

COSEWIC
Rapid Review of Classification

on the

Poor Pocket Moss
Fissidens pauperculus

in Canada

ENDANGERED
2022

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada



COSEPAC
Comité sur la situation
des espèces en péril
au Canada

The rapid review of classification process is used by COSEWIC for wildlife species that have not changed status since the previous COSEWIC assessment. Readily available information from the previous status report or status appraisal summary, recovery documents, recovery teams, jurisdictions, conservation data centres, and species experts is initially reviewed by the relevant Species Specialist Subcommittees before being reviewed by COSEWIC. The following is a summary of the relevant information.

COSEWIC Rapid Review of Classification 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:

COSEWIC. 2022. COSEWIC Rapid Review of Classification on the Poor Pocket Moss *Fissidens pauperculus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi pp. (<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>).

Production note:

COSEWIC acknowledges Karen Golinski for writing the rapid review of classification on the Poor Pocket Moss (*Fissidens Pauperculus*), in Canada, prepared under contract with Environment and Climate Change Canada. This rapid review of classification was overseen and edited by René Belland, Co-chair of the COSEWIC Mosses and Lichens Specialist Subcommittee.

For additional copies contact:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment and Climate Change Canada
Ottawa, ON
K1A 0H3

Tel.: 819-938-4125

Fax: 819-938-3984

E-mail: ec.cosepac-cosewic.ec@canada.ca
www.cosewic.ca

Également disponible en français sous le titre Examen rapide de la classification du COSEPAC sur le Fissident appauvri (*Fissidens pauperculus*) au Canada.



COSEWIC Assessment Summary

Assessment Summary – December 2022

Common name

Poor Pocket Moss

Scientific name

Fissidens pauperculus

Status

Endangered

Reason for designation

This western North American endemic moss reaches its northern range limit at a single, isolated Canadian locality in southwestern British Columbia. There, only a few small colonies occur within an extremely small (<6 m²) area, making the Canadian population especially vulnerable to human disturbance and events such as treefall and erosion following unusually heavy local rainfall

Occurrence

British Columbia

Status history

Designated Endangered in November 2001. Status re-examined and confirmed in May 2011 and December 2022.



COSEWIC Rapid Review of Classification

PREFACE

The taxonomy of Poor Pocket Moss (*Fissidens pauperculus* M. Howe) is unchanged since the species was last assessed by COSEWIC in 2011 (Tropicos 2021). Its provincial and global conservation ranks, S1 and G3?, respectively, are similarly unchanged (B.C. CDC 2021). No new subpopulations have been identified (B.C. CDC 2021, S. Joya pers. comm. 2021; T. McIntosh pers. comm. 2021), and there have been no changes to the extent of occurrence (EOO) or index of area of occupancy (IAO). Although the silt bank on which the species occurred in the gully in Lynn Canyon Park, British Columbia, collapsed in the mid 2010s (T. McIntosh pers. comm. 2021), McIntosh, K. Golinski, and D. Tucker visited the site in 2021 and found the population to be thriving (Figure 1 and 2).

It should be noted that the habitat of Poor Pocket Moss is inherently unstable, and the population had previously colonized freshly exposed patches of silt within the area where it occurred. This was mentioned in the Recovery Strategy for the Poor Pocket Moss in British Columbia (Poor Pocket Moss Recovery Team 2007) and the COSEWIC Status Appraisal Summary on the Poor Pocket Moss in Canada (COSEWIC 2011).

In the 2011 report, the population consisted of six colonies totaling approximately 1.03 m². An extensive search effort was completed for the 2011 status report and is still applicable to this reassessment. In 2021, McIntosh and Tucker found Poor Pocket Moss on three distinct clay “faces” on the banks of the gully at Lynn Canyon (Figures 3–6). One was sparsely populated (pictured with an active seep in Figure 1), whereas the other two supported large, robust colonies. The plants are minute, and are almost appressed to the clay—which makes them difficult to observe. However, the colonies were conservatively estimated to be 3–6 m² in extent.

Status History

Designated Endangered in November 2001. Status re-examined and confirmed in May 2011 and December 2022.

Updated map

Not required. See previous assessment (COSEWIC 2011).

TECHNICAL SUMMARY

Fissidens Pauperculus

Poor Pocket Moss

Fissident appauvri

Range of occurrence in Canada (province/territory/ocean): British Columbia

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines (2011) is being used)	Unknown
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	No
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations, whichever is longer up to a maximum of 100 years]	Unknown; the population has not been monitored.
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown; the population has not been monitored.
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations, whichever is longer up to a maximum of 100 years].	Unknown; the population has not been monitored so there are no data to identify trends.
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any period [10 years, or 3 generations, whichever is longer up to a maximum of 100 years], including both the past and the future.	Unknown; the population has not been monitored.
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	N/A; no decline has been measured.
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence (EOO)	4 km ² based on one 2 km x 2 km grid square.
Index of area of occupancy (IAO) (Always report 2x2 grid value).	4 km ² based on one 2 km x 2 km grid square.
Is the population "severely fragmented" i.e., is >50% of its total area of occupancy 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 distance larger than the species can be expected to disperse?	No.

Number of “locations”* (use plausible range to reflect uncertainty if appropriate)	One
Is there an [observed, inferred, or projected] decline in extent of occurrence?	No
Is there an [observed, inferred, or projected] decline in index of area of occupancy?	No
Is there an [observed, inferred, or projected] decline in number of subpopulations?	Not applicable
Is there an [observed, inferred, or projected] decline in number of “locations”**?	No
Is there an [observed, inferred, or projected] decline in [area, extent and/or quality] of habitat?	Unknown
Are there extreme fluctuations in number of subpopulations?	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

Number of Mature Individuals (in each subpopulation)

Subpopulations (give plausible ranges)	One
	In 2011 there was one subpopulation consisting of six mature individuals (colonies) covering approximately 1.03 m ² . As each colony is considered to be one individual, total population size was then 6 mature individuals. In 2021, the subpopulation was estimated to cover 3–6 m ² , so the total population size may be slightly greater than 6 mature individuals. The author notes inherent challenges to estimating the area covered owing to the small size of the plants and their patchy distribution.
Total	One

Quantitative Analysis

Is the probability of extinction in the wild at least [20% within 20 years or 5 generations whichever is longer up to a maximum of 100 years, or 10% within 100 years]?	Unknown
---	---------

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

Threats (direct, from highest impact to least, as per IUCN Threats Calculator)

Was a threats calculator completed for this species?

No. However, threats identified in the 2001 and 2011 status reports include stochastic events such as high rainfall events; physical disturbance caused by hikers and parks workers, and from construction materials from a footbridge washed downslope and into the vicinity of the population; changes in tree canopy structure; encroachment of habitat by other bryophytes; and effects of climate change on the moist, silt substrate of the habitat. Between 2011 and 2021, none of these threats caused a significant decline in the population at Lynn Canyon. Nevertheless the population size remains very small and much lower than 250.

What additional limiting factors are relevant?

The biology of Poor Pocket Moss has not been studied in detail but the 2007 recovery strategy notes that no information about spore viability, germination success, or dispersal distance are available for this species. The report also notes that its small size likely limits its competitive ability.

Rescue Effect (immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	This species is rare throughout its range and the status of outside populations is unknown. The nearest occurrence is in NW Washington (Clallam County), a distance of ca. 170 km. This status of this occurrence is unknown. Although its spore dispersal capacity is unknown, it is unlikely to exceed 50 km.
Is immigration known or possible?	Unknown and unlikely
Would immigrants be adapted to survive in Canada?	Unknown
Is there sufficient habitat for immigrants in Canada?	Unknown
Are conditions deteriorating in Canada?+	Unknown
Are conditions for the source (i.e., outside) population deteriorating?+	Unknown
Is the Canadian population considered to be a sink?+	Unknown
Is rescue from outside populations likely?	No

Data Sensitive Species

Is this a data sensitive species?	No
-----------------------------------	----

+ See [Table 3](#) (Guidelines for modifying status assessment based on rescue effect).

Status and Reasons for Designation:

Status: Endangered	Alpha-numeric codes: D1
Reasons for designation: This western North American endemic moss reaches its northern range limit at a single, isolated Canadian locality in southwestern British Columbia. There, only a few small colonies occur within an extremely small (<6 m ²) area, making the Canadian population especially vulnerable to human disturbance and events such as treefall and erosion following unusually heavy local rainfall.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Not applicable. No information available on population trends.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable. Both the EOO (4 km ²) and IAO (4 km ²) are below the thresholds for Endangered and the number of locations (1) is fewer than 5, but population is not severely fragmented and does not experience extreme fluctuations.
Criterion C (Small and Declining Number of Mature Individuals): Not applicable. No evidence for declining number of mature individuals.
Criterion D (Very Small or Restricted Population): Meets Endangered, D1, with fewer than 250 mature individuals.
Criterion E (Quantitative Analysis): Not applicable. Analysis not conducted.

ACKNOWLEDGEMENTS

Sincere thanks are extended to all the authorities contacted (below) and to René Belland, Co-chair of the Mosses and Lichens Subcommittee of COSEWIC for guidance in preparing the RRoC.

AUTHORITIES CONTACTED

Steve Joya, Bryologist, Vancouver, B.C.

Dr. Terry McIntosh, Bryologist, Biospherics Environmental Inc., Vancouver, B.C.

Jenifer Penny, Botanist, BC Conservation Data Centre, Victoria, B.C.

INFORMATION SOURCES

British Columbia Conservation Data Centre (B.C. CDC). 2021. BC Species and Ecosystems Explorer. British Columbia Ministry of Environment, Victoria, B.C. Website: <http://a100.gov.bc.ca/pub/eswp/> [accessed March 2021].

COSEWIC. 2001. COSEWIC status report on the Poor Pocket Moss *Fissidens pauperculus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. vi + 15 pp.

COSEWIC. 2011. COSEWIC status appraisal summary on the Poor Pocket Moss *Fissidens pauperculus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. xi pp.

Joya, S., pers. comm. 2021. March 2021.

McIntosh, T., pers. comm. 2021. March 2021.

Poor Pocket Moss Recovery Team. 2007. Recovery strategy for the poor pocket moss (*Fissidens pauperculus* M. Howe) in British Columbia. Prepared for the B.C. Ministry of Environment, Victoria, B.C. 16 pp.

Tropicos. 2021. *Fissidens pauperculus*. Website: <http://legacy.tropicos.org/Name/35155279> [accessed March 2021].

Writer of Rapid Review of Classification:

- Dr. G. Karen Golinski



Figure 1. Poor Pocket Moss at Lynn Canyon. Photo by Dan Tucker, October 7, 2021.



Figure 2. Poor Pocket Moss at Lynn Canyon. Photo by Dan Tucker, October 7, 2021.



Figure 3. Poor Pocket Moss habitat at Lynn Canyon. Photo by Dan Tucker, October 7, 2021.



Figure 4. Poor Pocket Moss habitat at Lynn Canyon. Photo by Dan Tucker, October 7, 2021.



Figure 5. Poor Pocket Moss habitat at Lynn Canyon. Photo Dan by Tucker, October 7, 2021.



Figure 6. Poor Pocket Moss habitat at Lynn Canyon. Photo by Dan Tucker, October 7, 2021.



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 (2022)

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.



Environment and
Climate Change Canada
Canadian Wildlife Service

Environnement et
Changement climatique Canada
Service canadien de la faune

Canada

The Canadian Wildlife Service, Environment and Climate Change Canada, provides full administrative and financial support to the COSEWIC Secretariat.