

Species:
Penstemon deustus var. variabilis

Index Result:
Less Vulnerable

Scientific Name
 Common Name
 Taxonomic Group
 Geographic Area

Hot-rock penstemon
 Vascular Plant
 Eastern Oregon

Confidence Very High
 (based on entered data)
 Date Assessed 5/12/2020
 GRank G5T1T2
 SRank S1S2
 Assessor Sue Vrillakas

Cave/Ground Water Obligate: No
 Migratory area included in assessment: No

Climate Change Vulnerability Index Values: (greatest score shown when range was selected)

Category	Factor	Score	Comments
Temperature Scope (predicted increase)	A >6.0F	0	
	A 5.5F	0	
	A 5.1F	0	
	A 4.5F	85	
	A 3.9F	15	
	A <3.9F	0	
Hamon AET:PET Moisture Metric Scope	< -0.119	8	
	-0.119	40	
	-0.096	29	
	-0.073	20	
	-0.05	3	
	>-0.028	0	
Sea level rise	B1	N	Interior species
Natural barriers	B2a	N	
Anthropogenic barriers	B2b	N	
Climate Change mitigation	B3	N	
Dispersal/Movement	C1	N	Current range is rather widespread
Historical thermal niche	C2ai	SI	Most of the population is in neutral category but at least 10% in somewhat increase
Physiological thermal niche	C2aii	N	
Historical hydrological niche	C2bi	N	Highest value 46.7323; lowest 11.6414; difference=35.0909
Physiol. hydrological niche	C2bii	Inc	
Disturbance dependence	C2c	N	Assumed that plants depended on local season moisture fluctuations
Ice/snow dependence	C2d	N	
Physical habitat restrictions	C3	N	
Other spp create habitat	C4a	N	
Dietary Versatility	C4b	U	
Pollinator Versatility	C4c	N	
Other spp for dispersal	C4d	N	
Pathogen sensitivity	C4e	N	
Competition sensitivity	C4f	U	
Interspecific Relationship	C4g	U	
Measured genetic variation	C5a	U	
Bottlenecks	C5b	U	
Plant reproductive system	C5c	U	
Phenological response	C6	U	
Documented response	D1	U	

Modeled change	D2	U	
Modeled overlap	D3	U	
Modeled protected areas	D4	U	

Additional Notes:

Range map created using ArcMap Miminum Mapping Boundary-Convex Hull on ORBIC element occurrence data, 4-29-2020 export. Climate and precipitation data from Climate Wizard using the A1B emissions scenario and ensemble average general circulation model: Historical = 1951-2006; Future = mid-century (2050s); Hamon AET:PET moisture metric (Hamon 1961).

References:**Data sources and notes:**

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Detailed definitions of criteria and methodology can be found in the documentation at <http://www.natureserve.org/conservation-tools/climate-change-vulnerability-index>

Legend and Definitions:

Affect to Vulnerability:
GI = Greatly increase
Inc = Increase
SI = Somewhat increase
N = Neutral
U = Unknown

Index Scores:

Extremely Vulnerable: Abundance and/or range extent within geographical area assessed extremely likely to substantially decrease or disappear by 2050.
Highly Vulnerable: Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.
Moderately Vulnerable: Abundance and/or range extent within geographical area assessed likely to decrease by 2050.
Less Vulnerable: Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.
Insufficient Evidence: Information entered about a species' vulnerability is inadequate to calculate an Index score.

Citation:

Oregon Biodiversity Information Center. 2020. Climate Change Vulnerability Index assessment for Hot-rock penstemon (*Penstemon deustus* var. *variabilis*). Institute for Natural Resources, Portland State University, Portland, OR.