



The Species Status Advisory Committee

**Status Review of**  
**Bodin's Milkvetch**  
*Astragalus bodinii*

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](mailto:endangeredspecies@gov.nl.ca).

## **Cover Photographs**

Flower: Aare Voitk

Leaves and fruit: Aare Voitk

## **Recommended Citation**

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## **Authors**

The initial draft of this status review was prepared by Elisabeth Belanzaran. Significant contributions to the report were made by John E. Maunder.

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## SSAC Status Review Summary

**Date of Status Review:** March 8, 2019

**Common Name**

Bodin's Milkvetch

**Scientific name**

*Astragalus bodinii*

**Status**

Threatened

**Reasons for Recommendation**

COSEWIC criteria D2

D2. Index of area of occupancy < 20 km<sup>2</sup>  
Number of locations ≤ 5

**Range in Newfoundland and Labrador**

Newfoundland only, one known location

**Status History**

In February 2008, the species was assessed as Threatened by the Species Status Advisory Committee. See the document entitled: "The Status of Bodin's Milkvetch (*Astragalus bodinii*) in Newfoundland and Labrador" (2008)

[https://www.flr.gov.nl.ca/wildlife/endangeredspecies/ssac/Bodins\\_Milkvetch\\_SSAC.pdf](https://www.flr.gov.nl.ca/wildlife/endangeredspecies/ssac/Bodins_Milkvetch_SSAC.pdf)

[This Web version may be abridged].

On September 27, 2013, the species was listed as Threatened in Newfoundland and Labrador under the Newfoundland and Labrador Endangered Species Act.

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

## Overview

### Species Description and Significance

#### General Description of the Species:

Weak-stemmed perennial herb, with a free-branching, carpet-forming growth pattern emerging from a taproot. Bears showy, pinkish-blue, flowers, typical of the pea family; the leaves are pinnately-divided.

#### Taxonomy and Designatable Units:

*Astragalus bodinii* E. Sheldon

Bodin's Milk-vetch  
Yukon Milk-vetch  
astragale de Bodin

Family: Fabaceae (Peas)

#### Synonyms :

*Astragalus bodinii* var. *yukonis* (M.E. Jones) B. Boivin  
*Astragalus stragulus* Fernald  
*Astragalus yukonis* M.E. Jones  
*Phaca bodinii* (E. Sheldon) Rydberg

(Synonymy adapted from Brouillet et al. 2017, Meades et al. 2000)

In NL, there is one designatable unit.

#### Taxonomic Notes:

There has been some speculation that the Newfoundland population of *A. bodinii* may actually be a distinct and unique variant of the species. Indeed, Fernald (1926: 214-215) considered the Newfoundland population to be a separate species - *Astragalus stragulus*. However, more extensive morphological and molecular study must be conducted before definite conclusions can be drawn (SSAC 2008). Preliminary, unpublished, molecular data does seem to support the idea that the NL population is at least somewhat distinct (pers. comm., Paul Sokoloff, Canadian Museum of Nature, via John E. Maunder, 2011).

## Social and Cultural Significance:

Bodin's Milkvetch has no known social, economic, or cultural significance in the province. There are no published Indigenous uses for the plant within the province. Notably Arnason et al. did not include it in their 1981 study of the ethnobotany of eastern Canada. In order to confirm this assertion, representatives from the Qalipu and Miawpukek First Nations were contacted. It was confirmed that there is no recorded traditional ecological knowledge of the species from the Qalipu Nation (J. Strickland, pers. comm., 2018; and I. Sullivan, pers. comm., 2018), though as of the time of this writing the Miawpukek representative had not responded.

## Distribution

### Global:

North American species, found in Canada (see details below) and United States (Nebraska, Wyoming, Colorado, New Mexico, Utah, Alaska) (NatureServe 2017)

### National:

Yukon, Northwest Territories, Alberta, Saskatchewan, Manitoba, Newfoundland (NatureServe 2017)

### Provincial:

One extremely restricted locality near Cook's Harbour, Newfoundland.

The Extent of Occurrence is 0.14 km<sup>2</sup>, and the Index of Area of Occupancy is 4 km<sup>2</sup> (See Figures section).

## Habitat

Relatively widespread in western North America, Bodin's Milkvetch appears to inhabit a reasonably varied, mostly upland habitat, of elevations between 300 to 3000m (SSAC 2008). In Newfoundland, however, the species occupies a unique coastal habitat (SSAC 2008).

The entire "natural habitat" of the species in Newfoundland appears to be mostly restricted to a narrow, discontinuous coastal strip, running between the beach pea (*Lathyrus japonicus*) zone of the upper beach and the seaward edge of the dwarf willow (*Salix*) turf zone just above the beach (SSAC 2008). Additionally, a narrow strip of disturbed habitat occurs closely adjacent to this natural habitat on

a frequently used ATV track. As well, a few minor areas of disturbed habitat occur on a few newly de-vegetated or eroded patches, resulting from localized turf blowouts, near this same ATV track (SSAC 2008).

The Cook's Point locality is significantly exposed to heavy salt spray during storms. Bodin's Milkvetch's preferred rooting substrate is coarse sand that is rich in pulverized shelly materials (mostly derived from Blue Mussels *Mytilus* sp.). The underlying substrate is limestone-dolostone (Table Head Formation) (deGrace 1974).

The abundance of calcareous coastline on the Northern Peninsula of Newfoundland makes it difficult to determine the potential extent of suitable habitat, as other factors influencing habitat suitability are currently unknown. However, given the extensive botanical coverage of the coastal fringe of northern Newfoundland, during the last century, it seems very unlikely that additional populations of this little plant have been missed.

In 2017, the entire perimeter of the Cooks Point Peninsula was surveyed and no new populations were found (Claudia Hanel, pers. comm. 2018).

## **Biology**

Bodin's Milkvetch is a calciphilic, perennial, carpet-forming legume growing from a taproot and bearing relatively showy, pinkish-blue, pea-like flowers. Plants are freely branching, and very short and compact, with pinnately-divided leaves and rounded pods with 5-8 seeds (Fernald 1950).

The Newfoundland populations have been observed to flower in July (on July 1<sup>st</sup> in 2005 and July 5<sup>th</sup> in 2002), as well as to have both flowers and immature fruits in early August (SSAC 2008, Claudia Hanel, pers. comm. 2018). John Maunder observed that fertile pods had not yet opened by October 14<sup>th</sup>, 2006 (SSAC 2008). There are no known or observed parasites or predators in the Newfoundland population.

## **Population Size and Trends**

The 2008 population estimates were based on the percentage of coverage (averaged to 15%) within the (then) area of occupancy (not index of area of occupancy) using an estimated 5-10 plants/m<sup>2</sup>. The population reported in 2008 was estimated to be between 2125-4250 individuals, all of which were considered to be mature. (SSAC 2008).

Monitoring conducted in July 2007, July 2008, July 2015, and August 2017 at the western end of the population (Wild Bight cemetery) confirmed the continued



presence of the species as fertile, with no new damages or threats observed (C. Hanel, pers. comm, May 7 2018).

Survival estimates have not been calculated for this population.

## Threats and Limiting Factors

An up-to-date threats assessment for *Astragalus bodinii* in Newfoundland, employing the protocol of Salafsky et al. (2008), is presented below:

### 5. Biological Resource Use

5.2. Unintentional effects from the collecting of turf may affect the species, as there has been documentation of some unknown and random removal in the vicinity of the species' habitats (SSAC 2008).

### 6. Human Intrusions & Disturbance

6.1. Community-related activities have affected the population of Bodin's Milkvetch, which exists in an area subject to frequent ATV use (SSAC 2008).

On the one hand, the ATV disturbance has created new areas of potential habitat (2008 estimates put approximately 50% of the population within these disturbed soils). On the other hand, surveyors have noted that the plants in the disturbed areas were generally stunted and showed poor reproductive potential (SSAC 2008).

## Protection, Status and Ranks

All ranks listed below for *Astragalus bodinii* are based on “Wild Species 2015: The General Status of Species in Canada” (Canadian Endangered Species Conservation Council 2016) and NatureServe (2017).

Category	Rank
Global	
G-rank:	G4
IUCN:	Not listed
National	
N-rank:	N4N5
COSEWIC:	Not assessed
Provincial	
Newfoundland:	S1, critically imperiled
Labrador:	Not present
Adjacent Jurisdictions:	
Quebec S-Rank	S2, imperiled

*Astragalus bodinii* was designated as Threatened under the Newfoundland and Labrador Endangered Species Act in September 2013. The species is included in a draft Limestone Barrens Ecosystem Plan (Limestone Barrens Species at Risk Recovery Team 2018).

The critical habitat for Bodin’s Milkvetch is now included in a Sensitive Wildlife Area (SWA) under the provincial Crown Lands Atlas. An inclusion of known critical, recovery, and potential habitat in an SWA on the provincial Crown Lands Atlas does not afford a species any legal protection, nor does it have any associated legislation (J. Humber, pers. comm., 2018). Rather, it functions as a habitat protection mechanism that affords a degree of protection. During the environmental assessment process, or during a land use referral from the Interdepartmental Land Use Committee (ILUC), an SWA designation will trigger a review by the Wildlife Division and/or the Forestry and Wildlife Research Division for any new land use or development proposals. This review can

lead to the denial of the proposal, conditions being placed on land use activities, and/or development of appropriate mitigation measures (Jessica Humber, pers. comm. 2018).

## Status Review Report

*Astragalus bodinii* E. Sheldon

Bodin's Milkvetch

Astragale de Bodin

Range of occurrence in NL (NL/ LB): Newfoundland only, 1 known location

### Existing SSAC Assessment:

Status category:

XT     E     T     V

Date of last assessment: February 20, 2008

Reason for designation at last assessment:

- Only 1 known population
- Extremely restricted range, area of occupancy and extent of occurrence significantly <1 km<sup>2</sup>
- Small population roughly estimated at 2125-4250 mature individuals
- Newfoundland is the only known locality in eastern North America, rescue effect highly unlikely

Criteria applied at last assessment:

- Qualified as Threatened under the SSAC/COSEWIC criteria D2: Area of occupancy <20 km<sup>2</sup> and number of locations <5

### SSAC Recommendation:

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

**Evidence supporting this Status Review:**

<b>Wildlife species:</b>	
Change in eligibility, taxonomy or designatable units:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>Range:</b>	
Change in Extent of Occurrence (EO):	Yes <input type="checkbox"/> No <input checked="" 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"/>
Explanation: [*] Use the IUCN definition of location	
Significant new survey information:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
Explanation:	
<b>Population Information:</b>	
Change in number of mature individuals:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unk <input type="checkbox"/>
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"/>
Significant new survey information:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Explanation: As there has not been a significant population survey undertaken since the writing of the 2008 status it is impossible to say whether there has been a significant change in population trends or mature individuals.	

<b>Threats:</b>	
Change in nature and/or severity of threats:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unk <input type="checkbox"/>
<b>Protection:</b>	
Change in effective protection:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>Explanation:  Although there are no new legal protections in place that protect the species' habitat, the critical habitat for Bodin's Milkvetch is now included in a Sensitive Wildlife Area (SWA) under the provincial Crown Lands Atlas.</p> <p><i>A. bodinii</i> is also included in the Limestone Barrens Ecosystem Recovery Plan (in progress), though there no specific plans for the recovery or protection of the species are described.</p>	
<b>Rescue Effect:</b>	
Change in evidence of rescue effect:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>Quantitative Analysis:</b>	
Change in estimated probability of extirpation:	Yes <input type="checkbox"/> No <input type="checkbox"/> Unk <input checked="" type="checkbox"/>
Details: There is no calculated probability of extirpation at this time.	

**Summary and Additional Considerations:**

No change.

**Acknowledgements and authorities contacted:**

Adam Durocher - Data Manager, Atlantic Canada Conservation Data Centre

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

Jonathan Strickland – Director of Natural Resources, Qalipu First Nation

Ian Sullivan - GIS Technician, Department of Natural Resources, Qalipu First Nation

**Author of Status Review:**

Elisabeth Belanzaran

## Technical Summary

*Astragalus bodinii*

Bodin's Milkvetch

Astragale de Bodin

Range of occurrence in the province: Newfoundland only; one location only

### Demographic Information

1. Generation time (usually average age of parents in the population)	Unknown, although perennial
2. Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Unknown
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?	a. n/a b. n/a c. n/a
8. Are there extreme fluctuations in number of mature individuals?	Unknown

### Extent and Occupancy Information

9. Estimated extent of occurrence	0.14 km <sup>2</sup>
10. Index of area of occupancy (IAO) (Always report 2x2 grid value).	4 km <sup>2</sup>



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
12. Number of locations* (use plausible range to reflect uncertainty)	1
13. Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?	Unknown
14. Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?	Unknown
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?	No
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 Individuals
Cook’s Point	2125-4250
Total	2125-4250

\* 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. Residential and Commercial Development  Biological Resource Use  Human Intrusion and Disturbance
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**Rescue Effect (immigration from outside Newfoundland)**

25. Status of outside population(s) most likely to provide immigrants to Newfoundland?	n/a. Newfoundland population is disjunct from other populations of the "species complex". No populations are closer than Manitoba.
26. Is immigration known or possible?	Unknown but very unlikely
27. Would immigrants be adapted to survive in Newfoundland?	Unknown, but possible.

<p>28. Is there sufficient habitat for immigrants in Newfoundland?</p>	<p>Virtually nothing is known of the habitat requirements of this taxon. However, the extremely limited occurrence of the taxon in Newfoundland (apparently unchanged since M.L. Fernald (1926) first collected it in Newfoundland would seem to indicate that there is not sufficient habitat for immigrants.</p>
<p>29. Is rescue from outside populations likely?</p>	<p>Very unlikely- the Newfoundland population is disjunct and the only example of the "species complex". from eastern North America.</p>

**Data Sensitive Species**

<p>30. Is this a data sensitive species?</p> <p>Probably not. Although the only known locality is proximal to a town, the tiny stature and the lack of cultural or economic significance of the species means it is unlikely to be targeted.</p>
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## Current Status

### 31. Status History (COSEWIC or SSAC)

In February 2008, the species was assessed as Threatened by the Species Status Advisory Committee, in the document entitled: "The Status of Bodin's Milkvetch (*Astragalus bodinii*) in Newfoundland and Labrador"

In September 27, 2013, the species was listed as Threatened 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):

D2. Area of occupancy <20 km<sup>2</sup> and number of locations < 5

### 33. Year Assessed: 2006

### 34. Reasons for Designation:

Qualifies as threatened under the SSAC/COSEWIC criteria D2:

- Only one known population
- Extremely restricted range, area of occupancy and extent of occurrence significantly < 1 km<sup>2</sup>. Small population (thought to be less than 500)
- Small population roughly estimated at 2125-4250 mature individuals
- Newfoundland is the only known locality in eastern North America, rescue effect highly unlikely

35. Author of Technical Summary: Elisabeth Belanzaran

36. Additional Sources of Information: n/a

## Recommended Status and Reasons for Designation

37. Recommended Status: <b>Threatened</b>	38. Alpha-numeric Code: D2
39. Reasons for Designation:  Qualifies as threatened under COSEWIC criteria D2	

### Applicability of Criteria

40. Criterion D2 (Very Small or Restricted Population):  ≤5 locations Index of area of occupancy <20 km <sup>2</sup>
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### Cited References

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### **Personal Communications**

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

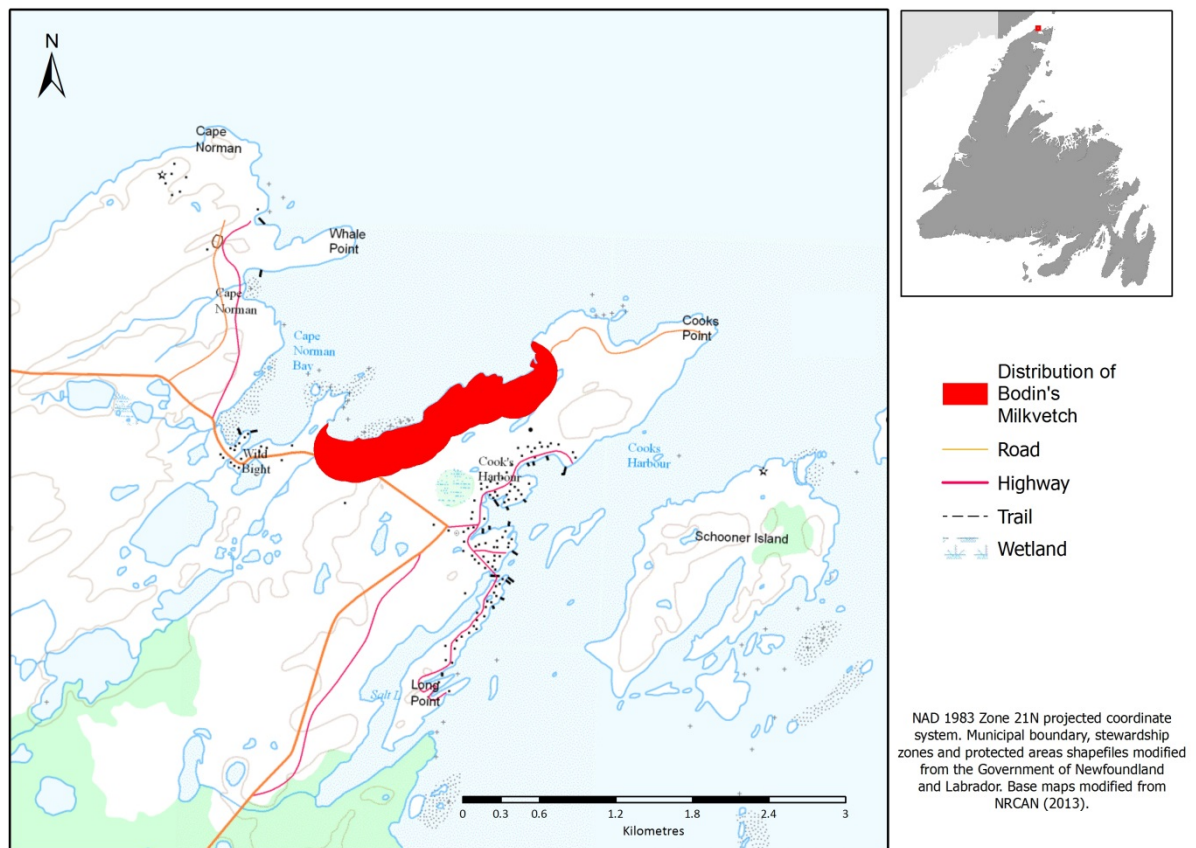
Jonathan Strickland – Director of Natural Resources, Qalipu First Nation

Ian Sullivan – GIS Technician, Department of Natural Resources, Qalipu First Nation

### **Additional Sources of information**

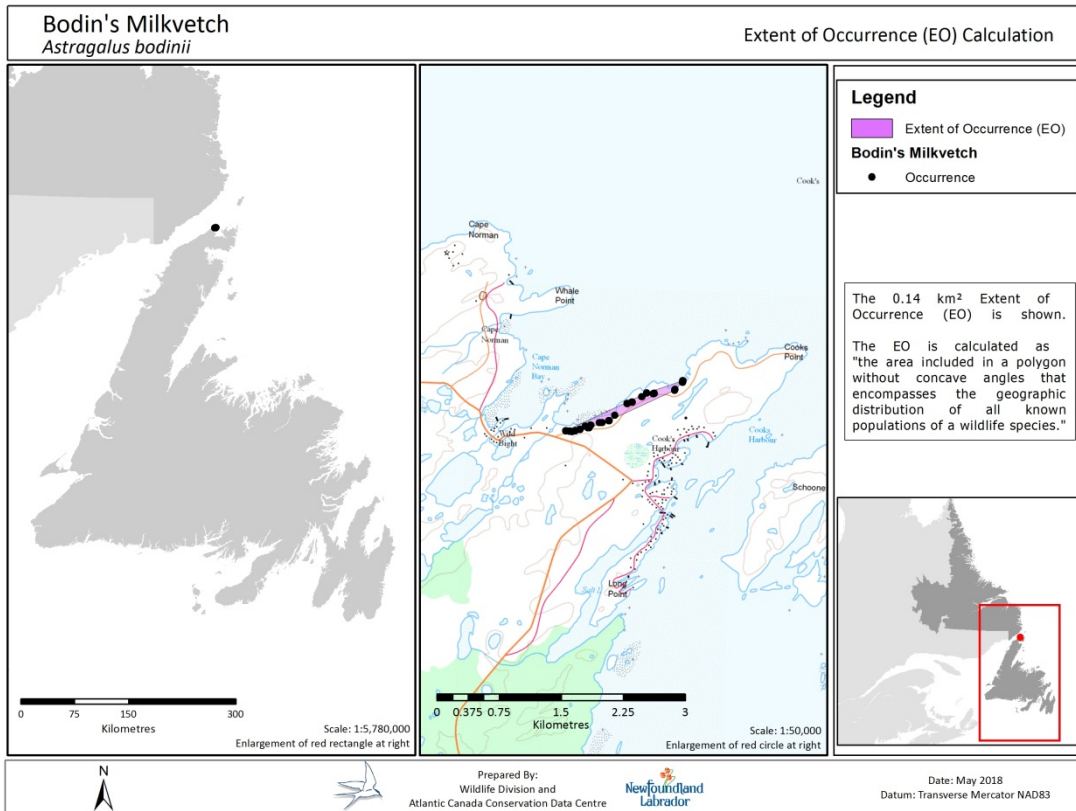
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## Figures

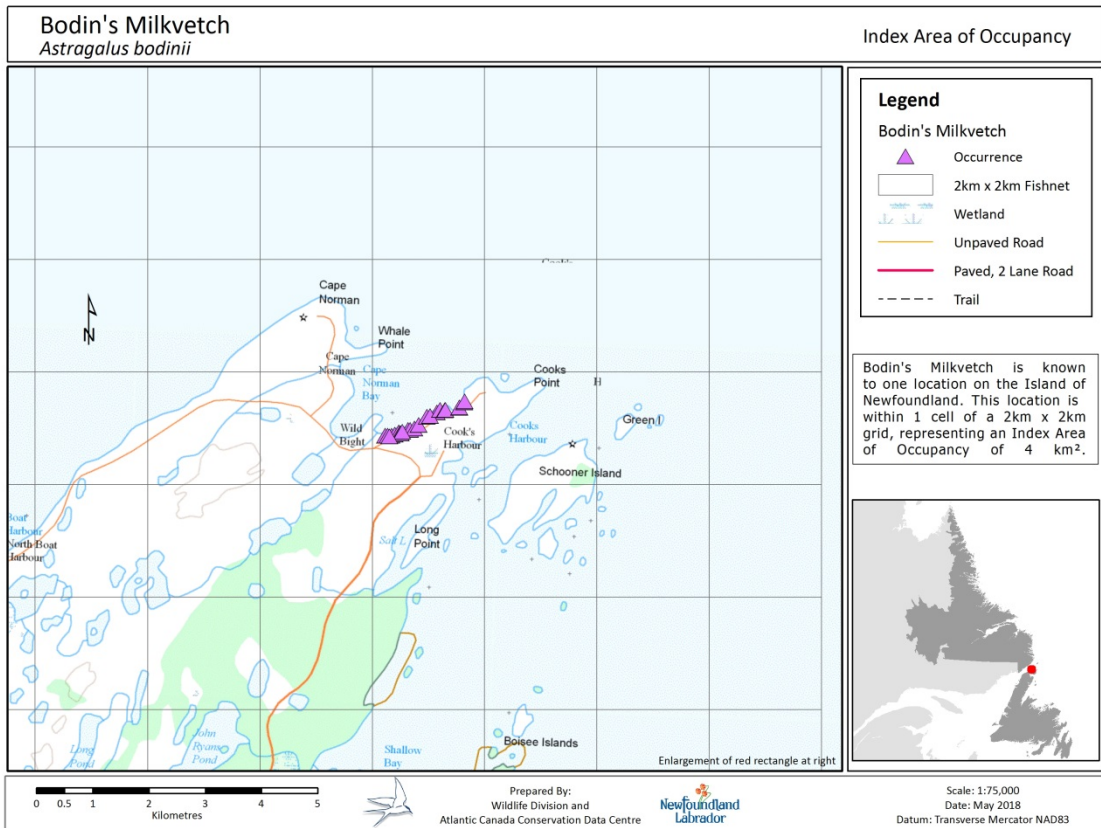


**Figure 1:** Map of location of Bodin's Milkvetch (*Astragalus bodinii*) in Newfoundland (Map generated by Adam Durocher).





**Figure 2:** Map showing the extent of occurrence of *A. bodinii* in Newfoundland, which is calculated to be 0.14 km<sup>2</sup> (Map created by Adam Durocher).



**Figure 3:** Map showing the Index of Area of Occupancy, calculated as being 4 km<sup>2</sup>, of *A. bodinii* in Newfoundland. (Map created by Adam Durocher).