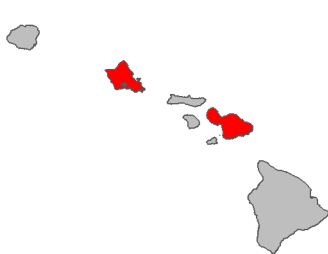


# Fire risk report for *Washingtonia filifera*

<b>Full Species Name</b> <i>Washingtonia filifera</i> (Linden ex Andri) H.Wendl. ex de Bary
<b>Family:</b> Arecaceae
<b>Common names:</b> California fan palm California washingtonia
<b>Synonyms:</b>
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 2000
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 11.5.
<a href="#">View photos on Starr Environmental</a>
<a href="#">View on Wikipedia</a>
<a href="#">View occurrences on iNaturalist</a>
<a href="#">View at Plants of Hawaii</a>
<a href="#">View photos on Flickr</a>

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Lowest risk      ⇔      Highest risk

This species is likely a **high** fire risk in Hawai'i with a fire risk score of **0.52**.

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*	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?)	Fire-prone	<p>"Historically, indigenous people maintained productivity of palms with periodic fires that determined oasis composition and affected the productivity, reproduction, and maintenance of the fire-tolerant palms. Periodic fires are also caused by lightning, but more recent fires have been caused by vandalism. ... fire has an effect on California fan palm and the composition of the associated plant community"</p> <p>Luna, Tara. "Propation Methods for Washingtonia Filifera (Linden Ex André) H. Wendi. (Arecaceae." Native Plants 13, no. 3 (2012): 216–21.</p> <p>-----</p> <p>"Naturally-occurring oases fires are usually ignited by lightning strikes; natural average fire frequency is undocumented. Oases fire records show that fire can occur at any time of year. Oases fuels are usually so prodigious and desiccated that lightning readily produces fire even when occurring in winter during heavy rain "</p> <p><a href="https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY">https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY</a></p>
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	<p>"Washingtonia filifera limited the potential to fire spread based on ability to start a fire."</p> <p><a href="https://doi.org/10.1016/j.foreco.2019.04.034">https://doi.org/10.1016/j.foreco.2019.04.034</a></p> <p>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 (2019): 163–73.</p>
Regenerates after fire (Does the plant regrow after fire by any	Yes	<p>"California palms are fire resistant. They are rarely killed by either the initial burning of their shag or by subsequent burnings."</p>

means? This includes resprouters, reseeder, and recruiters which dispersed into the area within approximately one year post fire)		<a href="https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY">https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY</a>
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Fire releases saplings suppressed by the shade of shrubs. Young palms, freed from competition for water and sunlight, grow vigorously in fire-opened sites [40]... Flower and fruit production nearly doubles in crown-scorched trees during the first postfire growing season [8,32]." <a href="https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY">https://www.fs.fed.us/database/feis/plants/tree/wasfil/all.html#FIRE%20ECOLOGY</a>
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"Group 2 (A. altissima and W. filifera): species characterized flammable and moderately flammable with .... W. filifera has the lowest fire ignition potential in order to mitigate fire risk throughout the summer, mainly at the end of this season. It even provides a lower FI value than A. retinodes and T. gallica improving fire extinguishing activities." <a href="https://doi.org/10.1016/j.foreco.2019.04.034">https://doi.org/10.1016/j.foreco.2019.04.034</a> 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 Management 444 (July 15, 2019): 163–73. -- "the following plants are either flammable, invasive, or both, and should not be used in areas of high fire danger: Washingtonia spp. . . 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.) ----- "These dead fronds are known to be a fire hazard" <a href="http://edis.ifas.ufl.edu/ST669">http://edis.ifas.ufl.edu/ST669</a> Edward F. Gilman and Dennis G. Watson. Washingtonia filifera: Desert Palm. Publication #ENH-826. University of Florida IFAS extension.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"fan palms Washingtonia robusta, R Native to isolated desert springs; W. filifera spreads from ornamental plantings; source of firebrands near urban areas"

		<p>Lambert, Adam, Carla D’Antonio, and Tom Dudley.  “INVASIVE SPECIES AND FIRE IN CALIFORNIA ECOSYSTEMS.”  Fremontia 38, no. 2–3 (2010): 29–36.</p> <p>-----</p> <p>"Other areas within the Trails contain an extremely diverse variety of vegetation with some being very flammable such as Mexican Palms (Washingtonia robusta"  <a href="http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.390.9969&amp;rep=rep1&amp;type=pdf">http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.390.9969&amp;rep=rep1&amp;type=pdf</a>  Maranghides, A., McNamara, D., Mell, W., Trook, J., &amp; Toman, B. (2013). A case study of a community affected by the Witch and Guejito Fires: Report# 2: Evaluating the effects of hazard mitigation actions on structure ignitions. National Institute of Standards and Technology, US Department of Commerce and US Forest Service, Gaithersburg, MD.</p>
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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

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

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