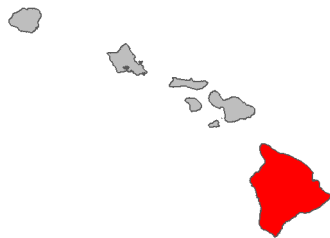


## Fire risk report for *Nerium oleander*

|                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------|
| <b>Full Species Name</b><br><i>Nerium oleander</i> L.                                                               |
| <b>Family:</b> Apocynaceae                                                                                          |
| <b>Common names:</b><br>oleander                                                                                    |
| <b>Synonyms:</b>                                                                                                    |
| Known occurrences (as of 2020)<br> |
| Year first documented as naturalized in Hawai'i: 2012                                                               |
| This species has been ranked by the Hawai'i Weed Risk Assessment program as Low Risk with a score of 6.             |
| <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>                                                                               |

0 | .5 1  
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                 | Uncertain |
| Fire promoting plant in its native range      | No        |
| Fire promoting plant in its introduced range* | No        |
| Regenerates after fire                        | Yes       |
| Promoted by fire                              | no data   |
| 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?)                                              | Uncertain | from the Mediterranean, so maybe. it's hard to find info about this in its native habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 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        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 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       | "The species recorded in January, were those regenerating vegetatively: <i>Quercus coccifera</i> L., <i>Pistacia lentiscus</i> L., <i>Phillyrea latifolia</i> L., <i>Erica arborea</i> L., <i>Arbutus unedo</i> L., <i>Arbutus andrachne</i> L., <i>Nerium oleander</i> L., <i>Cotinus coggygria</i> "<br><a href="http://users.auth.gr/~pgana/files/Goudelis_et_al_2007.pdf">http://users.auth.gr/~pgana/files/Goudelis_et_al_2007.pdf</a><br>Goudelis, G., Ganatsas, P. P., Spanos, I., & Karpi, A. (2007). Effect of repeated fire on plant community recovery in Penteli, central Greece. In <i>Eco-and Ground Bio-Engineering: the use of vegetation to improve slope stability</i> (pp. 337-343). Springer, Dordrecht. |
| Promoted by fire (Does the plant increase in abundance after a fire?)                                                                                                                             | no data   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Reported flammable (Is the species described as being flammable,                                                                                                                                  | Low       | "[listed as a low flammability shrub]"<br><a href="https://www.srs.fs.usda.gov/factsheet/pdf/selecting_firewise_shrubs.pdf">https://www.srs.fs.usda.gov/factsheet/pdf/selecting_firewise_shrubs.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                                              |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| being a major wildfire fuel, or high fire risk?)                                             |    | <p>-----</p> <p>"In this sense, the threeflammability measures, point out that <i>N. oleander</i> and <i>T. gallica</i> are the lesser flammable species."</p> <p>Molina, J. R., Lora, A., Prades, C., &amp; y Silva, F. R. (2019). Roadside vegetation planning and conservation: New approach to prevent and mitigate wildfires based on fire ignition potential. <i>Forest ecology and management</i>, 444, 163-173.<br/> <a href="https://www.sciencedirect.com/science/article/pii/S0378112719301501">https://www.sciencedirect.com/science/article/pii/S0378112719301501</a></p> <p>-----</p> <p>"<i>Nerium oleander</i> litters were the shortest to ignite .... Hierarchical cluster analysis performed on the flammability parameters of live leaves and of litters ranked the seven species in four distinct clusters from the most flammable (<i>Prunus laurocerasus</i> and <i>Pyracantha coccinea</i>) to the least flammable (<i>Pittosporum tobira</i> and <i>Nerium oleander</i>)"</p> <p><a href="https://ui.adsabs.harvard.edu/abs/2012EGUGA..1410307G/abstract">https://ui.adsabs.harvard.edu/abs/2012EGUGA..1410307G/abstract</a></p> <p>Ganteaume, A., Jappiot, M., &amp; Lampin, C. (2012, April). Assessing and ranking the flammability of some ornamental plant species to select firewise plants for landscaping in WUI (SE France). In <i>EGU General Assembly Conference Abstracts</i> (p. 10307).</p> <p>-----</p> <p>"<i>Nerium oleander</i>, with a relatively low moisture content (34..61 percent), likewise, required a relatively long time (16.8 sec.) to burn. The important difference between the two species was that the leaves of <i>Nerium oleander</i> ignited and burst into flame while those of <i>Atriplex halimus</i> merely glowed and blackened. [this was using a muffle furnace at 1100c"</p> <p>Ching, F. F., &amp; Stewart, W. S. (1962). Research with slow burning plants. <i>Journal of Forestry</i>, 60(11), 796-798.</p> |
| Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?) | No | monotypic genus, no relatives.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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 Kevin Faccenda in 2020.

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