# Fire risk report for *Prosopis juliflora*

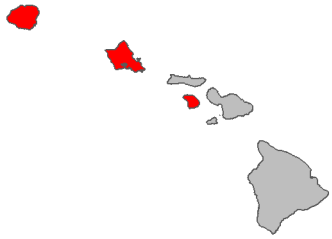
**Full Species Name**
*Prosopis juliflora* (Sw.) DC.

**Family**: Fabaceae

**Common names:**
algaroba
mesquite

**Synonyms:**

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1924

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 19.

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 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* | Yes |
| Regenerates after fire | Yes |
| Promoted by fire | No |
| Reported flammable* | Low |
| 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?) | No Data | no data about native range |
| 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 | " Allred (1949) agrees with this opinion and mentions that some of the most constantly recurring fires in Texas today occur where mesquite is densest"<br>https://repository.arizona.edu/bitstream/handle/10150/551291/AZU_TD_BOX258_E9791_1957_7.pdf?sequence=1<br>Blydenstein, J. (1957). The survival of velvet mesquite (Prosopis juliflora var. velutina) after fire. Thesis University of Arizona |
| 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 mesquite recovered after the fire by two methods: sprouting from the basal stem buds just below the ground surface, and sprouting from axillary buds on the branches of the crown itself. Because of more severe crown damage, small trees generally recovered from basal sprouts, while the larger trees tended to produce crown sprouts. A few trees produced basal and crown sprouts. [table reports 20% mortality]"<br>https://journals.uair.arizona.edu/index.php/jrm/article/viewFile/5352/4962<br>Cable, D. R. (1965). Damage to mesquite, Lehmann lovegrass, and black grama by a hot June fire. Rangeland Ecology & Management/Journal of Range Management Archives, 18(6), 326-329.<br>---------- |

| | | |
|---|---|---|
| | | "McLaughlin and Bowers (1982) reported up to 50% mortality of P. juliflora after a particularly hot fire in the Sonoran Desert. "<br>Gallaher, T., & Merlin, M. (2010). Biology and impacts of Pacific island invasive species. 6. Prosopis pallida and Prosopis juliflora (Algarroba, Mesquite, Kiawe)(Fabaceae). Pacific Science, 64(4), 489-526.<br>----------<br>"Once damaged through cutting or fire, the plants re-sprout with vigor, such that within two to three months it forms a thicket once more"<br>https://doi.org/10.1080/14888386.2009.9712842<br>Maundu, P., Kibet, S., Morimoto, Y., Imbumi, M., & Adeka, R. (2009). Impact ofProsopis julifloraon Kenya's semi-arid and arid ecosystems and local livelihoods. Biodiversity, 10(2-3), 33–50. |
| Promoted by fire (Does the plant increase in abundance after a fire?) | No | "Griffiths (1910) in a study on the Santa Rita Experimental Range in south-central Arizona also concluded that fire was a controlling factor which prevented the spread of mesquite over that area. Foster (1915) describes the invasion of mesquite on the Edwards Plateau of Texas as a gradual orchard-like spreading of the trees over the area until consequent reduction of grass cover and lack of competition allowed a heavy establishment of mesquite and other brush seedlings; he mentions lack of fires on the area as an additional factor aiding the spread of mesquite. "<br># contradictory<br>https://repository.arizona.edu/bitstream/handle/10150/551291/AZU_TD_BOX258_E9791_1957_7.pdf?sequence=1<br>Blydenstein, J. (1957). The survival of velvet mesquite (Prosopis juliflora var. velutina) after fire. Thesis University of Arizona |
| Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?) | Low | #no studies mention this species as providing fuel, all the fuel seems to be from grass |
| Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?) | No | fire ecology seems to be consistent across genus |

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.

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.