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Oregon State Rank Assessment for Midget Quillwort (*Isoetes minima*)

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Natural Heritage Ranking Form - Oregon State Rank

Oregon Ranking Form Midget quillwort (*Isoetes minima*)

Oregon Biodiversity Information Center

SPECIES ASSESSED

Scientific Name	<i>Isoetes minima</i>	ELCODE	PPISO01081
Common Name	Midget quillwort	Element ID	13015

Species Concept Reference Citation

St. John, H. 1963. Flora of southeastern Washington and of adjacent Idaho. Outdoor Pictures, Escondido, CA. 583 pp.

CONSERVATION STATUS RANK

Assigned Rank S2?

Rank Assignment Author	Lindsey Wise	Rank Review Date	7/15/2024
Rank Factors Author	Lindsey Wise	Rank Factors Date	07/15/2024
Calculated Rank	S2?	Rank Change Date	07/15/2024
Rank Methodology Used	Rank calculation - Biotics v2		

Assigned Rank Reasons

Additional sites found with many plants, but there are many threats, including road maintenance activities, trampling, changes in hydrology, and climate change.

RANGE/DISTRIBUTION

Range Extent

Rating 5000-20,000 square km (about 2000-8000 square miles)

Estimate 9800

Unit Used for Estimate Square
Kilometers

Comments

Area of Occupancy

Grid Cell Size 4 km² Grid Cells

Rating (as Number of 4 km² Grid Cells) E = 26-125

Comments 30 4-km² grid cells occupied

ABUNDANCE AND CONDITION

Number of Occurrences

Rating 21 - 80

Comments

23 estimated using 1 km separation distance. Likely additional EOs exist but not all likely habitat has been surveyed for this species.

Population Size

Rating 10,000 - 100,000 individuals

Comments

At least 11,500 counted in Blue Mountains in surveys 2018-2023.

Good Viability/Ecological Integrity

Number of Occurrences with Good Viability/Ecological Integrity

Rating None to few (0-12)

Comments

Viability has not been assessed, but most sites note threats are present.

THREATS

<u>Threat Category Code</u>	<u>Threat Category</u>	<u>Calculated Impact</u>	<u>Scope</u>	<u>Severity</u>	<u>Timing</u>	<u>Comments</u>
6	Human intrusions & disturbance	BD = High - low	Large: Affects most (31-70%) of the total population or occurrences or extent	Serious - slight	High: Continuing	
6.1	Recreational activities	BD = High - low	Large: Affects most (31-70%) of the total population or occurrences or extent	Serious - slight	High: Continuing	Off-road vehicle use, trampling by hikers
4	Transportation & service corridors	CD = Medium - low	Large: Affects most (31-70%) of the total population or occurrences or extent	Moderate - slight	High: Continuing	
4.1	Roads & railroads	CD = Medium - low	Large: Affects most (31-70%) of the total population or occurrences or extent	Moderate - slight	High: Continuing	Sites near roads could be impacted by road maintenance, including ditching
11	Climate change & severe weather	AC = Very high - medium	Pervasive: Affects all or most (71-100%) of the total population or occurrences or extent	Extreme - moderate	High: Continuing	
11.1	Habitat shifting & alteration	AC = Very high - medium	Pervasive: Affects all or most (71-100%) of the total population or occurrences or extent	Extreme - moderate	High: Continuing	Potential for habitat to decline substantially due to drying, succession, changing climate (Kerns et al. 2018, Maslovat et al. 2021)
2	Agriculture & aquaculture	Unknown	Large: Affects most (31-70%) of the total population or occurrences or extent	Unknown	High: Continuing	
2.3	Livestock farming & ranching	Unknown	Large: Affects most (31-70%) of the total population or occurrences or extent	Unknown	High: Continuing	
2.3.2	Small-holder grazing, ranching or farming	Unknown	Large: Affects most (31-70%) of the total population or occurrences or extent	Unknown	High: Continuing	Trampling by cattle, impacts to habitat
7	Natural system modifications	CD = Medium - low	Restricted - small	Extreme - moderate	High: Continuing	

7.2	Dams & water management/use	CD = Medium - low	Restricted - small	Extreme - moderate	High: Continuing	Water diversions, modifications can dry out habitat or lead to increased trampling by grazing animals
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Calculated Overall Threat Impact AB = Very high - high

Assigned Overall Threat Impact AB = Very high - high

TRENDS

Short-Term Trend

Rating FG = Decline of <30% to relatively stable

Comments

Likely some sites in Blue Mountains were destroyed by construction of cattle troughs at springs (Paula Brooks in Wise, Malacara, and Campbell 2024)

Long-Term Trend

Rating U = Unknown

OTHER FACTORS

Intrinsic Vulnerability Rating

Comments

Environmental Specificity Rating Narrow. Specialist or community with key requirements common.

Comments

Spring seepage areas, seasonally wet swales in dry prairie and sagebrush in subalpine areas at 1700–1800 m elevation (OregonFlora 2024, WNHP 2024).

ADDITIONAL SPECIES INFORMATION

Oregon Habitat Comments

Midget quillwort occurs in seasonally wet swales in sagebrush steppe and seepage areas in dry prairie that dry out by midsummer at elevations of 1,700 to 1,800 m (OregonFlora 2024, WNHP 2005). In the Blue Mountains, often occurs in spring seepage in upper slope grassland with scattered Douglas-fir, and in largely bare soil sites in which the plant grows to maturity early in the season before most other annual vascular plant species have emerged (Paula Brooks, Mark Darrach, Duncan Thomas field notes).

RANKING REFERENCES

<u>Short Citation</u>	<u>Author</u>	<u>Year</u>	<u>Full Citation</u>
Kerns et al.		2018	Kerns B.K., D.C. Powell, S. Mellmann-Brown, G. Carnwath, and J.B. Kim. 2018. Effects of projected climate change on vegetation in the Blue Mountains ecoregion, USA. <i>Climate Services</i> 10:33-43. Available at: https://doi.org/10.1016/j.cliser.2017.07.002
Maslovat et al.		2021	Maslovat, C., Batten, R., Brunton, D. and P. Sokoloff. 2021. Distribution, status, and habitat characteristics of Columbia Quillwort (<i>Isoetes minima</i> , Isoetaceae) in Canada. <i>The Canadian Field-Naturalist</i> , 135(3), pp.293-304. Available at: https://doi.org/10.22621/cfn.v135i3.2621
OregonFlora		2024	OregonFlora. 2024. OregonFlora website, including atlas, specimen and observation dataset, and plant descriptions. oregonflora.org
Wise et al.		2024	Wise, L.K., K. Malacara, and G. Cambell. 2024. <i>Isoetes minima</i> species account for potential Species of Conservation Concern, Blue Mountains National Forests. Developed by ORBIC for USDA Forest Service, Pacific Northwest Region. Institute for Natural Resources - Portland State University, Portland, OR.

RESOURCES

Oregon Biodiversity Information Center, Institute for Natural Resources
Portland State University, Mail Stop: INR, PO Box 751, Portland, OR 97207-0751 Phone: 503-725-9950

Additional ORBIC species ranking forms posted at
<https://inr.oregonstate.edu/orbic/rare-species/ranking-documentation>

Information on Natural Heritage ranking methodology is available at
<http://www.natureserve.org/biodiversity-science/publications/natureserve-conservation-status-assessments-methodology-assigning>

The Conservation Rank Calculator is developed and maintained by NatureServe and is available from
<http://www.natureserve.org/conservation-tools/conservation-rank-calculator>

ASSESSMENT CITATION

Lindsey Wise. 2024. Oregon state rank assessment for Midget quillwort (*Isoetes minima*). Oregon Biodiversity Information Center. Institute for Natural Resources, Portland State University, Portland, OR.