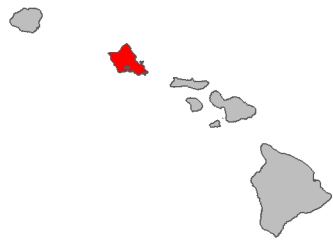


Fire risk report for *Guaiacum sanctum*

Full Species Name <i>Guaiacum sanctum</i> L.
Family: Zygophyllaceae
Common names: hollywood lignum vitae
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 2012
This species has been ranked by the Hawai'i Weed Risk Assessment program as Evaluate with a score of 3.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

0 **I** .5 1
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	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*	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?)	Fire-prone	"THE HIGHLY FRAGMENTED CENTRAL AMERICAN DRY FOREST (CADF) is a global priority for conservation (Janzen 1988a, Lerdaun et al. 1991). Fire is a prominent disturbance throughout this ecosystem (Koonce & Gonzalez-Cab ´ an 1990, Janzen 2002), occurring at high frequencies and burning with a low-to-moderate intensity.... s. Since wildfires are primarily anthropogenic, they are not generally considered part of any “natural” disturbance regime (Janzen 1988b). However, “natural” ignitions do occur and have been recently observed in the region as the result of lightning (Middleton et al. 1997) and volcanic activity (S. Otterstrom pers. obs.). [describes <i>G. sanctum</i> as occurring]" Otterstrom, S. M., Schwartz, M. W., & Velázquez-Rocha, I. (2006). Responses to fire in selected tropical dry forest trees 1. <i>Biotropica</i> , 38(5), 592-598. https://doi.org/10.1111/j.1744-7429.2006.00188.x
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	#fuels in native ecosystems seem to mainly be grasses
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	#not invasive anywhere and imperiled within its native range
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeder, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"Guaiacum sanctum was one of the more conspicuous species observed post fire in locations that had burned as hotspots. Seeds of this avian-dispersed plant are hard, black ellipsoids (Wendelken and Martin 1987) and fire scarification may be a mechanism facilitating germination. In a Costa Rican dry forest, <i>G. sanctum</i> populations have reduced regeneration (Jimenez 1999). At this Costa Rican site, fire has been excluded during the past 15 yr. For the two species of conservation concern,"

		Otterstrom, S. M., Schwartz, M. W., & Velázquez-Rocha, I. (2006). Responses to fire in selected tropical dry forest trees 1. <i>Biotropica</i> , 38(5), 592-598. https://doi.org/10.1111/j.1744-7429.2006.00188.x
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Burn treatment led to a significant increase in the density of seedlings for two species of conservation concern: <i>Guaiacum sanctum</i> and <i>Swietenia humilis</i> ." Otterstrom, S. M., Schwartz, M. W., & Velázquez-Rocha, I. (2006). Responses to fire in selected tropical dry forest trees 1. <i>Biotropica</i> , 38(5), 592-598. https://doi.org/10.1111/j.1744-7429.2006.00188.x
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>

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

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