



The Species Status Advisory Committee

**Status Review of
Northern Bog Aster**

Symphotrichum boreale

in Newfoundland and Labrador



**Department of Fisheries and Land Resources
Forestry and Wildlife Research Division**

Available in alternate formats.

Please contact the Department of Fisheries and Land Resources
at 709-637-2025 or endangeredspecies@gov.nl.ca.

Cover Photographs

Northern Bog Aster in bloom in the Wild Cove Fen. Photos by Claudia Hanel.

Recommended Citation

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SSAC Status Review Summary

Date of Status Review: March 8, 2019

Common Name

Northern Bog Aster

Scientific name

Symphyotrichum boreale

Status

Endangered

Reasons for Recommendation

COSEWIC criteria B1 (a), (b) iii, and B2 (a), (b) iii

B1. Extent of occurrence <5,000 km² and

(a) Known to exist at < 5 locations

(b) Continuing decline projected in (iii) area, extent and/or quality of habitat

B2. Index of area of occupancy <500 km²

(a) Known to exist at < 5 locations

(b) Continuing decline projected in (iii) area, extent and/or quality of habitat

Range in Newfoundland and Labrador

Newfoundland only; one known location with two closely situated localities

Status History

In April 2006, the species was assessed as Endangered by the Species Status Advisory Committee, in the document entitled: "The Status of Northern Bog Aster (*Symphyotrichum boreale*) in Newfoundland and Labrador"

http://www.flr.gov.nl.ca/wildlife/endangeredspecies/ssac/Northern_Bog_Aster_SSAC.pdf

[This Web version may be abridged].

In August 2010, the species was listed as Endangered in Newfoundland and Labrador under the Newfoundland and Labrador Endangered Species Act.

Because the species is not rare nationally, it has not been assessed by COSEWIC and is not protected under the federal Species at Risk Act.

Overview

Wildlife Species Description and Significance

General Description of the Species:

Symphyotrichum boreale is a colonial upright plant (<6)-15-85 cm tall (in Newfoundland none of the measured heights have exceeded 35 cm). Producing spreading rhizomatous clones. Generally, 1-3+ stems per genet. Stem slender and 0.6-2.8 cm in diameter; erect to ascending and unbranched (apart from flowering branches). Stems green to reddish, glabrous in lower stem with lines of short hairs on upper stem and flowering branches. Leaves lanceolate-linear, 15-90 mm long, typically 2-15 mm wide, and toothless or with small teeth along margin. Leaf surface glabrous, but with minute hairs along margin and sparse hairs along the underside of the midvein. Basal leaves broader and more variable (20-150 mm long, 5-60 mm wide) with sheathing winged stalks. Basal leaves and lower stem leaves wither before flowering. Mid and upper stem leaves without stalks, and all leaves generally ascending. Stemmed flower heads are found on the upper part of the plant, arising from leaf axils. One, to many, flower heads per plant. Flower heads ~2.5 cm in diameter with 20-50 narrow white ray flowers. Centre disk yellow, progressing to brown and purple hues with age. Ray flowers white to pale blue or pinkish. There are 4-5 series of phyllaries (bracts) of variable color ranging from hyaline (clear, see-through) to green to reddish purple. Minute hairs along the margin of the bracts; otherwise hairless. Bracts narrowly lanceolate-linear and sharply pointed. Outer bracts shorter, and sometimes flaring slightly. Flower stem with one to few leaf-like bracts, and glabrous, or with lines of hair. Fruits reverse egg shaped. Flattened cypselae (achenes from inferior ovaries) tan to brownish with purple streaks or grayish tan; 0.6-2 mm long with a white pappus and one ridge on each side. Chromosome count $2n = 16, 32, 48, 64$ (Löve 1982).

Adapted from Brouillet et al. (2006).

Taxonomy and Designatable Units:

Symphyotrichum boreale (Torrey and A. Gray) Á. Löve and D. Löve

Rush Bog Aster
Slender Bog Aster
White Bog Aster
aster boréal

Family: Asteraceae (Composites)

Synonyms:

Aster laxifolius Lindley var. *borealis* Torrey and A. Gray
Aster borealis (Torrey and A. Gray) Provancher
Aster franklinianus Rydberg
Aster junciformis Rydberg

In NL, there is one designatable unit.

Social, Cultural and Economic Significance:

There is no known traditional and/or local ecological knowledge on this species (SSAC 2006).

Distribution

Global

Symphotrichum boreale is a North American boreal species that ranges from Nebraska and Indiana in the south to the Yukon Territory in the north. Records from Alaska are based on preserved specimens, but there are multiple collections from above 60° N (GBIF Secretariat 2019).

National

Symphotrichum boreale is known from all Canadian provinces but is apparently missing from Labrador, Northwest Territories, and Nunavut.

Provincial

Symphotrichum boreale was previously known only from a fen along Wild Cove Brook, near Corner Brook (SSAC 2006). A new population was discovered in 2017 near Ball's Pond, north of the Wild Cove Fen population (see Figures 2, 5 and 6). The discovery of the new population was made during a survey of potential habitats, between 2000 and 2017, when a number of additional calcareous fens on the Great Northern Peninsula, and between Bay St. George and Bonne Bay further to the south, were surveyed (see Figure 7; Wild Cove Fen Recovery Team, in progress). It is estimated that at most 5% of the potential habitat of *S. boreale* has been examined on the Island of Newfoundland. The species is unknown in Labrador. (Claudia Hanel, pers. comm. 2018). Further sampling is necessary to determine the total range of *S. boreale* in Newfoundland.

The Extent of Occurrence is 6.35km² (see Figure 5), and the Indexed Area of Occupancy is 8 km² (Figure 6)

Habitat

S. boreale is generally found in wet, calcareous habitats (SSAC 2006, Brouillet et al. 2006). Throughout its range it may be found in: fens, bogs, open cedar-larch-spruce swamps, marshes, wet meadows, pond and stream margins, swales and shores, from sea level to >1500m elevation. In Newfoundland it is known only from open areas of rich calcareous fen. The Ball's Pond population is restricted to a small part of a wetland for reasons currently unknown.

Biology

Symphyotrichum boreale is a long-lived perennial. It reproduces asexually through underground rhizomes, with clonal rosettes forming at some distance from the parent. In Newfoundland it generally flowers in August through September (SSAC 2006). At least some members of the genus *Symphyotrichum* are known to reproduce asexually through seeds (i.e. aposporous apomixis, Noyes 2007). It is not known if *S. boreale* is apomictic. A 1980 survey of the ploidy of 3 individuals of *S. boreale* showed that the chromosome count is variable and that hybrids with other *Symphyotrichum* species may occur (Jones 1980, as *Aster borealis*). This suggests that polyploidy may be present and apomixis may be possible. Much is still unknown about this plant, such as longevity, generation length, seed output, seed viability, dispersal capabilities, germination requirements and other factors that affect population size, habitat viability and conservation potential (SSAC 2006). The pappus of the seed suggests wind dispersal and therefore considerable dispersal capabilities.

Clonal reproduction through rhizomes may lead to a significant overestimation of the number of individuals present.

Population Size and Trends

Symphyotrichum boreale produces spreading rhizomatous clones; generally, 1-3+ stems (i.e. ramets) per genet (see the "General Description of the Species" section, above). It is therefore next to impossible to accurately estimate the number of mature individuals of this species, in the field. The best that can be done is to count fertile shoots, and extrapolate.

In 2009, ~20% of the fen was surveyed by transect (Wild Cove Fen Recovery Team, in progress). During the survey 187 fertile stems were counted. Based on

an extrapolation from the transect figure, the total number of fertile stems at Wild Cove was estimated to be about 935. Dividing the above number by 3+ (see the first line of this section), yields a lower estimate of < 312 genets. Thus, the population of *Symphyotrichum boreale* at Wild Cove Fen may be considered to be about < 312-935 mature individuals.

No census has been done at Ball's Pond, but an estimate of < 300 fertile stems was made. Dividing by 3+ yields a lower estimate of < 100 genets.

Together, the Wild Cove Fen and Ball's Pond total population would be about < 412-1235 genets.

A single plot (5m x 5m) within the Wild Cove population was established in 2014 and sampled again in 2016 (see Table 1).

Table 1: Wild Cove population development from 2014-2016. (Claudia Hanel, pers. comm. 2018).

No. of Fertile Stems	2014				2016			
	Flowering	Vegetative	Total	V/F Ratio	Flowering	Vegetative	Total	V/F Ratio
Plot 1	25	45	70	1.8	10	225	235	22.5

Overall there seems to be a growth in population size, but a decline in flowering individuals. This is confirmed by counts of flowering heads done at the same time as the plots were surveyed, showing a 71.7% decline in flowering heads (Claudia Hanel, pers. comm. 2018). In 2014 up to four flower heads were found on a single plant, but in 2016 none of the plants had more than one flower head. This pattern is similar to what has been observed for *Nabalus racemosus* at the same locality (SSAC 2019). Climatic conditions between the years appear to have been comparable. Asexual reproduction can lead to misleading estimates of actual population size. For population viability estimates a genetic survey of the population would be useful.

Threats and Limiting Factors

The Wild Cove area 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 Wild Cove fen receives its moisture from sub-surface seepage from the surrounding slopes and mountains.

Therefore, the habitat is sensitive to activities uphill of the fen in the surrounding area.

A threats assessment for *Symphyotrichum boreale* at Wild Cove Fen, employing the protocol of Salafsky et al. (2008), is presented below:

Wild Cove Fen Population:

1. Residential & commercial development

1.2 Commercial and Industrial Area

In the 2006 status report the Genesis Organics composting facility was a cause of concern. The construction of the facility decreased the area of open fen. Issues of water quality were also raised. Since the previous report Genesis Organics has ceased its activities in the area, but compost is still being made at the site by Hi-Point Industries (Claudia Hanel, pers. comm. 2018).

There is also an active landfill in the immediate vicinity which has been implicated in further habitat degradation of the Wild Cove fen near the occurrences of *S. borealis* (Claudia Hanel, pers. comm. 2018). In 2011 an expansion of the existing landfill into the fen area was proposed and the regional waste disposal issue has not been settled yet. In recent years, the footprint has been expanded on the western side (towards the highway) and new buildings have been constructed.

3. Energy Production and Mining

3.2 Mining and Quarrying:

One of the quarries in the Wild Cove Fen watershed is currently being expanded downstream. If the quarry activities upstream of the fen continue to expand, a significant threat to Wild Cove Fen may result. Subtle long-term impacts of hydrological changes are not easily separated from impacts of climate change or natural fluctuations in ecological processes. It is possible that further quarry or road development in the area will result in increased concentration of the water flow into existing channels, which could lead to the drying out of some areas and localized flooding in others. Only a detailed hydrological study of the area will confirm this (Claudia Hanel, pers. comm. 2018).

5. Biological resource use

5.1 Hunting & Collection of Terrestrial Animals:

Hunting occurs in the area, but its extent and impact on the Wild Cove fen is not known.

5.3 Logging & Wood Harvesting

Domestic woodcutting is allowed in the Wild Cove Operating Area of Forest Management District 15 (Department of Natural Resources Forestry Services Branch, 2013). Evidence of past wood harvesting has been observed on the slopes surrounding the fen, but not in the stunted forest islands of the fen itself. It is not known to which extent the activity is ongoing, but the proposed domestic harvest from 2014-2018 is 1,275 m³ of wood. In the appendix to the Crown Districts 14 and 15 Five Year Operating Plan the listed Species at Risk present in this area are not mentioned under "Non Timber Considerations".

6. Human Intrusions & Disturbance

6.1 Recreational Activities

A groomed snowmobile trail bisects the western part of Wild Cove Fen. It could potentially pose a threat to any individuals located on the trail. Between Corner Brook and Wild Cove the trail runs in a roadside ditch along a section of Route 440. This section melts out fairly early in the spring, essentially reducing or eliminating snowmobile traffic to and from Corner Brook in low snow conditions.

11. Climate Change and Severe Weather

11.4 Storms and Flooding

A severe rainfall event accompanied by substantial snowmelt in January 2018 caused many localized road washouts at stream crossings in the Bay of Islands Area. The Wild Cove Fen has not been revisited since then to determine if it has been affected (Claudia Hanel, pers. comm. 2018).

Ball's Pond Population:

The Ball's Pond population is found in a fen near the pond. The fen is part of a varied wetland and the population is likely restricted to only a small part of

the total area. Why this is the case is currently unknown.

A threats assessment for *Symphyotrichum boreale* near Ball's Pond, employing Salafsky et al. (2008), is presented below:

1. Residential & commercial development

1.1 Housing and Urban Areas

Ball's Pond has a small community of cottages near the lake. The Northern Bog Aster population is situated approximately 250 m from a cluster of cottages and 250 m from the road. Further development of the community could potentially encroach on the population. Other associated risks are garbage, fires and potential spills. Currently these do not constitute a serious threat to the Ball's Pond population.

6. Human intrusions & disturbance

6.1 Recreational Activities

Recreational activities such as the use of ATVs could pose a potential threat to the Ball's Pond population, however, the threat is not deemed to be severe at this point.

Protection, Status and Ranks

All ranks listed below for *S. boreale* are based on the "Wild Species 2015: The General Status of Species in Canada" data (Canadian Endangered Species Conservation Council 2016) and NatureServe (2017).

Category	Rank
Global	
G-rank:	G5
IUCN:	Least Concern
National	
N-rank:	N5
COSEWIC:	Not assessed

Provincial

Newfoundland S-Rank:	S1, critically imperiled
Labrador S-Rank:	Not present

Adjacent Jurisdictions:

Prince Edward Island S-Rank	S2, imperiled
Nova Scotia S-Rank	S2?, imperiled
New Brunswick S-Rank	S3, vulnerable
Quebec S-Rank	S4, apparently secure

Symphotrichum boreale was designated as Endangered under the Newfoundland and Labrador Endangered Species Act in August 2010.

The whole Wild Cove Fen and some adjacent habitats harboring rare plants, including the endangered Rattlesnakeroot (*Nabalus racemosus*; SSAC 2019) are designated as Sensitive Wildlife Areas (SWAs) in the Provincial Land Use Atlas. An SWA is a non-legal habitat protection mechanism that functions to trigger a review process by the Wildlife Division or Forestry and Wildlife Research Division when new land development or use proposals are brought forward (J. Humber, pers. comm., 2018). During this review process, the proposed developments can be denied, there may be conditions placed on the development activities, and/or mitigations may be developed to address the negative effects on species at risk (J. Humber, pers. comm., 2018). Though SWAs have no legislation associated to them, they are an important habitat protection mechanism (Jessica Humber, pers. comm. 2018).

A part of Wild Cove Fen is zoned for Environmental Conservation in the Corner Brook Municipal Land Use Plan, but the area adjacent to the landfill is not included under that designation (Claudia Hanel, pers. comm. 2018). On December 17, 2018, the City of Corner Brook signed a Municipal Habitat Stewardship Agreement with the provincial government, aimed at protecting the same area of the fen from any future development.

Status Review Report

Northern Bog Aster

aster boréal

Symphyotrichum boreale

Range of occurrence in NL (NF/ LB): Newfoundland only

Existing SSAC Assessment:

Status category:

XT E T SC

Date of last assessment: April 12, 2006

Reason for designation at last assessment:

- Only 1 known population in the province
- Restricted to a single valley within the boundaries of the City of Corner Brook
- Habitat threatened by current and future industrial activities and development
- Recent development caused declined of approximately 3% in extent of the general habitat
- Small population (thought to be less than 500)
- Rescue effect unlikely

Criteria applied at last assessment:

- Qualified as Endangered under the SSAC/COSEWIC criteria B1, (a)(b)(iii) and criteria B2, (a)(b)(iii)

SSAC Recommendation:

- No change in status and criteria
 No change in status, new criteria

Evidence supporting this Status Review:

Wildlife species:	
Change in eligibility, taxonomy or designatable units:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Range:	
Change in Extent of Occurrence (EO):	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
Change in Index of Area of Occupancy (IAO):	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
Explanation: More properly, "n/a". "AO", not "IAO", was used in the 2006 report.	
Change in no. of known or inferred current locations*	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unk <input type="checkbox"/>
Comment: The threats to the Ball's Pond subpopulation are apparently less than those to the Wild Cove Fen population. However, overall, the differences may not be large enough to justify the designation of two separate locations.	
Significant new survey information:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
Explanation: New survey found one new population at Ball's Pond, 14.3 km from the Wild Cove population.	
Population Information:	
Change in number of mature individuals:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
Explanation: The discovery of the Ball's Pond population adds individuals to the total, however a detailed census has not yet been carried out.	
Change in population trend: [pre-2011 data is deficient]	Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input checked="" type="checkbox"/>
Change in severity of population fragmentation:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unk <input type="checkbox"/>
Change in trend in area and/or quality of habitat:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unk <input type="checkbox"/>

<p>Significant new survey information:</p> <p>Explanation:</p> <p>New surveys have shown that the population is larger than was originally estimated.</p> <p>The addition of the Ball's Pond population.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>Threats:</p>	
<p>Change in nature and/or severity of threats:</p> <p>Explanation:</p> <p>The recent (December 2017) approval to expand an upstream quarry may lead to further habitat encroachments and disturbances to the hydrology of the fen. Plastic bags and other lightweight garbage blown out of the landfill are reducing habitat quality at the western edge of the fen.</p> <p>Little is known of the threat situation at Ball's Pond, but an expansion of the cottage development may pose a threat to <i>S. boreale</i> in the area.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input checked="" type="checkbox"/></p>
<p>Protection:</p>	
<p>Change in effective protection:</p> <p>Explanation:</p> <p>In 2010 <i>S. boreale</i> recognized as an endangered species under the Newfoundland Endangered Species Act. The fen area is now included in a Sensitive Wildlife Area.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

Rescue Effect:	
Change in evidence of rescue effect:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Quantitative Analysis:	
Change in estimated probability of extirpation:	Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input checked="" type="checkbox"/>
Details: A quantitative analysis was not performed.	

Summary and Additional Considerations:

The habitat of the Wild Cove/Ball's Pond populations of *S. boreale* is expected to decline due to stochastic effects, human activities and, potentially, climatic conditions. As there are no known populations nearby to provide a rescue effect, this could result in the loss of the species on the Island of Newfoundland.

Acknowledgements and Authorities Contacted:

Claudia Hanel – Ecosystem Management Ecologist – Botanist, Forestry and Wildlife Research Division, Government of Newfoundland and Labrador

Jessica Humber – Ecosystem Management Ecologist – Biodiversity, Forestry and Wildlife Research Division, Government of Newfoundland and Labrador

Adam Durocher - Data Manager, Atlantic Canada Conservation Data Centre

Author of Status Review:

Sander Bennett Boisen

Technical Summary

Symphotrichum boreale

Northern bog aster

Aster boreal

Range of occurrence in the province: NF (Wild Cove and Ball's Pond)

Demographic Information

1. Generation time (usually average age of parents in the population)	Unknown, but >1yr
2. Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Projected
3. Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations]	Unknown
4. [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations].	Unknown
5. [Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations].	Unknown
6. [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future.	Unknown
7. Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	n/a
8. Are there extreme fluctuations in number of mature individuals?	Unknown

Extent and Occupancy Information

9. Estimated extent of occurrence	6.35 km ²
10. Index of area of occupancy (IAO) (Always report 2x2 grid value).	8 km ²

11.	Is the population “severely fragmented” i.e., >50% of its total area of occupancy is in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a large distance?	No. Only 2 known populations separated by ~14km.
12.	Number of locations*	1-2
13.	Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?	No
14.	Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?	No
15.	Is there an [observed, inferred, or projected] continuing decline in number of subpopulations?	No
16.	Is there an [observed, inferred, or projected] continuing decline in number of locations*?	No
17.	Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat?	Yes, projected decline in quality of habitat at Wild Cove.
18.	Are there extreme fluctuations in number of subpopulations?	No
19.	Are there extreme fluctuations in number of locations*?	No
20.	Are there extreme fluctuations in extent of occurrence?	No
21.	Are there extreme fluctuations in index of area of occupancy?	No

Number of Mature Individuals (in each subpopulation)

22.	Subpopulation (give plausible ranges)	N Mature <u>Genets</u> (estimates)
	Wild Cove	<312-935
	Ball’s Pond	<100-300
	Total	<412-1235

* See Definitions and Abbreviations on [COSEWIC website](#) and [IUCN 2010](#) for more information on this term.

Quantitative Analysis

23. Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years].	Unknown
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Threats (actual or imminent, to populations or habitats)

24. IUCN categories summary:

Wild Cove Fen:

1.2 Commercial and Industrial Area

- Habitat degradation from composting facility and landfill

3.2 Mining and Quarrying:

- Expansion of quarrying activity in the area poses a threat to the habitat.

5.1 Hunting & Collection of Terrestrial Animals:

- There is active hunting in the area

5.3 Logging & Wood Harvesting

- There is evidence of logging in the surrounding area

6.1 Recreational Activities

- There is evidence of an active snowmobile trail in the area

11.4 Storms and Flooding

- Potential habitat degradation due to large amount of snow melt; severity unknown.

Ball's Pond:

1.1 Housing and Urban Areas

6.1 Recreational Activities

The habitat is under threat from a number of human leisure and commercial activities. Extreme weather events pose a threat to the habitat due to flooding and wash out from the landfill, composting facility, roads and quarries.

Small population size leads to vulnerability due to demographic stochasticity.

Rescue Effect (immigration from outside Newfoundland)

25. Status of outside population(s) most likely to provide immigrants to Newfoundland?	Quebec (S4), New Brunswick (), Prince Edward Island (S2), Nova Scotia (S2)
26. Is immigration known or possible?	Immigration is theoretically possible, but seems very likely.
27. Would immigrants be adapted to survive in Newfoundland?	Probably
28. Is there sufficient habitat for immigrants in Newfoundland?	Probably
29. Is rescue from outside populations likely?	No

Data Sensitive Species

30. Is this a data sensitive species? No

Current Status

31. Status History (COSEWIC or SSAC)

In April 2006, the species was assessed as Endangered by the Species Status Advisory Committee, in the document entitled: "The Status of Northern Bog Aster (*Symphyotrichum boreale*) in Newfoundland and Labrador"

In August 2010, the species was listed as Endangered in Newfoundland and Labrador under the Newfoundland and Labrador Endangered Species Act.

Because the species is not rare nationally, it has not been assessed by COSEWIC and is not protected under the federal Species at Risk Act.

32. Criteria (old):

B1. Extent of occurrence < 5,000 km²

B2. Area of occupancy < 500 km²

(a) Known to exist at < 5 locations

(b) Continuing decline observed, inferred or projected in iii) area, extent and/or quality of habitat

33. Year Assessed: 2006

34. Reasons for Designation:

Qualified as Endangered under the SSAC/COSEWIC criteria B1, B 2. (a) and B 2. (b) iii):

- Only 1 known population in the province
- Restricted to a single valley within the boundaries of the City of Corner Brook
- Habitat threatened by current and future industrial activities and development threat with the quality of the habitat declining over the past 15 years based on expert observation over that time period
- Recent development caused declined of appr. 3 % in extent of the general habitat
- Small population (thought to be less than 500)
- Rescue effect unlikely

35. Author of Technical Summary: Sander Bennett Boisen

36. Additional Sources of Information:

Claudia Hanel of the Forestry and Wildlife Research Division, Department of Fisheries and Land Resources.

Recommended Status and Reasons for Designation

37. Recommended Status: Endangered	38. Alpha-numeric Code: B1 (a), (b) iii B2 (a), (b) iii
39. Reasons for Designation: Qualifies as endangered under COSEWIC criteria B1 (a),(b) iii, and B2 (a),(b) iii	

Applicability of Criteria

40. Criterion B (Small Distribution Range and Decline or Fluctuation): B1. Extent of occurrence estimated to be < 5000 km ² a. known to exist at ≤ 5 locations b. continuing decline projected in iii. in area, extent, and/or quality of habitat B2. Index of area of occupancy estimated to be < 500 km ² a. known to exist at <5 locations b. continuing decline projected in iii. in area, extent, and/or quality of habitat
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Additional Sources of Information

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Jessica Humber – Ecosystem Management Ecologist – Biodiversity, Forestry and Wildlife Research Division, Government of Newfoundland and Labrador

Figures

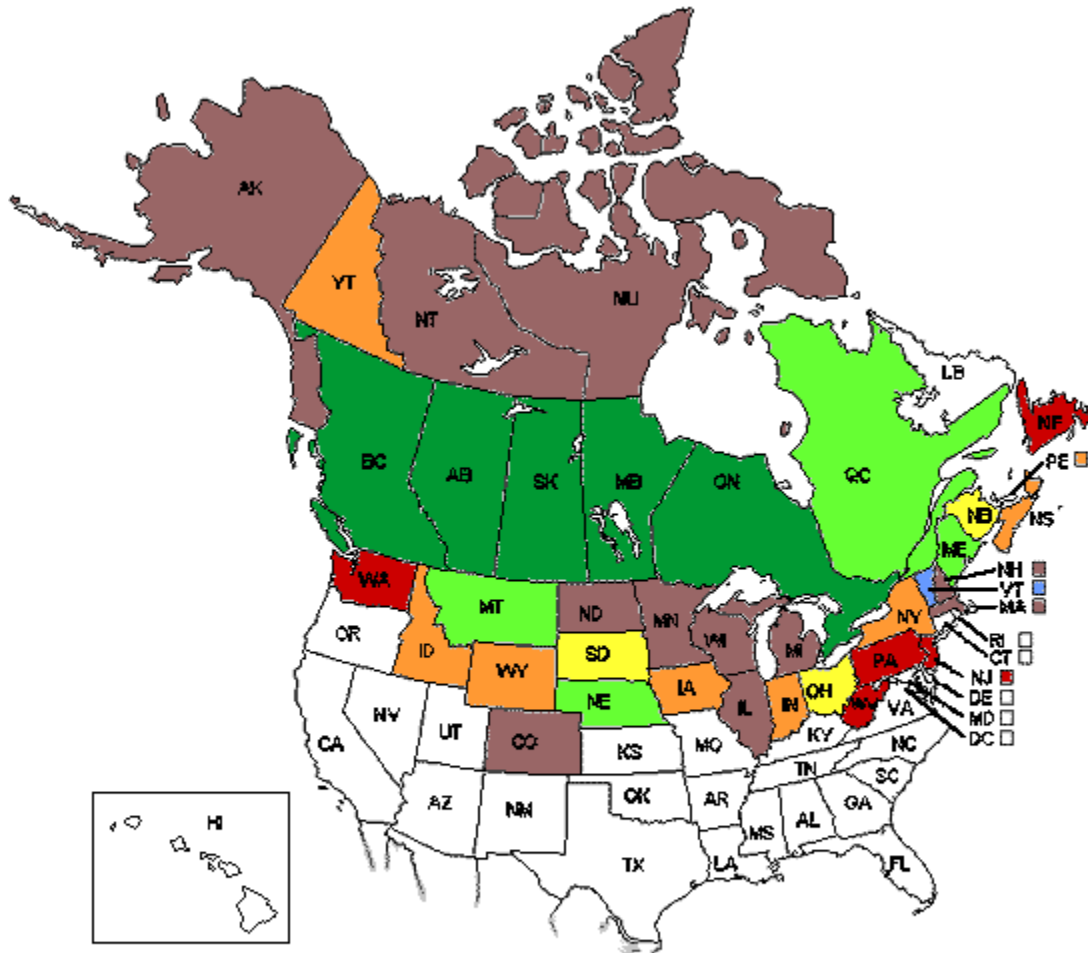


Figure 1: North American distribution of *Symphyotrichum boreale*. Color indicates conservation status with the following key: Red – Critically imperiled, Orange – Imperiled, Yellow – Vulnerable, Light Green – Apparently secure, Dark Green – Secure, Grey – unranked or under review. Source (NatureServe Explorer 2017).

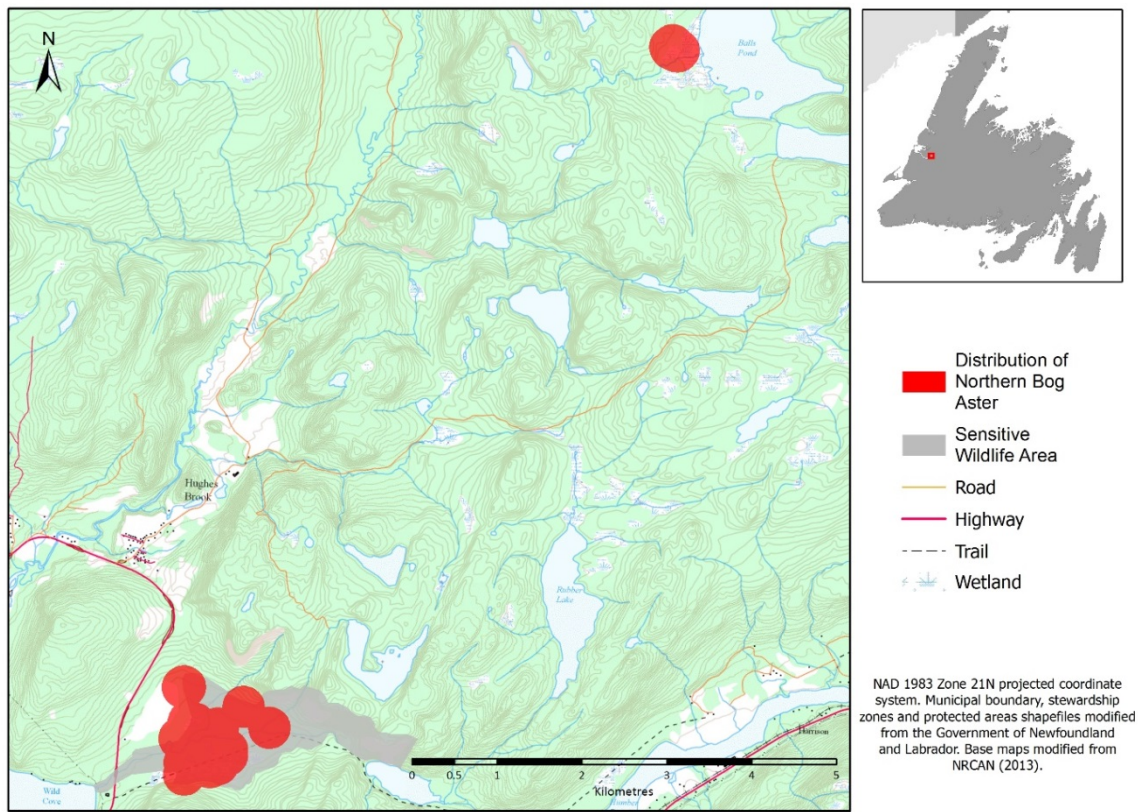


Figure 2: The current known distribution of *Symphyotrichum boreale* in Newfoundland. Note that the Wild Cove Fen population occurs within a ‘Sensitive Wildlife’ area. Note that the dotted line trail on the map does not accurately track the present road. All occurrences of *N. racemosus* occur north of that present road. Figure prepared by Adam Durocher, Atlantic Canada Conservation Data Centre.



Figure 3: An open area of the rich calcareous Wild Cove Fen. Picture courtesy of Claudia Hanel.



Figure 4: *Symphyotrichum boreale* in flower in Wild Cove fen. Picture courtesy of Claudia Hanel.

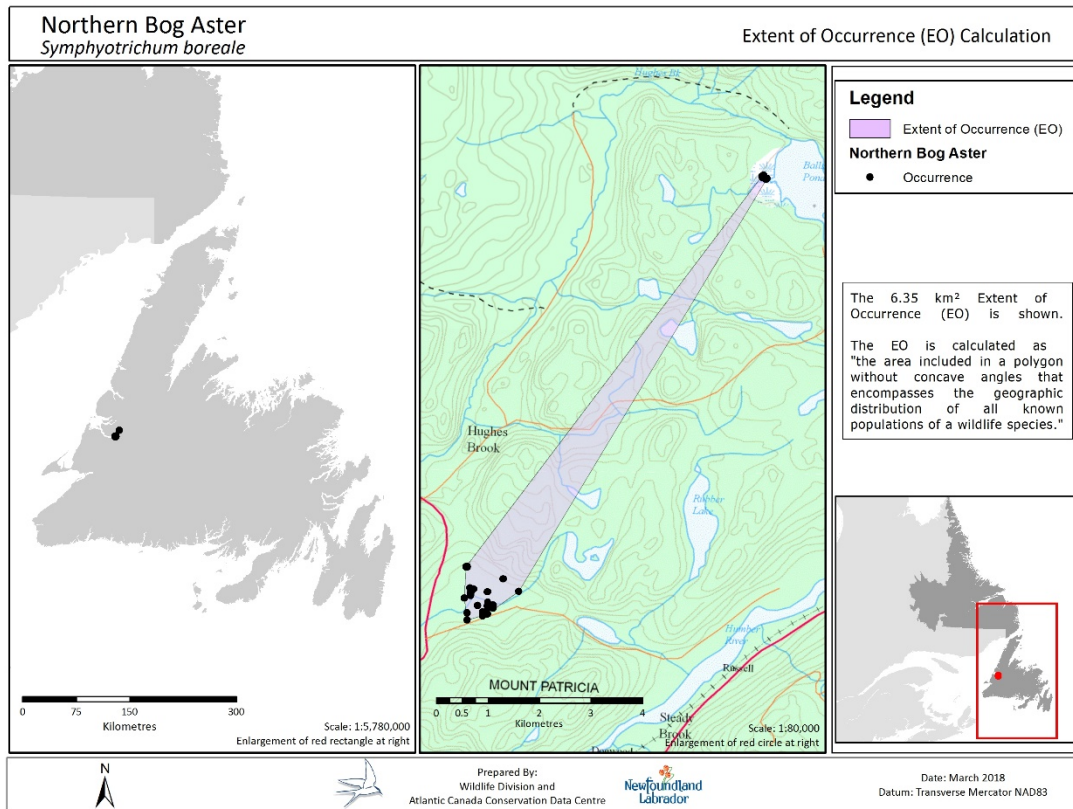


Figure 5: The extent of occurrence of *Symphyotrichum boreale* in western Newfoundland. Prepared by Adam Durocher, Atlantic Canada Conservation Data Centre.

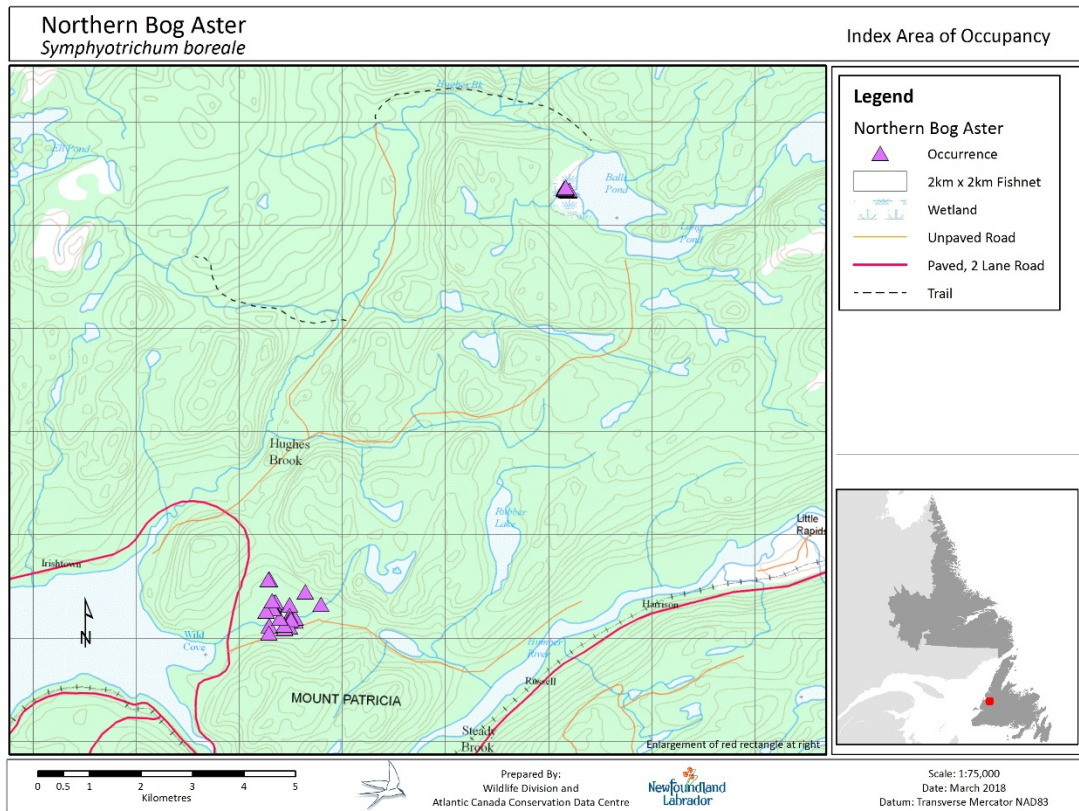


Figure 6: The indexed area of occurrence of *Symphyotrichum boreale* in western Newfoundland. Prepared by Adam Durocher, Atlantic Canada Conservation Data Centre.

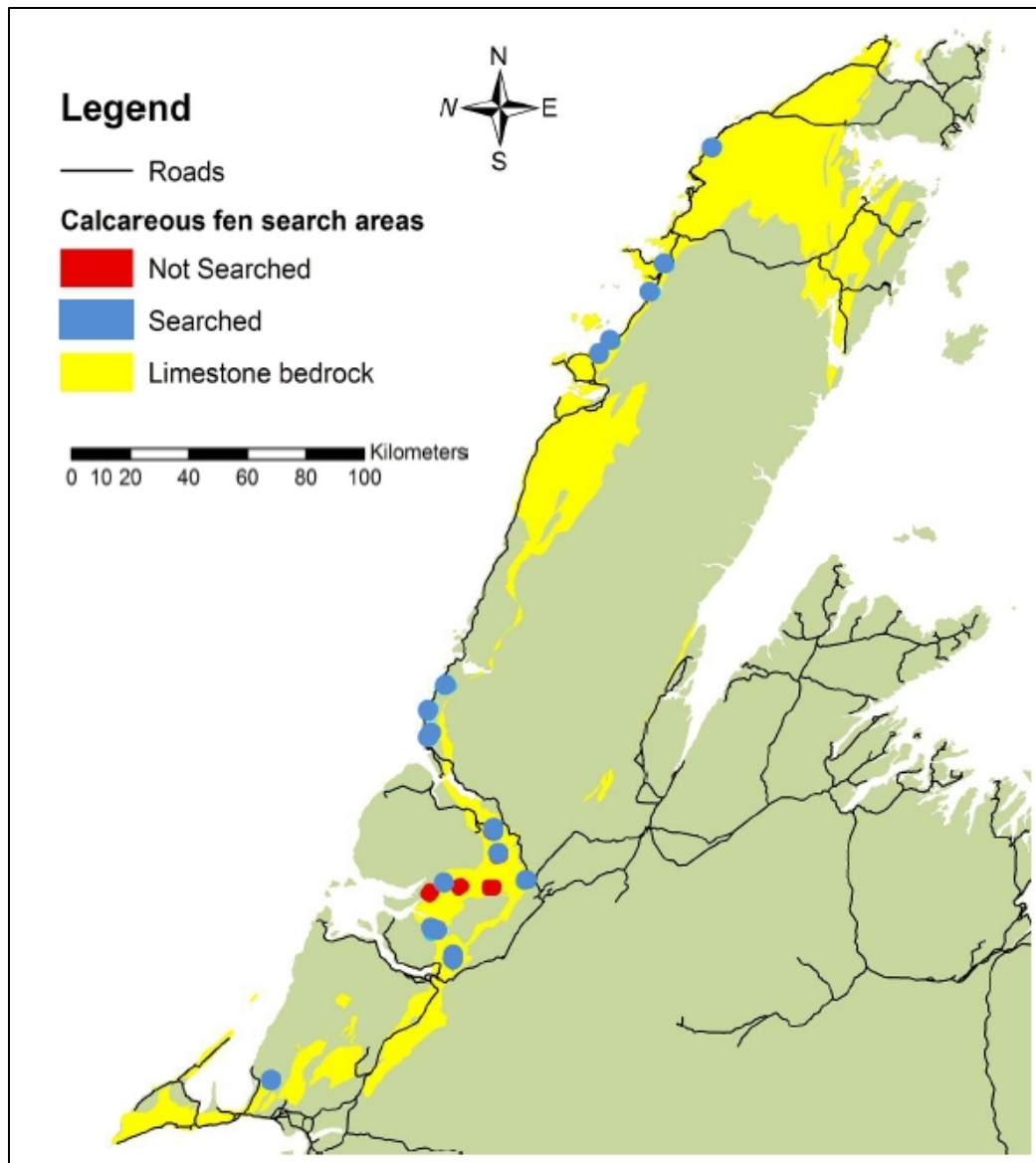


Figure 7: Completed searches and potential habitat not searched in Newfoundland for Northern Bog Aster (*Symphyotrichum boreale*) and Rattlesnakeroot (*Nabalus racemosus*) (Wild Cove Fen Recovery Team, in progress).