

The Status of  
**Rock Dwelling Sedge**  
*(Carex petricosa var. misandroides)*  
in Newfoundland and Labrador



Photo: Nathalie Djan-Chékar

**THE SPECIES STATUS ADVISORY COMMITTEE  
REPORT NO. 10**

**February 20, 2008**

## ASSESSMENT

<b>Assessment:</b> Endangered	<b>Current designation:</b> None
<b>Criteria met:</b> B2. Area of occupancy < 500 km <sup>2</sup> , a) known to exist at < 5 locations, b) continuing decline observed in iii) quality of habitat, C. Number of mature individuals <2,500, 2) continuing decline projected and inferred in numbers of mature individuals, a) fragmentation with i) no population estimated to contain >250 mature individuals, and D1. Number of mature individuals <250	
<b>Reasons for designation:</b>  Qualifies as " <i>endangered</i> " under the SSAC/COSEWIC criteria B2 (a) and (b) iii, C2 (a) i, and D1 <ul style="list-style-type: none"><li>• Area of occupancy excluding the historical locations &lt; 0.1 km<sup>2</sup></li><li>• Only 1 recently confirmed location and 4 historical locations</li><li>• Two of the historical locations have been subjected to continuing habitat loss and degradation</li><li>• Limestone habitats throughout the island are severely degraded due to anthropogenic effects</li><li>• Only 12 mature individuals at the recently confirmed location</li><li>• Rescue effect severely limited</li></ul>	

The original version of this report was prepared by John E. Maunder on behalf of the Species Status Advisory Committee.

## STATUS REPORT

*Carex petricosa* Dewey var. *misandroides* (Fernald) B. Boivin  
Rock Dwelling Sedge, Man-hater Sedge; Fr. carex misandroïde

Synonyms:

*Carex misandroides* Fernald [TYPE: Table Mountain, Port au Port,  
Newfoundland]

*Carex franklinii* Boott in Hooker var. *misandroides* (Fernald) Raymond

Family: Cyperaceae (Sedges)

Life Form: Perennial sedge.

## Distribution

### Global:

North America: Canada [see more detail below].

### National:

Newfoundland and Labrador (Newfoundland only), Québec (Ball and Zoladz, 1994).

### Provincial:

On the Island of Newfoundland, known only from 5 small west coast localities (Fig. 1).

## Annotated Range Map

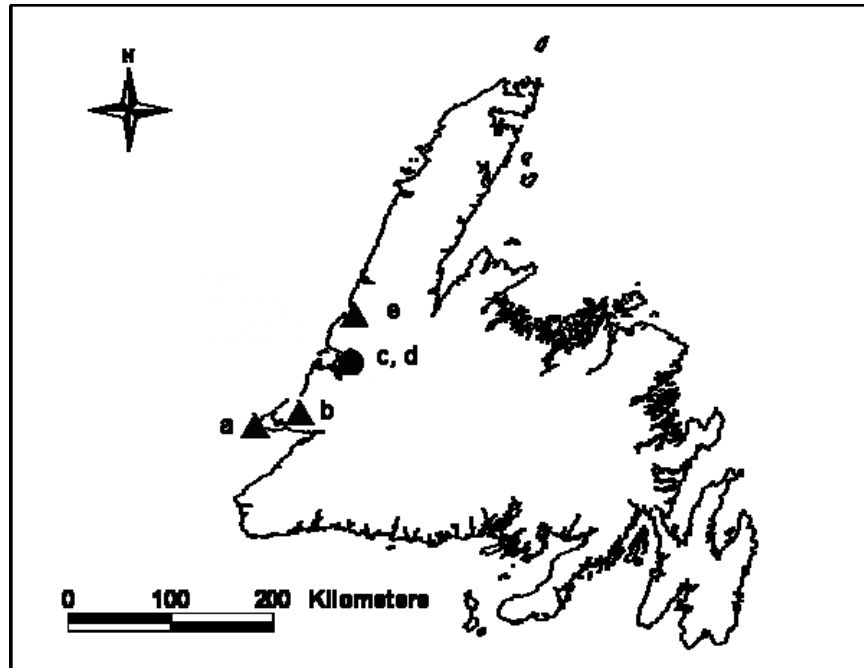


Figure 1. Known localities for *Carex petricosa* var. *misandroides* in Newfoundland: [a] Cape St. George, [b] Table Mountain, [c] William Wheeler Point, [d] Woman Cove, [e] Shag Cliff, Bonne Bay. [All are historical as indicated by a triangle, except for “c”].

## Description

A compact-to-slender, loosely tufted, rhizomatous, highly variable sedge, of limestone habitats.

## Habitat

A plant of limestone barrens, cliffs, screes, taluses, and shores; 0-300 m (Ball and Zoladz 1994).

In Newfoundland, specifically, it occurs on dry to damp limestone cliffs, barrens, and tablelands, slippery slaty talus slopes, and upper parts of scree slopes just below the turfy zone at the base of high limestone cliffs; substrate of gravels, mixed with fine soils, over rubble or bedrock; sometimes found on mossy knolls,

with small isolated shrubs (including *Betula papyrifera*, *Dasiphora fruticosa* and *Juniperus communis*). Altitude to about 300 m.

## Overview of Biology

Very little is known. Apparently mature spikes were evident at William Wheeler Point on July 21, 2000 (see photo on the cover of this report); and on Fernald's original herbarium collection from Table Mountain, dated July 16-17, 1914. Perennial. Apparently clonal. Calciphile.

## Population Size and Area of Occupancy

Unknown. Fernald (1915) stated that: "Only one knoll of *C. misandroides* was observed during a hurried trip across the tableland of Table Mountain" in 1914. Mackenzie and Griscom characterized the species as "rare and local" at Green Gardens [= Garden Hill], near Cape St. George, on July 18, 1922. There are no known historical population estimates or descriptions for either of: the Shag Cliff, Bonne Bay population; the William Wheeler Point, Bay of Islands population; or the Woman Cove, Bay of Islands population.

Estimating population size is particularly problematic. Despite recent directed attempts to relocate the several historical populations, there has been only one success, to date, at William Wheeler Point, where 12 individual plants were found by the Newfoundland Rare Plant Project team on July 21, 2000. Whether this lack of relocation success indicates a truly diminished Provincial population, and/or the result of the elusiveness of the species, is unknown.

## Traditional and Local Ecological Knowledge

No published or other evidence has been found regarding the aboriginal use of *C. petricosa* var. *misandroides* in Newfoundland. In particular, a specific inquiry to the Federation of Newfoundland Indians in 2007 yielded no definitive information. Arnason *et al.* (1981) failed to mention any species of *Carex* in their comprehensive study of eastern Canada ethnobotany.

## **Trends**

Population trends are unknown. The failure of recent workers to relocate four of the five historical populations, may, or may not, be an indication of a widespread population decline. On the other hand, there has been significant decline in area, extent and quality of limestone barren habitats at two of the historical location since the plants were last located. The TYPE locality at Table Mountain has seen the construction of a major post-war radar and communication facility. The Cape St. George locality has seen continuing development (road, oil exploration, recreational park and trails, commercial) and increased human activity.

## **Threats and Limiting Factors**

Very small population size. Prone to stochastic (ie. random) events. The Table Mountain population, if it still exists, may be impacted by ongoing activities associated with several communications towers operated by a number of federal agencies. The Cape St. George population, if it still exists, may be particularly impacted by ongoing oil exploration activities. Development pressure for housing and tourism are ongoing.

## **Existing Protection**

The population at Shag Cliff, Bonne Bay (if it still exists) is located within Gros Morne National Park.

## **Special Significance**

A rare, disjunct variety. Table Mountain, Port au Port is the TYPE locality for *Carex misandroides* Fernald.

## **Collections Examined**

Provincial Museum of Newfoundland and Labrador:  
One herbarium collection.

Agnes Marion Ayre Herbarium (Memorial University of Newfoundland):  
Two herbarium collections.

## Rank or Status

<b>Global</b>	
G-rank	not ranked
IUCN	not accessed
<b>National</b>	
N-rank	NNR (not ranked)
National General Status	subspecies not ranked
COSEWIC	not accessed
<b>Provincial</b>	
Provincial General Status	2
Newfoundland S-rank	S1
Newfoundland General Status	2
Labrador S-rank	not present
Labrador General Status	not present
<b>Adjacent Jurisdictions</b>	
Nova Scotia S-Rank	not present
Nova Scotia General Status	not present
Prince Edward Island S-Rank	not present
Prince Edward Island General Status	not present
New Brunswick S-Rank	not present
New Brunswick General Status	not present
Québec S-Rank	S1
Québec General Status	2

[NatureServe presently follows Kartesz (1994) in calling the taxon “*Carex misandroides* Fern.” The General Status of Species in Canada (2005) does not evaluate taxa below the species level.]

[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status ranks are based upon the “General Status of Species in Canada (2005)”, and S-Ranks are based upon “NatureServe Explorer”. Where there is apparent discrepancy, NatureServe Explorer ranks are considered to be the least current.]

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## TECHNICAL SUMMARY

<b>Distribution and Population Information</b>	<b>Criteria Assessment</b>
<i>Extent of occurrence (EO)(km<sup>2</sup>)</i>	approximately 2710 km <sup>2</sup> ; assuming that all historical populations are still extant; otherwise, < 0.0001 km <sup>2</sup>
<i>Area of occupancy (AO) (km<sup>2</sup>)</i>	< 0.0001 km <sup>2</sup> [William Wheeler Point only]; AOs of historical populations unknown
<i>Number of extant locations</i>	possibly 5; but, only one of these has been relocated within the last 25 years
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	unknown; has not been relocated at 4 out of 5 historical locations despite targeted efforts
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	unknown; 2 of the historical locations have experienced some decline in quality of habitat
<i>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</i>	unknown; perennial
<i>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</i>	12 [William Wheeler Point only]
<i>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	Unknown
<i>Are there extreme fluctuations (&gt;1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	Unknown
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	Yes
<b>Rescue Effect (immigration from an outside source)</b>	
<i>Does species exist elsewhere?</i>	Yes
<i>Status of the outside population(s)? [adjacent Provinces only]</i>	Québec, may be at risk
<i>Is immigration known or possible?</i>	Unlikely
<i>Would immigrants be adapted to survive here?</i>	Unknown
<i>Is there sufficient habitat for immigrants here?</i>	Unknown

## Appendix A. Population Information

### Recently Verified Occurrences/Range Use (recorded within the last 25 years)

Verified occurrences consist of observations supported by the collection of a voucher specimen (i.e. a sample to be identified/confirmed by experts and deposited in a herbarium).

William Wheeler Point (Fig. A-1[bottom]):

July 21, 2000. William Wheeler Point, Goose Arm, Bay of Islands, scree slope. Upper part of scree slope; just below turfy zone at base of high limestone cliffs; vegetation cover 25-50%, with small isolated shrubs; substrate soil, limestone gravel and rocks over limestone bedrock, mesic, with continuous seepage from cliff above; open. Slope: 40°. Aspect: W. Elevation about 95 m. [Observers: N. Djan-Chékar, J. Maunder, L. Brouillet, and C. Wentzell. Collection: NDC 00-424B (Provincial Museum of Newfoundland and Labrador)]

July 21, 2000. William Wheeler Point, Goose Arm, Bay of Islands, scree slope. Upper part of scree slope below high limestone cliffs; vegetation cover 25%, dominated by *Betula papyrifera*, *Dasiphora fruticosa* and *Juniperus communis*; substrate limestone outcrops and strips of blocky material alternating with strips of gravel mixed with fine soil, dry to mesic with seepage; in open patch of gravel mixed with fine soil among rocks. Slope: 40°. Aspect.: W. Elevation about 95 m. [Observers: N. Djan-Chékar, J. Maunder, L. Brouillet, and C. Wentzell. Collection: no specimens collected, by reason of plant rarity, but occurrence verified onsite by close observation and direct comparison with the single collection taken nearby on the same day.]

### Recent Search Effort (areas searched within the last 25 years with estimate of effort)

General rare plant surveys of the west and northeast coasts of the Island were conducted by members of the Newfoundland Rare Plant Project (*q.v.*), specifically during 1999 to 2001, when 1645 individual sites were surveyed and 7622 plant collections were made. Additional general rare plant surveys have been conducted within the Province by various National Parks personnel, and by J. E. Maunder of the Provincial Museum and H. Mann of Sir Wilfred Grenfell College (early 1970's to present), as well as by N. Djan-Chékar of the Provincial Museum (2002 to present). Significant additional general collecting has been conducted, on the south coast of the Island, by R. Etcheberry, of St.-Pierre et Miquelon (1986, 1987, 1989, 1990, 1992, and 1993).

Targeted rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of the publication "The Rare Vascular Plants of the Island of Newfoundland" (Bouchard *et al.* 1991), in: 1984

and 1985 (Gros Morne National Park), 1986 (southwest coast, and the general Port au Port area), 1987 (Great Northern Peninsula), 1988 (Baie Verte Peninsula, Notre Dame Bay, and central and eastern Newfoundland), 1989 (Gros Morne National Park, and the south coast), and 1990 (west coast, and Great Northern Peninsula).

Geographically focused rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of contracted rare plant reports for Port au Choix National Historic Park (Bouchard *et al.* 1993), L'Anse aux Meadows National Historic Park (Bouchard *et al.* 1993), Gros Morne National Park (Anions, 1994; Bouchard *et al.*, 1985, 1986, 1991, 1994, 1996; and Brouillet *et al.*, 1998), and Terra Nova National Park (Brouillet *et al.* 1997). Additional geographically focused rare plant surveys were conducted in the Squid Cove and Doctors Brook areas, and the Labrador Straits region by C. Hanel (2004, 2005a, 2005b).

Several recent directed attempts to relocate the Table Mountain, Stephenville, population have been made by the Rare Plant Project team (1999), and others, but no plants have been found. Two other directed searches by the Newfoundland Rare Plant Project team found only 12 individuals at William Wheeler Point on July 21, 2000; and no plants at all at nearby Woman Cove on July 22, 2000. Recent efforts to relocate the historical Cape St. George population by the Rare Plant Project team (1991), the personnel from the Université de Montréal during the course of the preparation of the publication "The Rare Vascular Plants of the Island of Newfoundland" (Bouchard *et al.* 1991), and others, have also been unsuccessful. To date, there have been no recent efforts to relocate the Shag Cliff, Bonne Bay population.

### **Historical Verified Occurrences/Range Use (recorded prior to the last 25 years)**

Table Mountain:

July 16 and 17, 1914. Table Mountain. Mossy knolls on the limestone tableland. "... Associated with a choice group of arctic-alpine calciphiles, such as *Kobresia caricina* Willd. [= *K. simpliciuscula* (Wahlenb.) Mackenzie], *Carex pedata* L. [= *C. glacialis* Mackenzie], *Salix leiolepis* Fernald [= *S. vestita* Pursh], *Anemone parviflora* Michx., *Potentilla nivea* L., *Dryas integrifolia* Vahl, *Hedysarum alpinum* L., *Antennaria eucosma* Fernald & Wiegand, *A. spathulata* Fernald [= *A. howellii* Greene subsp. *howellii*] and *Arnica chionopappa* Fernald [= *A. lonchophylla* Greene]" (Fernald 1915). Altitude 200-300 m. [Observers: M. L. Fernald, H. St. John. Collection: Fernald. 10801. GH (Gray Herbarium), TYPE collection; K (Kew); NY (New York Botanical Garden – online image at: <http://sweetgum.nybg.org/common/imagedisplay.php?irn=9816> (Last accessed September 18, 2007).

July 26, 1921. Table Mountain, center of south slope of second dome. Dry limestone barrens. [Observers: K. K. Mackenzie, L. Griscom. Collection: Mackenzie 10159. GH (Gray Herbarium); MT (Université de Montréal).]

July 19, 1967. Table Mountain (summit), Pine Tree. Limestone barrens. [Observer: E. Rouleau. Collection: Rouleau 10863. MT (Université de Montréal).]

Cape St. George:

July 18, 1922. Cape St. George, Green Gardens. Dry limestone barrens. Rare and local. [Observers: K. K. Mackenzie, L. Griscom. Collection: Mackenzie 11010. GH (Gray Herbarium).]

William Wheeler Point:

July 1948. William Wheeler Point, Goose Arm, Bay of Islands. Dry limestone ledges at the summit of the talus. Latitude: 49° 10' 12" Longitude: 57° 75' 21". [Observer: E. Rouleau. Collection: Rouleau 184. MT (Université de Montréal).]

Woman Cove:

July 8, 1952. Woman Cove (western end of), Middle Arm, Bay of Islands. On the slippery slaty talus slopes. Latitude: 49° 08' 29" Longitude: 58° 80' 25". [Observer: E. Rouleau. Collection: Rouleau 2965. MT (Université de Montréal); NFLD (Agnes Marion Ayre Herbarium of Memorial University).]

July 31, 1952. Woman Cove (western end of), Middle Arm, Bay of Islands. Slippery slaty talus slopes. Latitude: 49° 07' 02" Longitude: 58° 80' 25". [Observer: E. Rouleau. Collection: Rouleau 3411. MT (Université de Montréal).]

Shag Cliff:

August 12, 1958. Shag Cliff, Bonne Bay [opposite ferry dock at Norris Point]. Limestone cliff. Latitude: 49° 30' 42" Longitude: 57° [51'] 14". [Observer: T. T. Elkington. Collection: Elkington A289 (Provincial Wildlife Division database, source of the data is unknown).]

#### **Other Observations (unverified occurrences)**

None.

## **Potential Sites Unexplored**

Many of the limestone cliffs, screes and taluses of western Newfoundland are relatively inaccessible and have been poorly searched. The limestone barrens of the Port-au-Port Peninsula are extensive and have been relatively poorly searched. More extensive and focused efforts need to be made to try to relocate the remaining historical populations.

## Appendix B. Supplementary Details

### Taxonomic Clarifications

The taxonomic position of Fernald's *Carex misandroides* has long been a subject of debate. An historical perspective is provided by Raymond (1952).

The most recent relevant study, by Ball and Zoladz (1994), concluded: [1] that the morphology of *Carex misandroides*, from eastern North America, was not *consistently* different from that of *Carex petricosa*, from western North America and Asia, [2] that, consequently, the taxon *misandroides* did not merit species status, and should be included *within* the taxon *petricosa*, [3] that, nevertheless, eastern plants could still be distinguished from western plants, between 80% and 90% of the time, using stigma number (the *only* useful distinguishing feature) alone, and [4] that, therefore, considering also the several thousand kilometre disjunction between the eastern and western populations, the taxon *misandroides* should still merit varietal status. This reasoning has been generally accepted.

### Description

Slender, loosely cespitose sedge. **Culms** to 50 cm tall. **Rhizomes** long and slender. **Leaves:** blades 1-3.5 mm wide. **Inflorescences** 3-12(22) cm; proximal internodes 10-60(100) mm; peduncles of proximal spikes to 8 cm; proximal bracts with blades 5-140 mm; sheaths cylindric, 5-25(35) mm; mouth 0.9-1.5 mm wide. **Spikes** 3-8; lateral spikes androgynous or pistillate (rarely some entirely staminate); proximal spikes inclined or pendent, 5-30 × 3-7 mm; terminal spike staminate or androgynous, 10-28 × 1.8-4 mm. **Pistillate scales** brown to black, oblong-obovate, 3-5.8 × 1.1-2 mm; apex obtuse to acute, sometimes shortly awned. **Staminate scales** brown or black with hyaline margins, oblong-ovate, 3.1-6.2 × 1-3 mm. **Stigmas** mostly 2. **Anthers** 1.5-3 mm. **Perigynia** ascending, pale yellow proximally, brown or black distally, 3-9-veined, lanceolate, 3.5-5.5 × 1.1-2.4 mm, margins ciliate-serrulate distally; apex tapered, shortly setose (sometimes setae confined to veins), or subglabrous; beak indistinct, to 0.5(1) mm. **Achenes** biconvex when there are two stigmas and trigonal when there are three stigmas (Raymond 1952), 1.7-2.2 × 1-1.3 mm. (Modified after Ball and Mastrogriuseppe 2003).

"Flora of North America" image at:

[http://www.efloras.org/object\\_page.aspx?object\\_id=42073&flora\\_id=1](http://www.efloras.org/object_page.aspx?object_id=42073&flora_id=1) (Last accessed September 18, 2007).

New York Botanical Garden – online image of Fernald's type specimen at: <http://sweetgum.nybg.org/common/imagedisplay.php?irn=9816> (Last accessed September 18, 2007).

*Carex petricosa* (*sensu lato*) shows considerable variation, even within one clump, in the distribution of staminate and pistillate flowers in the inflorescence. The two taxa here recognized from North America (var. *petricosa* and var. *misandroides*) can usually be distinguished by stigma number (mostly 3 and mostly 2, respectively). However, a small number of individuals must still be determined on purely morphological grounds. (Ball and Zoladz 1994).

### **Collections Examined**

Provincial Museum of Newfoundland and Labrador:  
NDC 00-424B (NFM 8921) [see Appendix A for details].

Agnes Marion Ayre Herbarium (Memorial University of Newfoundland):  
Rouleau 2965 (2 duplicates: NFLD 3675 and 3676) [see Appendix A for details]