

Research and Development Series

# Research on Biodiversity Priority Bryophyte Species in Northern Ireland during 2000

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### **Research on Biodiversity Priority Bryophyte Species in Northern Ireland during 2000**

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**RESEARCH ON BIODIVERSITY PRIORITY BRYOPHYTE  
SPECIES  
IN NORTHERN IRELAND DURING 2000**

**FINAL REPORT ON RESULTS OF FIELDWORK IN CO. FERMANAGH**

by D. T. Holyoak

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## SUMMARY

Fieldwork to investigate bryophyte species of conservation concern was carried out in Co. Fermanagh on 40 days from 20th May to 28th June 2000. This work was preceded and followed by literature and herbarium research into old records of rare bryophytes in these counties.

Old sites were revisited and 'new' sites were sought for numerous 'Species of conservation concern in Northern Ireland', some of them UK BAP Priority species. 13 of these species were refound at one or more of their old sites; 41 'new' sites were found for 10 of these species; significant negative records were obtained for 10 of the species by revisiting their old sites. Lack of recorded locality detail greatly impeded attempts to refind both certain old records and some more recent records.

Several species placed on the 'Provisional list of species of conservation concern in Northern Ireland' were found so often that their removal from the list is advocated. This especially applies to *Cololejeunea minutissima*, *Dicranella staphylina*, *Plagiochila killarniensis* and *Seligeria pusilla*, all of which had also been found at 'new' sites in 1999. Several species including *Mnium marginatum* and *Pedinophyllum interruptum* appear to be locally common in limestone districts of western Co. Fermanagh and unlikely to be threatened.

A rich harvest of new records resulting from the fieldwork emphasises both the diversity of the Ulster bryoflora and the incompleteness of previous explorations. Records were made of nine bryophyte taxa new for Northern Ireland, among them one moss new to Ireland (*Brachythecium appleyardiae*, a UK BAP 'Priority Species') and one new to the UK (*Seligeria oelandica*). From these new finds, at least three taxa should probably be added to the 'List of species of conservation concern in Northern Ireland'. Totals of 30 new vice-county records and 21 updated vice-county records were obtained for bryophytes in Co. Fermanagh.

This report provides details of localities, habitats and voucher specimens for all records of all of the scarcer species encountered. Notes on associated plants, land management and threats are also given for some species. These notes are especially detailed for *Brachythecium appleyardiae*, *Daltonia splachnoides* and *Seligeria* spp. Full bryophyte species lists for the localities visited are given in Appendix 3.

As with the results of bryophyte surveys in Co. Londonderry and Co. Antrim in 1999, there can be no doubt that similarly intensive studies in other parts of Northern Ireland would still prove highly productive. Co. Tyrone, Co. Armagh and Co. Down have richly varied habitats but have received very little attention from bryologists in recent decades.

It is also suggested that further fieldwork should be carried out to reinvestigate bryophytes at two sites near Belfast. In addition, studies of old specimens from several museums are needed to revise identifications of several taxa (especially *Marsupella sphacelata* and *Seligeria* spp.), where there is evidence that some records from Northern Ireland are erroneous.

## Introduction

Fieldwork to investigate bryophyte species of conservation concern was carried out in Co. Fermanagh on 40 days from 20th May to 28th June 2000. This fieldwork was preceded and followed by extensive literature and herbarium research into old records of rare bryophytes there.

The fieldwork was mainly devoted to seeking numerous species from the 'Provisional list of species of conservation concern in Northern Ireland'. Special efforts were made to locate those species that are also listed as Priority species within the UK Biodiversity Action Plans (BAP). Efforts were also focussed towards sites with rich floras and hence with several 'species of conservation concern' occurring together, such as Correl Glen, Lough Navar Forest, Marble Arch and Caves, Crossmurrin Nature Reserve and Marlbank. In addition, some exploration of bryologically unknown areas was carried out, e.g. around Upper Lough Erne. Three of the days were mainly devoted to demonstrating bryological techniques to EHS staff.

## Methods

*A Check-list and Census Catalogue of British and Irish Bryophytes* (Blockeel & Long 1998) provides a convenient up-to-date list of liverworts and mosses recorded in Co. Fermanagh (vice-county H33), and other vice-counties throughout Northern Ireland, distinguishing in all cases between taxa recorded since 1949 and those only recorded before 1950. Prior to the present study, the only additional records from H33 are those made by Ron Porley (1999) which are listed in the Recorder's Reports in *Bulletin of the British Bryological Society* **75** (2000). In the present report a number of records from vice-county H33 are marked *provisionally* as NVCR (new vice-county record) or UVCR (up-dated vice-county record, i.e. first post-1949 record) on the basis of the *Census Catalogue* plus the latest Recorder's Reports. Voucher specimens have been retained to substantiate all of these records, which should be regarded only as provisional until the British Bryological Society's Recorders have checked the specimens. However, identifications of the voucher material of *Brachythecium appleyardiae* and *Seligeria oelandica* has already been confirmed. Vouchers will eventually be lodged at The Ulster Museum, Belfast (BEL) and the BBS Herbarium at the National Museum and Gallery of Wales, Cardiff (BBSUK).

Throughout this report the names of bryophytes follow Blockeel & Long (1998), but where these authors adopt new names that may be unfamiliar (mainly for mosses) the synonymous name ('syn.') used in the national *Atlas* (Hill *et al.* 1991-1994) is also mentioned. Names used for vascular plants follow Stace (1991).

To avoid a great deal of repetition in this report, much of the information is given only once under one of three main headings, with frequent cross-references. The headings are as follows:

- (1) Species of conservation concern (liverworts, then mosses, arranged alphabetically);

- (2) New and updated vice-county records (again, liverworts, then mosses, arranged alphabetically);
- (3) Bryofloras of individual sites, giving brief lists of species along with suggestions for conservation or management of some of the sites.

Several vice-counties are referred to by their numbers when presenting or discussing data: H33 = Co. Fermanagh, H36 = Co. Tyrone, H37 = Co. Armagh, H38 = Co. Down, H39 = Co. Antrim, H40 = Co. Londonderry. Other abbreviations used include: cfr = with sporophytes, *leg.* = collected by, NVCR = new vice-county record, UVCR = updated vice-county record (i.e. 1st post-1949 record).

## Notes on bryophyte species of ‘Conservation Concern in Northern Ireland’

Those species for which new or updated records or significant negative records were obtained during fieldwork in 2000 are considered here, in alphabetical sequence for liverworts then mosses. All species from the ‘Provisional List of Northern Ireland Species of Conservation Concern’ are included for which there are significant data, including several that now appear to have been under-recorded in the past and hence not to merit a place on this list. In addition several rare species (or infraspecific taxa) newly discovered in Northern Ireland are included, where they may merit a place on the ‘conservation concern’ list.

### Liverworts (alphabetical sequence)

#### *Anastrophyllum hellerianum*

The only records in Northern Ireland are from H33 (on rotting *Sorbus* wood, Meenameen Scarp in Navar Forest, June 1961, Mrs J.W. Fitzgerald, *Trans. B.B.S.* 4: 359; NMW) and ‘on a rotting tree trunk near the river at the first bridge, Banagher Glen, near Dungiven, H40, June 1959’ (Fitzgerald & Fitzgerald 1960 p. 175). Despite efforts to search rotting wood, it was not refound in L. Navar Forest in 2000.

#### *Calypogeia integristipula*

Collected in H33 at: Correll Glen, June 1913, by W.N. Tetley (as *C. neesiana*, but see *Trans. B.B.S.* 2: 301; BBSUK); Reyfad, S. of Knockmore Cliff by Mrs J.W. Fitzgerald in June 1961 (*Trans. B.B.S.* 4: 362; BBSUK); in valley S. of Correl Glen by Mrs J.A. Paton on 2 June 1969 (E). Recorded in June 1999 at Meenameen Scarp (*ca* H040560) (Porley 1999).

Records in 2000 were as follows:

00-221: on sandstone rock shaded under large overhang at base of N.-facing scarp, Meenameen Scarp, H035560, 3.vi.00.

00-230: in bryophyte carpet on shaded ledge under overhang of N.-facing sandstone crag, E. of Derrysahon, H067539, 4.vi.00.

00-233: on thin soil deep under overhangs at base of N.-facing sandstone crags, E. of Derrysahon, H065538, 4.vi.00.

00-351: under small overhangs on low wet sandstone rock by path in deciduous woodland, Correl Glen, H074546, 21.vi.00.

00-387: dry soil on ledge under large overhang of north-facing sandstone crag shaded by bushes and birch saplings, Correl, H075544, 25.vi.00.

All populations of *C. integristipula* seen in 2000 were rather small.

#### *Calypogeia neesiana*

The only record from H33 is apparently from 'fallen branches and ground in birch shrubwood, Bunnahoon L., ca 8½ miles NE. of Enniskellen; Rubers, Hessel & Klein, Sept 1968' (*Trans. B.B.S.* 6). Older records for H33 under the same name are referable to *C. integristipula* (*q.v.*), but *C. neesiana* s.s. is listed for H33 by Blockeel & Long (1998).

#### *Calypogeia suecica*

Fitzgerald (1962) reported this species from H33 'on peat at Aghahoorin, near Boho. ... (with plentiful *Cephalozia catenulata* on) a dryish north-west facing slope which had been burnt over the previous year' (voucher collected June 1959 is in BBSUK; cf. *Trans. B.B.S.* 4: 362). Mrs Fitzgerald also collected the species on 'W. facing slope, Little Dog, nr Knockmore Cliff' in June 1961, det. conf. J.A. Paton & S. Arnell (NMW).

During fieldwork in 2000 a watch was kept for this species on its usual habitats of decaying wood but it was not seen. The only burnt peat surfaces seen were freshly burnt or old and already recolonised by vascular plants. However, *C. suecica* may well recur in the region when appropriate habitats reappear.

#### *Cololejeunea minutissima*

Listed as rare in Northern Ireland, where previously recorded in H33 ('On hazel in wood near Hanging Rock': Crundwell 1959: 38) and at two sites in H40 (Holyoak 1999). Also listed for Marble Arch by ECCB party on 16 February 1993. Several more records from H33 found during May-June 2000 (see Appendix 3) imply that it is not rare in the county. *C. minutissima* is a very small liverwort that may sometimes be overlooked. Since its main habitat (on tree bark) is plentiful the species will probably prove to be too common to merit retention on the list of those 'of Conservation Concern' when epiphytic bryophytes receive more study in Northern Ireland.

#### *Cololejeunea rossettiana*

Recorded from H33: 'with *C. calcarea*, creeping over *Metzgeria conjugata* and *Neckera complanata*, under overhanging rock, Knockmore Cliff, June 1959, Fitzgerald' (*Trans. B.B.S.* 3: 768), and at Hanging Rock (H10-36-) by ECCB party on 16 February 1993. Recorded only near Marble Arch in May 2000, a surprising new record from a well worked locality:

00-102: on overhanging limestone rock *ca* 5 m above river, partly shaded, Marble Arch, H120344, 21.v.00.

00-108 and 00-110A: beneath overhang of limestone rock in ravine in deciduous woodland, near Marble Arch, H120342, 22.v.00.

Numerous other gatherings of *Cololejeunea* taken from limestone rocks for microscopical checking proved to be of *C. calcarea*, which is evidently commoner in H33 than *C. rossettiana*.

#### *Geocalyx graveolens*

Discovered new to Northern Ireland when a voucher specimen of *Mnium thomsonii* collected on Culcarrick Scarp (which is at *ca* H010550) on 9 June 1999 by R.D. Porley was sent to Gordon Rothero for checking (Porley 1999). The habitat was subsequently recorded as 'on base-rich ledge'. No other locality details were recorded and two full days of searching at Culcarrick Scarp during the present study failed to relocate either species.

#### *Jungermannia exsertifolia* ssp. *cordifolia*

Recorded on field sheet for Braade scarp (which is at approximately H052550) by ECCB party on 15 February 1993, but apparently no specimen was retained. The species is not listed for H33 by Blockeel & Long (1998).

The species was not seen at Braade scarp in June 2000, but two other records were made:

00-297: on pebble just above shallow flowing water of inlet stream at unshaded edge of lake, by NW. edge of Lough Macnean Lower, H094386, 10.vi.00.

00-353: on damp horizontal and sloping limestone at base of low north-facing crag and just above water-level of stream, partly shaded by woodland edge, W. of Kilgarrow, H079512, 22.vi.00.

#### *Leiocolea fitzgeraldiae*

A single record from H33 is only report of this recently described species in Northern Ireland, but it has almost been lost from the literature because of a printer's error ('Braade Scarp, Navar Forest, 23/05, June 1951, *J.W. Fitzgerald s.n.*': Errata to Paton & Perry 1995, *J. Bryol.* **18**: 863). During 2000 it was refound at Braade scarp and discovered at three other localities:

00-99: with other bryophytes on damp limestone boulder above spring in hazel-ash woodland, near Cladagh River below Marble Arch, H123350, 21.v.00.

00-286: part of mat of bryophytes on wet base of north-facing limestone crag, N. of Glencreawan Lough, H030571, 9.vi.00.

00-376: on damp sandstone beneath small overhangs at base of large north-facing sandstone crag, part shaded also by herbs and trees, Braade scarp, H052550, 24.vi.00.  
00-390: with other bryophytes on soil on wet ledge overhung by *Sesleria* and mosses, at base of large north-facing crag, slightly shaded by ash tree, Cliffs of Magho, H049575, 26.vi.00.

This species is known only in Britain and Ireland. It may prove to be sufficiently uncommon to merit a place on the 'List of Species of Conservation Concern in Northern Ireland'.

### *Lepidozia pearsonii*

Recorded from H33 by Fitzgerald & Fitzgerald (1960: 175), from 'rock clefts with *Bazzania tricrenata*, *B. trilobata*, *Hymenophyllum wilsoni* and *H. tunbridgense*, Cuilcagh, H 33, June 1959'. The version of same record in *Trans. B.B.S.* 3: 767 adds 'shaded crevice in lower rocks at 900 ft.'

Material collected on Cuilcagh in 2000 with similar associates was only of *L. reptans*, but *L. pearsonii* doubtless still persists there somewhere in the extensive screes of gritstone blocks.

*L. pearsonii* was listed on 15 February 1993 for both Correl Glen and Lough Navar Forest (approximately H038551) by the ECCB party, but the records do not appear to be supported by any specimens and they seem unlikely for this predominantly montane species.

### *Marsupella sphacelata*

The only record from Northern Ireland is from H33 from 'on rocks in outlet stream, Lough Atona, Cuilcagh' by Mrs J.W. Fitzgerald in June 1959 (*Trans. B.B.S.* 4: 713)(NMW) (locality is at H11-29-).

The voucher specimen for this record needs checking because my own gathering from the same location (00-179: see below) is of *M. emarginata* var. *aquatica*, apparently a NVCR.

### *Pedinophyllum interruptum*

Known in Northern Ireland only from H33: by a specimen collected in Oct. 1905 from the shore of Lough Erne by D. McArdle (NOT); from Buggan in 1959 (Mrs J.W. Fitzgerald); from 'Ravine of Cladagh River, in great abundance on rocks in spray from waterfall' (Crundwell 1959: 38) (DBN); collected beside river at Marble Arch in June 1959 by Mrs J.W. Fitzgerald (NMW); collected at Pollawaddy in Sept. 1960 by Mrs J.W. Fitzgerald (NMW). Also listed for Marble Arch by N.G. Hodgetts during visit by ECCB party on 16 February 1993.

Found at numerous localities in 2000:

00-92: on limestone boulders close to water-level beside spring in hazel-ash woodland, near Cladagh River below Marble Arch, H123350, 21.v.00.

00-94: with mosses on steep limestone rock above springs in deciduous (hazel-ash) woodland, near Cladagh River below Marble Arch, H123350, 21.v.00.

00-98: with other bryophytes on damp limestone boulder above spring in hazel-ash woodland, near Cladagh River below Marble Arch, H123350, 21.v.00.

00-206: on soil under shade of overhang at base of crag of calcareous sandstone, NE. of Lough Achork, H045559, 1.vi.00.

no voucher: small amount on shaded ledges of limestone rocks of east bank of river (below upper gorge), E. of Pollreagh, H118331, 8.vi.00.

00-330: on damp shaded top of boulder in cave entrance at base of E.-facing limestone crag, Cove Rock, SW. of Florence Court, H165323, 16.vi.00. (Large patches were seen inside entrance to northernmost cave, the biggest *ca* 100 x 150 cm. *P. interruptum* was locally dominant, but associates included *Mnium stellare*, *Asplenium trichomanes*, *Orthothecium intricatum*, *Phyllitis scolopendrium* and *Thamnobryum alopecurum*).

00-355: plentiful on thin damp soil under small overhang on north-facing crag of tufa-covered limestone in open ash woodland beside stream, W. of Kilgarrow, H076513, 22.vi.00.

*P. interruptum* is thus locally plentiful in humid sheltered habitats on the limestones of western Co. Fermanagh and not under any immediate threats there. A record from near Meenameen Scarp (voucher 00-206) is the first report of the species from any of the sandstone scarps, but it is undoubtedly very rare in those habitats.

#### *Plagiochila killarniensis*

Hitherto recorded in Northern Ireland only from H33 (trunk of ash tree in limestone woodland gorge, Marble Arch, H/13, Sérgio: *Bull. B.B.S.* **64**, 1994), H39 (Blockeel & Long 1998 p. 50) and H40 (two records at Windy Hill: Holyoak 1999).

Several additional records were made in H33 during 2000:

00-274: on low branch in ash-hazel woodland on slopes above river, E. of Pollreagh, *ca* H 118332, 8.vi.00.

00-414: on tree trunk in deciduous woodland near river, near Marble Arch, H12-34-, 25.v.00.

00-416: trunk of ash tree in deciduous woodland on limestone rocks above river, Marble Arch, H120344, 22.v.00.

00-418: in ash-hazel woodland on limestone hillslope, near Hanging Rock, H11-36-, 23.v.00.

00-421: on tree trunk by river in ash-hazel woodland in limestone ravine, near Pollreagh, H11-33-, 26.v.00.

00-422: on limestone rocks in grassland on hillslope, S. of Coaghan, H118351, 28.v.00.

This recently segregated species is easily overlooked as the commoner *P. spinulosa*, so that it is probably under-recorded. The large number of recent records implies that it should be removed from the 'List of Species of Conservation Concern in Northern Ireland'.

[*Scapania aequiloba*

Listed for Belmore Mt. in H33 by Crundwell (1959: 38) but no longer accepted for the vice-county by Blockeel & Long (1998).

### **Mosses (alphabetical sequence)**

*Amblyodon dealbatus*

Listed as Rare in Northern Ireland, where the only post-1949 records are from H33 and H40. Those from H40 were from 'Derry- Magilligan : Houston and Megaw' (Megaw 1938 p. 378), where *A. dealbatus* was refound in very small amounts in three places at Ballymaclary NNR on 15th July 1999 (see Holyoak 1999). The only record from H33 is from 'wet humus at base of cliffs, c. 700 ft., scarp south of Lough Navar' on 16 Sept. 1960 by R.D. Fitzgerald (*Trans. B.B.S.* 4: 168; BBSUK). (Some later versions of this record have assigned it to 'scarp N. of L. Navar', probably in error). In 2000 it was refound at a different scarp in the L. Navar Forest:

00-244: on soil of small damp ledge low on slightly overhanging N.-facing sandstone crag, E. part of Culcarrick Scarp, H011549, 5.vi.00, cfr. (One patch; associates mainly *Eucladium verticillatum*, *Riccardia chamedryfolia* and *Asplenium trichomanes*).

*Amblystegium tenax*

Previously noted as showing 'Rapid decline' in Northern Ireland, where the only post-1949 records were from H33 ('On rocks and tree roots in woodland stream near Hanging Rock': Crundwell 1959: 39). See Holyoak (1999) for updated record in H40. Single record from H33 in 2000:

00-84: vertical side of limestone boulder *ca* 10 cm above summer water-level of river, shaded by edge of deciduous woodland, Cladagh River below Marble Arch, H128356, 21.v.00. Photo 1 shows location and habitat.

*Antitrichia curtipendula*

Known historically from H33 (see below), one site in H39 and five in H40 (Megaw 1938 p. 390). In H40 in 1999 it was not refound on Benbradagh, but was still locally plentiful on Binevenagh (Holyoak 1999).

In H33 the species was collected at Marble Arch in a hazel copse in June 1950 and again on 2 July 1950 by J. Taylor (BBSUK, NMW) and recorded in Crossmurrin Nature Reserve (approximately H11-34-) by the ECCB party on 16 February 1993, on limestone rock in hazel scrub. Attempts to refind it near Marble Arch and in the south-eastern part of the Crossmurrin reserve in May and June 2000 were unsuccessful, but hampered by the inexact locality details previously recorded and the large extent of hazel scrub.

*Aulacomnium androgynum*

Recorded from H33 on 'thin humus on boulder and in crevices of cliff, c. 700 ft., scarp N. of L. Navar' by R.D. Fitzgerald on 16 Sept. 1960 (*Trans. B.B.S.* 4: 168; BBSUK). Elsewhere in the L. Navar Forest, it was recorded on field sheet for Braade scarp (approximately H052550) by ECCB party on 15 February 1993 and refound there on 7 June 1999 by R.D. Porley (1999). Also recorded in June 1999 at Meenameen Scarp (ca H040560) (Porley 1999).

*A. androgynum* was refound again at Braade scarp in June 2000:

00-372: steep almost unshaded overhung sandstone at base of north-facing crag, Braade scarp, H052550, 24.vi.00.

*Brachythecium appleyardiae*

This species was until recently known only from a small number of localities in England and hence regarded as a British endemic. It is treated as a 'Priority Species' within the UK BAP. However, A.J.E. Smith (*in litt.*, Nov. 2000) has recently confirmed identification of two gatherings of it from northern Germany. Recorded new for Ireland at six localities in H33 during the present study. Data on the voucher specimens from each locality are listed below. Appendix 1 gives details for each of the six localities found of the abundance of *B. appleyardiae*, its habitat characteristics and associated plants. Photos 3-6 show locations and habitats with *B. appleyardiae*, the Frontispiece and photos 7 and 8 show the plants (with characteristically curved homomallous branches).

Despite the addition of six 'new' localities, this is undoubtedly a rare species with a very restricted range and narrowly defined habitat preferences (see Appendix 1). Attempts to find it in Co. Leitrim during work for National Parks and Wildlife, Dúchas, during August 2000 were unsuccessful. Since *B. appleyardiae* is still known from less than 20 sites in the world, it should be added to the 'List of Species of Conservation Concern in Northern Ireland'.

00-128: on limestone rock of small ledge beneath overhangs at base of steep crag, shaded by *Fraxinus/Corylus* woodland, Hanging Rock, H112361, 23.v.00. Determination confirmed by T.L. Blockeel (duplicate specimen in BBSUK).

00-129: on dry horizontal limestone of ledge under overhangs at base of large crag, lightly shaded by ash-hazel woodland, Hanging Rock, H111362, 23.v.00.

00-160: with *Anomodon viticulosus* at base of large steep limestone crag facing east, with light shade from yew and hazel (growing on vertical surfaces on the *Anomodon viticulosus*), E. of Pollreagh, H119333, 26.v.00.

00-161: on dry top of limestone boulder at base of large steep limestone crag facing east, shaded by yew and overhanging rock, E. of Pollreagh, H119333, 26.v.00.

00-293: on thin overlying soil and on sloping limestone rock (partly beneath overhangs) at base of N.-facing crag, W. end of Knockmore Cliff, H083507, 10.vi.00.

00-321: on steep dry limestone under slight overhangs at base of N.-facing crag shaded by ivy and ash tree, Carrickbeg, H115466, 14.vi.00.

00-327: on dry limestone at base of E.-facing crag under small overhangs, partly shaded by deciduous woodland, Cove Rock, SW. of Florence Court, H165323, 16.vi.00.

00-347: on steep limestone beneath small overhang at base of large E.-facing crag, partly shaded by hawthorn bush, E. side of Benaughlin, H180314, 18.vi.00.

#### *Bryum capillare* var. *rufifolium*

00-403: in crevices at base of walls of abandoned cow-shed, beneath edge of corrugated roof of galvanised iron, Drumcrow West, H046575, 26.vi.00, cfr.

New for Northern Ireland and apparently rare in Ireland, where there is only one other record. However, this infraspecific form may well be under-recorded, partly because some of the literature casts doubt on its taxonomic validity (e.g. Crundwell in Hill *et al.* 1992: 99, although the variety is retained by Blockeel & Long 1998). Furthermore, it is most unlikely to be correctly identified using the key in the standard *Flora* by Smith (1978: 384-388).

#### *Bryum pallescens*

The only records from Northern Ireland are from H33 (2 September 1957, 'Limestone rocks near Marble Arch': Crundwell 1959: 39; *Trans. B.B.S.* 3: 483; voucher in BBSUK conf. A.J.E. Smith) and an old record from H38 (Blockeel & Long 1998: 118). Found once in H33 in 2000:

00-408: gritty soil at unshaded base of wall below edge of old galvanised-iron roof, Florence Court, H174345, 27.vi.00, cfr.

Probably under-recorded because of its strong superficial similarity to commoner species such as *B. imbricatum* and the need for detailed study of the peristome and spore measurements to ensure accurate identification.

#### *Bryum uliginosum*

A UK BAP priority species, with old records scattered thinly over much of Britain and Ireland, but very few modern finds. There are three old records from Northern Ireland: in

H33 (near Monea, 1905, Rev. H.W. Lett), in H39 from a ditch at Portrush and H40 at Magilligan (Megaw 1938 p. 383).

Brief searching near Monea (H33) on 28 June 2000 failed to reveal any obviously suitable habitat for the species, and disclosed that this area now has much agriculturally 'improved' grassland. In view of extensive habitat loss, it was also unsurprising that the species was not seen during fieldwork in the sand-dune areas near Portrush and in the Magilligan/ Ballymaclary/ Benone/ Umbra dunes during 1999. Hence *B. uliginosum* may well be extinct in Northern Ireland as is presumed to be the situation in Britain, although there is a faint hope that it may still be present but failing to produce the sporophytes needed for identification.

*Campyliadelphus elodes* (syn. *Campylium elodes*)

Recorded from H33 by a specimen collected on 26 March 1909 by W.N. Tetley at 'Portora narrows, Enniskellan' (BBSUK) and another report of it by Tetley at Portora in 1910. No attempt was made to refind these records.

*Daltonia splachnoides*

Found new for Northern Ireland at four localities in H33. It was consistently found growing as an epiphyte on humid north-facing slopes below sandstone scarps in association with rich floras of epiphytic bryophytes, mostly on low rowan twigs. Photos 10, 13 and 14 show the plants and typical habitats.

00-237: on twig low on rowan in open scrub on sandstone block-scrub below N.-facing scarp, Meenameen Scarp, H041560, 4.vi.00, cfr. (6 patches of *D. splachnoides* were found, all on thin low and often trailing twigs of rowans. Epiphytes growing close by were mainly *Ulota bruchii* and *Frullania teneriffae*, with smaller amounts of *Aphanolejeunea microscopica*, *Colura calyptrifolia*, *Dicranum scoparium*, *Lejeunea patens*, *Metzgeria temperata*; lower branches were thickly festooned with *Eurhynchium striatum*, *Isothecium myosuroides* var. *myosuroides*, *Rhytidiadelphus loreus* and *Thuidium tamariscinum*).

00-242: on bark low on *Salix cinerea* bush (among tall *Vaccinium myrtillus* and *Luzula sylvatica*) on block-scrub slope below sandstone crags, Culcarrick Scarp, H010549, 5.vi.00, cfr. (18 small patches seen, at 20-90 cm above ground. Principal associate *Lejeunea patens*, also small amounts of *Frullania teneriffae* and an immature *Scapania* sp.).

00-369: on thin low living branches of rowan (among young pines) on sandstone block-scrub at base of north-facing slope (with tall *Luzula sylvatica*), Bolusty Beg scarp, H058567, 23.vi.00, cfr. (*D. splachnoides* was growing on horizontal twigs of 1-cm diameter, in several pure patches near to *Ulota bruchii*, *Colura calyptrifolia*, *Aphanolejeunea microscopica* and *Metzgeria temperata*, less close to *Eurhynchium praelongum* and *Brachythecium rutabulum*. The location was near to the base of slope in a sheltered and partly shaded hollow. A rich epiphyte flora on rowans close by also included *Ulota phyllantha*, *Dicranum scoparium*, *Frullania teneriffae*, *Orthotrichum pulchellum* and *Ulota calvescens*.)

00-384: on twigs and branches of low rowan on north-facing slope with *Luzula sylvatica* and *Vaccinium myrtillus*, NE. of Lough Navar, H038550, 25.vi.00, cfr. (At this site 3 patches were found on rowans; also 1 large patch measuring 12 x 4 cm and *ca* 20 smaller patches on base of a leaning, 4-cm diameter stem of *Salix x multinervis* (see Photo 14). The *D. splachnoides* patches were at 0.3-1.5 m above ground, mainly pure, those on *Salix* associated with small amounts of *Zygodon conoideus*, *Hypnum jutlandicum*, *Eurhynchium praelongum* and *Frullania teneriffae*).

Although *D. splachnoides* probably has a very restricted range in Northern Ireland, it is more widespread in the west of Ireland as a whole and it therefore may not need to be treated as a 'Species of Conservation Concern in Northern Ireland'.

#### *Dicranella staphylina*

Found new to H33 in 2000:

00-145: on unshaded disturbed stony soil, near Marble Arch visitor centre, H121343, 25.v.00.

Listed as showing Rapid decline and as Rare in Northern Ireland. However, this rather nondescript moss was not described until 1969 and it remains much under-recorded, occurring mainly in arable fields and on other disturbed, non-basic soil. Recorded new to both H39 and H40 in 1999 (Holyoak 1999), with several records from each vice-county. It should be removed from the 'List of Species of Conservation Concern in Northern Ireland'.

#### *Dicranodontium asperulum*

Known in Northern Ireland only from H33 where collected on Cuilcagh on several visits between 1909 and June 1914 by W.N. Tetley (BBSUK, DBN), recorded as 'Very plentiful on the floor of large vertical clefts on the top of Cuilcagh, H 33, [5th] June 1959' (Fitzgerald & Fitzgerald 1960: 176) (NMW), as 'on rocks on peaty ground, abundant, *ca* 1800', Cuilcagh, 21 June '61, R.D. Fitzgerald (Priv. Hb. D.T. Holyoak), and again collected on Cuilcagh by R.D. Fitzgerald on 19 May 1965 (NMW).

In 2000 it was still plentiful on Cuilcagh:

00-172: forming extensive carpet on soil beneath overhanging block of gritstone in block scree on north-facing hillside (500 m elevation), SE. of Lough Atona, H112289, 29.v.00. Noted as also growing directly on the rock, including overhanging surfaces. Associates noted were: *Calypogeia muelleriana*, *Diplophyllum albicans*, *Hypnum jutlandicum*, *Pseudotaxiphyllum elegans*, *Scapania gracilis*, *Tetraphis pellucida*, *Calluna vulgaris* and *Vaccinium myrtillus*. *D. asperulum* was also locally abundant higher up the same slopes, including at *ca* 620 m elevation at H108289.

#### *Didymodon nicholsonii* (syn. *Barbula nicholsonii*)

00-296: on damp almost unshaded old tarmac at edge of car-parking area beside lake, by NW. edge of Lough Macnean Lower, H095386, 10.vi.00.

This is the first record from Northern Ireland of a species with few records in Ireland (only four records shown in Hill *et al.* 1992; four vice-counties listed by Blockeel & Long 1998). However, it is a nondescript moss of inauspicious habitats such as old tarmac and damp old concrete, so it is likely to be under-recorded. It should not be added to the lists of 'Species of conservation concern in Northern Ireland' unless further recording fails to locate more of it.

#### *Distichium capillaceum*

Two new records from H33:

00-215: on thin soil over damp sandstone in deep crevice under overhangs on N.-facing sandstone scarp, W. end of Meenameen Scarp, H033559, 3.vi.00, cfr.

00-336: on unshaded vertical limestone rock of low crag on north-facing heathy hillslope, N. side of Benaughlin, H175316, 18.vi.00, cfr.

#### *Entodon concinnus*

Found new to H33 in 2000:

00-167: on unshaded edge of limestone scree on SE.-facing hillslope, NW. of Marble Arch, H120348, 28.v.00. Probably not rare in short limestone grassland within Crossmurrin Nature Reserve, but easily overlooked as *Calliergonella cuspidata*.

This species was previously noted as showing Rapid decline and as Rare in Northern Ireland. During the 1999 fieldwork (Holyoak 1999) it was found to be widespread but local in short vegetation on dunes from Magilligan Point (voucher 99-136, from C 661387) eastwards to Umbra in H40. It was also refound on the dunes W. of Portstewart, H40 (voucher 99-602 from C 802362). Care is needed to distinguish it in the field from *Calliergonella cuspidata* and *Scleropodium purum*, since at first glance it combines features of both of these common species, either or both of which often occurs with *E. concinnus*. The species is plentiful on dunes and machair in W. Donegal (DTH unpublished).

#### *Fissidens monguillonii*

The first (and until recently the only) Irish record was made by Fitzgerald & Fitzgerald (1960: 176) 'Among roots of *Phragmites*, Kilturk Lough, Upper Lough Erne, H 33, June 1959, *c. fr.* 'This was a most uninteresting spot; a small lough covered at the edges with reeds whose roots were exposed owing to the low water level.' (voucher in BBSUK); (also given as 'at roots of rushes, generally submerged' in *Trans. B.B.S.* 3: 773). It was refound and collected at this locality by K. Lewis a few years later.

The species was not refound in May 2000, when water-levels may have been too high. However, there appeared to be little suitable habitat.

*Fissidens pusillus* (syn. *F. pusillus* var. *pusillus*)

Listed for H33 by Blockeel & Long (1998). Without revision of herbarium specimens it is unclear which (if any) of several published records under this name form the basis of the acceptable vice-county record. Collected once in 2000:

00-112: on damp sandstone boulder in ravine beside river in ash-hazel woodland, by Marble Arch, H120344, 22.v.00, cfr.

*Fontinalis squamosa* var. *dixonii*

The only Irish record of var. *dixonii* is from H33 (Blockeel & Long 1998), based on: 'rocky bed of stream, Owenbrean River, J.T.[aylor], July 1950' (*Trans. B. B. S.* **1**: 502). Not listed as a 'Species of Conservation Concern in Northern Ireland' because this is a rare *infraspecific* taxon within a comparatively widespread species.

Extensive searching in June 2000 along the river for more than 2 km upstream of the sink-hole (H11-32- etc.) produced many substantial populations of *F. squamosa* var. *squamosa* but nothing resembling var. *dixonii*.

*Grimmia retracta*

Collected from 'on rock in stream by the bridge in Correl Glen' (H33) by W.R. Megaw in April 1926 (*I.N.J.* **1**: 158; BEL). Persistent attempts to re-find it there in 2000 were unsuccessful and rocks in and beside this stretch of the river now seem too shaded by trees to be likely to support this species.

[*Homomallium incurvatum*

The only Irish record was claimed from material collected from Marble Arch (H33) in 1993 by T. Hallingbäck during the ECCB excursions (voucher in BBSUK) (Hodgetts & Hallingbäck 1994). Blockeel (in Blockeel & Long 1999: 3) has recently reported that the specimen lacks sporophytes and is probably a form of *Hypnum resupinatum*. *Homomallium incurvatum* should therefore be removed from the 'List of Species of Conservation Concern in Northern Ireland'.]

[*Hymenostylium insigne* (syn. *Gymnostomum insigne*)

A specimen labelled 'Saih Croppa, 2 July 1950, J. Taylor' (BEL) has been attributed to the Sruh Croppa River (above Marble Arch). A search of the lower part of the Sruh Croppa River around and above the sink holes on 6th June 2000 was unsuccessful and revealed little habitat suitable for the species. *H. insigne* is not listed for H33 or any other county in Northern Ireland by Blockeel & Long (1998).]

*Mnium marginatum*

There are several records in H33: collected from R. Erne near Belleek by H.N. Dixon on 23 June 1937 (BBSUK); recorded by Crundwell (1959: 39) in 1957 on 'Boulder in bed of

Cladagh River'; collected at Marble Arch by Mrs J.W. Fitzgerald on 4 June 1959 (NMW).

Numerous records in 2000 suggest it is locally common on limestone in southwestern parts of Co. Fermanagh:

00-137: base of low vertical limestone crag (at edge of solution hollow) shaded by hazel scrub, just S. of Crossmurrin Nature Reserve, H109342, 25.v.00.

00-141: on soil among boulders at edge of river (*ca* 0.5 m above summer water-level), shaded by ash-hazel woodland, Marble Arch, H120344, 25.v.00, cfr.

00-142: large patches on soil on sloping top of boulder in river (*ca* 0.4 m above summer water-level), partly shaded by ash-hazel woodland, Marble Arch, H120344, 25.v.00, cfr.

00-152: with *Trichostomum brachydontium* on thin soil over steep low limestone of low north-facing crag in grassland, S. of Pollawaddy, H121334, 26.v.00, cfr.

00-188: in very short open mossy grassland on S. side of bank of basic drift deposit in moorland, *ca* 1 km NE. of Lough Atona, H115301, 29.v.00, cfr. (Locally frequent here, with *ca* 0.6 m<sup>2</sup> in total).

00-253: soil on ledge of limestone rock by river at sink-hole in ash-hazel grove, Sruh Croppa River, H115336, 6.vi.00, cfr.

00-268: on soil of ledge on low limestone crag in ash-hazel woodland above east bank of river, E. of Pollreagh, H118332, 8.vi.00, cfr. (Another small patch seen nearby: on soil of overhung ledge of limestone rocks *ca* 2 m above river.)

00-272: on soil under overhang of limestone rock in ash-hazel woodland above river (on W. bank), E. of Pollreagh, H118332, 8.vi.00, cfr.

no voucher: on soil of river bank shaded by limestone rocks in ash-hazel woodland and on rock-ledge above, E. of Pollreagh, H118331, 8.vi.00, cfr.

00-338: on thin soil in shaded crevice and on unshaded vertical limestone rock of low limestone crags on north-facing heathy hillslope, N. side of Benaughlin, H175316, 18.vi.00, cfr.

00-359: on limestone rock near base of low crag on north-facing slope with ash-hazel woodland, W. of Kilgarrow, H075512, 22.vi.00.

All fertile gatherings (marked 'cfr' above) were synoicous and hence represented var. *marginatum*.

### *Mnium thomsonii*

Discovered new to Northern Ireland on Culcarrick Scarp (which is at *ca* H010550) on 9 June 1999 by R.D. Porley on 'a base-rich ledge'; a rare liverwort that was also new for

Northern Ireland, *Geocalyx graveolens*, was found intermixed with the voucher specimen when it was sent to Gordon Rothero for checking (Porley 1999) (voucher in BBSUK). No other locality details were recorded and two full days of searching at Culcarrick Scarp during the present study failed to relocate either species.

#### *Orthodontium gracile*

The only Irish record is based on a small amount cfr (initially misidentified as *O. lineare*) found by the well-known Portuguese bryologist C. Sérgio at an inexactly recorded location on Braade scarp (H33, approximately H052550) during the ECCB visit on 15 February 1993 (Hodgetts & Hallingbäck 1994). Attempts to refind it there and on other sandstone scarps in Lough Navar Forest were unsuccessful in 1999 (Porley 1999) and 2000.

A small amount of *O. lineare* cfr found during the present study on peaty decaying wood on top of a low sandstone crag near Meenameen Scarp (NE. of Lough Achork, H045559; voucher 00-205) temporarily raised false hopes of refinding *O. gracile*.

#### *Orthothecium rufescens*

Found on Cliffs of Magho in June 2000, new to Northern Ireland:

00-278: on damp limestone rock and thin clay soil over rock on base of flushed area of N.-facing limestone crag, N. of Glencreawan Lough, H023567, 9.vi.00. (Two closely adjacent patches were seen at this location, at foot of rocks on vertical to inclined wet surfaces. The patches measured 50 x 20 and 60 x 10-15 cm. They were mainly pure, with associated species close by recorded as *Sesleria caerulea*, *Breutelia chrysocoma*, *Carex flacca*, plus lesser amounts of *Saxifraga aizoides*, *Tussilago farfara*, *Ctenidium molluscum*, *Carex echinata* and *Palustriella commutata* var. *commutata*. Several more patches of similar size were found ca 10 m further west, and more was present higher on the rocks. At H021568 there was an additional patch measuring 60 x 20 cm on vertical rock of the base of the crag, shaded by hazels.)

The species is locally abundant on limestone mountains in Co. Sligo and Co. Leitrim, so that its listing as a 'Species of Conservation Concern in Northern Ireland' would not appear to be important.

#### *Philonotis rigida*

The only record from H33 is a specimen collected in 'cracks of limestone, c. 200 ft, Stonefort nr Boa Island' by R.D. Fitzgerald on 18 Aug. 1961 (*Trans. B. B. S.* 4: 372; BBSUK). No attempt was made to refind this record because the 'Stonefort' locality was not found on the maps that were available. The geological map shows limestone only to north and just west of Boa Island.

#### *Plagiothecium laetum*

The only Irish record is from 'wood nr Carrick L.' (H33) made on 28 June 1961 by R.D. Fitzgerald (NMW). Attempts to refind it in woodlands on the slopes between Correl Glen

and Carrick Lough were unsuccessful, but there is plenty of good woodland habitat there and the original locality details were too inexact to encourage any more detailed searching.

*Platydictya jungermannioides*

Collected in Correl Glen (H33) by D. McArdle in Oct. 1905 (*Trans. B.B.S.* 5: 421; DBN). Not refound in Correl Glen in 2000, despite extensive searching. Three 'new' records were made in 2000:

00-248: on ledge deeply shaded under large overhang of N.-facing sandstone crag, E. part of Culcarrick Scarp, H011549, 5.vi.00. (Adjoining a large patch of *Orthothecium intricatum*).

00-267: on soil under overhangs of limestone rocks on slope above river in ash-hazel woodland, E. of Pollreagh, H118333, 8.vi.00.

00-329: with other mosses on vertical dry limestone beneath overhangs at entrance to cave in E.-facing limestone crag in deciduous woodland, Cove Rock, SW. of Florence Court, H165323, 16.vi.00. (At the first site where voucher specimen was collected *P. jungermannioides* was rather sparse and much intermixed with other mosses. At a second site, in crevice near entrance to middle cave, it formed a nearly pure patch measuring 5 x 15 cm).

*Pohlia cruda*

Recorded in Northern Ireland from H33, H38, H39 and H40 (Blockeel & Long 1998). In 1999 the species was found or refound at three sites in H39 and one in H40 (Holyoak 1999). In H33 recorded by R.D. Porley at Letter Scarp (*ca* H065566) on 10 June 1999 (Porley 1999).

It was found once in H33 in 2000:

00-337: thin soil in shaded crevice of low limestone crags on north-facing heathy hillslope, N. side of Benaughlin, H175316, 18.vi.00.

The number of records accumulated for this species may suggest that it no longer merits listing as a 'Species of Conservation Concern in Northern Ireland', but its removal should perhaps be deferred until further fieldwork is carried out.

*Pohlia lutescens*

00-348: on vertical soil of bank beside track, partly shaded by scrub, just N. of Benaughlin, H174318, 18.vi.00.

New for Northern Ireland. Although there are only five other records from Ireland, this is an inconspicuous moss that may well be under-recorded. It should not be added to the 'List of Species of Conservation Concern in Northern Ireland' unless further survey work confirms that it is genuinely rare rather than merely overlooked.

*Rhynchostegiella curviseta*

Collected 'by Cladagh River, Marble Arch' on 13 Aug. 1965 by A.R. Perry (BBSUK). Several specimens of *Rhynchostegiella* collected in May 2000 along the Cladagh River were all forms of the locally common and rather variable *R. teneriffae*. *R. curviseta* is otherwise known in Northern Ireland only from a single old record in H39 ('White Rocks, Portrush', *leg.* Lett, in Megaw 1938).

*Rhynchostegium megapolitanum*

Single record from H33 (on 2 Sept. 1957) given by Crundwell (1959: 39) 'On gravel at roadside on south side of L. Macnean Lower' (BBSUK). Not seen in 2000, but the species is easily overlooked.

*Scleropodium cespitans*

The only record from H33 is a specimen collected on 'boulder, shore of Lough Erne' by J.S. Thomson on 24 June 1950 (*Trans. B.B.S.* 2: 485; BBSUK). The vague locality discourages efforts to re-find this record, and the artificial maintenance of high water-levels during recent decades may anyway have destroyed the habitat for *S. cespitans*.

*Seligeria acutifolia*

Known in Ireland from H9, H28, H33 and H39 (Blockeel & Long 1998), but surprisingly it was not shown or mentioned for Ireland in the *Atlas* (Hill *et al.* 1992 p. 106) and this probably explains why the species was not listed on the 'Provisional List of Northern Ireland Species of Conservation Concern'. Holyoak (1999) reviewed records from H39 and reported a new find in H40.

First recorded in H33 from: 'dry vertical shaded limestone face in gorge, Marble Arch, H/13, Hodgetts 2769, H 12-34-, 16/2/93' (*Bull. B.B.S.* 64; BBSUK: voucher specimen cfr checked by DTH on 23 January 2000). However, an older specimen exists: 'nr Florence Court, in swallowhole, Hb R D Fitzgerald, 8 July 1965. NMW C96.16. det Lidia Gos 1992.11.11 (admixture with *S. donniana*)' (voucher specimen cfr again checked by DTH on 23 January 2000) (this locality is probably too vague to be re-found, and it is surely >2 km from Florence Court).

Found at several new localities in 2000:

00-103: on slightly overhanging limestone rock *ca* 5 m above river, partly shaded, Marble Arch, H120344, 21.v.00. cfr.

00-114: on vertical faces of limestone boulder in ravine by river in ash-hazel woodland, by Marble Arch, H120344, 22.v.00 (with *S. donniana*), cfr.

00-131: on vertical side of limestone boulder in mossy scree in open ash-hazel woodland in small steep valley, The Fosstra, H112359, 23.v.00.

00-156: in small damp hollow low on limestone crag at edge of sink-hole part shaded by tall hazel scrub, E. of Pollreagh, H119333, 26.v.00, cfr.

00-266: on damp overhanging limestone beneath overhangs at base of S.-facing crag in open ash woodland on west bank of river, E. of Pollreagh, H118333, 8.vi.00, cfr.

00-269B: on damp overhanging limestone of crag in shade on east side of river gorge with ash woodland, E. of Pollreagh, H118331, 8.vi.00, cfr.

00-298: on damp limestone beneath overhang of small N.-facing crag shaded by scrub and saplings, SW. of Kilgarrow, H073503, 11.vi.00, cfr.

00-334: on damp limestone beneath overhangs of small crag at edge of lake (facing south), N. edge of Lough Formal, H046474, 17.vi.00, cfr.

[00-360: on slightly damp limestone at base of north-facing crag on slope in ash-hazel woodland, W. of Kilgarrow, H075512, 22.vi.00. Non-fertile material tentatively assigned to this species.]

There are now so many records of *S. acutifolia* that there is doubt whether it should be added to the list of 'Species of Conservation Concern in Northern Ireland'.

#### *Seligeria donniana*

Recorded in Northern Ireland from several localities in H39 (Megaw 1938: 343, Holyoak 1999) and in H33 'On damp limestone rocks in the Cladagh River below Marble Arch, H 33, June 1959' (Fitzgerald & Fitzgerald 1960: 176) (same record given as 'Middle Cladagh Glen', 4 June 1959, R.D. Fitzgerald, BBSUK; *Trans. B.B.S.* 3: 771) and at Knockmore Cliff by R.D. Fitzgerald in Sept. 1960.

Another unrecorded specimen from H33 is from: 'nr Florence Court, in swallowhole, Hb R D Fitzgerald, 8 July 1965. NMW C96.16. det Lidia Gos 1992.11.11', as admixture with specimen of *S. acutifolia* and kept with that species (voucher specimen cfr checked by DTH on 23 January 2000) (this locality is probably too vague to be refound, and it is surely >2 km from Florence Court).

Several additional records were made in H33 during 2000, suggesting this tiny moss has previously been somewhat overlooked:

00-113: on vertical faces of limestone boulder in ravine by river in ash-hazel woodland, by Marble Arch, H120344, 22.v.00 (with *S. acutifolia*), cfr.

00-151: on damp vertical limestone under overhang and holly bush on low north-facing crag in grassland, S. of Pollawaddy, H121334, 26.v.00, cfr.

00-269A: on damp overhanging limestone of crag in shade on east side of river gorge with ash woodland, E. of Pollreagh, H118331, 8.vi.00, cfr.

00-288: on underside of small overhang on moist vertical base of north-facing limestone crag, N. of Glencreawan Lough, H030571, 9.vi.00, cfr.

00-358: in tiny crevices of damp limestone beneath overhangs of north-facing crag in ash woodland, W. of Kilgarrow, H076512, 22.vi.00, cfr.

00-395A: on overhanging shaley limestone at base of north-facing crag, slightly shaded by hazels, Cliffs of Magho, H047574, 26.vi.00, cfr.

### *Seligeria oelandica*

This rare species was hitherto known south of the Arctic only on limestone in southern Sweden and north-west Eire (Co. Sligo and Co. Leitrim), where it is regarded as a relict from cold stages of the Pleistocene. Four records from on and near the Cliffs of Magho in Co. Fermanagh are thus the first for the species in Northern Ireland and for the UK as a whole. All of its populations in H33 are small and potentially at risk from changes in quantity or quality of water flushing the rocks. The tiny population in a flush (voucher 00-264) is also greatly at risk from trampling and other disturbance.

00-264: on thin tufaceous films on limestone pebbles in flush on open north-facing hillside, N. of Glencreawan Lough, H027568, 7.vi.00, cfr. (Det. conf. G. Rothero).

00-282: on wet tufa at base of flushed area of N.-facing limestone crag, N. of Glencreawan Lough, H023567, 9.vi.00, cfr.

00-391: on thin tufa film on steep limestone trickling with water at base of large north-facing crag, almost unshaded, Cliffs of Magho, H049575, 26.vi.00, cfr.

00-398: on near-vertical limestone with trickle of water at edge of waterfall on north-facing crag, Cliffs of Magho, H042573, 26.vi.00, cfr.

In view of the rarity of this species and its phytogeographical significance as a cold-stage relict it should be considered as an addition to the 'List of Species of Conservation Concern in Northern Ireland' and as an addition to the UK BAP.

### *Seligeria patula* (previously listed as *S. trifaria*)

'*S. trifaria*' was collected on: 'damp limestone, c. 500 ft., Upper Buggan' on 13 Sept. 1960 by R.D. Fitzgerald (*Trans. B.B.S.* 4: 160; BBSUK), providing the only record of *Seligeria* sect. *Trifariae* from H33 or indeed anywhere in Northern Ireland.

The following records of *S. patula* were made in 2000:

00-279, 00-281: on thin tufa film on wet vertical limestone of flushed area at base of N.-facing crag, N. of Glencreawan Lough, H023567, 9.vi.00, cfr.

00-356: on thin tufa film on limestone rock of crag (under overhangs) above stream bank in ash woodland, W. of Kilgarrow, H076513, 22.vi.00. (Small amounts of non-fertile

plants only, occurring sparsely over a few square centimetres. Identification based on papillose cells near leaf apices).

The previous record of *S. trifaria* from H33 may have been based on *S. patula*, especially since the 'Upper Buggan' locality of Fitzgerald given above may correspond to my 'W. of Kilgarrow' (see 00-356 above). Blockeel *et al.* (2000: 32) were the first to record *S. patula* (Lindb.) Broth. in Britain and Ireland ; they mention that fuller details will be published in a forthcoming monograph of the genus in Europe. Numerous recent Irish gatherings checked by the present author have all been of *S. patula*, with no *S. trifaria*.

### *Seligeria pusilla*

There are widely scattered old records in H39 (Megaw 1938: 343) and additional sites were found in 1999 (Holyoak 1999). The only other records from Northern Ireland are from H33: from Buggan on 9 June 1959 (leg. Mrs J.W. Fitzgerald, NMW), 'On damp limestone rocks on the scarp overlooking Lower Lough Erne at Magho, H 33, (10th) June 1959' (Fitzgerald & Fitzgerald 1960: 176) (BBSUK) and specimens collected from Marble Arch (on Arch and near entrance to it) by N.F. Stewart on 16 Feb. 1993 (N.F. Stewart pers. comm.; DBN).

Found in two separate regions in H33 during 2000:

00-269C: on damp overhanging limestone of crag in shade on east side of river gorge with ash woodland, E. of Pollreagh, H118331, 8.vi.00, cfr.

00-280: on thin tufa film under tiny overhang on wet limestone of flushed area at base of N.-facing crag, N. of Glencreawan Lough, H023567, 9.vi.00, cfr.

00-287: on moist near-vertical limestone of base of north-facing crag, N. of Glencreawan Lough, H030571, 9.vi.00, cfr.

00-289: beneath tiny overhang on damp limestone on partly shaded base of north-facing limestone crag, N. of Glencreawan Lough, H031571, 9.vi.00, cfr.

00-394: on vertical and slightly overhanging shaley limestone at unshaded base of north-facing crag, Cliffs of Magho, H047574, 26.vi.00, cfr.

00-395B: on overhanging shaley limestone at base of north-facing crag, slightly shaded by hazels, Cliffs of Magho, H047574, 26.vi.00, cfr.

00-401: on thin clayey film over slightly overhanging limestone at base of large north-facing crag, slightly shaded by ash-hazel woodland, Cliffs of Magho, H040573, 26.vi.00, cfr.

Since this species has numerous localities in H39 and is abundant at some of them, and it also has several localities in H33, it seems unnecessary to retain it as a 'Species of Conservation Concern in Northern Ireland' (cf. Holyoak 1999).

### *Seligeria recurvata*

Recorded in H33: 'on moist shaded rocks of cliff, nr Glencreawan Lough, L. Navar Forest, Parker, July 1957' (*Trans. B.B.S.* 3: 474). (This locality was probably on low sandstone outcrops just south of west end of Glencreawan Lough. An unsuccessful search was made there on 11 June 2000. The low rocks are perhaps now more shaded than in 1957 as shrubs and saplings are growing up now that grazing has long been abandoned, except by a few feral goats.)

Recorded at Bolusty Beg scarp (*ca* H 057567) in June 1999 by R.D. Porley (1999); refound there in June 2000:

00-367: on overhung vertical rock and underside of overhang (with *Fissidens gracilifolius*) low on north-facing sandstone crag, Bolusty Beg scarp, H056566, 23.vi.00, cfr.

### *Sphagnum angustifolium*

The only record from H33 was a specimen collected: 'on base of scarp in *Luzula sylvatica* - *Vaccinium myrtillus* tall herb comm., Carricknagower Scarp' (= *ca* H004542), 9/vi/99, R.D. Porley (1999) (BBSUK; det. M.O. Hill).

There are few Irish records of this species. Before it is added to the 'List of Species of Conservation Concern in Northern Ireland' it is desirable that further studies are made to establish that this recently segregated, critical species is rare rather than merely under-recorded.

### *Sphagnum platyphyllum*

Known in Northern Ireland only from a collection made by A. Thomson on 25 June 1937 from 'Castle Caldwell, bog by L. Erne,' (BBSUK, conf. M.O. Hill). A search around the edges of L. Erne at Castle Caldwell on 12 June 2000 failed to reveal any habitat supporting *Sphagna*. Much of this part of the lough shore has been afforested and coniferous plantations now extend almost to the shore over large areas.

### *Tomentypnum nitens* (syn. *Homalothecium nitens*)

The only record from Northern Ireland was made by R.E. Parker in 'large flush bog complex, W. of L. Meenameen' (H33) in Oct. 1957 (*Trans. B.B.S.* 3: 485; BBSUK).

Searches west of Meenameen Lough in June 2000 revealed that almost the whole area is now afforested with spruce plantations. No trace of *T. nitens* could be found in the narrow mesotrophic fen remaining at the lough's western edge, which still supported *Sphagnum contortum* and *S. teres*.

After the fieldwork ended a chance find was made of a published account describing the extinction of this rare moss due to afforestation (Foss & O'Connell 1997: 193, based on Parker 1990): 'A conflict arose between environmentalists and foresters in the early 1950s over Lough Meenameen Fen in Co. Fermanagh. The Northern Ireland Forest Service overruled the conservation of a rare moss, *Homalothecium nitens*, in favour of

the planting of a forty-hectare site, and the area was subsequently drained and planted (Parker, 1990).’

#### *Tortella densa*

The only record from Northern Ireland is from Crossmurrin Nature Reserve (H33), made by Tomas Hallingbäck during a visit by the ECCB party on 16 February 1993, when the area visited was recorded as H11-34- (Hodgetts & Hallingbäck 1994, N.G. Hodgetts pers. comm.). A voucher specimen confirmed by T.L. Blockeel has been lodged in BBSUK.

Efforts to refind it on several visits in May and June 2000 were unsuccessful, but hampered by the inexact locality details that were recorded.

#### *Tortella fragilis*

The only record in Ireland is from Crossmurrin Nature Reserve (H33), made by Tomas Hallingbäck during a visit by the ECCB party on 16 February 1993, when the area visited was recorded as H11-34- (Hodgetts & Hallingbäck 1994, N.G. Hodgetts pers. comm.). A voucher specimen confirmed by T.L. Blockeel has been lodged in BBSUK. An e-mail from Tomas Hallingbäck to Nick Hodgetts on 11 August 2000 reaffirmed that site was ‘SE part of Crossmurrin NNR I think’ and habitat was ‘an open site with very thin soil layer and much bare but eroded pavement limestone flat rocks’.

Efforts to refind it over many hours on several visits in May, June and August 2000 were unsuccessful, but hampered by the inexact locality details that are available. However, if the site was in the south-eastern part of Crossmurrin NNR, then *T. fragilis* must undoubtedly be very rare there. Photo 2 shows part of area that is likely to have been involved.

#### *Ulota drummondii*

Recorded from Correl Glen (H33) by W.N. Tetley in 1908. Again listed for Correl Glen (approximately H075546) by N.G. Hodgetts during the ECCB Excursion on 15 February 1993, although no specimen has been kept (N.G. Hodgetts pers. comm.). Prolonged efforts to refind the species in May and June 2000 were unsuccessful, although *Ulota bruchii*, *U. calvescens* and *U. crispa* were all present in quantity.

#### *Weissia controversa* var. *densifolia*

00-402: on soil at base of wall of abandoned cow-shed, beneath edge of corrugated roof of galvanised iron, Drumcrow West, H046575, 26.vi.00, cfr.

This is the first record of var. *densifolia* in Northern Ireland and only the third record of it in Ireland. Should be considered as a potential addition to the ‘List of Species of Conservation Concern in Northern Ireland’, if addition of infraspecific taxa is acceptable.

[*Zygodon rupestris* (syn. *Z. baumgartneri*)

Listed for four localities in H33 by R.G. Woods, based on surveys in June 1988 (in Harding 1989, Annex 2). However, the species is not listed for any county in Northern Ireland by Blockeel & Long (1998) and it was not found in May-June 2000, despite being searched for. Hence the records should be dismissed as probable misidentifications, unless voucher specimens can be located.]

## **New and updated vice-county records of bryophytes**

*Provisional* new or updated vice-county records (see above) are given in the list that follows, except that new records of *Brachythecium appleyardiae* and *Seligeria oelandica* have been confirmed by the BBS Recorder of Mosses. NVCR = new vice-county record, UVCR = updated vice-county record. All records were made by DTH; numbers prefixed 00- are DTH field numbers for specimens collected. The specimen submitted to national recorders is usually the largest/best gathering, not necessarily the specimen collected on the earliest date. For several species annotated '+ other records' there are additional records listed in Appendix 3.

### **Liverworts (alphabetical sequence):**

*Blepharostoma trichophyllum*            UVCR

00-89: vertical side of boulder *ca* 1.0 m above water-level of river in open deciduous woodland, by Cladagh River below Marble Arch, H124354, 21.v.00.

*Fossombronia pusilla*                            UVCR

00-168: on soil exposed in flush with patchy *Juncus effusus* on damp grassland slope near hazel scrub, W. of Marble Arch, H119347, 28.v.00, cfr.

*Jungermannia exsertifolia* ssp. *cordifolia*    NVCR

00-297: on pebble just above shallow flowing water of inlet stream at unshaded edge of lake, by NW. edge of Lough Macnean Lower, H094386, 10.vi.00. (+ 1 other record).

*Lophocolea heterophylla*                            NVCR

00-317: on low dead twig of *Salix cinerea* at base of N.-facing heathy slope, Meenameen Scarp, H034560, 13.vi.00.

*Marsupella emarginata* var. *aquatica*                            NVCR

00-177A and 00-177B: on gritstone boulders 10-20 cm above water at unshaded edge of lake (*ca* 475 m elevation), Lough Atona, H111292, 29.v.00.

00-179: on unshaded gritstone boulders shallowly submerged and just emergent from quick-flowing water of outlet stream near Lough Atona, H111292. 29.v.00.

00-179 was collected at location where *M. sphacelata* was reported (see above), so that voucher for that record now needs checking.

*Marsupella emarginata* var. *emarginata* UVCR

00-171A: on damp vertical gritstone at base of block scree on north-facing hillside (500 m elevation), SE. of Lough Atona, H112289. (+ another record nearby).

*Tritomaria quinquedentata* UVCR

00-413: on top of low limestone boulder forming part of low unshaded wall of ruin of cashel in open grassland, just S. of Crossmurrin Nature Reserve, H109341, 27.vi.00. (+ other records).

**Mosses (alphabetical sequence):**

*Anomodon viticulosus* UVCR

00-126: on base of steep limestone crag, partly shaded by ash-hazel woodland, Hanging Rock, H112361, 23.v.00.

*Blindia acuta* UVCR

00-149: on damp sandstone (?) boulder in ravine by river in ash-hazel woodland, just below Marble Arch, H120344, 25.v.00.

*Brachythecium appleyardiae* NVCR

Voucher specimen, 00-128: on limestone rock of small ledge beneath overhangs at base of steep crag, shaded by *Fraxinus/Corylus* woodland, Hanging Rock, H112361, 23.v.00. Determination confirmed by T.L. Blockeel (duplicate specimen in BBSUK).

See above and Appendix 1 for additional records and specimens.

*Brachythecium glareosum* UVCR

00-153: part of moss mat over low limestone boulder under hazel scrub, E. of Pollreagh, H119334, 26.v.00.

*Bryum capillare* var. *rufifolium* NVCR

00-403: in crevices at base of walls of abandoned cow-shed, beneath edge of corrugated roof of galvanised iron, Drumcrow West, H046575, 26.vi.00, cfr.

*Bryum imbricatum* (syn. *B. inclinatum*) UVCR

00-135: on thin soil among gravel at unshaded edge of track to car park, just S. of Crossmurrin Nature Reserve, H108340, 25.v.00, cfr. (+ 1 other record).

*Bryum pseudotriquetrum* var. *bimum* NVCR

00-211: in small flushed area with short vegetation overlying calcareous sandstone exposed beside edge of road, NE. of Lough Achork, H045558, 1.vi.00, cfr.

*Bryum radiculosum* UVCR

00-164: unshaded crumbling block of concrete beside road bridge over river/lake, Lady Craigavon Bridge, H331279, 27.v.00. (+ other records).

*Bryum rubens* NVCR

00-144: on unshaded disturbed stony soil, near Marble Arch visitor centre, H121343, 25.v.00.

*Bryum ruderale* NVCR

00-148: on unshaded disturbed stony soil, near Marble Arch visitor centre, H121343, 25.v.00.

*Calliargon stramineum* UVCR

00-182: small flush on open north-facing hillslope (ca 600 m elevation), SE. of Lough Atona, H108290, 29.v.00. (+ other records).

*Daltonia splachnoides* NVCR

00-242: on bark low on *Salix cinerea* bush (among tall *Vaccinium myrtillus* and *Luzula sylvatica*) on block-scrée slope below sandstone crags, Culcarrick Scarp, H010549, 5.vi.00, cfr. (+ other records: see above).

*Dicranella staphylina* NVCR

00-145: on unshaded disturbed stony soil, near Marble Arch visitor centre, H121343, 25.v.00.

*Didymodon nicholsonii* (syn. *Barbula nicholsonii*) NVCR

00-296: on damp almost unshaded old tarmac at edge of car-parking area beside lake, by NW. edge of Lough Macnean Lower, H095386, 10.vi.00.

*Didymodon rigidulus* (syn. *Barbula rigidula*) UVCR

00-90: on horizontal top of mortared-stone wall of road bridge, lightly shaded by edge of deciduous woodland, by Cladagh River below Marble Arch, H128356, 21.v.00. (+ other records).

*Didymodon sinuosus* UVCR

00-420: silty soil on limestone near river in ravine with ash-hazel woodland, near Pollreagh, H119333, 26.v.00.

*Distichium capillaceum* UVCR

00-215: on thin soil over damp sandstone in deep crevice under overhangs on N.-facing sandstone scarp, W. end of Meenameen Scarp, H033559, 3.vi.00, cfr. (+ 1 other record: see above).

*Ditrichum heteromallum* UVCR

00-187: on vertical gritstone rock with trickle of water (*ca* 600 m elevation), SE. of Lough Atona, H108289, 29.v.00, cfr.

*Drepanocladus revolvens* s.s. NVCR

00-310: on thin unshaded flushed soil over sandstone in disused quarry, Glennasheever, H034532, 12.vi.00.

*Entodon concinnus* NVCR

00-167: on unshaded edge of limestone scree on SE.-facing hillslope, NW. of Marble Arch, H120348, 28.v.00.

*Eurhynchium crassinervium* (syn. *Cirriphyllum crassinervium*) UVCR

00-91: on horizontal top of mortared-stone wall of road bridge, lightly shaded by edge of deciduous woodland, by Cladagh River below Marble Arch, H128356, 21.v.00. (+ 1 other record).

*Grimmia trichophylla* NVCR

00-140: on sandstone boulders in low dry-stone wall in grassland, just S. of Crossmurrin Nature Reserve, H107342, 25.v.00.

*Homalothecium lutescens* UVCR

00-166: on unshaded edge of limestone scree on SE.-facing hillslope, NW. of Marble Arch, H120348, 28.v.00. (+ other records).

*Isothecium myosuroides* var. *brachythecioides* UVCR

00-250: on sandstone rock of ledge at base of N.-facing crag, E. part of Culcarrick Scarp, H012549, 5.vi.00. (+ other records).

*Orthothecium rufescens* NVCR

00-278: on damp limestone rock and thin clay soil over rock on base of flushed area of N.-facing limestone crag, N. of Glencreawan Lough, H023567, 9.vi.00. (see above for additional information).

*Orthotrichum cupulatum* var. *cupulatum* NVCR

00-143: on top of large limestone boulder in grassland near edge of deciduous woodland, near Marble Arch visitor centre, H121343, 25.v.00, cfr. (+ other records).

*Orthotrichum cupulatum* var. *riparium* NVCR

00-323: on limestone boulders in grassland near edge of lake, by Upper Lough Erne S. of Carragh, H341294, 15.vi.00, cfr. (+ 2 other records).

*Physcomitrium pyriforme* UVCR

00-169: on disturbed sandy area in grassland near buildings, by visitor centre at Marble Arch, H121343, 28.v.00, cfr.

*Plagiomnium affine* NVCR

00-163: soil at base of *Phragmites* and *Salix cinerea* in flood-zone at edge of lake, S. shore of Kilturk Lough, H378254, 27.v.00. (+ 1 other record).

*Plagiothecium nemorale* NVCR

00-201: at base of hawthorn in hazel scrub on rocky limestone slope, SE. part of Crossmurrin Nature Reserve, H113343, 31.v.00. (+ other records).

*Platydictya jungermannioides* UVCR

00-248: on ledge deeply shaded under large overhang of N.-facing sandstone crag, E. part of Culcarrick Scarp, H011549, 5.vi.00.

*Pleuridium acuminatum* NVCR

00-256: on vertical soil of river bank at edge of marshy grassland, Sruh Croppa River, H115335, 6.vi.00, cfr.

*Pohlia lutescens* NVCR

00-348: on vertical soil of bank beside track, partly shaded by scrub, just N. of Benaughlin, H174318, 18.vi.00.

*Racomitrium affine* NVCR

00-320: on horizontal sandstone of boulder on moorland slope, SE. of Carricknagower Lough, H007542, 14.vi.00.

*Racomitrium heterostichum* NVCR

00-136: on sandstone boulder in damp grassland (overlying limestone bedrock), just S. of Crossmurrin Nature Reserve, H109342, 25.v.00. (+ other records).

*Rhynchostegium confertum* NVCR

00-124: on concrete block, lightly shaded by trees, N. of Hanging Rock, H110365, 23.v.00.

*Schistidium crassipilum* NVCR

00-251: on sloping surface of concrete fence post near roadside in open limestone grassland, by lower Owenbreen River, H119334, 6.vi.00, cfr. (+ other records).

*Scorpidium scorpioides* UVCR

00-302: with low *Carex* in unshaded calcareous flush, N. edge of Glencreawan Lough, H021564, 11.vi.00. (+ other records).

*Seligeria oelandica* NVCR

00-264: on thin tufaceous films on limestone pebbles in flush on open north-facing hillside, N. of Glencreawan Lough, H027568, 7.vi.00, cfr. (Det. conf. G. Rothero). (+ other records: see above).

*Seligeria patula* NVCR

00-279: on thin tufa film on wet vertical limestone of flushed area at base of N.-facing crag, N. of Glencreawan Lough, H023567, 9.vi.00, cfr. (+ other records: see above).

Older records of *S. trifaria* from H33 may have been based on this species (see above).

*Sphagnum contortum* NVCR

00-227: at base of sparse *Eriophorum angustifolium* and *Menyanthes trifoliata* in wet fen beside lake, W. end of Meenameen Lough, H023558, 3.vi.00. (+ 1 other record).

*Sphagnum teres* NVCR

00-224: with *Carex rostrata*, *Menyanthes trifoliata* and *Potentilla palustris* in wet fen beside lake, W. end of Meenameen Lough, H023558, 3.vi.00.

*Weissia controversa* var. *densifolia* NVCR

00-402: on soil at base of wall of abandoned cow-shed, beneath edge of corrugated roof of galvanised iron, Drumcrow West, H046575, 26.vi.00, cfr.

## **Notes on vascular plant of ‘Conservation Concern in Northern Ireland’**

### *Trichomanes speciosum*

The gametophyte was found at Carricknagower Scarp (H002542) on 14 June 2000, providing a new locality for the species, which is already known at several other scarps in Lough Navar Forest. The gametophyte was seen in a crevice of the sandstone crag of the scarp beneath ivy and close to an isolated oak sapling.

## **Significance of bryofloras of individual sites, with suggestions for their conservation**

To avoid a great deal of repetition, this section provides only a brief overview of the bryofloras of individual sites. Suggestions for conservation of the rarer bryophytes are made for the (minority of) sites where threats were apparent. Further details of any species found during the surveys in 2000 should **always** be sought above under the 'Species of conservation concern' heading, the 'New or updated vice-county records' heading, or both.

The present section discusses sites only in H33, and considers sites in sequence of National Grid references. It must be remembered that some of the sites are of greater importance for other plants or for animals than for their bryophytes, so that the apparent lack or scarcity of rarer bryophytes cannot be taken as representative of the whole biota.

Appendix 3 gives a bryophyte species list for each of the main sites studied in May and June 2000 as a copy of a recording card. These are mainly field records, so that a few taxa which cannot be identified reliably in the field will tend to be under-recorded (e.g. *Bryum* 'erythrocarpum' group).

### **H0--5-- General notes on sandstone scarps of Lough Navar Forest**

Young planted conifers are being removed from the rocky slopes beneath certain of the sandstone scarps (e.g. Photo 12) by the forestry authorities. Their removal is very much to be welcomed since continued growth of the conifers would seriously increase damage from shading to the rich bryofloras on the rocky scarps and the slopes of block-scrub beneath them, as well as rich epiphytic bryofloras in the associated rowan-sallow scrub (cf. Photos 10 and 11).

Cessation of grazing has been another unfortunate consequence of the coniferisation of much of the Lough Navar Forest region. Although feral goats continue to graze some areas, especially Carricknagower Scarp, their numbers are insufficient to prevent tall heath vegetation developing along with increase of scrub of sallows and rowans and birch saplings (e.g. Photo 9). The tall heath shades the rocks, reducing habitat for many of the bryophytes and for some of the scarcer vascular plants such as wintergreens (Pyrolaceae). The ungrazed tall heath vegetation also has potential to burn fiercely and fire damage has already occurred over large areas at Braade Scarp (where some grazing has now been reintroduced). It would be beneficial to reestablish grazing more widely on the scarps.

A few *Rhododendron* bushes are established very locally on the scarps, for example towards the western end of Meenameen Scarp. Because this species has shown potential for invasive increase at the expense of more interesting native vegetation, it would be

worthwhile devoting substantial resources to prevent it colonising the scarps. At this early stage in its spread, survey from the air to locate flowering *Rhododendron* bushes, quickly followed by cutting and stump treatment, apparently has a clear potential to be completely effective in exterminating the plant from the scarps.

#### **H01-54- Culcarrick Scarp**

An outstandingly rich bryophyte flora includes *Amblyodon dealbatus*, *Daltonia splachnoides* and *Platydictya jungermannioides*. In addition, Porley (1999) recorded *Geocalyx graveolens* and *Mnium thomsonii*, neither of which has been recorded elsewhere in Northern Ireland.

#### **H02-56-, H03-57-, etc. Cliffs of Magho (N. of Glencreawan Lough)**

Several kilometres of north-facing limestone and calcareous-shale crags support an outstandingly rich bryoflora that is concentrated in several areas that are permanently flushed with water. The rare bryophytes include *Leiocolea fitzgeraldiae*, *Orthothecium rufescens*, *Seligeria donniana*, *S. oelandica*, *S. patula* and *S. pusilla*, and the flushed rocks also support large populations of *Saxifraga aizoides*. *O. rufescens* is not known elsewhere in Northern Ireland and *S. oelandica* (four sites here) is unknown elsewhere in the U.K. Photo 16 shows the western end of the crags from the north.

All of the populations of *S. oelandica* are small and along with other bryophytes, potentially at risk from changes in quantity or quality of water flushing the rocks. The tiny population of *S. oelandica* in a flush above the crags (H027568) is also greatly at risk from trampling and other disturbance, and potentially at risk from collection of specimens. Areas with low sedges in the same flush support the rare land-snail *Vertigo geyeri*.

#### **H03-55- Navar Scarp**

Scrub on block-scrée beneath the crag supports *Daltonia splachnoides*. See above for general comments on habitat-management problems on the sandstone scarps.

#### **H03-56-, H04-55-, H04-56- Meenameen Scarp (and N. of L. Achork)**

Rare bryophytes recorded here were *Calypogeia integristipula*, *Daltonia splachnoides* and *Pedinophyllum interruptum*. Rich floras of commoner species occur on the sandstone rocks, in the block screes beneath them and as epiphytes on rowan-sallow scrub. See above for general comments on habitat-management problems on the sandstone scarps.

#### **H04-47- Lough Formal**

A small limestone crag at the northern edge of the lough supports *Seligeria acutifolia*.

#### **H046575 Drumcrow West**

A ruined cowshed among other buildings of a deserted farm produced records of *Weissia controversa* var. *densifolia* (on soil) and *Bryum capillare* var. *rufifolium* (on base of wall), two infraspecific taxa that have not hitherto been recorded in Northern Ireland. Both were apparently associated with zinc-enriched runoff from an old roof of galvanised iron sheeting. Further searching in comparable habitats in Northern Ireland may well provide more records of both taxa, so that efforts to protect this site would be inappropriate.

#### **H05-55- Braade Scarp**

Rare bryophytes found here in 2000 were *Aulacomnium androgynum* and *Leiocolea fitzgeraldiae*, but the sandstone rocks and block screes support a richly varied flora of common and scarcer bryophytes. The only Irish record of *Orthodontium gracile* was made at this scarp in 1993, but several attempts to re-find it have been unsuccessful and the species might now be extinct.

Repeated burning of heathland vegetation may have damaged the bryoflora of this scarp. The scarp and surrounding areas were being grazed by cattle in June 2000, so future accumulation of dry vegetation debris may be reduced, hopefully allowing less scope for damage from fires.

#### **H 05-56- Bolusty Beg scarp**

*Daltonia splachnoides* was found on rowans on the block scree beneath the scarp at H056567, along with a rich associated flora of epiphytic bryophytes. Young pines 5-7 m high need clearing from this part of the slope, before they shade out the rowans with their epiphytes. Further east on this scarp the young pines have already been cleared, but unfortunately all other shrubs and saplings (including willows and rowans) have been removed with them. In future it would be better to leave cut conifers lying where they fall on these rocky slopes, rather than destroy hardwood bushes by dragging cut conifers away. See above for additional general comments on habitat-management problems on the sandstone scarps.

#### **H06-53- E. of Derryvahan**

A varied bryoflora found on the sandstone rocks included *Calypogeia integristipula*. See above for general comments on habitat-management problems on the sandstone scarps.

#### **H07-50-, H07-51- SW. and W. of Kilgarrow**

Limestone crags and wooded slopes (Photo 15) and banks of a stream support a rich bryoflora including *Mnium marginatum*, *Pedinophyllum interruptum*, *Seligeria acutifolia*, *S. donniana* and *S. patula*. No immediate threats were apparent. It is important that cover of open deciduous woodland survives here to maintain humid conditions on the crags.

#### **H07-54- Correl Glen**

This rich bryophyte site is protected as a Nature Reserve. The only rare bryophyte found in 2000 was a tiny amount of *Calypogeia integristipula*, but a very large flora includes a number of uncommon species such as *Harpalejeunea molleri* and *Leptoscyphus cuneifolius*. Old records exist also for *Grimmia retracta*, *Platydictya jungermannioides* and *Ulota drummondii*, the first two of which may have been lost because of increased shading of the river banks and sandstone crags that has apparently developed over many years.

#### **H08-50- Knockmore Cliff**

The north-facing part of this large limestone crag supports small amounts of *Brachythecium appleyardiae* at the base of the rocks. Older records of *Seligeria* spp. are probably from rocks on the wooded slopes beneath the crags.

#### **H10-28-, H11-29-, H11-30- N. slopes of Quilcagh and Lough Atona**

The higher north- and east-facing slopes of Quilcagh have block screes with much *Dicranodontium asperulum*. An older record of *Lepidozia pearsonii* was from similar habitat and that species doubtless still persists somewhere. Well developed 'Northern Hepatic Mat' vegetation on the higher north-facing slopes merits protection as a rare and important vegetation type; it includes such uncommon species as *Anastrepta orcadensis* and *Herbertus aduncus* at this locality.

A record of *Marsupella sphacelata* in the outlet stream from L. Atona needs checking.

Banks of calcareous drift on the moorland-covered slopes lower on the north side of Quilcagh (around H115301) hold *Mnium marginatum*, *Pedinophyllum interruptum* and commoner calciphiles. These occur in short open turf and on low earthy banks. Their survival probably depends on continued but not excessive grazing by sheep. Over a period of several years since a new road was made up the northern slopes of Quilcagh, there appears to have been much new stock-proof fencing erected and stocking levels may well have increased.

#### **H10-34- Crossmurrin Nature Reserve**

Sheltered niches among low limestone rocks here support *Mnium marginatum* and *Pedinophyllum interruptum*. Records were also made in 1993 of *Antitrichia curtispindula* (on rock under hazel scrub), *Tortella fragilis* (sole Irish record) and *T. densa*. Realistic recommendations for conservation of the latter three species cannot be made unless they are rediscovered.

#### **H10-36-, H11-36- Marlbank and Hanging Rock**

The base of the large limestone crags at Hanging Rock support strong populations of *Brachythecium appleyardiae*. Damp parts of lower crags on slopes further west have *Pedinophyllum interruptum*. There are older records here for *Amblystegium tenax* and *Cololejeunea rossettiana*.

### **H11-33- Pollreagh and vicinity**

Limestone crags, a ravine and steep ash-hazel woodland on valley side slopes support a richly varied bryophyte flora with several rarities (*Brachythecium appleyardiae*, *Mnium marginatum*, *Pedinophyllum interruptum*, *Platydictya jungermannioides*, *Seligeria acutifolia*, *S. donniana*, *S. pusilla*). No immediate threats were apparent.

### **H11-35- The Fosstra**

Limestone scree in the small valley at H112359 has *Seligeria acutifolia*.

### **H11-46- Carrickbeg**

The large limestone crag has *Brachythecium appleyardiae* (at H115466).

### **H12-33- Pollawaddy**

Low limestone rocks support small populations of *Mnium marginatum* and *Seligeria donniana*.

### **H12-34- Marble Arch and Cladagh Glen**

This is one of the best known localities for bryophytes in Co. Fermanagh, with a rich flora occurring among limestone rocks and ravines, in the river and along its banks, and in the extensive ash-hazel woodland and hazel scrub. Rarities that are still here include *Cololejeunea rossettiana*, *Fissidens pusillus*, *Leiocolea fitzgeraldiae*, *Mnium marginatum*, *Pedinophyllum interruptum*, *Seligeria acutifolia* and *S. donniana*. There are also recent records of *Seligeria pusilla* and older records in the area for *Antitrichia curtipendula* and *Rhynchostegiella curviseta*. Further downstream, the Cladagh River (H128356) has *Amblystegium tenax*. The large numbers of visitors generally keep to well maintained paths and there appeared to be no immediate threats to the bryoflora.

### **H16-32- Carrickatlevin**

The heavily wooded Cove Rock (H165323) supports the largest of the Co. Fermanagh populations of *Brachythecium appleyardiae* and much *Pedinophyllum interruptum*. *Platydictya jungermannioides* was also found in two places. The rather heavy shade from old deciduous trees is presumably favourable for the rarer bryophytes, to judge from their abundance here, so forestry operations near the crags should be avoided. There is a well-grown coniferous plantation some distance downslope from the crags; any afforestation with conifers higher up the slope should be prevented. This is an important bryophyte site that merits statutory protection if it is not already adequately protected.

### **H17-31-, H18-31- Benaughlin**

North-facing limestone crags on an open hillside (around H175316) have *Distichium capillaceum* and *Mnium marginatum*, along with other species uncommon in Co. Fermanagh such as *Anoetangium aestivum*. Large limestone crags on the eastern side of the hill support small amounts of *Brachythecium appleyardiae* at H180314.

### **H17-34- Florence Court**

A record of *Bryum pallescens* from soil at the base of a wall of a building (H174346) may not be important since this species is likely to be under-recorded.

### **H37-25- Kilturk Lough**

*Phragmites* beds along the southern edge of the lough may still support *Fissidens monguillonii* at its only recorded locality in Northern Ireland. No immediate threats were apparent.

## **Conclusions and suggestions for future work**

Old sites were revisited and ‘new’ sites were sought for numerous ‘Species of conservation concern in Northern Ireland’, some of them UK BAP Priority species. 13 of these species were refound at one or more of their old sites; 41 ‘new’ sites were found for 10 of these species; significant negative records were obtained for 10 of the species by revisiting their old sites. Lack of recorded locality detail greatly impeded attempts to refind both certain old records and some more recent records.

Several species placed on the ‘Provisional list of species of conservation concern in Northern Ireland’ were found so often that their removal from the list is advocated. This especially applies to *Cololejeunea minutissima*, *Dicranella staphylina*, *Plagiochila killarniensis* and *Seligeria pusilla*, all of which had also been found at ‘new’ sites in 1999. Several species including *Mnium marginatum* and *Pedinophyllum interruptum* appear to be locally common in limestone districts of western Co. Fermanagh and unlikely to be threatened.

A rich harvest of new records resulting from the fieldwork emphasises both the diversity of the Ulster bryoflora and the incompleteness of previous explorations. Records were made of nine bryophyte taxa new for Northern Ireland, among them one moss new to Ireland (*Brachythecium appleyardiae*, a species hitherto regarded as an English endemic and BAP ‘Priority Species’) and one new to the UK (*Seligeria oelandica*). From these new finds, at least three taxa should be added to the ‘List of species of conservation concern in Northern Ireland’. Totals of 30 new vice-county records and 21 updated vice-county records were obtained for bryophytes in Co. Fermanagh.

As with the results of bryophyte surveys in Co. Londonderry and Co. Antrim in 1999, there can be no doubt that similarly intensive studies in other parts of Northern Ireland would prove as productive. Co. Tyrone, Co. Armagh and Co. Down have richly varied habitats but have received very little attention from bryologists in recent decades.

During the 1999 fieldwork visits planned to several sites in Co. Antrim were not carried out. Colin Glen on the west edge of Belfast has old records of several rare bryophytes (and vascular plants) but was not visited because no secure parking place was found nearby. It would be worthwhile liaising with the National Trust to make arrangements for a future visit whereby a car could be left in a safe place close to the Glen while carrying out surveys. Work along the River Lagan at Drum Bridge requires a small boat with

outboard motor to allow effective searching for *Orthotrichum sprucei* on the bases of riverside trees.

Attempts to re-find *Seligeria* spp. during fieldwork in 1999 and 2000 were frequently successful, but the species found often appeared to bear little relation to those listed in the older records from each site. Since herbarium material of these tiny mosses is often misidentified it is therefore desirable to borrow, check and where necessary re-identify various of the older gatherings from Northern Ireland. Loans from Belfast, Cardiff and Dublin should yield most of the specimens needed. Voucher specimens of *Marsupella sphacelata* from H33 also need to be re-examined.

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## Appendix 1. Supplementary records from Co. Antrim and Co. Londonderry.

### *Marsupella adusta* and *Marsupella sprucei* on Dart Mountain

*Marsupella sprucei* was reported (as *M. ustulata*) from exposed rocks on the summit of Dart Mountain in H36 and H40 (Fitzgerald & Fitzgerald 1960: 175). However, searches in 1999 yielded only *M. adusta* from what appeared to be exactly the same locations (see below), so the Fitzgeralds' specimens in BBSUK have been re-examined.

*M. sprucei* was also recorded from the undercliff at Fair Head (H39) by Fitzgerald & Perry (1964: 230) and refound there in 1999 (voucher DTH 99-781, from D 181436, BEL).

Reexamination by Mrs J.A. Paton of Mrs J.W. Fitzgerald's (BBSUK) specimens from Dart Mountain has confirmed that the H36 voucher collected in October 1957 was correctly identified as *M. sprucei*. This species is rare in Northern Ireland and thus it needs to be refound on Dart Mountain (where it might occur on both sides of the summit which would thus provide a future NVCR for H40). However, the H40 voucher collected in June 1958 by Mrs Fitzgerald was misidentified *M. adusta*. The following sheet gives photocopies of the two herbarium packets and new *Determinavit* slips.

Three finds of *Marsupella adusta* made during the 1999 survey thus represent the first records to be reported from Northern Ireland of a species otherwise known in Ireland only from two montane sites (one each in South Kerry and West Mayo: Blockeel & Long 1998). Since it is a very small plant it has probably been overlooked, although on Dart Mountain it was misidentified as *M. sprucei* in the past.

The records of *M. adusta* made in 1999 were on rocks around the summit of Dart Mountain (in H36 at H 602963 voucher DTH 99-698, and H40 at H 602963 voucher DTH 99-697) and on the undercliff at Fair Head, H39 (at H 602963 voucher DTH 99-791). All voucher specimens were divided with part of the material lodged at BBSUK and part at BEL. The Dart Mountain plants grew on low outcrops of hard metamorphosed siliceous rock without any close associates at 600-610 m elevation, those at Fair Head on the side of a dolerite block mixed with *Gymnomitrium crenulatum* at < 100 m elevation on a partly shaded north-facing slope. Thanks are due to Mrs Jean Paton for confirming determinations of these specimens.

The list of NVCR for Hepaticae in *Bulletin of the British Bryological Society* **75**: 42 (2000) reports the NVCR for *Marsupella adusta* listed above and corrects the misidentified record of *M. sprucei* from H40. Unfortunately a potentially confusing error of mine in labelling DTH 99-698 is perpetuated in the published report: this specimen was from H36 not H40 (data on packets in BBSUK and BEL also needs amending to H36).





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