Fire risk report for *Parkinsonia aculeata*

Full Species Name   *Parkinsonia aculeata* L.
Family: Fabaceae
Common names: Jerusalem thorn   Mexican palo verde
Synonyms:
Known occurrences (as of 2020)
Year first documented as naturalized in Hawai'i: 1975
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 20.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

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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 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	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?)	Fire-prone	"In poorly drained and regularly flooded grassland and savannas, the woody stratum is commonly dominated by the presences of Prosopis ruscifolia, finding also species such as Bulnesia bonariensis or Bulnesia sarmientoi, Capparis retusa or Capparis tweddiana and Acacia cavens or Acacia monacantha, Loncocharpus fluvialis, Tabebuia nodosa, Parkinsonia aculeata and palms such as Trithrinax schizophylla or Copernicia alba (Fig. 2)..... Fire is one of the main disturbances in Dry Chaco grasslands and savannas." Fernández, P. D., Matthias, B., Germán, B., Natalia, B. R., Sandra, B., Ignacio, G. N., ... & Ricardo, G. H. (2019). Grasslands and Open Savannas of the Dry Chaco.
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	No data suggesting this species promotes fire
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	No data suggesting this species promotes fire
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	"Intense dry heat from fires will have an important impact on seed dormancy (Scott 2006). It is likely that sufficient dry heat (e.g. 125°C for 8 minutes) will kill seeds while exposure to more intense heat for brief periods (e.g. 300°C for 1 minute) will release seeds from dormancy by altering seed coat properties. Fire, depending on its intensity, is therefore likely to kill surface seeds, releasing from dormancy some seeds that are close to the surface (<2 cm in depth), and not affecting seeds that are deeply buried." https://www.researchgate.net/profile/Rieks_Van_Klinken2/publication/282722871_The_biology_of_Australian_weeds _54_Parkinsonia_aculeata_L/links/561c402208ae6d17308b

		14fa/The-biology-of-Australian-weeds-54-Parkinsonia-aculeata-L.pdf van Klinken, R. D., Campbell, S. D., Heard, T. A., McKenzie, J., & March, N. (2009). The Biology of Australian Weeds: 54.'Parkinsonia aculeata'L. Plant Protection Quarterly, 24(3), 100.
Promoted by fire (Does the plant increase in abundance after a fire?)	No	
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	Low	"A key consideration, however, is the amount of fuel available for burning. The site used for this experiment was destocked in early 2003, four months before the first fire. Destocking allowed retention of grass fuel throughout the dry season. The opportunity to impose fires that are effective against P. aculeata will be strongly influenced by fuel availability" #implies that P. aculeata does not have enough biomass/continuity/flammability to burn by itself --------------------------- Listed as a plant for defensible space [therefore, low flammability] https://www.sandiegocounty.gov/pds/docs/DPLU199.pdf County of San Diego, Department of Planning and Land Use FIRE, PLANTS, DEFENSIBLE SPACE AND YOU BUILDING DIVISION
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