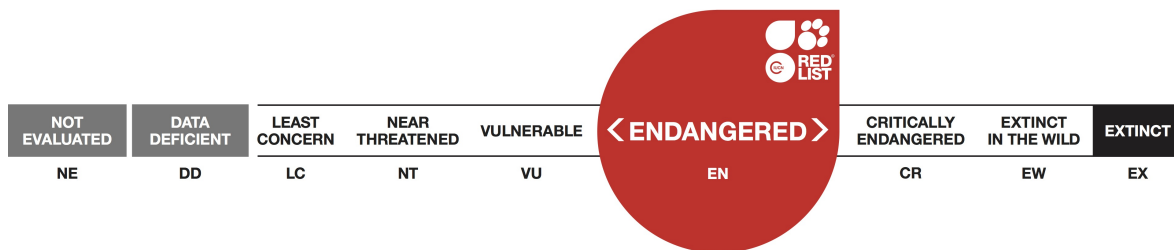


Rinodina brodoana

Assessment by: Lendemer, J.



View on www.iucnredlist.org

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae

Taxon Name: *Rinodina brodoana* Sheard, Lendemer & E.Tripp

Identification Information:

Rinodina brodoana is a blue-gray to brownish-gray crustose lichen that can be recognized by its growth on the bases of mature oak trees and thick, overlapping areoles with irregularly shaped soralia that appear to bubble from the surface.

Assessment Information

Red List Category & Criteria: Endangered B2ab(v) [ver 3.1](#)

Year Published: 2018

Date Assessed: August 31, 2017

Justification:

Rinodina brodoana is a crustose lichen that occurs on the bases of mature oak trees in remnant, mature low- and middle elevation forests within a small area of Great Smoky Mountains National Park in eastern North America. The species has likely been historically impacted by large scale habitat loss and degradation, phenomena which are inferred to continue in lands directly adjacent to all extant populations. Increased acquisition and protection of suitable habitat, monitoring of existing populations, and raising awareness of the species are recommended conservation measures for the species.

This species is categorised as **Endangered** based on the area of occupancy (AOO = 16 km²), small number of total locations (n=4), and the observed decline in habitat quality. The habitat that this species occurs in has been substantially impacted by logging activities in the past, as well as by flooding of lowlands for hydroelectricity. Although the species occurs within the borders of a protected management unit, the habitat quality in this area, including local climatic conditions, could be negatively impacted by proposed resource extraction as well as road/utility corridor construction on directly adjacent federal lands that are not afforded the same protected status.

Lendemer et al. (2014) ranked the species as **Critically Endangered B1ab(iii); D**, however that rank should be superseded by the one proposed here based on the subsequent discovery two additional populations, albeit within the already documented geographic range.

Geographic Range

Range Description:

Rinodina brodoana is narrowly endemic to middle and low elevation mature, acid forests dominated by

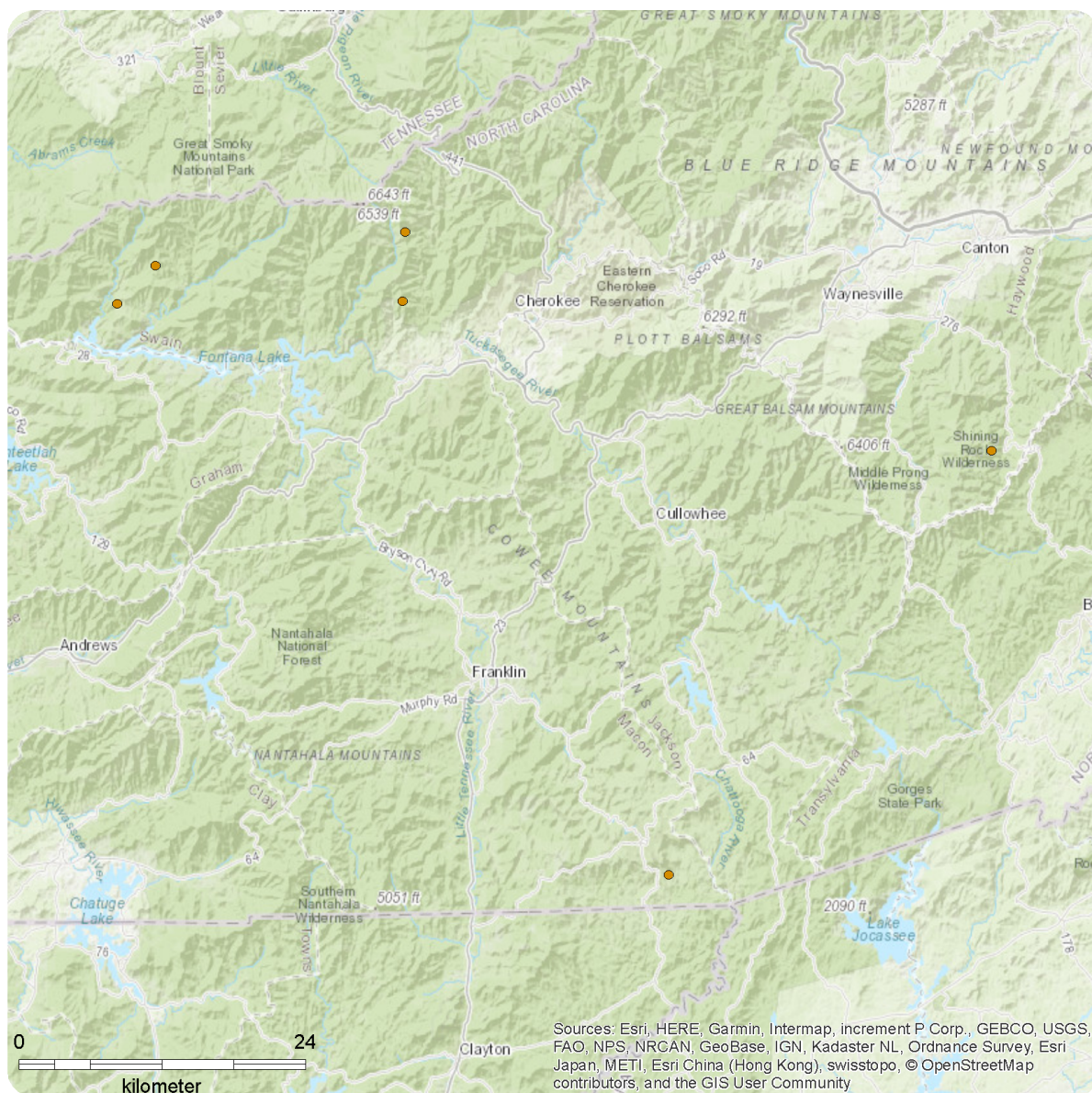
oak (*Quercus*) and hickory (*Carya*) in a small geographic area of the southern Appalachian Mountains of North Carolina in eastern North America. All of the populations occur on bark at the base of mature oak trees on the mountain slopes above the north shore of Fontana Lake, within Swain County, North Carolina.

Country Occurrence:

Native: United States (North Carolina)

Distribution Map

Rinodina brodoana



Range

- Extant (resident)

Compiled by:

IUCN



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



Population

The species was described in 2014 based on two populations discovered 2012 in a protected management unit (Great Smoky Mountains National Park). In 2015 two additional populations were discovered in the same management unit, at locations within several miles of the first discoveries. Extensive fieldwork, spanning decades, by experts within the same management unit (W.R. Buck, J.P. Dey, R.C Harris, J.C. Lendemer, T. Tønsberg, E.A. Tripp) has failed to locate populations outside of the small area within which the species is presently known. Similar efforts throughout the southern Appalachians, as well as large-scale study of museum specimens by taxonomic expert J.W. Sheard, have also failed to locate additional populations either historical or extant.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Rinodina brodoana is narrowly endemic to middle and low elevation mature, acid forests dominated by oak (*Quercus*) and hickory (*Carya*) in a small geographic area of the southern Appalachian Mountains of North Carolina in eastern North America. All of the populations occur on bark at the base of mature oak trees on the mountain slopes above the north shore of Fontana Lake, within Swain County, North Carolina.

Systems: Terrestrial

Threats (see Appendix for additional information)

The habitat that this species occurs in has been substantially impacted by logging activities in the past, as well as by flooding of lowlands for hydroelectricity. Although the species occurs within the borders of a protected management unit, the habitat quality in this area, including local climatic conditions, could be negatively impacted by proposed resource extraction as well as road/utility corridor construction on directly adjacent federal lands that are not afforded the same protected status.

Conservation Actions (see Appendix for additional information)

Monitoring of all populations is required to determine whether the species is still declining or stable. Increased acquisition of suitable habitat, and increased protections for suitable habitat already within management units is also needed. The potential impacts of resource extraction and development on adjacent lands should also be evaluated and considered in drafting regulations for use of those areas.

Credits

Assessor(s): Lendemer, J.

Reviewer(s): Scheidegger, C.

Contributor(s): Weerakoon, G.

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External Resources

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

Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.4. Forest - Temperate	Resident	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.3. Temperature extremes	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.1. Species mortality		
11. Climate change & severe weather -> 11.5. Other impacts	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.2. Gathering terrestrial plants -> 5.2.2. Unintentional effects (species is not the target)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	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 Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over part of range

Conservation Actions Needed

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

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.3. Habitat & natural process restoration
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.2. Policies and regulations

Research Needed

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

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

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 16
Number of Locations: 4
Lower elevation limit (m): 0
Upper elevation limit (m): 1000
Population
Continuing decline of mature individuals: Yes
All individuals in one subpopulation: Yes

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