

Wild Ennerdale

Survey of National Vegetation Classification Communities



A report by
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For Forestry Commission
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Contents

Introduction	4
Methods	4
Site Description	5
Vegetation Communities	7
Forestry Communities.....	7
Conifer forest with W11 understorey	7
Conifer forest with W17 understorey	9
Dense conifer forest	9
Conifer forest with mire vegetation understorey	9
Felled and/or replanted conifer forest	10
National Vegetation Classification Communities	14
Native Woodland Communities.....	14
W1 <i>Salix cinerea</i> – <i>Galium palustre</i> woodland.....	14
W4 <i>Betula pubescens</i> – <i>Molinia caerulea</i> woodland.....	14
W4c <i>Betula pubescens</i> – <i>Molinia caerulea</i> woodland <i>Sphagnum</i> sub-community.....	15
W7 <i>Alnus glutinosa</i> – <i>Fraxinus excelsior</i> – <i>Lysimachia nemorum</i> woodland	16
W11 <i>Quercus petraea</i> – <i>Betula pubescens</i> – <i>Oxalis acetosella</i> woodland	17
W17 <i>Quercus petraea</i> – <i>Betula pubescens</i> – <i>Dicranum majus</i> woodland.....	18
Non-woodland Communities	19
H8b <i>Calluna vulgaris</i> – <i>Ulex gallii</i> heath <i>Danthonia decumbens</i> sub-community.....	19
H8e <i>Calluna vulgaris</i> – <i>Ulex gallii</i> heath <i>Vaccinium myrtillus</i> sub-community.....	19
H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath.....	19
H12a <i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> heath <i>Calluna vulgaris</i> sub-community	20
H12c <i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> heath <i>Galium saxatile</i> – <i>Festuca ovina</i> sub-community	20
M6b <i>Carex echinata</i> – <i>Sphagnum recurvum/auriculatum</i> mire <i>Carex nigra</i> – <i>Nardus stricta</i> sub-community	21
M6c <i>Carex echinata</i> – <i>Sphagnum recurvum/auriculatum</i> mire <i>Juncus effusus</i> sub-community	22
M6d <i>Carex echinata</i> – <i>Sphagnum recurvum/auriculatum</i> mire <i>Juncus acutiflorus</i> sub-community	23
M10a <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire <i>Carex demissa</i> – <i>Juncus bulbosus/kochii</i> sub-community.....	24
M15b <i>Scirpus cespitosus</i> – <i>Erica tetralix</i> wet heath typical sub-community.....	24
M17 <i>Scirpus cespitosus</i> – <i>Eriophorum vaginatum</i> blanket mire.....	24
M23a <i>Juncus effusus/acutiflorus</i> – <i>Galium saxatile</i> rush pasture <i>Juncus acutiflorus</i> sub-community	25
M23b <i>Juncus effusus/acutiflorus</i> – <i>Galium saxatile</i> rush pasture <i>Juncus effusus</i> sub-community.....	26
M25a <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire <i>Erica tetralix</i> sub-community	26
M25c <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire <i>Angelica sylvestris</i> sub-community	26
M27/M23a <i>Filipendula ulmaria</i> – <i>Angelica sylvestris</i> mire / <i>Juncus effusus/acutiflorus</i> – <i>Galium saxatile</i> rush pasture <i>Juncus acutiflorus</i> sub-community	27
S9 <i>Carex rostrata</i> swamp	28
S19 <i>Eleocharis palustris</i> swamp.....	28
U4a <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland typical sub-community	28
U4b <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland <i>Holcus lanatus</i> – <i>Trifolium repens</i> sub-community.....	29
U4e <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland <i>Vaccinium myrtillus</i> – <i>Deschampsia flexuosa</i> sub-community.....	29
U5b <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland <i>Agrostis canina</i> – <i>Polytrichum commune</i> sub-community.....	30
U5c <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland <i>Carex panicea</i> – <i>Viola riviniana</i> sub-community.....	30
U5d <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland <i>Calluna vulgaris</i> – <i>Danthonia decumbens</i> sub-community	31
U19 <i>Thelypteris (Oreopteris) limbosperma</i> – <i>Blechnum spicant</i> community.....	31
U20a <i>Pteridium aquilinum</i> – <i>Galium saxatile</i> community <i>Anthoxanthum odoratum</i> sub-community	32
MG1 <i>Arrhenatherum elatius</i> grassland	32
MG5 <i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland.....	33
MG6a <i>Lolium perenne</i> – <i>Cynosurus cristatus</i> grassland typical sub-community.....	34
MG10 <i>Holcus lanatus</i> – <i>Juncus effusus</i> grassland.....	35
W23 <i>Ulex europaeus</i> – <i>Rubus fruticosus</i> scrub.....	35
References	36

Introduction

In 2002 the land within The Pillar and Ennerdale Site of Special Scientific Interest and Lake District High Fells candidate Special Area of Conservation was surveyed to National Vegetation Classification standards by English Nature as part of their programme of acquiring up to date information on the distribution of the vegetation communities which form the SAC features of interest (Jerram 2003). The following year the National Trust commissioned a similar survey of the remainder of their fell land in Ennerdale. As part of the Wild Ennerdale project the Forestry Commission commissioned a further survey of the remaining land covered by the Wild Ennerdale project for 2004. This includes the conifer plantations and farmland at the head of Ennerdale Water and to the north and west of the lake. This report presents the results of the 2004 survey which completes the coverage of NVC survey for Wild Ennerdale and includes land owned by the Forestry Commission, National Trust and United Utilities. The mapping of vegetation communities will aid the protection and management of features of biodiversity interest within the project area and aid predictions as to the likely outcome of management regimes in the valley.

Methods

The vegetation was mapped using the National Vegetation Classification (Rodwell 1991a & b and 1992). 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 a minimum of two 2 x 2m quadrats were recorded in each 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.

For areas of plantation woodland the canopy species are excluded from the assignment to communities and an attempt has been made to assess which native woodland type would be present in the absence of the plantation. Due to the scale of the forest and the impenetrability of some stands a certain amount of extrapolation has been required to give complete coverage of the forest area. As a result it is likely that some detail has been lost.

Site Description

The lower slopes and valley floor of the eastern part of Ennerdale are covered in conifer plantation, some of which was planted in the 1920s. There has however been extensive felling and replanting of the forest so that a wide range of different aged stands are present. Very recently felled stands are more or less devoid of vegetation due to the disturbance of the felling process, but within a year or two a pioneer vegetation consisting of scattered plants of common bent, pill sedge, green-ribbed sedge, heather and heath bedstraw develops. Later these felled (and often replanted stands) develop a closed sward dominated by wavy hair-grass, generally with frequent heather, heath bedstraw, broad buckler-fern and common bent. As the trees develop the canopy becomes closed and stops light reaching the forest floor, resulting in period where there is little groundflora present in plantations. This is particularly true of spruce stands. Larch stands tend to be more open and may always retain some groundflora. With thinning and maturing of trees stands of both larch and spruce (and other conifers) develop a variety of groundflora types largely dependent on substrate. On poorer soils a groundlayer dominated by wavy hair-grass with frequent bilberry, common bent and heath bedstraw is present. These stands have similarities to W17 *Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland, though with a far less well developed bryophyte component. On better soils (brown earths) the groundlayer is again grassy, but with frequent to abundant common bent and creeping soft-grass and a field layer of bracken. In stands along the foot of Bowness Knott bramble has become abundant, replacing bracken. This groundflora resembles that of W11 *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland. Where stands of conifers have been planted on wet ground the groundflora tends to have a marshy influence, with species such as soft rush, purple moor-grass and tufted hair-grass becoming prominent.

Clearings within the forest support a variety of vegetation types, including dry heath (H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath), wet heath (M15 *Scirpus cespitosus* – *Erica tetralix* wet heath), bracken (U20 *Pteridium aquilinum* – *Galium saxatile* community), acid grassland (U4 *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland and U5 *Nardus stricta* – *Galium saxatile* grassland). Areas of scree are also present on some areas of steeper ground. There are extensive areas of unafforested ground on Bowness Knott where H10 *Calluna vulgaris* – *Erica cinerea* heath predominates, together with stands of scree and bracken. H8 *Calluna vulgaris* – *Ulex gallii* heath is present on the lower crags.

Stands of broadleaved woodland are uncommon in the forest, being largely confined to narrow strips along gills and small stands along the road along the northern side of the valley. There are however significant stands of oak – birch woodland on the slopes of Latterbarrow and Bowness Knott. This woodland is generally W11 *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland on the lower slopes, whilst W17 *Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland predominates on higher, poorer ground. The blocks of oak woodland on Latterbarrow and Bowness Knott belong to the latter community.

At the head of Ennerdale Water the valley floor is occupied with inbye land around Gillerthwaite Farm. The fields are largely composed of semi-improved grassland (U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland, *Holcus* – *Trifolium* sub-community with stands of rush pasture (MG10 *Holcus lanatus* – *Juncus effusus* rush pasture). A couple of fields however have been more heavily improved and support MG6 *Lolium perenne* – *Cynosurus cristatus* grassland. The meanderings of the River Liza have left extensive areas of river shingle which have become vegetated with a mosaic of H8 *Calluna vulgaris* – *Erica cinerea* heath, M15 *Scirpus cespitosus* – *Erica tetralix* wet heath, U4e *Festuca* – *Agrostis* – *Galium* grassland, *Vaccinium myrtillus* sub-community and occasionally U20 *Pteridium* – *Galium* bracken community. Small areas of oak woodland with Scot's pine can also be present and there are frequent birch saplings (W17). At the head of the lake there is an extensive area of M25 *Molinia caerulea* – *Potentilla erecta* mire.

Around the northern and western ends of the lake there valley broadens out and farm land predominates. Much of this is improved pasture or meadow (MG6 *Lolium perenne* – *Cynosurus cristatus* grassland), however there are extensive areas of rush pasture, particularly along the western

end of the lake. Most of this rush pasture is species-poor MG10 *Holcus lanatus* – *Juncus effusus* rush pasture, but stands of more diverse M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush pasture are also present. On the lakeside to the east of Mireside there is an extensive area of diverse mire, rush pasture and wet woodland of considerable ecological interest with stands of W4 *Betula pubescens* – *Molinia caerulea* woodland, M27/M23a *Filipendula ulmaria* – *Angelica sylvestris* mire / *Juncus effusus/acutiflorus* – *Galium saxatile* rush pasture, *Juncus acutiflorus* sub-community, M25 *Molinia* – *Potentilla* mire and M6d *Carex* – *Sphagnum* mire, *Juncus acutiflorus* sub-community. Also of note here is a stand of species-rich U5 *Nardus stricta* – *Galium saxatile* grassland.

The Broadmoor plantations are low-lying and are conifer plantations over a marshy groundlayer, with fringes of wet broadleaved woodland (W4 *Betula* – *Molinia* woodland). Between these plantations and the lake is an area of bracken (U20 *Pteridium* – *Galium* community) and purple-moor-grass and rush mire (M25 *Molinia* – *Potentilla* mire and M6d *Carex* – *Sphagnum* mire, *Juncus acutiflorus* sub-community). W7 *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland is present along the banks of the River Ehen.

The crags below Heckbarley and Grike are covered in stands of dry heath (H10 *Calluna* – *Erica* heath and H12 *Calluna* – *Vaccinium* heath) and bracken (U20 *Pteridium* – *Galium* community), with the lower slopes covered by larch and spruce plantation over a W17 groundlayer.

Heckbarley plantation is largely dominated by dense spruce plantation with no groundflora. There are however areas of blanket mire (M17 *Eriophorum vaginatum* – *Scirpus cespitosus* mire), acid grassland (U4 *Festuca* – *Agrostis* – *Galium* grassland and U5 *Nardus* – *Galium* grassland) and wet and dry heath (M15 *Scirpus* – *Erica* wet heath and H12 *Calluna* – *Vaccinium* heath) along the margins of the plantation.

Vegetation Communities

Forestry Communities

Conifer forest with W11 understorey

Conifer W11								
Species	Q30	Q95	Q96	Q98	Q136	Q137	Constancy	Range
Agrostis capillaris	8	6	3	7	9		V	(3 - 9)
Pteridium aquilinum	4	6	7	5		8	V	(4 - 8)
Deschampsia flexuosa	3		6	5		6	IV	(3 - 6)
Galium saxatile		2	3	3		2	IV	(2 - 3)
Holcus mollis	4	6	4	6			IV	(4 - 6)
Larix sp	9	7	8	8			IV	(7 - 9)
Sorbus aucuparia g	1			1	2	2	IV	(1 - 2)
Festuca ovina	3	3	2				III	(2 - 3)
Pleurozium schreberi		4	5	5			III	(4 - 5)
Rhytidiadelphus squarrosus		2		4	4		III	(2 - 4)
Dryopteris filix-mas	1	4					II	(1 - 4)
Oxalis acetosella			4		5		II	(4 - 5)
Pinus sylvestris					9	8	II	(8 - 9)
Prunus avium		4	4				II	(4 - 4)
Rubus fruticosus				4	2		II	(2 - 4)
Thuidium tamariscinum					4	4	II	(4 - 4)
Anthoxanthum odoratum					3		I	(3 - 3)
Betula pubescens g		1					I	(1 - 1)
Betula pubescens s				4			I	(4 - 4)
Calluna vulgaris		5					I	(5 - 5)
Cirsium palustre	1						I	(1 - 1)
Digitalis purpurea			2				I	(2 - 2)
Hypnum cupressiforme		4					I	(4 - 4)
Teucrium scorodonia			2				I	(2 - 2)
Vaccinium myrtillus						2	I	(2 - 2)
No. species per quadrat	9	13	12	11	8	7		
Mean no. species per quadrat	10							

Conifer W11a				
Species	Q99	Q100	Constancy	Range
Betula pubescens s	4	5	2	(4 - 5)
Holcus mollis	4	4	2	(4 - 4)
Larix sp	8	8	2	(8 - 8)
Rubus fruticosus	8	6	2	(6 - 8)
Agrostis capillaris		7	1	(7 - 7)
Angelica sylvestris		2	1	(2 - 2)
Cirsium palustre		1	1	(1 - 1)
Crataegus monogyna s	4		1	(4 - 4)
Dactylis glomerata	5		1	(5 - 5)
Deschampsia flexuosa		6	1	(6 - 6)
Epilobium montana	2		1	(2 - 2)
Fraxinus excelsior g	2		1	(2 - 2)
Geranium robertianum	2		1	(2 - 2)
Ilex aquifolium g	4		1	(4 - 4)
Pleurozium schreberi		4	1	(4 - 4)
Potentilla erecta	2		1	(2 - 2)
Sorbus aucuparia g		4	1	(4 - 4)
Torillia japonica	1		1	(1 - 1)
No. species per quadrat		11	9	
Mean no. species per quadrat		10		

Stands of semi-mature and mature conifer plantation where adequate light reaches the forest floor on lower slopes with brown earth soils support groundlayer resembling that of W11 *Quercus* – *Betula* –

Oxalis woodland. The groundlayer is grassy with frequent to abundant common bent *Agrostis capillaris* and creeping soft-grass *Holcus mollis* and a field layer of bracken *Pteridium aquilinum*. Bryophytes can be frequent, including *Pleurozium schreberi*, *Rhytidiadelphus squarrosus* and *Thuidium tamariscinum*. Bramble *Rubus fruticosus* is occasional.

Mixed W11					
Species	Q4	Q88	Q89	Constancy	Range
Larix sp	4	6	4	3	(4 - 6)
Pteridium aquilinum	8	6	5	3	(5 - 8)
Calluna vulgaris	5		2	2	(2 - 5)
Deschampsia flexuosa	4		5	2	(4 - 5)
Fagus sylvatica		5	8	2	(5 - 8)
Pleurozium schreberi	4	2		2	(2 - 4)
Pseudoscleropodium purum		7	6	2	(6 - 7)
Agrostis capillaris		3		1	(3 - 3)
Dicranum scoparium			4	1	(4 - 4)
Galium saxatile		2		1	(2 - 2)
Plagiothecium undulatum			2	1	(2 - 2)
Polytrichum commune			5	1	(5 - 5)
Quercus petraea s	5			1	(5 - 5)
Rhytidiadelphus loreus			5	1	(5 - 5)
Sorbus aucuparia s	4			1	(4 - 4)
Vaccinium myrtillus	7			1	(7 - 7)
No. species per quadrat	8	7	10		
Mean no. species per quadrat	8.3				

At the foot of Bowness Knott bramble becomes abundant and bracken is largely absent, though the grasses remain. These stands have been mapped as Conifer W11a.

Some areas of mixed plantation also have a W11 groundlayer, again with abundant bracken *Pteridium aquilinum*. Bryophytes are also frequent, as can be heather *Calluna vulgaris*. These stands have been mapped as Mixed W11a.

Conifer forest with W17 understorey

On the poorer soils of the upper and mid-slopes of the main valley mature and semi-mature plantations have a groundlayer dominated by wavy hair-grass *Deschampsia flexuosa* with frequent bilberry *Vaccinium myrtillus*, common bent *Agrostis capillaris* and heath bedstraw *Galium saxatile* with occasional bryophytes. These stands have similarities to W17 *Quercus* – *Betula* – *Dicranum* woodland, though with a far less well developed bryophyte component.

Conifer W17										
Species	Q1	Q3	Q7	Q55	Q56	Q70	Q72	Q73	Constancy	Range
<i>Deschampsia flexuosa</i>	8	9	9	8	8	10	9	9	V	(8 - 10)
<i>Vaccinium myrtillus</i>	4	2	6	5	3	4	2		V	(2 - 6)
<i>Agrostis capillaris</i>	4	4		2		3	2	2	IV	(2 - 4)
<i>Galium saxatile</i>	2	3	3			2	4	3	IV	(2 - 4)
<i>Larix</i> sp	9		10			9	9	9	IV	(9 - 10)
<i>Plagiothecium undulatum</i>		2	2				2	2	III	(2 - 2)
<i>Polytrichum commune</i>		2	4	5	5				III	(2 - 5)
<i>Picea</i> sp		10		10	10				II	(10 - 10)
<i>Rhytiadelphus loreus</i>			2			3	5		II	(2 - 5)
<i>Rhytiadelphus squarrosus</i>	3						3	4	II	(3 - 4)
<i>Anthoxanthum odoratum</i>						2		2	II	(2 - 2)
<i>Dryopteris dilatata</i>		1			3				II	(1 - 3)
<i>Hypnum jutlandicum</i>		4			5				II	(4 - 5)
<i>Ilex aquifolium</i> g	1	2							II	(1 - 2)
<i>Mnium hornum</i>			4		4				II	(4 - 4)
<i>Oxalis acetosella</i>	3							2	II	(2 - 3)
<i>Pseudoscleropodium purum</i>	2					2			II	(2 - 2)
<i>Quercus petraea</i> g	1	1							II	(1 - 1)
<i>Sorbus aucuparia</i> g	1	2							II	(1 - 2)
<i>Blechnum spicant</i>	1								I	(1 - 1)
<i>Calluna vulgaris</i>	1								I	(1 - 1)
<i>Dicranum scoparium</i>			4						I	(4 - 4)
<i>Erica cinerea</i>		1							I	(1 - 1)
<i>Eurynchium praelongum</i>	4								I	(4 - 4)
<i>Molinia caerulea</i>				4					I	(4 - 4)
<i>Pleurozium schreberi</i>								5	I	(5 - 5)
<i>Pteridium aquilinum</i>	4								I	(4 - 4)
No. species per quadrat	15	13	9	6	7	8	8	9		
Mean no. species per quadrat	9.4									

Dense conifer forest

Stands of conifer plantation with a dense canopy allowing little light to reach the ground are fairly widespread across the valley, and predominate at Heckbarley. The ground below these stands is mainly covered in a layer of needles with little vegetation present, generally only isolated plants of broad buckler fern *Dryopteris dilatata* and scattered patches of bryophytes.

Dense conifer					
Species	Q8	Q29	Constancy	Range	
<i>Dryopteris dilatata</i>	1	1	2	(1 - 1)	
<i>Picea</i> sp	10	10	2	(10 - 10)	
<i>Brachythecium rutabulum</i>	1		1	(1 - 1)	
<i>Plagiothecium undulatum</i>	1		1	(1 - 1)	
No. species per quadrat	4	2			
Mean no. species per quadrat	3				

Conifer forest with mire vegetation understorey

In a few stands areas of conifer plantation are planted on wet ground. These areas have a groundlayer with frequent soft rush *Juncus effusus*, wavy hair-grass *Deschampsia flexuosa*, purple moor grass *Molinia caerulea*, tufted hair-grass *Deschampsia cespitosa*, creeping buttercup *Ranunculus repens* and Yorkshire fog *Holcus lanatus* amongst other species. No samples were recorded in this vegetation.

Felled and/or replanted conifer forest

There has been a considerable amount of felling within the valley in recent years and much of this has been replanted with conifers. These stands have largely been categorised by the time since felling. Very recently felled areas are more-or-less devoid of vegetation and are mapped as “Recent felled”.

Stands where one or two years have lapsed since felling have a sparse pioneer vegetation with scattered plants of common bent *Agrostis capillaris*, pill sedge *Carex pilulifera*, green-ribbed sedge *Carex binervis*, heather *Calluna vulgaris* and heath bedstraw *Galium saxatile*, together with a range of other species. There are extensive areas of bare ground in these stands. These stands are mapped as “Pioneer F/R”.

Pioneer felled/replanted							
Species	Q48	Q49	Q50	Q51	Q52	Constancy	Range
<i>Agrostis capillaris</i>	2	4	1	2	4	V	(1 - 4)
<i>Carex pilulifera</i>	4	4	4	6	7	V	(4 - 7)
<i>Calluna vulgaris</i>	4	1		1	2	IV	(1 - 4)
<i>Carex binervis</i>	1	4		7	4	IV	(1 - 7)
<i>Galium saxatile</i>		4	4		4	III	(4 - 4)
<i>Carex demissa</i>				4	1	II	(1 - 4)
<i>Deschampsia flexuosa</i>	4		1			II	(1 - 4)
<i>Festuca ovina</i>			1		4	II	(1 - 4)
<i>Juncus squarrosus</i>		1			1	II	(1 - 1)
<i>Polytrichum commune</i>				2		II	(2 - 2)
<i>Salix cinerea</i> g				1	1	II	(1 - 1)
<i>Vaccinium myrtillus</i>		1			1	II	(1 - 1)
<i>Blechnum spicant</i>				2		I	(2 - 2)
<i>Carex echinata</i>				1		I	(1 - 1)
<i>Carex hostiana</i>					4	I	(4 - 4)
<i>Carex panicea</i>					1	I	(1 - 1)
<i>Chamerion angustifolium</i>			1			I	(1 - 1)
<i>Dicranum scoparium</i>			2			I	(2 - 2)
<i>Digitalis purpurea</i>					1	I	(1 - 1)
<i>Dryopteris dilatata</i>				4		I	(4 - 4)
<i>Eriophorum vaginatum</i>			4			I	(4 - 4)
<i>Ilex aquifolium</i> g				1		I	(1 - 1)
<i>Nardus stricta</i>		1				I	(1 - 1)
<i>Oreopteris limbosperma</i>				4		I	(4 - 4)
<i>Senecio jacobaea</i>					1	I	(1 - 1)
<i>Senecio vulgaris</i>				1		I	(1 - 1)
<i>Viola riviniana</i>				1		I	(1 - 1)
No. species per quadrat	5	8	9	14	14		
Mean no. species per quadrat	10						

Where several years have passed since felling vegetation has been able to become established, generally in the form of a closed grassy sward dominated by wavy hair-grass *Deschampsia flexuosa*, with frequent common bent *Agrostis capillaris*, heather *Calluna vulgaris*, broad buckler fern *Dryopteris dilatata* and heath bedstraw *Galium saxatile*. Sheep's fescue *Festuca ovina*, *Polytrichum commune* and bilberry *Vaccinium myrtillus* are also common components. This vegetation is largely found on more poorer dry soils. These stands are mapped as “Established F/R”.

Established felled/replanted

Species	Q44	Q47	Q53	Q54	Q57	Q58	Q59	Q60	Q61	Q71	Q74	Q83	Constancy	Range
<i>Agrostis capillaris</i>	3	2	2	2	2	8	4	3	5	3	2	3	V	(2 - 8)
<i>Deschampsia flexuosa</i>	9	10	10	10	8	3	8	9	8	7	8	8	V	(3 - 10)
<i>Calluna vulgaris</i>	1			4	4	5	4	4	4	5		4	IV	(1 - 5)
<i>Dryopteris dilatata</i>	1	2	2	2	2	2	4	2				1	IV	(1 - 4)
<i>Galium saxatile</i>		3			2	2	2	3		3	3	2	IV	(2 - 3)
<i>Festuca ovina</i>	4				7	6	6	2	6	3			III	(2 - 7)
<i>Polytrichum commune</i>	2		2	2	4		4		4			4	III	(2 - 4)
<i>Vaccinium myrtillus</i>			2		2			2	1		5		III	(1 - 5)
<i>Larix</i> sp g						1	1					1	II	(1 - 1)
<i>Blechnum spicant</i>						1			1				I	(1 - 1)
<i>Carex pilulifera</i>				1								6	I	(1 - 6)
<i>Digitalis purpurea</i>						1	2						I	(1 - 2)
<i>Holcus lanatus</i>					1	2							I	(1 - 2)
<i>Hypnum cupressiforme</i>		4		4									I	(4 - 4)
<i>Picea</i> sp g						1						1	I	(1 - 1)
<i>Picea</i> sp s		4		4									I	(4 - 4)
<i>Pleurozium schreberi</i>										7	6		I	(6 - 7)
<i>Potentilla erecta</i>					1				1				I	(1 - 1)
<i>Sorbus aucuparia</i> g					1	1							I	(1 - 1)
<i>Anthoxanthum odoratum</i>							2						I	(2 - 2)
<i>Carex binervis</i>										2			I	(2 - 2)
<i>Dicranum scoparium</i>												4	I	(4 - 4)
<i>Juncus squarrosus</i>				1									I	(1 - 1)
<i>Oreopteris limbosperma</i>							4						I	(4 - 4)
<i>Pseudoscleropodium purum</i>										3			I	(3 - 3)
<i>Rhytidiadelphus loreus</i>								4					I	(4 - 4)
<i>Rhytidiadelphus squarrosus</i>		2											I	(2 - 2)
No. species per quadrat	6	7	5	9	11	11	11	8	8	8	5	10		
Mean no. species per quadrat	8.3													

Whilst the above communities account for the majority of the dry felled and replanted ground, two other communities have also been categorised. The first is found on better soils along the valley floor and was present in two stands just east of the inbye of Gillerthwaite Farm. This vegetation, mapped as "Felled W11" is dominated by the broad-leaved grasses common bent *Agrostis capillaris* and Yorkshire fog *Holcus lanatus*, with frequent heath bedstraw *Galium saxatile*.

Felled W11

Species	Q81	Q82	Q84	Q85	Constancy	Range
<i>Agrostis capillaris</i>	8	8	8	7	V	(7 - 8)
<i>Galium saxatile</i>	3	3	5	3	V	(3 - 5)
<i>Holcus lanatus</i>	5	3	7	8	V	(3 - 8)
<i>Betula pubescens</i> g	3	2			III	(2 - 3)
<i>Festuca ovina</i>		4	2		III	(2 - 4)
<i>Juncus effusus</i>	2			2	III	(2 - 2)
<i>Potentilla erecta</i>	2		2		III	(2 - 2)
<i>Rhytidiadelphus squarrosus</i>		7	6		III	(6 - 7)
<i>Carex binervis</i>	2				II	(2 - 2)
<i>Carex pilulifera</i>	2				II	(2 - 2)
<i>Cirsium palustre</i>				1	II	(1 - 1)
<i>Deschampsia flexuosa</i>				1	II	(1 - 1)
<i>Digitalis purpurea</i>	2				II	(2 - 2)
<i>Fagus sylvatica</i> g		1			II	(1 - 1)
<i>Hypnum cupressiforme</i>	4				II	(4 - 4)
<i>Hypochaeris radicata</i>	2				II	(2 - 2)
<i>Pleurozium schreberi</i>				6	II	(6 - 6)
<i>Polytrichum commune</i>	4				II	(4 - 4)
<i>Rumex acetosella</i>			2		II	(2 - 2)
No. species per quadrat	12	7	7	7		
Mean no. species per quadrat	8.3					

The second is found over a large area at the eastern end of Bowness Plantation. Here the grasses and sedges of other felled ground are replaced by frequent to abundant heather *Calluna vulgaris* and bell

heather *Erica cinerea*, plus frequent *Polytrichum commune*, wavy hair-grass *Deschampsia flexuosa*, purple moor grass *Molinia caerulea* and bilberry *Vaccinium myrtillus*. This vegetation is mapped as “F/R H10”

Felled/replanted H10								
Species	Q13	Q14	Q16	Q17	Q18	Q19	Constancy	Range
<i>Calluna vulgaris</i>	2	3	9	7	8	7	V	(2 - 9)
<i>Erica cinerea</i>	2	2	5	6	4	5	V	(2 - 6)
<i>Betula pubescens</i> g		2	2	1	1		IV	(1 - 2)
<i>Dryopteris dilatata</i>	1	1		2	2		IV	(1 - 2)
<i>Polytrichum commune</i>	5	4		4		2	IV	(2 - 5)
<i>Deschampsia flexuosa</i>				4	4	8	III	(4 - 8)
<i>Molinia caerulea</i>	4	5	2				III	(2 - 5)
<i>Vaccinium myrtillus</i>				2	2	2	III	(2 - 2)
<i>Agrostis capillaris</i>	5	5					II	(5 - 5)
<i>Carex binervis</i>	4	4					II	(4 - 4)
<i>Carex pilulifera</i>	5				4		II	(4 - 5)
<i>Erica tetralix</i>		2	2				II	(2 - 2)
<i>Picea</i> sp s				5	4		II	(4 - 5)
<i>Anthoxanthum odoratum</i>	4						I	(4 - 4)
<i>Blechnum spicant</i>				2			I	(2 - 2)
<i>Carex echinata</i>		5					I	(5 - 5)
<i>Chamerion angustifolium</i>		1					I	(1 - 1)
<i>Digitalis purpurea</i>	1						I	(1 - 1)
<i>Festuca ovina</i>		4					I	(4 - 4)
<i>Juncus bulbosus</i>		4					I	(4 - 4)
<i>Juncus effusus</i>		2					I	(2 - 2)
<i>Luzula campestris</i>	2						I	(2 - 2)
<i>Picea</i> sp g			2				I	(2 - 2)
<i>Pinus sylvestris</i> g					1		I	(1 - 1)
<i>Pleurozium schreberi</i>						4	I	(4 - 4)
<i>Potentilla erecta</i>			1				I	(1 - 1)
<i>Rubus fruticosus</i>			1				I	(1 - 1)
<i>Senecio jacobaea</i>		1					I	(1 - 1)
<i>Sorbus aucuparia</i> g			1				I	(1 - 1)
No. species per quadrat	11	15	9	9	9	6		
Mean no. species per quadrat	9.8							

Where the ground is damp however the vegetation in felled and replanted areas is characterised by an abundance of *Polytrichum commune*, purple moor grass *Molinia caerulea* and soft rush *Juncus effusus*. Heather *Calluna vulgaris*, common bent *Agrostis capillaris*, broad buckler fern *Dryopteris dilatata*, wavy hair-grass *Deschampsia flexuosa* and cross-leaved heath *Erica tetralix*. In a few stands tufted hair-grass *Deschampsia cespitosa* may also be abundant. The composition of these stands very diverse, and it is possible that this community could be further sub-divided.

Damp felled/replanted															
Species	Q2	Q43	Q45	Q46	Q65	Q66	Q67	Q68	Q69	Q86	Q87	Q200	Q205	Constancy	Range
<i>Molinia caerulea</i>	4	4		4	4		5	5	7	4	5	2	2	V	(2 - 7)
<i>Polytrichum commune</i>	4	6	6	4		8	6	6	5		4	4	8	V	(4 - 8)
<i>Calluna vulgaris</i>	5			5	5	4	4	4	4		4	5	2	IV	(2 - 5)
<i>Dryopteris dilatata</i>	1	2	1	2	2	2	1	2		1				IV	(1 - 2)
<i>Juncus effusus</i>	5	2	4	5	2					5	4	6	3	IV	(2 - 6)
<i>Agrostis capillaris</i>	2	3	3		3		4			2	3	2		IV	(2 - 4)
<i>Erica tetralix</i>	5				2	2	2	4	4			2	4	IV	(2 - 5)
<i>Deschampsia flexuosa</i>		8		5	7	4	4	4	4					III	(4 - 8)
<i>Potentilla erecta</i>	2	2		2	4	2					2		2	III	(2 - 4)
<i>Digitalis purpurea</i>	2		2		2					1	1	1		III	(1 - 2)
<i>Carex binervis</i>	2		3	2	4			4						II	(2 - 4)
<i>Holcus lanatus</i>			4	6	4					3		2		II	(2 - 6)
<i>Carex pilulifera</i>					4	5	4	7						II	(4 - 7)
<i>Galium saxatile</i>	3	3								5	5			II	(3 - 5)
<i>Picea sp g</i>			4			4	1						4	II	(1 - 4)
<i>Salix cinerea g</i>					2	1						4	1	II	(1 - 4)
<i>Carex echinata</i>									4			3	3	II	(3 - 4)
<i>Pleurozium schreberi</i>	5									6	4			II	(4 - 6)
<i>Sphagnum capillifolium</i>	4											4	6	II	(4 - 6)
<i>Vaccinium myrtillus</i>						1	2					2		II	(1 - 2)
<i>Cirsium palustre</i>					2								1	I	(1 - 2)
<i>Deschampsia cespitosa</i>			6									2		I	(2 - 6)
<i>Festuca ovina</i>				5							3			I	(3 - 5)
<i>Juncus squarrosus</i>			4						1					I	(1 - 4)
<i>Rubus fruticosus</i>												4	1	I	(1 - 4)
<i>Athyrium filix-femina</i>												4		I	(4 - 4)
<i>Betula pubescens</i>	5													I	(5 - 5)
<i>Crepis capillaris</i>												1		I	(1 - 1)
<i>Dryopteris affinis</i>										4				I	(4 - 4)
<i>Empetrum nigrum</i>							1							I	(1 - 1)
<i>Hypnum cupressiforme</i>											4			I	(4 - 4)
<i>Hypnum jutlandicum</i>		4												I	(4 - 4)
<i>Juncus acutiflorus</i>												2		I	(2 - 2)
<i>Juncus conglomeratus</i>	2													I	(2 - 2)
<i>Larix sp</i>	4													I	(4 - 4)
<i>Luzula campestris</i>												2		I	(2 - 2)
<i>Picea sp</i>	4													I	(4 - 4)
<i>Prunella vulgaris</i>					2									I	(2 - 2)
<i>Ranunculus flammula</i>													2	I	(2 - 2)
<i>Rhytiadelphus squarrosus</i>										4				I	(4 - 4)
<i>Sphagnum cuspidatum</i>													4	I	(4 - 4)
<i>Sphagnum recurvum</i>													6	I	(6 - 6)
<i>Vaccinium oxycoccus</i>													1	I	(1 - 1)
<i>Viola palustris</i>			2											I	(2 - 2)
No. species per quadrat	17	9	10	11	15	10	11	8	7	10	13	15	17		
Mean no. species per quadrat	11.8														

National Vegetation Classification Communities

Native Woodland Communities

W1 *Salix cinerea* – *Galium palustre* woodland

Grey willow *Salix cinerea* carr is uncommon in the valley, being confined to a few small stands east of Mireside. The vegetation has a canopy of grey willow over a groundlayer of peat and scattered herbs such as marsh bedstraw *Galium palustre*, meadowsweet *Filipendula ulmaria* and marsh pennywort *Hydrocotyle vulgaris*.

W1	
Species	Q169
<i>Salix cinerea</i>	10
<i>Callitriche</i> sp	3
<i>Galium palustre</i>	3
<i>Filipendula ulmaria</i>	2
<i>Hydrocotyle vulgaris</i>	2
<i>Juncus acutiflorus</i>	2
No. species per quadrat	6

W4 *Betula pubescens* – *Molinia caerulea* woodland

Stands of damp birch woodland are occasional in the valley. Some, like that along Smithy Beck, are hard to characterise below community level, whilst others clearly belong to a sub-community. The former have a canopy of downy birch *Betula pubescens*, with abundant purple moor grass *Molinia caerulea* in the groundlayer. Other species present may include common bent *Agrostis capillaris*, wavy hair-grass *Deschampsia flexuosa* and grey willow *Salix cinerea*.

W4	
Species	Q11
<i>Molinia caerulea</i>	9
<i>Betula pubescens</i>	8
<i>Agrostis capillaris</i>	4
<i>Salix cinerea</i>	4
<i>Sorbus aucuparia</i>	4
<i>Deschampsia flexuosa</i>	3
<i>Dryopteris filix-mas</i>	2
<i>Calluna vulgaris</i>	1
<i>Quercus petraea</i> g	1
No. species per quadrat	9

W4c *Betula pubescens* – *Molinia caerulea* woodland Sphagnum sub-community

Stands of birch woodland on peat with frequent to abundant *Sphagna* and *Polytrichum commune* are present occasionally, most notably on the edge of the lake at Mireside and around the Broadmoor plantation. Purple moor grass *Molinia caerulea* is generally frequent, but can be absent in some stands. Whilst birch is generally the main canopy constituent, alder *Alnus glutinosa* can also be abundant in stands. Common bent *Agrostis capillaris* and common sedge *Carex nigra* are also common features of the groundlayer, which is often very wet, with frequent pools of water.

W4c								
Species	Q146	Q147	Q154	Q155	Q156	Q157	Constancy	Range
<i>Betula pubescens</i>	7	5	8	8	8	8	V	(5 - 8)
<i>Sphagnum recurvum</i>	4	5	8	6	6	4	V	(4 - 8)
<i>Sphagnum palustre</i>	5		5	7	6	6	V	(5 - 7)
<i>Agrostis capillaris</i>	2	5	2		2		IV	(2 - 5)
<i>Alnus glutinosa</i>	7	8	5	4			IV	(4 - 8)
<i>Carex nigra</i>			4	4	3	6	IV	(3 - 6)
<i>Molinia caerulea</i>	5	4	5	5			IV	(4 - 5)
<i>Polytrichum commune</i>	7			4	7	8	IV	(4 - 8)
<i>Dryopteris carthusiana</i>			1	2		1	III	(1 - 2)
<i>Juncus acutiflorus</i>					3	1	II	(1 - 3)
<i>Lonicera periclymenum</i>			2	2			II	(2 - 2)
<i>Quercus petraea</i>			5	5			II	(5 - 5)
<i>Rubus fruticosus</i>			2	2			II	(2 - 2)
<i>Sorbus aucuparia</i>			4	1			II	(1 - 4)
<i>Athyrium filix-femina</i>				1			I	(1 - 1)
<i>Dryopteris dilatata</i>	4						I	(4 - 4)
<i>Filipendula ulmaria</i>		2					I	(2 - 2)
<i>Fraxinus excelsior</i>				1			I	(1 - 1)
<i>Holcus mollis</i>			2				I	(2 - 2)
<i>Hydrocotyle vulgaris</i>	2						I	(2 - 2)
<i>Juncus effusus</i>	2						I	(2 - 2)
<i>Potentilla erecta</i>						1	I	(1 - 1)
<i>Pteridium aquilinum</i>				1			I	(1 - 1)
<i>Ranunculus repens</i>		2					I	(2 - 2)
<i>Succisa pratensis</i>		3					I	(3 - 3)
<i>Viola palustris</i>		3					I	(3 - 3)
No. species per quadrat	10	9	13	15	7	8		
Mean no. species per quadrat	10.3							

W4c mire				
Species	Q159	Q160	Constancy	Range
<i>Betula pubescens</i>	6	6	V	(6 - 6)
<i>Calluna vulgaris</i>	4	4	V	(4 - 4)
<i>Carex nigra</i>	2	2	V	(2 - 2)
<i>Erica tetralix</i>	2	4	V	(2 - 4)
<i>Eriophorum angustifolium</i>	3	2	V	(2 - 3)
<i>Hylocomium splendens</i>	5	6	V	(5 - 6)
<i>Molinia caerulea</i>	6	7	V	(6 - 7)
<i>Potentilla erecta</i>	2	2	V	(2 - 2)
<i>Sphagnum recurvum</i>	4	4	V	(4 - 4)
<i>Vaccinium myrtillus</i>	4	4	V	(4 - 4)
<i>Vaccinium oxycoccus</i>	2	2	V	(2 - 2)
<i>Hypnum cupressiforme</i>	4		III	(4 - 4)
<i>Juncus acutiflorus</i>		2	III	(2 - 2)
<i>Narthecium ossifragum</i>	2		III	(2 - 2)
No. species per quadrat	13	12		
Mean no. species per quadrat	12.5			

Within the *Betula* – *Molinia* woodland at Mireside there is a central area with M17 mire. This is partially wooded and where trees are present the vegetation clearly falls into W4c, but has a more

ombrotrophic nature than the other samples of this sub-community. In particular heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, common cotton-grass *Eriophorum angustifolium*, cranberry *Vaccinium oxycoccus* and bilberry *Vaccinium myrtillus* are all constant (see samples 159 and 160).

W7 *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland

Along the River Ehen and on the lakeside below How Hall Farm are stands of alder *Alnus glutinosa* woodland with a herb-rich groundflora. This woodland occurs where there is some flushing of the soil and is more mesotrophic than W4 *Betula* – *Molinia* woodland. As well as alder ash *Fraxinus excelsior* and rowan *Sorbus aucuparia* are constant in the canopy, whilst grey willow *Salix cinerea* is occasional as a shrub layer. Tufted hair-grass *Deschampsia cespitosa*, creeping buttercup *Ranunculus repens*, remote sedge *Carex remota*, yellow pimpernel *Lysimachia nemorum* and soft rush *Juncus effusus* are the principal groundflora species and meadowsweet *Filipendula ulmaria* can be locally abundant.

W7								
Species	Q185	Q186	Q201	Q202	Q203	Q204	Constancy	Range
<i>Alnus glutinosa</i>	6	9	9	9	9	9	V	(6 - 9)
<i>Fraxinus excelsior</i>	4	4	5	4	4	4	V	(4 - 5)
<i>Lysimachia nemorum</i>	2	2	4	2	3	3	V	(2 - 4)
<i>Carex remota</i>		2	4	4	4	5	V	(2 - 5)
<i>Deschampsia cespitosa</i>		2	6	4	2	4	V	(2 - 6)
<i>Sorbus aucuparia</i>	4	4	4	4		4	V	(4 - 4)
<i>Juncus effusus</i>	3	5		5		1	IV	(1 - 5)
<i>Ranunculus repens</i>			6	4	3	6	IV	(3 - 6)
<i>Galium palustre</i>				3	2	3	III	(2 - 3)
<i>Salix cinerea</i>		4		4	4		III	(4 - 4)
<i>Agrostis capillaris</i>			2		5		II	(2 - 5)
<i>Cirsium palustre</i>		2				1	II	(1 - 2)
<i>Crataegus monogyna</i>	4				4		II	(4 - 4)
<i>Crepis paludosa</i>	2					1	II	(1 - 2)
<i>Fagus sylvatica</i>	5	4					II	(4 - 5)
<i>Filipendula ulmaria</i>	8	8					II	(8 - 8)
<i>Rubus fruticosus</i>	2	4					II	(2 - 4)
<i>Acer pseudoplatanus</i>						4	I	(4 - 4)
<i>Ajuga reptans</i>	2						I	(2 - 2)
<i>Cardamine amara</i>				3			I	(3 - 3)
<i>Carex sylvatica</i>			2				I	(2 - 2)
<i>Circaea lutetiana</i>					2		I	(2 - 2)
<i>Digitalis purpurea</i>			1				I	(1 - 1)
<i>Dryopteris dilatata</i>		4					I	(4 - 4)
<i>Geranium robertianum</i>	2						I	(2 - 2)
<i>Glyceria fluitans</i>				3			I	(3 - 3)
<i>Holcus mollis</i>			2				I	(2 - 2)
<i>Ilex aquifolium</i>	4						I	(4 - 4)
<i>Ilex aquifolium</i>		4					I	(4 - 4)
<i>Mentha aquatica</i>						4	I	(4 - 4)
<i>Molinia caerulea</i>		2					I	(2 - 2)
<i>Montia fontana</i>				3			I	(3 - 3)
<i>Oxalis acetosella</i>					4		I	(4 - 4)
<i>Phalaris arundinacea</i>		1					I	(1 - 1)
<i>Polygonium persicaria</i>				1			I	(1 - 1)
<i>Quercus petraea</i>	6						I	(6 - 6)
<i>Ranunculus flammula</i>						2	I	(2 - 2)
<i>Succisa pratensis</i>		2					I	(2 - 2)
<i>Viola palustris</i>					2		I	(2 - 2)
<i>Viola riviniana</i>					2		I	(2 - 2)
No. species per quadrat	14	17	11	14	14	14		
Mean no. species per quadrat	14							

W11 Quercus petraea – Betula pubescens – Oxalis acetosella woodland

This is the principal native woodland on dry lower ground in the valley. Sessile oak *Quercus petraea* and downy birch *Betula pubescens* are the principal canopy species, with rowan *Sorbus aucuparia* also constant. A wide range of other trees may also be present. The groundlayer is generally grassy, with abundant common bent *Agrostis capillaris* and creeping soft-grass *Holcus mollis*, plus frequent wood sorrel *Oxalis acetosella*. Bracken *Pteridium aquilinum* and bramble *Rubus fruticosus* can also be abundant in some stands.

W11						
Species	Q97	Q180	Q192	Q193	Constancy	Range
<i>Agrostis capillaris</i>	6	6	9	8	V	(6 - 9)
<i>Betula pubescens</i>	9		8	7	IV	(7 - 9)
<i>Holcus mollis</i>	8	7		4	IV	(4 - 8)
<i>Oxalis acetosella</i>		5	1	2	IV	(1 - 5)
<i>Quercus petraea</i>		8	4	8	IV	(4 - 8)
<i>Sorbus aucuparia</i>	4	4	4		IV	(4 - 4)
<i>Dactylis glomerata</i>			4	2	III	(2 - 4)
<i>Festuca ovina</i>	3		3		III	(3 - 3)
<i>Rumex acetosa</i>			2	2	III	(2 - 2)
<i>Alnus glutinosa</i>		4			II	(4 - 4)
<i>Anthoxanthum odoratum</i>		3			II	(3 - 3)
<i>Corylus avellana</i>				4	II	(4 - 4)
<i>Deschampsia cespitosa</i>				4	II	(4 - 4)
<i>Fraxinus excelsior</i>		4			II	(4 - 4)
<i>Fraxinus excelsior s</i>	2				II	(2 - 2)
<i>Ilex aquifolium</i>				4	II	(4 - 4)
<i>Ilex aquifolium g</i>		1			II	(1 - 1)
<i>Mnium hornum</i>				4	II	(4 - 4)
<i>Pleurozium schreberi</i>	4				II	(4 - 4)
<i>Potentilla erecta</i>			2		II	(2 - 2)
<i>Pteridium aquilinum</i>	4				II	(4 - 4)
<i>Salix cinerea</i>		4			II	(4 - 4)
<i>Stellaria hostiana</i>				2	II	(2 - 2)
<i>Teucrium scorodonia</i>	2				II	(2 - 2)
<i>Thuidium tamariscinum</i>	4				II	(4 - 4)
<i>Veronica montana</i>				3	II	(3 - 3)
<i>Viola riviniana</i>	3				II	(3 - 3)
No. species per quadrat	11	10	9	13		
Mean no. species per quadrat	10.8					

W17 Quercus petraea – Betula pubescens – Dicranum majus woodland

This woodland type is found on thin rocky soils, generally on sloping ground. It is uncommon in Ennerdale, with the main stands present on the lower slopes of Latterbarrow and Bowness Knott. Sessile oak *Quercus petraea* is the main canopy species, with constant rowan *Sorbus aucuparia*. Downy birch is occasional. There is little shrub layer, other than an occasional holly *Ilex aquifolium* tree. The ground is generally dominated by a varying mix of wavy hair-grass *Deschampsia flexuosa*, bilberry *Vaccinium myrtillus* and bryophytes such as *Isopterygium elegans*, *Thuidium tamariscinum*, *Polytrichum commune* and *Isothecium myosuroides*.

W17							
Species	Q90	Q91	Q92	Q93	Q94	Constancy	Range
<i>Deschampsia flexuosa</i>	6	5	1	2	6	V	(1 - 6)
<i>Quercus petraea</i>	9	9	9	9	9	V	(9 - 9)
<i>Sorbus aucuparia</i>	5	4	4	5	4	V	(4 - 5)
<i>Vaccinium myrtillus</i>		6	4	9	8	IV	(4 - 9)
<i>Ilex aquilinum</i> g	2	3			2	III	(2 - 3)
<i>Isopterygium elegans</i>			8	4	5	III	(4 - 8)
<i>Polytrichum commune</i>			4	2	2	III	(2 - 4)
<i>Thuidium tamariscinum</i>	7	7			4	III	(4 - 7)
<i>Betula pubescens</i>		4	4			II	(4 - 4)
<i>Isothecium myosuroides</i>	5		5			II	(5 - 5)
<i>Oxalis acetosella</i>	2				1	II	(1 - 2)
<i>Agrostis capillaris</i>		2				I	(2 - 2)
<i>Dicranum majus</i>			4			I	(4 - 4)
<i>Fagus sylvatica</i> g					1	I	(1 - 1)
<i>Hedera helix</i>	2					I	(2 - 2)
<i>Hypnum cupressiforme</i>		4				I	(4 - 4)
<i>Ilex aquilinum</i>				4		I	(4 - 4)
<i>Rubus fruticosus</i>		1				I	(1 - 1)
<i>Teucrium scorodonia</i>	1					I	(1 - 1)
No. species per quadrat	9	10	9	7	10		
Mean no. species per quadrat	9						

Non-woodland Communities

H8b *Calluna vulgaris* – *Ulex gallii* heath *Danthonia decumbens* sub-community

This community is present on vegetated banks of river shingle along the lower reaches of the River Liza forming dense stands dominated by western gorse *Ulex gallii* and heather *Calluna vulgaris*. Other species are sporadic in occurrence, except for heath bedstraw *Galium saxatile* and purple moor grass *Molinia caerulea*, which are both frequent in occurrence. This vegetation is a poor fit in any of the H8 sub-communities, but appears to fit best here.

H8b Species	Q123	Q124	Q128	Q133	Q135	Constancy	Range
<i>Calluna vulgaris</i>	5	8	6	4	5	V	(4 - 8)
<i>Ulex gallii</i>	9	6	8	10	8	V	(6 - 10)
<i>Galium saxatile</i>			2	2	2	III	(2 - 2)
<i>Molinia caerulea</i>	4	2	4			III	(2 - 4)
<i>Deschampsia flexuosa</i>		2			5	II	(2 - 5)
<i>Hypnum cupressiforme</i>		4			5	II	(4 - 5)
<i>Polytrichum commune</i>	2		2			II	(2 - 2)
<i>Potentilla erecta</i>		2	3			II	(2 - 3)
<i>Agrostis capillaris</i>					2	I	(2 - 2)
<i>Digitalis purpurea</i>			4			I	(4 - 4)
<i>Festuca ovina</i>				4		I	(4 - 4)
<i>Hypochaeris radicata</i>		1				I	(1 - 1)
<i>Pleurozium schreberi</i>			4			I	(4 - 4)
<i>Sorbus aucuparia</i> s			1			I	(1 - 1)
<i>Sphagnum capillifolium</i>				5		I	(5 - 5)
<i>Teucrium scorodonia</i>			4			I	(4 - 4)
No. species per quadrat	4	7	11	4	6		
Mean no. species per quadrat	6.4						

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

Stands of western gorse *Ulex gallii* heath on crags, principally on Bowness Knott. Heather *Calluna vulgaris* and western gorse *Ulex gallii* are abundant, with frequent bell heather *Erica cinerea* and bilberry *Vaccinium myrtillus*. Wavy hair-grass *Deschampsia flexuosa* and *Pleurozium schreberi* are occasional.

H8e Species	Q24	Q25	Q26	Q27	Q28	Constancy	Range
<i>Calluna vulgaris</i>	8	8	4	5	5	V	(4 - 8)
<i>Erica cinerea</i>	4	6	5	5	7	V	(4 - 7)
<i>Ulex gallii</i>	7	5	8	7	8	V	(5 - 8)
<i>Vaccinium myrtillus</i>	6	4	6	6	2	V	(2 - 6)
<i>Deschampsia flexuosa</i>			2	2	2	III	(2 - 2)
<i>Pleurozium schreberi</i>		4		4	5	III	(4 - 5)
<i>Pteridium aquilinum</i>			4	6		II	(4 - 6)
<i>Cladonia impexa</i>					2	I	(2 - 2)
No. species per quadrat	4	5	6	7	7		
Mean no. species per quadrat	5.8						

H10 *Calluna vulgaris* – *Erica cinerea* heath

This heath is found extensive on the crags of Bowness Knott and the crags below Heckbarley. heather *Calluna vulgaris*, bell heather *Erica cinerea* and bilberry *Vaccinium myrtillus* are all abundant, with frequent *Pleurozium schreberi*, wavy hair-grass *Deschampsia flexuosa* and cross-leaved heath *Erica tetralix*.

H10							
Species	Q5	Q20	Q21	Q22	Q23	Constancy	Range
<i>Calluna vulgaris</i>	8	8	7	9	6	V	(6 - 9)
<i>Erica cinerea</i>	6	7	7	6	7	V	(6 - 7)
<i>Vaccinium myrtillus</i>	4	3	6	4	8	V	(3 - 8)
<i>Pleurozium schreberi</i>		4	4	4	4	IV	(4 - 4)
<i>Deschampsia flexuosa</i>		2	2		2	III	(2 - 2)
<i>Erica tetralix</i>	4	3	2			III	(2 - 4)
<i>Pteridium aquilinum</i>	4			4		II	(4 - 4)
<i>Betula pubescens</i> s	1					I	(1 - 1)
<i>Cladonia impexa</i>			4			I	(4 - 4)
<i>Molinia caerulea</i>	4					I	(4 - 4)
<i>Potentilla erecta</i>	2					I	(2 - 2)
<i>Quercus petraea</i> s	1					I	(1 - 1)
<i>Sorbus aucuparia</i> s	1					I	(1 - 1)
<i>Trichophorum cespitosus</i>		1				I	(1 - 1)
No. species per quadrat	10	7	7	5	5		
Mean no. species per quadrat	6.8						

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

This heath is present on the upper slopes of Lingmell, within Lingmell Plantation and on the slopes of Great Borne. Heather *Calluna vulgaris* dominates over bilberry *Vaccinium myrtillus* and a bryophyte layer with species such as *Plagiothecium undulatum*, *Hypnum cupressiforme* and *Pleurozium schreberi*.

H12a							
Species	Q104	Q105	Q108	Q110	Q111	Constancy	Range
<i>Calluna vulgaris</i>	10	10	9	8	7	V	(7 - 10)
<i>Plagiothecium undulatum</i>	4	5	2	2	4	V	(2 - 5)
<i>Vaccinium myrtillus</i>	2	2	2	7	8	V	(2 - 8)
<i>Deschampsia flexuosa</i>			3	2	2	III	(2 - 3)
<i>Hypnum cupressiforme</i>		6	6			II	(6 - 6)
<i>Pleurozium schreberi</i>				7	8	II	(7 - 8)
<i>Brachythecium rutabulum</i>				4		I	(4 - 4)
<i>Empetrum nigrum</i>					4	I	(4 - 4)
<i>Erica tetralix</i>	1					I	(1 - 1)
<i>Picea</i> sp s		1				I	(1 - 1)
<i>Polytrichum commune</i>					1	I	(1 - 1)
<i>Rhytidiadelphus loreus</i>	4					I	(4 - 4)
No. species per quadrat	5	5	5	6	7		
Mean no. species per quadrat	5.6						

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

This grassy heath is present in clearings within the main plantations and on the slopes of Heckbarley and Crag Fell. Heather *Calluna vulgaris* is abundant, with frequent bilberry *Vaccinium myrtillus*, wavy hair-grass *Deschampsia flexuosa*, sheep's fescue *Festuca ovina*, heath bedstraw *Galium saxatile* and bryophytes.

H12c								
Species	Q36	Q106	Q107	Q109	Q112	Q113	Constancy	Range
<i>Calluna vulgaris</i>	9	6	7	7	8	8	V	(6 - 9)
<i>Deschampsia flexuosa</i>	3	7	3	3	4	5	V	(3 - 7)
<i>Vaccinium myrtillus</i>	2	5	4	4	2	5	V	(2 - 5)
<i>Festuca ovina</i>			2	4	4	4	IV	(2 - 4)
<i>Galium saxatile</i>	3	2	2		4	4	IV	(2 - 4)
<i>Hypnum cupressiforme</i>	4		8		6	6	IV	(4 - 8)
<i>Pleurozium schreberi</i>	4			7		4	III	(4 - 7)
<i>Agrostis capillaris</i>		3	3				II	(3 - 3)
<i>Carex binervis</i>	1						I	(1 - 1)
<i>Erica tetralix</i>					1		I	(1 - 1)
<i>Molinia caerulea</i>	4						I	(4 - 4)
<i>Oreopteris limbosperma</i>			1				I	(1 - 1)
<i>Plagiothecium undulatum</i>				1			I	(1 - 1)
<i>Potentilla erecta</i>						2	I	(2 - 2)
<i>Rhytidiadelphus loreus</i>				4			I	(4 - 4)
<i>Sphagnum capillifolium</i>	4						I	(4 - 4)
<i>Trichophorum cespitosus</i>					2		I	(2 - 2)
No. species per quadrat	9	5	8	7	7	8		
Mean no. species per quadrat	7.3							

Along the shingle banks of the River Liza there are a few stands of a community resembling H12c, but different in composition to the vegetation described above. This shingle vegetation has abundant heather *Calluna vulgaris* and sheep's fescue *Festuca ovina*, with frequent wavy hair-grass *Deschampsia flexuosa* and heath milkwort *Polygala serpyllifolia*, and locally abundant *Pleurozium schreberi* and *Polytrichum commune*. Downy birch *Betula pubescens* saplings are also common.

H12c shingle				
Species	Q63	Q64	Constancy	Range
<i>Betula pubescens</i> s	1	2	V	(1 - 2)
<i>Calluna vulgaris</i>	6	8	V	(6 - 8)
<i>Deschampsia flexuosa</i>	3	3	V	(3 - 3)
<i>Festuca ovina</i>	8	6	V	(6 - 8)
<i>Pleurozium schreberi</i>	6	4	V	(4 - 6)
<i>Polygala serpyllifolia</i>	3	2	V	(2 - 3)
<i>Polytrichum commune</i>	4	5	V	(4 - 5)
<i>Carex binervis</i>		2	III	(2 - 2)
<i>Cladonia impexa</i>		4	III	(4 - 4)
<i>Deschampsia cespitosa</i>		1	III	(1 - 1)
<i>Galium saxatile</i>	3		III	(3 - 3)
<i>Molinia caerulea</i>		1	III	(1 - 1)
<i>Potentilla erecta</i>		2	III	(2 - 2)
<i>Vaccinium myrtillus</i>	2		III	(2 - 2)
No. species per quadrat	9	12		
Mean no. species per quadrat	10.5			

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

All the acidic short-sedge flushes, runnels and soakways found during the survey belong to this community. It is characterised by an open sward of carnation sedge *Carex panicea*, purple moor grass *Molinia caerulea*, common cotton-grass *Eriophorum angustifolium*, bog asphodel *Narthecium ossifragum* and mat grass *Nardus stricta*. *Sphagnum auriculatum* is often abundant within this and a range of other Sphagna may also be present. Herbs are generally no more than occasional, but tormentil *Potentilla erecta* is constant and round-leaved sundew *Drosera rotundifolia* is frequent. Sheep's fescue *Festuca ovina* and heath rush *Juncus squarrosus* can also be frequent. This is a very variable community and a wide range of other mire species can be present.

M6b											
Species	Q33	Q75	Q76	Q77	Q129	Q130	Q131	Q140	Q145	Constancy	Range
Carex panicea		3	3	3	3	3	3	3	3	V	(3 - 3)
Molinia caerulea	4	3	3	3	3	3		5	3	V	(3 - 5)
Narthecium ossifragum		2	3	3	2	3		2	3	V	(2 - 3)
Eriophorum angustifolium		3	3		3	3	2	3	3	IV	(2 - 3)
Nardus stricta		2	2	2	4	4	3		3	IV	(2 - 4)
Potentilla erecta	2		2		3	3	3		2	IV	(2 - 3)
Sphagnum auriculatum		6	6	2	7	6	2			IV	(2 - 7)
Drosera rotundifolia		2	3	2	1			2		III	(1 - 3)
Festuca ovina	2				3	2	2			III	(2 - 3)
Juncus squarrosus	4	4	2				3			III	(2 - 4)
Breutelia chrysocoma		4	3						6	II	(3 - 6)
Eleocharis quinqueflora		2	3	3						II	(2 - 3)
Juncus bulbosus		3	2	3						II	(2 - 3)
Rhynchospora alba		2	3	3						II	(2 - 3)
Sphagnum cuspidatum						4	4	2		II	(2 - 4)
Agrostis capillaris	2					2				II	(2 - 2)
Carex echinata	8	3								II	(3 - 8)
Carex hostiana			2	3						II	(2 - 3)
Hydrocotyle vulgaris								2	4	II	(2 - 4)
Juncus articulatus							1		1	II	(1 - 1)
Sphagnum papillosum	5	4								II	(4 - 5)
Sphagnum recurvum								2	4	II	(2 - 4)
Sphagnum tenellum						5	7			II	(5 - 7)
Aulacomnium palustre							5			I	(5 - 5)
Calliergon cuspidatum									6	I	(6 - 6)
Carex demissa	2									I	(2 - 2)
Carex pulicaris									2	I	(2 - 2)
Cirsium palustre									2	I	(2 - 2)
Dactylorhiza maculata					1					I	(1 - 1)
Danthonia decumbens	1									I	(1 - 1)
Drepanocladus revolvens			2							I	(2 - 2)
Erica tetralix			2							I	(2 - 2)
Holcus lanatus									2	I	(2 - 2)
Menyanthes trifoliata								2		I	(2 - 2)
Pedicularis sylvestris									2	I	(2 - 2)
Polytrichum commune	4									I	(4 - 4)
Ranunculus acris									3	I	(3 - 3)
Ranunculus flammula									2	I	(2 - 2)
Sphagnum palustre	8									I	(8 - 8)
Succisa pratensis									4	I	(4 - 4)
Trichophorum cespitosus		1								I	(1 - 1)
Utricularia sp								2		I	(2 - 2)
Viola palustris	2									I	(2 - 2)
No. species per quadrat	12	15	16	10	10	11	12	10	18		
Mean no. species per quadrat	12.7										

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

This is the principal rush mire of the poorer soils of the upper valley. The sward is characterised by an abundance of *Polytrichum commune* and, in some stands, *Sphagnum recurvum* and *Sphagnum palustre* within which there is frequent soft rush *Juncus effusus*.

M6c				
Species	Q62	Q182	Constancy	Range
<i>Juncus effusus</i>	5	3	V	(3 - 5)
<i>Polytrichum commune</i>	4	7	V	(4 - 7)
<i>Agrostis capillaris</i>	7		III	(7 - 7)
<i>Calluna vulgaris</i>	2		III	(2 - 2)
<i>Carex echinata</i>		3	III	(3 - 3)
<i>Carex nigra</i>		2	III	(2 - 2)
<i>Deschampsia cespitosa</i>	4		III	(4 - 4)
<i>Digitalis purpurea</i>	2		III	(2 - 2)
<i>Festuca ovina</i>	5		III	(5 - 5)
<i>Galium saxatile</i>	4		III	(4 - 4)
<i>Holcus lanatus</i>	5		III	(5 - 5)
<i>Juncus conglomeratus</i>	2		III	(2 - 2)
<i>Luzula campestre</i>	1		III	(1 - 1)
<i>Molinia caerulea</i>		4	III	(4 - 4)
<i>Potentilla erecta</i>		1	III	(1 - 1)
<i>Salix cinerea s</i>	1		III	(1 - 1)
<i>Sphagnum palustre</i>		7	III	(7 - 7)
<i>Sphagnum recurvum</i>		4	III	(4 - 4)
<i>Vaccinium oxycoccus</i>		3	III	(3 - 3)
No. species per quadrat	12	9		
Mean no. species per quadrat	10.5			

M6d *Carex echinata* – *Sphagnum recurvum/auriculatum* mire *Juncus acutiflorus* sub-community

This community is largely found to the east of Mireside. This sub-community tends to be more diverse than the M6c *Juncus effusus* sub-community, with abundant *Sphagnum recurvum* below sharp-flowered rush *Juncus acutiflorus*. A range of other species are regularly or constantly present, including marsh thistle *Cirsium palustre*, purple moor grass *Molinia caerulea*, marsh violet *Viola palustris*, greater bird's-foot trefoil *Lotus pedunculatus*, tormentil *Potentilla erecta*, soft rush *Juncus effusus*, marsh pennywort *Hydrocotyle vulgaris* and common bent *Agrostis capillaris*.

M6d					
Species	Q141	Q142	Q151	Constancy	Range
<i>Cirsium palustre</i>	2	4	3	V	(2 - 4)
<i>Juncus acutiflorus</i>	6	6	3	V	(3 - 6)
<i>Molinia caerulea</i>	4	2	3	V	(2 - 4)
<i>Sphagnum recurvum</i>	9	8	2	V	(2 - 9)
<i>Viola palustris</i>	2	2	2	V	(2 - 2)
<i>Agrostis capillaris</i>	3	3		IV	(3 - 3)
<i>Hydrocotyle vulgaris</i>	4	5		IV	(4 - 5)
<i>Juncus effusus</i>	3	3		IV	(3 - 3)
<i>Lotus pedunculatus</i>	2		2	IV	(2 - 2)
<i>Potentilla erecta</i>	2	2		IV	(2 - 2)
<i>Calliargon cuspidatum</i>			6	II	(6 - 6)
<i>Cardamine pratense</i>			2	II	(2 - 2)
<i>Carex echinata</i>			3	II	(3 - 3)
<i>Carex panicea</i>			3	II	(3 - 3)
<i>Eriophorum angustifolium</i>			3	II	(3 - 3)
<i>Festuca ovina</i>		3		II	(3 - 3)
<i>Lychnis flos-cuculi</i>			1	II	(1 - 1)
<i>Polytrichum commune</i>	2			II	(2 - 2)
<i>Ranunculus acris</i>			2	II	(2 - 2)
<i>Ranunculus flammula</i>			3	II	(3 - 3)
<i>Sphagnum palustre</i>	4			II	(4 - 4)
No. species per quadrat	12	10	14		
Mean no. species per quadrat	12				

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

This base-rich flush community is only present on the thin strip of lakeshore below the path along the southern shore. More extensive areas are present within Pillar and Ennerdale SSSI which lies adjacent to this strip. A full description of this community is given in the NVC report on the SSSI.

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

This wet heath community is found on shallow peats on the shallow slopes at the eastern end of the valley, on the upper edge of the forest in clearings on the southern edge of the plantation near High Beck, along the floodplain of the River Liza, along Smithy Beck, at the western end of the lake and on areas of open ground within the Heckbarley plantation. Purple moor grass *Molinia caerulea* is abundant to dominant, with frequent heather *Calluna vulgaris* and tormentil *Potentilla erecta*. Cross-leaved heath *Erica tetralix*, bog asphodel *Narthecium ossifragum*, starry sedge *Carex echinata*, heath bedstraw *Galium saxatile*, *Hypnum cupressiforme* and bilberry *Vaccinium myrtillus* are also regular constituents.

M15b Species	Q10	Q15	Q31	Q37	Q117	Q121	Q122	Constancy	Range
<i>Calluna vulgaris</i>	2	2	4	2	4	7	5	V	(2 - 7)
<i>Molinia caerulea</i>	9	7	9	9	9	7	8	V	(7 - 9)
<i>Potentilla erecta</i>	1		2	2	2	3	2	V	(1 - 3)
<i>Erica tetralix</i>		2	2	2	2			III	(2 - 2)
<i>Galium saxatile</i>	2					3	3	III	(2 - 3)
<i>Hypnum cupressiforme</i>			2			6	6	III	(2 - 6)
<i>Narthecium ossifragum</i>		4	3	3				III	(3 - 4)
<i>Vaccinium myrtillus</i>	2	2					2	III	(2 - 2)
<i>Carex echinata</i>		4		2				II	(2 - 4)
<i>Juncus acutiflorus</i>		3			2			II	(2 - 3)
<i>Trichophorum cespitosus</i>			5	5				II	(5 - 5)
<i>Achillea millefolium</i>						2		I	(2 - 2)
<i>Agrostis capillaris</i>	3							I	(3 - 3)
<i>Campanula rotundifolia</i>						2		I	(2 - 2)
<i>Carex demissa</i>		5						I	(5 - 5)
<i>Deschampsia flexuosa</i>	3							I	(3 - 3)
<i>Digitalis purpurea</i>							4	I	(4 - 4)
<i>Drosera rotundifolia</i>				1				I	(1 - 1)
<i>Festuca ovina</i>							5	I	(5 - 5)
<i>Juncus bulbosus</i>		4						I	(4 - 4)
<i>Juncus squarrosus</i>				1				I	(1 - 1)
<i>Pinguicula vulgaris</i>		2						I	(2 - 2)
<i>Polytrichum commune</i>			2					I	(2 - 2)
<i>Sphagnum capillifolium</i>		4						I	(4 - 4)
<i>Sphagnum cuspidatum</i>		2						I	(2 - 2)
<i>Sphagnum palustre</i>				4				I	(4 - 4)
<i>Sphagnum papillosum</i>				8				I	(8 - 8)
<i>Sphagnum recurvum</i>					4			I	(4 - 4)
No. species per quadrat	7	12	8	11	6	7	8		
Mean no. species per quadrat	7.8								

M17 *Scirpus cespitosus* – *Eriophorum vaginatum* blanket mire

Small areas of blanket bog on the fringes of the Heckbarley plantation and an area of incipient raised mire east of Mireside fall into this community. The vegetation is composed of tussocks of hare's-tail cotton-grass *Eriophorum vaginatum* with frequent to abundant wavy hair-grass *Deschampsia flexuosa*, bilberry *Vaccinium myrtillus*, heather *Calluna vulgaris*, common sedge *Carex nigra* and purple moor grass *Molinia caerulea*. Bryophytes are generally abundant, particularly *Pleurozium schreberi*, *Sphagnum capillifolium* and *Polytrichum commune*.

M17

Species	Q158	Q194	Q195	Q197	Q198	Constancy	Range
<i>Eriophorum vaginatum</i>	6	8	8	8	6	V	(6 - 8)
<i>Deschampsia flexuosa</i>		3	3	3	2	IV	(2 - 3)
<i>Pleurozium schreberi</i>	4		6	6	6	IV	(4 - 6)
<i>Vaccinium myrtillus</i>	4	2		4	4	IV	(2 - 4)
<i>Calluna vulgaris</i>		1	5		8	III	(1 - 8)
<i>Carex nigra</i>		2		2	2	III	(2 - 2)
<i>Molinia caerulea</i>	4	4		6		III	(4 - 6)
<i>Polytrichum commune</i>	7	6		4		III	(4 - 7)
<i>Sphagnum capillifolium</i>	7		6		4	III	(4 - 7)
<i>Erica tetralix</i>	2				2	II	(2 - 2)
<i>Eriophorum angustifolium</i>	3			2		II	(2 - 3)
<i>Galium saxatile</i>		2		4		II	(2 - 4)
<i>Nardus stricta</i>		4		2		II	(2 - 4)
<i>Vaccinium oxycoccus</i>	3		4			II	(3 - 4)
<i>Betula pubescens s</i>	2					I	(2 - 2)
<i>Dactylorhiza maculata</i>	1					I	(1 - 1)
<i>Empetrum nigrum</i>					2	I	(2 - 2)
<i>Juncus squarrosus</i>		5				I	(5 - 5)
<i>Narthecium ossifragum</i>	2					I	(2 - 2)
<i>Plagiothecium undulatum</i>					5	I	(5 - 5)
<i>Rhytidiadelphus squarrosus</i>		7				I	(7 - 7)
No. species per quadrat	12	11	6	10	10		
Mean no. species per quadrat	9.8						

M23a *Juncus effusus/acutiflorus* – *Galium saxatile* rush pasture
***Juncus acutiflorus* sub-community**

M23a

Species	Q153	Q163	Q176	Q179	Q190	Q191	Constancy	Range
<i>Juncus acutiflorus</i>	7	3	7	5	2	4	V	(2 - 7)
<i>Rumex acetosa</i>	2	3	2	2	4	3	V	(2 - 4)
<i>Galium palustre</i>	2	2		2	2		IV	(2 - 2)
<i>Juncus effusus</i>		6		5	8	8	IV	(5 - 8)
<i>Agrostis capillaris</i>			2		2	3	III	(2 - 3)
<i>Angelica sylvestris</i>		4	3			4	III	(3 - 4)
<i>Epilobium palustre</i>	2	2			2		III	(2 - 2)
<i>Filipendula ulmaria</i>				7	6	5	III	(5 - 7)
<i>Holcus lanatus</i>			3		2	2	III	(2 - 3)
<i>Lotus pedunculatus</i>	3		3			2	III	(2 - 3)
<i>Viola palustris</i>	4	3	3				III	(3 - 4)
<i>Achillea ptarmica</i>			2	2			II	(2 - 2)
<i>Cirsium palustre</i>	4		2				II	(2 - 4)
<i>Deschampsia cespitosa</i>					2	2	II	(2 - 2)
<i>Dryopteris carthusiana</i>	1	2					II	(1 - 2)
<i>Hydrocotyle vulgaris</i>	2	2					II	(2 - 2)
<i>Molinia caerulea</i>	4		5				II	(4 - 5)
<i>Arrhenatherum elatius</i>			1				I	(1 - 1)
<i>Festuca ovina</i>		4					I	(4 - 4)
<i>Festuca rubra</i>					2		I	(2 - 2)
<i>Juncus articulatus</i>	2						I	(2 - 2)
<i>Potentilla erecta</i>	2						I	(2 - 2)
<i>Potentilla palustris</i>		2					I	(2 - 2)
<i>Ranunculus acris</i>	2						I	(2 - 2)
<i>Senecio aquatica</i>					1		I	(1 - 1)
<i>Sphagnum palustre</i>		6					I	(6 - 6)
<i>Stachys palustris</i>		5					I	(5 - 5)
<i>Succisa pratensis</i>			2				I	(2 - 2)
No. species per quadrat	13	13	12	6	11	9		
Mean no. species per quadrat	10.7							

Extensive areas of this rush pasture are present on the low lying farmland beyond the confines of the forest. sharp-flowered rush *Juncus acutiflorus* and soft rush *Juncus effusus* are frequent to abundant,

with frequent herbs such as common sorrel *Rumex acetosa*, marsh bedstraw *Galium palustre*, wild angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, marsh willowherb *Epilobium palustre*, marsh violet *Viola palustris* and greater bird's-foot trefoil *Lotus pedunculatus*. Yorkshire fog *Holcus lanatus* and common bent *Agrostis capillaris* are also frequent. Bryophytes are uncommon.

**M23b *Juncus effusus*/acutiflorus – *Galium saxatile* rush pasture
Juncus effusus sub-community**

A single stand of this rush pasture was found east of Mireside. It is similar to the M23a *Juncus acutiflorus* sub-community, but lacks sharp-flowered rush *Juncus acutiflorus* and is less diverse.

M23b	
Species	Q150
<i>Juncus effusus</i>	9
<i>Lotus pedunculatus</i>	3
<i>Galium palustre</i>	2
<i>Cirsium palustre</i>	4
<i>Potentilla erecta</i>	2
<i>Rumex acetosa</i>	3
<i>Cardamine pratense</i>	2
<i>Festuca ovina</i>	2
<i>Epilobium palustre</i>	2
<i>Agrostis capillaris</i>	2
No. species per quadrat	10

**M25a *Molinia caerulea* – *Potentilla erecta* mire
Erica tetralix sub-community**

This mire is overwhelmingly dominated by purple moor grass *Molinia caerulea*, with frequent tormentil *Potentilla erecta* and *Sphagnum recurvum*. Other species are occasional. It is present in a large area of mire at the head of Ennerdale Water and a small are stand east of Mireside.

M25a				
Species	Q138	Q139	Constancy	Range
<i>Molinia caerulea</i>	10	9	V	(9 - 10)
<i>Potentilla erecta</i>	2	2	V	(2 - 2)
<i>Sphagnum recurvum</i>	2	4	V	(2 - 4)
<i>Carex echinata</i>	2		III	(2 - 2)
<i>Dactylorhiza maculata</i>		1	III	(1 - 1)
<i>Festuca ovina</i>	2		III	(2 - 2)
<i>Hypnum cupressiforme</i>		4	III	(4 - 4)
<i>Narthecium ossifragum</i>	3		III	(3 - 3)
<i>Polygala serpyllifolia</i>	2		III	(2 - 2)
<i>Sphagnum papillosum</i>		4	III	(4 - 4)
No. species per quadrat	7	6		
Mean no. species per quadrat	6.5			

**M25c *Molinia caerulea* – *Potentilla erecta* mire
Angelica sylvestris sub-community**

Small stands of herb-rich *Molinia* mire are occasional east of Mireside and in the floodplain of the River Liza. Purple moor grass *Molinia caerulea* is abundant, with frequent marsh thistle *Cirsium palustre*, tormentil *Potentilla erecta*, Devil's-bit scabious *Succisa pratensis*, meadowsweet *Filipendula ulmaria* and marsh violet *Viola palustris*.

M25c						
Species	Q125	Q126	Q127	Q162	Constancy	Range
<i>Cirsium palustre</i>	4	5	4	4	V	(4 - 5)
<i>Molinia caerulea</i>	7	8	7	7	V	(7 - 8)
<i>Potentilla erecta</i>	2	2	2	3	V	(2 - 3)
<i>Succisa pratensis</i>	5	5	5	2	V	(2 - 5)
<i>Filipendula ulmaria</i>	5	4	5		IV	(4 - 5)
<i>Viola palustris</i>	2	2		3	IV	(2 - 3)
<i>Achillea ptarmica</i>	2			2	III	(2 - 2)
<i>Agrostis capillaris</i>		2	3		III	(2 - 3)
<i>Festuca ovina</i>		5	5		III	(5 - 5)
<i>Galium palustre</i>			2	3	III	(2 - 3)
<i>Plantago lanceolata</i>		2	2		III	(2 - 2)
<i>Thymus praecox</i>	4	4			III	(4 - 4)
<i>Angelica sylvestris</i>				4	II	(4 - 4)
<i>Calluna vulgaris</i>			4		II	(4 - 4)
<i>Campanula rotundifolia</i>	2				II	(2 - 2)
<i>Carex panicea</i>			4		II	(4 - 4)
<i>Centaurea nigra</i>			4		II	(4 - 4)
<i>Dactylorhiza maculata</i>				2	II	(2 - 2)
<i>Holcus lanatus</i>			2		II	(2 - 2)
<i>Juncus acutiflorus</i>				3	II	(3 - 3)
<i>Juncus effusus</i>				2	II	(2 - 2)
<i>Lotus pedunculatus</i>				2	II	(2 - 2)
<i>Luzula campestre</i>				2	II	(2 - 2)
<i>Nardus stricta</i>				4	II	(4 - 4)
<i>Polytrichum commune</i>				5	II	(5 - 5)
<i>Prunella vulgaris</i>	2				II	(2 - 2)
<i>Ranunculus acris</i>		2			II	(2 - 2)
<i>Rumex acetosa</i>				2	II	(2 - 2)
No. species per quadrat	10	11	13	16		
Mean no. species per quadrat	12.5					

**M27/M23a *Filipendula ulmaria* – *Angelica sylvestris* mire /
Juncus effusus/*acutiflorus* – *Galium saxatile* rush pasture
Juncus acutiflorus sub-community**

M27/M23a							
Species	Q164	Q165	Q166	Q167	Q168	Constancy	Range
<i>Filipendula ulmaria</i>	7	5	8	6	7	V	(5 - 8)
<i>Juncus acutiflorus</i>	6	7	4	3	6	V	(3 - 7)
<i>Oenanthe crocata</i>	5	4	6	6	6	V	(4 - 6)
<i>Succisa pratensis</i>		4	2	2	2	IV	(2 - 4)
<i>Cirsium palustre</i>		1		2	2	III	(1 - 2)
<i>Galium palustre</i>	2		2	2		III	(2 - 2)
<i>Lotus pedunculatus</i>		3		2	2	III	(2 - 3)
<i>Valeriana officinalis</i>	1	2			2	III	(1 - 2)
<i>Achillea ptarmica</i>					2	I	(2 - 2)
<i>Chrysosplenium oppositifolia</i>			4			I	(4 - 4)
<i>Dryopteris carthusiana</i>				1		I	(1 - 1)
<i>Epilobium palustre</i>	2					I	(2 - 2)
<i>Hydrocotyle vulgaris</i>					2	I	(2 - 2)
<i>Rumex acetosa</i>				2		I	(2 - 2)
<i>Sparganium erectum</i>	4					I	(4 - 4)
<i>Thuidium tamariscinum</i>				4		I	(4 - 4)
<i>Viola palustris</i>					2	I	(2 - 2)
No. species per quadrat	7	7	6	10	10		
Mean no. species per quadrat	8						

This is a rush pasture with abundant sharp-flowered rush *Juncus acutiflorus*, meadowsweet *Filipendula ulmaria* and hemlock water dropwort *Oenanthe crocata*. Devil's-bit scabious *Succisa pratensis* is also constant, whilst marsh thistle *Cirsium palustre*, marsh bedstraw *Galium palustre*, greater bird's-foot trefoil *Lotus pedunculatus* and common valerian *Valeriana officinalis* are all

frequent. The community appears to be intermediate between the tall herb mire M27 and M23a rush pasture, the abundance of *Juncus acutiflorus* preventing it from being a good fit in M27. It is found in a single stand east of Mireside.

S9 *Carex rostrata* swamp

Stands of this bottle sedge *Carex rostrata* swamp fringe Moss Dub and on the shore of Ennerdale Water at its eastern end. The constancy of *Sphagnum recurvum* would suggest that this is M4 *Carex rostrata* – *Sphagnum recurvum* mire, but these stands are in open water with only scattered *Sphagnum* plants more suggestive of a swamp community than a mire.

S9				
Species	Q119	Q120	Constancy	Range
<i>Carex rostrata</i>	3	3	V	(3 - 3)
<i>Sphagnum recurvum</i>	4	2	V	(2 - 4)
<i>Carex nigra</i>		2	III	(2 - 2)
<i>Eleocharis palustris</i>	3		III	(3 - 3)
<i>Menyanthes trifoliata</i>		2	III	(2 - 2)
<i>Potamogeton polygonifolius</i>		5	III	(5 - 5)
<i>Ranunculus flammula</i>		2	III	(2 - 2)
No. species per quadrat	3	6		
Mean no. species per quadrat	4.5			

S19 *Eleocharis palustris* swamp

Stands of fen with frequent common spikerush *Eleocharis palustris* in open water are present in Moss Dub. Lesser spearwort *Ranunculus flammula* is also constant.

S19				
Species	Q116	Q118	Constancy	Range
<i>Eleocharis palustris</i>	3	3	V	(3 - 3)
<i>Ranunculus flammula</i>	2	3	V	(2 - 3)
<i>Carex nigra</i>		2	III	(2 - 2)
<i>Juncus acutiflorus</i>	2		III	(2 - 2)
<i>Mentha aquatica</i>	2		III	(2 - 2)
<i>Molinia caerulea</i>	4		III	(4 - 4)
<i>Potamogeton polygonifolius</i>	6		III	(6 - 6)
<i>Sphagnum recurvum</i>		4	III	(4 - 4)
No. species per quadrat	6	4		
Mean no. species per quadrat	5			

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

Small stands of this acid grassland are occasional throughout the valley. The sward is categorised by frequent to abundant sheep's fescue *Festuca ovina* and common bent *Agrostis capillaris*, with frequent heath bedstraw *Galium saxatile*, sweet vernal-grass *Anthoxanthum odoratum*, tormentil *Potentilla erecta*, pill sedge *Carex pilulifera*, common sorrel *Rumex acetosa* and *Rhytidadelphus squarrosus*.

U4a					
Species	Q102	Q134	Q161	Constancy	Range
<i>Agrostis capillaris</i>	8	7	2	V	(2 - 8)
<i>Anthoxanthum odoratum</i>	3	2	2	V	(2 - 3)
<i>Festuca ovina</i>	3	8	9	V	(3 - 9)
<i>Galium saxatile</i>	3	1	3	V	(1 - 3)
<i>Potentilla erecta</i>	3	3	3	V	(3 - 3)
<i>Carex pilulifera</i>	3	2		IV	(2 - 3)
<i>Rhytiadelphus squarrosus</i>	4	2		IV	(2 - 4)
<i>Rumex acetosa</i>		2	2	IV	(2 - 2)
<i>Achillea millefolium</i>			3	II	(3 - 3)
<i>Centaurea nigra</i>			1	II	(1 - 1)
<i>Deschampsia flexuosa</i>		2		II	(2 - 2)
<i>Holcus lanatus</i>			2	II	(2 - 2)
<i>Poa pratensis</i>		2		II	(2 - 2)
<i>Polytrichum commune</i>	2			II	(2 - 2)
<i>Pteridium aquilinum</i>	1			II	(1 - 1)
<i>Succisa pratensis</i>			1	II	(1 - 1)
<i>Thuidium tamariscinum</i>	3			II	(3 - 3)
No. species per quadrat	10	10	10		
Mean no. species per quadrat	10				

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

Stands of this semi-improved acid grassland are present in the inbye of Gillerthwaite Farm and in the farmland at the western end of Ennerdale Water. common bent *Agrostis capillaris* is more abundant in this sub-community than in U4a and Yorkshire fog *Holcus lanatus* is also frequent to abundant. White clover *Trifolium repens* can also be present.

U4b				
Species	Q101	Q181	Constancy	Range
<i>Agrostis capillaris</i>	9	8	V	(8 - 9)
<i>Festuca ovina</i>	3	4	V	(3 - 4)
<i>Holcus lanatus</i>	4	7	V	(4 - 7)
<i>Potentilla erecta</i>	2	2	V	(2 - 2)
<i>Anthoxanthum odoratum</i>		2	III	(2 - 2)
<i>Juncus effusus</i>	1		III	(1 - 1)
<i>Luzula campestre</i>		2	III	(2 - 2)
<i>Poa pratensis</i>	2		III	(2 - 2)
<i>Pteridium aquilinum</i>	1		III	(1 - 1)
<i>Rhytiadelphus squarrosus</i>	3		III	(3 - 3)
<i>Rumex acetosa</i>		3	III	(3 - 3)
<i>Trifolium repens</i>		2	III	(2 - 2)
No. species per quadrat	8	8		
Mean no. species per quadrat	8			

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

This heathy grassland is present in clearings within and on the fringes of conifer plantations, on areas of shingle along the River Liza and on the slopes of Lingmell. It is similar to the other U4 grasslands, but heather *Calluna vulgaris*, bilberry *Vaccinium myrtillus* and wavy hair-grass *Deschampsia flexuosa* are constant, as are *Hypnum cupressiforme* and *Polytrichum commune*.

U4e						
Species	Q103	Q114	Q115	Constancy	Range	
<i>Agrostis capillaris</i>	6	2	2	V	(2 - 6)	
<i>Calluna vulgaris</i>	4	4	6	V	(4 - 6)	
<i>Deschampsia flexuosa</i>	4	8	8	V	(4 - 8)	
<i>Galium saxatile</i>	2	2	3	V	(2 - 3)	
<i>Festuca ovina</i>	5	2		IV	(2 - 5)	
<i>Hypnum cupressiforme</i>		5	6	IV	(5 - 6)	
<i>Polytrichum commune</i>		1	2	IV	(1 - 2)	
<i>Vaccinium myrtillus</i>	3	6		IV	(3 - 6)	
<i>Anthoxanthum odoratum</i>	2			II	(2 - 2)	
<i>Carex pilulifera</i>	7			II	(7 - 7)	
<i>Picea sp s</i>			4	II	(4 - 4)	
<i>Potentilla erecta</i>	2			II	(2 - 2)	
<i>Sphagnum capillifolium</i>		4		II	(4 - 4)	
<i>Sphagnum subnitens</i>		4		II	(4 - 4)	
<i>Trichophorum cespitosus</i>	4			II	(4 - 4)	
No. species per quadrat	10	10	7			
Mean no. species per quadrat	9					

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

Stands of this grassland are confined to peripheral areas of the forest towards its eastern end. mat grass *Nardus stricta* is frequent to abundant, with constant carnation sedge *Carex panicea*, heath bedstraw *Galium saxatile*, *Polytrichum commune* and tormentil *Potentilla erecta*. Wavy hair-grass *Deschampsia flexuosa* can be locally dominant.

U5b								
Species	Q32	Q34	Q35	Q79	Q80	Q132	Constancy	Range
<i>Agrostis capillaris</i>	3	3	3	4	2	7	V	(2 - 7)
<i>Nardus stricta</i>	9	4	4	8	9	3	V	(3 - 9)
<i>Festuca ovina</i>	3		3	2	2	7	V	(2 - 7)
<i>Carex panicea</i>	3			2	3	2	IV	(2 - 3)
<i>Galium saxatile</i>	3		3	2	2		IV	(2 - 3)
<i>Polytrichum commune</i>	2	4	3			2	IV	(2 - 4)
<i>Potentilla erecta</i>	2			3	3	4	IV	(2 - 4)
<i>Danthonia decumbens</i>				2	2	2	III	(2 - 2)
<i>Deschampsia flexuosa</i>		9	9				II	(9 - 9)
<i>Rhytidiadelphus squarrosus</i>				3	3		II	(3 - 3)
<i>Blechnum spicant</i>	1						I	(1 - 1)
<i>Calluna vulgaris</i>			1				I	(1 - 1)
<i>Carex binervis</i>				4			I	(4 - 4)
<i>Carex pilulifera</i>	2						I	(2 - 2)
<i>Dryopteris dilatata</i>		1					I	(1 - 1)
<i>Hypnum cupressiforme</i>		4					I	(4 - 4)
<i>Juncus squarrosus</i>			1				I	(1 - 1)
<i>Molinia caerulea</i>					2		I	(2 - 2)
No. species per quadrat	9	6	8	9	9	7		
Mean no. species per quadrat	8							

U5c Nardus stricta – Galium saxatile grassland
Carex panicea – Viola riviniana sub-community

A single stand of this herb-rich *Nardus stricta* grassland was found to the east of Mireside. In addition to frequent mat grass *Nardus stricta*, common bent *Agrostis capillaris*, sheep's fescue *Festuca ovina* and sweet vernal-grass *Anthoxanthum odoratum* a range of herbs are frequent, including eyebright *Euphrasia officinalis*, ribwort plantain *Plantago lanceolata* and lousewort *Pedicularis sylvestris*. The ground is slightly flushed.

U5c	
Species	Q152
<i>Nardus stricta</i>	5
<i>Agrostis capillaris</i>	3
<i>Festuca ovina</i>	3
<i>Anthoxanthum odoratum</i>	2
<i>Danthonia decumbens</i>	3
<i>Potentilla erecta</i>	4
<i>Carex panicea</i>	3
<i>Euphrasia officinalis</i>	3
<i>Plantago lanceolata</i>	3
<i>Pedicularis sylvestris</i>	2
<i>Luzula campestre</i>	2
<i>Lotus corniculatus</i>	2
No. species per quadrat	12

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

This heathy grassland is found in unforested areas on the upper edges of Ennerdale Forest and around the margins of Heckbarley Plantation. Mat grass *Nardus stricta*, heather *Calluna vulgaris*, bilberry *Vaccinium myrtillus*, wavy hair-grass *Deschampsia flexuosa* and *Pleurozium schreberi* are constant and frequent to abundant, whilst a range of other typical heath and acid grassland species can also be present.

U5d				
Species	Q196	Q199	Constancy	Range
<i>Calluna vulgaris</i>	4	7	V	(4 - 7)
<i>Deschampsia flexuosa</i>	4	5	V	(4 - 5)
<i>Nardus stricta</i>	4	4	V	(4 - 4)
<i>Pleurozium schreberi</i>	6	5	V	(5 - 6)
<i>Vaccinium myrtillus</i>	6	5	V	(5 - 6)
<i>Agrostis capillaris</i>		2	III	(2 - 2)
<i>Festuca ovina</i>		2	III	(2 - 2)
<i>Galium saxatile</i>		2	III	(2 - 2)
<i>Molinia caerulea</i>	5		III	(5 - 5)
<i>Rhytidiadelphus squarrosus</i>		4	III	(4 - 4)
No. species per quadrat	6	9		
Mean no. species per quadrat	7.5			

U19 *Thelypteris* (*Oreopteris*) *limbosperma* – *Blechnum spicant* community

A single stand of this fern community was found at the upper end of the valley on a boulder strewn slope. In addition to frequent lemon scented mountain fern *Oreopteris limbosperma* there is a grassy sward of wavy hair-grass *Deschampsia flexuosa* and sheep's fescue *Festuca ovina*, plus frequent to abundant *Polytrichum commune* and frequent heather *Calluna vulgaris*, scaly male fern *Dryopteris affinis* and broad buckler fern *Dryopteris dilatata*.

U19							
Species	Q38	Q39	Q40	Q41	Q42	Constancy	Range
<i>Deschampsia flexuosa</i>	3	3	7	7	7	V	(3 - 7)
<i>Festuca ovina</i>	6	4	3	4	4	V	(3 - 6)
<i>Oreopteris limbosperma</i>	5	5	5	5	4	V	(4 - 5)
<i>Polytrichum commune</i>	4	7	4	5	6	V	(4 - 7)
<i>Calluna vulgaris</i>	2	1		4	5	IV	(1 - 5)
<i>Dryopteris affinis</i>		5	5	4	5	IV	(4 - 5)
<i>Dryopteris dilatata</i>		4	3	4	5	IV	(3 - 5)
<i>Blechnum spicant</i>		2	2		1	III	(1 - 2)
<i>Chamerion angustifolium</i>	2			2	2	III	(2 - 2)
<i>Epilobium brunnescens</i>	2		1	2		III	(1 - 2)
<i>Galium saxatile</i>	2	3	2			III	(2 - 3)
<i>Hypnum cupressiforme</i>			4	4	4	III	(4 - 4)
<i>Vaccinium myrtillus</i>			2	2	2	III	(2 - 2)
<i>Agrostis capillaris</i>	2			3		II	(2 - 3)
<i>Cryptogramma crispa</i>	4	4				II	(4 - 4)
<i>Deschampsia cespitosa</i>	5	4				II	(4 - 5)
<i>Juncus effusus</i>		1		1		II	(1 - 1)
<i>Nardus stricta</i>		4	4			II	(4 - 4)
<i>Picea sp s</i>		4	1			II	(1 - 4)
<i>Rhytidiadelphus loreus</i>			4		4	II	(4 - 4)
<i>Senecio vulgaris</i>			1	1		II	(1 - 1)
<i>Alchemilla alpina</i>			1			I	(1 - 1)
<i>Carex demissa</i>	1					I	(1 - 1)
<i>Cirsium arvense</i>			2			I	(2 - 2)
<i>Cirsium palustre</i>	2					I	(2 - 2)
<i>Cirsium palustre</i>				2		I	(2 - 2)
<i>Digitalis purpurea</i>	2					I	(2 - 2)
<i>Epilobium palustre</i>				2		I	(2 - 2)
<i>Potentilla erecta</i>			2			I	(2 - 2)
<i>Senecio jacobaea</i>					2	I	(2 - 2)
No. species per quadrat	14	14	18	16	13		
Mean no. species per quadrat	15						

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

Stands of bracken *Pteridium aquilinum* are present in clearings throughout the Ennerdale Forest and are also occasionally present in the farmland at the western end. Bracken is dominant over a grassy groundlayer of common bent *Agrostis capillaris*, *Rhytidiadelphus squarrosus* and heath bedstraw *Galium saxatile*.

U20a						
Species	Q6	Q9	Q78	Constancy	Range	
<i>Agrostis capillaris</i>	6	3	8	V	(3 - 8)	
<i>Pteridium aquilinum</i>	10	10	9	V	(9 - 10)	
<i>Rhytidiadelphus squarrosus</i>	4	4	3	V	(3 - 4)	
<i>Galium saxatile</i>	2	3		IV	(2 - 3)	
<i>Deschampsia flexuosa</i>			3	II	(3 - 3)	
<i>Hypnum cupressiforme</i>	3			II	(3 - 3)	
<i>Oxalis acetosella</i>			2	II	(2 - 2)	
<i>Plagiothecium undulatum</i>			2	II	(2 - 2)	
<i>Pleurozium schreberi</i>			4	II	(4 - 4)	
<i>Potentilla erecta</i>	2			II	(2 - 2)	
No. species per quadrat	6	7	4			
Mean no. species per quadrat	5.7					

MG1 *Arrhenatherum elatius* grassland

This coarse mesotrophic grassland is present in a small number of unmanaged grassland stands at the western end of the valley. False oat-grass *Arrhenatherum elatius* is abundant to dominant, with frequent creeping thistle *Cirsium arvense*, common sorrel *Rumex acetosa*, common bent *Agrostis*

capillaris, cock's-foot *Dactylis glomerata*, red fescue *Festuca rubra*, Yorkshire fog *Holcus lanatus* and ribwort plantain *Plantago lanceolata*.

MG1					
Species	Q187	Q188	Q189	Constancy	Range
<i>Arrhenatherum elatius</i>	10	8	8	V	(8 - 10)
<i>Cirsium arvense</i>	1	4	1	V	(1 - 4)
<i>Rumex acetosa</i>	2	2	1	V	(1 - 2)
<i>Agrostis capillaris</i>		3	3	IV	(3 - 3)
<i>Anthoxanthum odoratum</i>		2	2	IV	(2 - 2)
<i>Dactylis glomerata</i>	4	2		IV	(2 - 4)
<i>Festuca rubra</i>		6	7	IV	(6 - 7)
<i>Holcus lanatus</i>	2		2	IV	(2 - 2)
<i>Plantago lanceolata</i>	2	4		IV	(2 - 4)
<i>Alopecurus pratensis</i>	1			II	(1 - 1)
<i>Chaerophyllum temulentum</i>		2		II	(2 - 2)
<i>Juncus effusus</i>			1	II	(1 - 1)
<i>Stellaria graminea</i>	1			II	(1 - 1)
No. species per quadrat	8	9	8		
Mean no. species per quadrat	8.3				

A coarse grassland lacking false oat-grass *Arrhenatherum elatius* is present in a single stand alongside the weir at the end of the lake. The principal components of the sward are sheep's fescue *Festuca ovina*, common knapweed *Centaurea nigra*, common bent *Agrostis capillaris*, sweet vernal-grass *Anthoxanthum odoratum*, Yorkshire fog *Holcus lanatus*, ribwort plantain *Plantago lanceolata* and creeping buttercup *Ranunculus repens*. crested dog's-tail *Cynosurus cristatus* is occasional. There is no clear fit of this vegetation to the NVC, but there appear to be affinities to both MG1 and MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland, and perhaps U4 *Festuca* – *Agrostis* – *Galium* grassland. It is mapped as an intermediate between the former two communities.

MG1/MG5				
Species	Q183	Q184	Constancy	Range
<i>Agrostis capillaris</i>	5	3	V	(3 - 5)
<i>Anthoxanthum odoratum</i>	2	2	V	(2 - 2)
<i>Centaurea nigra</i>	4	2	V	(2 - 4)
<i>Festuca ovina</i>	8	8	V	(8 - 8)
<i>Holcus lanatus</i>	3	2	V	(2 - 3)
<i>Plantago lanceolata</i>	3	3	V	(3 - 3)
<i>Ranunculus repens</i>	2	3	V	(2 - 3)
<i>Achillea millefolium</i>		2	III	(2 - 2)
<i>Alopecurus pratensis</i>	2		III	(2 - 2)
<i>Cirsium arvense</i>	2		III	(2 - 2)
<i>Cynosurus cristatus</i>		2	III	(2 - 2)
<i>Dactylis glomerata</i>	4		III	(4 - 4)
<i>Odontites verna</i>		1	III	(1 - 1)
<i>Rumex acetosa</i>		2	III	(2 - 2)
<i>Trifolium repens</i>		2	III	(2 - 2)
No. species per quadrat	10	12		
Mean no. species per quadrat	11			

MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland

A single stand of unimproved mesotrophic pasture was found in the inbye of Gillerthwaite Farm. The sward is composed of frequent to abundant crested dog's-tail *Cynosurus cristatus*, with frequent common bent *Agrostis capillaris*, sheep's fescue *Festuca ovina* and Yorkshire fog *Holcus lanatus*, plus frequent herbs including yarrow *Achillea millefolium*, harebell *Campanula rotundifolia*, common cat's-ear *Hypochaeris radicata*, autumn hawkbit *Leontodon autumnalis*, ribwort plantain *Plantago lanceolata* and selfheal *Prunella vulgare*.

MG5				
Species	Q143	Q144	Constancy	Range
Achillea millefolium	5	4	V	(4 - 5)
Agrostis capillaris	6	3	V	(3 - 6)
Campanula rotundifolia	2	2	V	(2 - 2)
Cynosurus cristatus	6	7	V	(6 - 7)
Festuca ovina	3	6	V	(3 - 6)
Holcus lanatus	2	2	V	(2 - 2)
Hypochaeris radicata	5	4	V	(4 - 5)
Leontodon autumnalis	2	3	V	(2 - 3)
Plantago lanceolata	5	3	V	(3 - 5)
Prunella vulgaris	2	2	V	(2 - 2)
Ranunculus acris	3	4	V	(3 - 4)
Rumex acetosa	2	3	V	(2 - 3)
Anthoxanthum odoratum		2	III	(2 - 2)
Cerastium fontanum		2	III	(2 - 2)
Cirsium palustre	2		III	(2 - 2)
Lolium perenne		3	III	(3 - 3)
Luzula campestre		2	III	(2 - 2)
Taraxacum officinale		2	III	(2 - 2)
Trifolium repens	3		III	(3 - 3)
No. species per quadrat	14	17		
Mean no. species per quadrat	15.5			

The verges of the forest roads also probably fall into this community due to the buffering of what would otherwise be acid soils by imported limestone chippings. The grassland is often herb-rich with no clear dominants in the open sward. Common species include crested dog's-tail *Cynosurus cristatus*, Yorkshire fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, ribwort plantain *Plantago lanceolata*, smooth hawk's-beard *Crepis capillaris*, selfheal *Prunella vulgare*, eyebright *Euphrasia officinalis*, dandelion *Taraxacum officinale*, meadow buttercup *Ranunculus acris* and purging flax *Linum catharticum*.

Verge grassland	
Species	Q12
Cynosurus cristatus	3
Holcus lanatus	2
Festuca ovina	3
Dactylis glomerata	3
Lolium perenne	2
Agrostis capillaris	3
Plantago lanceolata	3
Crepis capillaris	3
Prunella vulgaris	3
Euphrasia officinalis	3
Taraxacum officinale	2
Ranunculus acris	2
Trifolium repens	2
Rumex acetosa	2
Odontites verna	1
Linum catharticum	3
Cerastium fontanum	2
Plantago major	2
No. species per quadrat	18

MG6a Lolium perenne – Cynosurus cristatus grassland typical sub-community

This is the principal grassland of the agricultural fields in the valley. Rye-grass *Lolium perenne* and crested dog's-tail *Cynosurus cristatus* predominate, with frequent white clover *Trifolium repens* and common sorrel *Rumex acetosa*. This is a species-poor grassland sward.

MG10 *Holcus lanatus* – *Juncus effusus* grassland

This is a species-poor rush pasture found in fields of improved pasture where the field drainage has deteriorated and forms extensive stands, particularly around the edge of the lake. Soft rush *Juncus effusus* is abundant and Yorkshire fog *Holcus lanatus*, common sorrel *Rumex acetosa* and common bent *Agrostis capillaris* frequent. Other species are no more than occasional.

MG10							
Species	Q148	Q149	Q170	Q171	Q173	Constancy	Range
<i>Holcus lanatus</i>	2	4	4	4	7	V	(2 - 7)
<i>Juncus effusus</i>	9	7	7	9	8	V	(7 - 9)
<i>Rumex acetosa</i>	2	3	2	2	3	V	(2 - 3)
<i>Agrostis capillaris</i>	5	5	7	3		IV	(3 - 7)
<i>Cirsium palustre</i>		4			1	II	(1 - 4)
<i>Galium palustre</i>		2	2			II	(2 - 2)
<i>Juncus acutiflorus</i>		2			2	II	(2 - 2)
<i>Lotus pedunculatus</i>				1	2	II	(1 - 2)
<i>Molinia caerulea</i>				4	2	II	(2 - 4)
<i>Potentilla erecta</i>			2	2		II	(2 - 2)
<i>Ranunculus repens</i>			2		2	II	(2 - 2)
<i>Trifolium repens</i>		2	1			II	(1 - 2)
<i>Anthoxanthum odoratum</i>			2			I	(2 - 2)
<i>Cardamine pratense</i>	2					I	(2 - 2)
<i>Carex nigra</i>		2				I	(2 - 2)
<i>Cirsium vulgare</i>	4					I	(4 - 4)
<i>Digitalis purpurea</i>				4		I	(4 - 4)
<i>Epilobium palustre</i>					2	I	(2 - 2)
<i>Festuca ovina</i>		4				I	(4 - 4)
<i>Festuca rubra</i>			2			I	(2 - 2)
<i>Poa trivialis</i>	2					I	(2 - 2)
<i>Polygonum persicaria</i>					1	I	(1 - 1)
<i>Ranunculus flammula</i>		2				I	(2 - 2)
No. species per quadrat	7	11	10	8	10		
Mean no. species per quadrat	9.2						

W23 *Ulex europaeus* – *Rubus fruticosus* scrub

Stands of common gorse *Ulex europaeus* dominated scrub are present in rough pasture at the western end of the lake. *Ulex europaeus* forms a closed canopy with scrambling plants of bramble *Rubus fruticosus* and a groundlayer of Yorkshire fog *Holcus lanatus* or bare soil. Western gorse *Ulex gallii* is occasionally present in stands.

W23							
Species	Q172	Q174	Q175	Q177	Q178	Constancy	Range
<i>Holcus lanatus</i>	4	2	4	1	9	V	(1 - 9)
<i>Ulex europaeus</i>	8	9	8	8	9	V	(8 - 9)
<i>Rubus fruticosus</i>	4	5		7	2	IV	(2 - 7)
<i>Ulex gallii</i>	4		5		5	III	(4 - 5)
<i>Agrostis capillaris</i>	6		4			II	(4 - 6)
<i>Pteridium aquilinum</i>	4		5			II	(4 - 5)
<i>Ranunculus repens</i>			2		2	II	(2 - 2)
<i>Rumex acetosa</i>			2		3	II	(2 - 3)
<i>Corydalis claviculata</i>					2	I	(2 - 2)
<i>Festuca ovina</i>	2					I	(2 - 2)
<i>Galium aparine</i>				1		I	(1 - 1)
<i>Juncus effusus</i>	2					I	(2 - 2)
<i>Potentilla erecta</i>	2					I	(2 - 2)
No. species per quadrat	9	3	7	4	7		
Mean no. species per quadrat	6						

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