Fire risk report for *Acacia melanoxylon*

Full Species Name *Acacia melanoxylon* R.Br. ex Aiton	
Family: Fabaceae	
Common names: Blackwood acacia Australian blackwood	
Synonyms:	
Known occurrences (as of 2020)	

Year first documented as naturalized in Hawai'i: 1978	
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 12.	
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 **0.25**.

This species was ranked by 49 managers on a scale of 'no risk', 'low risk', 'medium risk', or 'high risk'. The numerical score ranges from 0 to 1 with higher scores indicating more managers considered it a higher risk. A score of > .31 indicates high risk.

Summary of Fire ecology	
Native habitat fire proneness	No Data
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*	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?)	No Data	
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 great capacity of individuals of A. melanoxylon to establish in ecosystems is due to long-lasting individuals which generate vigorous resprouting from the root (Knapic et al. 2006) and show stimulation of germination due to fire (Jiménez et al. 2010; Arán et al. 2013). Also, this species possesses other functional features, such as producing an abundant, persistent and really resilient soil seed bank, which is one of the greatest obstacles to control the spread of this species in most parts of the world (Richardson and Kluge 2008)." Arán, D., García-Duro, J., Cruz, O., Casal, M., & Reyes, O. (2017). Understanding biological characteristics of Acacia melanoxylon in relation to fire to implement control measurements. Annals of Forest Science, 74(3), 61. ---------------------------- "Whilst regeneration without fire takes place sporadically, even-aged regeneration of considerable density follows catastrophic fires. Acacia melanoxylon coppices after

		damage and frequently root-suckers, forming dense thickets in some areas. " https://doi.org/10.1071/bt9780365 Farrell, TP, & Ashton, DH. (1978). Population Studies on Acacia melanoxylon R. Br. I. Variation in Seed and Vegetative Characteristics . Australian Journal of Botany, 26(3), 365. ---------------------------- "No Atherosperma moschatum or Acacia melanoxylon trees were killed [after a surface fire] (Tables 1 and 2), and most Anodopetalum biglandulosum trees survive" https://www.researchgate.net/profile/Robert_Hill9/publication/248898521_Rainforest_Fire_in_Western_Tasmania/links/5be5e0094585150b2baa77bb/Rainforest-Fire-in-Western-Tasmania.pdf Hill, R. S. (1982). Rainforest fire in western Tasmania. Australian Journal of Botany, 30(6), 583-589.
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Whilst regeneration without fire takes place sporadically, even-aged regeneration of considerable density follows catastrophic fires. Acacia melanoxylon coppices after damage and frequently root-suckers, forming dense thickets in some areas. " https://doi.org/10.1071/bt9780365 Farrell, TP, & Ashton, DH. (1978). Population Studies on Acacia melanoxylon R. Br. I. Variation in Seed and Vegetative Characteristics . Australian Journal of Botany, 26(3), 365.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	Low	[table 1, flammability medium on a scale from low to very high, therefore rated as low] Pyrke, A. F., & Marsden-Smedley, J. B. (2005). Fire-attributes categories, fire sensitivity, and flammability of Tasmanian vegetation communities. Tasforests, 16, 35-46.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"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 Hawaiʻi 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 Hawaiʻi is available from the Hawaiʻi 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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