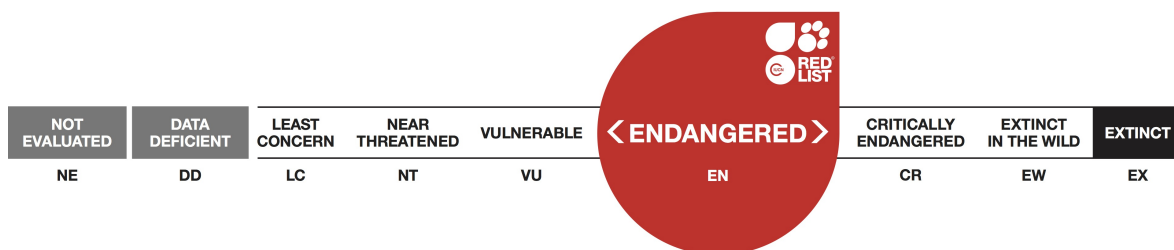


Cladonia perforata, Florida Perforate Reindeer Lichen

Assessment by: Yahr, R. (Lichen Specialist Group)



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae

Taxon Name: *Cladonia perforata* A.Evans

Common Name(s):

- English: Florida Perforate Reindeer Lichen, Perforate Reindeer Lichen

Taxonomic Notes:

Cladonia perforata was named by Alexander Evans based on collections from North Gulf Coast Florida, Okaloosa County. No other names have ever been used for this species.

Assessment Information

Red List Category & Criteria: Endangered B1ab(iii,iv,v)c(iii,iv) [ver 3.1](#)

Year Published: 2003

Date Assessed: April 30, 2003

Annotations: Needs Updating

Justification:

Cladonia perforata occurs in three widely disjunct regions of Florida (North Gulf Coast, Lake Wales Ridge and Atlantic Coast Ridge) over a total extent of approximately 3,400 km². Each region consists of several to many severely fragmented occupied habitat patches (subpopulations), each typically on the order of one km² or less. The total number of such subpopulations is only just over 30. Reproduction is limited to poorly-dispersing vegetative fragments that have few opportunities to colonize these disjunct habitat patches. Of the approximately 32 known natural locations (two locations are reintroduced), only 22 are protected. Along both the Lake Wales Ridge and the Atlantic Coast Ridge, unprotected subpopulations lie on high-value real estate, making their long-term persistence unlikely without protection. Even protected subpopulations are occasionally subject to fires and hurricanes, periodic natural disturbances which influence both long-term habitat maintenance and short term subpopulation persistence. A hurricane in 1996 severely impacted the North Gulf Coast region, extirpating two of the three subpopulations and reducing the third subpopulation by more than 70%. Fires are important for opening shrub and tree canopies while they threaten subpopulations in the short term. Low-fuel patches that don't carry fire are critical refugia for lichens and must be maintained for subpopulations to persist. *C. perforata* subpopulations are largest in intermediate times between fires, where populations have rebounded after disturbance, but where canopies remain open.

Geographic Range

Range Description:

Three major regions of occurrence exist. 1) North Gulf Coast, including a single natural subpopulation (the largest known subpopulation "East Pass", 0.5-1 km²), and one remnant thallus after Hurricane Opal

destroyed two subpopulations, "Pole 28" and "A2". In addition, two reintroduced populations (at Pole 28 and A2) were established in 2000. 2) Lake Wales Ridge. This region contains the bulk (22 of 32) of the known subpopulations, scattered across single endemic-rich ridge system. Many subpopulations are severely fragmented and dispersal among them very unlikely. The total area of occupancy in this ca. 2,700 km² area is probably on the order less than 5 km² in disjunct patches. Two locations are important for the amount of protected habitat, active fire-management programs and presence of several occupied (with large areas occupied) and unoccupied habitat patches: Archbold Biological Station with 7 subpopulations, Ridge State Forest with 3, and Lake Apthorpe Preserve with 2. Several privately-held populations are of high habitat quality and large area of occupancy. 3) The Atlantic Coast Ridge has two important locations, but overall low extent of occurrence (ca. 720 km²) and area of occupancy. Jonathan Dickinson State Park protects several subpopulations (including one large one at County Line Rd.), and the Bureau of Land Management protects two subpopulations at Jupiter Lighthouse. Several other scattered sites are privately held, small in area occupied and unlikely to persist under dense tree canopies or without being extirpated for coastal development projects.

Population size - in the traditional sense - for *Cladonia perforata* is difficult to estimate. It consists of strictly asexual, branching structures which reproduce via vegetative fragmentation. Genetic studies have so far supported an asexual life history (pers. obs.). Effective population sizes are typically one or two genetic individuals per subpopulation. Therefore density and area occupied are probably better measures of abundance for this species than count data. Most subpopulations probably contain less than 0.1 km² coverage of lichen, with a few containing only a few square meters. The degree of fragmentation is naturally high, since appropriate habitat (open Florida scrub) is naturally patchy and disjunct. Most locations are separated by many kilometers of intervening unsuitable habitats and even locations supporting several subpopulations in close proximity still have what are probably very effective barriers to dispersal among them.

Country Occurrence:

Native: United States (Florida)

Population

Current Population Trend: Unknown

Habitat and Ecology (see Appendix for additional information)

Cladonia perforata occurs primarily in open Florida rosemary scrub, with large gaps between shrubs and plenty of bare sand and other terrestrial lichens. These scrub habitats are fossil inland dunes or stable coastal dunes. It occupies the highest topographic positions throughout most of this range. In the North Gulf Coast region, it can occur downslope into seasonal depressional wetlands with dense herbaceous cover, but saltwater overwash will kill it. *C. perforata* grows slowly and branches once a year. Fragmentation (vegetative reproduction) can happen via trampling or natural breakage after decades of growth *in situ*.

Systems: Terrestrial

Threats (see Appendix for additional information)

The main threats to *C. perforata* are from habitat loss in the Lake Wales Ridge and Atlantic Coast Ridge, from hurricanes in the North Gulf Coast (overwash and windthrow into unsuitable sites), and from improper fire management throughout. A single hurricane or fire can reduce subpopulations by more than 70% or extirpate it entirely. Dispersal from disjunct sites is extremely unlikely.

Conservation Actions (see Appendix for additional information)

Cladonia perforata is Federally Listed Endangered by the US Fish and Wildlife Service, making all Federal landowners with *C. perforata* responsible for its protection and conservation under the Endangered Species Act. The state of Florida additionally has an active conservation and natural heritage program which tracks listed species (*C. perforata* is state-listed endangered and has a Heritage Ranking of G1N1) and works to conserve them through land acquisition and management. At least two Lake Wales Ridge sites were acquired under a state project for conservation and recreation lands.

Conservation actions also include reintroduction efforts at Eglin Air Force Base, home to the largest subpopulation (East Pass) and the two extirpated sites at Pole 28 and A10. East Pass was used as a source population for these reintroductions and there is ongoing monitoring of hurricane impacts and reintroduced population success. Post-fire recovery is being monitored at several subpopulations on the Lake Wales Ridge. Fire management is a critical part of conservation of this and many other Florida scrub species and is ongoing throughout most protected sites along the Lake Wales Ridge and the Atlantic Coast Ridge.

Credits

Assessor(s): Yahr, R. (Lichen Specialist Group)

Reviewer(s): Wolseley, P.A., Smith, C. & Scheidegger, C. (Lichen Red List Authority)

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External Resources

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Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
3. Shrubland -> 3.6. Shrubland - Subtropical/Tropical Moist	-	Suitable	-
5. Wetlands (inland) -> 5.7. Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha)	-	Marginal	-
13. Marine Coastal/Supratidal -> 13.3. Marine Coastal/Supratidal - Coastal Sand Dunes	-	Suitable	-

Threats

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

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.2. Species disturbance		
7. Natural system modifications -> 7.1. Fire & fire suppression -> 7.1.3. Trend Unknown/Unrecorded	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.3. Other ecosystem modifications	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.4. Storms & flooding	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

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

Conservation Actions in Place
In-Place Species Management
Successfully reintroduced or introduced benignly: Yes

Conservation Actions Needed

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

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.1. Site/area management
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.3. Sub-national level

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

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