Fire risk report for *Deschampsia cespitosa*

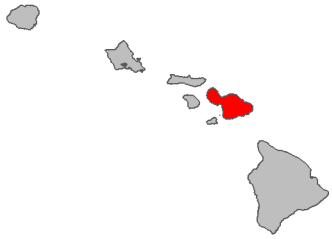
Full Species Name
Deschampsia caespitosa subsp. beringensis (L.) P.Beauv.

Family: Poaceae

Common names:
Beringian hairgrass
tufted hairgrass

Synonyms:
Deschampsia caespitosa

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2009

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 **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	No
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	"Native prairies, remarkable for their biodiversity, once dominated the landscape of the Willamette Valley. Before the mid- 1800's the Kalapuya, indigenous people of the Willamette Valley, maintained these prairies by setting annual fires, facilitating hunting and gathering of food plants (Boyd 1986, Boag 1992). These fires reduced the abundance of shrubs and trees, favored the abundance of grasses such as tufted hairgrass, Deschampsia cespitosa, and promoted a rich variety of native forbs." http://people.oregonstate.edu/~wilsomar/PDF/CW_Fin_98_Abst.pdf Clark, D. L., Wilson, M. V., & Refuges, W. O. (1998). Fire effects on wetland prairie plant species. A report to US Fish and Wildlife Service, Western Oregon refuges, Corvallis Oregon. ---------- "Wildfire Case Study Tufted hairgrass response was studied following a lightning-ignited fire in Ellis Meadow, a 30-acre (12 ha) subalpine meadow within the Roaring River drainage of Kings Canyon National Park, California, in the southern Sierra Nevada. The prefire community was subalpine meadow vegetation within forest dominated by Sierra lodgepole pine (Pinus contorta spp. murrayana). The meadow community was dominated by beaked sedge (Carex rostrata), tufted hairgrass (Deschampsia cespitosa), Idaho bentgrass (Agrostis idahoensis), and Mexican rush (Juncus mexicanus). Other common herbaceous species were primrose monkeyflower (Mimulus primuloides), Parish's yampah (Perideridia parishii), small white violet (Viola macloskeyi), and several species of fireweed (Epilobium spp.) [24,25]." https://www.fs.fed.us/database/feis/plants/graminoid/descaes/all.html ---------- "Fire is not usually a significant risk in many of the wet habitats affected by D. caespitosa. Nevertheless the plant is probably quite resistant to the effects of fire. Rapid regrowth of leaves from the hearts of the tussocks has been observed after the leaves and the outsides of the tussocks had been burned off in a grass fire"

		https://doi.org/10.2307/2259475 Davy, A. J. (1980). Deschampsia Caespitosa (L.) Beauv. Journal of Ecology, 68(3), 1075-1096.
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	#Occurs in some fire adapted areas, but I can't find references to it promoting fire
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	#Very little info available about this as an invasive
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	Deschampsia cespitosa and Carex unilateralis both had nearly 100% survival after fire (Table 4). Even though survival was not affected by burning, aboveground vegetative and reproductive biomass decreased after fire compared to the unburned treatment (Table 4). Inflorescence numbers for both species also greatly decreased in the burn plots, but there were block <U+F0B4> treatment interactions (Table 4), which make treatment effects more difficult to interpret (Underwood 1997). http://people.oregonstate.edu/~wilsomar/PDF/CW_Fin_98_Abst.pdf Clark, D. L., Wilson, M. V., & Refuges, W. O. (1998). Fire effects on wetland prairie plant species. A report to US Fish and Wildlife Service, Western Oregon refuges, Corvallis Oregon.
Promoted by fire (Does the plant increase in abundance after a fire?)	No	
Reported flammable (Is the species described as being flammable,	No Data	

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

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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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