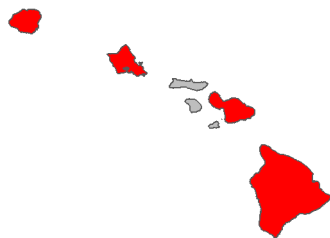


Fire risk report for *Eucalyptus globulus subsp. globulus*

Full Species Name <i>Eucalyptus globulus subsp. globulus</i> Labill.
Family: Myrtaceae
Common names: blue gum
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 1990
This species has not yet been ranked by the Hawai'i Weed Risk Assessment program as of 2020.
View photos on Starr Environmental
View on Wikipedia
View occurrences on iNaturalist
View at Plants of Hawaii
View photos on Flickr

0 **I** .5 1
 Lowest risk ⇔ Highest risk

This species is likely a **high** fire risk in Hawai'i with a fire risk score of **0.60**.

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	Fire-prone
Fire promoting plant in its native range	Yes
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?)	Fire-prone	"Most eucalyptus communities in Australia have evolved in the presence of periodic fire [3]. Tasmanian bluegum is highly flammable, but is seldom killed by fire." https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html
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?)	Yes	"Most eucalyptus communities in Australia have evolved in the presence of periodic fire [3]. Tasmanian bluegum is highly flammable, but is seldom killed by fire." https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	Yes	"Fuel buildup occurs very rapidly in unmanaged Tasmanian bluegum stands in California [1,33]. Fuel reduction programs can reduce wildfire hazard, as can the establishment of fuelbreaks [1,31]" https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html ----- "The fuel complex formed by this debris is extremely flammable, and under severe weather conditions could produce drifting burning material with the potential to ignite numerous spot fires. Because stringy bark is carried away while burning, eucalyptus forests are considered the worst in the world for spreading spot fires. The Oakland hills firestorm was both intense and difficult to control because of the many stands of eucalyptus. Individual trees growing near structures or in public use areas are hazardous because of the potential for branch failure." http://ucce.ucdavis.edu/datastore/detailreport.cfm?usernumber=48&surveynumber=182
Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeder,	Yes	"Tasmanian bluegum recovers well from fire [3]. Epicormic sprouting is common in trees only scorched by fire. It is also common in trees where crown fire occurred but bark was thick enough to protect dormant branch buds. Heat-damaged bark is shed, and sprouting proceeds rapidly [50]."

and recruiters which dispersed into the area within approximately one year post fire)		https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html ----- "The most common post-fire regeneration type among the sampled trees was basal resprouting (89.2%), though 20.9% had epicormic resprouting." Catry, F. X., Moreira, F., Tujeira, R., & Silva, J. S. (2013). Post-fire survival and regeneration of <i>Eucalyptus globulus</i> in forest plantations in Portugal. <i>Forest Ecology and Management</i>, 310, 194-203.
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Naturally established <i>E. globulus</i> plants were present in 93.1%, 19.0% and 98.6% of samples in pure <i>E. globulus</i>, pure <i>P. pinaster</i> and mixed stands, respectively. Cohort median density was 0.20 plants m² and maximum density was 4.55 plants m². Median height of plants was 2.0 m and 95.3% of them had h > 1.30 m and DBH 65 cm. Establishment probability, density and median height were highest in the most productive regions. Three post-fire management operations had a significant influence on the response variables: (i) salvage logging was associated with a higher density; (ii) tillage was associated with a lower density and a smaller median height; (iii) understorey removal was associated with a lower occurrence probability... . Larcombe et al. (2013) demonstrated that fire was associated with higher recruitment levels of <i>E. globulus</i>, as it had been suggested earlier by Kirkpatrick (1975)" Águas, A., Ferreira, A., Maia, P., Fernandes, P. M., Roxo, L., Keizer, J., ... & Moreira, F. (2014). Natural establishment of <i>Eucalyptus globulus</i> Labill. in burnt stands in Portugal. <i>Forest Ecology and Management</i>, 323, 47-56. ----- "<i>E. globulus</i> average germination percentage in Control 1 was 14.4% (Fig. 2). The ANOVA detected significant differences ($p < 0.0001$) among Control 1 and 110 °C-5 min, 110 °C-10 min, 150 °C-5 min, 150 °C-10 min, 200 °C-5 min and 200 °C-10 min treatments. All of them reduced germination or killed all seeds." #heat decreases germination potential Arán, D., García-Duro, J., Reyes, O., & Casal, M. (2013). Fire and invasive species: modifications in the germination potential of <i>Acacia melanoxylon</i>, <i>Conyza canadensis</i> and <i>Eucalyptus globulus</i>. <i>Forest Ecology and Management</i>, 302, 7-13.

Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"Tasmanian bluegum is highly flammable, but is seldom killed by fire. The bark catches fire readily, and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy and to disseminate fire ahead of the main front" https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Most eucalyptus communities in Australia have evolved in the presence of periodic fire [3]. Tasmanian bluegum is highly flammable, but is seldom killed by fire. The bark catches fire readily, and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy and to disseminate fire ahead of the main front [3,7,8,50]. Other features of Tasmanian bluegum that promote fire spread include heavy litter fall, flammable oils in the foliage, and open crowns bearing pendulous branches, which encourages maximum updraft [3,9]. Despite the presence of volatile oils that produce a hot fire, leaves of Tasmanian bluegum are classed as intermediate in their resistance to combustion, and juvenile leaves are highly resistant to flaming [11]." https://www.fs.fed.us/database/feis/plants/tree/eucglo/all.html#FIRE%20EFFECTS

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.

