Fire risk report for *Nassella cernua*

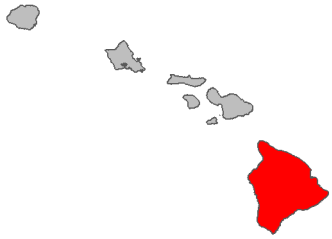
Full Species Name
Nassella cernua (Stebbins & Love) Barkworth

Family: Poaceae

Common names:
needlegrass

Synonyms:
Stipa cernua

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 1957

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 9.

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 **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	Fire-prone
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	No Data
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	"Nodding and purple needlegrass (Nassella cernua and purpurea, respectively) and three-awn (Aristida purpurea longiseta) grasslands/meadows occurred frequently on the East Ranch, most often as patches or locally dominant stands. Other native grasses occur on the East Ranch as well: no severe impacts from the fire are expected to the native grasses and of those populations burned, recovery was high. " https://www.sdparks.org/content/dam/sdparks/en/pdf/Resource-Management/Appendix_B_Post-Cedar_Fire_Plant_Surveys_2004.pdf Moran, V., & Proprietor, S. (2004). Post-Cedar Fire Ecosystem and Rare Plant Impact Survey. --- "Because most low elevation grasslands evolved with fire, established perennial grasses rebound after fire while weed seeds are destroyed. [paper later mentions N. cernua as a component of this community]" https://www.cnga.org/resources/Documents/Bibliographies%20and%20Articles/Anderson,%20John-Historical%20Works/Farm%20Edges%20Yolo%20RCD/Anderson_Direct%20Seeding%20in%20Sac%20Vlly,%20Foothills.pdf Anderson, J., Robins, P., Holmes, R. B., & Laddish, K. (2001). Direct seeding of California native grasses in the Sacramento Valley and foothills. Robins P, Holmes RB, Laddish K (eds.).
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	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	"Nodding and purple needlegrass (Nassella cernua and purpurea, respectively) and three-awn (Aristida purpurea longiseta) grasslands/meadows occurred frequently on the East Ranch, most often as patches or locally dominant stands. Other native grasses occur on the East Ranch as well: no severe impacts from the fire are expected to the native grasses and of those populations burned, recovery was high. " #suggests that this may regenerate, but not specific enough for me to say with certainty https://www.sdparks.org/content/dam/sdparks/en/pdf/Resource-Management/Appendix_B_Post-Cedar_Fire_Plant_Surveys_2004.pdf Moran, V., & Proprietor, S. (2004). Post-Cedar Fire Ecosystem and Rare Plant Impact Survey. --- "It is now known that fire often promotes Nassella and probably resulted in an increase in density (Sampson 1944; Jones and Love 1945; Biswell 1956; Ahmed 1983)" https://www.jstor.org/stable/pdf/41425222.pdf Hamilton, J. G. (1997). Changing perceptions of pre-European grasslands in California. Madrono, 311-333. --- "Plants need some protection from grazing duringflowering to ensure seed formation and food storagein the crown. Once established, it is generally firetolerant, but not fire resistant. The season of a burn isthe most important factor in determining the severityof the effects on the plants. It will re-sprout afterspring or fall burns, but summer burns can bedamaging. Smaller plants are often less damaged byfire than larger plants because they burn lessintensely and don’t smolder for long periods of time" https://plants.usda.gov/plantguide/pdf/pg_nace.pdf
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	"It is now known that fire often promotes Nassella and probably resulted in an increase in density (Sampson 1944; Jones and Love 1945; Biswell 1956; Ahmed 1983)" https://www.jstor.org/stable/pdf/41425222.pdf Hamilton, J. G. (1997). Changing perceptions of pre-European grasslands in California. Madrono, 311-333.
Reported flammable (Is the species described as being flammable,	No Data	#likely, but no data. uncertain if it reaches high density or not.

being a major wildfire fuel, or high fire risk?)		
Relative is flammable (Does a plant in the same genus meet the Reported Flammable criteria?)	No	

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.