

## Heritage Rank Status Factors

**Elcode** NBMUS12020  
**Gname** BROTHERELLA ROELLII  
**Gcomname** MOSS

### Number of Occurrences

C = 21- 80

**Comments** Estimated 40-50 occurrences worldwide. The University of Alberta database has the most complete listing with 41 records from Canada, representing about 27 sites. Six sites are known historically from Washington. The BC records were collected between 1965-1995. The ISMS database contains 8 records from Washington, representing 5 sites. The Washington occurrences have not been relocated.

### Number of Occurrences with Good Viability

C = Few (4-12) occurrences with good viability

**Comments** Estimated 10 occurrences worldwide with good viability, all in British Columbia. The 6 occurrences in Washington have not been relocated and their viability is unknown.

### Population Size

C = 250-1,000 individuals

**Comments** Estimated 250-500 individuals worldwide.

### Range Extent

E = 5,000-20,000 km<sup>2</sup> (about 2,000-8,000 square miles)

**Comments** Estimated range is 5000-8000 square miles worldwide. Endemic to the Pacific Northwest, where known only from southwestern British Columbia and western Washington. The Washington occurrences are all historic and have not been relocated. In British Columbia all collections are restricted to lower Howe Sound and the lower Fraser Valley.

### Area of Occupancy

A = <0.4 km<sup>2</sup> (less than about 100 acres)

LA = <4 km (less than about 2.5 miles)

**Comments** Estimated area of occupancy is 10-20 acres worldwide.

### Long-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

D = Moderate Decline (decline of 25-50%)

**Comments** Moderate long-term decline of 25-50%. Likely habitat in Washington and British Columbia has been heavily logged and is subject to widespread urban and suburban development. No new populations have been found in Washington.

## Short-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

U = Unknown. Short-term trend in population, range, area occupied, and number and condition of occurrences unknown.

**Comments** The short-term trend in British Columbia is unknown. Suburban housing developments are expanding rapidly in the Lower Mainland where *Brotherella* occurs.

## Threats

C = Substantial, non-imminent threat. Threat is moderate to severe but not imminent (> 10 years) for most of the population, occurrences, or area.

Scope High Severity Moderate Immediacy Low

**Comments** Substantial threat, but non-imminent. Sensitive to changes in light level and microclimate caused by removal or thinning of the canopy and loss of woody debris. Suburban housing developments are expanding rapidly in the Lower Mainland where *Brotherella* occurs.

## Number of Appropriately Protected and Managed Occurrences

B = Few (1-3) occurrences appropriately protected and managed

**Comments** Estimated 2-3 protected sites that are managed appropriately.

## Intrinsic Vulnerability

C = Not Intrinsically Vulnerable. Species matures quickly, reproduces frequently, and/or has high fecundity such that populations recover quickly (< 5 years or 2 generations) from decreases in abundance; or species has high dispersal capability such that extirpated populations soon become reestablished through natural recolonization (unaided by humans). Ecological community occurrences are resilient or resistant to irreversible changes in composition and structure and quickly recover (within 10 years).

**Comments** Not intrinsically vulnerable. Plants are small and fragile, but reproduce readily by spores and fragmentation of gametophytes. Plants will recolonize sites when suitable habitat and substrate are present, but this depends on the availability of inoculum from nearby populations.

## Environmental Specificity

B = Narrow. Specialist or community with key requirements common.

**Comments** Narrow environmental specificity. This species is most common on rotten wood and bark, in cool to moist mixed deciduous and conifer forest, usually at low elevations along valley margins. Incident light, at least after hardwoods drop their leaves in the fall, appears to be important for the species. Most reports are from open, mixed coniferous and deciduous forest, on slopes, stream terraces and swampy floodplains. Bigleaf maple and red alder are the preferred hardwood habitat. It likely has mycorrhizal associations with decomposer fungi in the rotting wood, and may play a key role in nutrient cycling in forest ecosystems.

## Other Considerations

NRANK - N1. Wilfred Schofield is revising *Brotherella* in the Pacific Northwest and he restricts *B. roellii* to the lower Fraser River valley and western Washington. Ranked S3 in BC, but revision of the genus restricts the range of *B. roellii* and it needs to be elevated to S2. Ranked SH in Washington.

**Edition** 2/20/2003 **Edauthor** John A. Christy and Judith Harpel

**Grank** G2 **Grank Date** 1/13/2003

## Reasons

Estimated 40-50 occurrences worldwide, but with highly restricted range. Estimated 10 occurrences worldwide with good viability. Estimated 250-500 individuals worldwide. Estimated range is 5000-8000 square miles worldwide. Endemic to the Pacific Northwest (British Columbia and Washington). Estimated area of occupancy is 10-20 acres worldwide. Moderate long-term decline of 25-50%, but the short-term trend in British Columbia is unknown. Substantial threat, but non-imminent. Estimated 2-3 protected sites that are managed appropriately. Not intrinsically vulnerable. Environmental specificity narrow.

### **BCD Sources**

Christy, J.A. & D.H. Wagner. 1996. Guide for the identification of rare, threatened or sensitive bryophytes in the range of the northern spotted owl, western Washington, western Oregon, and northwestern California. USDI Bureau of Land Management. 200 pp.

### **New Sources**

University of Alberta. 2002. Devonian Botanic Garden bryophyte database. Edmonton, Alberta.  
<<http://www.devonian.ualberta.ca/devonian/bryosearch.cfm>>.

USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service. 2002. Interagency Species Management System [ISMS] database. Portland, Oregon.