

Species English Name Taxonomic Group Geographic Area  Cave/Ground Water Obligate Migratory area included in assessment:	<b>Species Data:</b> <i><b>Botrychium montanum</b></i> <b>Mountain grape-fern</b> Vascular Plant NE Oregon  No  No	<b>Index Result:</b> <b>Moderately Vulnerable</b> <b>Confidence Moderate</b> (based on entered data)  GRank G3 SRank S2  Assessor Caitlin Lawrence
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**Climate Change Vulnerability Index Values:** (greatest 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	70	
	A 3.9F	29	
	A <3.9F	1	
Hamon AET:PET Moisture Metric Scope	< -0.119	10	
	-0.119	42	
	-0.096	27	
	-0.073	17	
	-0.05	4	
	>-0.028	0	
Sea level rise	B1	N	Populations range across a good portion on NE Oregon so should not have barrier issues.
Natural barriers	B2a	N	
Anthropogenic barriers	B2b	N	
Climate Change mitigation	B3	N	
Dispersal/Movement	C1	N	Spores are small and can theoretically travel across large distances.
Historical thermal niche	C2ai	SI	
Physiological thermal niche	C2aii	U	Found across a wide precip range.  This species grows in wet areas, riparian corridors and seeps.
Historical hydrological niche	C2bi	N	
Physiol. hydrological niche	C2bii	Inc	
Disturbance dependence	C2c	N	
Ice/snow dependence	C2d	N	
Physical habitat restrictions	C3	N	
Other spp create habitat	C4a	SI	
Dietary Versatility	C4b	U	All Botrychium species are believed to be obligately dependent on mycorrhizal relationships (Beatty et al 2003).
Pollinator Versatility	C4c	N	
Other spp for dispersal	C4d	N	
Pathogen sensitivity	C4e	N	
Competition sensitivity	C4f	N	
Interspecific Relationship	C4g	U	

Measured genetic variation	C5a	SI	Studies of genetic variation in the genus have shown it is low, but some authors suggest it's not an issue for the species in this genus (see Beatty et al 2003)
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	

**Data sources and notes:**

Climate and precipitation data from Climate Wizard using the A1B emissions scenario and ensemble average general circulation model. Historical = past 50 years; Future = mid-century (2050s). Species data from ORBIC database. Assessment performed in conjunction with the Element Rank Calculator. Other resources consulted: NREL national wind resources, 50m resolution ([http://www.nrel.gov/gis/data\\_analysis\\_background.html](http://www.nrel.gov/gis/data_analysis_background.html)); SILVIS lab Wildland Urban Interface 2010 layer ([http://silvis.forest.wisc.edu/maps/wui\\_main](http://silvis.forest.wisc.edu/maps/wui_main)); Oregon Department of Geology and Mineral Industries geologic map (<http://www.oregongeology.org/sub/publications/GMS/gms.htm>); US mining claims on federal lands (<http://mrdata.usgs.gov/mine-claim/>); Oregon Protected Areas Database (<http://gapanalysis.usgs.gov/padus/data/>).

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**

<b>Affect to Vulnerability:</b>
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.