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### *A phytosociological study of Widdybank Fell in upper Teesdale*

Alison V. Jones

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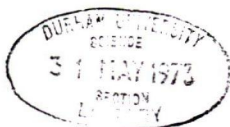
A PHYTOSOCIOLOGICAL STUDY  
OF  
WIDDYBANK FELL IN UPPER TEESDALE

being a Thesis for the Degree of Doctor of Philosophy  
of the University of Durham

by

Alison V. Jones, B.Sc. (Edin.)

VOL 2



January 1973

FIG. A

1:10000

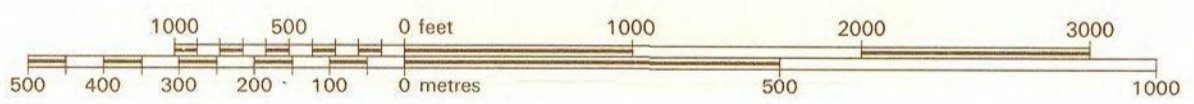
WIDDYBANK FELL

Vegetation

VEGETATION CLASSIFICATION

- 1 Class: *Asplenietea rupestris* (wall and scree communities)  
Order: *Androsacetalia vandellii* (communities of Siliceous rocks)
- 2 Class: *Festuco-Brometea* (calcareous lowland grasslands)  
Order: *Brometalia erecti* (dry and semi-dry grasslands)  
Alliance: *Mesobromion erecti*  
Sub-Alliance: *Sesuvio-Mesobromion* (short grassland)
- Class: *Violetea calamitariae* (vegetation on soils rich in heavy metals)  
Order: *Violetalia calamitariae*  
Alliance: *Thlaspion calamitariae* (pioneer communities of the class)
- 3 Class: *Molinio-Arrhenatheretea* (cultivated rich pastures and marshy meadows)  
Order: *Arrhenatheretalia* (species-rich meadows and pastures)  
Alliance: *Ranunculo-Anthoxanthion* (sub-alpine meadows and pastures)
- 4 Class: *Parvocaricetea* (short-sedge marsh)  
Order: *Caricetalia nigrae* (mesotrophic sedge marsh)  
Alliance: *Caricion curtu nigrae*
- 5 Order: *Tofieldietalia* (calcareous sedge marsh)  
Alliance: *Caricion davallianae*
- 6 Class: *Oxycocco-Sphagneteta* (bogs and wet heaths)  
Order: *Ericetalia tetralicis* (wet heaths)  
Alliance: *Ericion tetralicis*
- 7 Order: *Sphagnetalia magellanica* (ombrogenous bogs)  
Alliance: *Erico-Sphagnion*
- 8 Class: *Nardo-Callunetea* (grass heath)  
Order: *Nardetalia* (acid grassland)  
Alliance: *Violion caninae*
- 9 Order: *Calluno-Ulicetalia* (heath)  
Alliance: *Empetretion boreale nigri*
- Areas with vegetation of two Alliances
- Alliance only occupying 80-95% of the area
- Areas without vegetation—natural or man-made
- A-W Complexes of a number of Alliances and unclassified vegetation  

A 3, 9	H 4, 5, 6, 9	O 3, 4, 5
B 2, 3, 5, 7, 9	J 2, 3, 5, 7, 8, 9	P 4, 5, 8
C 2, 3, 4, 6, 8, 9	K 2, 3, 4, 5, 9	S 2, 3, 4, 8, 9
D 2, 3, 4, 5, 7, 8, 9	L 3, 4, 5, 9	U 4, 8
E 6, 7, 9	N 2, 3, 8	V 2, 3
F 4, 5, 8, 9	P 2, 3, 9	W 2, 3
		X C
- G Soligenous mire with high covers of *Juncus effusus*
- T Scattered tufts of vegetation amongst baked marl fragments



SCALE 1:10,000  
Heights in metres above Ordnance Datum.  
Contour interval 10 metres

LEGEND

- river, stream, sike
- contours (metres)
- road, track
- spot level (metres)
- footpath
- fence, wall
- building

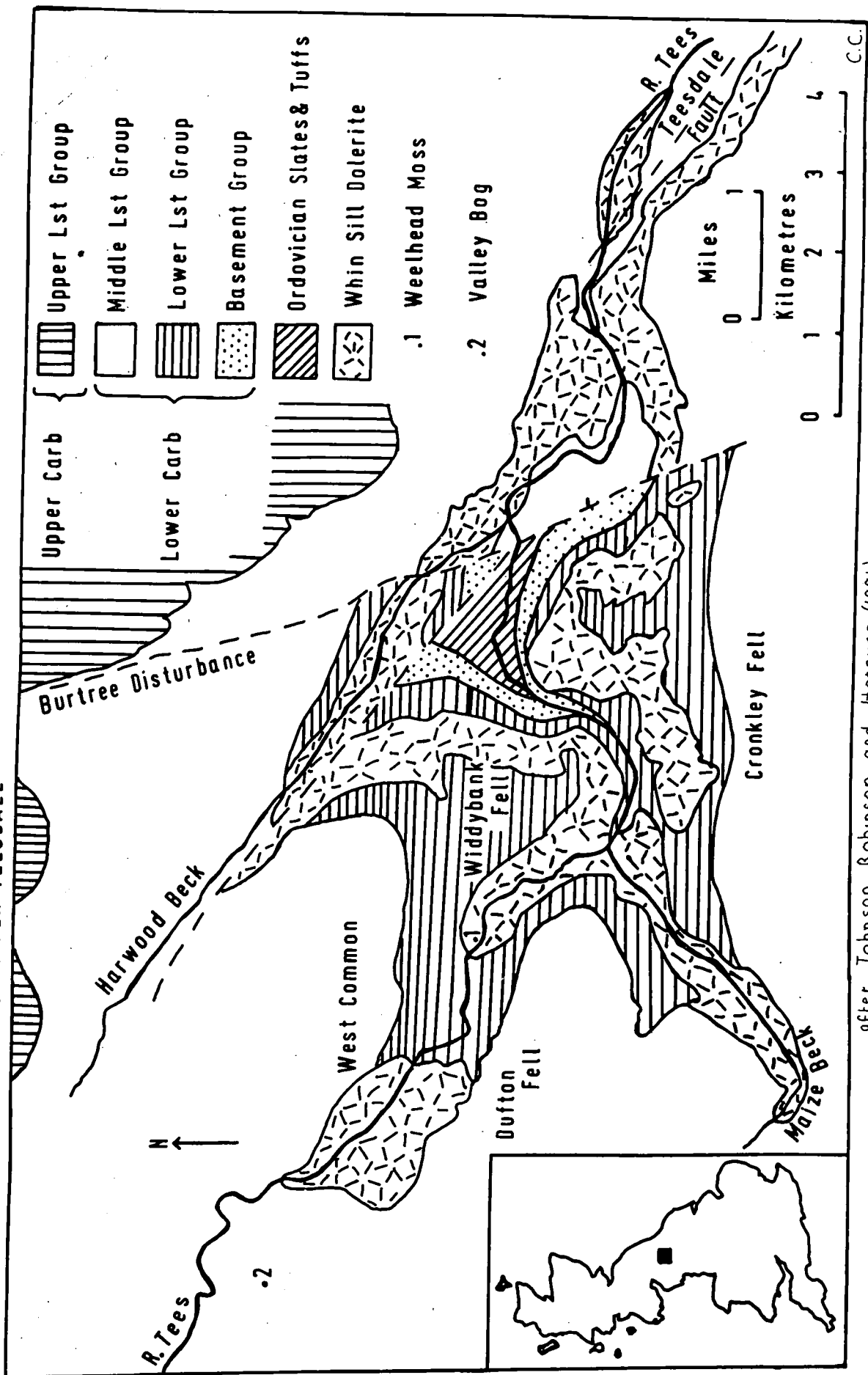


Aerial photography dated June 1969 by Meridian Airmaps Ltd., Lancing, Sussex.  
Field survey for control of photogrammetric mapping by Department of Surveying, University of Newcastle upon Tyne.  
Vegetation survey prepared from ground observations and air photograph interpretation by A. V. Jones, B.Sc., University of Durham.  
Photogrammetric mapping and fair drawing by M. S. Evans, Department of Surveying, University of Newcastle upon Tyne.  
Additional cartographic work and printing by A. W. Gattrell & Co. Ltd., London.

This map is the result of a research project financed by the Teesdale Trust and carried out in the Universities of Durham and Newcastle upon Tyne under the supervision of M. E. Bradshaw, Ph.D. and I. Newton, M.Sc.

Five large-scale maps (1:2500) of those areas on Widdybank Fell with vegetation on calcareous substrata and a descriptive booklet by M. E. Bradshaw, Ph.D. and A. V. Jones, B.Sc., outlining the classificatory system used, are available from:  
The Secretary,  
Department of Extra-Mural Studies,  
University of Durham,  
32, Old Elvet,  
Durham.

FIG. B GEOLOGICAL SKETCH MAP OF UPPER TEESDALE



after Johnson, Robinson and Hornung (1971)

C.C.

FIG. C  
WIDDYBANK FELL  
AERIAL PHOTOGRAPH AT 1:2,500

83 69 076

Ag 100  
152

FIG. D  
WIDDYBANK FELL  
AERIAL PHOTOGRAPH AT 1:7,500



82 69 072

TEESDALE.

82/69  
10.10.69



CONTACT SCALE  
1:7500



MERIDIAN AIRMAPS LIMITED,  
COMMERCE WAY,  
LANCING, SUSSEX.

TABLE I (continued) (2)

Mapping Unit No. No. of Aufnahmen	A	7	1	2	3	5	4	6	7	V	22	21	20	19	▲	B <sup>1</sup>	15	16	18	17	C	8	9	11	12	13	9	10	23	24	28	25	27	29	26	31	32	33																				
NARDO-CALLUNETEA characters																				2	I														15	16	18	17	C	8	9	11	12	13	9	10	23	24	28	25	27	29	26	31	32	33		
Calluna vulgaris	I																I	I	IV	V	I	I	II	I	IV			IV	V	V	V	IV	II	V	V	V	II																					
Carex pilulifera					I	I																																																				
Hieracium pilosella (?)				I	II	III																																																				
Nardetalia characters																																																										
Nardus stricta																																																										
Antennaria dioica (?)			I																																																							
Botrychium lunaria (?)																																																										
Violion caninae characters																																																										
Juncus squarrosus																																																										
Galium saxatile																																																										
Polygala serpyllifolia																																																										
Calluno-Ullicetalia characters																																																										
Hypnum ericetorum				I	III	III	II																																																			
Arctostaphylos uva-ursi																																																										
Empetrium nigri character																																																										
Empetrum nigrum																																																										

# transgressive character; also valid for Calluna-Ullicetalia  
 (+) present in vegetation of mapping unit although not recorded in an Aufnahme.

Classification of mapping units:

Asplenietea rupestris	Festuco-Brometea	Violetea calaminariae	Molinio-Arrhenatheretea
Androsacetalia vandellii	Brometalia erecti	Violetetalia calaminariae	Arrhenatheretalia elatioris
Androsacion vandellii	Mesobromion erecti	Phlaspeion calaminariae	Ranunculo-Anthoxanthion
Mapping unit A <sup>9</sup>	Seslerio-Mesobromion	Mapping unit V	Mapping units 19-22
	Mapping units 1-7		
Montio-Cardaminetea			
Montio cardaminetalia	Parvocaricetea	Oxycocco-Sphagnetea	Nardo-Callumetea
Cratoneurion	Caricetalia nigrae	Ericetalia tetralicis	Nardetalia
Mapping units ▲, B <sup>0</sup>	Caricion curto-nigrae	Ericion tetralicis	Violion caninae
	Mapping units 15-18, C <sup>0</sup>	Mapping unit 23	Mapping units 25, 27, 29
	Tofieldietalia	Sphagnetalia magellanici	Calluno-Ullicetalia
	Caricion davallianae	Erico-Sphagnion	Empetrium nigri
	Mapping units 8-14	Mapping units 24, 28	Mapping units 26, 31-33

Identification used in Tables I and XIII only.

TABLE XLIII (Continued)

Mapping Unit No. No. of Aufnahmen	A	1	2	3	5	4	6	7	V	22	21	20	19	9	B	15	16	18	17	C	8	9	11	12	13	14	23	24	28	25	27	29	26	31	32	33		
OXYCOCCO-SPHAGNETEA																																						
Sphagnetalia magellanici																																						
Erico-Sphagnion character																																						
Sphagnum imbricatum																																						
Sphagnion Ausci character																																						
and differential (:) )																																						
Sphagnum fuscum																																						
Betula nana (:) )																																						
NARDO-CALLUNETEA																																						
Calluno-Ulicetalia character																																						
Arctostaphylos uva-ursi																																						
Species of uncertain affinity																																						
Viola rupestris x riviniana		I																																				
Draba incana																																						
Antennaria dioica																																						
Thalictrum alpinum																																						
Gymnostomum recurvirostrum																																						
Cololejeunea calcaria																																						
Anoetangium aestivum																																						

(X) present in Mapping Unit although not in Aufnahmen of Tables XXVIII, XXXI or XXXVIII.

Classification of mapping units:

- |                          |                          |                          |                             |
|--------------------------|--------------------------|--------------------------|-----------------------------|
| Asplenietea rupestris    | Festuco-Brometea         | Violetea calaminariae    | Molinio-Arrhenatheretea     |
| Androsacetalia vandellii | Brometalia erecti        | Violetalia calaminariae  | Arrhenatheretalia elatioris |
| Androsacion vandellii    | Mesobromion erecti       | Thlaspeion calaminariae  | Ranunculo-Anthoxanthion     |
| Mapping unit A           | Seslerio-Mesobromion     | Mapping unit V           | Mapping units 19 - 22       |
| Montio-Cardaminea        | Parvocaricetea           | Oxycooco-Sphagnetea      | Nardo-Callunetea            |
| Montio-Cardaminea        | Caricetalia nigrae       | Ericetalia tetralicis    | Nardetalia                  |
| Gratoneurion             | Caricion curto-nigrae    | Ericion tetralicis       | Violion caninae             |
| Mapping units A, B       | Mapping units 15 - 18, C | Mapping unit 23          | Mapping units 25, 27, 29    |
|                          | Tofieldietalia           | Sphagnetalia magellanici | Calluno-Ulicetalia          |
|                          | Caricion davallianae     | Erico-Sphagnion          | Empetrium nigrum            |
|                          | Mapping units 8 - 14     | Mapping units 24, 28     | Mapping units 26, 31 - 33   |

0 identification used in Tables I and XLIII only.



TABLE I (continued)

Mapping Unit No. No. of Aufnahmen	A	1	2	3	5	4	6	7	V	22	21	20	19	▲ B	15	16	18	17	C	8	9	11	12	13	14	23	24	28	25	27	29	26	31	32	33			
	7	7	12	11	33	12	17	13	6	3	8	12	9	9 3	19	23	9	6	5	27	8	8	13	9	10	6	24	27	15	8	19	9	13	8	7			
Caricetalia differentials from Tofieldietalia <sup>#</sup>																																						
Acrocladium stramineum																																						
Polytrichum commune																																						
Aulacomnium palustre																																						
Drosera rotundifolia																																						
Sphagnum plumulosum																																						
Tofieldietalia characters																																						
and differentials (o)																																						
Carex dioica																																						
Drepanocladus revolvens																																						
Campyllum stellatum																																						
Pinguicula vulgaris (o)																																						
Equisetum variegatum																																						
Eleocharis quinqueflora																																						
Juncus alpinoarticulatus <sup>x</sup>																																						
Parnassia palustris (o)																																						
Campyllum chrysophyllum																																						
Bartsia alpina																																						
Scorpidium scorpioides																																						
Campothecium nitens																																						
Caricion davallianae characters																																						
and differentials (o)																																						
Carex capillaris (o)																																						
C. lepidocarpa																																						
Primula farinosa (o)																																						
Carex hostiana																																						
Tofieldia pusilla																																						
Sagina nodosa																																						
Pellia endiviifolia																																						
Eriophorum latifolium																																						
Mnium pseudopunctatum																																						
Fissidens osmundioides																																						
Cinclidium stygium																																						
Catoscopium nigratum																																						
OXYCOCCO-SPHAGNETEA characters																																						
Sphagnum tenellum																																						
S. capillaceum																																						
Calyptogeia trichomanes																																						
Aulacomnium palustre																																						
Drosera rotundifolia																																						
Lepidozia setacea																																						
Ericetalia tetralicis and																																						
Ericion tetralicis characters																																						
Erica tetralix																																						
Trichophorum cespitosum																																						
Juncus squarrosus																																						
Sphagnum compactum																																						
Gymnocolea inflata																																						
Sphagnetalia magellanici characters																																						
Eriophorum vaginatum																																						
Sphagnum rubellum																																						
Mylia anomala																																						
Sphagnum recurvum <sup>++</sup>																																						
S. magellanicum																																						
Pohlia nutans																																						
Polytrichum alpestre																																						
Cephalozia connivens																																						
Vaccinium oxycoccus																																						
Erico-Sphagnion characters																																						
Sphagnum papillosum																																						
Narthecium ossifragum																																						
Odontoschisma sphagni																																						
Sphagnum plumulosum																																						
S. imbricatum																																						

# only shown for Parvocaricetea  
x ssp. arthropphyllus (Brenner) Reichg. (Westhoff and den Held 1969) - not recognised in the British Isles.  
O Sphagnum capillaceum and S. rubellum not distinguished.  
V ssp. germanicum  
/ also Violion caninae character  
++ ssp. recurvum var. parvulum Warnst. (Westhoff and den Held 1969) - not recognised in the British Isles; designations of records to this rank not confirmed.  
(+) present in vegetation of mapping unit although not recorded in an Aufnahme.

TABLE I

VEGETATION OF  
CONSTANCIES OF CLASS, ORDER AND ALLIANCE

## WIDDYBANK FELL :

## CHARACTER AND DIFFERENTIAL SPECIES

(Classification of mapping units given at end of Table)

Mapping Unit No. No. of Aufnahmen	A	1	2	3	5	4	6	7	V	22	21	20	19	▲AB	15	16	18	17	G	8	9	11	12	13	14	23	24	28	25	27	29	26	31	32	3		
ASPLENIETEA RUPESTRIS character																																					
Asplenium trichomanes (+)																																					
Androsacetalia vandellii																																					
Androsacion vandellii character																																					
Woodsia ilvensis (x)																																					
FESTUCO-BROMETEA and Brometalia erecti characters																																					
Koeleria cristata		V	IV	V	V	V	V	V	V					IV	II																				III		
Gentianella amarella		I	III	IV	IV	I	IV	III	III				III	I																							
Helianthemum chamaecistus		V	V	III	II	I	III	II																													
Helictotrichon pratense		II	I	I	I	I	I	II																													
Helianthemum canum			II																																		
Hippocrepis comosa			I																																		
Anthyllis vulneraria			I																																		
Scabiosa columbaria					I																																
Mesobromion erecti character																																					
Carex ericetorum		IV	III		I	I																															
Seslerio-Mesobromion characters and differentials (o)																																					
Sesleria caerulea		V	V	V	V	V	V	V		IV	IV										IV	II	I													I	
Cornicularia aculeata (o)	V	III	V	V	IV	I	II	II	V	III	I	I		1	II	I	III	II		III	II					II								III	II		
Galium sternerii (o)		I	II	V	V	V	V	V	IV		V	IV	IV								IV	II	II													I	
Carex capillaris (o)			I	V	IV	I	V	V	III					1	II	I	III	II		III	IV	II	II		I										I		
Gentiana verna				III	III	III	III	IV		III	I										I				III											II	
Primula farinosa (o)			I					V																													
Viola rupestris		V	III	I	I		I	I						I	3			I			IV	II	V	IV	II	III									I		
Rhytidium rugosum (o)		I	III																																		
Polygala amara				I	I		II																														
Dryas octopetala (o)			I	I	I																																
Epipactis atrorubens (o)					I																																
VIOLETEA CALAMINARIAE and Violetalia calaminariae character																																					
Minuartia verna		III	IV	IV	II		I	I	IV		I										I	I			III												
MOLINIO-ARRHENATHERETEA characters																																					
Plantago lanceolata				IV	I	I	II	III		3	IV	III	III								II																
Ranunculus acris				I	II					2	IV	III	III								II																
Festuca rubra				I				I		1		III	IV	III	3	I	I	II			II																
Cerastium holosteoides				I	II	I			I	3	IV	I	II	III	3	III	II	IV	I	II	II																
Cardamine pratensis					I					2	II		IV								I																
Climacium dendroides				I					II	2	I	II	IV								I																
Poa pratensis																																					
Holcus lanatus																																					
Rumex acetosa																																					
Arrhenatheretalia elatioris characters																																					
Bellis perennis				I	II		I	I			IV	III	III																								
Taraxacum officinale s.l.		I		I	II		I	III		1	I	III	III	I	2	I	III	IV	III		I			I													
Achillea millefolium				I	II		I	I		2	IV	I									I			II													
Veronica officinalis					I						I				1																						
MONTIO-CARDAMINETEA and Montio-Cardaminetalia character																																					
Philonotis fontana											I	I																									
Cratoneurion characters																																					
Cratoneuron commutatum				I										II	II																						
C. filicinum														II	II																						
Saxifraga aizoides				I																																	
Philonotis calcarea																																					
PARVOCARICETEA characters																																					
Riccardia pinguis											I	II																									
Carex demissa					I							IV	IV								III	IV	IV	III	V	IV											
Drepanocladus exannulatus																																					
Pedicularis palustris																																					
Caricetalia nigrae and Caricion curto-nigrae characters																																					
Carex nigra																																					
Ranunculus flammula																																					
Carex echinata																																					
Viola palustris																																					
Epilobium palustre																																					
Sphagnum recurvum *																																					
Carex curta																																					

\* ssp. amblyphyllum Russ. (Westhoff and den Held 1969) -

(+) present in vegetation of mapping unit although not recorded in <sup>an</sup> Aufnahme.  
 (x) formerly present in vegetation of mapping unit.

not recognised in the British Isles; designations of records to this rank not confirmed.

NODUM OF WHIN SILL BLOCK SCREE

Aufnahme No.	484	485	SW1	SW2	SW3	SW4	SW5
Species No.	25	22	27	28	30	25	30
Aspect	NE	NE	N	N	N	N	N
Slope °	20	20	20	15	20	10	10
Cover % (total)	50	75					
Size of Aufnahme (sq.m.)	16	8					
Average species No.					27		

Differential species group of Nodum

Rhacomitrium fasciculare	3.3	4.3	+	+	11	+	11
R. lanuginosum	4.3	3.3	5	5	3	4	4
Diplophyllum albicans	2.3	3.3	4	4	3	1	2
Cornicularia aculeata	4.3	4.3	2	2	+	+	1
Orthocaulis floerkii	3.3	+2	+	1	2	1	
Cladonia pyxidata	3.3		+	1	+	+	+
C. squamosa	2.2	2.2		1	+	+	1
Pertusaria corallina	3.3		2	4	4	3	+
Cryptogramma crispa	1.2		3	+	2		2
Lycopodium selago	2.2	3.3	+		+	+	
Dicranum scoparium	+2		+	+	+		+
Cladonia furcata	2.3	2.3	+	+	+		
Deschampsia flexuosa		3.3		+	1		+
Vaccinium myrtillus		(2.2)		+	+		+
Parmelia saxatilis	3.3	3.3		2		2	
Galium saxatile		4.3	2				2
Rhytidiadelphus loreus		2.2			+		+

Companion species

Festuca ovina	3.3	4.3	4	+	1	1	3
Lecidea spp.	3.3		3	2	3	3	5
Polytrichum commune			2	+	+	+	+
Pleurozium schreberi			1	+	+	+	+
Lophozia ventricosa			3	2	3	3	3
Andreaea rupestris			+	+	1	+	+
Sphaerophorus fragilis			+	3	+	1	+
Cladonia floerkeana			+	+		+	+
Lecidea lithophila				+	2	1	+
Cladonia coccifera				+		+	+
Lecidea granulosa			1	1	1		
L. leucophaea					2	+	+
Stereocaulon vesuvianum			+			2	+
Dryopteris filix-mas	2.2	+2					
Agrostis tenuis			+		+		
Oxalis acetosella			1				+
Polytrichum formosum	2.3	3.3					
Campylopus flexuosus			+				+
Grimmia patens			+		+		
Rhytidiadelphus squarrosus			+				+
Parmelia physodes				+		+	
Rhizocarpon geographicum						+	+
Cladonia arbuscula		2.2					+
C. bellidiflora	2.2	2.2					
Alectoria pubescens	3.3	3.3					

Also :

- 484: Calluna vulgaris +.3, Blechnum spicant 2.2,  
Polytrichum piliferum 3.3, Pohlia annotina +,  
Tetraplodon mnioides +.3, Stereocaulon evolutum 3.3;
- 485: Potentilla erecta 2.1, Agrostis canina 3.3, Festuca vivipara 3.3;
- SW2: Brachythecium rutabulum +, Splachnum sphaericum +;
- SW3: Hylocomium splendens +, Pohlia nutans 1, Lophocolea bidentata +;
- SW4: Cladonia impexa + .

From Eddy Welch and Rawes (1969)  
SW1 - SW5: Whin Sill block scree facies.

TABLE VI

SOIL CHARACTERISTICS OF  $\alpha$  NODAL GROUP WITH SESLERIA AND KOELERIA

Mapping Unit	Profile No.	Aufn.No.	Soil-type	Sample depth (where distinguished)	pH	L.o.I.	P <sub>2</sub> O <sub>5</sub>	CaCO <sub>3</sub>	Ca	Zn	Pb	N	
2			Rendzina $\alpha$		1	7.3	5.29		32.8	7.1	19.0	0.18	
					2	7.4	4.67		30.8		0.56		
					3	7.3	5.57		30.3	4.2	9.6	0.44	
I			Rendzina $\beta$		1	7.3	8.55		33.5	5.5	17.5	0.47	
					2	7.4	14.14		46.8		0.57		
					3	7.4	9.13		43.0	2.8	5.7	0.53	
3		8	Rendzina $\beta$ (var.)	0 - 5 5 - 15	104	7.1	16.96	1.44	2.85	35.2			0.71
					107	8.1	8.35	0.84	40.85	53.5		0.34	
						8.1	6.95	0.84	66.26	54.0	1.8	3.4	0.30
						7.2	22.56	0.96	24.95	53.0	41.0	18.0	0.78
5	120		Rendzina $\beta$	hummock hollow	115	8.0	9.82	1.20	63.14	55.0	6.9	23.0	0.65
					109	7.9	10.62	0.60	63.14	57.0	6.8	24.0	0.67
					138	7.7	10.36	3.00	59.72	49.5		0.40	
					134	7.3	17.31	1.44	20.86	51.5		1.22	
					3	7.5	19.65	0.60	26.52	61.5		1.07	
						6.8	19.83	3.00	5.74	29.2	15.5	84.0	0.78
						6.8	14.85	1.32	3.02	24.2		0.65	
						10 - 20	7.1	14.79	0.96	2.30	18.2		0.71
						20 - 35	7.1	7.61	0.60	4.28	22.8		0.41
						72	5.8	22.84	2.52	1.84	20.6		0.95
		7.1	17.13	1.92	3.06	31.2		0.77					
4		97	Shallow brown earth		102	5.4	16.78	0.96	11.8	8.0	9.5	0.56	
						5.4	21.67	1.32	8.25		0.78		
6	1		Brown earth - brown calcareous soil		2	6.7			41.5	9.5	15.0	0.56	
					3	7.4			44.0		0.39		
						7.3			46.1	8.0	27.0	0.44	
7			Rendzina $\beta$	0 - 8 8 - 17	112	7.8	15.90	2.16	11.45	8.90	1.6	2.1	0.72
					78	7.8	6.96	3.00	44.88	53.5		0.31	
					136	8.1	5.31	1.56	46.55	53.5		0.22	
					65	7.8	16.32	0.60	34.27	57.75		0.80	
						7.7	17.89	0.48	30.27	64.0	4.0	4.8	0.77
						7.5	20.90	0.36	9.00	62.5	5.0	3.7	0.89
						81	6.3	40.31	2.40	52.5		1.97	
	6.0	31.60	2.16	37.2		1.64							

## Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.  
Soil-types follow the terminology of the current publications of the  
Soil Surveys of England and Wales

Samples from top 15 cm of profile unless otherwise indicated; depth in cm.

L.o.I. Loss on Ignition

P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid : mg P<sub>2</sub>O<sub>5</sub> / 100g.

CaCO<sub>3</sub> - % total weight.

Ca - meq / 100g.

Zn }  
Pb } - p.p.m.

N - total N : % total weight.

TABLE III (continued)

Additional species

- 348: *Viola riviniana* x *V. rupestris* 1.1;  
309: *Trichostomum brachydontium* +;  
518: *Solorina saccata* 3.3;  
428: *Squamarina crassa* 2;  
368: *Festuca rubra* 1.2, *Thuidium delicatulum* 2.2;  
8: *Bryum pallescens* 1;  
4: *Bryum pallescens* 1, *B. argenteum* 1, *Barbula cylindrica* 3,  
*Solorina saccata* 2;  
118: *Bryum* sp. 2.2, *Lathyrus montanus* +;  
104: *Cladonia furcata* +;  
306: *Viola riviniana* x *V. rupestris* 4.1;  
125: *Anomobryum concinnatum* +2;  
313: *Anemone nemorosa* +, *Geum rivale* 2.1;  
71: *Neckera complanata* 1;  
98: *Fissidens osmundioides* +, *Bryum pallens* +2;  
353: *Saxifraga aizoides* 6.4, *Pohlia deliculata* 3.3, *Solenostoma triste* +2,  
*Fissidens taxifolius* +2;  
365: *Mnium marginatum* +2, *Thuidium delicatulum* 2.2;  
364: *Cirsium palustre* +;  
299: *Fissidens osmundioides* +2;  
120: *Cladonia impexa* +, *Barbula unguiculata* +, *Peltigera praetextata* +2;  
134: *Climacium dendroides* 3.3;  
109: *Fissidens cristatus* 2.2;  
138: *Polytrichum juniperinum* 2.2, *Veronica officinalis* 2.2;  
75: *Cratoneuron commutatum* 1;  
3: *Rhodobryum roseum* 1;  
122: *Juncus squarrosus* +2, *Carex demissa* 2.2;  
5: *Cephaloziella hampeana* 1, *Mnium punctatum* 1, *Mnium hornum* 2;  
137A: *Lycopodium selago* +2, *Veronica officinalis* 1.2, *Polytrichum piliferum* 4.3,  
*Atrichum undulatum* 2.2;  
103: *Cardamine pratensis* 1.1, *Carex demissa* 3.3, *Mnium hornum* +2;  
319: *Nardus stricta* +2;  
110: *Bryum* cf. *caespiticium* 2.2;  
105: *Cladonia gracilis* +, *C. furcata* 2.1;  
102: *Lathyrus montanus* +;  
116: *Barbula unguiculata* +;  
333: *Lophozia ventricosa* +;  
96: *Cladonia impexa* 2.2;  
108: *Equisetum variegatum* +;  
94: *Cladonia cariosa* +, *Festuca rubra* +;  
865: *Campylium stellatum* 2, *Peltigera praetextata* +;  
13: *Bryum capillare* 1, *Hypochoeris radicata* 1;  
81: *Bryum pallens* 1.2, *Campylium stellatum* 1.2;  
77: *Cetraria glauca* 1;  
106: *Cephalozia bicuspidata* +;  
136: *Thuidium delicatulum* +;  
63: *Leiocolea muelleri* +, *Cololejeunea calcarea* 1.2, *Lycopodium selago* (+).

TABLE IV

α NODAL GROUP WITH SESLERIA CAERULEA AND KOELERIA CRISTATASummary Table

Mapping Unit No. No. of Aufnahmen	1 7	2 12	3 11	5 33	4 12	6 17	7 13
<u>Differential species of α Nodal group</u>							
Sesleria caerulea	V	V	V	V	V	V	V
Koeleria cristata	V	IV	V	V	V	V	V
Cladonia subrangiformis	III	V	V	V	V	IV	IV
Campanula rotundifolia	IV	III	V	V	V	V	IV
Tortella tortuosa	V	V	V	IV	I	IV	V
Scapania aspera	IV	III	V	V	I	V	V
Sieglingia decumbens	III	III	III	IV	III	IV	IV
Ditrichum flexicaule	IV	V	V	III	I	IV	V
Hypnum lacunosum	II	III	IV	IV	III	III	IV
Cornicularia aculeata	III	V	V	IV	I	II	II
Cetraria islandica	II	III	IV	IV	III	IV	III
Gentianella amarella	I	III	IV	IV	I	IV	III
Helianthemum chamaecistus	V	V	III	II	I	III	II
Cladonia pocillum	III	III	III	II	III	III	III
Rhacomitrium canescens	III	III	III	IV	I	III	IV
Plantago maritima	III	II	I	II	I	IV	V
Frullania tamarisci	I	II	III	III	II	III	III
Viola rupestris	V	III	I	I		I	I
Antennaria dioica	I		I	II	I	I	I
Helictotrichon pratense	II	I	I	I	I	I	II
<u>Differential species of β Nodal group with Minuartia verna</u>							
Minuartia verna		III	IV	IV	II		I
<u>Differential species of δ Nodal group and Noda with Carex ericetorum</u>							
Carex ericetorum		IV	III		I	I	
x Kobresia simpliciuscula		V					
Rhytidium rugosum		I	III				
<u>Differential species group of β Nodal group with Carex pulicaris and Polygonum viviparum</u>							
Galium sterneri	I	II	V		V	V	V
Viola viniana	I		V		V	IV	IV
Carex capillaris		I	V		IV	I	V
C. caryophyllea			V		V	III	II
Cladonia arbuscula	I		IV		IV	III	II
Gentiana verna			III		III	III	IV
Carex pulicaris					III	V	III
Polygonum viviparum		I	I		III	II	III
<u>Differential species group of δ Nodal group with bryophytes</u>							
Rhytidiadelphus squarrosus	I		I		III	IV	I
Pleurozium schreberi			I		II	V	I
Hypnum ericetorum		I			III	III	I
<u>Differential species group of Nodum with Plantago lanceolata</u>							
Plantago lanceolata					IV	I	II
Hieracium pilosella		I	II		III	I	I
Thuidium tamariscinum					III	I	I
<u>Differential species group of Nodum with Calluna</u>							
Calluna vulgaris			I		V	I	I
Rhytidiadelphus loreus			I		V	I	I
Agrostis stolonifera		I			III	I	I
Polygala serpyllifolia					III	I	I
<u>Differential species of δ Nodal group with Kobresia</u>							
x Kobresia simpliciuscula					I	I	V
<u>Differential species group of Nodum with Primula farinosa</u>							
Primula farinosa		I					V
Carex hostiana						I	III
C. lepidocarpa					I		III







TABLE VII

NODUM WITH MINUARTIA VERNA AND TRIFOLIUM REPENS

Aufnahme No.	100	560	557	556	559	558
Species No.	22	22	29	28	36	23
Aspect		S	S	W	NE	S
Slope <sup>o</sup>		20	20	20	10	10
Cover % : total	95	80	60	80	80	50
Phanerogams	65	70	50	70	50	40
Cryptogams	95	40	10	10	40	10
Size of Aufnahme (sq.m.)	1	1	2	2	2	4
Average species No.				27		

Differential species group of Nodum

Koeleria cristata	4.2	2.3	4.3	2.2	+3	4.3
Cornicularia aculeata	3.4	2.2	+	2.1	+2	+2
Trifolium repens	4.3	3.2	3.1	3.2	3.2	
Viola riviniana	2.1		1.1	2.2	2.1	+
Cetraria islandica	+	+	+	+	+	
Cladonia subrangiformis	4.4	2.1	+	1.1	2.1	
Euphrasia officinalis agg.	1.1		2.1	2.1	+	
Galium sternerii	3.1			3.2	1.2	2.2
Minuartia verna (Ch.)	4.3		2.3	4.3		3.3
Linum catharticum		+	2.1		+	2.1
Rhacomitrium lanuginosum	9.5	1.2			2.2	+2
R. canescens		2.2	3.3	3.3	4.3	
Viola lutea	2.1		1.1	2.2	2.2	

Character species of Class, Order and Alliance (Ch.)Companion species

Festuca ovina	7.4	7.3	6.3	7.3	6.3	5.3
Thymus drucei	6.4	5.3	4.4	4.4	5.3	4.3
Agrostis tenuis		2.2		4.3	3.2	3.3
Hylocomium splendens		4.2	2.2	2.2	3.3	
Carex capillaris				2.3	2.2	+
Plantago lanceolata				2.2	2.2	+2
Taraxacum officinale s.l.				2.3	1.2	+
Gentianella amarella			2.2		2.2	2.1
Tortella tortuosa				3.3	5.3	3.3
Ctenidium molluscum				2.2	3.3	3.2
Hypnum lacunosum		4.3	3.3		3.2	
Selaginella selaginoides			2.2	2.2	2.2	
Carex flacca			2.2	4.2		+
Potentilla erecta			2.2	2.2		+2
Campanula rotundifolia			1.1		2.1	2.2
Dicranum scoparium			3.3	+2	2.2	
Carex caryophyllea	6.2				2.2	
Deschampsia caespitosa			4.3		4.3	
Galium saxatile	1.1		3.2			
Plantago maritima				2.2		2.2
Prunella vulgaris			2.2		2.1	
Climacium dendroides				2.1	3.1	
Ditrichum flexicaule		2.3			+2	
Bellis perennis					3.1	+2
Plagiochila asplenioides		2.2	+2			
Cladonia pocillum				+		+2
C. arbuscula	3.3	+3				
Barbilophozia barbata	4.3		+2			

Also :

- 100 : Briza media 4.2, Hypnum ericetorum 4.3, Polytrichum juniperinum 4.4, Rhytidiadelphus squarrosus 2.2, Cladonia uncialis +2;  
560 : Lophocolea bidentata 2.2, Acrocladium cuspidatum 2.2, Rhytidiadelphus triquetrus 2.2, Thuidium philbertii+;  
557 : Achillea millefolium 2.1, Equisetum variegatum 2.1, Frullania tamarisci +2, Fissidens adianthoides 2.3;  
556 : Cirsium palustre 2.1;  
559 : Cerastium holosteoides +, Agrostis stolonifera +2, Carex pulicaris 1.3, Pseudoscleropodium purum 2.2, Grimmia doniana 2.2;  
558 : Baeomyces sp. +2.

TABLE VIII

ASSOCIATION MINUARTIO-THLASPEETUM Shim. 1968

Sub-association variant	typicum	achilletesum	cladonietosum			
	typical Mesobromion					
	A	B	C	E	F	D
No. of Aufnahmen	7	7	3	6	3	7

Alliance (X) and AssociationCharacter species

Minuartia verna (Ch.)

V	V	3	IV	2	V
V	IIII	2		1	IV

Thlaspi alpestre (X)

Differential species of Sub-associations  
and variant

Achillea millefolium

Euphrasia nemorosa

Plantago lanceolata

Rhytidiadelphus squarrosus

Anthoxanthum odoratum

	V	3	I <sup>#</sup>		
I	V	3	IV <sup>#</sup>		I
	IV	2	III	1	
	IV	3	I	3	
	IV	1			

Koeleria cristata

Anthyllis vulneraria

Helictotrichon pratense

Scabiosa columbaria

	I	2	V		I
		2			
		2			
		2			

Cornicularia aculeata

Calluna vulgaris

Cladonia pyxidata

C. rangiformis

C. chlorophaea

	V	3	IV
		3	IV
I		1	V
	I		V
			V

Character species of Class and Order (Ch.)Companion species (constancy IV and V)

Festuca ovina	V	V	3	V	3	IV
Thymus drucei	III	V	3	V	3	III
Agrostis tenuis	V	III	2	V	3	V
Linum catharticum	II	V	3	IV	2	III
Trifolium repens	III	V	2	V	2	III
Campanula rotundifolia	V	IV	2	III	1	III
Lotus corniculatus		V	3		1	III
Rumex acetosa	V	IV	2			III
Hylocomium splendens		I	2	IV	3	
Viola riviniana		I	1	V	2	
Cerastium holosteoides	I	IV		I	2	
Rhacomitrium lanuginosum		I		IV	3	
Viola lutea	I	I		IV	1	II
Galium sternerii			1	IV		
Cetraria islandica				V	3	
Rhacomitrium canescens				IV	1	
Cladonia subrangiformis				V		

\* Euphrasia officinalis agg.

## Key:

From Shimwell (1968)

Minuartia-Thlaspeetum

A sub-ass. typicum - Derbyshire and Yorkshire

sub-ass. achilletesum

B typical variant - Somerset, Derbyshire and N. Pennines

C Mesobromion variant - Derbyshire

D sub-ass. cladonietosum - Derbyshire, Yorkshire and Westmorland

A.V.Jones - Widdybank Fell

E Nodum with Minuartia verna and Trifolium repens

From Eddy, Welch and Rawes (1969) - Moor House N.N.R., Westmorland

F Made ground-lists nos. 1, 2 and 3.

TABLE IX

SOIL CHARACTERISTICS OF THE NODUM WITH MINUARTIA AND TRIFOLIUM

<u>Profile No.</u>	<u>Aufn. No.</u>	<u>Soil type</u>	<u>pH</u>	<u>L.O.I.</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>CaCO<sub>3</sub></u>	<u>Ca</u>	<u>Zn</u>	<u>Pb</u>	<u>N</u>
1		Rendzina initiale	7.6				42.3	16.5	32.0	0.23
2	100	Rendzina	6.6	9.47	1.44	5.32	13.4	6.8	>100.0	0.23

Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.

Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth - from top 15 cm profile

L.o.I. - Loss on Ignition: % dry weight

P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid; mg P<sub>2</sub>O<sub>5</sub>/100g

CaCO<sub>3</sub> - % total weight

Ca - m eq/100 g

Zn )  
Pb ) - p.p.m.

N - total N: %total weight.



TABLE XII

ASSOCIATION CRATONEURETUM COMMUTATI ASS. NOV. PROV.

	Sub-ass. cardaminetosum pratensis					J	Sub-ass. saxifragetosum aizoidis				
	Cratoneuron filicinum var.		Saxifraga aizoidis var.				E	Alchemilla glabra var.			
	typical sub-var.	Carex dioica sub-var.	A	B	C			D	F	typical sub-var.	saxifraga oppositifolia sub-var.
No. of Aufnahmen	4	3	20	9	11	4	3	K	G	H	
<u>Association character and differential species</u>											
Cratoneuron commutatum (A)		3	V	V	V	4	3	III	III	2	
Festuca rubra		1	IV	III	V	4	3	V	V	4	
<u>Differential species of Sub-ass. cardaminetosum pratensis</u>											
Cardamine pratensis.	3 1		V	V	IV						
<u>Differential species of Cratoneuron filicinum variant</u>											
Cratoneuron filicinum (A)	4	2	IV	II					II	1	
Sagina nodosa	2	1	IV	II					I		
Leontodon autumnalis	1	2	V			1					
Epilobium palustre	2	1	IV		I						
Juncus articulatus		2	III	IV	I					I	
Philonotis calcarea (A)		3	II	II		1		I			
<u>Differential species of Carex dioica sub-variant</u>											
Carex dioica			III	IV	II						
C. nigra			V	III	II						
Triglochin palustris			III	III							
<u>Differential species of Sub-ass. saxifragetosum aizoidis</u>											
Saxifraga aizoides (A)					V		4		V	V	4
Pinguicula vulgaris	2	2	I		I		4		2	V	1
Ctenidium molluscum			II				3		3	IV	3
Blindia acuta			I				2		2	V	1
<u>Differential species of Drepanocladus revolvens variant</u>											
Drepanocladus revolvens		1	II				4			I	
<u>Differential species of Alchemilla glabra var.</u>											
Alchemilla glabra			II		I					V	2
Carex pulicaris			II		I		1			IV	3
<u>Differential species of Saxifraga oppositifolia sub-var.</u>											
Saxifraga oppositifolia									V	V	4
Alchemilla alpina									III	IV	4
Thalictrum alpinum.					I				III	III	4
<u>Class and Order character species</u>											
Philonotis fontana			V		IV						
Epilobium alsinefolium			III		III					III	2
Pohlia wahlenbergii		3	I							II	
Caltha palustris			III		I					I	
<u>Alliance character species (A)</u>											

TABLE XII (continued)

	A	B	C	D	F	J	E	K	G	H
No. of Aufnahmen	4	3	20	9	11	4	3	7	9	4
Companion species ( <i>constancies</i> V and IV)										
<i>Bryum pseudotriquetrum</i>	1	2	V	V	II	3		IV	IV	3
<i>Agrostis stolonifera</i>	1	3	I	V	II		1		I	
<i>Riccardia pinguis</i>		1	IV	III	I	4		IV	I	2
<i>Carex panicea</i>		2	V	III	II			III		
<i>C. demissa</i>			V	II	I				III	
<i>C. lepidocarpa</i>		3	I	III			2	I	I	
<i>Selaginella selaginoides</i>	1		IV	I	I	1	2	V	V	4
<i>Thymus drucei</i>	1		I			1	2	I	IV	3
<i>Deschampsia caespitosa</i>			II	II	IV			V	V	4
<i>Acrocladium cuspidatum</i>		3	II		I		1	III	IV	1
<i>Carex flacca</i>	2	3	I				3	III	I	
<i>Pellia endiviifolia</i>	4	2	I		I		1		III	2
<i>Polygonum viviparum</i>			III		I				V	4
<i>Ranunculus acris</i>		1	II		I			V	V	1
<i>Parnassia palustris</i>			I					III	V	
<i>Euphrasia officinalis</i> agg.				I		1		II	V	2
<i>Linum catharticum</i>			I	I			3		IV	
<i>Agrostis tenuis</i>					II				V	4
<i>Plagiochila asplenioides</i>								II	III	4
<i>Rhytidiadelphus triquetrus</i>									IV	4
<i>Luzula multiflora</i>									II	4
<i>Orthothecium rufescens</i>								V		
<i>Festuca ovina</i>		1	III	I	I	1		II	V	4
<i>Juncus bulbosus</i>	1		IV	II	I <sup>+</sup>				I <sup>+</sup>	
<i>Prunella vulgaris</i>	1	1	IV	I					I	
<i>Ranunculus flammula</i>		1	IV							
<i>Agrostis canina</i>			IV		I		1		I	2
<i>Juncus triglumis</i>			IV		I					
<i>Epilobium anagallidifolium</i>			IV						I	
<i>Trifolium repens</i>			IV						I	
<i>Achillea ptarmica</i>			IV							
<i>Cirsium palustre</i>			IV							

\* including *C. palustris* var. *minor*

+ *J. kochii*

### Key

From Ivimey-Cook and Proctor (1965) - The Burren, County Clare, Ireland

A Lists nos. 107, 108, 109, 111 )  
 B Lists nos. 605, 609, 9241 ) Communities of calcareous springs

From Eddy, Welch and Rawes (1969) - Moor House N.N.R., Westmorland

C Cratoneuron - Carex nodum

A. V. Jones - Widdybank Fell

D Nodum with Cardamine and Cratoneuron commutatum

E Community fragment with Saxifraga aizoides and Cratoneuron commutatum

From McVean and Ratcliffe (1962) - Scottish Highlands

F Cratoneuron - Saxifraga aizoides nodum

G Saxifragetum aizoidis

H Saxifragetum aizoidis - mixed Saxifrage facies

From Birks (1969) - Isle of Skye

J Cratoneuron commutatum - Saxifraga aizoides nodum

K Saxifragetum aizoidis McV. and R. 1962

TABLE XIII

SOIL CHARACTERISTICS OF NODUM WITH CARDAMINE AND CRATONEURON

<u>Profile No.</u>	<u>Soil type</u>	<u>Sample depth</u> (where distinguished)	<u>pH</u>	<u>Ca</u>	<u>Zn</u>	<u>Pb</u>	<u>N</u>
1	Moss hummock	0-20	7.2	59.3	>100.0	15.0	1.05
		20 +	7.4	37.3	39.0	22.0	0.06
2	"		6.7	62.8			0.57

Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.

Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth - top 15 cm of profile unless otherwise indicated.

L.o.I. - Loss on ignition: % dry weight.

Ca - m eq/100 g

Zn )  
- p.p.m.

Pb )

N - total N: % total weight.





TABLE XIV (continued)

Also :

- 462 : Rhodobryum roseum 3.1;  
349 : Mnium undulatum 2.2, Eurhynchium praelongum 2.2;  
121 : Polygala serpyllifolia 1.2, Cladonia uncialis 2.3,  
 Frullania tamarisci 2.3, Tritomaria quinqueidentata 2.3,  
 Sanguisorba officinalis 2.2, Diplophyllum albicans +,  
 Ptilidium ciliare 1.2, Cladonia rangiformis 1.2;  
137B: Antennaria dioica +, Succisa pratensis +;  
504 : Ptilidium ciliare 2.3, Cladonia uncialis 3.3, C. furcata 2.2,  
 Campylopus fragilis 2.3;  
126 : Cetraria islandica 1.1, Mnium undulatum 3.4, Thuidium delicatulum 5.4;  
127 : Galium verum 1.1, Antennaria dioica +.2, Philonotis fontana 3.3,  
 Dichodontium pellucidum +, Plantago major +;  
236 : Galium boreale 1.2, Minuartia verna +.2, Botrychium lunaria +,  
 Eurhynchium praelongum 2.2;  
162 : Carex dioica 4.3, Tofieldia pusilla 1.2, Lycopodium selago +.2,  
 Barbilophozia barbata 2.2, Rhytidiadelphus loreus 2.2,  
 Frullania tamarisci 1.2, Peltigera leucophlebia +, P. praetextata +,  
 Cladonia pyxidata +;  
159 : Carex dioica 1.2, Equisetum palustre +.2, E. variegatum 3.1,  
 Pellia endiviifolia 3.2, Mnium punctatum +;  
352 : Mnium punctatum 3.3;  
57 : Juncus articulatus 2;  
59 : Tortella tortuosa 3, Barbula tophacea 3, Mnium pseudopunctatum 2;  
483 : Calluna vulgaris 2.2, Tortella tortuosa +.3, Philonotis fontana 2.2,  
 Preissia quadrata +, Campyllum chrysophyllum +.2, Pellia endiviifolia +;  
29 : Galium boreale 1;  
172 : Galium boreale 3.1, Trollius europaeus 1.1, Fissidens osmundioides 2.2;  
60 : Juncus kochii +, Galium verum 1;  
165 : Carex dioica 4.3, Equisetum palustre 2.1, Triglochin palustris 1.1,  
 Eriophorum angustifolium 4.1, Tritomaria quinqueidentata +,  
 Mnium punctatum 2.3, Philonotis fontana 2.3, Juncus squarrosus +.2;  
363 : Splachnum ovatum +.2, Lophozia ventricosa +.2;  
30 : Thalictrum alpinum 5, Filipendula ulmaria 1;  
31 : Valeriana dioica 4.3;  
27 : Thalictrum alpinum 8;  
58 : Armeria maritima 2, Valeriana dioica 2.1;  
168 : Armeria maritima +.2;  
171 : Cetraria islandica +.2;  
362 : Equisetum variegatum 2.1;  
174 : Thalictrum alpinum 6.3, Mnium undulatum 2.2, Campylopus fragilis 1.3,  
 Frullania tamarisci +, Tritomaria quinqueidentata 2.2 .

TABLE XVI (continued)

	A	B	D	E	F	K	J	L	P	O	Q	H	N	M	G	T	S	R	C
No. of Aufnahmen	10	6	23	8	9	9	12	2	6	12	6	8	16	10	3	5	9	4	12
<u>Differential species of Sub-ass. galietosum saxatilis</u>																			
Galium saxatile	IV	IV	IV	III				1	II	II	II				3	III	IV	IV	V
Luzula campestris	III	III	IV	III	II					I	II	IV			3	V	V	V	
Polytrichum alpinum										I	I					II		III	IV
Thuidium delicatulum					I			2	I							V	V	III	
<u>Differential species of variants and sub-variants</u>																			
Carex pilulifera									I			III	III	III					I
Cirsium palustre	I	IV	III	II	IV	I	I				I		I		2	IV	V		
Potentilla sterilis	I			I						I			I			V	II		
Ptilidium ciliare			I						I	I	I	II		I			III	IV	IV
Deschampsia flexuosa									II				I	II					V
<u>Class, Order and Alliance character species (Ch.)</u>																			
Plantago lanceolata	IV	V	IV	IV	IV	III	III		III	III	IV	IV	III	III	3	V	IV	IV	I
Ranunculus acris	V	V	II	I	III	III	III	2	III	V	IV	IV	V	IV	2	V	IV		I
Cerastium holosteoides	IV	IV	V	IV	V	II	I			II	IV	IV	III	IV	3	III	V	II	I
Festuca rubra	V	V	V	IV	IV	IV	III	1	I	III	IV	IV	V	I	1	V	III	III	I
Bellis perennis	IV	IV	IV	II	III	III	III		IV	II	IV	IV	II			IV	III	III	
Achillea millefolium	V	V	IV	III	I		I			II		IV	II	I	2	IV	III	IV	II
Rumex acetosa	IV	V	IV	I							III		II	III		II			III
Veronica officinalis	II	III	II	IV	I					II		I	II	II		II	I	III	
Climacium dendroides	I	III	III	II	II	IV	II	1		I		I			2		I		
Veronica chamaedrys	III	III	I						I				I	I		I		II	
Poa pratensis											II	I	I						
<u>Companion species (constancy V)</u>																			
Festuca ovina	V	V	V	V	V	V	V	2	V	V	V	V	V	V	2	V	V	V	V
Agrostis tenuis	V	V	V	IV	V	V	V	2	IV	IV	V	V	V	V	3	V	V	V	V
Anthoxanthum odoratum	V	V	V	I	IV	I	I		IV	III	V	III	V	V	2	V	IV	II	V
Hylocomium splendens	IV	IV	IV	II	II	IV	IV	2	III	III	V	IV	V	IV	1	II	IV	III	II
Trifolium repens	IV	IV	V	III	V	II	III	1	I	II	II	V	III	III	3	IV	IV	II	I
Potentilla erecta	II	V	III	I	I	V	V	2	V	IV	V	V	IV	IV	1	IV	IV	V	III
Rhytidadelphus squarrosus	III	IV	IV	III	V	V	II	1	I	III	III	IV	V	IV	3	III	V	V	V
Viola riviniana	IV	IV	IV	V	IV	V	III	2	III	V	V	V	IV	V	1	V	V	V	
Prunella vulgaris	IV	IV	V	V	V	V	V	2	III	V	V	V	V	I	3	V	III		
Hypnum ericetorum	III	III	IV	V	I	I	I		II	III	I	II	II	III	2	II	V	III	III
Carex panicea	II	IV	III	I	V	V	V	2	III	IV		III	II	II		III			
Deschampsia caespitosa	II	III	I	I	II	IV	V		II	II	I	III	II	II	1	II	IV	II	I
Carex flacca	II	IV	II	IV	IV	V	IV			II	I	IV	I						
Dicranum scoparium	II	I	III	III	II	I		1		II	I	IV	III			II	V	V	II
Lotus corniculatus	III	I	I				II		I	III	V	III	II	I		II	I	II	
Pleurozium schreberi		II	I	III		II	I	1	I		I	III	I	III			V	I	III
Agrostis canina	I	I	V	I	III		IV	1	II	V	I		III	III	2	V	IV		IV
Acrocladium cuspidatum	I	I	I	I	I	V	IV			II	I	III	II		3	V	IV		
Campanula rotundifolia	I		I	I	I	II	II		II	III		V	II	I			III	III	
Pseudoscleropodium purum	I		I	I		II	II	2	I	II	V	IV	III	II			IV	IV	II
Euphrasia officinalis agg.						IV	V	2	III	IV	IV	V	IV	III	1	IV	IV	III	
Agrostis stolonifera			I	I	II	V	IV	1				III			1				
Bryum pseudotriquetrum					III	III	V	1	I	II	II		I		1	III	I		
Fissidens adianthoides			I		II	V	IV		I	II		II	I		1	I			
Equisetum palustre				I	V		I			II		II	I		1				

\* E. curta

TABLE XVI

ASSOCIATION FESTUCO-POETUM SHIM, 1968 AND ASSOCIATION FESTUCO-NARDETUM ASS. NOV. PROV.

Ass. Festuco-Poetum

Association

Festuco - Nardetum

Nardetum

Sub-ass. cynosuretosum Sub-ass. sub-alpinum

Sub-ass. caricetosum pulicaris

Sub-ass.

galietosum

saxatilis

Ditrichum variant

typical variant

Carex pilulifera var.

Cirsium palustre var.

Ptilidium ciliare var.

Plantago maritima sub-var.

typical sub-var.

typical Sesleria sub-var. sub-var.

Carex pulicaris sub-var.

typical sub-var.

Potentilla sterilis sub-var. sub-var.

Ptilidium flexuosa sub-var. sub-var.

Cardamine facies Sesleria facies

Thalictrum facies Saxifraga facies

N

M

G

T

S

R

C

No. of Aufnahmen

10

6

23

8

9

9

12

2

6

12

6

8

16

10

3

5

9

4

12

TABLE XVI

Key

From Shinwell (1968)

Ass. Festuco-Poetum and

A Sub-ass. cynosuretosum - Breconshire/ Yorkshire.  
B Sub-ass. sub-alpinum - N. Pennines.

From Eddy, Welch and Rawes (1969) - Moor House N.N.R., Westmorland.

C Festucetum p.p.  
D Agrostu-Festucetum typicum  
E Agrostu-Festucetum, Sesleria facies  
F Carex panicea - Ctenidium molluscum nodum

A.V. Jones - Widdybank Fell.  
L Nodal group with Trifolium repens and Plantago lanceolata

G Nodum with Galium saxatile (m.u. 22)  
H Nodum with Carex caryophyllea (m.u. 21)  
J Nodum with Sesleria (m.u. 20)  
K Nodum with Cardamine (m.u. 19)

From Ratcliffe (1966) - Widdybank Fell.  
L Grass-rich Caricetum

From McVean and Ratcliffe (1962) - Scottish Highlands.  
H Species-poor Agrostu-Festucetum p.p.  
N Species-rich Agrostu-Festucetum  
O Saxifrageto-Agrostu-Festucetum  
P Thalictrum-Ctenidium provisional nodum

From Berks (1969) - Isle of Skye.  
Q Agrostu-Festucetum (species-rich)

From Edgell (1969) - Cader Idris, North Wales.  
R Basic grassland - dry facies  
S Basic grassland - herb-rich Agrostis-Festuca sociation

From Ratcliffe (1959) - Carneddau, Snowdonia, N. Wales.  
T Basic grassland

Ass. Festuco-Poetum character species

Poa subcaerulea V V IV III III

Differential species of Ass. Festuco-Poetum and Sub-associations

Thymus drucei V V V V IV V V 2  
Ctenidium molluscum V V III V V V V 1  
Carex caryophyllea IV IV IV V II II III 1  
Galium sternerii IV IV II IV III IV IV 2  
Saxifraga hypnoides IV V I II V V 1

Cynosurus cristatus V I  
Holcus lanatus (Ch.) IV I

Euphrasia confusa I V V V IV  
Achillea ptarmica V IV III IV  
Plagiochila asplenioides IV III IV II II II 1  
Barbilophoza barbata IV III IV I I  
Tritomaria quinquedentata IV III IV I I 1  
Ranunculus repens IV III II

Ass. Festuco-Nardetum character and differential species

Nardus stricta II III III III II  
Sieglingia decumbens I II II I IV III III II

Differential species of Sub-ass. caricetosum pulicaris

Carex pulicaris I II III IV V V 2 V V V IV III I 1  
Selaginella selaginoides III IV IV III V V 2 V V III V II I  
Linum catharticum III III IV V IV IV 1 II V IV III II I

Differential species of Ditrichum variant, sub-variants and facies

Ditrichum flexicaule I I IV IV III III III I I II II II  
Carex demissa IV IV III III I I I I 2  
C. capillaris IV IV 2 II III II I 1 IV I  
Leontodon autumnalis II IV II V III IV III I I I 1 IV I

Plantago maritima IV IV 1 II I II I I 1

Cardamine pratensis (Ch.) II I V IV I II 2 I II II

Sesleria caerulea I I V IV IV IV

Thalictrum alpinum II V II II II

Saxifraga aizoides I V V

Differential species of sub-var. with Sesleria of typical variant

Viola lutea I I II I IV IV  
Koeleria cristata I I I II I

L NODAL GROUP WITH TRIFOLIUM REPENS AND PLANTAGO LANCEOLATASummary Table

Mapping Unit No. No. of Aufnahmen	22	21	20	19
<u>Differential species group of L Nodal group</u>				
Trifolium repens	3	V	III	II
Plantago lanceolata	3	IV	III	III
Ranunculus acris	2	IV	III	III
<u>Differential species group of Nodum with Galium saxatile</u>				
Galium saxatile	3			
Anthoxanthum odoratum	2	III	I	
Agrostis canina	2			
<u>Differential species group of L Nodal group with Carices</u>				
Carex pulicaris		IV	V	V
Euphrasia officinalis	1	V	V	IV
Carex flacca		IV	IV	V
Viola riviniana	1	V	III	V
Galium sternerii		V	IV	IV
Carex panicea		III	V	V
Deschampsia caespitosa	1	III	V	IV
Hylocomium splendens	1	IV	IV	IV
Agrostis stolonifera	1	III	IV	V
Bellis perennis		IV	III	III
<u>Differential species group of Nodum with Carex caryophyllea</u>				
Cerastium holosteoides	3	IV	I	II
Luzula campestris	3	IV		
Carex caryophyllea		V	III	II
Campanula rotundifolia		V	II	II
Viola lutea	1	IV	I	II
Achillea millefolium	2	IV	I	
Koeleria cristata		IV	II	
Sieglingia decumbens		IV	I	
Alchemilla glabra		IV	II	
Polytrichum formosum	1	IV		
Carex pilulifera		III		
Hypnum lacunosum		III		
Polygonum viviparum		III	I	I
Gentianella amarella		III	I	
Gentiana verna		III	I	
Lotus corniculatus		III	I	
Cornicularia aculeata		III	I	I
Hieracium pilosella	1	III		
Atrichum undulatum	1	III		
Cladonia pocillum		III		
Peltigera canina		III		
<u>Differential species group of L Nodal group with Carex demissa and Ctenidium molluscum</u>				
Ctenidium molluscum	II	IV	V	V
Bryum pseudotriquetrum	1	II	V	III
Fissidens adianthoides	1	II	IV	V
Leontodon autumnalis	1	II	IV	IV
Plantago maritima	1	I	IV	IV
Carex demissa			IV	IV
Festuca rubra	1		III	IV
Carex capillaris			IV	IV
Taraxacum officinale s.l.	1	I	III	III
Ditrichum flexicaule			III	III
<u>Differential species group of Nodum with Sesleria</u>				
Sesleria caerulea		IV	IV	
Linum catharticum		III	IV	
Nardus stricta		III	III	
Campylium stellatum			III	
<u>Differential species group of Nodum with Cardamine</u>				
Cardamine pratensis	2	II		IV
Climacium dendroides	2	I	II	IV
Drepanocladus revolvens			II	III

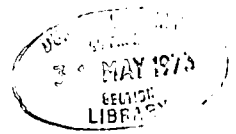


TABLE XVII

SOIL CHARACTERISTICS OF ~~THE~~ NODAL GROUP WITH TRIFOLIUM AND PLANTAGO

Mapping Unit	Profile No.	Aufn. No.	Soil type	Sample depth (where distinguished)	pH	L.o.I.	P <sub>2</sub> O <sub>5</sub>	CaCO <sub>3</sub>	Ca	Zn	Pb	N
19		58	Calcareous peaty gley	0-10	6.4	33.69	2.04	2.86	48.0			1.67
				10+	7.3	5.35	1.68	1.22	11.8		0.15	
		168	"	0-10	6.1	75.21	8.88		86.5	25.0	1.9	3.36
				10+	8.1	1.82	0.30	66.72	91.0	22.0	5.3	0.08
20		159	Gley		6.6	24.09	1.32	2.92	53.25			1.07
					6.0	15.89	1.92		21.3		0.89	
	1		Calcareous gley		7.4				36.0	20.0	11.0	0.12
					6.7				49.5	53.5	27.0	0.98
21		397	Brown earth with gleying	0-5	5.3	20.74	1.20		9.70			0.86
				5-20	5.5	13.29	1.44		5.95		0.61	
				20-60	5.5	7.27	1.44	1.66	2.55		0.14	
	1		Brown earth with gleying		5.8				30.0	100.0	3.7	1.11
					6.7				38.8	19.5	26.0	0.81
		121	"	hummock hollow		6.2	15.4	0.60		19.6		
					5.3	16.71	0.60		10.5		0.74	
22		210	Organic alluvium		5.0	11.62	1.74		11.9	10.5	9.9	0.38
				1	4.6	22.04			6.5	22.5	7.6	0.78
				3	5.0	18.69			11.0	2.2	4.6	0.41

Notes:

- Profile No. distinguishes those not made at a specific Aufnahme location
- Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.
- Sample depth - top 15 cm of profile unless otherwise indicated.
- L.o.I. - Loss on Ignition: % dry weight
- P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid: mg P<sub>2</sub>O<sub>5</sub>/100 g
- CaCO<sub>3</sub> - % total weight
- Ca - m eq/100 g
- Zn )  
Pb ) - p.p.m.
- N - total N: % total weight

TABLE XXV (continued)

Also:

- 16: Hypnum ericetorum 1, Anthoxanthum odoratum 3;  
 175: Hypnum ericetorum 1.2, Dicranum scoparium 2.3, Campylopus flexuosus +, Thuidium delicatulum +, Mnium undulatum 2.2, Climacium dendroides 1.1, Rhytidiadelphus triquetrus 2.2, Sanguisorba officinalis 2.2, Achillea ptarmica 1.1;  
 173: Cirsium palustre +, Valeriana dioica 2.2, Cladonia ochrochlora +.2, Peltigera leucophlebia +, Hieracium pilosella 2, Achillea ptarmica +, Geum rivale 1.1, P. canina 2.2,  
 280: Peltigera leucophlebia +, Rhytidiadelphus triquetrus 2.2, Climacium dendroides 2.2, Thuidium philibertii 1.2, Lotus corniculatus (+)  
 91: Galium boreale 4.2, Polygonum viviparum 3.1;  
 154: Anthoxanthum odoratum +, Luzula campestris 2.2;  
 92: Cladonia coniocrea +.2, C. rangiformis 1.3;  
 83: Trollius europaeus 1.2, Mnium hornum +;  
 14: Agrostis canina 1;  
 279: Thuidium tamariscinum +;  
 149: Carex caryophylla 1.1, Cladonia crispata 4.2, C. ochrochlora +.2, Tritomaria quinquentata 3.2;  
 62: Koeleria cristata 1.2, Cetraria islandica +;  
 85: Splachnum ovatum 1.3, Cladonia rangiformis 3.3, Dicranella sp. 1.3;  
 88: Diplophyllum albicans 2.3, Bryum pallens 1.2, Dicranella sp. 1.2, Cladonia pyxidata 2.2, C. ochrochlora 2.2, C. degenerans +, Balomyces roseus +, Lycopodium selago +.2;  
 69: Cetraria islandica 1, Cephalozia media 2;  
 287: Bellis perennis +, Achillea millefolium +, Lotus corniculatus 1.2, Polygala serpyllifolia +;  
 288: Blysmus compressus 3.2, Lotus corniculatus 1.2, Polygala serpyllifolia (+), Cirsium palustre (+);  
 166: Philonotis fontana 1.1;  
 297: Thuidium tamariscinum 2.1;  
 86: Lycopodium selago 1.2, Mnium hornum 1.3, Diplophyllum albicans 2.2, Calypogeia trichomanes 2.2, Cladonia pyxidata 3.2;  
 87: Cladonia rangiformis 1.2;  
 84: Carex curta 3.2;  
 89: Grimmia apocarpa +;  
 67: Ilex aquifolium + (seedling), Cololejeunea calcarea 3.3;  
 531: Minuartia stricta 3.3;  
 499: Trichophorum caespitosum<sup>++</sup> 4.3, Polygala serpyllifolia +.2, Leontodon hispidus 2.1, Blindia acuta 3.3;  
 20: Carex caryophylla 1, Drosera rotundifolia 2, Pedicularis sylvatica 1, Thuidium tamariscinum 1, Mnium punctatum 1, Diplophyllum albicans 1, Calypogeia trichomanes 1, Barbula tophacea 1;  
 118: Leontodon hispidus 1, Trichophorum caespitosum<sup>++</sup> 3, Campylopus flexuosus 1, Brentelia chrysocoma 1;  
 24: Dactylorhiza stricta 1;  
 284: Juncus effusus 4.3, Mnium punctatum 1.2;  
 495: Chiloscyphus pallescens var. fragilis<sup>++</sup> 2.2;  
 21: Mnium punctatum 1;  
 22: Dactylorhiza stricta 1, Menyanthes trifoliata +, Agrostis canina 1, Valeriana dioica 1, Calypogeia trichomanes 1;  
 496: Narthecium ossifragum 3.1, Ranunculus flammula 2.2, Polygonum viviparum 1.1, Aulacomnium palustre 2.3, Cladonia furcata +;  
 164: Carex caryophylla 1;  
 359: Bellis perennis 3.1, Cirsium palustre 1, Leontodon hispidus 2.2, Blysmus compressus 4.2, Thuidium philibertii 1.2;  
 487: Valeriana dioica 3.2;  
 488: Blindia acuta 2.2;  
 481: Brentelia chrysocoma 2.2;  
 170: Splachnum ovatum +;  
 268: Philonotis calcarea 2.2, Leontodon taraxacoides +;  
 350: Philonotis fontana 2.2;  
 430: Carex rostrata 4.2;  
 291: Agrostis canina +.2;  
 160: Galium saxatile 2.2;  
 281: Bellis perennis +;  
 11: Drepanocladus aduncus 1;  
 150: Baeomyces roseus 1.2, Cetraria islandica +;  
 425: Anoetangium aestivum 2.2;  
 517: Minuartia stricta 4.3;

<sup>++</sup> ssp. germanicum.

<sup>++</sup> Chiloscyphus pallescens var. fragilis (Roth.) K. Müll (Watson 1966)

TABLE XXVII

## SOIL CHARACTERISTICS OF A NODAL GROUP WITH CAREX DIOICA AND C. LEPIDOCARPA

Mapping Unit	Profile No.	Aufn. No.	Soil type	Sample location (where distinguished)	pH	L.o.I.	P <sub>2</sub> O <sub>5</sub>	CaCO <sub>3</sub>	Ca	Zn	Pb	N
8		62	Calcareous gley	hummock	7.6	11.88	0.24	6.76	49.5			0.46
		86		hollow	7.7	12.33	0.36	15.80	52.5			0.39
		86	"	hummock	7.4	14.20	1.44	4.12	39.8			0.56
				hollow	7.7	11.03	1.20	11.45	42.0			0.57
		87	(Flushed)	hummock	6.9	5.21	2.52	4.90	39.0			0.98
			Calcareous gley	hollow	7.3	15.81	1.44	21.26	61.5			0.98
		88	"gley"	hummock	8.0	6.55	1.08	31.49	54.0	4.5	15.0	0.32
				hollow	8.2	4.63	1.32	50.30	55.5	3.4	9.7	0.20
9	1		Calcareous gley		6.9				25.0	100.0	29.0	0.23
		61	(Flushed) Calcareous groundwater gley		8.2	2.78	0.48	45.70	50.5			0.09
		84	"	hummock	7.8	4.32	1.68	65.10	44.25	22.5	23.0	0.18
				hollow	7.8	5.23	1.68	63.80	48.0	22.0	26.0	0.23
11	1		(Flushed) Calcareous gley		6.1	36.18			38.5	100.0	3.2	1.41
		2	"		5.4	36.64			30.0			1.22
		3	"		6.5	24.63			17.5	46.5	6.1	0.35
12	1		Peaty gley		6.0	43.11			39.5	64.5	2.1	1.68
		2	"		5.9	58.80			24.3			0.96
		3	"		5.3	58.03			49.0	22.0	1.2	1.67
13		160	(Flushed) peat		6.0	67.4	1.62		51.5		1.89	
14	1		(Flushed) Calcareous gley	hummock	7.2				63.0	100.0	7.5	1.43
				hollow	7.2				27.5	100.0	5.3	0.15
		2	Moss hummock		7.3				40.0			0.17
		3			7.4				40.0	33.0	53.0	0.66

## Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.  
Soil types follows the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth - top 15 cm profile

L.o.I. - Loss on Ignition: % dry weight

P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid: mg P<sub>2</sub>O<sub>5</sub>/100 g

CaCO<sub>3</sub> - % total weight

Ca - m eq/100 g

Zn )  
Pb ) - p.p.m.

N - total N: % total weight

Drepanocladus revolvens and Cratoneuron commutatum not distinguished in the field.

MODAL GROUP WITH CAREX

Mapping Unit No., Aufnahm. No., Species No., Slope, Cover %, Phanerogams, Cryptogams, Size of Aufnahm. (sq. m), Average Species No.

Table with columns for species groups: Nodal group with Carex nigra and Equisetum, Nodal group with Carex stricta and Carex demissa, Nodal group with Molinia caerulea and Eriophorum latifolium, Nodal group with Juncus triglumis, Nodal group with Sesleria.

Differential species groups of Nodal group with Kobresia and Ctenidium, Nodal group with Equisetum variegatum, Nodal group with Carex nigra and Equisetum palustre.

Differential species groups of Nodal group with Equisetum variegatum, Nodal group with Carex nigra and Equisetum palustre.

Character species of Class, Order and Alliance (Ch.), Pellia endiviifolia, Barisia alpina, Pedicularis palustris, Campyllum chrysophyllum, Fissidens osmundioides, Mniun pseudopunctatum, Scorridium scorpioides, Catoscopium nigratum.

DIOICA AND CAREX LEPIDOCARPA

simplificuscula and Ctenidium, noduliscum, molniscum

Table with columns for species groups: Nodal group with Carex nigra and Equisetum, Nodal group with Carex stricta and Carex demissa, Nodal group with Molinia caerulea and Eriophorum latifolium, Nodal group with Juncus triglumis, Nodal group with Sesleria.

Differential species groups of Nodal group with Equisetum variegatum, Nodal group with Carex nigra and Equisetum palustre.

Differential species groups of Nodal group with Carex nigra and Equisetum palustre.

Character species of Class, Order and Alliance (Ch.), Pellia endiviifolia, Barisia alpina, Pedicularis palustris, Campyllum chrysophyllum, Fissidens osmundioides, Mniun pseudopunctatum, Scorridium scorpioides, Catoscopium nigratum.

MODAL GROUP WITH CAREX

Mapping Unit No., Aufnahm. No., Species No., Slope, Cover %, Phanerogams, Cryptogams, Size of Aufnahm. (sq. m), Average Species No.

Table with columns for species groups: Nodal group with Carex nigra and Equisetum, Nodal group with Carex stricta and Carex demissa, Nodal group with Molinia caerulea and Eriophorum latifolium, Nodal group with Juncus triglumis, Nodal group with Sesleria.

Differential species groups of Nodal group with Kobresia and Ctenidium, Nodal group with Equisetum variegatum, Nodal group with Carex nigra and Equisetum palustre.

Differential species groups of Nodal group with Equisetum variegatum, Nodal group with Carex nigra and Equisetum palustre.

Character species of Class, Order and Alliance (Ch.), Pellia endiviifolia, Barisia alpina, Pedicularis palustris, Campyllum chrysophyllum, Fissidens osmundioides, Mniun pseudopunctatum, Scorridium scorpioides, Catoscopium nigratum.



ASSOCIATION PINGUICHO-CARICETUM DIOLICAE ass. nov.

Sub-ass. Sub-association Equisetum variegati molinietosum  
Sesleria var.  
Juncus triglumis -  
Gymnostomum var.  
Juncus triglumis sub-var.  
Gymnostomum sub-var.

Sub-ass. thalictro-saxifragetosum  
Saxifraga - Scorpidium variant  
Succisa sub-var.

Sub-ass. eleocharetosum  
typical sub-var.  
Hardus sub-var.  
typical variant  
typical sub-var.

No. of Aufnahmen  
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Association character (Ch.) and differential species

Carex dioica (O., Ch.)	V	2	III	II	V	IV	IV	IV	V	1
Carex pulicaris	IV	3	V	V	I	I	I	I	I	
Eriophorum palustre (Ch.)	IV	2	III	III	II	III	III	III	IV	1
Toffieldia pusilla (A., Ch.)	I	1	V	IV	III	III	III	IV	IV	1
Plantago maritima	V	3	IV	V	V	V	V	V	V	1
Carex lepidocarpa (A., Ch.)		3	V	V	V	V	V	V	V	1
Kobresia simpliciuscula (Ch.)										

Differential species of Sub-ass. equisetum variegati and variants

Equisetum variegatum (O.)	III	3	III	III	V	III	III	III	II	
Sesleria caerulea	III	2	IV	III	I	I	I	I	I	
Rhacomitrium lanuginosum		1	IV	III	I	I	I	I	I	
Ditrichum flexicaule		1	IV	III	I	I	I	I	I	
Juncus triglumis		1	I	I	IV	IV	IV	IV	V	1
J. alpinorhynchus (O.)*		1	I	I	V	III	III	III	V	1
Gymnostomum recurvirostrum		1	I	IV	I	IV	IV	IV	V	1
Sagina nodosa (A.)		1	I	I	I	III	III	III	III	1
Minuartia verna		1	I	I	I	II	II	II	II	1

Differential species of Sub-ass. thalictro-saxifragetosum

Phalictrum alpinum	I	1	II	III	I	I	I	I	I	
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Differential species of Sub-ass. eleocharetosum

Eleocharis quinqueflora (O.)	I	1	I	II	III	III	III	III	1	
Eriophorum angustifolium	I	3	I	III	III	III	III	III	1	
Carex nigra	I	3	I	III	III	III	III	III	1	
Juncus kochii	I	1	I	I	I	I	I	I	1	
Equisetum palustre	I	1	I	I	II	II	II	II	1	
Carex demissa (Cl.)	I	1	I	I	II	II	II	II	1	

Differential species of Saxifraga-Scorpidium variant

Scorpidium scorpioides (O.)	I	1	I	II	I	I	II	II	1	
Saxifraga aizoides	I	1	I	II	I	I	II	II	1	
Blindia acuta	I	1	I	II	I	I	II	II	1	
Erica tetralix	I	1	I	I	I	I	I	I	1	
Carex echinata	I	1	I	I	I	I	I	I	1	

Differential species of typical sub-variant

Acrocladium trifarium	I	1	I	III	I	I	III	III	1	
Breutelia chrysocoma	I	1	I	III	I	I	III	III	1	
Juncus squarrosus	I	1	I	III	I	I	III	III	1	

\* ssp. arthropophyllus (Brenner) Reicheg. (Festhoff and den Held 1969) - not recognised in the British Isles.

+ Juncus bulbosus

Key

From Shinwell (1968)

- A Sub-ass. molinietosum - Derbyshire, Craven (Yorkshire) and Westmorland
- B Sub-ass. kobresietosum - Widdybank Fell

A.V. Jones - Widdybank Fell

- C Nodal Group with *Carex dioica* and *Carex lepidocarpa*
- D Nodum with *Sesleria* (m.n. 8) } Nodal group with *Equisetum variegatum*
- E Nodum with *Juncus triglumis* (m.n. 9) }
- F Nodum with *Nolina* and *Eriophorum latifolium* (m.n. 11) } Nodal group with *Carex nigra* and *Equisetum palustre*
- G Nodum typical

\* Nodal group with *Kobresia* and *Ctenidium*

H Nodum with *Gymnostomum*

From Ratcliffe (1966) - Widdybank Fell

- J Kobresieto-Caricetum - lists 1, 3-5, 8-9
- K lists 1-6 and 8-11 } Gymnostometo-Caricetum
- L list 7 }

From McEwan and Ratcliffe (1962) - Scottish Highlands

- M Cariceto-Saxifragetum aizoidis
- N lists 1-2, 4, 6, 8, 10-12, 16-17 } *Carex panicea* - *Campyllum stellatum*
- O lists 3, 5, 7, 9, 13-14 } nodum
- P list 15 }
- Q Cariceto-Saxifragetum aizoidis - low-level facies

From Poore (1950c) - Perthshire

- R *Carex demissa* - *C. panicea* nodum
- S *Carex hostiana* - *C. demissa* nodum

From Binks (1969) - Isle of Skye

- T *Carex* - *Saxifraga aizoides* nodum
- U *Carex panicea* - *Campyllum stellatum* association
- V *Eriophorum latifolium* - *Carex hostiana* association

1947  
 No. of Aufnahmen

Differential species of sub-var. with *Succisa* and facies

	A	B	C	J	D	K	K	H	L	M	T	R	S	U	N	E	Q	V	F	O	G	P
<i>Succisa pratensis</i>																						
<i>Molinia caerulea</i>																						
<i>Eriophorum latifolium</i> (A.)																						
<i>Pernassia palustris</i>																						
<i>Juncus acutiflorus</i>																						
<i>Drosera anglica</i>																						
<i>Schoenus nigricans</i>																						

Differential species of sub-var. with *Nardus* of typical variant

<i>Nardus stricta</i>																						
-----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Class character species (Cl.)

<i>Riccardia pinguis</i>																						
<i>Pedicularis palustris</i>																						

Order character species (O.)

<i>Campyllum stellatum</i>																						
<i>Drepanocladus revolvens</i> s.l.																						
<i>Bartsia alpina</i>																						
<i>Campyllum chrysophyllum</i>																						

Alliance character species (A.)

<i>Carex hostiana</i>																						
<i>Rissidens osmundioides</i>																						
<i>Pellia endiviifolia</i>																						
<i>Catoscopium nigratum</i>																						
<i>Cinclidium stygium</i>																						
<i>Mnium seligeri</i>																						
<i>M. pseudopunctatum</i>																						
<i>Riccardia multifida</i>																						

Companion species (constancies V and IV)

<i>Carex panicea</i>																						
<i>Juncus articulatus</i>																						
<i>Seleginella selaginoides</i>																						
<i>Ctenidium molluscum</i>																						
<i>Potentilla erecta</i>																						
<i>Festuca ovina</i>																						
<i>Carex flacca</i>																						
<i>Pinguicula vulgaris</i>																						
<i>Linum catharticum</i>																						
<i>Prunella vulgaris</i>																						
<i>Primula farinosa</i>																						
<i>Briza media</i>																						
<i>Euphrasia officinalis</i>																						
<i>Cratoneuron commutatum</i>																						
<i>Rissidens adianthoides</i>																						
<i>Bryum pseudotriquetrum</i>																						
<i>Phlymus drucei</i>																						
<i>Deschampsia caespitosa</i>																						
<i>Cirsium palustre</i>																						
<i>Carex capillaris</i>																						
<i>Leontodon autumnalis</i>																						
<i>Agrostis stolonifera</i>																						
<i>Marthecium ossifragum</i>																						
<i>Trichophorum cespitosum</i>																						
<i>ssp. Germanicum</i>																						

XXVI  
 CONT.

TABLE XVIII (continued)

Also:

- 153: *Barbilophozia floerkei* 2.3, *Rhacomitrium canescens* 2.2,  
*Cladonia arbuscula* 1.2;  
82: *Sesleria caerulea* + ;  
167: *Splachnum ovatum* +.2;  
361: *Parnassia palustris* 3.1, *Succisa pratensis* 4.3, *Thuidium philibertii* +,  
*Sieglingia decumbens* 2.2;  
515: *Rhacomitrium canescens* 3.3, *Calluna vulgaris* 2.2;  
157: *Tofieldia pusilla* 2.2;  
286: *Menyanthes trifoliata* +, *Succisa pratensis* 2.1, *Blysmus compressus* 4.3,  
*Utricularia minor* 2.2;  
356: *Carex capillaris* 2.2, *Gymnostomum recurvirostrum* 3.3;  
158: *Cinclidium stygium* 2.2;  
132: *Peltigera leucophlebia* 1.2, *Bryum* sp. 2.3, *Tofieldia pusilla* 2.1,  
*Pinguicula vulgaris* + ;  
169: *Carex capillaris* + ;  
298: *Parnassia palustris* (+), *Lophozia ventricosa* 2.2;  
148: *Carex capillaris* 3.3, *Barbula reflexa* 2.3, *Tortella tortuosa* +.3;  
152: *Juncus alphinoarticulatus* 2.1, *Cladonia uncialis* 2.2, *C. arbuscula* +,  
*Peltigera canina* +.2;  
512: *Campanula rotundifolia* 3.1;  
409: *Lophozia ventricosa* 2.3, *Narthecium ossifragum* 4.1, *Calluna vulgaris* 5.3,  
*Empetrum nigrum* 1.1, *Philonotis calcarea* 4.3;  
179B: *Achillea ptarmica* + ;  
155: *Scapania undulata* 1.2;  
178: *Solenostoma triste* + ;  
141: *Splachnum ovatum* 2.2;  
139: *Cinclidium stygium* 2.2;  
146: *Cinclidium stygium* 4.3;  
186: *Peltigera leucophlebia* +, *Pinguicula vulgaris* 2.1;  
184: *Carex rostrata* +.2, *Cladonia pocillum* +.2;  
493: *Dicranum scoparium* 2.3;  
305: *Rhytidiadelphus loreus* 2.2, *Mnium hornum* 2.2, *Sieglingia decumbens* +.2;  
479: *Dicranum scoparium* 2.3, *Chiloscyphus pallescens* var. *fragilis*<sup>#</sup> 2.3,  
*Galium verum* + ;  
491: *Saxifraga aizoides* 2.1<sup>o</sup>, *Dicranum scoparium* 2.2, *Polytrichum formosum* 1.2,  
*Juncus acutiflorus* 3.1;  
\*U III 405: *Lophozia ventricosa* 1.2, *Philonotis calcarea* 5.3;  
CONT. 145: *Koeleria cristata* + ;  
478: *Campylopus fragilis* +.2, *Chiloscyphus pallescens* var. *fragilis*<sup>#</sup> 2.3,  
*Calluna vulgaris* 2.2;  
423: *Galium palustre* 3.2, *Mnium pseudopunctatum* +.2, *Carex rostrata* 5.3,  
*Brachythecium rutabulum* 3.2;  
176: *Triglochin palustris* + ;  
161: *Cetraria glauca* +, *Tritomaria quinquentata* 1.2, *Cladonia pocillum* +.2,  
*Dicranum bonjeanii* 2.2, *Rhytidiadelphus loreus* + ;  
183: *Brachythecium rivulare* 2.2;  
177: *Valeriana dioica* 4.2;  
191: *Rhytidiadelphus loreus* 1.1;  
187: *Bryum rubens* +, *Carex caryophyllea* + ;  
181: *Plagiothecium undulatum* +.2, *Valeriana dioica* 4.2, *Primula farinosa* + ;  
185: *Plagiothecium denticulatum* +.2, *Aulacomnium palustre* +.2,  
*Polytrichum formosum* 3.3, *Plagiochila spinulosa* +.2, *Dicranum bonjeanii* 2.3,  
*Atrichum undulatum* 1.2;  
424: *Barbilophozia floerkei* +, *Polytrichum formosum* +.2, *Carex caryophyllea* 2.1,  
*Cochlearia alpina* 3.3, *Viola lutea* 1.1, *Peltigera canina* 2.2;  
469: *Sphagnum plumulosum* 4.3, *Drosera rotundifolia* 3.2, *Campylopus flexuosus* +,  
*Sphagnum subsecundum* var. *auriculatum* 4.3, *Carex rostrata* 4.1;  
182: *Brachythecium rivulare* 3.2, *Atrichum undulatum* + ;  
189: *Atrichum undulatum* 3.3, *Calypogeia trichomanes* 1.2;  
200: *Calypogeia trichomanes* 1.2, *Aulacomnium palustre* 2.2;  
188: *Montia fontana* 2.1, *Veronica serpyllifolia* +, *Stellaria graminea* 1.2,  
*Plagiothecium undulatum* 2.2, *Rumex acetosa* 2.1;  
217: *Mnium hornum* 2.1, *Sphagnum papillosum* 7.4;  
292: *Holcus mollis* 2.2, *Galium palustre* +, *Mnium pseudopunctatum* 3.2,  
*Camptothecium nitens* 8.4, *Triglochin palustris* + ;  
295: *Triglochin palustris* +, *Galium palustre* + ;  
296: *Chara vulgaris* 3.3;  
290: *Juncus acutiflorus* 4.4;  
490: *Juncus acutiflorus* 4.1

\*<sup>#</sup> *Chiloscyphus pallescens* var. *fragilis* (Roth) K. Müll. (Watson 1966).

TABLE XIX

CLASS PARVOCARICETEA :  $\infty$  NODAL GROUPS SUMMARISED

- a) With *Carex dioica* and *Carex lepidocarpa* (Caricion davallianae)  
 b) With *Carex nigra* and *Carex pulicaris* (Caricion curto-nigrae)

Mapping unit No. No. of Aufnahmen	a						b				
	8	9	11	12	13	14	15	16	18	17	5
	27	8	13	9	9	10	19	23	9	6	5

Differential species common to both  $\infty$  Nodal groups

<i>Juncus articulatus</i>	III	III	IV	IV	V	V	IV	IV	II	I	IV
<i>Carex dioica</i>	III	V	IV	V	V	V	V	V	III	I	II

Differential species of  $\infty$  Nodal group with *Carex dioica* and *C. lepidocarpa*

<i>Riccardia pinguis</i>	III	IV	IV	III	V	IV	IV	IV	I	I	
<i>Drepanocladus revolvens</i>	III	IV	IV	III	IV	III	III	III	I	I	III
<i>Carex lepidocarpa</i>	IV	V	III	II	IV	IV	III	I			
<i>Campyllum stellatum</i>	III	IV	IV	IV	IV	II	III	IV	II		
<i>Primula farinosa</i>	IV	II	V	IV	II	III			I		
<i>Pinguicula vulgaris</i>	III	IV	IV	IV	V	IV		I	I		
<i>Plantago maritima</i>	V	III	II	III	III	IV		II	I		

Differential species of  $\beta$  Nodal group with *Kobresia* and *Ctenidium*

<i>Kobresia simpliciuscula</i>	V	V	V	IV	III	I	I	II			
<i>Ctenidium molluscum</i>	V	IV	V	V	II	I	IV	IV	II	I	
<i>Carex pulicaris</i>	V	I	IV	IV	II		IV	V	V	III	I
<i>C. hostiana</i>	IV	III	III	III	II		III	II	II		
<i>Tofieldia pusilla</i>	III	II	V	III		I		I			

Differential species of  $\delta$  Nodal group and Noda with *Equisetum variegatum*

<i>Equisetum variegatum</i>	III	V	I	I	II	II	III		I	
<i>Rhacomitrium lanuginosum</i>	V		II		I	I	I	I		
<i>Thymus drucei</i>	V			II		III	II	I	II	I
<i>Carex capillaris</i>	IV		II	II		III	I			
<i>Sesleria caerulea</i>	IV		II	I			I			
<i>Ditrichum flexicaule</i>	IV	I	II				II			
<i>Scapania aspera</i>	III		III	I	I	I	II	II		I
<i>Galium sternerii</i>	III			II		I	II	I	III	II
<i>Tortella tortuosa</i>	III		I	I			I			
<i>Juncus alpinoarticulatus</i>	I	V	IV	I	I		I			
<i>Triglochin palustris</i>		IV	II		I				I	II
<i>Juncus triglumis</i>	I	IV								

Differential species of  $\delta$  Nodal group and Noda with *Carex nigra* and *Equisetum palustre*

<i>Eleocharis quinqueflora</i>	III	III	III	III	V	I	II	I		I
<i>Molinia caerulea</i>			V	II	I		II	II		I
<i>Succisa pratensis</i>	I		IV	II			I			
<i>Eriophorum latifolium</i>	I		IV						I	
<i>Juncus acutiflorus</i>			IV	II	I					
<i>Parnassia palustris</i>	I		III	II		I	I			

Differential species of Nodum with *Gymnostomum*

<i>Gymnostomum recurvirostrum</i>		I	I	I	I	V	I			
<i>Minuartia verna</i>	I	I				III				
<i>Sagina nodosa</i>				I	II	III	I	I	III	II

Differential species of  $\infty$  Nodal group with *Carex nigra* and *C. pulicaris*

<i>Carex nigra</i>	I		III	IV	III		IV	V	IV	IV	V
<i>Eriophorum angustifolium</i>	I	III	IV	IV	V		IV	V	IV	II	III
<i>Nardus stricta</i>	II		I	IV			III	IV	V	V	I
<i>Carex demissa</i>	I			V	II	I	II	V	IV	III	II
<i>Equisetum palustre</i>			IV	IV	III		IV	IV	IV	II	IV

Differential species of  $\beta$  Nodal group and Noda with *Carex flacca* and bryophytes

<i>Fissidens adianthoides</i>	V		III	III	II		IV	V	II	I	
<i>Carex flacca</i>	V	III	V	IV	IV	I	IV	IV	I		
<i>Cratoneuron filicinum</i>	I	I	III	II	II	I	III	II	II		
<i>Ranunculus flammula</i>			I				II	III	III	II	II
<i>Carex echinata</i>			II	I	I		III	I	III	I	
<i>Juncus kochii</i>			III	III	III		II	IV		II	

Differential species of  $\beta$  Nodal group and Noda with *Juncus effusus* and

	Cerastium holosteoides										
<i>Juncus effusus</i>			I				II	II	IV	V	
<i>Rhynchospora squarrosus</i>	I			I			II	I	V	V	
<i>Cerastium holosteoides</i>	I				I		I	I	IV	III	I
<i>Thuidium tamariscinum</i>	I		I				I	I	IV	IV	
<i>Mnium punctatum</i>			II				I	II	IV	IV	
<i>Luzula campestris</i>	I								IV	IV	
<i>Juncus squarrosus</i>							I	II	IV	III	
<i>Anthoxanthum odoratum</i>	I						I	I	III	IV	
<i>Cirsium palustre</i>	I			I					III	III	
<i>Trifolium repens</i>	I		I	I			I	II	III		
<i>Holcus lanatus</i>									III		
<i>Pseudoscleropodium purum</i>	I	I	I	I			I	I	III	II	
<i>Mnium undulatum</i>									III	II	
<i>Ajuga reptans</i>									III	II	
<i>Viola palustris</i>							I	I		V	I
<i>Acrocladium stramineum</i>										V	
<i>Polytrichum commune</i>										V	
<i>Galium saxatile</i>					I				I	III	
<i>Polygala serpyllifolia</i>	I		I						I	IV	

Differential species of Nodum with *Potamogeton*

<i>Potamogeton polygonifolius</i>									I		IV
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TABLE XXI

SOIL CHARACTERISTICS OF THE NODAL GROUP WITH CAREX NIGRA AND C. PULICARIS

<u>Mapping Unit</u>	<u>Aufn. no.</u>	<u>Soil type</u>	<u>Sample depth</u> (where distinguished)	<u>pH</u>	<u>L.o.I.</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>CaCO<sub>3</sub></u>	<u>Ca</u>	<u>Zn</u>	<u>Pb</u>	<u>N</u>
15	167	Peat		6.5	82.33	7.38	2.50	58.0			2.19
	157	"		5.8	71.21	2.16		61.5			2.82
	142	(Flushed) Peat	0-7.5	6.3	61.51	0.60		49.5			2.03
			7.5-15.0	6.1	54.92	0.24		51.5			1.82
	156	"		5.4	22.25	0.24		57.75			1.26
	132	Peaty gley		5.6	45.98	0.36		49.5			1.53
	179A	"	hummock	6.3	64.52	5.04		42.5			2.42
	180	"		6.8	47.88	1.80	4.59	42.0	13.5	2.2	1.80
16	184	Peaty gley	hummock)	6.0	38.83	1.50		39.0			1.55
			hollow )	5.7	34.85	1.80		35.75			0.05
			12-22	6.2	1.52	5.52		84.7			0.54
			22+	6.3	0.73	25.92		16.7			0.03
	186	"		5.8	31.61	2.10		34.5	16.0	2.4	1.44
	179B	"	hollow	6.0	52.14	2.94		80.0			2.02
	139	(Flushed) Peat	0-7.5	5.7	65.00	1.08		51.5			2.13
			7.5-15	5.6	69.57	0.96		50.5			1.86
146		"	0-7.5	5.3	61.62	0.48		39.0	20.0	2.8	1.80
			7.5-15	5.2	66.72	0.60		37.0	14.0	3.3	1.88
18	181	Peaty gley		5.3	33.8	8.10		28.5			2.00
	183	"		6.1	57.7	3.66		55.0			2.02
	185	"	0-20	5.2	13.3	1.32		16.7	2.1	2.1	0.02
			45+	5.8	2.85	0.60		7.4			1.46
	161	Peat		5.2	49.06	1.44		63.5	45.0	2.4	2.04
17	188	Peaty gley		5.1	60.29	5.64		21.9			2.31
	189	"		5.0	16.81	1.62		16.7			0.66
	217	"		4.5	27.52	1.80		9.2			1.14

NOTES:

Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth - top 15 cm of profile unless otherwise indicated.

L.o.I. - Loss on Ignition: % dry weight.

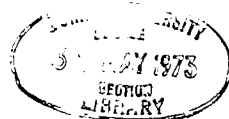
P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid: mg P<sub>2</sub>O<sub>5</sub>/100 g

CaCO<sub>3</sub> - % total weight

Ca - m eq/100 g

Zn )  
Pb ) - p.p.m.

N - total N: % total weight



JUNCUS EFFUSUS AND/OR CAREX ROSTRATA DOMINATED MIRES ON WIDDYBANK FELL

Mapping Unit No.	II		III			
	201	202	203	205	206	204
Aufnahme No.	201	202	203	205	206	204
Species No.	5	12	18	18	17	20
Cover % : total	100	100	100	100	100	100
- Phanerogams	50	60	60	75	80	75
Cryptogams	90	90	90	95	75	75
Size of Aufnahme (sq m)	4	4	4	4	4	4
Average species No.				17		

Differential species group of Mapping Units II and III

Carex rostrata	7.5	7.4	5.2	2.1	2.2
Polytrichum commune	3.2	6.3	7.3	8.4	2.1
Sphagnum recurvum (P†)	9.5	8.4	7.3	5.3	
Eriophorum angustifolium	3.1	3.1	2.1	3.1	
Acrocladium stramineum	2.1	2.1	2.1	3.2	

Differential species group of Mapping Unit III

Carex nigra (P)	3.2	4.2	4.2	(+)	4.2
Galium saxatile (N)	3.2	4.2	3.2	4.2	4.2
Holcus lanatus (M)	1.1	3.1	3.1	3.1	3.2

Agrostis stolonifera	2.2	2.2	+2		
Festuca ovina	2.2	4.3	4.3		
Potentilla erecta				+	1.2

Lophocolea bidentata				2.2	2.2
Festuca rubra (M)				4.3	3.2
Rumex acetosa (M)				3.2	+2
Stellaria graminea				+	4.2

Juncus effusus	6.5	6.5	5.5	6.4	
Agrostis canina	4.3	4.3	5.3	5.3	
Deschampsia caespitosa (M)	2.2	3.2	5.3	4.3	
Carex curta (P)	(+2)	3.1		2.1	
C. echinata (P)		+		+	
Rhynchospora squarrosus			3.3	8.4	9.5
Agrostis tenuis			2.2	2.2	2.2
Cardamine pratensis				+	+2 +2

Juncus squarrosus	2.3				
Eriophorum vaginatum	2.1				
Deschampsia flexuosa		2.2			
Epilobium palustre (P)		+2			
Nardus stricta (N)			+2		
Acrocladium cuspidatum				3.2	
Climacium dendroides				+	
Montia fontana					2.2
Cerastium holosteoides					+
Poa pratensis (M)					3.2
Brachythecium rutabulum					?+

Character species of:

Parvocaricetea and Caricion curto-nigrae	(P)
Molinio-Arrhenatheretea and Molinietales	(M)
Nardetalia and Violion caninae	(N)

† S. recurvum ssp. amblyphyllum Russ. (Westhoff and den Held 1969) - not recognised in the British Isles.

JUNCUS EFFUSUS AND/OR CAREX ROSTRATA DOMINATED MIRES IN THE BRITISH ISLES

	A	B	C	D	E	F
No. of Aufnahmen	1	5	10	20	10	3
<u>Species of constancies III, IV and V</u>						
Polytrichum commune	1	IV	V	V	V	3
Sphagnum recurvum (P <sup>‡</sup> )	1	III	V	V	V	3
Eriophorum angustifolium	1	III	V	IV	III	1
Galium saxatile (N)		V	II	IV	IV	3
Juncus effusus		IV	V	V	V	3
Agrostis canina		IV	V	V	IV	2
Festuca ovina		III	II	V	I	3
Rhytidiadelphus aquarrosus		III		III	IV	3
Carex nigra (P)		V	III	IV	II	
C. rostrata	1	IV	V			1
Holcus lanatus (M)		V	I	II		
Deschampsia caespitosa (M)		IV			I	
Acrocladium stramineum	1	III	II	II		1
Agrostis stolonifera		III			III	
A. tenuis		III		I		
Carex curta (P)		III	I	I		
Cardamine pratensis		III		II		
Nardus stricta (N)		I	III	III	II	
Aulacomnium palustre			III	I	II	2
Anthoxanthum odoratum			II	III	III	2
Festuca rubra (M)		II	II	III		
Rumex acetosa (M)		II	I		III	
Deschampsia flexuosa		I	II	I	IV	2
Pleurozium schreberi			I	II	III	3
Rhytidiadelphus loreus				I	III	2
Sphagnum palustre			I	I	II	3
Hylocomnium splendens				I	I	3
<u>Parvocaricetea and Caricion curto-nigra character species (P)</u>						
Carex echinata		II	I	II	II	
Epilobium palustre		I	I	II		
Viola palustris			I	I	I	2
Riccardia pinguis			I	II		
Potentilla palustris			I			
Ranunculus flammula			I	I		
Hydrocotyle vulgaris						1
<u>Molinio-Arrhenatheretea and Molinietales character species (M)</u>						
Poa pratensis			I			
<u>Nardetalia and Violion caninae character species (N)</u>						
Luzula multiflora			I	II		

‡ S. recurvum ssp. amblyphyllum Russ. (Westhoff and den Held 1969) - not recognised in the British Isles.

Key

A.V. Jones - Widdybank Fell

A Carex rostrata mireB Juncus effusus mire

From Eddy, Welch and Rawes (1969) - Moor House N.N.R., Westmorland

C Sphagneto-Juncetum effusi - Carex rostrata facies

D Sphagneto-Juncetum effusi - typicum

From Edgell (1969) - Cader Idris, N. Wales

E Juncus effusus - Sphagnum recurvum sociation

From Ratcliffe (1959) - Carneddau, Snowdonia, N. Wales

F Juncus effusus bog

TABLE XXIV

SOIL CHARACTERISTICS OF THE CAREX ROSTRATA/JUNCUS EFFUSUS MIRES

<u>Mapping Unit</u>	<u>Afn. No.</u>	<u>pH</u>	<u>L.o.I.</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>Ca</u>	<u>N</u>
II	201a	4.50	88.15	3.60	7.40	1.87
III	203	4.40	11.34	0.30	2.55	2.37
	206	4.60	10.63	1.50	6.38	0.47

Notes:

Sample depth - top 15 cm profile

L.o.I. - Loss on Ignition: % dry weight

P<sub>2</sub>O<sub>5</sub> - "extractable" in acetic acid: mg P<sub>2</sub>O<sub>5</sub>/100 g

Ca - m eq/100 g

N - total N: % total weight



ASSOCIATION VIOLIO-EPILIOBETUM PALUSTRIS Ass. Nov.

No. of Aufnahmen	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
5	E	L M B G A	O U V	P J W X Q
3	12	23 12	8	5 3
19	5	9	8	5 3
5	9	8	10	2
16	6	6	9	4
6	6	6	4	4
6	6	6	12	9
6	6	6	9	11
6	6	6	9	9

Association character species	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Carex echinata (C.n.)	I	3 III III II	IV V 3	IV V 1
Viola palustris (C.n.)	I	2 III I III	III III 1	V V 1
Epilobium palustre (C.n.)	II	2 II I	III I	V V 1
Juncus kochii	II	2 II IV II*	2	V V 1

Differential species of Sub-ass. caricetosum pulicaris	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Carex pulicaris	I	3 V V I	II	II
Equisetum palustre (P)	IV	I IV III	I	I
Carex demissa (Ch.)	II	1 III V II	II	2

Differential species of variants and sub-variants	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Potamogeton polygonifolius	IV	I	I	I
Riocardia pinguis (Ch.)	2	II IV III	II	III
Campylulum stellatum	2	III IV I	III	III
Fissidens adianthoides	III	V I	II	II
Oenidium molluscum	III	IV I	I	I
Carex lepidocarpa	I	I II	II	II
Cratoneuron filicinum	I	III IV	II	II
Juncus effusus	1	II II	II	3 1 1
Rhuidium tamariscinum	1	II I	II	1 1
Trifolium repens	1	II III	I	I
Polygala serpyllifolia	I	III V	II	I

Differential species of Sub-ass. sphagnetosum	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Sphagnum recurvum (C.n.+)	I	I	V 3	III 1
Polytrichum commune	I	I	V 1	III III
Acrocladium stramineum	I	I	III	III 1

Differential species of variants and sub-variants	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Sphagnum palustre	I	I	V 3	III III
Carex rostrata	2	II IV	V 2	V 2
Sphagnum warnstorffianum	1	I	V	V
S. teres	1	I	V	V
Juncus acutiflorus	II	1 II I	I	V 4 4
Sphagnum papillosum (S)	I	III	II	II III
Carex curta (C.n.)	I	III	II	II III
Sphagnum russowii	I	I	I	III V
Carex aquatilis	I	I	I	III V
C. rariflora	I	I	I	III V

Differential species of variants and sub-variants	Sub-ass. caricetosum pulicaris		Sub-ass. sphagnetosum	
	Potamogeton var.	Variant with bryophytes	Sphagnum palustre variant	Sphagnum papillosum variant
Parvocaricetea character species (Ch.)	I	I	I	I
Drepanocladus exannulatus	I	I	I	I
Pedicularis palustris	I	I	I	I
Potentilla palustris	I	I	I	I

Key

A.V. Jones - Widdybank Fell

A Nodal group with *Carex nigra* and *Carex pulicaris*

B Nodum with *Cratoneuron filicinum* and *Nodal* group with *Equisetum variegatum* and *Carex flacca*

C Nodum with *Ranunculus flammula* and *Carex echinata* and bryophytes

D Nodum with *Trifolium repens* } *Nodal* group with *Juncus*

E Nodum with *Viola palustris* } *effusus* & *Cerastium holsteoides*

F Nodum with *Potamogeton polygonifolius*

G From Ratcliffe (1966) - Widdybank Fell

H From Eddy, Welch & Rawes (1969) - Moor House, N.W. Westmorland

I From Welch (1967) - Moor House N.W. Westmorland

J From Eddy, Welch & Rawes (1969) - Moor House, N.W. Westmorland

K From McVean and Ratcliffe (1962) - Scottish Highlands

L Species-rich *Juncetum squarrosum* sub-alpinum

M Hypno-Caricetum alpinum

N Species-rich *Nardetum* sub-alpinum

O Sphagneto-Juncetum *effusum*

P *Carex rostrata* - *Sphagnum warnstorffianum* nodum

Q *Juncus acutiflorus* - *Acrocladium cuspidatum* nodum p.p.

R Sphagneto-Caricetum sub-alpinum

S Sphagneto-Caricetum alpinum

T *Carex aquatilis* - *Rariflora* nodum

U From Birks (1969) - Isle of Skye

V Sphagneto-Juncetum *effusum*

W From Edgeell (1969) - Gader Idriis, N. Wales

X From Ratcliffe (1959) - Carneddau, Snowdonia, N. Wales

Y *Juncus acutiflorus* bog.

TABLE XVIII

α NODAL GROUP WITH CAREX NIGRA AND CAREX PULICARIS

β Nodal group with Juncus effusus and Cerastium holosteoides

Mapping Unit No.	Nodal group with Carex flacca and bryophytes		Nodal group with Carex nigra and Carex pulicaris		Nodal group with Juncus effusus and Cerastium holosteoides												
	Mapping Unit No.	Species No.	Mapping Unit No.	Species No.	Mapping Unit No.	Species No.											
153	82	167	156	361	157	286	356	158	132	169	298	142	148	180	179	152	512
28	23	18	29	30	20	30	26	18	45	35	25	32	36	29	35	37	33
Aspect	SW	WSW	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
Slope °	5	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cover % (total)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Phanerogams	90	100	90	75	50	90	75	50	90	90	90	90	90	90	90	90	80
Cryptogams	75	90	85	75	100	60	95	100	100	30	60	50	100	25	40	100	75
Size of Awn (sq.m)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Average species No.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Differential species group of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group	Differential species groups of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group
Carex nigra (Ch.)	8.5 2.2	3.3 8.4 4.3	9.4 4.3
Eriophorum angustifolium	1.1	3.3 3.3 2.1	4.3 3.4
Carex pulicaris	2.1 8.4 4.2	2.1 4.2 3.2	2.2 5.2
Nardus stricta	2.2 6.4	3.2 3.3	4.3 2.2
Carex demissa (Ch.)	1.2 2.3	2.2 2.2 + 2.2	3.3 3.3
Equisetum palustre	2.1 + 1.1	2.1 2.1 + 3.1	3.1 1.1
Juncus articulatus (Ch.)	2.1 3.1 2.2	3.1 2.1 2.1 3.1	2.2 3.1

Differential species groups of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group	Differential species groups of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group
Ctenidium molluscum	2.2 4.3 4.3	2.2 2.2 4.3 2.2	4.3 3.3
Fissidens adianthoides	1.1	3.3 2.2 2.2 2.2	3.3 3.3 3.3
Carex flacca	2.1 8.4 4.2	2.1 4.2 3.2	2.2 1.1
Campylum stellatum	2.2 6.4	3.2 3.3	4.3 2.2
Riccardia pinguis (Ch.)	1.2 2.3	2.2 2.2 + 2.2	3.3 3.3
Drepanocladus revolvens	10.5 7.4	3.3 5.3 2.2 2.2	2.2 1.2 3.3
Cratoneuron filicinum	3.3 3.3 4.3	1.2 2.3 4.3	4.3 3.3 4.3
Equisetum variegatum	2.1 4.1 3.1 2.1	3.1 2.1	4.1 1.1 3.1
Carex echinata (Ch.)	6.4 2.2 7.3	5.3 4.3 3.3 7.3 3.2	4.2 6.3
Juncus kochii	2.2 2.2	2.2 1.1 + 2.2 1.1 +	3.3 2.2

Differential species groups of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group	Differential species groups of <u>α</u> Nodal group	Differential species groups of <u>β</u> Nodal group
Juncus effusus	1.1	4.2	4.3 4.3 2.2
Rhynchospora squarrosa			
Cerastium holosteoides			
Thuidium tamariscinum			
Mnium punctatum			
Luzula campestris			
Juncus squarrosus			
Anthoxanthum odoratum			
Cirsium palustre			
Trifolium repens			
Holcus lanatus			
Pseudocyperopodium purum			
Mnium undulatum			
Sagina nodosa			
Ajuga reptans			
Viola palustris (Ch.)			
Acrocladium stramineum			
Polytrichum commune			
Galium saxatile			
Polygala serpyllifolia			



ASSOCIATION NARTHECIO-ERICETUM TETRALICIS MOORE (1964) 1968

	A	B	C	D	E
No. of Aufnahmen	42	6	21	14	9
<u>Differential species of Narthecio-Ericetum tetralicis and related associations<sup>++</sup></u>					
<i>Gladonia uncialis</i>	II	IV	II	III	III
<i>Potentilla erecta</i>	IV	II	III	V	V
<i>Carex panicea</i>	IV	II	II	II	I
<i>Polygala serpyllifolia</i>	II	I	II	III	III
<i>Pedicularis sylvatica</i>	I			II	IV
<i>Succisa pratensis</i>	II			II	II
<i>Sphagnum auriculatum</i>	II	I			
<i>Juncus acutiflorus</i>	II				
<i>Gymnocolea inflata</i> (Ch.)	I				
<u>Character species of Narthecio-Ericetum tetralicis</u>					
<i>Carex echinata</i>	III	II	V	II	II
<i>Nardus stricta</i>	II	III	III	I	
<i>Sphagnum palustre</i>	I		III	III	II
<i>Agrostis canina</i>	II	II	III	I	
<i>Viola palustris</i>	I		II		
<i>Luzula multiflora</i>	I		II		
<i>Carex nigra</i>	I			II	
<i>C. rostrata</i>	I			I	
<i>Juncus effusus</i>	I				
<i>Genista anglica</i>	I				
<i>Acrocladium stramineum</i>	I				
<i>Salix repens</i>	I				
<i>Rhacomitrium lanuginosum</i>	II	IV	IV	IV	IV
<u>Character species of Pleurozia purpurea-Erica tetralix Association</u>					
<i>Pinguicula vulgaris</i>	I		II	II	I
<i>Rhytidiadelphus loreus</i>	I		IV	I	I
<i>Pleurozia purpurea</i>	I			II	IV
<i>Campylopus atrovirens</i>				III	III
<i>Schoenus nigricans</i>					II
<i>Plagiothecium undulatum</i>					I
<i>Pinguicula lusitanica</i>					I
<u>Class character species</u>					
<i>Drosera rotundifolia</i>	III		III	II	III
<i>Sphagnum capillaceum</i>	II		III	III	III
<i>S. tenellum</i>	I	V		II	III
<i>Aulacomnium palustre</i>	II		III		
<i>Lepidozia setacea</i>	I	I		I	
<i>Dactylorhiza maculata</i> ssp. <i>ericetorum</i>				I	II
<u>Ericetalia character species (Ch.)</u>					
<i>Trichophorum cespitosum</i> <sup>#</sup>	IV	V	V <sup>+</sup>	V	V
<i>Erica tetralix</i>	V	V	III	V	V
<i>Juncus squarrosus</i>	II	IV	V	IV	III
<i>Sphagnum compactum</i>	I	II		II	III
<u>Sphagnetalia character species</u>					
<i>Eriophorum vaginatum</i>	I		III	IV	II
<i>Sphagnum recurvum</i> <sup>+</sup>	II	I			II
<i>S. rubellum</i>	I			III	
<i>Polytrichum alpestre</i>			II		
<i>Carex pauciflora</i>	I				
<i>Calypogeia sphagnicola</i>	I				
<i>Mylia anomala</i>				I	
<i>Pohlia nutans</i>				I	
<u>Erico-Sphagnion character and differential(≠) species</u>					
<i>Narthecium ossifragum</i>	IV	V	V	III	V
≠ <i>Eriophorum angustifolium</i>	IV	IV	V	IV	I
≠ <i>Molinia caerulea</i>	IV	I	III	III	V
≠ <i>Hypnum cupressiforme</i>	IV	I	V	III	II
<i>Sphagnum papillosum</i>	IV		II	II	II
<i>Odontoschisma sphagni</i>	I	II	II	III	I
≠ <i>Gladonia impea</i>	II	I		I	II
<i>Sphagnum plumulosum</i>	II		II	I	II
≠ <i>Campylopus flexuosus</i>	I	I		III	I
<i>Myrica gale</i>	I				II
≠ <i>Leucobryum glaucum</i>	I				I
<i>Sphagnum imbricatum</i>				I	II
≠ <i>Rhynchospora alba</i>	I				
<u>Companion species</u>					
<i>Calluna vulgaris</i>	V	IV	III	V	V
<i>Diplophyllum albicans</i>	I	II	IV	II	
<i>Pleurozium schreberi</i>	IV			III	I
<i>Dicranum scoparium</i>	I		III	II	I
<i>Deschampsia flexuosa</i>	I		II	I	II
<i>Polytrichum commune</i>	I		III	I	
<i>Cephalozia bicuspidata</i>	I		II	I	
<i>Sphagnum cuspidatum</i>	II	I			
<i>Vaccinium myrtillus</i>	I			II	
<i>Pinus sylvestris</i>	I				
<i>Dicranum bonjeanii</i>	I				

++ see text

# ssp. *germanicum*

+ identity of sub-species not given in original table

/ ssp. *revurvum* var. *parvulum* Warnst. (Westhoff and den Held 1969) not recognised in the British IslesKey

From Moore (1964) 1968 - Scottish Highlands, Normandy and Ireland

A Narthecio-Ericetum tetralicis

A.V. Jones - Widdybank Fell

B Nodum with *Erica* and *Trichophorum* (m.u. 23)

From Edgell (1969) - Cader Idris, North Wales

C *Trichophorum cespitosum* nodum

From Birks (1969) - Isle of Skye

D Trichophoreto-Callunetum McV. &amp; R. 1962

E Molinieto-Callunetum McV. &amp; R. 1962



TABLE XXVIII

NODUM WITH ERICA AND TRICHOPHORUM.

Mapping Unit No.	23					
Aufnahme No.	260	378	396	377	379	229
Species No.	6	14	12	17	19	20
Aspect						WNW
Slope <sup>o</sup>						8
Cover % : total	90	95	100	90	80	100
Phanerogams		50	60	60	75	75
Cryptogams		75	90	60	30	80
Size of Aufnahme (sq m)	1	1	2	2	2	4
Average species No.						15

Differential species group of Nodum

<i>Erica tetralix</i> (Ch.) <sup>#</sup>	5.1	4.3	6.3	4.3	4.3	5.3
<i>Trichophorum cespitosum</i> (Ch.)	6.1	3.3	4.3	6.5	4.4	5.4
<i>Narthecium ossifragum</i>		5.2	4.1	3.2	4.2	4.2
<i>Sphagnum tenellum</i> (Ch.)		+2	6.4	3.3	2.2	5.3
<i>Calluna vulgaris</i>		4.3		6.3	6.4	5.3
<i>Eriophorum angustifolium</i>	5.1		4.1	3.1		(1.1)
<i>Cladonia uncialis</i>	4.2	2.3		2.2		2.2
<i>Juncus squarrosus</i> (Ch.)		5.3	2.2		+2	3.3
<i>Nardus stricta</i>					+2	6.2 3.3
<i>Cladonia furcata</i>					2.2	2.2 +
<i>C. arbuscula</i>		+3		8.5		3.3

Character species of Class, Order and Alliance (Ch.)

<i>Sphagnum compactum</i>	8.4				5.4
<i>Lepidozia setacea</i>					1.2

Companion Species

<i>Rhacomitrium lanuginosum</i>	4.2			2.3	2.2	3.2
<i>Splachnum ovatum</i>		+3		+3		2.2
<i>Cladonia squamosa</i>				2.3	+2	
<i>Cornicularia aculeata</i>		+2		3.3		
<i>Potentilla erecta</i>					3.2	3.1
<i>Carex panicea</i>					3.1	
<i>C. echinata</i>				6.3		4.3
<i>Agrostis canina</i>				+2		2.2
<i>Odontoschisma sphagni</i>		3.3		3.3		
<i>Diplophyllum albicans</i>				+2	3.3	
<i>Cephaloziella hampeana</i>				2.2	2.2	
<i>Cladonia impexa</i>	4.2					
<i>Juncus kochii</i>						+
<i>J. bulbosus</i>				3.1		
<i>Splachnum campullacuum</i>				+2		
<i>Sphagnum cuspidatum</i>				8.4		
<i>S. subsecundum</i> var. <i>auriculatum</i>				+2		
<i>Polygala serpyllifolia</i>					2.2	
<i>Campylopus flexuosus</i>					2.2	
<i>Cladonia chlorophaea</i>					+2	
<i>Molinia caerulea</i>						4.2
<i>Hypnum ericetorum</i>						4.3
<i>Sphagnum recurvum</i>						5.3
<i>S. subsecundum</i> var. <i>innundatum</i>						6.4

<sup>#</sup> ssp. *germanicum*

TABLE XXIX

CLASS OXYCOCCO-SPHAGNETEA : NODUM AND NODAL GROUP SUMMARISED

- a = NODUM WITH ERICA AND TRICHOPHORUM (ERICION TETRALICIS)  
 b =  $\infty$  NODAL GROUP WITH CALLUNA AND ERIOPHORUM VAGINATUM  
 (ERICO-SPHAGNION)

	a	b	
Mapping unit No.	23	24	28
No. of Aufnahmen	6	24	27

Differential species common to all Noda

Calluna vulgaris	IV	V	V
Eriophorum angustifolium	IV	V	V
Erica tetralix	V	V	III

Differential species of Nodum with Erica and Trichophorum

Trichophorum cespitosum <sup>*</sup>	V	V	I
Narthecium ossifragum	V	V	II
Sphagnum tenellum	V	IV	
Cladonia uncialis	IV	II	
Juncus squarrosus	IV		I
Cladonia arbuscula	III	II	II
Nardus stricta	III	I	I
Cladonia furcata	III	I	

Differential species of  $\infty$  Nodal group with Calluna and Eriophorum vaginatum

Eriophorum vaginatum	V	V
Sphagnum papillosum	V	III
S. capillaceum/rubellum	III	V
Mylia anomala	III	III

Differential species of Nodum with Narthecium and Trichophorum

Sphagnum cuspidatum	I	IV	I
Cladonia impexa	I	III	I
Carex rostrata		III	

Differential species of Nodum with Empetrum and Sphagnum recurvum

Calypogeia trichomanes		II	V
Empetrum nigrum		I	V
Sphagnum recurvum	I	I	IV
Lophozia ventricosa		I	IV
Plagiothecium undulatum			IV
Aulacomnium palustre			IV
Hypnum ericetorum	I	I	III
Ptilidium ciliare		I	III
Polytrichum commune			III
Rhytidiadelphus loreus			III
Pleurozium schreberi			III
Pohlia nutans			III
Carex nigra			III
Campylopus flexuosus	I		III

<sup>\*</sup> ssp. germanicum

TABLE XXXIII

SOIL CHARACTERISTICS OF THE NODUM WITH ERICA AND TRICHOPHORUM  
AND THE  $\mathcal{L}$  NODAL GROUP WITH CALLUNA AND ERIOPHORUM VAGINATUM

<u>Mapping</u> Unit	<u>Profile</u> No.	<u>Aufn.</u> No.	Soil type	pH.	L.O.I.	Ca	Zn	Pb	N
23	1		(Humic) Ground- water gley	4.4	26.88	6.5			0.74
	2		Blanket peat	4.0	85.71	4.5			1.77
24	1		Blanket (Sphagnum)peat	3.6	94.53	6.5	5.8	1.2	0.90
	2		" "	3.4	94.29	7.8	4.0	1.4	1.14
28		192	Blanket (Sphagnum)peat	3.9	85.57	11.9			2.05
		215	" "	3.7	95.97	11.5			1.56
		196	Blanket (amorphous) peat	3.6	93.17	4.48			0.64
		235	" "	3.7	93.68	1.30	1.0	1.4	2.06

Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.

Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth- top 15 cm of profile.

L.o.I. - Loss on Ignition: % dry weight.

CaCO<sub>3</sub> - % total weight

Ca - m eq/100 g

Zn )  
Pb ) p.p.m.

N total N; % total weight

TABLE XXXI (continued)

Additional species:

- 44 : Carex panicea 3, Molinia caerulea 3, Juncus kochii 3;  
47 : Gymnocolea inflata 4, Juncus kochii 3, Triglochin palustris 1,  
Molinia caerulea 3;  
36 : Cephalozia media 1;  
383 : Rhacomitrium lanuginosum 2.1;  
395 : Juncus kochii 3.1, Sphagnum subsecundum var. auriculatum 2.2;  
240 : Tetraplodon mnioides +, Diplophyllum albicans 4.2;  
256 : Tetraplodon mnioides +;  
33 : Cladonia crispata var. cetrariaeformis 2;  
41 : Cephalozia media 1, Riccardia pinguis 1;  
224 : Gymnocolea inflata 3.2;  
390 : Cephaloziella hampeana 3.3;  
386 : Rhacomitrium lanuginosum 3.3, Splachnum ovatum +.2, Cladonia furcata 2.1;  
246 : Lepidozia reptans +;  
429 : Calypogeia fissa 3.3, Campylopus fragilis 2.2, Diplophyllum albicans 2.3;  
454 : Drepanocladus exannulatus 1.2;  
451 : Ceratodon purpureus 2.2, Acrocladium stramineum +;  
376 : Vaccinium vitis-idaea 2.2;  
235 : Cladonia bellidiflora 2.2;  
220 : Bryum sp. +, Acrocladium stramineum 2.2;  
228 : Acrocladium stramineum 2.2;  
463 : Barbilophozia floerkei 2.2;  
234 : Cladonia ochrochlora +.2;  
215 : Plagiothecium denticulatum +;  
196 : Usnea subfloridana +.2;  
194 : Barbilophozia floerkei 3.2, Carex flacca 2.2, Agrostis stolonifera 3.3;  
192 : Campylopus fragilis 1.3, Polygala serpyllifolia 2.2, Galium saxatile 4.2,  
Agrostis tenuis 1.2





No. of Aufnahmen	A	B	G	H	I	N	P	Q	T	J	C	D	E	U	W	Y	X	Z	R	S	O	K	V	L	M	F
	90	80	50	10	10	10	24	80	12	23	13	106.138	213	6	6	3	7	5	22	24	27	12	9	27	19	36

## Sphagnion fusci character (F.) and differential (E.) species

<i>Empetrum nigrum</i> (#)	I	I	I	II	II	V	II	V	II	V	I	I	III	I	3	III	V	V	V	V	V	V	V	V	II	II
<i>Cladonia arbuscula</i> (#)				I	III	II	III						I	II	III	II	III	II	III	II	III	II	III	II	IV	IV
<i>Sphagnum fuscum</i>	II			I									I											I	II	II
<i>Cetraria islandica</i>																								II	I	I
<i>Cladonia squamosa</i>																								II	I	I
<i>Empetrum hermaphroditum</i> (#)																										V
<i>Cladonia rangiferina</i>																										II
<i>Betula nana</i>																										II
<i>Vaccinium uliginosum</i> (#)																										II
<i>Cephalozia media</i>																										II
<i>Calypogeia neesiana</i>																										II
<i>Vaccinium microcarpum</i>																										I

## Companion species

<i>Calluna vulgaris</i>	V	V	I	I	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<i>Pleurozium schreberi</i>	I	II	I	IV	II	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	V
<i>Dicranum scoparium</i>	I	I	II	II	II	V	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	V
<i>Polytrichum commune</i>	I	I	I	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	III
<i>Cladonia uncialis</i>	III	I	II	II	V	II	II	I	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III
<i>Cephalozia bicuspidata</i>	I			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	III
<i>Sphagnum cuspidatum</i>	III	I	II	II	IV	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	III
<i>Rhacomitrium lanuginosum</i>	I	I	I	II	I	III	I	II	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	III
<i>Diplophyllum albicans</i>	I	I	II	II	II	II	II	II	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III
<i>Deschampsia flexuosa</i>	I			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	III
<i>Potentilla erecta</i>																										III
<i>Sphagnum palustre</i>																										I
<i>Nardus stricta</i>																										I
<i>Agrostis canina</i>																										I

## Key

- From Moore (1968)  
 Erico - Sphagnetum magellanici Moore (1964) 1968  
 A Extreme atlantic race (col. 10) - Irish central lowlands  
 B Sub-atlantic race (col. 11) - west Wales, coastal areas of Holland and North Germany  
 C) Sub-continental race ((col. 12) - north Germany  
 D) ((col. 13) - north-west Germany, Belgium  
 E Vaccinio - Ericetum tetralicis Moore 1962 (col. 14) - south Ireland, north England  
 F) Calluneto - Eriophoretum McV. & R. 1962) (col. 21) - Scottish Highlands  
 G) Empetreto - Eriophoretum McV. & R. 1962) (col. 21) - Scottish Highlands  
 From Chapman (1964) - Northumberland  
 G Type 1 bog and type 2 bog  
 From Ratcliffe (1964) - south and extreme east-central Scotland  
 H Lowland Calluna - Eriophorum bog  
 From Eddy, Welch & Raves (1969) - Moor House, N.N.R., Westmorland  
 I *Erica facies*  
 J *typicum* } Trichophoro - Eriophoretum McV. & R. 1962 emend.  
 K *Calluna facies* }  
 L Calluneto - Eriophoretum McV. & R. 1962 emend. - typical, Sphagnetum recurvum and Empetrum facies  
 M Eriophoretum - high-level and grazed facies  
 From Ratcliffe (1959) - Carneddau, north Wales  
 Y Calluna - Eriophorum vaginatum bog  
 From Birks (1969) - Isle of Skye  
 Z Calluneto - Eriophoretum McV. & R. 1962 emend.  
 A.V. Jones - Widdybank Fell  
 N Nodum with *Marthecium* and *Trichophorum* (m.u. 24) ) Nodal group with *Calluna*  
 O Nodum with *Empetrum* and *Sphagnetum recurvum* (m.u. 28) ) and *Eriophorum vaginatum*  
 From Pearsall (1941) - Stainmore, northern Pennines  
 P Type A moss and type B moss  
 From Tallis (1969) - Berwyn mountains, north Wales  
 Q *Rhacomitrium* - *Cladonia* and *Drosera* - *Marthecium* (noda) *Erica tetralix* - *Vaccinium*  
 R *Plegiothecium undulatum* - *Hylacomium splendens* (nodum) *Oxyccoccus* series  
 S *Campylopus* - *Diplophyllum* and *Juncus squarrosus* - *Vaccinium vitis-idaea* noda - *Juncus squarrosus* - *Deschampsia flexuosa* series.  
 From Birse and Robertson (1967) - south Scotland  
 T Calluna - Eriophorum vaginatum - Trichophorum bog s.l.  
 U Calluna - Eriophorum vaginatum - Trichophorum bog Calluna facies  
 V Upland Calluna - Eriophorum vaginatum moor  
 From Edgell (1969) - Cader Idris, north Wales  
 W Eriophorum vaginatum bog - low-level facies  
 X Eriophorum vaginatum bog - high-level facies  
 From Ratcliffe (1959) - Carneddau, north Wales  
 Y Calluna - Eriophorum vaginatum bog  
 From Birks (1969) - Isle of Skye  
 Z Calluneto - Eriophoretum McV. & R. 1962 emend.

CLASS NARDO-CALLUNETEA :  $\infty$  NODAL GROUPS SUMMARISEDa)  $\infty$  NODAL GROUP WITH NARDUS STRICTA AND JUNCUS SQUARROSUSb)  $\infty$  NODAL GROUP WITH CALLUNA AND CLADONIA ARBUSCULA

Mapping unit No. No. of Aufnahmen	a			b			
	25	27	29	26	31	32	33
	17	8	19	9	13	8	7

Differential species common to both  $\infty$  Nodal groups

Calluna vulgaris	V	IV	II	V	V	V	II
Nardus stricta	V	IV	V	IV	III		III
Hypnum ericetorum	V	I	IV	V	IV	V	V
Pleurozium schreberi	III	I	III	V	I	V	V

Differential species of  $\infty$  Nodal group with Nardus stricta and Juncus squarrosus

Molinia caerulea	III	IV	III	III			
Juncus squarrosus	III	V	V	I			
Eriophorum angustifolium	III	V	III	I			
Carex echinata	III	IV	III	I			
Juncus effusus	II	II	III				
Agrostis canina	III	IV	IV	IV	II		II

## Differential species of Nodum with Erica tetralix and Carex dioica

Erica tetralix	V			IV			
Polygala serpyllifolia	V		II		III	IV	I
Carex dioica	V						
Hylocomium splendens #	IV		II			III	I
Trichophorum cespitosum #	III	II	II	III			
Rhacomitrium lanuginosum	III				I	III	I
Narthecium ossifragum	IV	III	I	I			
Diplophyllum albicans	III		I	I	II		
Cladonia furcata	III			I	II		
Carex hostiana	III					II	I
C. pulicaris	III	I				II	
C. demissa	III		I				
Selaginella selaginoides	III						
Thuidium tamariscinum	III		I			I	
Juncus bulbosus /	III						
Succisa pratensis	III					I	I
Thalictrum alpinum	II					I	

Differential species of  $\infty$  Nodal group with Carex nigra and Polytrichum commune

Carex nigra	II	IV	V				
Polytrichum commune		V	V				I
Aulacomnium palustre	I	V	IV				
Sphagnum recurvum	I	III	IV				
Calyptogeia trichomanes	I	IV	III	II			
Lophocolea bidentata	I	III	III	II		III	I
Acrocladium stramineum		III	III				

## Differential species of Noda

XXXX CONT	Eriophorum vaginatum	I	IV	I			
	Deschampsia flexuosa	I	IV	I	I	IV	II
	Rhytidiadelphus squarrosus	I		V		II	IV
	Sphagnum papillosum	I	II	IV			
	Plagiothecium undulatum	I	I	IV			
	Anthoxanthum odoratum	I		III			
	Luzula campestris x			III		I	III

Differential species of  $\infty$  Nodal group with Calluna and Cladonia arbuscula

Cladonia arbuscula	III			IV	I	IV	IV
Galium saxatile			V	III	IV	V	V
Dicranum scoparium	I	I	I	IV	III	III	V
Vaccinium myrtillus		I	I	III	IV	II	III

## Differential species of Nodum with Empetrum and Erica

Empetrum nigrum	I	III		IV	I	III	
Campylopus flexuosus				III			
Carex binervis				III	I		I

Differential species of  $\infty$  Nodal group with Carex pilulifera

Carex pilulifera					IV	III	IV
Polytrichum formosum					II	III	IV

## Differential species of Nodum with Pteridium aquilinum and Deschampsia flexuosa

Pteridium aquilinum					IV		
Parmelia physodes				I	IV	I	
Pohlia nutans	I	I	I		III		I
Blechnum spicant					II		

Differential species of  $\infty$  Nodal group with Campanula rotundifolia

Agrostis stolonifera	III	II				V	III
Campanula rotundifolia						V	III
Briza media	I					IV	IV
Cladonia subrangiformis						IV	IV
Ptilidium ciliare	II	III	III	I	II	III	III

## Differential species of Noda

Viola riviniana	I				II	II	V
Anthoxanthum odoratum					II	II	IV
Cetraria islandica							III
Thymus drucei							III
Koeleria cristata							III
Viola lutea							III
Dicranum bonjeanii							III
Sieglingia decumbens					II		V
Carex caryophyllea						II	III

# ssp. germanicum

/ including Juncus kochii

x Luzula ? multiflora

TABLE XXXVII

## SOIL CHARACTERISTICS OF A NODAL GROUP WITH NARDUS STRICTA AND JUNCUS SCARROSUS

<u>Mapping Unit</u>	<u>Profile No.</u>	<u>Aufn. No.</u>	<u>Soil type</u>	<u>pH</u>	<u>L.o.I.</u>	<u>Ca</u>	<u>Zn</u>	<u>Pb</u>	<u>N</u>
25	1		Peaty gley	6.0	56.61	59.3			2.7
	2		(Humic) Groundwater gley	5.3	24.20	27.8	3.9	2.3	1.02
	3		Peaty gley	5.1	30.17	24.3	3.2	1.5	1.08
27	1		(Flushed) Peat	3.1	89.36	4.3	3.5	4.3	0.63
	2		(Humic) Groundwater gley	3.4	19.08	3.0			0.78
29		193	(Humic) Groundwater gley	4.1	20.87	2.55			0.52
		207	Peaty gley	3.9	64.98	2.30			0.94
		222	"	4.0	83.56	1.95	1.2	2.1	2.22
		213	(Blanket) Peat	3.9	53.32	4.38			1.80

Notes:

- Profile No. distinguishes those not made at a specific Aufnahme location.  
Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales  
Sample depth - from top 15 cm profile  
L.o.I. - Loss on Ignition: % dry weight  
Ca - m eq/100 g  
Zn )  
Pb ) - p.p.m.  
N - total N: % total weight







TABLE XLI

SOIL CHARACTERISTICS OF  $\infty$  NODAL GROUP WITH CALLUNA AND CLADONIA ARBUSCULA

<u>Mapping Unit</u>	<u>Profile No.</u>	<u>Aufn. No.</u>	<u>Soil type</u>	<u>pH</u>	<u>L.o.I.</u>	<u>Ca</u>	<u>Zn</u>	<u>Pb</u>	<u>N</u>
26	1		Peaty gley	3.1	88.10	5.0	3.3	1.2	1.71
	2		Peat	3.4	49.13	21.8	9.5	1.8	1.53
31	1		Acid Brown earth	3.8	14.18	1.0	1.1	3.7	0.39
	2		Gley	3.1	15.42	1.4	1.5	4.3	0.60
32	1		(Humic)Groundwater gley	3.6	15.67	2.3	5.1	9.6	0.66
		114	Acid Brown earth	5.3	15.08	51.5	17.0	32.0	0.62
33	1		Acid Brown earth	3.7	17.65	1.1	1.9	9.1	0.57

Notes:

Profile No. distinguishes those not made at a specific Aufnahme location.  
Soil types follow the terminology of the current publications of the Soil Surveys of England and Wales.

Sample depth - from top 15 cm profile

L.o.I. - Loss on Ignition: % dry weight

Ca = m.eq/100 g.

Zn }  
Pb } - p.p.m.

N - total N: % total weight

TABLE XXXIX

## VACCINIUM MYRTILLUS HEATH - CALLUNA VULGARIS COMPLEX Bridgewater 1970 p.p.

## CALLUNA VULGARIS COMMUNITY Bridgewater 1970

Variant:	typical	Festuca ovina		Erica tetralix	Pohlia nutans	Luzula multiflora				
Sub-variant:	typical	Anthoxanthum odoratum		Leucobryum glaucum	Pteridium aquilinum					
		A	C	B						
No. of Aufnahmen	11	4	8	1	7	6	3	2	1	2
<u>Differential species of community and complex</u>										
Calluna vulgaris	V	4	V	1	II	V	3	2		2
Deschampsia flexuosa	IV	1	II		I	II	3	1		2
Hypnum ericetorum	V	4	V	1	V	V	1	2		1
Nardus stricta	II	1			III	II	1			
Rhytidiadelphus squarrosus	I	1	IV		III	II				
Parmelia physodes	III	1	I			II	1			1
Dicranum scoparium	III	4	III		V	III	1			
Pleurozium schreberi	II	4	V	1	V	V	2	2		
Galium saxatile	II	4	V	1	V		2			
Agrostis tenuis	II	3	V	1	V	IV	2	1		1
Plagiothecium undulatum	I			1		III	1	2		1
Sieglingia decumbens		2			V	I				
Lophocolea bidentata	II	2	III		I	I				
Potentilla erecta	I	4	V	1	V	III	2			

Differential species of variants and sub-variants

Empetrum nigrum	I	2	III							
Barbilophozia floerkei	I	3	I		II					
Ptilidium ciliare		4	III	1	III	I				
Hylocomium splendens		3	III	1	I	I				
Cladonia arbuscula		4	IV	1	IV	I				
Festuca ovina	I	4	V	1	V		1			
Campanula rotundifolia		3	V	1	III					
Rhytidiadelphus loreus	I	3	II	1						
Cetraria islandica		2	III		II					
Polygala vulgaris		2								
Thymus drucei		2	III							
Carex capillaris		3	II							
Erica tetralix						V				
Carex binervis						II				
Juncus articulatus			I			II				
Pohlia nutans	I				I	I	3			
Luzula multiflora	I							22		.2
Festuca rubra	I				I			2		
Leucobryum glaucum	I					II		2		
Anthoxanthum odoratum					IV		1	2		
Pteridium aquilinum	I					I				2
Campylopus flexuosus	I						1			2
Betula spp. (seedlings)										2

Companion species (constancy V and IV)

Cladonia subrangiformis			V		IV					
Agrostis stolonifera	I		V		III		1			
Carex pilulifera	I		IV	1	IV		1			
Briza media			IV		IV					
Polytrichum formosum			III	1	IV					
Luzula campestris			III		IV					
Viola riviniana		1	V	1	I					
Polygala serpyllifolia			IV	1	I					

Key

A.V. Jones - Widdybank Fell

A Nodum with Viola riviniana (m.u. 32) ) ♂ Nodal group with Galium saxatile and Luzula campestris  
 B Nodum with Sieglingia decumbens (m.u. 33) )

⊗ Nodal group with Calluna and Cladonia arbuscula p.p.

From Ratcliffe (1966) - Widdybank Fell

C Festuceto - Callunetum p.p.

From Bridgewater (1970) - North-west Yorkshire, Durham, Northumberland, Westmorland  
 Table III.2.a. Calluna vulgaris community :

Nomenclature and details of all vegetation units except  
 cols. A and B (Anthoxanthum odoratum sub-var.)

TABLE XL

## VACCINIUM MYRTILLUS HEATH - DESCHAMPSIA FLEXUOSA COMPLEX Bridgewater 1970 p.p.

## EMPETRUM NIGRUM COMMUNITY Bridgewater 1970

Variant	Rhytidiadelphus		Juniperus	Erica	Gymnocolea	Juncus			
	typical	loreus	communis	cinerea	inflata	squarrosus			
Sub-variant	typical	Erica tetralix	Carex pilulifera	Sieglingia decumbens	Pohlia nutans				
		A	B						
	6	2	IX	13	4	3	5	2	2
<u>Differential species of complex</u>									
Vaccinium myrtillus	V	2	III	IV	4	2	IV	2	2
Calluna vulgaris	V	2	V	V	3	3	V	2	2
Deschampsia flexuosa	V	1	I	IV	4	3	IV		1
Hypnum ericetorum	V	2	V	IV	4	3	III	2	
Nardus stricta	III	2	IV	III	1	1	IV	2	1
Parmelia physodes	III	1	I	IV			I	1	1
Dicranum scoparium	V	1	IV	III	3	1	II		1
Pleurozium schreberi	IV	2	V	I	4	1	I	1	
Potentilla erecta	I		IV	II	1				
<u>Differential species of community</u>									
Empetrum nigrum	V	2	IV	I	4	2	V	2	2
<u>Differential species of variants and sub-variants</u>									
Rhytidiadelphus loreus	II	2	II						
Ptilidium ciliare		2	I	I					
Cladonia arbuscula		2	IV	I	1			1	
Festuca ovina	I	2	III	V				1	1
Galium saxatile		2	III	IV	2	3			
Erica tetralix	I		IV						
Carex binervis			III	I					
Molinia caerulea			III						
Trichophorum cespitosum			III						
Carex pilulifera				IV		1	II		
Juniperus communis				I	4				
Pteridium aquilinum				IV	3		2		
Erica cinerea				II		2	V		
Sieglingia decumbens	I	1		I		3	I		
Polytrichum juniperinum						3	I		
Pohlia nutans	I			III		1	V		
Cladonia coccifera	I			II	1		III		1
C. floerkeana							II		1
Juncus squarrosus			I		1		III	1	2
Agrostis tenuis	I	1		V			IV		
Gymnocolea inflata								2	
Cladonia uncialis			II	I				2	1
C. pyxidata	I							2	
Cladonia chlorophaea			III	IV					2
<u>Companion species (constancy IV)</u>									
Agrostis canina			IV	II					

# ssp. germanicum

/ var. pleurota

Key

A.V. Jones - Widdybank Fell

A Nodum with Empetrum and Erica (m.u. 26)B Nodum with Pteridium and Deschampsia flexuosa (m.u. 31)) Calluna and Cladonia arbuscula p.p.

From Bridgewater (1970) - North Yorkshire moors and Durham to Cumberland

Table III.3.b. Empetrum nigrum community :Nomenclature and details of all vegetation units except Erica tetralix and Carex pilulifera sub-vars.

Aufnahme No. 227 551 552 553 554 555 394 226 437 401 415 417 400 416 398 399 418 414 402 411 413 412 455 456 459 131 123 79 90 114 129 130 358 357 360 494 438

## Class, Order and Alliance character species (Ch.)

Companion species	227	551	552	553	554	555	394	226	437	401	415	417	400	416	398	399	418	414	402	411	413	412	455	456	459	131	123	79	90	114	129	130	358	357	360	494													
<i>Festuca ovina</i>	3.3	+	+	+	+	+	+	2.2	3.3	6.4	6.3	6.3	3.3	3.3	3.3	3.3	4.3	5.3	6.4	4.3	6.4	7.3	5.3	7.3	5.3	7.3	6.4	6.3	8.5	6.3	6.3	8.5	6.3	8.5	6.3	8.5	5.3	5.3											
<i>Potentilla erecta</i>	+	+	+	+	+	+	+	1.1 (+.2)	3.3	+2	3.2	3.3	3.3	3.3	3.3	4.2	4.2	4.2	4.2	4.2	4.2	2.1	3.1	4.2	3.1	2.1	4.4	5.2	5.4	4.1	4.1	3.2	4.2	4.1	3.2	4.2	4.2	4.2											
<i>Agrostis tenuis</i>								6.3	3.2	5.3	6.3	4.2	3.2	3.2	3.2	2.2	2.2	4.2	4.2	4.2	4.2	1.1	2.2	4.3	2.2	1.1	2.2	4.1	2.2	2.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2									
<i>Cladonia chlorophaea</i>	2.1						3.3	3.3	2.2	5.4	4.3	2.2	4.3	2.2	2.2	2.2	2.2	3.3	3.3	3.3	3.3	3.3	3.3	2.3	3.3	2.3	2.2	4.1	2.2	2.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2									
<i>Rhytidadelphus squarrosus</i>								1.1	3.3																																								
<i>Agrostis canina</i>	3.2	+	+	+	+	+	3.3	2.2	3.3	5.4	4.3	2.2	3.3	3.3	3.3	4.2	4.2	4.3	4.3	4.3	4.3	2.2	2.2	4.3	2.2	2.2	4.3	3.2	3.2	1.2	1.2	1.2	1.1	1.1	2.2	2.2	2.2	2.2	2.2	2.2									
<i>Barbillophozia floerkei</i>								3.1	+																																								
<i>Cornicularia aculeata</i>								2.3	+																																								
<i>Cladonia uncialis</i>	4.1						+	2.2	+																																								
<i>Carex panicea</i>								3.1	3.3																																								
<i>Lophocolea bidentata</i>								2.3	2.3																																								
<i>Cladonia squamosa</i>								2.2	2.2																																								
<i>C. furcata</i>								2.2	2.2																																								
<i>Rhytidadelphus loreus</i>								1.1	3.3																																								
<i>Diplophyllum albicans</i>								2.2	3.3																																								
<i>Splachnum ovatum</i>								2.2	3.3																																								
<i>Campylopus fragilis</i>								2.2	3.3																																								
<i>Polytrichum piliferum</i>								2.2	3.3																																								
<i>Cladonia coccifera</i> var. <i>pleurota</i>								2.2	3.3																																								
<i>Vaccinium vitis-idaea</i>								1.2	3.3																																								
<i>Sorbus aucuparis</i>								2.2	3.3																																								
<i>Andraea rupestris</i>								2.2	3.3																																								
<i>Sphagnum rubellum</i>								2.2	3.3																																								
<i>Cladonia coniocerea</i>								2.2	3.3																																								
<i>C. macilenta</i>								(+.2)	3.3																																								
<i>C. floerkeana</i>								3.3	2.2																																								
<i>Dicranella heteromalla</i>								2.2	2.2																																								
<i>Erica cinerea</i>								2.2	2.2																																								
<i>Carex hostiana</i>								2.2	2.2																																								
<i>Trifolium repens</i>								2.2	2.2																																								

## Additional species

- 227 : *Carex echinata* 3.2, *Baeomyces rufus* 2.2;  
 251 : *Polytrichum commune* + ;  
 394 : *Odontoschisma sphagni* 3.3, *Calyptogeia trichomanes* 2.2, *Sphagnum capillaceum* +.3 ;  
 226 : *Marthecium ossifragum* 2.2, *Carex echinata* 4.3, *Lophozia ventricosa* 1.2,  
*Juncus squarrosus* +.2, *Calyptogeia trichomanes* 1.1 ;  
 437 : *Eriophorum angustifolium* 2.1, *Cephalozia hampeana* 3.2 ;  
 401 : *Cirsium palustre* +, *Veronica serpyllifolia* +, *V. chamaedrys* 3.1 ;  
 400 : *Digitalis purpurea* + ;  
 416 : *Dryopteris filix-mas* +.2, *Cryptogramma crista* +.2 ;  
 398 : *Cephalozia hampeana* 2.3, *Scapania compacta* +, *Rhacomitrium heterostichum* 2.3,  
*Cladonia cervicornis* 2.2, *Lichen* sp. A +.2 ;  
 399 : *Dryopteris filix-mas* +.2, *Holcus mollis* +.2, *Solidago virgaurea* +, *Mnium hornum* 2.2,  
*Lophozia ventricosa* 3.3, *Lichen* sp. A +.2 ;  
 418 : *Luzula pilosa* 2.2 ;  
 414 : *Cladonia bellidiflora* 2.2, *C. impea* 2.2, *Parmelia tubulosa* 2.2 ;  
 402 : *Betula pubescens* +, *Cephalozia bicuspidata* + ;  
 411 : *Hieracium pilosella* 3.1, *Teucrium scorodonia* 4.3, *Juniperus communis* 5.1,  
*Hypnum cupressiforme* var. *filiforme* 4.3 (on *Juniperus*), *Hypericum pulchrum* 1.2,  
*Crataegus monogyna* +, *Barbillophozia barbata* 2.2, *Rhacomitrium canescens* 3.3 ;  
 413 : *Teucrium scorodonia* 4.4, *Juniperus communis* +, *Festuca vivipara* 3.2,  
*Lonicera periclymenum* 3.2, *Rhacomitrium heterostichum* 3.3, *Trichostomum tenuirostre* +.3.

## Additional species (continued)

- 412 : *Ceratodon purpureus* +.2, *Leptodontium flexifolium* 2.3 ;  
 455 : *Galium sternerii* 2.2, *Sesleria caerulea* 2.2 ;  
 456 : *Barbillophozia hatcheri* 2.2 ;  
 459 : *Pseudoscleropodium purum* 2.2 ;  
 131 : *Taraxacum officinale* s.l. +, *Juncus articulatus* +, *Selaginella selaginoides* 1.2,  
*Barbillophozia barbata* 1.1 ;  
 123 : *Carex capillaris* +, *Scapania aspera* +, *Cladonia bellidiflora* 2.2,  
*C. pyxidata* 2.2 ;  
 79 : *Thalictrum alpinum* 1.1, *Succisa pratensis* +, *Scapania aspera* 1.1,  
*Carex pulicaris* 2.2, *Cladonia impea* 2.2 ;  
 90 : *Sanguisorba officinalis* 1.2, *Carex pulicaris* 2.2, *C. lepidocarpa* 1.2,  
*Rhytidadelphus triquetrus* 2.3, *Thuidium tamariscinum* 2.3 ;  
 114 : *Euphrasia officinalis* 1.2, *Ranunculus acris* 2.3, *Polygonum viviparum* 4.1,  
*Carex capillaris* 2.2, *Selaginella selaginoides* 2.3 ;  
 130 : *Plagiochila asplenioides* 1.2 ;  
 358 : *Festuca rubra* 2.2, *Rhacomitrium canescens* +.2 ;  
 357 : *Ranunculus acris* 2.1, *Mnium hornum* 4.2 ;  
 360 : *Plantago maritima* 1.1, *Deschampsia caespitosa* 3.3, *Succisa pratensis* +,  
*Bryum pseudotriquetrum* + ;  
 494 : *Prunella vulgaris* 2.2, *Sanguisorba officinalis* +.2, *Carex flacca* 4.3,  
*Polytrichum commune* 2.1, *Pseudoscleropodium purum* 2.2, *Thuidium delicatulum* 2.2,  
*Atrichum undulatum* 2.2

