

*R9 Species Conservation Assessment*  
*for*  
*Cladonia wainioi* Savicz  
**in**  
**The Upper Great Lakes National Forests**



*Cladonia wainioi*

*Prepared by*  
*Clifford Wetmore*  
*Dept. of Plant Biology*  
*University of Minnesota*  
*1445 Gortner Ave.*  
*St. Paul, MN 55108*  
**wetmore@tc.umn.edu**

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### DISCLAIMER

This Conservation Assessment was prepared to compile the published and unpublished information on the subject species or community. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

Cover photo by C. Wetmore.

### EXECUTIVE SUMMARY

*Cladonia wainioi* Savicz is designated as a Regional Forester Sensitive Species on the Superior National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare Conservation Approaches and a Conservation Strategy that will include management actions to conserve the species.

This conservation assessment provides available information on *Cladonia wainioi* Savicz and its distribution, habitat, range, status, life history, and ecology. *Cladonia wainioi* grows in boreal bogs and rocks in arctic regions of North America and eastern Asia. It is not listed on red lists in Europe. In the Great Lakes area common habitat for this species is large rock outcrops. It is an R9 Sensitive Species on Superior National Forest in Minnesota. Threats to *Cladonia wainioi* are damage to the rocky areas where this grows by logging, roads, or trails.

### ACKNOWLEDGEMENTS

Appreciation is extended to the curators of the herbaria for help in obtaining label data for collections of rare lichens and to Dr. James Bennett for assistance.

Regional USFS personnel also provided maps and assistance in obtaining data for their forests and are thanked for their help.

## **INTRODUCTION**

For this document a search was made of the printed literature, Internet (W-1), and other literature thought to have pertinent information. Distribution and ecological information was gathered along with range-wide status and threats. All collections of the species found in the University of Michigan Herbarium (MICH), University of Minnesota Herbarium (MIN), Michigan State University Herbarium (MSC), and University of Wisconsin Herbarium (WIS) were located and the labels copied and entered into species databases. From these records ecological information, land ownership, and distribution maps were prepared for the area covered in this report. The draft reports were then sent to reviewers for comments and additions.

Most lichens do not have common names that are widely known, although some attempts have been made to create them (Brodo et al. 2001). For most species there is little known about the detailed ecology and the historical distributions of these lichens but some data could be derived from the herbarium collections.

## **NOMENCLATURE AND TAXONOMY**

Family: Cladoniaceae

Scientific name: *Cladonia wainioi* Savicz

Common name: none

USDA plant code: CLWA5

Synonyms: *Cladonia pseudorangiformis* Asah.

## **DESCRIPTION OF SPECIES**

“Podetia greenish to brownish mineral gray, sparsely squamulate, the axils open”; “pycnidia common, apothecia rare, dark brown” (Hale 1979).

This species is quite branched and is similar in form to the common *Cladonia multiformis* and *Cladonia furcata*, but those species are PD+ red while *C. wainioi* is PD-. Both species have corticate podetia as opposed to the *Cladina* species that are non-corticate. *Cladonia wainioi* also looks like *Cladina rangiferina* and may be confused in the field but *C. wainioi* has brown tips of the podetial branches and is corticate while *Cladina* species are non-corticate and do not have brown tips.

## **LIFE HISTORY**

Reproduction : This lichen rarely has apothecia and disperses asexually by thallus fragments.

Ecology : It grows on thin soil and humus on sunny rocks in our region but in bogs in alpine and arctic areas (Ahti 1962). Because it grows on sunny rocks it seems to be tolerant to periods of drought.

Dispersal : Dispersal is by thallus fragments so it cannot disperse very far.

Obligate Associations : NA

## **HABITAT**

Range-wide : This species is known from northeast Asia extending across northern North America “It is abundant in maritime bogs in Newfoundland. In forested areas it is found in scattered patches in treeless bogs and wooded swamps or on boulders in thinly wooded forests. It often attains a cover of 1 to 5 per cent in a

plant community, but rarely more. In Northern Ontario it was infrequently found on rock outcrops and on ground in old sandy *Pinus banksiana* lichen woodlands in the middle boreal zone, but only in the northern boreal zone is it common" (Ahti 1962).

National Forests : In our area this species has only been found on large rock outcrops.

Site Specific : One collection in Superior National Forest was collected on a rock cliff and the other was found on a rock ledge above a cliff. Both sites were in full sun.

### **DISTRIBUTION AND ABUNDANCE**

Range-wide Distribution : This is an Asian and North American species extending from Alaska to Newfoundland south to New England mountains (Thomson 1984). In Asia it extends south to Japan (Ahti 1962).

Region-wide Distribution : Within the region this species is only known from Michigan and Minnesota (see Appendix 1). Harris (1978) lists this species as rare in Michigan where it is only known from Isle Royale (Fryday et. al. 2001). In this region before 1970 it was known from 3 localities, and after 1970 it has been collected at 9 additional localities.

Population Trends : Range-wide there is no indication of population trends. Within the region it has apparently always been rare and no population trends are indicated. Because this species occurs on large rocky areas the human influence is probably minimal. Forest succession probably has eliminated some previous habitats as well as human activities such as mining and building houses on ridgetops.

### **RANGEWIDE STATUS**

This species is not listed in outside of North America. For definitions of ranks see Appendix 4.

U. S. Fish and Wildlife Rank: Not ranked

Global Heritage Status Rank : Not ranked

U. S. National Heritage Rank : Not ranked

U. S. Forest Service, R9 Sensitive Species: Sensitive on Superior National Forest .

See Appendix 2.

Michigan Rank : Not ranked

Minnesota Rank : Special Concern

Wisconsin Rank : Not ranked

Ontario, Canada Rank : Not ranked

In the northern part of the range of *Cladonia wainioi* this species is fairly abundant and not threatened. In our region it is at the southern edge of its range and is rare. One historical locality in Superior National Forest was probably destroyed by iron ore mining. One recent locality in the Superior is well within the protected BWCA on a rock point that could receive some foot traffic. The locality on the trail from T Lake is off the trail and not likely to be damaged.

### **POPULATION BIOLOGY AND VIABILITY**

This species probably seldom reproduces by spores and has no asexual means of dispersal. The main dispersal method is by thallus fragments. The population near Tower, Minnesota is probably gone but other recent collections indicate that it is

maintaining its distribution in our area at the southern end of its range. In this area the usual habitat is on large sunny rock outcrops. These habitats usually are not threatened but every population of this scattered species would be important to provide propagules for dispersal. The thallus fragments would not be able to blow far in the wind and the species may depend on the infrequent spore production for dispersal over greater distances.

### **POTENTIAL THREATS**

North and northeast of our area in Canada this species is not rare but it is found only in the northernmost parts of our area. In this edge of its distribution there is a risk of loss of the species.

Present or Threatened Risks to Habitat : In our region the usual habitat is north-facing rock cliffs. Construction of roads, trails or logging that destroy the habitat near these sites would be a threat to the survival of this species or sites for potential colonization.

Overutilization : NA

Disease or Predation : NA

Inadequacy of Existing Regulatory Mechanisms : Michigan and Wisconsin do not have official lists of protected lichens and are not monitoring them.

Other Natural or Human Factors : Potentially climate warming could threaten this species because it is at the southern end of its distribution in our area. Forest succession could also eliminate the large rock areas where it grows but detailed ecological information is lacking for this species so this is uncertain.

### **SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION**

Eleven of the 12 known localities of this species are in areas under state or federal ownership. See data base table for known localities in Appendix 3.

### **RESEARCH AND MONITORING**

Existing Surveys, Monitoring, and Research : None

Research Priorities : Known localities of this species should be relocated and detailed ecological information obtained. Additional localities of suitable habitat should be located to assess the more accurate distribution of this species in our region. There seem to be several potential localities in Superior National Forest and more could be located by low-level plane flights.

### **REFERENCES**

- Ahti, T. 1962. Notes on the lichen *Cladonia pseudorangiformis* Asah. - Arch. Soc. Zool. Bot. Fenn. 'Vanamo' 17(1): 38-41.
- Brodo, I., S. Sharnoff, & S. Sharnoff, 2001. Lichens of North America. Yale Univ. Press.
- Harris, R. 1978. Lichens of the Straits Counties, Michigan. Publ. by the author.
- Fryday, A., J. Fair, M. Googe, A. Johnson, E. Bunting, and A. Prather. 2001. Checklist of lichens and allied fungi of Michigan. Contrib. Univ. Michigan Herbarium 23: 145-223.
- Hale, M. E. 1979. How to Know the Lichens. 2. ed. Dubuque.

## INTERNET SOURCES

W-1 Recent Literature on Lichens - [http://www.toyen.uio.no/botanisk/botmus/lav/sok\\_rll.htm](http://www.toyen.uio.no/botanisk/botmus/lav/sok_rll.htm)

W-2 Plant name database: [http://plants.usda.gov/cgi\\_bin/topics.cgi](http://plants.usda.gov/cgi_bin/topics.cgi)

## LIST OF CONTACTS

### Information Requests:

Superior National Forest, Minnesota: Jack Greenlee (Forest Plant Ecologist) (218) 229-8817 (intercom 1217) [jackgreenlee@fs.fed.us](mailto:jackgreenlee@fs.fed.us)

Huron-Manistee National Forests, Michigan: Alix Cleveland (Plant Ecologist) (231) 775-5023 x 8729 [acleveland@fs.fed.us](mailto:acleveland@fs.fed.us)

Chequamegon-Nicolet National Forest, Wisconsin: Linda R. Parker, (Forest Ecologist) (715) 762-5169 [lrparker@fs.fed.us](mailto:lrparker@fs.fed.us)

Hiawatha National Forest, Michigan: Jan Schultz (Forest Plant Ecologist) (906) 228-8491 [jschultz@fs.fed.us](mailto:jschultz@fs.fed.us)

Ottawa National Forest, Michigan: Susan Trull (Forest Botanist), (906).932.1330 ext. 312 [strull@fs.fed.us](mailto:strull@fs.fed.us)

Chippewa National Forest, Minnesota: Ray Newman, (Forest Botanist), [rwnewman@fs.fed.us](mailto:rwnewman@fs.fed.us)

### Review Requests :

Superior National Forest, Minnesota: Jack Greenlee (Forest Plant Ecologist) (218) 229-8817 (intercom 1217) [jackgreenlee@fs.fed.us](mailto:jackgreenlee@fs.fed.us)

Dr. Alan Fryday, Herbarium, Michigan State University, East Lansing, MI (517) 355 4696 [fryday@msu.edu](mailto:fryday@msu.edu)

Dr. James Bennett, Biological Resources Division, U. S. Geological Survey, Madison, WI (608) 262 5489 [jpbennet@wisc.edu](mailto:jpbennet@wisc.edu)

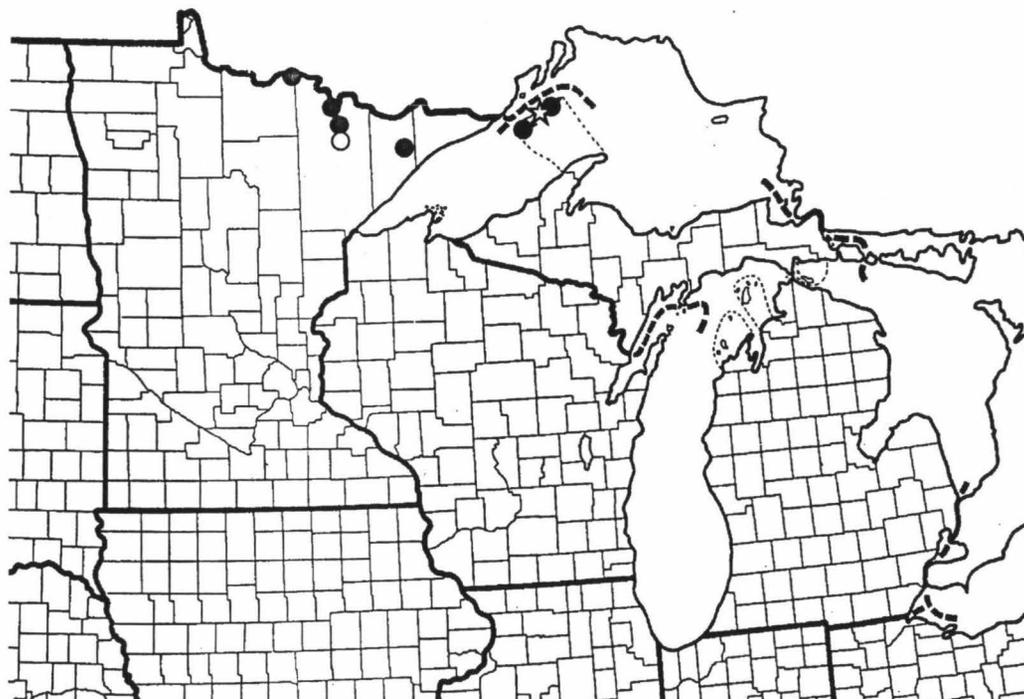
APPENDIX 1 Distribution of *Cladonia wainioi*.

APPENDIX 2 Lichens of conservation concern on the Lakes States National Forests.

APPENDIX 3 Locality data of *Cladonia wainioi*.

APPENDIX 4 Definitions of Ranks

APPENDIX 1 Distribution of *Cladonia wainioi*



*Cladonia wainioi*

- ☆ = MICH herbarium specimens before 1970
- ★ = MICH herbarium specimens after 1970
- = MIN herbarium specimens before 1970
- = MIN herbarium specimens after 1970
- ☆ = MSC herbarium specimens before 1970
- ★ = MSC herbarium specimens after 1970
- = WIS herbarium specimens before 1970
- = WIS herbarium specimens after 1970

**APPENDIX 2 Lichens of conservation concern on the Lakes States National Forests**

Scientific Name	CN	CP	HI	HM	OT	SU
<i>Arctoparmelia centrifuga</i>						(X)
<i>Caloplaca parvula</i>						X
<i>Cetraria aurescens</i>			(X)	(X)	(X)	X
<i>Cetraria oakesiana</i>			(X)	(X)	(X)	X
<b><i>Cladonia wainioi</i></b>						<b>X</b>
<i>Lobaria quercizans</i>	(X)		(X)	(X)	(X)	X
<i>Peltigera venosa</i>						X
<i>Pseudocyphellaria crocata</i>						X
<i>Ramalina thrausta</i>						(X)
<i>Sticta fuliginosa</i>						X
<i>Usnea longissima</i>					(X)	X

X = present in the forest and listed as sensitive  
 (X)= present in the forest but not listed as sensitive

- National Forest Codes
- CN** Chequamegon/Nicolet
  - CP** Chippewa
  - HI** Hiawatha
  - HM** Huron/Manistee
  - OT** Ottawa
  - SU** Superior

APPENDIX 3 Locality data of *Cladonia wainioi*

<i>Area</i>	<i>State</i>	<i>County</i>	<i>Locality</i>	<i>Year</i>
	MN	St. Louis	Tower	1901
Isle Royale NP	MI	Keweenaw	Rock Harbor	1930
Isle Royale NP	MI	Keweenaw	McCargo Cove	1930
Isle Royale NP	MI	Keweenaw	W Caribou Isl.	1983
Isle Royale NP	MI	Keweenaw	Saginaw Point, SW	1983
Isle Royale NP	MI	Keweenaw	Minong Ridge Trail, W end	1984
Isle Royale NP	MI	Keweenaw	McGinty Cove, SW of	1984
Isle Royale NP	MI	Keweenaw	Huginnen Cove, 1 mi S of	1984
Superior NF	MN	Lake	Trail to T Lake	2001
Superior NF	MN	Lake	Basswood Lake, Jackfish Bay, N end	1986
Voyageurs NP	MN	St. Louis	Browns Bay, W side of	1979
Voyageurs NP	MN	Koochiching	Dryweed Isl., N side of	1979
<b>Count = :</b>		12		

## APPENDIX 4 Definitions of Ranks

### Definitions of Global Heritage Ranks

**G3: Vulnerable**—Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

**G4: Apparently Secure**—Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

**G5: Secure**—Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

### Definitions of National and Subnational Heritage Ranks

**N2, S2: Imperiled**—Imperiled in the nation or subnation because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or subnation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

**N3, S3: Vulnerable**—Vulnerable in the nation or subnation either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

**N4, S4: Apparently Secure**—Uncommon but not rare, and usually widespread in the nation or subnation. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

**N5, S5: Secure**—Common, widespread, and abundant in the nation or subnation. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

**N?, S?: Unranked**—Nation or subnation rank not yet assessed.

### Minnesota Ranks

**Endangered:** A species is considered endangered if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota.

**Threatened:** A species is considered threatened if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota.

**Special Concern:** A species is considered a species of special concern if, although the species is not endangered or threatened, it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

**Regional USDA Forest Service Ranks** (USDA Forest Service. 1995. Forest Service Manual 2670.5. Washington, D.C.)

**Sensitive Species:** Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

- a. Significant current or predicted downward trends in population numbers or density.
- b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.