Fire risk report for *Acacia retinodes*

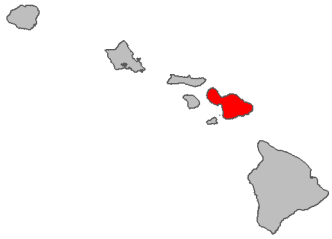
Full Species Name
Acacia retinodes Schltdl.

Family: Fabaceae

Common names:
water wattle

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2009

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 8.

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 Data
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	"The dominant trees in the valleys and riparian zones of the streams are native eucalypts (Eucalyptus cladocalyx, E. cosmophylla and E. baxteri), tea-tree (Leptospermum continentale), and she-oak (Allocasuarina verticillata). In the sparse understory, wattles (Acacia retinodes), ferns (Pteridium esculentum) and riparian shrubs (Bursaria spinosa and Leptospermum lanigerum) occur down to the water's edge with sclerophyllous shrubs (Prostanthera spinosa and A. paradoxa) and grasstrees (Xanthorrhoea semiplana ssp.tateana) occurring away from the stream bank. Many of these species contain volatile secondary compounds and burn readily" Boulton, A, G Moss, and D Smithyman. "Short-Term Effects of Aerially-Applied Fire-Suppressant Foams on Water Chemistry and Macroinvertebrates in Streams after Natural Wild-Fire on Kangaroo Island, South Australia." Hydrobiologia 498 (2003): 177–89. ---------- "Occurs in developed soils on low hills and ranges, in South Australian blue gum, peppermint box, and red gum woodlands, with an annual rainfall of 350-1000 mm. Associated species include Eucalyptus leucoxylon..." O'Leary, M. "Review of Acacia Retinodes and Closely Related Species, A. Uncifolia and A. Provincialis (Leguminosae: Mimosoideae: Sect. Phyllodineae)." Journal of the Adelaide Botanic Gardens 21 (February 2007): 95–109.) ---------- "Water wattle (Acacia retinodes) is native from coastal South Australia, Tasmania (Flinders Island), and Victoria, Australia (GRIN 2003)." http://hear.its.hawaii.edu/Pier/pdf/pohreports/acacia_retinodes.pdf. Starr, Forest, and Kim Starr. "Acacia Retinodes." U.S. Geological Survey--Biological Resources Division, April 2003.
Fire promoting plant in its native range (Does the species act as a major fuel source, increase fire severity,	No	No Data

frequency, or modify fuel bed characteristics within its native range?)		
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	No Data
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	"wooody legume seeder" [in the context of post fire regeneration]" https://www.researchgate.net/profile/Heidi_Zimmer/publication/342144337_Post-fire_weeds_triage_manual_Black_Saturday_Victoria_2009_-Natural_Values_fire_recovery_program_Post-fire_Weeds_Triage_Manual/links/5ee4470a458515814a5b7be6/Post-fire-weeds-triage-manual-Black-Saturday-Victoria-2009-Natural-Values-fire-recovery-program-Post-fire-Weeds-Triage-Manual.pdf Zimmer, H., Cheal, D., & Cross, E. (2012). Post-fire Weeds Triage Manual: Black Saturday Victoria 2009–Natural values fire recovery program. Department of Sustainability and Environment, Heidelberg, Victoria.
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?)	Low	"A. altissima had the highest moisture content (209.33%), followed by A. retinodes (194.1%) . . . In relation to ignition IF and TTI (Valette, ,1990, Hernando, 2009), E. camaldulensis and P. alba were classified as the most flammable category in opposition to A. retinodes, T. gallica and N. oleander classified as slightly flammable species (Table 3)...The lowest FD was shown by two slightly flammable species (T. gallica and A. retinodes). T. gallica FD could be related to the high foliar content of salts (Thomson et al., 1969), and as a consequence, an incomplete combustion." https://doi.org/10.1016/j.foreco.2019.04.034 Molina, J, A Lora, C Prades, and F Rodriguez Y Silva. “Roadside Vegetation Planning and Conservation: New Approach to Prevent and Mitigate Wildfires Based on Fire

		Ignition Potential." Forest Ecology and Managment 444 (July 15, 2019): 163–73.
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

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

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