-97. ---------- "Flemingia (Flemingia macrophylla) is a legume shrub with deep roots, which can grow to a height of approximately 2.5 m. It is a hardy plant that can resist long dry spells and is capable of surviving on very poorly drained and occasionally water-logged soils. The species is found on both clay and lateritic soils and is tolerant to shade and fire" http://hostcambodia.com/mekarn/procsr/muitrp.pdf Mui, N. T., & Preston, T. R. (2005). Feeding systems for goats in the tropics. In Proceeding of International workshop on small ruminant production and development in South East Asia. MEKARN, Nong Lam, HCMC, Vietnam (pp. 53-63).
Promoted by fire (Does the plant increase in abundance after a fire?)	no data	
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	No	

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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