Fire risk report for *Washingtonia robusta*

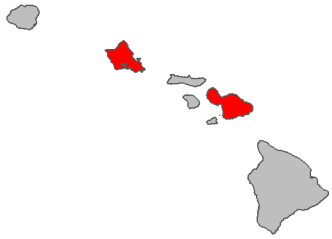
Full Species Name
Washingtonia robusta H.Wendl.

Family: Arecaceae

Common names:
Mexican fan palm
Mexican washingtonia

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1998

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 15.

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 **high** fire risk in Hawai'i with a fire risk score of **0.53**.

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	No Data
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	Yes
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	High
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	"native to northern Mexico . . . Though considered a desert palm, it is native to areas having permanent surface or subsurface water and thus is not as drought tolerant as might be expected." https://edis.ifas.ufl.edu/st670 Broschat, Timothy. “Washingtonia Robusta: Mexican Fan Palm.” EDIS, 2017. ---------- #little data reports on the natural fire regime
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)	Yes	"the frond skirt is a fire hazard" https://www.biisc.org/washingtonia-robusta-mexican-fan-palm/
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	"Also, unlike W filifera, W robusta grows in natural areas of coastal southern California despite competition from native species and recurring fires." #necessarily regenerates if surviving in areas with frequent fires http://csusm-dspace.calstate.edu/bitstream/handle/10211.3/122470/MartusCarolyn_Spring2008.pdf?sequence=3 Martus, C. (2014). The establishment and impact of non-native Mexican fan palms (Washingtonia robusta) on native riparian habitats in San Diego County, California. ---------- "The trunks are not readily consumed by fire and a few plants have been foundalive with more than half the basal trunk removed by fire and/or other forces"

		https://doi.org/10.1016/j.jaridenv.2006.03.002 Bullock, S. H., & Heath, D. (2006). Growth rates and age of native palms in the Baja California desert. Journal of arid environments, 67(3), 391-402.
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"and in W. filifera burning increases reproduction (spadix production; Cornett, 1986)" https://doi.org/10.1016/j.jaridenv.2006.03.002 Bullock, S. H., & Heath, D. (2006). Growth rates and age of native palms in the Baja California desert. Journal of arid environments, 67(3), 391-402.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"fan palms Washingtonia robusta...source of firebrands near urban areas" Lambert, Adam, Carla D'Antonio, and Tom Dudley. "INVASIVE SPECIES AND FIRE IN CALIFORNIA ECOSYSTEMS." Fremontia 38, no. 2–3 (2010): 29–36. --- "A shag of dead fronds extends down the bole unless it is burned by fire or detached by flood or wind" #must be flammable in order to burn off Minnich, R. A., Franco-Vizcaíno, E., & Salazar-Ceseña, M. (2011). Distribution and regional ecology of Californian palm oases interpreted from Google earth images. Aliso: A Journal of Systematic and Evolutionary Botany, 29(1), 1-12. --- "the frond skirt is a fire hazard" https://www.biisc.org/washingtonia-robusta-mexican-fan-palm/
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"These dead fronds are known to be a fire hazard" http://edis.ifas.ufl.edu/ST669 Edward F. Gilman and Dennis G. Watson. Washingtonia filifera: Desert Palm. Publication #ENH-826. University of Florida IFAS extension.

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.