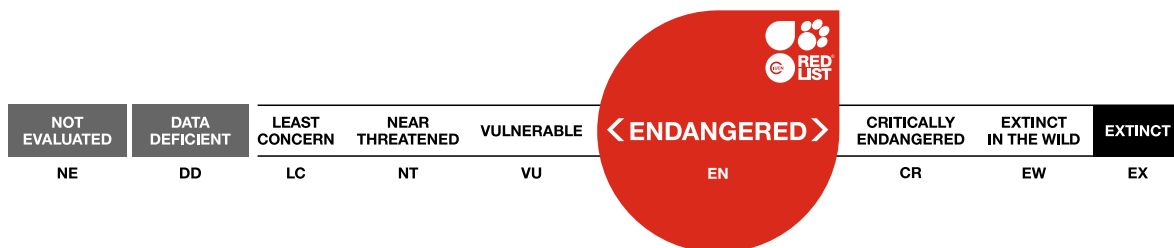


Cladonia appalachiensis

Assessment by: Lendemer, J., Allen, J. & McMullin, T.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae

Scientific Name: *Cladonia appalachiensis* Yoshim. & Sharp ex Lendemer & R.C.Harris

Synonym(s):

- *Cladonia appalachensis* Yoshim. & Sharp ex Lendemer & R.C.Harris [orth. error]

Assessment Information

Red List Category & Criteria: Endangered B1ab(iv,v)+2ab(iv,v) [ver 3.1](#)

Year Published: 2020

Date Assessed: October 6, 2019

Justification:

This species warrants an Endangered status because the EOO is <100 km² (12 km²), the AOO is <500 km² (6 km²), there are fewer than five locations (three total), and a major decline has occurred within the past 100 years (40% inferred decrease).

Geographic Range

Range Description:

Cladonia appalchensis only grows in a small portion of the Great Smoky Mountains National Park where Anakeesta rock outcrops occur on the highest ridge dividing North Carolina and Tennessee. Extensive searches for this species outside of the national park did not result in the discovery of additional populations (Allen and Lendemer 2016).

Country Occurrence:

Native, Extant (resident): United States (North Carolina, Tennessee)

Population

There are three documented locations of this species, all of which are known to be extant. All populations are found within a very small area at high elevations in the Great Smoky Mountains National Park. No population monitoring has occurred or is currently being implemented. Two populations that were documented in the 1970's are now extirpated. There has also been observed decline in population sizes in sites frequently visited by tourists. In these areas, the species grows in highly sensitive cliff communities on rock outcrops directly adjacent to, and traversed by, established trails that are highly visited.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Cladonia appalachensis only grows on high elevation Anakeesta rock, and iron-rich rock type, outcrops in the Great Smoky Mountains National Park.

Systems: Terrestrial

Threats (see Appendix for additional information)

Disruption of populations by visitors could pose a threat to localities in highly visited areas. Monitoring must be conducted to determine whether or not mechanical disruption is negatively impacting this species, in which case limitation of access or other forms of protection may be warranted. There is evidence of changes in cloud cover and humidity in high-elevation rock outcrops in the southern Appalachians (Cullata and Horton 2014), which could lead to declines in this species' abundance.

Conservation Actions (see Appendix for additional information)

Monitoring *Cladonia appalachensis* is essential to ensure that visitors to the Great Smoky Mountains National Park are not negatively impacting this species. If they are impacting this species, signs to encourage people to stay on the path will be helpful. Additionally, a detailed population genetic study will help direct protection prioritization of individuals at each site.

Credits

Assessor(s): Lendemer, J., Allen, J. & McMullin, T.

Reviewer(s): Yahr, R.

**Facilitator(s) and
Compiler(s):** Scheidegger, C.

Bibliography

Allen, J.L. and Lendemer, J.C. 2016. Climate change impacts on endemic, high-elevation lichens in a biodiversity hotspot. *Biodiversity and Conservation* 25(3): 555-568.

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External Resources

For [Supplementary Material](#), and for [Images and External Links to Additional Information](#), please see the Red List website.

Appendix

Plant Growth Forms

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Plant Growth Form
L. Lithophyte
M. Fungus
LC. Lichen

Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Whole (>90%)	Causing/could cause fluctuations	Medium impact: 7
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: Yes, over entire range
Percentage of population protected by PAs: 91-100
Area based regional management plan: No
Occurs in at least one protected area: Yes
Invasive species control or prevention: Not Applicable
In-place species management

Conservation Action in Place
Harvest management plan: No
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: No
Included in international legislation: No
Subject to any international management / trade controls: No

Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action Needed
2. Land/water management -> 2.1. Site/area management
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.2. Training
4. Education & awareness -> 4.3. Awareness & communications

Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 12
Continuing decline in area of occupancy (AOO): No
Extreme fluctuations in area of occupancy (AOO): No

Distribution
Estimated extent of occurrence (EOO) (km ²): 12
Continuing decline in extent of occurrence (EOO): No
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 3
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 1,480
Upper elevation limit (m): 1,990
Population
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: No
No. of subpopulations: 3
Continuing decline in subpopulations: Yes
Extreme fluctuations in subpopulations: No
Habitats and Ecology
Generation Length (years): 30
Movement patterns: Not a Migrant
Congregatory: Congregatory (year-round)

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