

*Conservation Assessment  
for  
Peltigera venosa (L.) Hoffm.*



*Photo: Stephen Sharnoff*

***USDA FOREST SERVICE, EASTERN REGION***

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Prepared by  
Clifford Wetmore  
Dept. of Plant Biology  
University of Minnesota  
1445 Gortner Ave.  
St. Paul, MN 55108  
[wetmore@tc.umn.edu](mailto:wetmore@tc.umn.edu)



*This Conservation Assessment was prepared to compile the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. 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, Suite 580 Milwaukee, Wisconsin 53203.*

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## EXECUTIVE SUMMARY

*Peltigera venosa* (L.) Hoffm. 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 *Peltigera venosa* (L.) Hoffm. and its distribution, habitat, range, status, life history, and ecology. *Peltigera venosa* grows on soil in circumboreal and arctic regions. This species is Endangered or Vulnerable in parts of Europe. In the Great Lakes area common habitat for this species is on bare soil of roadbanks and tip-up mounds. It is an R9 Sensitive Species on Superior National Forest in Minnesota. Threats to *Peltigera venosa* are road construction and some kinds of trail maintenance that would damage the soil banks. This species is sensitive to air pollution.

## 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:** Peltigeraceae  
**Scientific name :** *Peltigera venosa* (L.) Hoffm.  
**Common name :** none  
**USDA plant code :** PEVE60  
**Synonyms :** none

## DESCRIPTION OF SPECIES

“Thallus small, 1-2 cm broad, fan-shaped, dull green to light brown, adnate to suberect on soil, composed of separate lobes; upper surface shiny and smooth; lower surface with dark veins sparsely covered with tiny warts (cephalodia); rhizines inconspicuous; apothecia common, horizontal” (Hale 1979).

The species is characterized by the small separate rounded thallus lobes that are bright green when wet with apothecia on the upper surface near the margins. Two similar wet-green *Peltigera* species are *P. aphthosa* and *P. leucophlebia* that are both common and have larger and elongated lobes with strictly marginal apothecia on the lower surface of the lobes. See color photo # 621 in Brodo et al. (2001) and McCune & Geiser (1997) p. 219.

## LIFE HISTORY

**Reproduction** : This lichen reproduces sexually by spores but the spores must land in humid areas with both green algae and bluegreen algae (cyanobacteria).

**Ecology** : This lichen grows on soil on roadbanks and trails and soil at base of fallen trees. It is important in nitrogen fixation because of the cephalodia contain *Nostoc* (that have heterocysts where nitrogen fixation occurs). *Nostoc* is very sensitive to air pollution. These habitats need to be moist and receive liquid water for the *Nostoc* to grow.

**Dispersal** : Dispersal of this lichen is by spores, but the narrow habitat requirements mean that the chance of landing in a suitable habitat are small, at least in our area.

**Obligate Associations** : NA

## HABITAT

**Range-wide** : This species is known from Europe, Arctic North America and Arctic Asia (Thomson 1950). In central Europe it grows on mosses on older trees and mossy rocks (Poelt 1969) and usually in the high montane to alpine sites in cool, shady, moist situations (Wirth 1995). In Italy it grows on acid substrates in the upper montane to alpine areas (Nimis 1993). In the British Isles it occurs on rocks in upland sites (Purvis et al. 1969). The most authoritative paper on the habitat is in the revision of the genus *Peltigera* in Europe by Vitikainen (1994). He states that *P. venosa* grows “on bare soils, very rare on other substrata, preferring moist or shaded habitats and not too closed vegetation; a weak competitor, and often represented by few thalli only. Often found on sandy soils and in caves on river banks, on lake shores, along creeks, on talus slopes, in ravines, along roads and some pathsides and in rock crevices”. In North America the habitats are similar to those in Europe. Brodo et al. (2001) says it is found “on bare mineral soil in moist, shaded nooks and crannies such as along the banks of creeks or roads, generally in regions of high rainfall”. Thomson (1984) lists the habitat in the North American Arctic as moist soil and rocks, edge of animal burrows and similar places.

**National Forests** : In our region this species is very rare and on moist cliffs, soil banks, and waterfall canyons (Thomson 2002).

**Site Specific** : There are no recent collections from the regional National Forests with specific site data.

## **DISTRIBUTION AND ABUNDANCE**

**Range-wide Distribution** : This species has a circumboreal, arctic, boreal, and alpine distribution (Thomson 1950, 1984, Vitikainen 1994). It occurs in northern Europe and in the mountains to the Iberian Peninsula (Poelt 1969). In Asia it is recorded from northern China and southern China (Wei 1991). In North America it is distributed from Alaska south in the mountains to New Mexico in the west and in the northern part of eastern North America (Brodo et al. 2001).

**Region-wide Distribution** : This species has only been reported from Michigan (Fryday et al. 2001) and Minnesota (see Appendix 1). In this region before 1970 it was known from 9 localities, and after 1970 it has been collected at 7 additional localities.

**Population Trends** : Range-wide and in this region there are no indications of population trends. Because this species grows on thinly vegetated soil, the absence of old trees falling over may have reduced the possible habitats. Perhaps in the extensive blow-down area in Superior National Forest this species may increase its distribution within the next 100 years.

## **RANGEWIDE STATUS**

This species is listed as endangered in Poland and Vulnerable in Slovakia but not ranked in other countries. Because this species is sensitive to air pollution this is probably the main factor in its rarity in central Europe. It is fairly common in western North America, and further north in Canada and is not threatened there. For definitions of ranks see Appendix 4.

<b>U. S. Fish and Wildlife Rank:</b>	Not ranked
<b>Global Heritage Status Rank :</b>	Not ranked
<b>U. S. National Heritage Rank :</b>	Not ranked
<b>US Forest Service, R9 Sensitive Species:</b>	Sensitive on Superior National Forest. See Appendix 2.
<b>Michigan Rank :</b>	Not ranked
<b>Minnesota Rank :</b>	Special Concern
<b>Wisconsin Rank :</b>	Not ranked
<b>Ontario, Canada Rank :</b>	Not ranked

This species has always been rare in our region. Some of the historical localities may have been disturbed by buildings and shoreline development.

## **POPULATION BIOLOGY AND VIABILITY**

This species reproduces by spores that can easily be blown to new localities. The limiting factor may be suitable habitats. It grows on thinly vegetated moist soil, perhaps in old-growth forests, and may be a colonizer species – one that begins growth on bare soil but is eliminated after the vascular plants take over the site. Narrow shady forests roads in mature forests may provide suitable habitats and further searching for this species along such roads would be desirable.

Sunny roadbanks are probably not suitable habitats but tip-up mounds and banks of trails in shady moist places may be ideal. Usually it takes several years (or decades) for sites with tip-up mounds to develop the necessary shade and moisture conditions for this lichen. However, the species is now so rare at the southern end of its distribution in our region that its survival is in doubt. Perhaps when the 1999 Boundary Waters Canoe Area blowdown develops suitable habitats it might be worth trying to introduce the species.

## **POTENTIAL THREATS**

The range-wide viability is stable in North America but in our region there is probably not a viable population. Large tracts of clear-cut logging would not be desirable if it is to survive.

**Present or Threatened Risks to Habitat** : This species grows on thin soil in moist situations. Road or trail construction that reduces the humidity would be a threat to its survival.

**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** : Major fires would eliminate suitable moist habitats. Climate warming would probably reduce the survivability of this species in our area because this species is at the southern end of its distribution here. Air pollution would destroy the lichen by damaging the algae in the thallus.

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

Of the 16 known localities of this species 10 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 should be checked for the survival of this species. New localities of this species should be looked for along old logging roads and along trails.

Transplanting of thallus lobes from other areas might be tried to establish new colonies of this species in suitable habitats.

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## INTERNET SOURCES

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

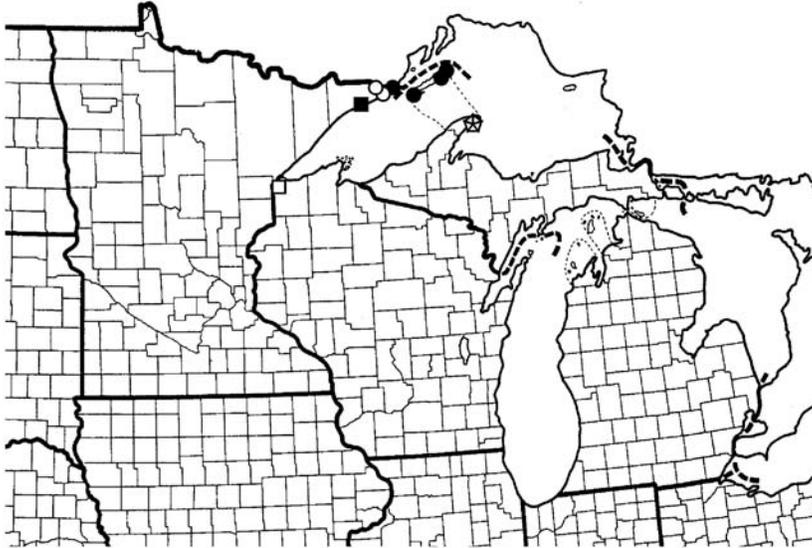
Superior National Forest, Minnesota: Jack Greenlee (Forest Plant Ecologist) (218) 229-8817 (intercom 1217) [jackgreenlee@fs.fed.us](mailto:jackgreenlee@fs.fed.us)

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)

## APPENDICES

### APPENDIX 1 Distribution of *Peltigera venosa*



#### *Peltigera venosa*

- ☆ = 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
<i>Cladonia wainioi</i>						X
<i>Lobaria quercizans</i>	(X)		(X)	(X)	(X)	X
<b><i>Peltigera venosa</i></b>						<b>X</b>
<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 *Peltigera venosa***

<i>Area</i>	<i>State</i>	<i>County</i>	<i>Locality</i>	<i>Year</i>
	MN	Cook	Temperence River, Hidden Falls	1975
	MI	Keweenaw	L Superior, Bear Creek E of Bete Grise	1976
	MI	Keweenaw	Lake Superior shore	1960
	MN	Cook	Portage between S Fowl L & Pigeon R	1897
	MN	Cook	Pigeon River, L. Superior	1977
	MN	Cook	Grand Portage	1897
Isle Royale NP	MI	Keweenaw	Tobin Harbor	1930
Isle Royale NP	MI	Keweenaw	Rock Harbor	1930
Isle Royale NP	MI	Keweenaw	Davidson Isl.	1958
Isle Royale NP	MI	Kweenaw	Davidson Isl.	1972
Isle Royale NP	MI	Keweenaw	Lookout Louise	1983
Isle Royale NP	MI	Keweenaw	Davidson Isl.	1972
Isle Royale NP	MI	Keweenaw	NE of Thompson Isl.	1984
Pattison SP	WI	Douglas	west cliff at Manitou Falls	1942
Pattison SP	WI	Douglas	Black River	1944
Superior NF	MN	Cook	South Fowl Lake	1897

**Count = :** 16

**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.