Fire risk report for *Melaleuca armillaris*

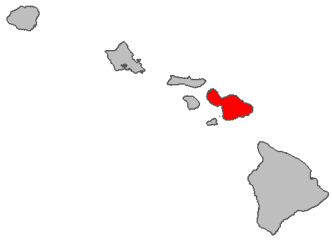
Full Species Name
Melaleuca armillaris (Sol. ex Gaertn.) Sm.

Family: Myrtaceae

Common names:
bracelet honey myrtle

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2011

This species has not yet been ranked by the Hawai'i Weed Risk Assessment program as of 2020.

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 **0.30**.

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	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	No
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	" Much heathland is subject to frequent burning... [lists M. armillaris as occuring]" https://doi.org/10.1111/j.1442-9993.1989.tb01459.x Adam, P., Stricker, P., Wiecek, B. M., & Anderson, D. J. (1989). The vegetation of seacliffs and headlands in New South Wales, Australia. Australian Journal of Ecology, 14(4), 515-545.
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 within approximately one year post fire)	Yes	"The recent fire on Curtis killed all the individuals of M. armillaris that it touched. It thus appears that this has no mechanism such as epicormic shoots or root suckers that enable the individual to survive fire. However, the area of regeneration of M. armillaris at least equaled the area of fire-killed trees. Quite commonly the regeneration was not coincident with the old occurrence, the usual pattern being a displacement of regeneration to one side" https://eprints.utas.edu.au/13639/1/1973_Kirkpatrick_Natural_History_Curtis_Island_Pt2.pdf Kirkpatrick, J. B., Massey, J. S., & Parsons, R. F. (1973). Natural History of Curtis Island, Bass Strait-2. Soils and Vegetation with notes on Rodondo Island. In Papers and Proceedings of the Royal Society of Tasmania (Vol. 107, pp. 131-144).

Promoted by fire (Does the plant increase in abundance after a fire?)	No	"...and Melaleuca armillaris (R. Bradstock pers. comm. 2006). While it is not always clear that reduced fire frequency is the primary reason that these species gain dominance, this is generally considered part of the story. Past grazing by cattle may also be a factor. " http://hotspotsfireproject.org.au/download/literature-review-fire-vegetation-southern-rivers.pdf Watson, P. (2006). Fire and the Vegetation of the Southern Rivers Region. Draft for comment.(Hotspots project, Nature Conservation Council of NSW Sydney). ---------- "Commonly grown for ornament, as a windbreak or street tree and sometimes giving rise to seedlings, particularly after fire. " https://vicflora.rbg.vic.gov.au/flora/taxon/aee04d1d-f4a0-4714-9ece-08e5b6401e33
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	Low	"[considered flammable based on phylogeny; table 1]" #not sure that this is type of data we want https://core.ac.uk/reader/15114636 Crisp, M. D., Burrows, G. E., Cook, L. G., Thornhill, A. H., & Bowman, D. M. (2011). Flammable biomes dominated by eucalypts originated at the Cretaceous–Palaeogene boundary. Nature Communications, 2(1), 1-8. ---------- "[listed as fire resistant/retardant ; table 2]" https://treenet.org/wp-content/uploads/2020/01/Wildfire-Tree-management-Arborist-3-Tree-Management-and-Wildfire.pdf Moore, G. M. WILDFIRE, TREE MANAGEMENT AND THE ARBORIST.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Although melaleuca has evolved several adaptations that permit its exploitation of fire within the plant communities and ecosystems of southern Florida, the relationship between melaleuca and fire in its native habitats is unclear. Seasonal swamp forests and woodlands in northern Australia that are dominated by Melaleuca spp. are "adapted to regular fire" [89]," https://www.fs.fed.us/database/feis/plants/tree/melqui/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.

This research was funded by the Department of the Interior Pacific Islands Climate Adaptation Science Center. The project described in this publication was supported by Grant or Cooperative Agreement No.G20AC00073 to Curt Daehler from the United States Geological Survey. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Geological Survey. Mention of trade names or commercial products does not constitute their endorsement by the Pacific Islands Climate Adaptation Science Center or the National Climate Adaptation Science Center or the US Geological Survey.