

COSEWIC
Status Appraisal Summary

on the

Long's Braya
Braya longii

in Canada

ENDANGERED
2011

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada



COSEPAC
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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COSEWIC Assessment Summary

Assessment Summary – May 2011

Common name

Long's Braya

Scientific name

Braya longii

Status

Endangered

Reason for designation

This regionally restricted Canadian endemic is known only from five sites within the limestone barrens on the island of Newfoundland. Since it was last assessed as Endangered in 2000, this species continues to experience declines in total population size and increases in the number and severity of biotic threats, which include the non-native Diamondback Moth and two pathogens.

Occurrence

Newfoundland and Labrador

Status history

Designated Endangered in April 1997. Status re-examined and confirmed in May 2000 and May 2011.

Population Information:

Change in number of mature individuals: yes no
 Change in total population trend: yes no
 Change in severity of population fragmentation: yes no
 Significant new survey information: yes no

Explanation:

Long's Braya population sizes are based on 1998-2000 census of flowering individuals reported in the 2002 Braya Recovery Plan (Hermanutz *et al.*, 2002) compared with a survey of flowering individuals done in 2008 (Hermanutz *et al.*, 2009). With one exception, all counted populations of reproductive Long's Braya have decreased across the range from approximately 7,200 flowering individuals to 5,500 flowering individuals (Table 1; Hermanutz *et al.*, 2009). Sandy Cove is represented by 3 subpopulations all within 1 km radius, subdivided by roads.

Table 1. A comparison of the total number of flowering *Braya longii* individuals counted in both naturally (N) and anthropogenically disturbed (D) habitat in 1998-2000 and 2008 in the 4 known populations. Sandy Cove population is comprised of 3 subpopulations.

Population	Disturbance	1998-2000 Census	2008 Census
Anchor Point East	N	50	Not counted
Yankee Point	N	10	2
	D	1 600	3 224
Sandy Cove			
Airstrip	N	900	411
	D	2 400	778
Lion's Club	N	180	12
	D	760	261
Crusher	N	800	75
	D	500	230
Shoal Cove	D	35	556
Total		7 235	5 549

Threats:

Change in nature and/or severity of threats: yes no

Explanation:

Since the previous report the major identified threat (gravel extraction and road construction) has stopped and is no longer considered to be a threat. ATV activity has been greatly reduced though continues to be a minor threat. There is one insect pest (Diamondback Moth (*Plutella xylostella*)) and two pathogens causing mortality in Long's Braya populations (Squires *et al.*, 2009; Squires 2010). The insect and one pathogen (*Fusarium* sp.) were identified in the last assessment, but the other pathogen (which is suspected to be viral or bacterial) is new and was first recorded in 2003 (Squires, 2010). The Diamondback Moth (*Plutella xylostella*) is:

- European in origin;
- A widespread agricultural pest on mustard family plants;
- Is known for its ability to disperse long distances;
- Capable of severely damaging *Braya* populations (and crops) by immigration of adults, even in areas where the climate is not conducive to completion of life cycles locally;
- Has shown an ability to develop rapid resistance to pesticides and biological control agents. (Capinera 2011)

Protection:

Change in effective protection:

yes no

Explanation:

There is a small Ecological Reserve at the "provisional" stage that currently protects the Long's Braya population and its critical habitat at Sandy Cove; the reserve protects 700 flowering plants. The area has interim protection and it is anticipated that it will become a full ecological reserve in the near future.

Rescue Effect:

Evidence of rescue effect:

yes no

Explanation:

No change since previous assessment and none possible as species is endemic to the island of Newfoundland.

Quantitative Analysis:

Change in estimated probability of extirpation:

yes no

Details:

Population viability analysis of Long's Braya populations suggests that there will be a continued decline in the size of populations on undisturbed habitat over the next 10 years unless the threat of insect herbivory is mitigated (Squires, 2010). Modelling suggests that Long's Braya populations on anthropogenically disturbed habitat will remain stable or increase over the next 10 years (Squires 2010). However, population-specific models need to be completed to determine if this is true for all populations as the last census recorded declines in some populations and increases in others (Hermanutz *et al.*, 2009; Squires, 2010).

Summary and Additional Considerations:

Declines in total population size of Long's Braya and an increase in the number and severity of biotic threats indicates that Long's Braya still requires the protection and recovery efforts afforded a species listed as endangered.

Consultations: none required

Sources of information:

Capinera, J.L. 2011. University of Florida Institute of Food and Agricultural Sciences, Department of Entomology and Nematology: Featured Creatures - Diamondback Moth - *Plutella xylostella* (Linnaeus). Web site: http://entnemdept.ifas.ufl.edu/creatures/veg/leaf/diamondback_moth.htm [Accessed May, 2011]

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Squires, S.E., L. Hermanutz and P.L. Dixon. 2009. Agricultural insect pest compromises survival of two endemic *Braya* (Brassicaceae). *Biological Conservation* 142: 203-211.

Squires, S.E. 2010. Insect pests and pathogens compromise the persistence of two endemic and rare *Braya* (Brassicaceae). Ph.D. Thesis, Department of Biology, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador.

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TECHNICAL SUMMARY

Braya longii

Long's Braya

Range of occurrence in Canada: Newfoundland

Braya de Long

Demographic Information

Generation time	Decades
Is there an observed continuing decline in number of mature individuals?	yes
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations	23% decline over the last 10 years
Observed percent reduction or increase in total number of mature individuals over the last 10 years, or 3 generations.	23% decline over the last 10 years
Projected percent increase in total number of mature individuals over the next 10 years.	none
Inferred percent 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.	none
Are the causes of the decline clearly reversible and understood and ceased?	some reversible and understood, not ceased
Are there extreme fluctuations in number of mature individuals?	no

Extent and Occupancy Information

Estimated extent of occurrence <i>Actual EO = 14 km² based on minimum convex polygon around observations. Due to COSEWIC convention the IAO cannot exceed the EO.</i>	20 km ²
Index of area of occupancy (IAO) <i>(2x2 km grid) based on four populations: Anchor Point, Yankee Point, Sandy Cove [Airstrip, Lion's Club, Gravel Crusher], and Shoal Cove: 5 grids (Figure 1).</i>	20 km ²
Is the total population severely fragmented?	no
Number of "locations*" <i>Based on the threats of insects and pathogens could rapidly affect all individuals in all populations in a single season.</i>	1
Is there an observed continuing decline in extent of occurrence?	no
Is there an observed and projected continuing decline in index of area of occupancy?	no
Is there an observed continuing decline in number of populations?	no
Is there an observed continuing decline in number of locations?	no
Is there an observed continuing decline in quality of habitat?	no
Are there extreme fluctuations in number of populations?	no
Are there extreme fluctuations in number of locations*?	no
Are there extreme fluctuations in extent of occurrence?	no
Are there extreme fluctuations in index of area of occupancy?	no

* See definition of location.

Number of Mature Individuals (in each population)

Population	Number of Mature Individuals
Anchor Point East (1998-2000 census 50)	not counted
Yankee Point natural (1998-2000 census 10)	2
Anthro (1998-2000 census 1600)	3224
Sandy Cove	
Airstrip natural (1998-2000 census 900)	411
Anthro (1998-2000 census 2400)	778
Lion's Club natural (1998-2000 census 180)	12
Anthro (1998-2000 census 760)	261
Crusher natural (1998-2000 census 800)	75
Anthro (1998-2000 census 500)	230
Shoal Cove Anthro (1998-2000 census 35)	556
Total 7235	5549

Quantitative Analysis

<p>Probability of extinction in the wild</p> <p>Population viability analysis of Long's Braya populations suggests that there will be a continued decline in the size of populations on undisturbed habitat over the next 10 years unless the threat of insect herbivory is mitigated (Squires, 2010). Modelling suggests that Long's Braya populations on anthropogenically disturbed habitat will remain stable or increase over the next 10 years (Squires 2010). However, population-specific models need to be completed to determine if this is true for all populations as the last census recorded declines in some populations and increases in others (Hermanutz <i>et al.</i>, 2009; Squires, 2010). It has been calculated the <i>B. longii</i> (on undisturbed substrate only) could go extinct within the next 150 years.</p>	
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Threats (actual or imminent, to populations or habitats)

Insect pest and two pathogens

Rescue Effect (immigration from outside Canada)

Status of outside population(s)? Endemic to Newfoundland	
Is immigration known or possible?	impossible
Would immigrants be adapted to survive in Canada?	n/a
Is there sufficient habitat for immigrants in Canada?	n/a
Is rescue from outside populations likely?	no

Current Status

COSEWIC: ENDANGERED (May 2011)

Status and Reasons for Designation

Status: ENDANGERED	Alpha-numeric code: B1ab(v)+2ab(v)
Reasons for designation: This regionally restricted Canadian endemic is known only from five sites within the limestone barrens on the island of Newfoundland. Since it was last assessed as Endangered in 2000, this species continues to experience declines in total population size and increases in the number and severity of biotic threats, which include the non-native Diamondback Moth and two pathogens.	

Applicability of Criteria

<p>Criterion A (Decline in Total Number of Mature Individuals): Not applicable. Though there has been a decline in number of mature individuals, the decline is not >30%.</p>
<p>Criterion B (Small Distribution Range and Decline or Fluctuation): Meets Endangered B1ab(v)+B2ab(v).</p>
<p>Criterion C (Small and Declining Number of Mature Individuals): Not applicable. The number of mature individuals exceeds thresholds for Endangered. Meets Threatened C1.</p>
<p>Criterion D (Very Small or Restricted Total Population): Not applicable. Number of mature individuals exceeds thresholds for D1; however, may meet Threatened D2 due to the biological threats.</p>
<p>Criterion E (Quantitative Analysis): Not applicable. Population viability analysis indicates that the natural populations will continue to decline but the anthropogenically disturbed habitat will remain stable.</p>



Figure 1. Long's Braya distribution.



COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS (2011)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.



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