Fire risk report for *Acacia aulacocarpa*

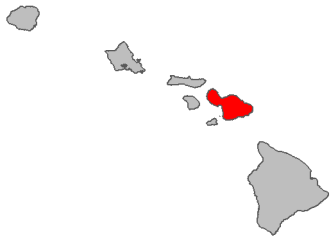
Full Species Name
Acacia aulacocarpa A.Cunn. ex Benth.

Family: Fabaceae

Common names:
New Guinea wattle
golden flowered salwood

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

0	.5	1
Lowest risk	⇔	Highest risk

This species is likely a **low** fire risk in Hawai'i with a fire risk score of **0.22**.

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	Non 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	Yes
Reported flammable*	No Data
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?)	Non Fire-prone	"A. mangium, A. aulacocarpa and some of the other Australian tropical rainforest acacias" Arnold, R, A Gonzales, and A Abarquez. “Domestication of Exotic Acacia Species in Bukidnon Province, Philippines.” Recent Developments in Acacia Planting. ACIAR Proceedings 82 (1997): 136–42. ---------- "native range is New Guinea, E. Queensland to NE. New South Wales" http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:469779-1 ---------- "The occurrence of old emergent A. aulacocarpa trees with d.b.h.* as large as 36 in., with younger trees of the same species, is characteristic of the rain-forests on shallower, mainly granitic soils of the coastal spurs and ridges..." https://doi.org/10.1071/bt9580220 Webb, LJ. (1958). Cyclones as an ecological factor in tropical lowland rain-forest, North Queensland. Australian Journal of Botany, 6(3), 220.
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,	Yes	"On exposed spurs of the rugged coastal ranges, Acacia aulacocarpa A. Cunn. is a common emergent of vine forests. Fire following "dry" cyclone damage may further modify vine forests adjacent to fire-paths in sclerophyll or grassy forest. The principal effects of fire are the absence of the

and recruiters which dispersed into the area within approximately one year post fire)		fire-sensitive Calamus spp., and the presence of numerous sclerophyllous species in addition to A. aulacocarpa.... It could be argued that past fires have influenced these forests, since it is well known that fire hastens the germination of Acacia seeds. However, there is no evidence that fires have occurred frequently enough to promote the regeneration of A. aulacocarpa " https://doi.org/10.1071/bt9580220 Webb, LJ. (1958). Cyclones as an ecological factor in tropical lowland rain-forest, North Queensland. Australian Journal of Botany, 6(3), 220. --- "Its ability to extend from the monsoon vine forest to the Melaleuca alliance can be attributed to several factors such as its hardseededness and subsequent ability to regenerate after fires, an ability to grow in exposed open sites, tolerance of adverse soil conditions (especially periodic waterlogging), and its rapid early growth rate" https://www.jstor.org/stable/pdf/43594382.pdf Boland, D. J., Pinyopusarerk, K., McDonald, M. W., Jovanovic, T., & Booth, T. H. (1990). The habitat of Acacia auriculiformis and probable factors associated with its distribution. Journal of Tropical Forest Science, 159-180.
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"On exposed spurs of the rugged coastal ranges, Acacia aulacocarpa A. Cunn. is a common emergent of vine forests. Fire following "dry" cyclone damage may further modify vine forests adjacent to fire-paths in sclerophyll or grassy forest. The principal effects of fire are the absence of the fire-sensitive Calamus spp., and the presence of numerous sclerophyllous species in addition to A. aulacocarpa.... It could be argued that past fires have influenced these forests, since it is well known that fire hastens the germination of Acacia seeds. However, there is no evidence that fires have occurred frequently enough to promote the regeneration of A. aulacocarpa... When periods of dry, hot, windy weather follow cyclonic damage, fire risk is great, even in mesic tropical rain-forests traditionally regarded as immune to fire. The abundance of fallen branches and suspended dead vines, and of fragmented shrivelled leaves, provides ideal conditions for the entrance of fires from adjacent sugar cane farms. The result is a characteristic pattern of grassland tongues (e.g. with Acacia aulacocarpa

		and Imperata cylindrica (J.) Beauv. var. major (Nees) C. E. Hubbard as fire indicators) ascending fired spurs " https://doi.org/10.1071/bt9580220 Webb, LJ. (1958). Cyclones as an ecological factor in tropical lowland rain-forest, North Queensland. Australian Journal of Botany, 6(3), 220. --- "[seedlings sprouted after fire. table 2]" httsp://doi.org/10.1071/bt99020 Williams, P. R. (2000). Fire-stimulated rainforest seedling recruitment and vegetative regeneration in a densely grassed wet sclerophyll forest of north-eastern Australia. Australian Journal of Botany, 48(5), 651.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	#Does not seem to be flammable
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"[Acacia melanoxylon reported as a fire hazard]" https://firesafemarin.org/plants/fire-hazardous --- "However, since flammability and fire severity are also elevated due to invasion by Acacia spp." Rascher, Katherine G., André Große-Stoltenberg, Cristina Máguas, Joao Augusto Alves Meira-Neto, and Christiane Werner. Acacia longifolia invasion impacts vegetation structure and regeneration dynamics in open dunes and pine forests. Biological Invasions 13, no. 5 (2011): 1099-1113.)

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.

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.