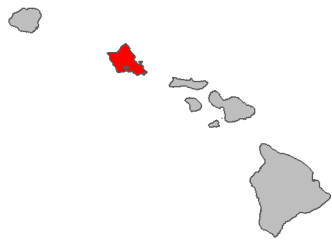


Fire risk report for *Panicum virgatum*

Full Species Name <i>Panicum virgatum</i> L.
Family: Poaceae
Common names: switchgrass
Synonyms:
Known occurrences (as of 2020) 
Year first documented as naturalized in Hawai'i: 1938
This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 11.
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 **0.72**.

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*	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	"Switchgrass needs periodic fire to maintain its vigor and abundance. On the Konza Prairie in Kansas, it showed a linear decrease in abundance with time since burning. On areas burned annually in the spring, it was a codominant with big bluestem, little bluestem, and indiangrass [32]. " #north american praries are fire prone https://www.fs.fed.us/database/feis/plants/graminoid/panvir/all.html#FIRE%20ECOLOGY
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	" In eastern Kansas, a 5-year-old planted switchgrass stand burned in late April yielded 250 pounds of seeds per acre (280 kg/ha), while an unburned portion of the same stand yielded only 190 pounds of seeds per acre (212 kg/ha) [13]." #must be flammable if a community of only it burned https://www.fs.fed.us/database/feis/plants/graminoid/panvir/all.html#FIRE%20ECOLOGY
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	apparently no info in the literature about this species outside of north america
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	"Because the rhizomes of sod-forming switchgrass ecotypes typically occur at depths of 2 to 5 inches (5-12 cm) [77], they are unharmed by the heat of fire. Plants burned during the spring when dormant send up vigorous new growth from these surviving rhizomes. Rhizomes survive summer fires also, but postfire tiller density may be reduced because of low carbohydrate reserves and damage to aboveground apical meristems [see Fire Effects On Plant]. Some bunch-forming switchgrass ecotypes are not well adapted for fire survival [see Fire Effects On Plant]." https://www.fs.fed.us/database/feis/plants/graminoid/panvir/all.html#FIRE%20ECOLOGY
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"Switchgrass cover and biomass often increase slightly to moderately following dormant-season burns. It generally responds best to burning in late spring, just prior to the start of new growth. For example, in moderately grazed pastures that were annually burned over a 16-year period in

		the Flint Hills of Kansas, switchgrass cover was higher under late spring burning (May 1) than under early spring (March 20), mid-spring (April 10), or no burning [4,47]. Prescribed early and mid-May burning in North Dakota increased switchgrass canopy coverage, but late June burning did not. First and second year increases were as follows [57]:" https://www.fs.fed.us/database/feis/plants/graminoid/panvir/all.html#FIRE%20ECOLOGY
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"Fire removes aboveground parts of switchgrass. Switchgrass litter is resistant to matting down. This standing dead material is apparently a good fuel source which readily carries fire." https://www.fs.fed.us/database/feis/plants/graminoid/panvir/all.html#FIRE%20ECOLOGY
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"Environmental weeds such as Guinea grass (<i>Panicum maximum</i>) and couch (<i>Digitaria eriantha</i>) are also present and pose a fire risk due to the large flammable fuel loads they create." http://www.mackay.qld.gov.au/__data/assets/pdf_file/0009/99450/Grasstree_Beach_SCSLP_Final.pdf Sarina Landcare Catchment Management Association. 2008. Sarina Coastal Sustainable Landscapes Project - Grasstree Beach.

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.

