Fire risk report for *Schizachyrium condensatum*

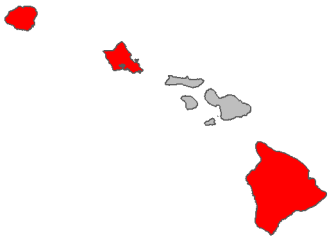
Full Species Name
Schizachyrium condensatum (Kunth) Nees

Family: Poaceae

Common names:
little bluestem
beardgrass

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1961

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 13.

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 **high** fire risk in Hawai'i with a fire risk score of **0.81**.

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	No
Fire promoting plant in its introduced range*	Yes
Regenerates after fire	No
Promoted by fire	No Data
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	" However, in the region of APA, ARA and TAI, fire has been traditionally used as part of grassland management: burns at the end of winter are used to remove excess biomass that had not been consumed by cattle and to stimulate resprouting.... [appendix lists S. condensatum as present in APA and TIA]" Andrade, B. O., Bonilha, C. L., de Abreu Ferreira, P. M., Boldrini, I. I., & Overbeck, G. E. (2016). Highland grasslands at the Southern tip of the Atlantic Forest biome: Management options and conservation challenges. Oecologia Australis.
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)	Yes	". Invasion by Schizachyrium condensatum alone is apparently sufficient to initiate a cycle in which long-lived, relatively diverse Metrosideros polymorpha woodland is converted to a grassland dominated by highly flammable Melinis minutiflora" Hughes, F., Vitousek, P. M., & Tunison, T. (1991). Alien grass invasion and fire in the seasonal submontane zone of Hawai'i. Ecology, 72(2), 743-747. --- "Although, Lenoir et al. (2010) suggested that downslope range shifts of species may be biotic responses to habitat modifications, in the case of S. condensatum , it is likely related to its dominance after fire" Angelo, C. L., & Daehler, C. C. (2013). Upward expansion of fire-adapted grasses along a warming tropical elevation gradient. Ecography, 36(5), 551-559. --- #seemingly not invasive outside of hawaii

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)	No	"We did not harvest S. condensatum in burned sites because living plants were rare." D'Antonio, C. M., Yelenik, S. G., & Mack, M. C. (2017). Ecosystem vs. community recovery 25 years after grass invasions and fire in a subtropical woodland. Journal of Ecology, 105(6), 1462-1474. ---------- "Although S. condensatum persists after fire, it is largely replaced by the African grass, Melinis minutiflora, and total exotic grass cover increase" D'Antonio, C. M., Hughes, R. F., & Tunison, J. T. (2011). Long-term impacts of invasive grasses and subsequent fire in seasonally dry Hawaiian woodlands. Ecological Applications, 21(5), 1617-1628. that it does regenerate, but not that well in HI
Promoted by fire (Does the plant increase in abundance after a fire?)	No Data	
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	High	"The grass is invasive because it promotes the spread of fires and displaces native vegetation with pure stands. Such stands accumulate laarge quantities of dead and flammable biomass, increasing fire frequency and intensity. " http://www.hear.org/pier/species/schizachyrium_condensatum.htm
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	Yes	"As a warm season grass, little bluestem is well adapted to spring and fall fires; at these times of year sufficient carbohydrate stores exist. Lightning-caused fire in summer was historically common in the bluestem prairie," https://www.fs.fed.us/database/feis/plants/graminoid/schsco/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

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Fact sheet prepared by Kevin Faccenda (faccenda@hawaii.edu) in November 2021. Data were prepared by Kevin Faccenda in 2020.

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