

**The Status of  
Rattlesnakeroot  
(*Prenanthes racemosa*)  
in Newfoundland and Labrador**



photo © Nathalie Djan-Chékar

**THE SPECIES STATUS ADVISORY COMMITTEE  
REPORT NO. 5**

**April 12, 2006**

## ASSESSMENT

<b>Assessment:</b> Endangered	<b>Current designation:</b> None
<b>Criteria met:</b>  B1. Extent of occurrence <5,000 km <sup>2</sup> B2. Area of occupancy <500 km <sup>2</sup>  (a) Known to exist at < 5 locations  (b) Continuing decline observed, inferred or projected in i) extent of occurrence, ii) area of occupancy, and iii) area, extent and/or quality of habitat	
<b>Reasons for designation:</b>  Qualifies as " <i>endangered</i> " under the SSAC/COSEWIC criteria B1, B 2. (a) and B 2. (b) i), ii) and iii): <ul style="list-style-type: none"><li>• Only 1 confirmed population in the province</li><li>• Restricted to a small valley within the boundaries of the City of Corner Brook</li><li>• Adjacent industrial activities and development potentially affecting habitat quality</li><li>• Recent decline of appr. 3% in extent of habitat due to development was probably accompanied by a corresponding decline in population</li><li>• Rescue effect unlikely</li></ul>	

This report was completed by Ms. Claudia Hanel, under contract to the SSAC.

## STATUS REPORT

### ***Prenanthes racemosa* Michx.**

rattlesnakeroot, glaucous white lettuce, purple rattlesnakeroot, glaucous rattlesnake-root, racemose rattlesnake-root, Prairie Rattlesnake-root; Fr: prenanthe à grappe

Synonyms (from Meades et al. (2000), Maine Department of Conservation (no date), and St. Hilaire (2004))

- *Nabalus racemosus* (Michx.) DC
- *Harpalyce racemosa* (Michx.) D. Don ex Beck

Name of population(s) or subspecies: Newfoundland population, most likely subspecies *racemosa* if recognizing subspecies (Scoggan 1979). However, the subspecies are not recognized by Meades et al. (2000) or L. Brouillet (personal communication, February 8, 2006). The subspecies and varieties have not been ranked by Nature Serve (2005) throughout most of their putative range and it is possible that they will not be accepted as valid taxa in many jurisdictions.

Family: Asteraceae

Life form: Herbaceous perennial plant, forb

### **Distribution**

#### **Global: (from Nature Serve (2005))**

Boreal North America, from Newfoundland west to British Columbia, south to New Jersey, and west to Colorado.

#### **National: (from Nature Serve (2005))**

It occurs in all Canadian provinces, but is absent from the Territories.

#### **Provincial:**

The species was confirmed only from one site at Wild Cove Brook, near Corner Brook in Western Newfoundland. Reports from Labrador need to be confirmed, but probably refer to the Côte-Nord in northeastern Quebec (Meades et al. 2000).

## Annotated range map

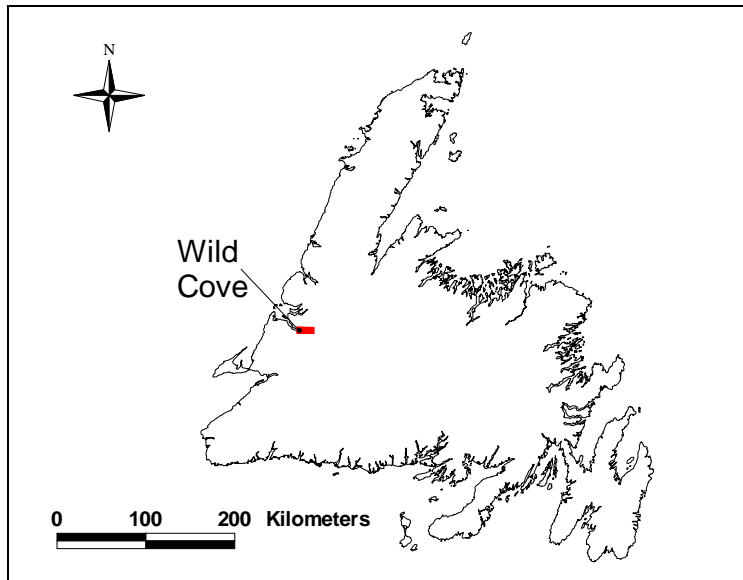


Figure 1. Location of Wild Cove, near Corner Brook, the only site in Newfoundland where *Prenanthes racemosa* has been observed.

## Description and habitat



Figure 2. *Prenanthes racemosa* in its fen habitat, which is mainly open with interspersed larch and shrubs. Photo used with permission from Nathalie Djan-Chékar.

## Description

The following description was adapted from St. Hilaire (2002), Fernald (1950), Scoggan (1979), Robert W. Freckman Herbarium (no date) and Gleason and Cronquist (1991). The plants arise from tuberous roots, are 0.2-1.5 m tall, and have milky juice. Lower leaves are oval to obovate to oblong-lanceolate, denticulate, and 7-40 cm long and 1.5-10 cm wide. Basal leaves taper to winged petioles that are rarely cut-pinnatifid (Figure 3). The upper stem leaves become smaller and sessile to partly clasping. The stem and leaves are glaucous. The inflorescence is narrow and elongate, with flower heads loosely ascending or occasionally nodding, in crowded clusters forming a dense or interrupted leafy thyrse. When in bud, the flowering end of the stem is bent almost perpendicular to the lower stem (Figure 4), but this straightens as the flowers open. Ray flowers are pink or purplish, occasionally white. Disk flowers are absent. Involucres are 9-14 mm long, purplish or blackish, sparsely to (usually) densely long-hairy, and contain 12-15 flowers. The fruit are dry achenes, which are short, linear-oblong, striate or grooved, and not contracted at the apex, with a creamy to light brown pappus.



Figure 3. Basal leaf of *Prenanthes racemosa*, showing the characteristic glaucous colour. (Photo used with permission from Nathalie Djan-Chékar.)



Figure 4. Nodding inflorescence of *Prenanthes racemosa* during the beginning of flowering (anthesis). (Photo used with permission from John E. Maunder.)

### **Habitat**

Throughout its range this species grows in a variety of habitats. Fernald (1950) listed calcareous riverbanks, shores and damp prairies as habitat, and the Ohio Department of Natural Resources (2005) also listed fens and meadows. The populations in New Brunswick and Maine grow only on calcareous river shores that are annually flooded and scoured by ice (St. Hilaire 2002; Sean Blaney, Senior Botanist, Atlantic Canada Conservation Data Centre, personal communication, January 31, 2006). In Newfoundland this plant has only been observed in a rich, calcareous fen.

### **Overview of Biology**

*Prenanthes racemosa* a perennial herb that flowers in August and September (Fernald 1950). The pappus suggests wind dispersal of the achene, but given its habitat in Maine, water dispersal is also likely (St. Hilaire 2002).

Ripe seed collected on prairie remnants in Wisconsin, and cold-stratified out-of doors for four months had a 100% germination rate (Greene and Curtis 1950). Seed is available

commercially from Prairie Moon Nursery (2006), which specializes in seeds of native prairie plants.

Parasitic fungi recorded on *Nabalus racemosus* (= *Prenanthes racemosa*) in Wisconsin include an *Ascochyta* species on leaves and *Septoria nabali* (Greene 1952 and 1945, respectively, in St. Hilaire 2002). *Puccinia nabali*, a rust fungus, was reported on *N. racemosus* in Saguenay County (Arthur 1910 in St. Hilaire 2002). According to Louise Lefebvre (Assistant Curator, National Mycological Herbarium, personal communication, Feb. 14, 2006) neither *S. nabali* or *P. nabali* are known from Newfoundland, but two other species known from the province, *P. variabilis* and *P. orbiculata*, could occur on the same host as *P. nabali*.

### **Population size**

The extent of the whole population is not yet known. During spot counts of small subsample areas in three patches in 2000, approximately 44 individuals were enumerated. At 32 other patches spread over approximately 1 km of fen, seeds were collected but the plants were not counted. The total estimate for the number of plants ranges from several hundred to several thousand.

### **Traditional and local ecological knowledge**

None known.

### **Trends**

There is insufficient information to detect any recent trends in population or distribution. However, the extent of the relatively open fen declined by approximately 3% in the last 25 years with the establishment of a composting facility. As the species was observed to the edge of the composting facility, it is extremely likely that some of this area was suitable habitat for *Prenanthes racemosa* and that some individuals were destroyed.

### **Threats and limiting factors**

The area containing *Prenanthes racemosa* falls within the municipal boundary of the City of Corner Brook and is located approximately 3 km from the built-up area of the city. However, the wetness of the habitat and the absence of residential areas nearby have kept human use of the fen relatively low.

The catchment basin of the fen is relatively small, and its hydrology is sensitive to changes. Sub-surface seepage water from the surrounding mountains affects the soil moisture of the fen as does the feeder stream (Wild Cove Brook), which also arises in

the surrounding mountains. Any land uses on the mountain slopes which affect either the quantity or quality of the water traveling through the fen are potential threats to the site.

A gravel road running the length of the valley is used to access gravel pits located on the slopes surrounding the fen. The whole valley is contained within a Fee Simple Mining Grant issued to Corner Brook Pulp and Paper (Fred Kirby, Project Geologist, Quarry Materials Management, Mines Branch, Newfoundland and Labrador Department of Natural Resources, personal communication, March 30, 2006). There is some concern that an expansion of gravel pits upstream of the fen could disrupt or increase the water supply to the fen. Unless the changes in water supply are severe, the effects are likely to be very gradual and long-term habitat changes. If the site became wetter, the soil moisture tolerance of the plant may be exceeded, and if the site became drier, the encroachment of trees may pose a threat. According to the Ohio Department of Natural Resources (2005) overgrowth of woody species can be a threat, and it is vital for the conservation of the species to maintain open habitats by controlling woody plants. From 1:12,500 colour aerial photos taken in 1978, 1986 and 2001, it appears that some encroachment by trees and shrubs has occurred, but the photos vary in quality and exposure. It is possible that the construction of the road and gravel pits have already had a negative impact on the habitat, but in the absence of both baseline data and regular monitoring, this is impossible to confirm.

There is a housing development planned for an area close to, but downstream of the fen (Christine Doucet, Senior Biologist, Habitat Management Program, Wildlife Division, Newfoundland and Labrador Department of Environment and Conservation, personal communication, January 2006), and while this development is unlikely to affect the hydrology of the fen, the presence of an increased number of residents in the area could result in increased foot traffic and trampling of the plants.

Two industries, the City of Corner Brook landfill site, and the Genesis Organics composting facility, would likely affect water quality in the fen if their operations are expanded upstream. During the establishment of the composting facility the extent of the open fen (which very likely contained some *Prenanthes racemosa*) was reduced. Any expansion of the composting facility would be especially harmful as it would reduce the amount of available habitat even further and would likely also destroy individuals of *P. racemosa*.

Herbivory, seed predation, pathogens, or human harvesting or destruction of individuals of *Prenanthes racemosa* have not been observed as threats to the population.

### **Existing protection**

Neither the species nor its habitat at the Wild Cove location are currently protected.



## Special significance

There is no known scientific or cultural significance of the species.

<b>Ranks or Status</b>	<b>Rank or Status</b>
<b>Global</b>	
G-rank:	G5
IUCN:	not listed
<b>National</b>	
N-rank:	N5
National General Status	not available
COSEWIC:	not listed
<b>Provincial</b>	
Provincial General Status:	2, may be at risk
Newfoundland S-rank:	S1
Newfoundland General Status	2, may be at risk
Labrador S-rank	SR
Labrador General Status	6, not assessed
<b>Adjacent Jurisdictions,:</b>	
Prince Edward Island S-Rank	Not present
Prince Edward Island General Status	Not present
Nova Scotia S-Rank	S1, one site only
Nova Scotia General Status	Historic
New Brunswick S-Rank	S3
New Brunswick General Status	4, Secure
Quebec S-Rank	S4S5
Quebec General Status	4, secure

## Sources of information and list of references

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- Wildlife Division, Newfoundland and Labrador Department of Environment and Conservation. 2006. Rare Plant Database, January 24, 2006.

### **Collections examined**

The author of this report was present during the sampling of all known population patches, and collection of specimens and seeds from these. Three specimens are listed

in the Newfoundland and Labrador Plant Database of (Wildlife Division, 2006). Two of these have the principal copy deposited at the Herbarium of the Provincial Museum of Newfoundland and Labrador (NFM), with duplicates at the Herbar Marie Victorin at the Université de Montréal (MT). The NFM duplicates were originally identified by Stuart Hay of the Université de Montréal and examined by John E. Maunder (Curator Emeritus of Natural History at the Provincial Museum of Newfoundland and Labrador, personal communication, February 15, 2006). He confirmed the identification of both and noted that one specimen was young, with its inflorescence still nodding and flowers unopened, while the other had 15 heads in developing fruit and 2 heads in flower. About 10 flowers were observed per head, but this was difficult to count because of overlap. If this plant is representative, an estimate of the seed production potential would be 170 seeds per plant per year. Another specimen has its primary duplicate located at the Herbar Marie Victorin at the Université de Montréal (MT), and another at the herbarium of the Canadian Museum of Nature (CAN) in Ottawa. This specimen was not examined. In September 2000, seeds were collected and these were deposited at the Memorial University of Newfoundland Botanical Garden in St. John's. These seeds are still located there in cold storage (Wilf Nicholls, Director, Memorial University of Newfoundland Botanical Garden, personal communication, February 9, 2006).

## TECHNICAL SUMMARY

<b>Distribution and Population Information</b>	<b>Criteria Assessment</b>
<i>Extent of occurrence (EO)(km<sup>2</sup>)</i>	<i>Known EO 0.3, but up to 0.9 possible in same location</i>
<i>Area of occupancy (AO) (km<sup>2</sup>)</i>	<i>Unknown, but &gt;0.00114</i>
<i>Number of extant locations</i>	<i>1</i>
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	<i>Unknown, but likely stable</i>
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	<i>Has likely declined by ~3% within the last 25 years.</i>
<i>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</i>	<i>Unknown, but &gt;1 yr</i>
<i>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</i>	<i>Several hundred to several thousand</i>
<i>Total population trend, specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	<i>Unknown, but has likely declined within last 25 years</i>
<i>Are there extreme fluctuations (&gt;1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	<i>Unknown, but unlikely</i>
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	<i>Only a single confirmed population in NL</i>
<b>Rescue Effect (immigration from an outside source)</b>	
<i>Does species exist elsewhere?</i>	<i>Yes</i>
<i>Status of the outside population(s)?</i>	<i>Closest population (Nova Scotia) historic, Quebec and New Brunswick populations secure.</i>
<i>Is immigration known or possible?</i>	<i>Very unlikely. Nearest population ~350 km</i>
<i>Would immigrants be adapted to survive here?</i>	<i>unknown, but likely yes</i>
<i>Is there sufficient habitat for immigrants here?</i>	<i>Unknown</i>

## Appendix A. Population Information

### Recently verified occurrences/range use (verified 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). An observer familiar with the species may collect only one voucher specimen to document occurrence within a given area .

The following data were taken from the plant database of the Wildlife Division (2006) unless otherwise noted.

- Plant first collected by Luc Brouillet and Saucier of the Université de Montréal in 1987. A partial count of the population was done.
- The site was revisited by Nathalie Djan-Chékar, Henry Mann and the author of this report in July 2000. Three stations were done with patch measurements, population subsamples (not always done in the most representative portion, but, in at least one case, in the densest area). Location coordinates accurate to 10 m were recorded with a GPS.
- The site was revisited by Nathalie Djan-Chékar, Henry Mann and the author of this report in early September 2000. The fen was explored from the known location of the plants westward until the wastewater containment dyke was reached. Location coordinates accurate to 10 m were recorded with a GPS at all 32 patches encountered and seeds were collected to be deposited with the Memorial University Botanical Garden. No counts or patch size measurements were made.
- The site was revisited in July 2003 by Nathalie Djan-Chékar, Gerry Yetman, Luc Brouillet, Christine Doucet and the author of this report. The plants were relocated, but were not counted.
- John Maunder photographed some plants of the population on August 7, 2003.
- The site was visited in October 2005 by the author of this report and *Prenanthes racemosa* were observed sporadically from the eastern portion of the known population to the area at the confluence of two brooks. This would extend the known population eastward approximately 0.6 km. No GPS location coordinates were taken during this visit, and the location is approximate. The plants were too senesced to permit collection of specimens, but were still clearly identifiable to species.

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

- This plant has not been specifically searched for outside of its known location, nor has any attempt to determine the full extent of the population in the Wild Cove Fen been made.
- Of the known fen location, approximately 25-33% of the potentially suitable habitat has been searched.
- Other calcareous fens in boreal forest areas were visited without locating any *Prenanthes racemosa*. However, these areas may lie outside of the range of the

species and it is also possible that these areas represented unsuitable habitat. Fens in limestone barrens were not listed, as this habitat is likely too harsh for *P. racemosa*. Search effort records were extracted from the provincial rare plant database (Wildlife Division, 2006) unless otherwise noted.

- 2005 Corner Brook Area (Mount Moriah, Blow Me Down Cross Country Ski Park) and one fen northwest of Deer Lake (personal hikes by C. Hanel) (<1 day, 1 person)
- 2003 and 2005, Highlands of St. John, Great Northern Peninsula, Squid Cove Rare Plant Survey and Doctor's Brook Rare Plant Survey (Hanel 2005) (~2 days in fens, 2 people)
- 2001, Serpentine Lake area (<1 day, 3 people)
- 2000, between Eddies Cove West and Highlands of St. John, Great Northern Peninsula, Newfoundland Rare Plant Project (~1 day, 3 people, + ~ ½ day, 2 people)
- 2000, 1999 areas inland of Savage Cove, Great Northern Peninsula, Newfoundland Rare Plant Project (<1 day, 3 people+ <1 day, 2 people)
- 1999, Round Head, western Port au Port Peninsula, Newfoundland Rare Plant Project (~1/2 day, 3 people)
- 1995, South Head, Gros Morne National Park, Great Northern Peninsula (<1 day, 3 people)
- 1989, Sally's Cove, Gros Morne National Park, Great Northern Peninsula (<1 day, 2 people)
- 1984, Lomond River, Gros Morne National Park, (<1 day, 5 people)
- 1972 Berry Hill, Gros Morne National Park, Great Northern Peninsula (~1 day, 2 people)

#### **Historical verified occurrences/range use (not verified in the last 25 years)**

- None

#### **Other observations (unverified occurrences)**

- The species has been reported as occurring in Newfoundland and Labrador by Rouleau (1978), but no location was specified.

#### **Potential sites unexplored (explain reason for potential)**

- There are many other fens in calcareous areas in the western part of Newfoundland. However, it is not known if the habitat there would be suitable for *Prenanthes racemosa*. The Wild Cove fen appears to be quite unique among visited fens in western Newfoundland (Nathalie Djan-Chékar, personal communication, January 27, 2006). Some of its unique features include the high relief of the surrounding mountains and the calcareous substrate, which results in a large amount of nutrient-rich seepage from the surrounding hillsides. A search of other potentially suitable wetlands is highly recommended.
- A coarse search for potential *Prenanthes racemosa* habitat could be performed using NTS 1:50,000 topographic maps, geological maps, and the Newfoundland Forest Inventory. The wetlands could be further evaluated using air photos, and the most promising sites could be visited to establish the presence of the species.

