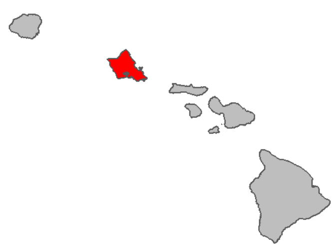
Fire risk report for *Smilax bona-nox*

Full Species Name *Smilax bona-nox* L.	
Family: Smilacaceae	
Common names: saw greenbrier catbriar	
Synonyms:	
Known occurrences (as of 2020) 	
Year first documented as naturalized in Hawai'i: 2005	
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 .5 1

Lowest risk ⇔ Highest risk

This species is likely a **high** fire risk in Hawai'i with a fire risk score of **0.50**.

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	Yes
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	High
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	"Only known in cultivation (the species occurs in damp fields, flood-plains, woodland, etc. over a large area of the eastern USA (from Maine to Florida), Mexico and the West Indies, and is very variable in the wild)." Cullen, James. "544. SMILAX BONA-NOX 'CANTAB': Smilacaceae." Curtis's Botanical Magazine 23, no. 1 (February 2006): 25–29. ---------------------------- "Saw greenbrier is tolerant of periodic fire because it will sprout from the rhizomes when top-killed. It is not dependent on fire for regeneration; it occurs in both fire-tolerant communities and communities which infrequently experience fire. Saw greenbrier occurs in the pine flatwoods of the lower Atlantic Coastal Plain, which were historically maintained in open condition by periodic fire, and are now managed with prescribed fires [15]. Similarly, it is often found in longleaf pine (Pinus palustris) communities which were also historically maintained by fire. Longleaf pine communities have largely been replaced by other communities, mostly loblolly pine, which can also be managed with prescribed fire [43]. Saw greenbrier is a member of Florida bay swamps, which experience fire on the average of once per century [10]." (https://www.fs.fed.us/database/feis/plants/vine/smibon/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	"The fire progressed eastwardly through thick cedar and oak closed canopy with heavy dormant greenbrier (Smilax bona-nox) understory to the large rock and wood siding home." #seems to imply that the smilax was fueling the fire if it was dominant understory plant https://tfsweb.tamu.edu/uploadedFiles/FRP/1148%20Complex%20Fire%20Case%20Study-Web.pdf Ridenour, Karen, Rich Gray, Jan Fulkerson, April Phillips, and Misty Wilburn. "1148 Complex Fire Palo Pinto Country: A Case Study." Texas Forest Service, September 2009.
Fire promoting plant in its introduced range (Same as Fire Promoting Native but	No	

within the species introduced range)		
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	"Saw greenbrier is tolerant of periodic fire because it will sprout from the rhizomes when top-killed. It is not dependent on fire for regeneration; it occurs in both fire-tolerant communities and communities which infrequently experience fire. Saw greenbrier occurs in the pine flatwoods of the lower Atlantic Coastal Plain, which were historically maintained in open condition by periodic fire, and are now managed with prescribed fires [15]. Similarly, it is often found in longleaf pine (Pinus palustris) communities which were also historically maintained by fire. Longleaf pine communities have largely been replaced by other communities, mostly loblolly pine, which can also be managed with prescribed fire [43]. Saw greenbrier is a member of Florida bay swamps, which experience fire on the average of once per century [10]." (https://www.fs.fed.us/database/feis/plants/vine/smibon/all.html)
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Stems per plant increased from 1.47 to 1.62 (measured July 1975) [36]. Also in Texas, prescribed surface fires were conducted in February, 1982 to assess the response of vegetation under either Plateau oak (Quercus fusiformis) or post oak. By July, saw greenbrier had increased in relative dominance and frequency on both site types [20]." https://www.fs.fed.us/database/feis/plants/vine/smibon/all.html#FIRE%20ECOLOGY ---------------------------- "Rhus and Smilax [bona-nox] had an earlier start in above ground growth in both burned treatments even when compared to other species in the same burned area... After the second collection date both burned treatments decreased in underground biomass along with the control. The fire clearly altered the dynamics of biomass accumulation in Smilax underground parts." #looks like this doesn't benifit from very frequent burning https://shareok.org/bitstream/handle/11244/24089/Thesis-1974-H915e.pdf?sequence=1 Hulnik, F. W. (1974). Effect of Fire on the Growth of Rhus Glabra L. and Smilax Bona-Nox L (Doctoral dissertation, Oklahoma State University).
Reported flammable (Is the species described	High	"The fire progressed eastwardly through thick cedar and oak closed canopy with heavy dormant greenbrier (Smilax

as being flammable, being a major wildfire fuel, or high fire risk?)		bona-nox) understory to the large rock and wood siding home." #seems to imply that the smilax was fueling the fire if it was dominant understory plant https://tfsweb.tamu.edu/uploadedFiles/FRP/1148%20Complex%20Fire%20Case%20Study-Web.pdf Ridenour, Karen, Rich Gray, Jan Fulkerson, April Phillips, and Misty Wilburn. "1148 Complex Fire Palo Pinto Country: A Case Study." Texas Forest Service, September 2009.
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	No	"Roundleaf greenbrier resists fire by sprouting from rhizomes [15,27,28]. Canopy openings caused by fire may favor roundleaf greenbrier." https://www.fs.fed.us/database/feis/plants/vine/smirot/all.html

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 Hawaiʻi 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 Hawaiʻi is available from the Hawaiʻi 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) in November 2021. Data were prepared by Ronja Steinbach and Kevin Faccenda in 2020.

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