

	Species Data:	Index Result:
Species	<i>Botrychium ascendens</i>	Moderately Vulnerable
English Name	Upward-lobed moonwort	Confidence Moderate
Taxonomic Group	Vascular Plant	(based on entered data)
Geographic Area	NE Oregon	
		GRank G3
Cave/Ground Water Obligate	No	SRank S2
Migratory area included in assessment:	No	Assessor Caitlin Lawrence

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	100	
	A 3.9F	0	
	A <3.9F	0	
Hamon AET:PET Moisture Metric Scope	< -0.119	20	
	-0.119	60	
	-0.096	20	
	-0.073	0	
	-0.05	0	
	>-0.028	0	
Migratory Exposure: Climate Change Exposure Index	>7		
	6-7		
	4-5		
	<4		
Sea level rise Natural barriers Anthropogenic barriers Climate Change mitigation	B1	N	
	B2a	N	
	B2b	N	
	B3	N	
Dispersal/Movement Historical thermal niche Physiological thermal niche Historical hydrological niche Physiol. hydrological niche Disturbance dependence Ice/snow dependence Physical habitat restrictions	C1	N	Spores are small and can theoretically travel across large distances.
	C2ai	SI	
	C2aii	N	Range of around 36 inches
	C2bi	N	
	C2bii	Inc	
	C2c	N	Most sites are in open, mesic meadows. Thus, it seems that <i>B. ascendens</i> generally prefers open or early successional habitats that might be associated with hydrologic disturbances. (Beatty et al 2003).
	C2d	N	
	C3	N	

Other spp create habitat	C4a	SI	All Botrychium species are believed to be obligately dependent on mycorrhizal relationships (Beatty et al 2003).
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	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); SILVIS lab Wildland Urban Interface 2010 layer (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

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)

change (increases/decreases),
substantially by 2050. Actual range
boundaries may change.
Insufficient Evidence: Information
entered about a species' vulnerability
is inadequate to calculate an Index