Natural England Commissioned Report NECR333

WEST PENWITH MOORS, CORNWALL BRYOPHYTE SURVEY (2013)

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background - Natural England is gathering evidence to support the potential notification of areas of semi-natural habitat in the West Penwith area of West Cornwall as a Site of Special Scientific Interest (SSSI). The area lies within the St Just Mining District part of the Cornwall and West Devon Mining Landscape World Heritage Site in recognition of its industrial heritage associated with metalliferous mining. It also has an outstanding archaeological heritage, most notably from the Bronze Age and Iron Age periods.

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Further information
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1. INTRODUCTION

Natural England is gathering evidence to support the potential notification of areas of semi-natural habitat in the West Penwith area of West Cornwall as a Site of Special Scientific Interest (SSSI). The area lies within the St Just Mining District part of the Cornwall and West Devon Mining Landscape World Heritage Site in recognition of its industrial heritage associated with metalliferous mining. It also has an outstanding archaeological heritage, most notably from the Bronze Age and Iron Age periods.

Over the past 60 years a significant number of populations of nationally rare and nationally scarce mosses and liverworts (collectively referred to as bryophytes) have been found in West Penwith (see below, and Appendix I, which defines the different terms used for species conservation status). This report sets out the results of a targeted assessment of the current status of these species at their historical or new locations within the proposed notification boundary.

Species	**Conservation Status**
Aloina ambigua	NS, LC
Bryum tenuisetum	NS, LC
Cephalozia catenulata	NS, LC
Cephaloziella calyculata	BAP, S.41, NR, NT
Cephaloziella stellulifera	NS, LC
Cladopodiella francisci	NS, LC
Fossombronia foveolata	BAP, S.41, NS, LC
Gymnostomum viridulum	NS, LC
Platyhypnidium lusitanicum (formerly *P. alopecuroides*)	NS, LC
Riccia crozalsii	NS
Weissia perssonii	NS

2. METHODS

Natural England provided a set of historical records made between 1963 and 2005 for the 11 target species (Appendix II). Contact was also made with Dr David Holyoak, the British Bryological Society Regional Recorder for Cornwall and the Isles of Scilly (Watsonian vice-county 1) who kindly supplied copies of his own records for these species. His additional dataset did not however provide any new records.

The assessment was extended to include two additional locally scarce/uncommon mosses: *Grimmia orbicularis* (known historically from ruins of china clay works in the Leswidden/Busvargus and Tregeseal Common area) and *Heterocladium wulfsbergii*, known from a stream near Lower Porthmeor.

As the areas to be surveyed were theoretically quite large, the habitat requirements of the target species were used to highlight areas of potentially suitable habitat for detailed searches. This was possible for some, but not all of the species. Some of the historical records were only localised to a 1km or 10km Ordnance Survey grid square and in these cases a judgement had to be made about the likely presence of populations in the context of current vegetation characteristics and known hydrological, physical and topographical features. In this respect additional information about vegetation types at Carn Galver (Cox, 2010) and elsewhere in West Penwith (National Vegetation Classification surveys undertaken on behalf of Natural England by Cornwall Environmental Consultants in 2012) was helpful.

At each locality, a search was first made for areas of potentially good habitat for each species known to have been found in the area in the past. Once located, each area was carefully searched. When found, populations of target species (and any other notable bryophytes) were recorded to 10m (8

figure) accuracy using a hand-held GPS receiver (Garmin eTrex Vista HCX) and photographed to illustrate the location and species. Where a species was present in multiple places within a relatively small area, representative photographs were taken and the extent of the population was described. For each population, a subjective assessment of its health and the condition of its habitat was made.

Most of the fieldwork was undertaken between 18-21 February 2013 in dry but windy conditions following prolonged wet weather. In the Leswidden/Busvargus and Tregeseal Common area some of the fieldwork was deferred until 29 May due to access constraints. Names used in this report reflect the currently accepted BBS nomenclature (Hill et al 2008).

2.1 Constraints

The fieldwork was undertaken at an appropriate time of year for the majority of the target species, the main exception being *Fossombronia foveolata*, which is a summer annual.

There were two constraints to locating species on the ground. At several localities dense vegetation supporting abundant Western Gorse *Ulex gallii* was widespread and presented a formidable barrier to access on foot. Some areas of potentially suitable habitat could not therefore be reached e.g. some of the disused china clay workings near Leswidden and much of Hannibal's Carn and Carn Galver (including the carns themselves).

Restrictions on access to certain landholdings meant that some areas were not surveyed. These included Lanyon Quoit and the south-eastern corner of Leswidden.

3. SURVEY RESULTS

3.1 Confirmed Populations

Figures 1 - 4 show the locations of populations of seven species found in the course of the fieldwork as well as the areas covered. Areas marked on the figures as 'not surveyed' are those which were considered to have potential to support notable bryophytes but which, due to impenetrable vegetation, could not be accessed fully during fieldwork. Supporting population details are given in Table 1 and in Section 3.2. Populations of the following target bryophytes were found:

- *Cephalozia catenulata;*
- *Cephaloziella calyculata;*
- *Grimmia orbicularis;*
- *Gymnostomum viridulum;*
- *Heterocladium wulfsbergii;*
- *Platyhypnidium lusitanicum.*

At Leswidden, a single population of *Leucodon sciuroides* var. *morensis* was recorded from the wall of a former china clay works now converted to a commercial compound. This large moss was not identified as a target bryophyte prior to fieldwork and it was encountered by chance during searches for other species. Its rarity in Cornwall was not recognised until later, and no photographs were therefore taken at the time. The population comprises a single large patch on the inner (south-facing) wall where it appears to have been known since at least 1994. According to the Bryophytes of Cornwall and the Isles of Scilly - online at www.cisfbr.org.uk - there are only three other known populations of *L. sciuroides* var. *morensis* in Cornwall and its national distribution is also highly restricted, although it has no formal status. A buffer strip several metres wide at the foot of the wall may have been conditioned via a planning consent in the past to safeguard this population.

Figure 1: Carn Brea Survey Area

July 2013 1:6636


Bryophyte Survey
Area Surveyed
Area Not Surveyed
Bryophyte Records
5
4
12
6
8
3
Figure 2: Leswidden Survey Area
July 2013
1:6636

Figure 3: Carn Galver and Porthmeor Survey Area

July 2013 1:6636

Figure 4: Trink Hill Survey Area

July 2013 1:6636

Table 1: Confirmed Populations

Species Name	Location	Grid Reference	Figure no. and ref.	Condition
Cephalozia catenulata	Little Galver	SW4329435948	3.1	Apparently thriving and able to reproduce sexually. Not threatened.
	Hannibal's Carn	SW4315736377	3.2	
Cephaloziella calyculata	Leswidden	SW3946130954	2.3	Single patch with reproductive structures. Vulnerable and threatened by encroaching scrub.
Grimmia orbicularis	Busvargus and Tregeseal Common	SW3909831133	2.4	One patch, with capsules. Not threatened.
	Busvargus and Tregeseal Common	SW3913731202	2.5	Multiple patches widespread on wall tops and south-facing walls of disused china clay works. Apparently thriving and not threatened.
	Leswidden	SW3953631024	2.6	
Gymnostomum viridulum	Carn Galver Mine	SW4213136472	3.7	Healthy – many small patches in habitat kept open by regular human disturbance. Not threatened.
	Leswidden	SW3946130954	2.8	Thriving on fallen chimney blocks but threatened by scrub encroachment.
Heterocladium wulfsbergii	Lower Porthmeor	SW4308737030	3.9	Healthy population on several rocks in the stream. Not threatened.
		SW4305637047	3.10	
		SW4304537052	3.11	
Leucodon sciuroides var. *morensis*	Leswidden	SW3910929800	2.12	Single patch, currently protected from activities in works compound by a buffer strip but vulnerable to future development proposals.
Platyhypnidium lusitanicum	Lower Porthmeor	SW4308737030	3.13	Healthy population on multiple rocks in stream. Not threatened.
		SW4306437033	3.14	
		SW4305637047	3.15	
		SW4303237058	3.16	
		SW4303237101	3.17	

3.2 Photographic Record

3.2.1 Cephalozia catenulata

Figure ref. 3.1 – Little Galver

There are a few patches of *C. catenulata* on wet peat over boulders, among degenerate Ling *Calluna vulgaris* on the northern side of Little Galver. This area has been opened up recently by livestock.

See next photo for detail

Figure ref. 3.1 – Little Galver

Perianths are present i.e. the population is fertile.

Figure ref. 3.2 – Hannibal's Carn

A robust population of *C. catenulata* is present in several patches on wet peat on top of several boulders at the northern-eastern tip of Hannibal's Carn.

Perianths are present i.e. the population is fertile.

3.2.2 Cephaloziella calyculata

Figure ref. 2.3 – Leswidden

A small population of *C. calyculata* grows in a crevice on top of a granite block. Nearby scrub is encroaching the block and is a threat to this population.

See next photo for detail

Figure ref. 2.3 – Leswidden

The population size is approximately 15 x 7 cm. Perianths are present i.e. the population is fertile.

3.2.3 Grimmia orbicularis

Figure ref. 2.4 – Busvargus & Tregeseal Common

A single small cushion is present on the upper surface of a wall of a disused china clay works.

Detail not photographed

Figure ref 2.5 – Busvargus & Tregeseal Common

Numerous plants are present on various south-facing walls and wall tops of disused china clay works.

See next photo for detail

Figure ref. 2.5 – Busvargus & Tregeseal Common

Grimmia orbicularis (arrowed) forms blackish hoary patches among various common calcicoles i.e. *Grimmia pulvinata* (small greyish cushions) and *Schistidium crassipilum* (olive green tufts).

It is also likely that *G. orbicularis* is present on similar old china clay mine infrastructure immediately east of this (centred at NGR SW39173116) but dense gorse in the area prevented access. The species is also present on sunny walls of another former china clay dry at Leswidden (Figure ref. 6) but photographs were not taken of that population.

3.2.4 Gymnostomum viridulum

Figure ref. 3.7 – Carn Galver Mine

G. viridulum grows on a crumbling old wall on the north side of the engine house. It forms small patches on ledges and in crevices. This structure is close to a public car park and it appears to be scrambling on the ruins by visitors that is maintaining the open ground needed by this species.

See next photo for detail

Figure ref. 3.7 – Carn Galver Mine

G. viridulum is the smallest, vivid green moss with rounded leaf tips in the photo. It grows among other small mosses including *Aloina aloides* and *Barbula convoluta*.

Figure ref. 2.8 – Leswidden

Granite blocks from a dismantled chimney support a population of *G. viridulum*, which inhabits sunny crevices on top of several of the blocks.

Scrub encroachment is starting to threaten the population here, which will not survive extensive shading.

See next photo for detail

Figure ref. 2.8 – Leswidden

There are multiple small patches of *G. viridulum* (arrowed) growing with other small mosses on skeletal soil in this crevice and in similar places on other blocks nearby.

3.2.5 Heterocladium wulfsbergii

A population of *H. wulfsbergii* was found on splashed/inundated rocks in the channel of a fast-flowing unnamed stream at Lower Porthmeor. Several different patches within the population were noted

(Map references 9-11) but because it was relatively frequent within a short section of the stream in similar places, only one representative photograph.

Figure ref. 3.9 – unnamed stream, Lower Porthmeor

H. wulfsbergii is plentiful on the surfaces of several small rocks just below a turbulent cascade. This moss prefers shaded locations where it will be regularly splashed and/or inundated and is found in several similar situations downstream as far as the next footbridge.

See next photo for detail

Figure ref. 3.9 – unnamed stream, Lower Porthmeor

A dry patch of *H. wulfsbergii.*

3.2.6 Platyhypnidium lusitanicum

P. lusitanicum was occasional on submerged or semi-submerged rocks in the water in the same section of stream as *Heterocladium wulfsbergii* and frequently grew with it on shaded rocks below cascades (Map references 13-17).

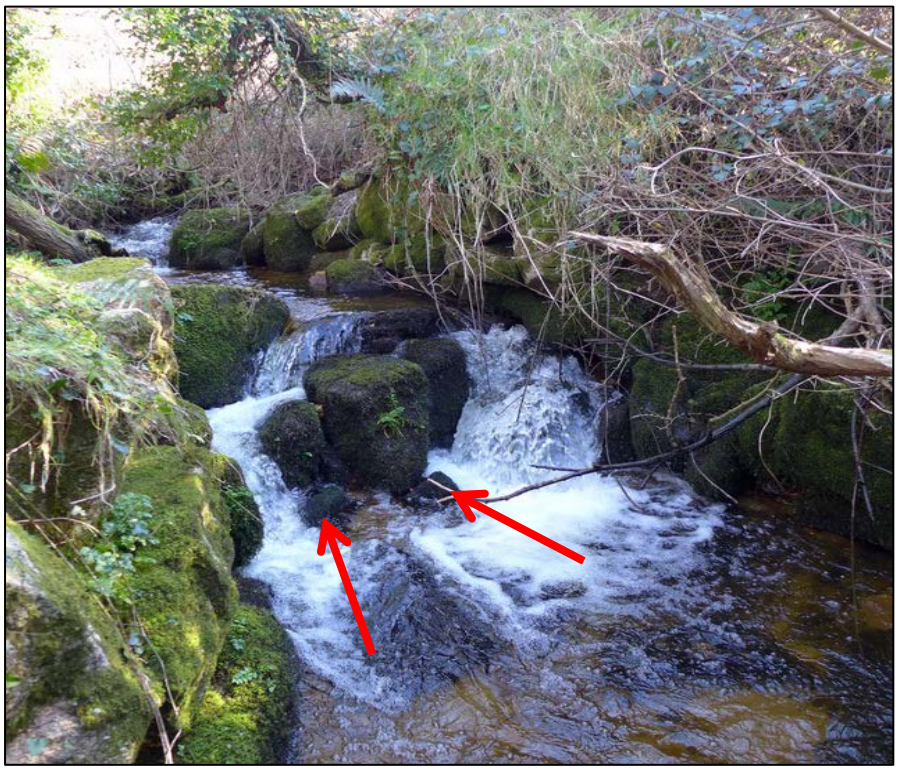

Figure ref. 3.15 – unnamed stream, Lower Porthmeor

Two small rocks below a shaded cascade support a population of *P. lusitanicum* (arrowed). It is also found in several similar places elsewhere in this part of the stream.

See next photo for detail

Figure ref. 3.15 – unnamed stream, Lower Porthmeor

P. lusitanicum covering a partly submerged rock below a cascade. It forms stringy colonies that are well-adapted to turbulent flow conditions.

3.3 Unconfirmed Species

No populations of the following species were found in the course of the survey:

- *Fossombronia foveolata;*
- *Weissia perssonii;*
- *Cladopodiella francisci*
- *Riccia crozalsii;*
- *Cephaloziella stellulifera;*
- *Bryum tenuisetum;*
- *Aloina ambigua*.

3.3.1 Fossombronia foveolata

This diminutive liverwort is an opportunist, colonising recently exposed damp mud and peat and completing its life cycle within a few months before its habitat is inundated by rising winter groundwater levels. Microscopic examination of its spores is required to confirm its identity; these are produced most frequently in summer or early autumn. *F. foveolata* was seen most recently in 2005 at a locality given as Chapel Carn Brea/Carn Grean SW3828. However, scrubby heath/former quarry habitat searched within this square held no obvious pools, flushes or otherwise damp ground considered likely to support *F. foveolata*.

A second 1995 record placed the species on damp sediment around a pool in former china clay workings at Tredinney Common. Unfortunately, high water levels in the pool in February 2013 prevented early exposure of mud around the pool. Water levels had dropped greatly by late May, but the sediment had not been exposed for a sufficiently long period to allow detectable growth of this liverwort. Another survey is intended in late summer 2013 when any populations should be evident.

3.3.2 Weissia perssonii

The single 1996 record of this moss was localised to the 10km OS grid square that not only includes Carn Galver but much of the coastal land to the north as well. Consideration of the habitat requirements of *Weissia perssonii* suggests that there would be a very small probability of finding this species within the areas to be surveyed inland, even if suitable habitat was present. *W. perssonii* is almost exclusively a coastal species, growing on soil on cliffs, cliff tops and in rock crevices. It is most likely that the 1996 population was found somewhere in Aire Point to Carrick Du SSSI, which includes much of the coastline north of Carn Galver.

3.3.3 Cladopodiella francisci

There were two historical records of this species. One, dating from 1963 and localised only to a 1km grid square, may have originated from pools associated with (now disused) china clay works in the Leswidden area. This habitat is likely to have been infilled or lost to natural succession, the only remaining pool being large and deep and unsuitable for *C. francisci*. The other, a record of a population in the Carn Galver area in 1987, was described as being 'on rock'. It could not be found in the small seepages present over the carn rocks which probably represent the only potential habitat in the area. It may therefore have been lost from its previous location because of successional changes or could still be present in other habitat, possibly on other wet rocks around the carn that were concealed by dense scrub at the time of survey.

3.3.4 Riccia crozalsii

An ephemeral species, *R. crozalsii* grows on thin soils which are parched in summer, suppressing competition with perennial species. As long as ground conditions are moist, it is normally visible and identifiable between February and June.

A 1963 record from the 10km square which includes Lanyon Quoit was not ground-truthed because of difficulty negotiating access. It is also understood that habitats currently present at this site are likely to have low potential for *R. crozalsii*. Another old (1966) record was linked to 1km square which includes the southern edge of Trink Hill and farmland to the south. Only Trink Hill could be surveyed, where habitat was found to be unsuitable. It is possible that the historical record may have originated from mine workings outside the survey boundary now converted to farmland. A speculative search of disturbed mine waste and paths near the old Trink Hill engine house only produced a population of the common *Riccia sorocarpa.*

3.3.5 Cephaloziella stellulifera

This very slender liverwort would be easy to overlook and may well persist on mine spoil, coastal paths or other sparsely vegetated open places. The most recent record (2000) is localised to the Carn Galver hectad and may have been recorded outside the current survey boundary. Another old record dated from 1966 (1km square including part of the southern side of Trink Hill) and may have originated from approximately the same area as the population of *Riccia crozalsii* recorded at the same time. A speculative search of mine waste near the old Trink Hill engine house yielded only the very common *Cephaloziella divaricata*.

3.3.6 Bryum tenuisetum

This small moss of heathland looks similar to several other species of *Bryum* and is best confirmed by examining its rhizoidal tubers. The Carn Galver record, made in 1987 is only referable to the 10km grid square so it is unclear if it occurred within the boundary of the current survey area. It would also be very easy to overlook if it occurred in small quantity.

3.3.7 Aloina ambigua

This is a relatively distinctive moss that requires open, base-rich ground. Its 1994 record from Leswidden was quite accurately localised and it is possible that it could have been associated with the populations of *Cephaloziella calyculata* and *Gymnostomum viridulum* on crumbling granite blocks at Map reference 8. A species of *Aloina* was found in rock crevices there but it did not have the mature capsules necessary to distinguish *A. ambigua* from the far commoner *A. aloides*.

4. CONCLUSIONS

The survey findings paint a mixed picture of the current status of notable bryophyte populations. It can be challenging finding populations of plants that may be very small or that have very specific habitat needs, especially where historical records are geographically unlocalised or quite dated. A number of the target species e.g. *Cephaloziella calyculata*, *C. stellulifera* and *Gymnostomum viridulum* are diminutive plants that demand open, unshaded habitats with little or no competition from larger bryophytes or vascular plants. In the areas where these species were previously recorded (or suspected of having been recorded), such habitat features were very scarce, whilst others, which could have supported some of these species in the past, for example china clay ruins, had been subsumed by scrub. Other wholesale landscape changes including conversion to arable or demolition of structures could have resulted in the loss of the habitat supporting ephemerals such as *Riccia crozalsii*.

It is not implausible to think that appropriate habitat management (especially clearance of scrub from the ruins of mine-related structures and carns) could begin to reverse the pattern of decline for some species. This is already beginning to happen around Hannibal's Carn and Little Galver, where livestock grazing (and possibly other management work) is starting to reclaim the carns from dense scrub. The process of opening up such features is not only important for maintaining or creating habitats supporting notable bryophytes, but it also allows access to bryologists and other biological surveyors who may be able to record and/or monitor other populations.

Notwithstanding the above, one locality is in need of immediate attention to safeguard extant populations of notable bryophytes. Crumbling granite blocks which are the remains of a dismantled chimney associated with the former china clay workings at Leswidden provide good habitat for a small population of *Cephaloziella calyculata* and a larger population of *Gymnostomum viridulum* (Figure map references 3 and 8). There is currently no management of the vegetation around the blocks and the sunny aspect of the upper surfaces, where both species live, is threatened by the encroachment of Butterfly-bush *Buddleja davidii* and other fast-growing species. Neither bryophyte is shade-tolerant and may also be at risk if fallen leaves accumulate on the blocks in autumn and winter. It is recommended therefore that scrub cutting (by hand) should be undertaken around the blocks at the earliest possible opportunity.

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APPENDIX I: BRYOPHYTE CONSERVATION CATEGORIES

Conservation Category	Abbreviation	Status	Definition	Source
Extent	NR	Nationally Rare	A species present in 1-15 10km Ordnance Survey grid squares in Britain post-1950	*A revised list of nationally rare bryophytes* (2010) by C.D Preston, in Field Bryology 100
	NS	Nationally Scarce	A species present in 16-100 10km Ordnance Survey grid squares in Britain post-1950	*A revised list of nationally scarce bryophytes* (2006) by C.D Preston, in Field Bryology 90
Threat	CR	Critically Endangered	A taxon facing an extremely high risk of regional extinction in the wild in the near future, as detailed by any of the criteria A, B, or D (see below)	IUCN categories / *A revised Red List of bryophytes in Britain* (2011) by N.G. Hodgetts, in Field Bryology 103
	EN	Endangered	A taxon that is not CR but facing an very high risk of regional extinction in the wild in the immediate future, as defined by any of the criteria A, B, or D (see below)	
	VU	Vulnerable	A taxon that is not CR or EN, but facing a high risk of regional extinction in the medium-term future, as defined by any of the criteria A, B, or D (see below)	
	NT	Near Threatened	A taxon that has been evaluated against the criteria but does not qualify for CR, EN or VU, but is close to qualifying for a threatened category in the future. A taxon is regarded as close to qualifying for a threatened category in Britain if it occurs in 6-15 10km squares (post-1979) but it has not declined; or in 16-19 10km squares (post-1979) and has declined.	
	LC	Least Concern	A taxon that occurs in 20 or more hectads (post-1979) or in 16-19 hectads (post-1979) and shows no decline.	
Conservation	S.41	Section 41	A species identified by the Secretary of State as being of principle importance for the purpose of conserving biodiversity in England.	Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006
	BAP	UKBAP Priority Species	A species identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP).	UK Biodiversity Action Plan (as updated)

Summary of the IUCN criteria and categories as interpreted for the British bryophyte flora (see Conservation Category: Threat above)

Fulfilling any one of these criteria leads to the application of a threat category at the appropriate level.

Criterion A. Rapid decline. A2c is used for a small number of taxa, on the basis of a decline in habitat quality; A3c is used for a small number of taxa, on the basis of a predicted decline and loss of habitat. >80% decline (CR); >50% decline (EN); >30% decline (VU). The timescale used by IUCN for assessing these percentage declines is '*the last 10 years or three generations, whichever is the longer*'.

Criterion B. Small range, fragmented, declining or fluctuating. Fragmented and extreme fluctuations only used for specialist reservoir species, as both phenomena are common natural features of bryophyte populations.

1. Extent of occurrence (estimated using the α-hull method, where α =2): <100 km² (CR), <5,000 km² (EN), <20,000 km² (VU), and:
(a) Single location (CR); 5 locations or fewer (EN); 10 locations or fewer (VU).
(b) Continuing decline observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals

2. Area of occupancy: <10 km², using 1 hectad (CR); <500 km², using 5 hectads (EN); <2,000 km², using 20 hectads (VU), and at least two of (a)–(c):

(a) Single location (CR); 5 locations or fewer (EN); 10 locations or fewer (VU).
(b) Continuing decline observed, inferred or projected, in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals

(c) Extreme fluctuations in any of the following (but only used for reservoir species):
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals

Criterion C requires detailed data on both population size and decline, and has not been used, since this level of information is not available for British bryophytes.

Criterion D/D1. Very small population. Used very sparingly, and only if there is no reasonable doubt: <50 individuals estimated (CR); <250 individuals estimated (EN); <1,000 individuals estimated (VU).

Criterion D2. Very small range. Used extensively to assign taxa to VU: 5 or fewer locations.

Criterion E uses quantitative analyses to consider the probability of extinction in the wild. This has not been used at all, as there have been no population viability analyses published on bryophytes in Britain.

APPENDIX II. HISTORICAL RECORDS OF SPECIES AND LOCATIONS

Name	Location	Grid Reference	Most recent record	Habitat details (where recorded)
Aloina ambigua	Leswidden	SW394309	1994	Thin soil on old concrete at end of wall of ruin.
Bryum tenuisetum	Carn Galver	SW43	1987	
Cephalozia catenulata	Hannibal's Carn	SW4336	1967	Peat on rocks
Cephaloziella calyculata	S. of road E. of St Just (Leswidden?)	SW3830	1996	Old clay.
Cephaloziella calyculata	Leswidden	SW391311	1997	Thin soil on old concrete wall of ruined building.
Cephaloziella calyculata	Leswidden	SW394309	1997	Thin soil over granitic blocks on ruins of mortared wall.
Cephaloziella calyculata	Leswidden	SW39473096	2004	Thin soil on edge of large block of concrete.
Cephaloziella calyculata	Leswidden	SW394309	1993	
Cephaloziella calyculata	Leswidden	SW394308	1997	Thin soil low on ruined wall of building. Becoming shaded by sallow 1999.
Cephaloziella stellulifera	Carn Galver & nearby	SW43	2000	
Cephaloziella stellulifera	Trink Hill	SW5036	1966	
Cladopodiella francisci	Carn Galver	SW4236	1987	On rock
Cladopodiella francisci	Clayworks E. of St Just (Leswidden?)	SE3831	1963	
Fossombronia foveolata	Chapel Carn Brea / Carn Grean	SW3828	2005	
Fossombronia foveolata	Tredinney Common	SW394286	1995	Damp clay close to edge of pool.
Gymnostomum viridulum	Leswidden	SW387311	1994	
Gymnostomum viridulum	Leswidden	SW394310	2004	
Gymnostomum viridulum	Carn Galver	SW4236	1987	Rock
Gymnostomum viridulum	Carn Galver & nearby	SW43	2000	
Platyhypnidium alopecuroides	Porthmeor	SW430371	1996	Granitic rocks in stream near water level shaded inside sallow carr.
Riccia crozalsii	Lanyon Quoit	SW43	1964	
Riccia crozalsii	Trink Hill	SW5036	1966	
Weissia perssonii	Carn Galver tetrad	SW43	1996	