

Pillar and Ennerdale SSSI

Survey of National Vegetation Classification Communities



A report by
Rigby Jerram
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Rigby Jerram Ecological
Consultants
93 Serpentine Road
Kendal
Cumbria
LA9 4PD
Tel & Fax: 01539 726618
e-mail:
rigby@rjaecology.freeserve.co.uk

Contents

<u>Introduction</u>	3
<u>Methods</u>	5
<u>Site Description</u>	6
<u>National Vegetation Classification Communities</u>	7
<u>H8e Calluna vulgaris – Ulex gallii heath Vaccinium myrtillus sub-community</u>	7
<u>H10c Calluna vulgaris – Erica cinerea heath</u> <u>Festuca ovina – Anthoxanthum odoratum sub-community</u>	7
<u>H12a Calluna vulgaris – Vaccinium myrtillus heath Calluna vulgaris sub-community</u>	8
<u>H12b Calluna vulgaris – Vaccinium myrtillus heath</u> <u>Vaccinium vitis-idaea – Cladonia impexa sub-community</u>	8
<u>H12c Calluna vulgaris – Vaccinium myrtillus heath</u> <u>Galium saxatile – Festuca ovina sub-community</u>	9
<u>H12c / H18a Calluna vulgaris – Vaccinium myrtillus heath /</u> <u>Vaccinium myrtillus – Deschampsia flexuosa heath</u>	9
<u>H21a Calluna vulgaris – Vaccinium myrtillus – Sphagnum capillifolium heath</u> <u>Calluna vulgaris – Pteridium aquilinum sub-community</u>	10
<u>M4 Carex rostrata – Sphagnum recurvum mire</u>	10
<u>M6b Carex echinata – Sphagnum recurvum/auriculatum mire</u> <u>Carex nigra – Nardus stricta sub-community</u>	11
<u>M6c Carex echinata – Sphagnum recurvum/auriculatum mire Juncus effusus sub-community</u>	11
<u>M10a Carex dioica – Pinguicula vulgaris mire</u> <u>Carex demissa – Juncus bulbosus/kochii sub-community</u>	12
<u>M11b Carex demissa – Saxifraga aizoides mire</u> <u>Cratoneuron commutatum – Eleocharis quinqueflora sub-community</u>	12
<u>M15 Scirpus cespitosus – Erica tetralix wet heath ledges</u>	13
<u>M15a Scirpus cespitosus – Erica tetralix wet heath Carex panicea sub-community</u>	13
<u>M15b Scirpus cespitosus – Erica tetralix wet heath typical sub-community</u>	14
<u>M15d Scirpus cespitosus – Erica tetralix wet heath Vaccinium myrtillus sub-community</u>	15
<u>M17a Scirpus cespitosus – Eriophorum vaginatum blanket mire</u> <u>Drosera rotundifolia – Sphagnum sub-community</u>	15
<u>M19 Calluna vulgaris – Eriophorum vaginatum blanket mire</u>	16
<u>M25b Molinia caerulea – Potentilla erecta mire Anthoxanthum odoratum sub-community</u>	16
<u>M31 Anthelia julacea – Sphagnum auriculatum spring</u>	17
<u>M32a Philonotis fontana – Saxifraga stellaris spring Sphagnum auriculatum sub-community</u>	17
<u>M32b Philonotis fontana – Saxifraga stellaris spring</u> <u>Montia fontana – Chrysosplenium oppositifolium sub-community</u>	17
<u>S9b Carex rostrata swamp Menyanthes trifoliata – Equisetum fluviatile sub-community</u>	18
<u>U4a Festuca ovina – Agrostis capillaris – Galium saxatile grassland typical sub-community</u>	18
<u>U4b Festuca ovina – Agrostis capillaris – Galium saxatile grassland</u> <u>Holcus lanatus – Trifolium repens sub-community</u>	18
<u>U4e Festuca ovina – Agrostis capillaris – Galium saxatile grassland</u> <u>Vaccinium myrtillus – Deschampsia flexuosa sub-community</u>	18
<u>U5a Nardus stricta – Galium saxatile grassland species-poor sub-community</u>	19
<u>U5b Nardus stricta – Galium saxatile grassland</u> <u>Agrostis canina – Polytrichum commune sub-community</u>	19
<u>U5d Nardus stricta – Galium saxatile grassland</u> <u>Calluna vulgaris – Danthonia decumbens sub-community</u>	19
<u>U5e Nardus stricta – Galium saxatile grassland Racomitrium lanuginosum sub-community</u>	20
<u>U6 Juncus squarrosus – Festuca ovina grassland</u>	20
<u>U10a Carex bigelowii – Racomitrium lanuginosum moss-heath Galium saxatile sub-community</u> ..	20

U16c	Luzula sylvatica – Vaccinium myrtillus tall-herb community species-poor sub-community	21
U17	Luzula sylvatica – Geum rivale tall-herb community	21
U19	Thelypteris limbosperma – Blechnum spicant community	22
U20a	Pteridium aquilinum – Galium saxatile community	
	Anthoxanthum odoratum sub-community	22
U21	Cryptogramma crista – Deschampsia flexuosa community	23
	Racomitrium talus	23
	Scree	23
W17b	Quercus petraea – Betula pubescens – Dicranum majus woodland typical sub-community	23
	References	25

Introduction

The Pillar and Ennerdale fells form part of the Lake District High Fells candidate Special Area of Conservation proposed under the European Habitats and Species Directive. The SAC has been proposed because it contains representative examples of several of the vegetation communities of European importance listed in the Habitats Directive. This survey has been undertaken to accurately map the distribution of those communities which form the SAC features of interest (Table 1). Accurate mapping of these vegetation communities will aid the protection and management of the features of interest for which the site has been proposed as a SAC.

Table 1 Lake District High Fells cSAC features and their relationship to the National Vegetation Classification communities (not all communities are present within Pillar and Ennerdale)	
Habitat Directive Type	NVC Type
Northern Atlantic wet heaths with <i>Erica tetralix</i>	M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath
	M16 <i>Erica tetralix</i> – <i>Sphagnum compactum</i> wet heath
Blanket bog	M1 <i>Sphagnum auriculatum</i> bog pools
	M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath
	M17 <i>Scirpus cespitosus</i> – <i>Eriophorum vaginatum</i> blanket mire
	M18 <i>Erica tetralix</i> – <i>Sphagnum papillosum</i> raised and blanket mire
	M19 <i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire
	M20 <i>Eriophorum vaginatum</i> blanket mire
Alkaline fens	M9 <i>Carex rostrata</i> – <i>Calliargon cuspidatum/giganteum</i> mire
	M10 <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire
	M11 <i>Carex demissa</i> – <i>Saxifraga aizoides</i> mire
European dry heaths	H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath
	H12 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath
	H18 <i>Vaccinium myrtillus</i> – <i>Deschampsia flexuosa</i> heath
Alpine and boreal heaths	H13 <i>Calluna vulgaris</i> – <i>Cladonia arbuscula</i> heath
	H14 <i>Calluna vulgaris</i> – <i>Racomitrium lanuginosum</i> heath
	H15 <i>Calluna vulgaris</i> – <i>Juniperus communis</i> heath
	H17 <i>Calluna vulgaris</i> – <i>Arctostaphylos alpinus</i> heath
	H19 <i>Vaccinium myrtillus</i> – <i>Cladonia arbuscula</i> heath
Siliceous alpine and boreal grasslands	U7 <i>Nardus stricta</i> – <i>Carex bigelowii</i> grass heath
	U10 <i>Carex bigelowii</i> – <i>Racomitrium lanuginosum</i> moss heath

Table 1 Lake District High Fells cSAC features and their relationship to the National Vegetation Classification communities (not all communities are present within Pillar and Ennerdale)	
Habitat Directive Type	NVC Type
Species-rich <i>Nardus</i> grassland on siliceous substrates in mountain areas	CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland CG11 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Alchemilla alpina</i> grassland U4c <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland <i>Lathyrus montanus</i> – <i>Stachys betonica</i> sub-community U5c <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland <i>Carex panicea</i> – <i>Viola riviniana</i> sub-community
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	U17 <i>Luzula sylvatica</i> – <i>Geum rivale</i> tall herb community
Siliceous rocky slopes with chasmophytic vegetation	U21 <i>Cryptogramma crispa</i> – <i>Deschampsia flexuosa</i> community
Calcareous rocky slopes with chasmophytic vegetation	OV39 <i>Asplenium trichomanes</i> – <i>Asplenium ruta-muraria</i> community OV40 <i>Asplenium viride</i> – <i>Cystopteris fragilis</i> community U15 <i>Saxifraga aizoides</i> – <i>Alchemilla glabra</i> banks
Siliceous scree of the montane to snow levels	U21 <i>Cryptogramma crispa</i> – <i>Deschampsia flexuosa</i> community
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	W11 <i>Quercus petraea</i> – <i>Betula pubescens</i> – <i>Oxalis acetosella</i> woodland W17 <i>Quercus petraea</i> – <i>Betula pubescens</i> – <i>Dicranum majus</i> woodland
<i>Juniperus communis</i> formations on heaths or calcareous grasslands	W19 <i>Juniperus communis</i> ssp <i>communis</i> – <i>Oxalis acetosella</i> woodland W21 <i>Crataegus monogyna</i> scrub

Methods

The vegetation was mapped using the National Vegetation Classification (Rodwell 1991 – 2000). Stands of homogeneous vegetation were identified and assigned to NVC communities and sub-communities. The extent of these stands was mapped onto 1:10,000 OS base maps. To ensure that vegetation types were assigned to the correct NVC communities five 2 x 2m quadrats were recorded in each vegetation type. In a few instances this did not prove possible due to the scarcity of the vegetation type. Where quadrats were recorded species abundance was recorded using the domin scale:

Domin score	Percentage ground cover
10	91-100%
9	76-90
8	51-75
7	34-50
6	26-33
5	11-25
4	4-10
3	} many individuals
2	<4 } several individuals
1	} few individuals

Constancy tables are presented for the communities recorded.

Site Description

The Pillar and Ennerdale site covers the southern side of the Ennerdale valley above the forest boundary, from Sail Beck at the eastern end to the north-western slopes of Crag Fell at the western end of Ennerdale Water. The southern boundary of the site more-or-less follows the watershed, incorporating the summits of Pillar, the Scoat Fells, Steeple, Haycock, Iron Crag and Crag Fell, with its highest point on Pillar at 892m. The eastern half of the site is composed of Borrowdale Volcanic rocks and has characteristically steep craggy slopes, whilst the western part is underlain by granite and here the fells have smoother profiles with relatively shallower slopes.

These geological and topographical differences are reflected in the vegetation. The steep craggy ground to the east is largely covered by acid grasslands, with U5b *Nardus stricta* – *Galium saxatile* grassland *Agrostis canina* – *Polytrichum commune* sub-community, U4a *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland typical sub-community and U4e *Vaccinium myrtillus* – *Deschampsia flexuosa* sub-community, together with a grassy heath community intermediate between H12c *Calluna vulgaris* – *Vaccinium myrtillus* heath *Galium saxatile* – *Festuca ovina* sub-community and H18a *Vaccinium myrtillus* – *Deschampsia flexuosa* heath *Hylocomium splendens* – *Rhytidiadelphus loreus* sub-community. The ledges and crags here support stands of heath, mainly H12a *Calluna* – *Vaccinium* heath *Calluna vulgaris* sub-community, but also, on lower ground, H10c *Calluna vulgaris* – *Erica cinerea* heath *Festuca ovina* – *Anthoxanthum odoratum* sub-community. Some ledges also support the U16 *Luzula sylvatica* – *Vaccinium myrtillus* tall-herb community and a few the U17 *Luzula sylvatica* – *Geum rivale* tall-herb community. Flushes are frequent on these slopes and where the waters a relatively base-poor M15 *Scirpus cespitosus* – *Erica tetralix* mire and, less commonly, M6b *Carex echinata* – *Sphagnum recurvum/auriculatum* mire *Carex nigra* sub-community mires are present, the former often found on flushed slabs. Where there is some base-enrichment of the irrigating waters from calcitic veins in the Borrowdale Volcanics M10a *Carex dioica* – *Pinguicula vulgaris* mire *Carex demissa* – *Juncus bulbosus/kochii* sub-community flushes are present. The summit ridge supports stands of montane grassland and heath, U10a *Carex bigelowii* – *Racomitrium lanuginosum* moss-heath *Galium saxatile* sub-community, or, more commonly, a degraded form of this which is intermediate between the latter community and U4e *Festuca* – *Agrostis* – *Galium* grassland *Vaccinium* – *Deschampsia* sub-community. Scree slopes and boulder fields are frequent on these steep rocky slopes and here the U21 *Cryptogramma crispera* – *Deschampsia flexuosa* community and carpets of *Racomitrium lanuginosum* are found.

The less rugged ground of the eastern part of the site is characterised by extensive areas of dry heath, mainly H12 *Calluna* – *Vaccinium* heath, but on lower ground and the crags of Crag Fell, H10 *Calluna* – *Erica* heath. Stands of wet heath (M15b *Scirpus* – *Erica* wet heath typical sub-community and locally the M15d *Vaccinium myrtillus* sub-community) can be frequent within this and in some places forms extensive stands. M6b *Carex* – *Sphagnum* mire *Carex nigra* sub-community, M10a *Carex* – *Pinguicula* mire *Carex* – *Juncus* sub-community and M15a *Scirpus* – *Erica* wet heath *Carex panicea* sub-community flushes are present throughout this heath. The summits here support a range of communities, including the U4e *Festuca* – *Agrostis* – *Galium* grassland *Vaccinium* – *Deschampsia* sub-community / U10 *Carex bigelowii* – *Racomitrium lanuginosum* moss-heath intermediate community and H12b *Calluna* – *Vaccinium* heath *Vaccinium vitis-idaea* – *Cladonia impexa* sub-community, as well as areas of U5 *Nardus* – *Galium* grassland. The lower slopes of this area support extensive stands of bracken (U20a *Pteridium aquilinum* – *Galium saxatile* community *Anthoxanthum odoratum* sub-community) and, along the edge of Ennerdale Water, a large area of W17 *Quercus petraea* – *Betula pubescens* – *Dicranum scoparium* woodland.

A notable feature of the site is the presence, in a single spring/flush at the head of Silver Cove Beck, of the M31 *Anthelia julacea* – *Sphagnum auriculatum* spring community.

National Vegetation Classification Communities

H8e *Calluna vulgaris* – *Ulex gallii* heath *Vaccinium myrtillus* sub-community

A single stand of *Calluna* – *Ulex gallii* heath was found within Pillar and Ennerdale, located on the crags of Ben Gill around the waterfall. *Ulex gallii* is abundant, with frequent *Calluna* and *Erica cinerea* and occasional *Vaccinium myrtillus*. Grasses are common at low cover and there is a scattering of bryophytes.

H8e Species	P116
<i>Ulex gallii</i>	8
<i>Calluna vulgaris</i>	6
<i>Erica cinerea</i>	6
<i>Hylocomium splendens</i>	4
<i>Deschampsia flexuosa</i>	3
<i>Agrostis capillaris</i>	2
<i>Festuca ovina</i>	2
<i>Rhytidiadelphus squarrosus</i>	2
<i>Vaccinium myrtillus</i>	2
<i>Pteridium aquilinum</i>	1
No. species per sample	10

H10c *Calluna vulgaris* – *Erica cinerea* heath *Festuca ovina* – *Anthoxanthum odoratum* sub-community

This slightly grassy heath is present on crags and rock outcrops at lower altitudes, generally below 350m. *Calluna* tends to dominate, with frequent to abundant *Erica cinerea* amongst it. *Vaccinium myrtillus* is also constant, usually as an understorey. Stands tend to be open and grasses (*Deschampsia*, *Festuca* and *Agrostis*) are common amongst the dwarf-shrubs. Bryophytes, particularly *Hypnum cupressiforme* and *Hylocomium splendens* frequently form small patches on the ground and dwarf-shrub stems.

H10c Species	P029	P112	P113	P117	P135	P136	P137	Constancy
<i>Calluna vulgaris</i>	8	7	8	9	7	8	8	V
<i>Erica cinerea</i>	6	8	7	5	5	7	6	V
<i>Deschampsia flexuosa</i>	3		2	3		3	3	IV
<i>Festuca ovina</i>	3			2	3	2	2	IV
<i>Hypnum cupressiforme</i>	3	4	5		2	4		IV
<i>Vaccinium myrtillus</i>			4	3	2	5	4	IV
<i>Agrostis capillaris</i>	2				2	2	2	III
<i>Hylocomium splendens</i>			3	2	2	4		III
<i>Potentilla erecta</i>	2	2			2		2	III
<i>Danthonia decumbens</i>						2	2	II
<i>Polygala serpyllifolia</i>					2		2	II
<i>Pteridium aquilinum</i>					2		2	II
<i>Sorbus aucuparia</i>		1					1	II
<i>Carex binervis</i>	2							I
<i>Cladonia impexa</i>				4				I
<i>Dicranum scoparium</i>					4			I
<i>Empetrum nigrum</i>				4				I
<i>Galium saxatile</i>					2			I
<i>Oreopteris limbosperma</i>						4		I
<i>Rhytidiadelphus loreus</i>				4				I
<i>Rhytidiadelphus squarrosus</i>				3				I
<i>Solidago virgaurea</i>	1							I
No. species per sample	9	5	6	10	12	10	11	

H12a *Calluna vulgaris* – *Vaccinium myrtillus* heath *Calluna vulgaris* sub-community

This heath covers extensive areas on ground below 500m west of Steeple. It is also present as smaller stands on the crags to the east. *Calluna* is dominant, with an understorey of frequent *Vaccinium myrtillus*. Bryophytes are generally abundant, notably *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Hypnum cupressiforme*. *Deschampsia flexuosa* is also constant, but at low cover.

H12a Species	P020	P067	P077	P078	P097	Constancy
<i>Calluna vulgaris</i>	8	9	10	9	9	V
<i>Deschampsia flexuosa</i>	2	3	2	3	2	V
<i>Rhytidiadelphus loreus</i>	3	2	5	6	6	V
<i>Vaccinium myrtillus</i>	6	3	2	2	3	V
<i>Hylocomium splendens</i>		5	5		4	III
<i>Hypnum cupressiforme</i>	4		6	7		III
<i>Galium saxatile</i>	2			2		II
<i>Plagiothecium undulatum</i>	2				4	II
<i>Polytrichum commune</i>		5	2			II
<i>Diplophyllum albicans</i>	4					I
<i>Empetrum nigrum</i>				4		I
<i>Pleurozium schreberi</i>			2			I
<i>Potentilla erecta</i>	4					I
<i>Rhytidiadelphus squarrosus</i>		2				I
<i>Solidago virgaurea</i>	2					I
<i>Sphagnum quinquefarium</i>	5					I
<i>Thuidium tamariscinum</i>					4	I
No. species per sample	11	7	8	7	7	

H12b *Calluna vulgaris* – *Vaccinium myrtillus* heath *Vaccinium vitis-idaea* – *Cladonia impexa* sub-community

This community is largely confined to the ridge top above Iron Crag and is not present below 500m. It is characterised by a low, wind-clipped sward dominated by *Calluna*, with frequent *Carex pilulifera*, *Cladonia impexa*, *Festuca ovina*, *Nardus stricta* and *Racomitrium lanuginosum*, all generally at low cover. *Hypnum cupressiforme* is the only constant, other than *Calluna*, to contribute significant cover. This community is distinguished from the otherwise similar H12c community below, by the constancy of *Cladonia impexa* and *Racomitrium*.

H12b Species	P103	P104	P105	P106	P107	Constancy
<i>Calluna vulgaris</i>	10	9	10	10	9	V
<i>Carex pilulifera</i>	2	3	3	3	3	V
<i>Cladonia impexa</i>	1	2	1	1	1	V
<i>Festuca ovina</i>	2	3	3	3	3	V
<i>Hypnum cupressiforme</i>	4	5	4	4	5	V
<i>Vaccinium myrtillus</i>	2	2	3	3	2	V
<i>Nardus stricta</i>	2	1		2		III
<i>Racomitrium lanuginosum</i>			4	2	4	III
<i>Galium saxatile</i>	2	2				II
<i>Agrostis capillaris</i>				2		I
<i>Cladonia furcata</i>		2				I
<i>Dicranum scoparium</i>			4			I
<i>Empetrum nigrum</i>		4				I
<i>Huperzula selago</i>		1				I
<i>Hylocomium splendens</i>				3		I
<i>Potentilla erecta</i>					1	I
No. species per sample	8	11	8	10	8	

**H12c *Calluna vulgaris* – *Vaccinium myrtillus* heath
Galium saxatile – *Festuca ovina* sub-community**

This community is generally found as patches of grassy heath, either amongst more extensive stands of the H12a *Calluna* sub-community, or as more heathy areas amongst areas where grassland predominates. However at the northern end of Lingmell a large area of this vegetation is found at the main stock access point to this area of fell due to localised heavy grazing.

The vegetation is generally composed of abundant *Calluna* with frequent *Vaccinium myrtillus*, *Agrostis capillaris*, *Nardus stricta*, *Festuca ovina*, *Carex pilulifera*, *Galium saxatile* and mosses such as *Rhytidiadelphus loreus*, *Hypnum cupressiforme* and *Polytrichum commune*. In some stands however the relative abundances of *Calluna* and *Vaccinium* are reversed, and where *Calluna* becomes scarce or even absent this community grades into the H12c/H18a community described below.

H12c Species	P007	P064	P098	P102	P108	P110	Constancy
<i>Calluna vulgaris</i>	4	9	8	8	8	9	V
<i>Vaccinium myrtillus</i>	7	2	2	3	3	3	V
<i>Agrostis capillaris</i>	3	4	3	2		2	V
<i>Nardus stricta</i>	1		4	5	5	5	V
<i>Rhytidiadelphus loreus</i>	2		4	4	4	4	V
<i>Carex pilulifera</i>		3		2	2	2	IV
<i>Festuca ovina</i>	3		5	3		3	IV
<i>Galium saxatile</i>	3		3	4	2		IV
<i>Hypnum cupressiforme</i>		4		4	4	3	IV
<i>Polytrichum commune</i>	7	3		2	2		IV
<i>Hylocomium splendens</i>	2	5	5				III
<i>Deschampsia flexuosa</i>	3	3					II
<i>Plagiothecium undulatum</i>	2	2					II
<i>Pleurozium schreberi</i>	2		4				II
<i>Potentilla erecta</i>	2		3				II
<i>Alchemilla alpina</i>	1						I
<i>Dicranum scoparium</i>					2		I
<i>Empetrum nigrum</i>			2				I
<i>Juncus squarrosus</i>					4		I
<i>Ptilidium ciliare</i>						2	I
<i>Thuidium tamariscinum</i>	2						I
No. species per sample	15	9	11	10	10	9	

**H12c / H18a *Calluna vulgaris* – *Vaccinium myrtillus* heath
Galium saxatile – *Festuca ovina* sub-community /
Vaccinium myrtillus – *Deschampsia flexuosa* heath
Hylocomium splendens – *Rhytidiadelphus loreus* sub-community**

Extensive stands of this grassy heath with abundant *Vaccinium myrtillus* and no *Calluna* is found on the steep mid and lower slopes of Pillar and Scoat Fell, and, at the western end of the site, below Revelin Crag. The grasses *Deschampsia flexuosa*, *Agrostis capillaris* and *Festuca ovina* are frequent to abundant, whilst mosses as a group are abundant and often constitute the majority of the cover, with *Polytrichum commune* and *Rhytidiadelphus loreus* being particularly abundant. The vegetation strongly resembles the H18a community, however here it largely occurs within the sub-montane zone and the latter community is described by Rodwell (1991b) as a community of the montane zone, hence attribution of this vegetation to a transitional community between the sub-montane H12c and montane H18a.

H12c/H18a Species	P001	P010	P011	P032	Constancy
<i>Agrostis capillaris</i>	3	4	5	5	4
<i>Deschampsia flexuosa</i>	7	3	5	3	4
<i>Festuca ovina</i>	3	2	2	2	4
<i>Galium saxatile</i>	3	4	3	3	4
<i>Hypnum cupressiforme</i>	3	4	2	3	4
<i>Polytrichum commune</i>	7	2	6	8	4
<i>Rhytidiadelphus loreus</i>	2	5	7	2	4
<i>Vaccinium myrtillus</i>	8	7	7	7	4
<i>Dicranum scoparium</i>	2		1	2	3
<i>Hylocomium splendens</i>	2	2	2		3
<i>Nardus stricta</i>			2	2	2
<i>Potentilla erecta</i>	3		1		2
<i>Rhytidiadelphus squarrosus</i>	3	3			2
<i>Anthoxanthum odoratum</i>				2	1
<i>Cryptogramma crispa</i>			1		1
<i>Luzula campestris</i>			2		1
<i>Plagiothecium undulatum</i>		2			1
<i>Pleurozium schreberi</i>	2				1
<i>Racomitrium lanuginosum</i>	1				1
No. species per sample	12	11	14	11	

H21a *Calluna vulgaris* – *Vaccinium myrtillus* – *Sphagnum capillifolium* heath *Calluna vulgaris* – *Pteridium aquilinum* sub-community

Small areas of *Calluna* – *Vaccinium* heath with a carpet of *Sphagnum quinquefarium* and/or *S. capillifolium* and other bryophytes such as *Polytrichum commune*, *Dicranum scoparium*, *Rhytidiadelphus loreus* and *Diplophyllum albicans* are present occasionally on the lower crags below Pillar, the lower slopes of The Side and on Revelin Crag. Such stands are confined to humid situations and steep slopes.

H21a Species	P062	P063	P123	Constancy
<i>Calluna vulgaris</i>	5	7	8	3
<i>Deschampsia flexuosa</i>	3	3	3	3
<i>Sphagnum quinquefarium</i>	8	7	4	3
<i>Vaccinium myrtillus</i>	6	5	3	3
<i>Dicranum scoparium</i>	2		2	2
<i>Festuca ovina</i>	2		2	2
<i>Polytrichum commune</i>	5	4		2
<i>Rhytidiadelphus loreus</i>	4	4		2
<i>Sphagnum capillifolium</i>		5	6	2
<i>Blechnum spicant</i>	2			1
<i>Diplophyllum albicans</i>			4	1
<i>Galium saxatile</i>			2	1
<i>Hylocomium splendens</i>	2			1
<i>Hypnum cupressiforme</i>		4		1
<i>Oxalis acetosella</i>	2			1
<i>Potentilla erecta</i>	2			1
<i>Racomitrium lanuginosum</i>			4	1
No. species per sample	12	8	10	

M4 *Carex rostrata* – *Sphagnum recurvum* mire

Stands of this valley mire and seepage zone community are confined to a few small stands on Tewit How. These mires are very wet and dominated by a carpet of *Sphagnum fallax* (*S. recurvum*) and/or *S. papillosum*, within which there is an open sward of *Carex rostrata* and frequent *Juncus bulbosus*. Other species tend to be scarce.

M4						
Species	P085	P086	P087	P088	P089	Constancy
<i>Carex rostrata</i>	4	5	4	3	5	V
<i>Juncus bulbosus</i>	3	2	3	3	3	V
<i>Sphagnum fallax</i>	9	10	9	3	5	V
<i>Polytrichum commune</i>			2	3		II
<i>Sphagnum papillosum</i>			5	9		II
<i>Empetrum nigrum</i>				2		I
<i>Eriophorum angustifolium</i>				3		I
<i>Menyanthes trifoliata</i>					1	I
<i>Sphagnum capillifolium</i>				2		I
<i>Sphagnum denticulatum</i>					4	I
No. species per sample	3	3	5	8	5	

**M6b *Carex echinata* – *Sphagnum recurvum/auriculatum* mire
Carex nigra – *Nardus stricta* sub-community**

This is a community of base-poor flushes present usually as small stands at moderately high to high altitudes across the site. Sphagna are abundant, often forming a carpet, with *Sphagnum denticulatum* (*S. auriculatum*), *S. fallax* (*S. recurvum*), *S. subsecundum* and *S. papillosum* all common. Within this there is an open sward of short sedges, grasses and other graminoids, particularly *Carex echinata*, *C. panicea*, *Eriophorum angustifolium*, *Narthecium ossifragum* and *Nardus stricta*.

M6b						
Species	P093	P094	P099	P100	P109	Constancy
<i>Carex echinata</i>	4	6	7	8	3	V
<i>Eriophorum angustifolium</i>	3	3	3	3	3	V
<i>Nardus stricta</i>		1	2	3	2	IV
<i>Narthecium ossifragum</i>	4	3	2		3	IV
<i>Carex panicea</i>			1	3	2	III
<i>Polytrichum commune</i>			3	3	2	III
<i>Sphagnum denticulatum</i>	8	8			10	III
<i>Potentilla erecta</i>			2	2		II
<i>Sphagnum fallax</i>			3	6		II
<i>Sphagnum papillosum</i>			7	5		II
<i>Sphagnum subsecundum</i>	6	5				II
<i>Agrostis capillaris</i>				2		I
<i>Drosera rotundifolia</i>					2	I
<i>Rhytiadelphus loreus</i>				2		I
<i>Trichophorum cespitosum</i>					2	I
<i>Vaccinium myrtillus</i>				1		I
<i>Viola palustris</i>			4			I
No. species per sample	5	6	10	11	9	

**M6c *Carex echinata* – *Sphagnum recurvum/auriculatum* mire
Juncus effusus sub-community**

This is a rare community within the SSSI, only recorded in two small groups of flushes. It is characterised by a carpet of *Sphagnum fallax* (*S. recurvum*) and *Polytrichum commune* below a sward of *Juncus effusus*.

M6c	
Species	P115
<i>Sphagnum fallax</i>	10
<i>Juncus effusus</i>	3
<i>Agrostis capillaris</i>	2
<i>Carex echinata</i>	2
<i>Nardus stricta</i>	2
<i>Polytrichum commune</i>	2
<i>Potentilla erecta</i>	1
No. species per sample	7

M10a *Carex dioica* – *Pinguicula vulgaris* mire
***Carex demissa* – *Juncus bulbosus/kochii* sub-community**

M10a Species	P018	P023	P092	P095	P111	Constancy
<i>Aneura pinguis</i>	3	4	2	2	2	V
<i>Campyllum stellatum</i>	3	2	2	6	2	V
<i>Carex viridula oedocarpa</i>	5	6	7	6	3	V
<i>Nardus stricta</i>	3		4	4	2	IV
<i>Carex dioica</i>		3	2	3		III
<i>Carex panicea</i>			6	4	4	III
<i>Festuca ovina</i>	3	6		3		III
<i>Juncus bulbosus</i>			2	3	3	III
<i>Scapania undulata</i>	2	2			2	III
<i>Cratoneuron commutatum</i>			5	5		II
<i>Drepanocladus revolvens</i>				2	6	II
<i>Euphrasia officinalis</i>	2			1		II
<i>Saxifraga stellaris</i>	1	3				II
<i>Selaginella selaginoides</i>			2	2		II
<i>Agrostis capillaris</i>					2	I
<i>Alchemilla alpina</i>	2					I
<i>Bryum pseudotriquetrum</i>		4				I
<i>Campanula rotundifolia</i>				2		I
<i>Carex echinata</i>					2	I
<i>Carex hostiana</i>	1					I
<i>Danthonia decumbens</i>				2		I
<i>Deschampsia cespitosa</i>		4				I
<i>Diplophyllum albicans</i>		3				I
<i>Eriophorum angustifolium</i>					3	I
<i>Fissidens</i> sp				2		I
<i>Juncus squarrosus</i>			4			I
<i>Luzula campestris</i>		1				I
<i>Narthecium ossifragum</i>			2			I
<i>Pinguicula vulgaris</i>	2					I
<i>Potentilla erecta</i>				2		I
<i>Racomitrium lanuginosum</i>			4			I
<i>Rumex acetosa</i>		4				I
<i>Trichophorum cespitosum</i>					2	I
<i>Sphagnum denticulatum</i>	3					I
<i>Sphagnum tenellum</i>	4					I
<i>Taraxacum officinalis</i>	2					I
<i>Thalictrum alpinum</i>	2					I
<i>Thymus polytrichus</i>				2		I
<i>Vaccinium myrtillus</i>	2					I
<i>Viola riviniana</i>	1					I
No. species per sample	17	12	12	17	12	

This is a short sedge mire community of base-enriched flushes and seepages. *Carex viridula* ssp *oedocarpa* (*C. demissa*), *C. dioica*, *C. panicea*, *Festuca ovina*, *Juncus bulbosus* and *Nardus stricta* are frequent to abundant, forming a closed sward, within which a range of bryophytes are common, though only occasionally contributing significant cover, including *Aneura pinguis*, *Campyllum stellatum*, *Scapania undulata*, *Cratoneuron commutatum* and *Drepanocladus revolvens*.

M11b *Carex demissa* – *Saxifraga aizoides* mire
***Cratoneuron commutatum* – *Eleocharis quinqueflora* sub-community**

A single stony flush with affinities with this community was found near Black Sail Pass. The vegetation, which consists of a very open sward of sedges, short rushes and grasses, with scattered bryophytes over a stony substrate, is also close to the M10a *Carex dioica* – *Pinguicula vulgaris* mire community above.

M11b	
Species	P028
Carex dioica	3
Carex flacca	3
Carex viridula oedocarpa	3
Festuca ovina	3
Juncus bulbosus	3
Saxifraga stellaris	3
Campylium stellatum	2
Drepanocladus revolvens	2
Juncus articulatus	2
Nardus stricta	2
Selaginella selaginoides	2
Pinguicula vulgaris	1
No. species per sample	12

M15 *Scirpus cespitosus* – *Erica tetralix* wet heath ledges

M15 ledges						
Species	P008	P009	P012	P021	P022	Constancy
Campylopus atrovirens	5	5	5	4	4	V
Trichophorum cespitosum	3	3	4	3	2	V
Sphagnum denticulatum	8	5	5	4	5	V
Sphagnum papillosum	2	5	4	5	4	V
Succisa pratensis	4	1	1	1	1	V
Calluna vulgaris	4	6		2	5	IV
Selaginella selaginoides		1	2	2	2	IV
Sphagnum tenellum		5	4	5	4	IV
Deschampsia flexuosa			2	2	3	III
Festuca ovina			2	3	4	III
Potentilla erecta	3			2	2	III
Agrostis capillaris	2		2			II
Carex viridula oedocarpa	1			2		II
Molinia caerulea		1			2	II
Narthecium ossifragum		2	2			II
Pinguicula vulgaris	2			1		II
Racomitrium fasciculare	2		6			II
Racomitrium lanuginosum				4	4	II
Solidago virgaurea				2	3	II
Vaccinium myrtillus				1	2	II
Blechnum spicant		1				I
Breutelia chrysocoma	4					I
Carex binervis					1	I
Nardus stricta				4		I
Oreopteris limbosperma	1					I
Polytrichum commune				2		I
No. species per sample	13	11	12	18	16	

This vegetation, mapped as M15, occurs on more-or-less continuously irrigated slabs and wet ledges on the crags below Pillar and Scoat Fell. It often has the form of pillows of *Sphagnum* oozing or dripping over slabs of rock with scattered plants of other species present in fissures in the slabs. The principal Sphagna are *Sphagnum denticulatum*, *S. papillosum* and *S. tenellum*. *Campylopus atrovirens* also forms frequent cushions. *Trichophorum cespitosum* (*Scirpus cespitosus*) is always frequent and can be moderately abundant and bushes of *Calluna* are usually present. Two other constants are *Succisa pratensis* and *Selaginella selaginoides*. A wide range of other flush and ledge species can also be present.

M15a *Scirpus cespitosus* – *Erica tetralix* wet heath *Carex panicea* sub-community

This is a community of flushes where the irrigating waters are very modestly base-enriched. The sward is often quite open, composed of short sedges, rushes and affiliates, such as *Carex panicea*, *C. viridula* ssp *oedocarpa*, *Trichophorum cespitosum* (*Scirpus cespitosus*), *Juncus bulbosus*, *Molinia caerulea*, *Narthecium ossifragum* and *Rhynchospora alba*. *Erica tetralix* and herbs such as *Potentilla*

erecta and *Pedicularis sylvatica* are also regular components. Bryophytes are also a feature of the vegetation, but only *Breutelia chrysocoma* occurs with any regularity, however Sphagna, notably *Sphagnum denticulatum*, can be abundant in stands. These flushes appear to be confined to the slopes of The Side and Crag Fell.

M15a				
Species	P126	P129	P132	Constancy
<i>Carex panicea</i>	3	3	3	3
<i>Drosera rotundifolia</i>	2	3	3	3
<i>Erica tetralix</i>	2	2	3	3
<i>Narthecium ossifragum</i>	3	3	3	3
<i>Potentilla erecta</i>	2	2	2	3
<i>Trichophorum cespitosum</i>	2	3	2	3
<i>Breutelia chrysocoma</i>		4	2	2
<i>Carex viridula oedocarpa</i>		3	3	2
<i>Juncus bulbosus</i>	3		3	2
<i>Molinia caerulea</i>		3	3	2
<i>Pedicularis sylvestris</i>		1	3	2
<i>Rhynchospora alba</i>		2	3	2
<i>Bryum pseudotriquetrum</i>		4		1
<i>Campylopus atrovirens</i>			2	1
<i>Carex echinata</i>	3			1
<i>Danthonia decumbens</i>	2			1
<i>Drepanocladus revolvens</i>			2	1
<i>Euphrasia officinalis</i>		1		1
<i>Juncus articulatus</i>		2		1
<i>Juncus squarrosus</i>	2			1
<i>Nardus stricta</i>	2			1
<i>Polygala serpyllifolia</i>	3			1
<i>Racomitrium lanuginosum</i>			2	1
<i>Sphagnum denticulatum</i>	8			1
<i>Sphagnum innundatum</i>		2		1
<i>Sphagnum subsecundum</i>			4	1
<i>Succisa pratensis</i>			2	1
No. species per sample	13	15	17	

M15b *Scirpus cespitosus* – *Erica tetralix* wet heath typical sub-community

M15b					
Species	P057	P059	P068	P076	Constancy
<i>Eriophorum angustifolium</i>	3	3	3	3	4
<i>Narthecium ossifragum</i>	3	3	3	3	4
<i>Trichophorum cespitosum</i>	7	5	4	3	4
<i>Erica tetralix</i>		5	3	5	3
<i>Molinia caerulea</i>	3	3	3		3
<i>Nardus stricta</i>		2	2	3	3
<i>Sphagnum papillosum</i>	7	6	8		3
<i>Sphagnum tenellum</i>		5	2	5	3
<i>Calluna vulgaris</i>			8	4	2
<i>Drosera rotundifolia</i>	1	2			2
<i>Sphagnum capillifolium</i>	5			5	2
<i>Sphagnum denticulatum</i>		7		8	2
<i>Carex echinata</i>				3	1
<i>Carex panicea</i>				2	1
<i>Juncus bulbosus</i>		3			1
<i>Juncus squarrosus</i>			2		1
<i>Polygala serpyllifolia</i>	1				1
<i>Polytrichum commune</i>	4				1
<i>Potentilla erecta</i>	3				1
No. species per sample	10	11	10	11	

This wet heath community is widespread over the Ennerdale fells, present in the form of small valley mires and covering more extensive tracts, as on the slopes of The Side. These mires are wet and,

where the peat deepens, grade into stands of M17a *Scirpus – Eriophorum* mire. A carpet of *Sphagna* is always present, composed of a combination of *Sphagnum papillosum*, *S. tenellum*, *S. capillifolium* and *S. denticulatum*. Over this there is an open sward of *Trichophorum cespitosum* (*Scirpus cespitosus*), *Eriophorum angustifolium*, *Narthecium ossifragum*, *Erica tetralix*, *Molinia caerulea* and *Nardus stricta*.

M15d *Scirpus cespitosus – Erica tetralix* wet heath *Vaccinium myrtillus* sub-community

This is a somewhat drier wet heath community than the M15b typical sub-community, and could be regarded as either a degraded form of this wet heath or as a transitional community to a dry heath community such as the H12 *Calluna – Vaccinium* heath. It is characterised by the dominance of *Calluna*, a species which is scarce in other M15 sub-communities, plus frequent, but at modest cover, *Erica tetralix* and *Trichophorum cespitosum* (*Scirpus cespitosus*). Hypnaceous mosses, particularly *Hypnum cupressiforme*, are abundant below the canopy of *Calluna*. *Sphagna* are notably absent and stands tend to be relatively species-poor.

M15d mire						
Species	P065	P066	P071	P074	P075	Constancy
<i>Calluna vulgaris</i>	9	9	10	10	10	V
<i>Trichophorum cespitosum</i>	4	4	4	3	3	V
<i>Erica tetralix</i>	2	2		3	3	IV
<i>Hypnum cupressiforme</i>	5		9	7	7	IV
<i>Deschampsia flexuosa</i>	3	3				II
<i>Dicranum scoparium</i>		4			4	II
<i>Hylocomium splendens</i>		5			4	II
<i>Potentilla erecta</i>			3	3		II
<i>Vaccinium myrtillus</i>	3	3				II
<i>Agrostis capillaris</i>	4					I
<i>Carex echinata</i>	2					I
<i>Carex pilulifera</i>	3					I
<i>Dicranella heteromalla</i>	2					I
<i>Plagiothecium undulatum</i>	3					I
<i>Polytrichum commune</i>	4					I
<i>Racomitrium lanuginosum</i>				4		I
No. species per sample	12	7	4	6	6	

M17a *Scirpus cespitosus – Eriophorum vaginatum* blanket mire *Drosera rotundifolia – Sphagnum* sub-community

M17a							
Species	P060	P061	P069	P070	P072	P073	Constancy
<i>Eriophorum vaginatum</i>	6	7	5	5	4	4	V
<i>Sphagnum papillosum</i>	8	8	8	8	9	5	V
<i>Narthecium ossifragum</i>		3	3	2	3	2	V
<i>Trichophorum cespitosum</i>	2	4		2	3	2	V
<i>Calluna vulgaris</i>			7	9	4	9	IV
<i>Erica tetralix</i>		2	2	2	5		IV
<i>Eriophorum angustifolium</i>	3		3		3	2	IV
<i>Hypnum cupressiforme</i>			4	4		5	III
<i>Polytrichum commune</i>	2	2	2				III
<i>Sphagnum capillifolium</i>			5	2		7	III
<i>Juncus squarrosus</i>	1	2					II
<i>Molinia caerulea</i>	3	3					II
<i>Nardus stricta</i>	2	2					II
<i>Potentilla erecta</i>	3				2		II
<i>Carex echinata</i>	3						I
<i>Drosera rotundifolia</i>					3		I
<i>Rhytidiadelphus loreus</i>						4	I
<i>Viola palustris</i>	2						i
No. species per sample	11	9	9	8	9	9	

Small stands of this community are present on pockets of deep peat throughout the site, but more commonly on the less craggy western half. It is present not only as small areas of blanket mire, but also in valley mires. The vegetation is characterised by the presence of tussocks of *Eriophorum vaginatum* with a matrix of *Sphagnum papillosum* and *S. capillifolium*. *Calluna* is usually present, and can be very abundant, whilst *Erica tetralix*, also a constant tends to occur as scattered plants. *Eriophorum angustifolium*, *Trichophorum cespitosum* (*Scirpus cespitosus*) and *Narthecium* are also constant in this community.

M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire

This blanket mire community is present on what for blanket mire is relatively shallow peat on a gentle to moderately steep slope west of Revelin Crag. The vegetation appears to be a slightly degraded form of this community and does not fit well into any of the sub-communities. The sward is composed of tussocks of *Eriophorum vaginatum*, with frequent *Vaccinium myrtillus*, *Calluna* and *Deschampsia flexuosa*. Bryophytes are frequent to locally abundant, with *Sphagnum capillifolium*, *S. papillosum* and *Polytrichum commune* the most abundant species.

M19						
Species	P118	P119	P120	P121	P122	Constancy
<i>Deschampsia flexuosa</i>	3	3	3	3	3	V
<i>Eriophorum vaginatum</i>	8	6	5	7	5	V
<i>Polytrichum commune</i>	4	4	2	2	5	V
<i>Vaccinium myrtillus</i>	3	3	2	3	3	V
<i>Calluna vulgaris</i>	6		6	6	7	IV
<i>Rhytiadelphus loreus</i>	5		4	6	5	IV
<i>Sphagnum capillifolium</i>	4	4	7		5	IV
<i>Carex nigra</i>			2	2	2	III
<i>Empetrum nigrum</i>			2	3	2	III
<i>Hylocomium splendens</i>	3	4		3		III
<i>Erica tetralix</i>		1	3			II
<i>Galium saxatile</i>		2		2		II
<i>Sphagnum papillosum</i>		8	2			II
<i>Cladonia impexa</i>			1			I
<i>Eriophorum angustifolium</i>				2		I
<i>Juncus squarrosus</i>			2			I
<i>Pleurozium schreberi</i>			4			I
<i>Potentilla erecta</i>		1				I
No. species per sample	8	10	14	11	9	

M25b *Molinia caerulea* – *Potentilla erecta* mire *Anthoxanthum odoratum* sub-community

M25b			
Species	P133	P134	Constancy
<i>Agrostis capillaris</i>	2	3	2
<i>Anthoxanthum odoratum</i>	2	2	2
<i>Festuca ovina</i>	6	3	2
<i>Molinia caerulea</i>	8	7	2
<i>Plantago lanceolata</i>	5	3	2
<i>Potentilla erecta</i>	3	3	2
<i>Calluna vulgaris</i>		1	1
<i>Carex flacca</i>		2	1
<i>Centaurea nigra</i>	2		1
<i>Danthonia decumbens</i>		2	1
<i>Euphrasia officinalis</i>	2		1
<i>Holcus lanatus</i>		2	1
<i>Leontodon autumnalis</i>	2		1
<i>Lotus corniculatus</i>		4	1
<i>Pimpinella saxifraga</i>		2	1
<i>Pteridium aquilinum</i>		2	1
<i>Succisa pratensis</i>	2		1
No. species per sample	10	13	

This grassy flush community is present along a short section of lakeshore path. *Molinia* tussocks are abundant, with frequent *Agrostis capillaris*, *Anthoxanthum*, *Festuca ovina*, *Potentilla erecta* and *Plantago lanceolata*. In addition to these constants a range of other herbs are present, including *Succisa*, *Euphrasia*, *Pimpinella saxifraga* and *Lotus corniculatus*.

M31 *Anthelia julacea* – *Sphagnum auriculatum* spring

A single stand of this community was found at the head of Silver Cove on flushed slabs of granite. Cushions of *Anthelia julacea* are present, with frequent *Sphagnum inundatum* and frequent to occasional *Scapania undulata*, *Nardus stricta*, *Marsupella emarginata* and *Pinguicula vulgaris*. Much of the ground is unvegetated.

M32a *Philonotis fontana* – *Saxifraga stellaris* spring *Sphagnum auriculatum* sub-community

Sphagnum dominated springs are present locally on the slopes of Pillar and Scoat Fell and Crag Fell. Generally *Sphagnum denticulatum* (*S. auriculatum*) dominates, but in some stands *S. inundatum* (*S. auriculatum*) is present instead. In addition *Polytrichum commune* can be abundant, whilst *Agrostis capillaris*, *Scapania undulata* and *Deschampsia cespitosa* are regularly present.

M32a Species	P053	P054	P055	P056	P058	Constancy
<i>Agrostis capillaris</i>	3	3	2	2		IV
<i>Polytrichum commune</i>	8	2	5	2		IV
<i>Scapania undulata</i>	4	4	4	7		IV
<i>Sphagnum denticulatum</i>		9	9	6	10	IV
<i>Deschampsia cespitosa</i>			4	2	2	III
<i>Bryum pseudotriquetrum</i>				8		I
<i>Carex echinata</i>					2	I
<i>Festuca ovina</i>				3		I
<i>Juncus articulatus</i>					1	I
<i>Nardus stricta</i>					2	I
<i>Narthecium ossifragum</i>					1	I
<i>Poa annua</i>				1		I
<i>Saxifraga stellaris</i>				4		I
<i>Sphagnum inundatum</i>	7					I
<i>Sphagnum papillosum</i>			5			I
<i>Sphagnum subsecundum</i>			4			I
<i>Viola palustris</i>				1		I
No. species per sample	4	4	7	10	6	

M32b *Philonotis fontana* – *Saxifraga stellaris* spring

Montia fontana – *Chrysosplenium oppositifolium* sub-community

Rills with abundant *Chrysosplenium oppositifolium* and *Scapania undulata* are occasional on the slopes of Iron Crag, Tewit How and Silver Cove. *Festuca ovina*, *Bryum pseudotriquetrum* and *Philonotis fontana* are also frequent, whilst *Saxifraga hypnoides* is generally present as a few scattered plants. A range of other bryophytes can also be present. This vegetation usually extends for no more than a few tens of centimetres from the edge of a stream.

M32b Species	P024	P025	P027	P040	Constancy
<i>Chrysosplenium oppositifolium</i>	8	9	9	9	4
<i>Scapania undulata</i>	6	5	4	4	4
<i>Bryum pseudotriquetrum</i>	4	4	4		3
<i>Festuca ovina</i>	3	3		2	3
<i>Philonotis fontana</i>	5	4	2		3
<i>Saxifraga hypnoides</i>	1	2		1	3
<i>Agrostis capillaris</i>	2	3			2
<i>Cerastium fontanum</i>			2	5	2
<i>Poa trivialis</i>			3	3	2
<i>Alchemilla alpina</i>		2			1
<i>Calliergon cuspidatum</i>				4	1
<i>Cardamine pratensis</i>				2	1
<i>Cochlearia officinalis</i>				3	1
<i>Marsipella emarginata</i>			4		1
<i>Plagiomnium affine</i>				2	1
<i>Plagiomnium undulatum</i>				4	1
<i>Sagina nodosa</i>			2		1
No. species per sample	7	8	8	11	

S9b *Carex rostrata* swamp *Menyanthes trifoliata* – *Equisetum fluviatile* sub-community

This swamp community was found in a single small tarn on Tewit How surrounded by M4 *Carex rostrata* – *Sphagnum recurvum* mire. *Carex rostrata* and *Menyanthes trifoliata* are constant, with the former forming an emergent open sward. Other species are no more than occasional.

S9b Species	P080	P081	P082	P083	P084	Constancy
<i>Carex rostrata</i>	3	6	3	4	3	5
<i>Menyanthes trifoliata</i>	2	2	2	2	2	5
<i>Potamogeton polygonifolius</i>		4			2	2
<i>Sphagnum denticulatum</i>		2		2		2
<i>Juncus bulbosus</i>		3				1
<i>Ranunculus flammula</i>		2				1
No. species per sample	2	6	2	3	3	

U4a *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland typical sub-community

This is an acid grassland community of well drained brown earth soils. It is dominated by two grasses, *Agrostis capillaris* and *Festuca ovina*, plus frequent *Potentilla erecta*, *Galium saxatile* and *Anthoxanthum odoratum*. Mosses, particularly *Rhytidiadelphus squarrosus* can be frequent. This grassland is found extensively on the crags of the upper slopes of Pillar and Scoat Fell and less extensively around the foot of Crag Fell.

U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland *Holcus lanatus* – *Trifolium repens* sub-community

This is a somewhat agriculturally improved version of the former community and is found where there are higher congregations of stock or there has been some agricultural improvement. On Pillar and Ennerdale it is confined to a strip along the fence line on Lingmell close to the stock access point for this part of the fell. *Agrostis capillaris* predominates over *Festuca ovina*, with frequent *Holcus lanatus* and *Trifolium repens*. Species such as *Potentilla erecta* and *Galium saxatile* tend to be less abundant in this community than they are in the typical sub-community.

U4e *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland *Vaccinium myrtillus* – *Deschampsia flexuosa* sub-community

This heathy grassland is found on the crags and upper slopes of Pillar, Scoat Fell, Haycock and Iron Crag. The sward is dominated by *Festuca ovina* with frequent *Galium saxatile* and *Vaccinium myrtillus*. *Alchemilla alpina* can be frequent in some stands. Bryophytes are frequent in the sward, but

generally at low cover, with no species featuring as a regular component other than *Polytrichum commune* and *Rhytidiadelphus loreus*.

U4e Species	P016
<i>Festuca ovina</i>	8
<i>Galium saxatile</i>	5
<i>Alchemilla alpina</i>	3
<i>Deschampsia flexuosa</i>	3
<i>Polytrichum commune</i>	3
<i>Rhytidiadelphus loreus</i>	3
<i>Vaccinium myrtillus</i>	3
<i>Rhytidiadelphus squarrosus</i>	2
No. species per sample	8

U5a *Nardus stricta* – *Galium saxatile* grassland species-poor sub-community

This is a grassland community of slightly peaty gleyed soils. *Nardus* dominates, generally with frequent *Agrostis capillaris*, *Festuca ovina*, *Galium saxatile*, *Potentilla erecta* and *Rhytidiadelphus squarrosus*. It is fairly uncommon here, occurring extensively on Tewit How and as occasional small stands along the main ridge.

U5b *Nardus stricta* – *Galium saxatile* grassland *Agrostis canina* – *Polytrichum commune* sub-community

This is similar to the species-poor sub-community, but has a more diverse sward with a greater abundance of *Agrostis* spp. and mosses such as *Polytrichum commune* and *Hypnum cupressiforme*. *Vaccinium myrtillus* tends to be a regular component of the sward at low cover. This is the most common form of U5 on the site, forming extensive stands on the mid and upper slopes of Pillar, Scoat Fell and Haycock and on Crag Fell.

U5d *Nardus stricta* – *Galium saxatile* grassland *Calluna vulgaris* – *Danthonia decumbens* sub-community

U5d Species	P079	P096	P101	Constancy
<i>Calluna vulgaris</i>	4	6	4	3
<i>Empetrum nigrum</i>	4	2	2	3
<i>Nardus stricta</i>	8	4	7	3
<i>Vaccinium myrtillus</i>	2	3	3	3
<i>Agrostis capillaris</i>		2	3	2
<i>Deschampsia flexuosa</i>	2	3		2
<i>Festuca ovina</i>		8	3	2
<i>Galium saxatile</i>		3	3	2
<i>Hylocomium splendens</i>	4		2	2
<i>Hypnum cupressiforme</i>	5	4		2
<i>Potentilla erecta</i>	1		2	2
<i>Racomitrium lanuginosum</i>		2	2	2
<i>Rhytidiadelphus loreus</i>	5		4	2
<i>Carex panicea</i>			3	1
<i>Carex pilulifera</i>	2			1
<i>Juncus squarrosus</i>			4	1
<i>Rhytidiadelphus squarrosus</i>		3		1
No. species per sample	10	11	13	

This is a heathy grassland with abundant *Nardus* and *Calluna*; and frequent *Empetrum*, *Vaccinium*, *Festuca ovina*, *Agrostis capillaris*, *Galium saxatile*, *Rhytidiadelphus loreus* and *Hypnum cupressiforme*. It is most extensive in Silver Cove and on Iron Crag, with smaller stands on Tewit How. Although *Racomitrium* is present in some samples these lack the other montane elements which distinguish the U5e *Racomitrium* sub-community described below.

**U5e Nardus stricta – Galium saxatile grassland
Racomitrium lanuginosum sub-community**

This acid grassland contains elements of montane communities and is found in a few small stands on Tewit How and Crag Fell. *Nardus* is constant but tends not to be abundant, with *Festuca ovina* or *Deschampsia flexuosa* being the principal grasses. Dwarf-shrubs are a feature of this vegetation, with *Empetrum*, *Vaccinium myrtillus* and *V. vitis-idaea* all constant. Notably however *Calluna* is absent, distinguishing this vegetation from the former sub-community. Of note here is the constancy of *Racomitrium lanuginosum* and the regular presence of species associated with montane heaths and grasslands, such as *Carex bigelowii*, *Diphasiastrum alpinum*, *Huperzula selago* and a variety of foliose *Cladonia* species.

U5e Species	P090	P091	P125	Constancy
<i>Empetrum nigrum</i>	5	4	4	3
<i>Festuca ovina</i>	6	7	3	3
<i>Galium saxatile</i>	2	4	2	3
<i>Nardus stricta</i>	4	2	4	3
<i>Racomitrium lanuginosum</i>	4	2	1	3
<i>Vaccinium myrtillus</i>	3	3	2	3
<i>Vaccinium vitis-idaea</i>	2	2	3	3
<i>Agrostis capillaris</i>	2	2		2
<i>Carex bigelowii</i>	2	2		2
<i>Cladonia impexa</i>		1	2	2
<i>Diphasiastrum alpinum</i>	6	7		2
<i>Huperzula selago</i>	2	2		2
<i>Potentilla erecta</i>		2	1	2
<i>Carex pilulifera</i>			2	1
<i>Cladonia arbuscula</i>			2	1
<i>Cladonia furcata</i>			3	1
<i>Cladonia uncialis</i>			2	1
<i>Deschampsia flexuosa</i>			6	1
<i>Dicranum scoparium</i>			2	1
<i>Hypnum cupressiforme</i>			7	1
No. species per sample	11	13	16	

U6 Juncus squarrosus – Festuca ovina grassland

This community is confined to a small section of the summit ridge west of Haycock where it is present on thin deposits of peat amongst montane grassland. *Juncus squarrosus* tends to be dominant, though in some stands *Nardus stricta* can be abundant too. *Agrostis capillaris*, *Festuca ovina* and *Galium saxatile* all tend to be frequent, but at low cover in this community.

**U10a Carex bigelowii – Racomitrium lanuginosum moss-heath
Galium saxatile sub-community**

This community was confined to the summit of Pillar, however degenerate examples where *Racomitrium* is less abundant than in these samples is more widespread and this vegetation has been mapped as U4e/U10 as it appears transitional between the U10a community described here and the U4e heathy grassland described above.

Festuca ovina is the principal grass species, with frequent to abundant *Racomitrium lanuginosum* and frequent *Vaccinium myrtillus*, *Polytrichum piliferum*, *Deschampsia flexuosa* and *Cladonia uncialis*. *Galium saxatile*.

U10a											
Species	P041	P043	P045	P051	P052	P042	P044	P046	P047	P048	Constancy
<i>Festuca ovina</i>	8	7	7	7	7	7	8	7	8	8	V
<i>Racomitrium lanuginosum</i>	6	7	6	6	7	5	1	2	4	3	V
<i>Vaccinium myrtillus</i>	3	2	3	1	2	3	2	2	3	2	V
<i>Galium saxatile</i>	3	5	5	7	3	7			7	7	IV
<i>Agrostis capillaris</i>	2	2	3				4	2		2	III
<i>Cladonia uncialis</i>		1	2	2	1	1				2	III
<i>Deschampsia flexuosa</i>	2	2		3	3			3		3	III
<i>Polytrichum piliferum</i>		3	3				6	5	3	4	III
<i>Carex bigelowii</i>							5	5	3	4	II
<i>Huperzula selago</i>	2			2	1						II
<i>Polytrichum commune</i>	2			2	3						II
<i>Rhytidiadelphus loreus</i>	1			2	1						II
<i>Cladonia furcata</i>			2								I
<i>Cladonia sp</i>								3			I
<i>Cornicularia aculeata</i>								1			I
<i>Cryptogramma crispa</i>	4										I
<i>Dicranella heteromalla</i>			2								I
<i>Diphasiastrum alpinum</i>		5									I
<i>Pleurozium schreberi</i>				2							I
No. species per sample	10	9	9	10	9	5	6	9	6	9	

U16c *Luzula sylvatica* – *Vaccinium myrtillus* tall-herb community species-poor sub-community

This community is found on ungrazed ledges, mainly on Pillar and Scoat Fell, but also on Revelin Crag. *Luzula sylvatica* is abundant/dominant, with frequent *Deschampsia flexuosa*, *Agrostis capillaris*, *Galium saxatile*, *Hypnum cupressiforme* and *Vaccinium myrtillus*. Of the two ledge communities present on Pillar and Ennerdale this is by far the most frequently encountered.

U16c						
Species	P026	P035	P036	P039	P124	Constancy
<i>Deschampsia flexuosa</i>	2	2	2	4	3	V
<i>Luzula sylvatica</i>	9	7	9	9	9	V
<i>Agrostis capillaris</i>	3	2	3	2		IV
<i>Galium saxatile</i>	3	4	3	3		IV
<i>Hypnum cupressiforme</i>		4		4	2	III
<i>Vaccinium myrtillus</i>		3	3	3		III
<i>Calluna vulgaris</i>		5			4	II
<i>Cryptogramma crispa</i>		4		4		II
<i>Dicranum scoparium</i>		4	4			II
<i>Digitalis purpurea</i>		4	2			II
<i>Dryopteris dilatata</i>				1	4	II
<i>Rhytidiadelphus loreus</i>		3	3			II
<i>Blechnum spicant</i>			4			I
<i>Dicranella heteromalla</i>				4		I
<i>Diplophyllum albicans</i>			4			I
<i>Juniperus communis</i>		5				I
<i>Phegopteris connectilis</i>			2			I
<i>Saxifraga stellaris</i>				1		I
<i>Solidago virgaurea</i>			2			I
<i>Sphagnum denticulatum</i>	4					I
No. species per sample	5	12	12	10	5	

U17 *Luzula sylvatica* – *Geum rivale* tall-herb community

Ledges supporting tall-herbs appear to be rare on the crags of Pillar and Ennerdale, with only one located, though other small stands may be present on the numerous small ledges and gullies present. In the sample recorded *Heracleum* is the main herb present, with plants of *Alchemilla glabra*, *Sedum rosea*, *Thalictrum alpinum*, *Solidago virgaurea* and *Vaccinium myrtillus* also present. Bryophytes and grasses are also frequent, including *Rhytidiadelphus loreus*, *Dicranum scoparium*, *Festuca ovina* and *Agrostis capillaris*.

U17	
Species	P019
Rhytiadelphus loreus	6
Festuca ovina	5
Heracleum sphondylium	5
Alchemilla alpina	4
Alchemilla glabra	4
Dicranum scoparium	4
Sedum rosea	4
Thalictrum alpinum	4
Agrostis capillaris	3
Campanula rotundifolia	3
Galium saxatile	3
Solidago virgaurea	3
Taraxacum officinalis	3
Vaccinium myrtillus	3
Deschampsia cespitosa	2
Oxalis acetosella	2
Selaginella selaginoides	2
Succisa pratensis	2
No. species per sample	18

U19 *Thelypteris limbosperma* – *Blechnum spicant* community

Small stands of *Oreopteris limbosperma* (*Thelypteris limbosperma*) are common on the lower slopes of Pillar and on the upper edge of the woodland along Ennerdale Water. *Oreopteris* is abundant/dominant, often forming a semi-closed canopy, below which *Thuidium tamariscinum* is abundant, with frequent *Agrostis capillaris*, *Potentilla erecta*, *Oxalis acetosella* and *Viola riviniana*.

U19						
Species	P002	P003	P004	P005	P006	Constancy
Agrostis capillaris	3	3	2	2	2	V
Oreopteris limbosperma	9	9	9	10	10	V
Thuidium tamariscinum	7	8	7	2	2	V
Potentilla erecta	2	2		2	2	IV
Oxalis acetosella	2	3	3			III
Vaccinium myrtillus	3			2	2	III
Viola riviniana		2		2	1	III
Deschampsia flexuosa	3			2		II
Galium saxatile		2	2			II
Blechnum spicant					1	I
Festuca ovina	3					I
Plagiothecium undulatum		2				I
Polytrichum commune			2			I
Sphagnum palustre			2			I
Sphagnum quinquefarium	7					I
Sphagnum tenellum			2			I
No. species per sample	9	8	8	7	7	

U20a *Pteridium aquilinum* – *Galium saxatile* community *Anthoxanthum odoratum* sub-community

Stands dominated by *Pteridium aquilinum*, generally with a groundlayer of *Agrostis capillaris*, *Anthoxanthum odoratum* and *Galium saxatile* are extensive on well drained lower slopes of The Side and Crag Fell and along the lower parts of the Silver Cove Beck and Deep Gill valleys. Further east this community is uncommon, largely due to the altitude of the forest fence.

U21 *Cryptogramma crista* – *Deschampsia flexuosa* community

The more stable areas of scree support a community with frequent to abundant *Cryptogramma crista* and frequent *Deschampsia flexuosa*, *Oxalis*, *Festuca ovina*, *Racomitrium lanuginosum* and *Vaccinium myrtillus*.

U21						
Species	P030	P031	P033	P034	P037	Constancy
<i>Cryptogramma crista</i>	5	5	6	5	8	V
<i>Deschampsia flexuosa</i>	2	3	2		3	IV
<i>Oxalis acetosella</i>	1	3		1	2	IV
<i>Festuca ovina</i>			4	4	4	III
<i>Racomitrium lanuginosum</i>	4	2	4			III
<i>Vaccinium myrtillus</i>		2	2	2		III
<i>Agrostis capillaris</i>			4		2	II
<i>Polytrichum alpinum</i>				4	4	II
<i>Polytrichum commune</i>	1				4	II
<i>Carex pilulifera</i>				1		I
<i>Digitalis purpurea</i>				1		I
<i>Galium saxatile</i>					2	I
<i>Hypnum cupressiforme</i>	4					I
<i>Racomitrium fasciculare</i>	2					I
<i>Rhytidiadelphus loreus</i>					2	I
No. species per sample	7	5	6	7	9	

Racomitrium talus

Some areas of large block scree support blankets of *Racomitrium lanuginosum* between the boulders, *Deschampsia flexuosa*, *Festuca ovina* and *Rhytidiadelphus loreus* can also be frequent. There is no NVC fit for this vegetation.

<i>Racomitrium talus</i>								
Species	P013	P014	P015	P017	P038	P049	P050	Constancy
<i>Racomitrium lanuginosum</i>	7	6	7	6	5	8	9	V
<i>Deschampsia flexuosa</i>	1	2		1				III
<i>Festuca ovina</i>			1			4	2	III
<i>Rhytidiadelphus loreus</i>		1		1	2			III
<i>Diplophyllum albicans</i>				2	2			II
<i>Polytrichum commune</i>	1			1				II
<i>Racomitrium fasciculare</i>					1	2		II
<i>Cryptogramma crista</i>		1						I
<i>Dicranella heteromalla</i>					2			I
<i>Hypnum cupressiforme</i>		2						I
<i>Racomitrium heterostichum</i>	1							I
<i>Vaccinium myrtillus</i>		2						I
No. species per sample	4	6	2	5	5	3	2	

Scree

Areas mapped as scree are largely devoid of vegetation.

W17b *Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland typical sub-community

Oak – birch woodland is present all along the southern shore of Ennerdale Water, extending onto the flanks of Marr Knott and, as small stands, along the lower parts of Deep Gill and Silver Cove Beck, extending up to an altitude of 260m. Birch tends to predominate in the canopy, but oak is also frequent, as are ash and rowan. Holly and hawthorn are occasional, as is hazel. The groundlayer tends to be composed of a mix of *Deschampsia flexuosa*, *Vaccinium myrtillus* and bryophytes such as *Rhytidiadelphus loreus*, *Plagiochilla porelloides*, *Polytrichum commune*, *Plagiothecium undulatum* and *Sphagnum quinquefarium*. *Pteridium* can be locally frequent.

W17b						
Species	P114	P127	P128	P130	P131	Constancy
<i>Betula pubescens</i>	9	6	8	8	6	V
<i>Deschampsia flexuosa</i>	3	7	5	5	3	V
<i>Rhytidiadelphus loreus</i>	5	5	5	7	8	V
<i>Oxalis acetosella</i>	3	2		3	3	IV
<i>Plagiochilla porelloides</i>		4	4	5	4	IV
<i>Polytrichum commune</i>	3	2		3	3	IV
<i>Pteridium aquilinum</i>	2	2	2	2		IV
<i>Quercus petraea</i>		6	5	6	8	IV
<i>Sphagnum quinquefarium</i>		4	4	4	6	IV
<i>Vaccinium myrtillus</i>	6	2	2		3	IV
<i>Agrostis capillaris</i>	2	3		3		III
<i>Dicranum scoparium</i>		4	5		4	III
<i>Festuca ovina</i>		5	5	3		III
<i>Fraxinus excelsior</i>		4	4	4		III
<i>Plagiothecium undulatum</i>		2	3	3		III
<i>Sorbus aucuparia</i>	4	4			4	III
<i>Anthoxanthum odoratum</i>		4	2			II
<i>Hypnum cupressiforme</i>	4		4			II
<i>Isothecium myosuroides</i>		5			4	II
<i>Thuidium tamariscinum</i>				5	4	II
<i>Bazzania trilobata</i>					5	I
<i>Blechnum spicant</i>				1		I
<i>Crataegus monogyna</i>				1		I
<i>Eurhynchium praelongum</i>			4			I
<i>Galium saxatile</i>			3			I
<i>Holcus mollis</i>		4				I
<i>Hymenophyllum wilsonii</i>			2			I
<i>Pleurozium schreberi</i>	6					I
<i>Salix capraea</i>				1		I
<i>Sphagnum palustre</i>				4		I
No. species per sample	11	19	17	18	14	

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