



Acuteleaf Small Limestone Moss

Photo: © Richard Caners



Scientific name
Seligeria acutifolia

Taxon
Mosses

COSEWIC status
Endangered

Canadian range
British Columbia

Reason for designation

This minute, habitat-specific moss has a very restricted distribution in Canada, where it is known from only two sites on Vancouver Island, British Columbia. It is confined to limestone outcrops near sea level beneath a high, coniferous forest canopy in hypermaritime climatic regions near the coast. Primary threats include impacts to habitat from quarrying, logging, and roads. The site near Kennedy Lake is currently not expected to be harvested. However, plans to quarry the marble deposit at the site near Wood Cove, where two-thirds of the known Canadian population occurs, imminently threaten this subpopulation.

Wildlife Species Description and Significance

Acuteleaf Small Limestone Moss (*Seligeria acutifolia*) is a minute, upright, light-green-coloured moss that forms sparse colonies on vertical surfaces of limestone bedrock. Characters distinguishing it from closely related species include the highly differentiated

specialized leaves (known as perichaetial leaves) surrounding the female reproductive organ, and the short, stout stalks (setae) supporting the spore-bearing capsules.

The species is known from Europe, eastern Asia, and northwestern North America. Phylogeographic relationships among the various populations have not been studied but are of interest owing to the large gaps between the occurrences.

Distribution

Acuteleaf Small Limestone Moss is known from only three sites in North America: two on western Vancouver Island, British Columbia, and one in southeastern Alaska. The distance between the sites in British Columbia is around 173 km, and the site in Alaska is located approximately 870 km north of the northernmost Canadian site.



Global distribution of Acuteleaf Small Limestone Moss (*Seligeria acutifolia*).

Source: COSEWIC. 2018. COSEWIC assessment and status report on the Acuteleaf Small Limestone Moss *Seligeria acutifolia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 35 pp.

Habitat

Acuteleaf Small Limestone Moss is a narrow habitat specialist. In coastal British Columbia it has only been found on moist vertical surfaces of slightly granular limestone outcrops beneath a high canopy of conifers near sea-level. Both sites are located within the ‘Southern variant’ of the Very Wet Hypermaritime subzone of the Coastal Western Hemlock biogeoclimatic zone (CWHvh1); this variant is confined to the west coast of Vancouver Island and a small strip of low-lying land on the adjacent mainland coast

near the northern tip of Vancouver Island. The climate of the CWHvh1 is characterized by cool temperatures, high rainfall, and fog throughout much of the year.

The limestone bedrock is characterized as ‘pure’ to ‘highly pure’ and is associated with undifferentiated Parson Bay and Quatsino formations and possibly an undifferentiated Buttle Lake Group Formation. These formations do not occur further north and differ in geological history and composition from most substrates on the mainland coast and Haida Gwaii.

Biology

The reproductive biology of Acuteleaf Small Limestone Moss is poorly known. The moss is monoicous, meaning both male and female reproductive structures occur on the same shoots. Although spore-containing capsules were observed at both sites on Vancouver Island in 2016, they were not abundant, and it is not known whether the spores were viable. However, it is thought that *Seligeria* must reproduce relatively frequently for the colony to persist in its habitat. The species has an estimated generation time of 5–8 years.

Dispersal via wind to suitable habitat beyond the immediate vicinity of the sites where the species occurs in British Columbia is unlikely because the thin-walled, delicate spores of *Seligeria* have poor survivability and the places where Acuteleaf Small Limestone Moss occurs are sheltered by coniferous forest and rugged topography.

The species does not produce specialized structures to facilitate asexual reproduction, unlike some mosses including *Seligeria carniolica*. Vegetative reproduction by means of fragmentation has not been observed and the gametophytes (i.e., shoots) are firmly attached to the rock surface, limiting potential long-distance dispersal by birds.

The adaptability of Acuteleaf Small Limestone Moss is unknown but is thought to be highly limited by its small size, which reduces its competitiveness on wetter and drier rock surfaces, and its close affinity to sheltered moist, vertical calcareous rock substrates of a particular chemical composition and texture.



Photo: © Richard Caners

Population sizes and trends

The population of Acuteleaf Small Limestone Moss in Canada consists of at least three colonies comprised of an estimated 800–1500 shoots. Two of the colonies are found near Wood Cove in Kashutl Inlet on northwestern Vancouver Island, and the third is located near Kennedy Lake, to the south. The subpopulations have not been monitored; therefore, population trends are unknown. However, based on herbarium specimens it is known that both subpopulations have persisted for at least 45 years.

Threats and limiting factors

Acuteleaf Small Limestone Moss occupies an uncommon niche on the hypermaritime coast of British Columbia. Calcareous rock outcrops occur sporadically in sheltered sites at low elevation, and despite targeted surveys for this report and extensive surveys by numerous experienced bryologists throughout the coast in the past decades, the species has only been found twice.

The primary threats to the Canadian population are quarrying, roads, and logging. Most imminent is quarrying; the northern subpopulation (Wood Cove) is associated with a commercially valuable marble deposit within an active mineral claim. Logging is a threat to both subpopulations; if the canopy of mature conifers was to be removed, the species would likely be extirpated. Although there are no roads near the remote Wood Cove site, the Kennedy Lake subpopulation could be impacted by road maintenance activities such as rock blasting and grading.

Rescue from the subpopulation in Alaska, which is approximately 870 km to the north, is extremely unlikely. Dispersal is severely limited by biological and environmental factors and by the sparseness of potentially suitable habitat.

Protection, status, and ranks

Acuteleaf Small Limestone Moss has no legal protection or status. Its global conservation rank is 'Apparently Secure', rounded from a "range-rank" of 'Vulnerable' to 'Secure' (reflecting uncertainty). In Canada, it has been assessed as 'Critically Imperiled' at both the national and provincial levels.

In the United States Acuteleaf Small Limestone Moss is not ranked, but in Europe it is assessed as 'Vulnerable' in several countries. However, in a recent assessment of the conservation status of European bryophytes the species was not included in the candidate list, and the International Union for the Conservation of Nature (IUCN) currently places it in the category of 'Least Concern'.

Source: COSEWIC. 2018. COSEWIC assessment and status report on the Acuteleaf Small Limestone Moss *Seligeria acutifolia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 35 pp.

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