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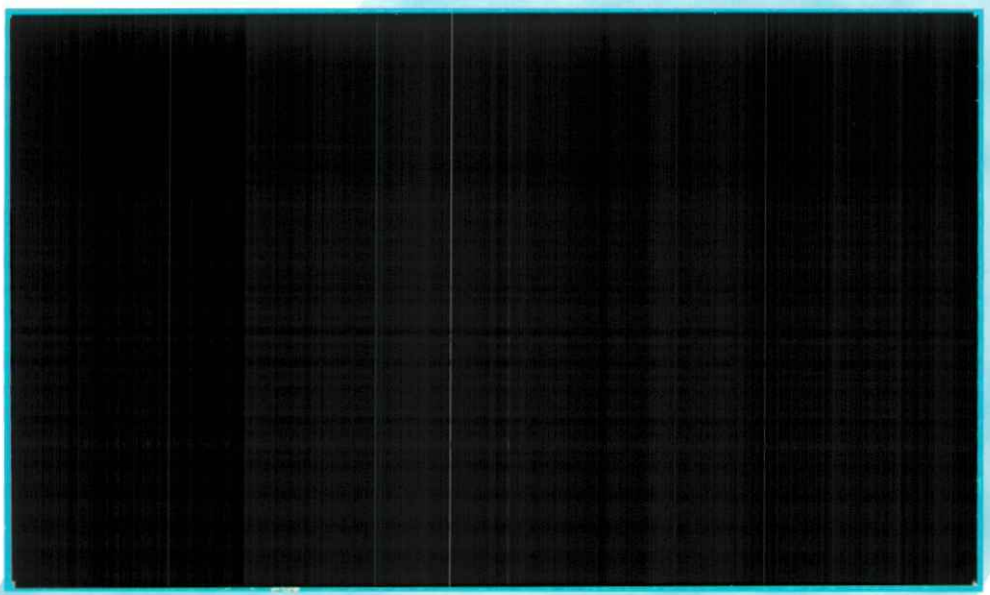
Institute of Terrestrial Ecology



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ITE sites

Monks Wood
(Admin HQ)
Abbots Ripton
HUNTINGDON PE17 2LS
Telephone 01487 773381-8
Fax 01487 773467
Email MONKSWOOD@ITE.AC.UK

Merlewood Research Station
GRANGE-OVER-SANDS
Cumbria LA11 6JU
Telephone 015395 32264
Fax 015395 34705
Email MERLEWOOD@ITE.AC.UK

Edinburgh Research Station
Bush Estate
PENICUIK
Midlothian EH26 0QB
Telephone 0131 445 4343
Fax 0131 445 3943
Email BUSH@ITE.AC.UK

Furzebrook Research Station
WAREHAM
Dorset BH20 5AS
Telephone 01929 551518-9, 551491
Fax 01929 551087
Email FURZEBROOK@ITE.AC.UK

Banchory Research Station
Hill of Brathens
Glassel, BANCHORY
Kincardineshire AB31 4BY
Telephone 01330 823434
Fax 01330 823303
Email BANCHORY@ITE.AC.UK

Bangor Research Unit
University of Wales, Bangor
Deiniol Road
BANGOR, Gwynedd LL57 2UP
Telephone 01248 370045
Fax 01248 355365
Email BANGOR@ITE.AC.UK

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INSTITUTE OF TERRESTRIAL ECOLOGY
(NATURAL ENVIRONMENT RESEARCH COUNCIL)

Botanical Character of the British Countryside and change between 1978 and 1990: Technical Annexes

Institute of Terrestrial Ecology
Merlewood Research Station
Grange Over Sands
Cumbria
LA11 6JU

February 1998

CONTENTS

Annex 1:

Cross-classification table between CVS vegetation classes and NCC Phase 1 habitat types, CORINE biotopes and Biodiversity Action Plan Broad Habitats.

Matches are based upon expert judgement. Attempts at cross-matching are affected by differences in the scale at which the different classifications are resolved. Also CVS units are not spatially explicit. They are synoptic units derived from a stratified sample of botanical quadrat records and therefore often difficult to equate with broad habitat classification units lacking an explicit botanical definition.

Table showing CVS vegetation classes and the closest matching units in three other classification systems, n.e.= no equivalent unit.

CVS vegetation class	CORINE biotope	NCC Phase 1 habitat unit	Nearest biodiversity broad habitat type
1	82	J1	6
2	82	J1	6
3	82	J1	6
4	82	J1	6
5	82	J1	6
6	81	B4	n.e.
7	84	J2	5, 7
8	31.8, 84	J2	5
9	31.8, 84	C3	5
10	n.e.	C3	5
11	37.1	B4	16
12	n.e.	B4	5
13	18, 38.2	B4	5
14	38.2	C1, C3	5
15	37.1	V3	5
16	31.8, 84	A1	5
17	22.3, 53	F2	n.e.
18	n.e.	A1	16
19	37.1, 53	F1	13
20	n.e.	B4	5
21	31.8, 84	J2	5
22	n.e.	C3	16
23	81	B4	7
24	41.1, 41.3	A1	1
25	31.8, 84	C3, J2	4
26	31.8	A2	8
27	81	B4	5
28	n.e.	C3	8
29	81	B4	7
30	81	B4	7
31	81	B4	7
32	n.e.	F3	13
33	n.e.	B5	13
34	31.8	B6	7
35	41.2, 41.3	A1	1
36	n.e.	A1	16
37	31.8	B6	8
38	n.e.	B6	8
39	n.e.	A1	1
40	38	B6	7
41	53	n.e.	10, 13
42	41.2, 44, 84	A1	1
43	38	B6	8
44	n.e.	B3	1
45	41.2, 44, 84	A1	16
46	41.2, 44, 84	A1	1
47	16, 1A	B2	8
48	1a, 37.1, 54	F1	13
49	41.2, 41.5, 44	A1	n.e.
50	41.2, 84	A1	1
51	1A, 37.2	B5	13
52	1A, 38	B2	8
53	n.e.	B1	8
54	37.1	n.e.	13
55	37.2	B5	9

continued

CVS vegetation class	CORINE biotope	NCC Phase 1 habitat unit	Nearest biodiversity broad habitat type
56	38	B2	8
57	37.2, 54	n.e.	n.e.
58	37.2, 54	E2	9
59	54	B1, C3	1, 19
60	37.2, 54	B1	9
61	n.e.	B1	9
62	41.5, 84	A1	1
63	54	B1, D2	5
64	n.e.	B1	9
65	18, 1A	D6	9
66	54	E2	16
67	37.2	n.e.	19
68	41.6, 84	n.e.	1
69	41.6, 84	A1	n.e.
70	41.6	A1	1
71	n.e.	D6	9
72	n.e.	n.e.	16
73	n.e.	D2	19
74	n.e.	E2	13
75	42, 83.3	A1	1
76	n.e.	n.e.	13
77	42, 83.3	A1	1
78	35	n.e.	n.e.
79	31.1	E2	19
80	31.1	D6	19
81	31.2	D4	9
82	31.1	D6	19
83	31.2	D6	19
84	31.2	D1	19
85	51.2, 52.1	E2	19
86	31.1	E2	19
87	51.2, 52.1	D2	19
88	31.4	D4	18
89	31.2	D4	18
90	31.1	D6	11
91	31.4	D1	19
92	51.1, 52.1	E1	19
93	31.4	D4	18
94	51.1, 52.1	n.e.	19
95	n.e.	E1	20
96	52.1	E1	19
97	52.1	E1, E2	20
98	51.1, 52.1	E1	19
99	51.1, 52.1	E1	19
100	22.3	E1	19

Annex 2:

Occurrence of CVS plot classes in twelve major land cover types recorded in the ITE Countryside Survey .

Annex 8

Landcovertypes for each vegetation class

Landcover types

1. Crops	*4. Grass mosaic and bracken*	*7. Bog*	*10. Water and wetland*
2. Fertile grassland	*5. Moorland grass*	*8. Woodland*	*11. Maritime vegetation*
3. Infertile grassland	*6. Tall grassland/ herb*	*9 Heath and screes*	*12. Communications and urban*

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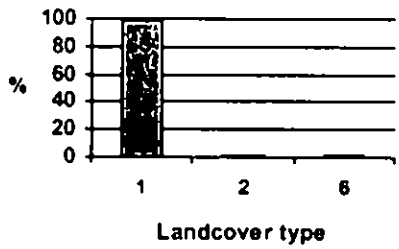

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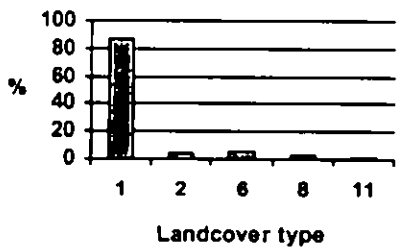

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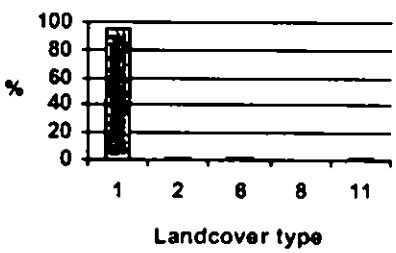

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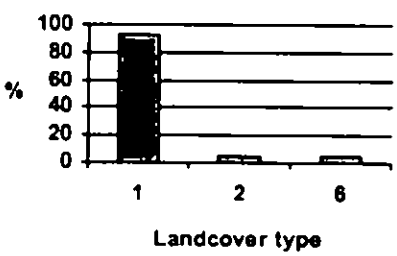

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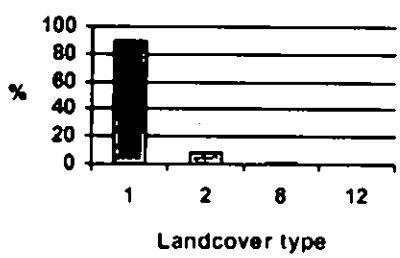

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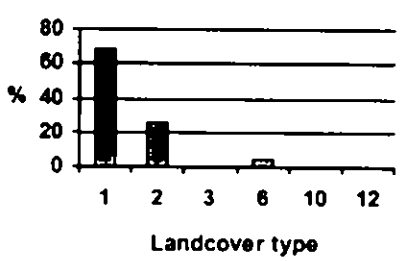

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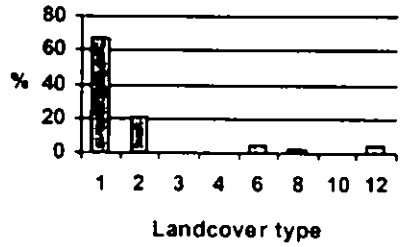

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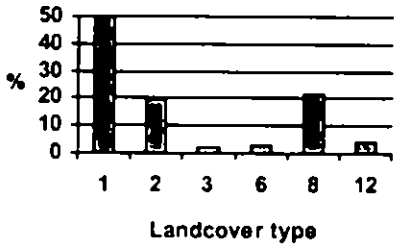

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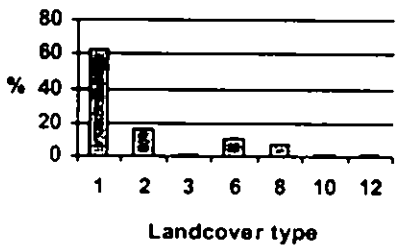

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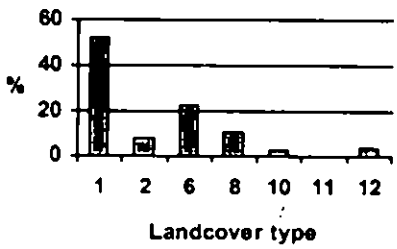

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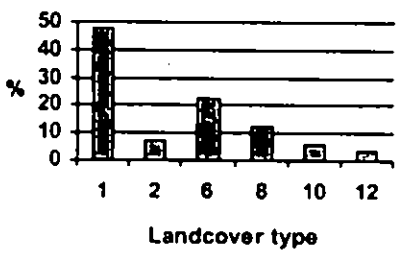

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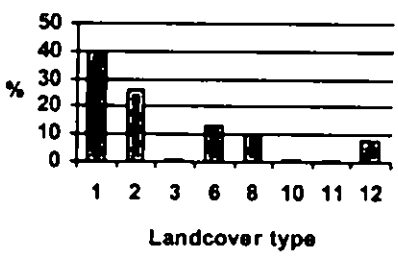

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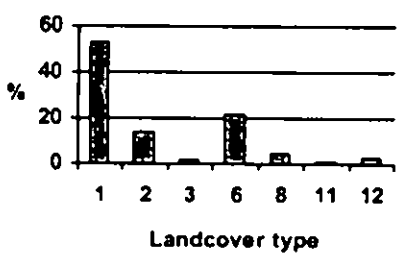

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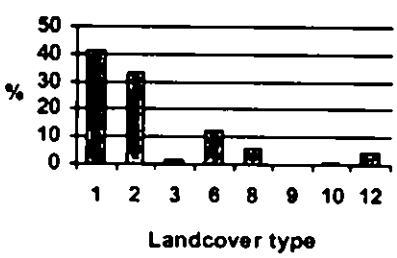

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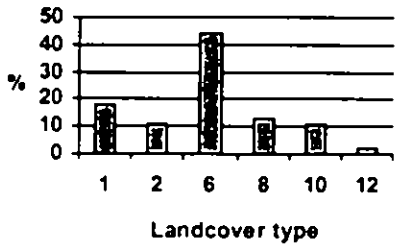

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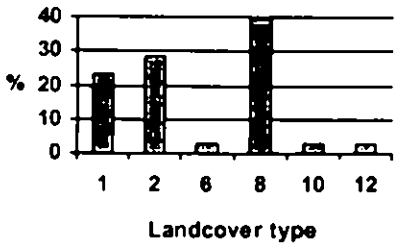

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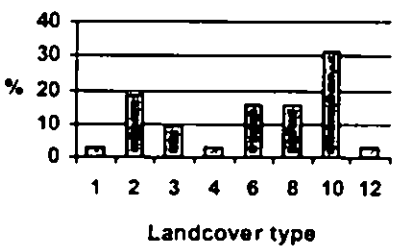

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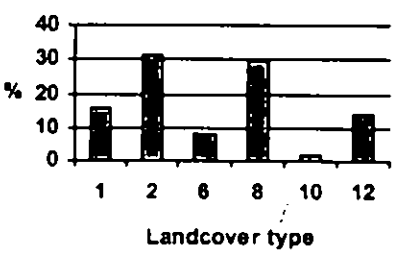

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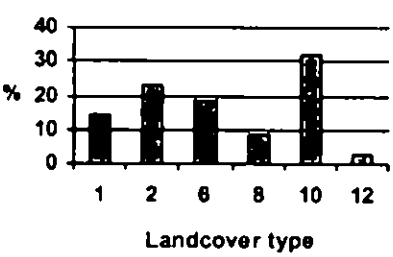

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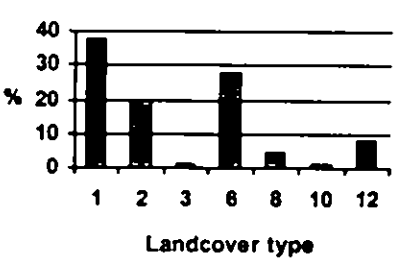

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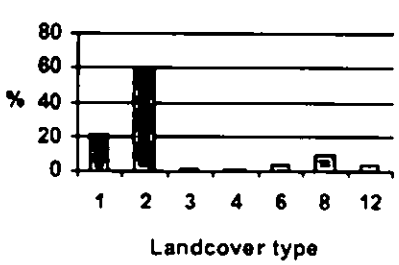

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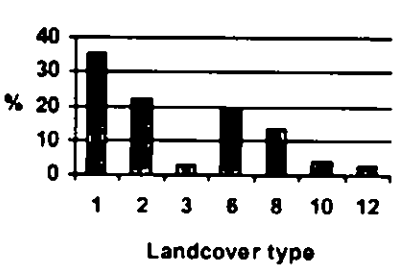

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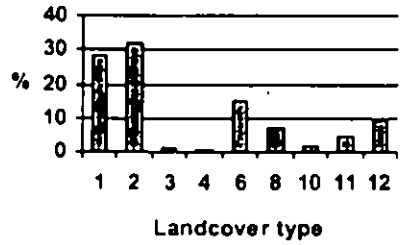

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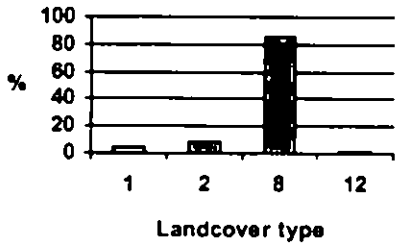

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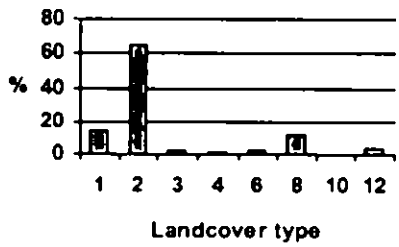

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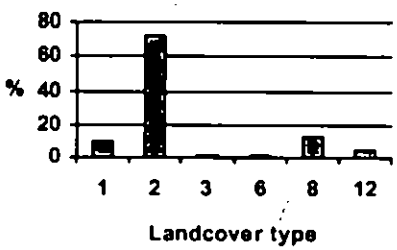

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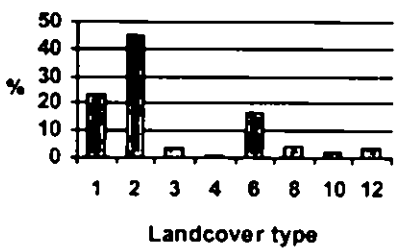

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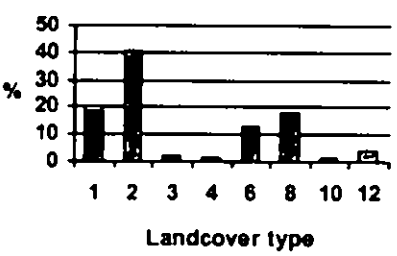

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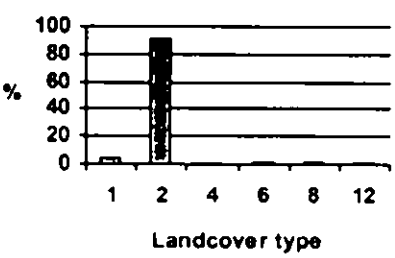

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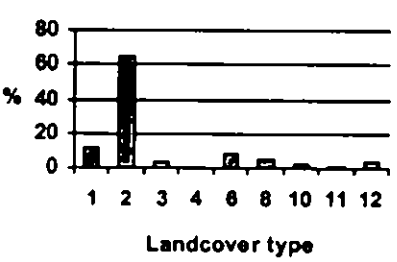

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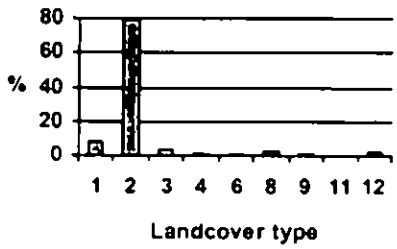

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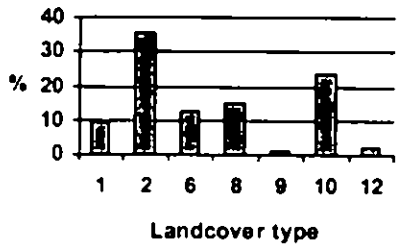

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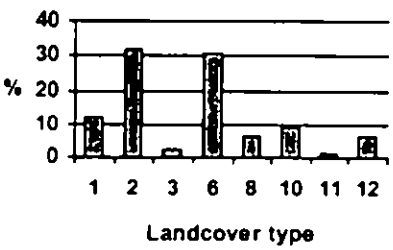

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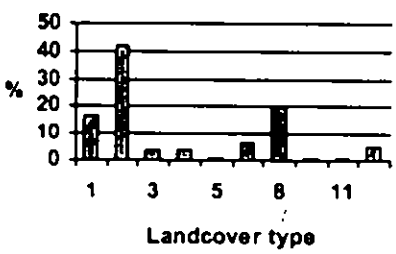

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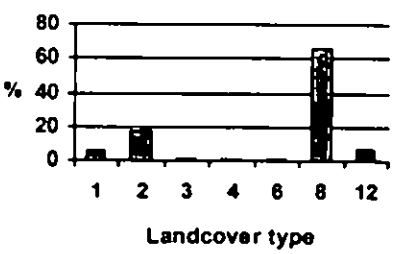

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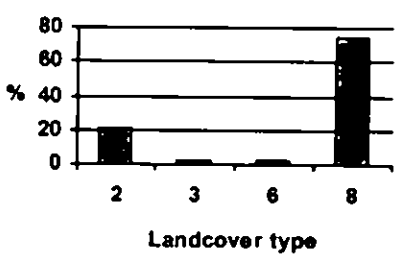

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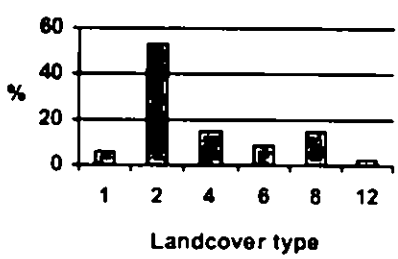

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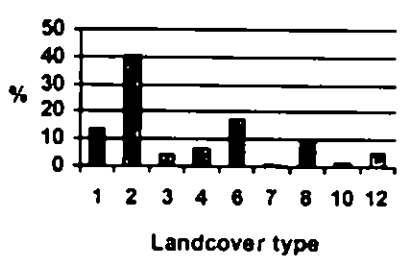

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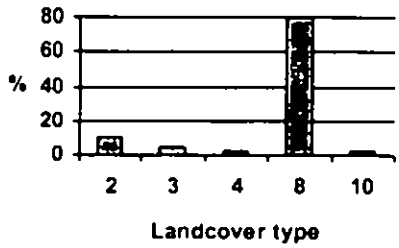

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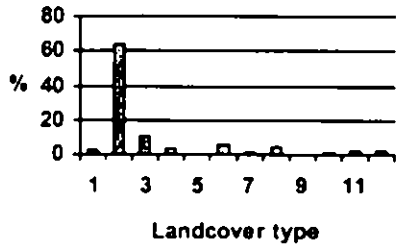

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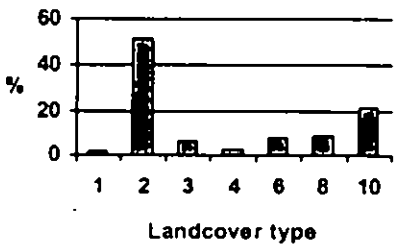

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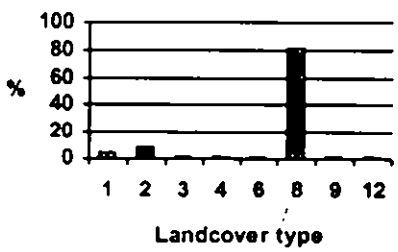

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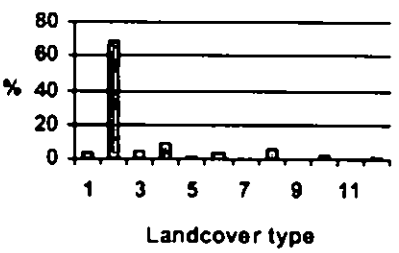

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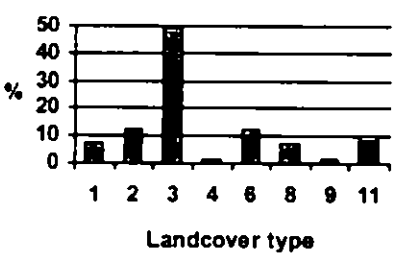

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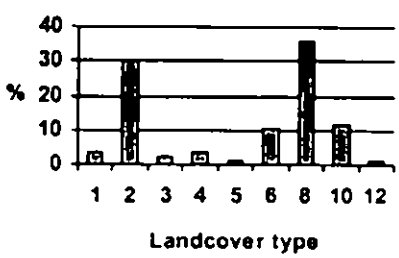

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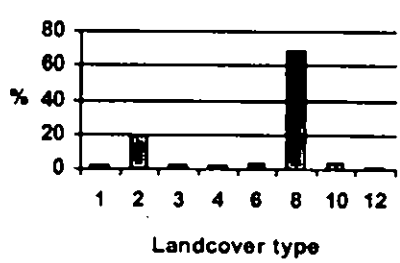

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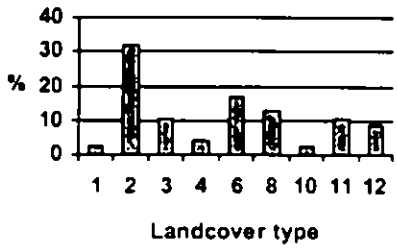

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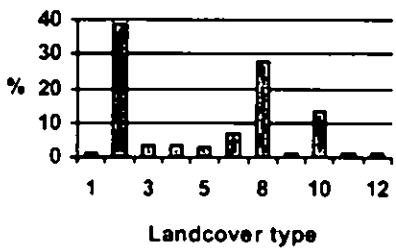

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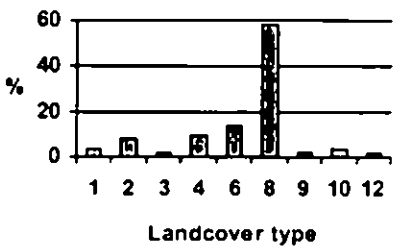

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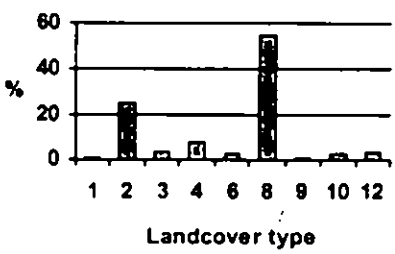

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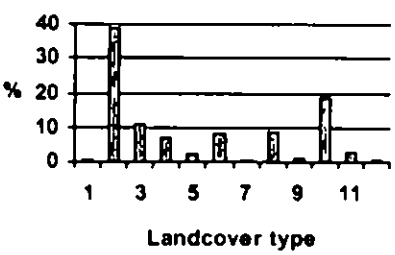

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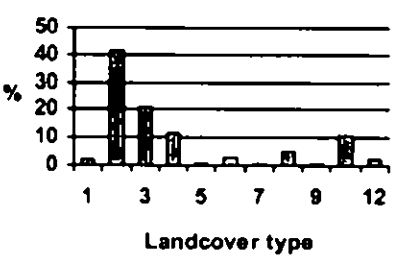

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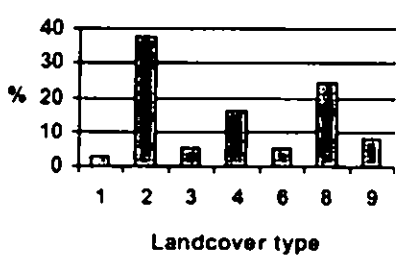

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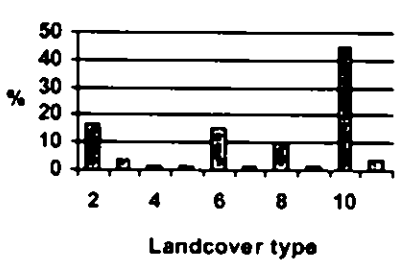

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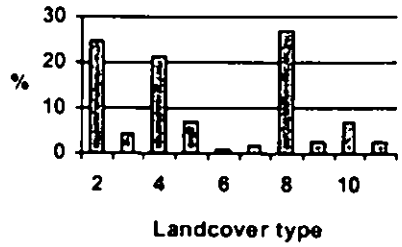

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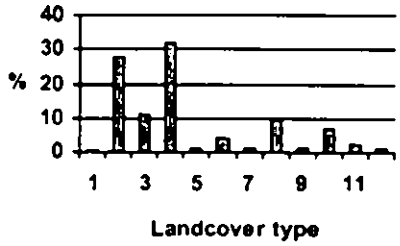

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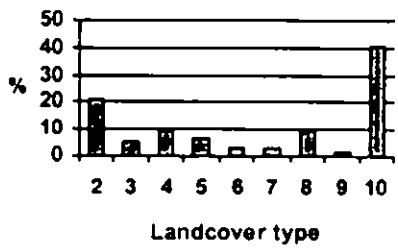

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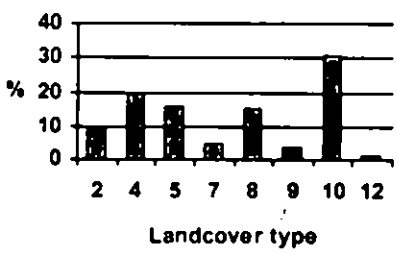

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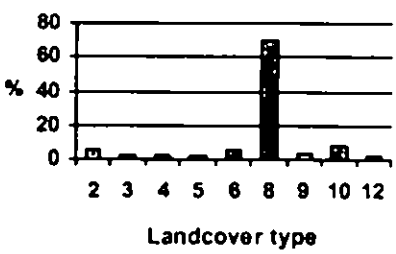

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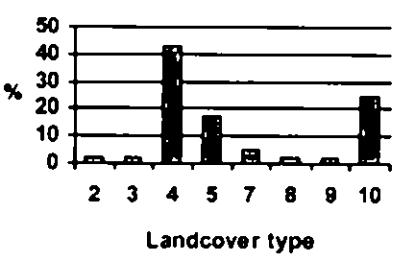

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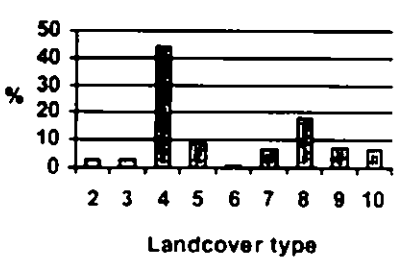

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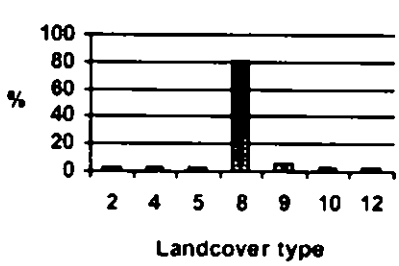

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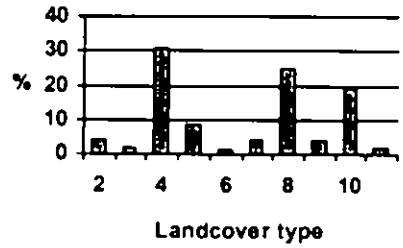

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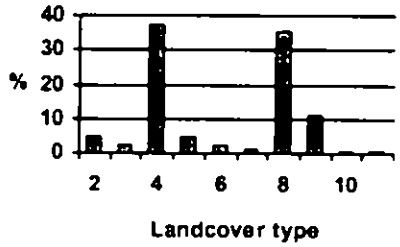

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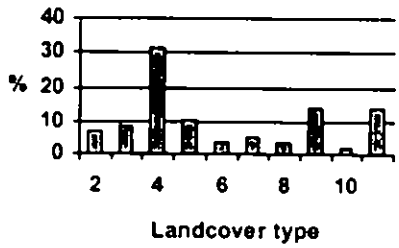

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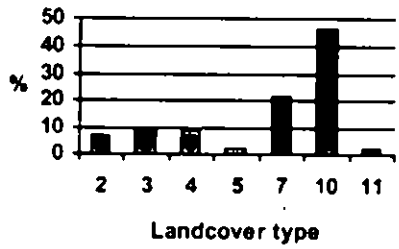

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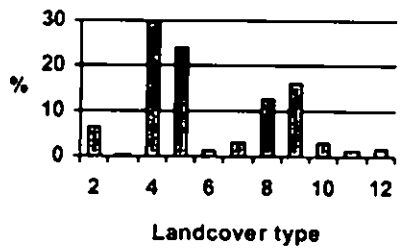

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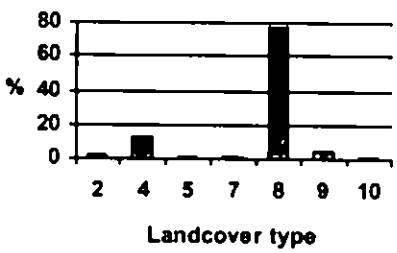

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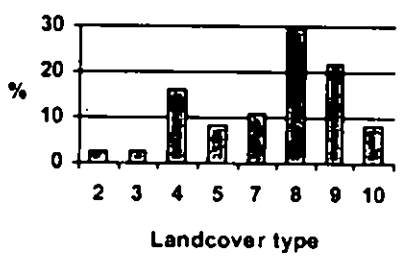

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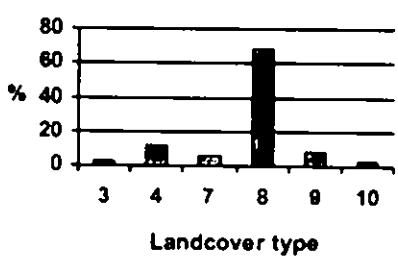

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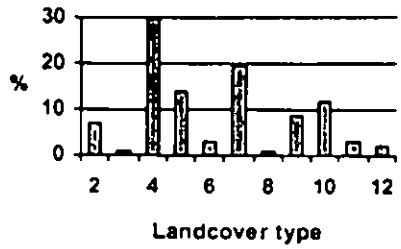

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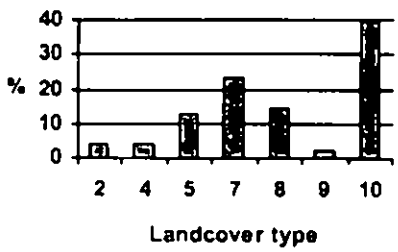

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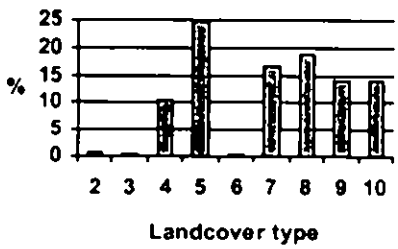

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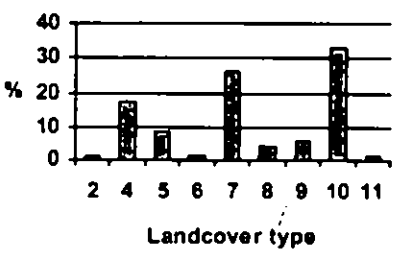

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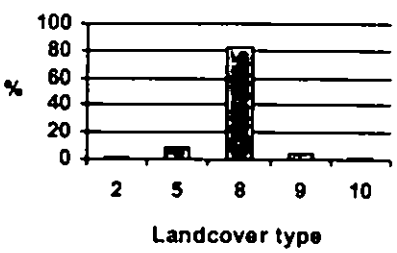

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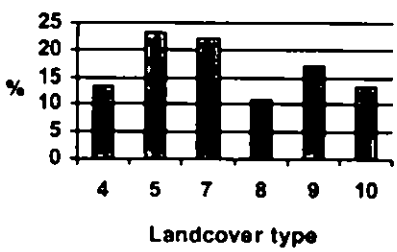

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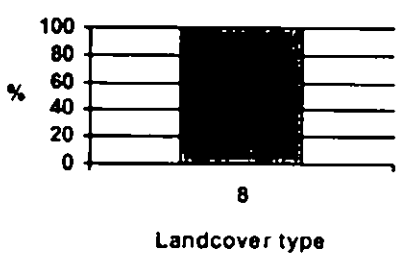

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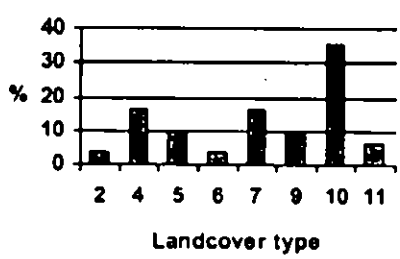

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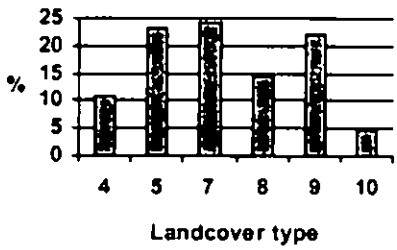

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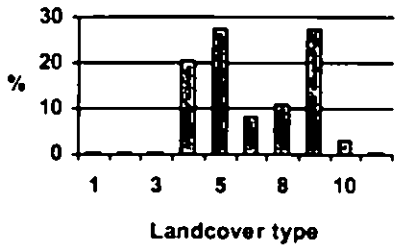

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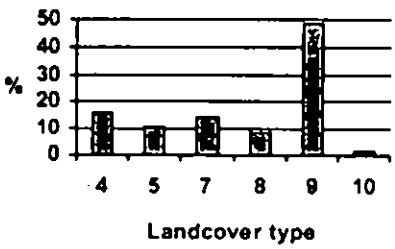

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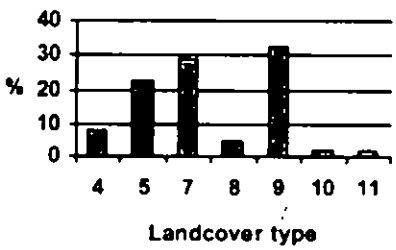

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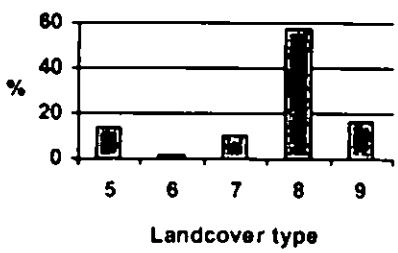

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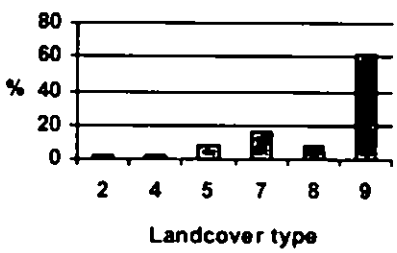

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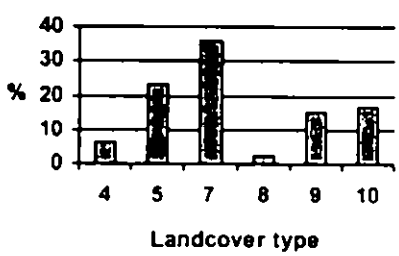

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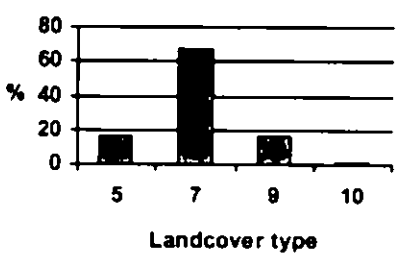

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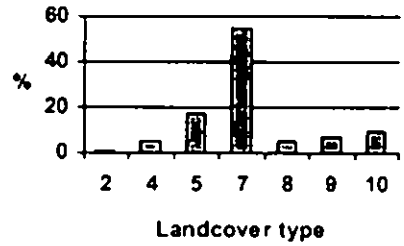

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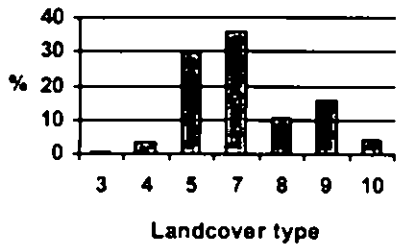

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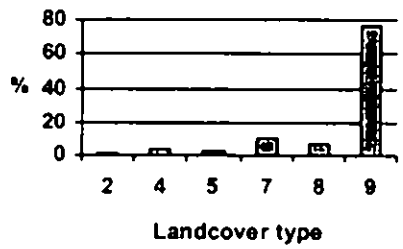

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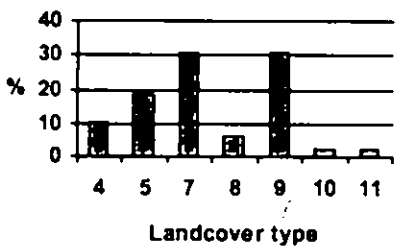

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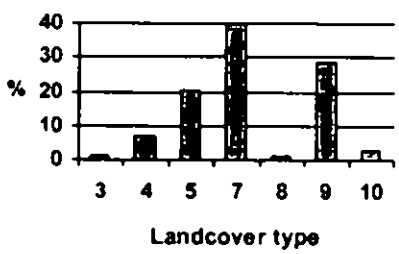

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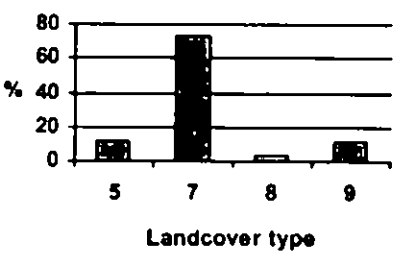

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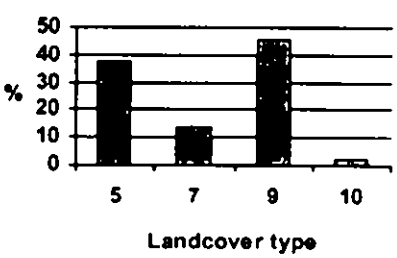

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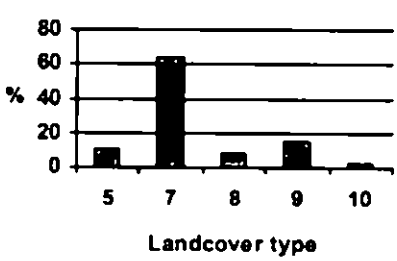

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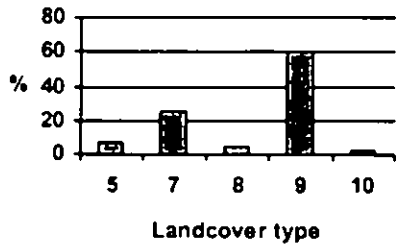

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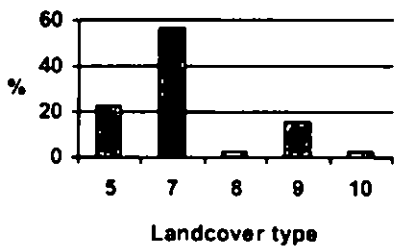

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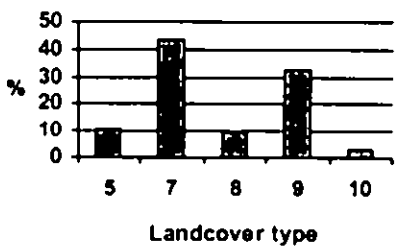

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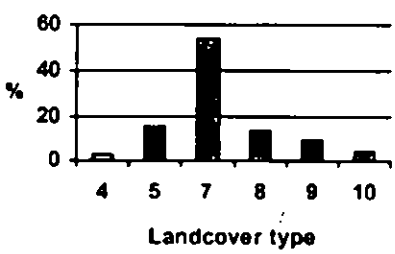

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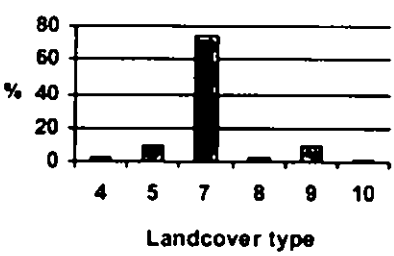

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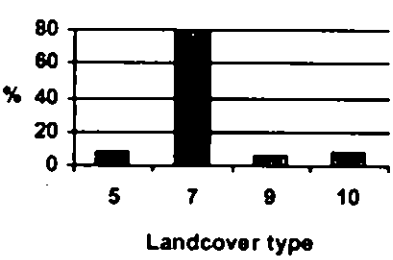


Annex 3:

Top five percentage similarity coefficients between CVS plot classes and the communities and sub-communities of the National Vegetation Classification.

Computed by the general purpose program SIMIL written by Julian Dring at the Unit of Vegetation Science, University of Lancaster. Based on the Czekanowski coefficient with a downweighting of rare species in the CVS data to 0.1.

Similarity between CVS vegetation classes and NVC units

Class	NVC unit	Name	% Similarity
1	OV24	Urtica dioica-Galium aparine community	35.1
1	OV10	Poa annua-Senecio vulgaris community	34.9
1	OV22b	Cirsium vulgare-Cirsium arvense subcommunity	34.7
1	OV13	Stellaria media-Capsella bursa-pastoris community	34.7
1	OV24a	typical subcommunity	34.4
2	OV19	Poa annua-Matricaria maritima community	47
2	OV19b	Lolium perenne-Capsella bursa-pastoris subcommunity	45.8
2	OV10	Poa annua-Senecio vulgaris community	44.4
2	OV9	Stellaria media-Polygonum aviculare community	40.3
2	OV19c	Atriplex prostrata-Chenopodium album subcommunity	39.4
3	OV19b	Lolium perenne-Capsella bursa-pastoris subcommunity	43.9
3	OV10	Poa annua-Senecio vulgaris community	43.2
3	OV19	Poa annua-Matricaria maritima community	42.5
3	OV9	Stellaria media-Polygonum aviculare community	41.2
3	OV21	Poa annua-Plantago major community	39.1
4	OV10	Poa annua-Senecio vulgaris community	45.8
4	OV19b	Lolium perenne-Capsella bursa-pastoris subcommunity	45.6
4	OV9	Stellaria media-Polygonum aviculare community	44.1
4	OV19	Poa annua-Matricaria maritima community	43.9
4	OV13	Stellaria media-Capsella bursa-pastoris community	41.4
5	OV9	Stellaria media-Polygonum aviculare community	47.7
5	OV10	Poa annua-Senecio vulgaris community	47.1
5	OV19b	Lolium perenne-Capsella bursa-pastoris subcommunity	46.2
5	OV21	Poa annua-Plantago major community	46.1
5	OV21c	Polygonum aviculare-Ranunculus repens subcommunity	44.4
6	OV19b	Lolium perenne-Capsella bursa-pastoris subcommunity	45

Class	NVC unit	Name	% Similarity
6	OV19	Poa annua-Matricaria maritima community	44.9
6	OV21	Poa annua-Plantago major community	41.8
6	OV9	Stellaria media-Polygonum aviculare community	41.7
6	OV21c	Polygonum aviculare-Ranunculus repens subcommunity	41.3
7	MG1	Arrhenatherum elatius coarse grassland	38.7
7	W24	Rubus fruticosus-Holcus lanatus underscrub	37.6
7	MG1b	Urtica dioica subcommunity	37.6
7	MG1a	Festuca rubra subcommunity	36.3
7	MG1c	Filipendula ulmaria subcommunity	35.3
8	W21a	Hedera helix-Urtica dioica subcommunity	36.4
8	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	36.3
8	W21	Crataegus monogyna-Hedera helix scrub	36.2
8	W8e	Geranium robertianum subcommunity	35.7
8	W6	Alnus glutinosa-Urtica dioica woodland	35.5
9	MG1b	Urtica dioica subcommunity	40.5
9	W24	Rubus fruticosus-Holcus lanatus underscrub	40.4
9	MG1	Arrhenatherum elatius coarse grassland	38.5
9	MG1c	Filipendula ulmaria subcommunity	38.4
9	OV25	Urtica dioica-Cirsium arvense community	38.3
10	MG1b	Urtica dioica subcommunity	44.4
10	MG1	Arrhenatherum elatius coarse grassland	43.2
10	MG1a	Festuca rubra subcommunity	41.7
10	MG1c	Filipendula ulmaria subcommunity	40.9
10	OV26d	Arrhenatherum elatius-Heracleum sphondylium subcommunity	37.2
11	OV26d	Arrhenatherum elatius-Heracleum sphondylium subcommunity	38.6
11	MG1	Arrhenatherum elatius coarse grassland	37.9
11	MG1b	Urtica dioica subcommunity	37.3
11	MG1a	Festuca rubra subcommunity	36.6

Class	NVC unit	Name	% Similarity
11	W24	Rubus fruticosus-Holcus lanatus underscrub	36.4
12	MG1	Arrhenatherum elatius coarse grassland	41.3
12	MG1a	Festuca rubra subcommunity	39.9
12	W24	Rubus fruticosus-Holcus lanatus underscrub	38.3
12	MG1b	Urtica dioica subcommunity	37.8
12	OV23	Lolium perenne-Dactylis glomerata community	36.4
13	MG1	Arrhenatherum elatius coarse grassland	49.1
13	MG1a	Festuca rubra subcommunity	48.6
13	MG1b	Urtica dioica subcommunity	43.6
13	OV23	Lolium perenne-Dactylis glomerata community	42.3
13	MG1c	Filipendula ulmaria subcommunity	40.6
14	MG1	Arrhenatherum elatius coarse grassland	40
14	MG1a	Festuca rubra subcommunity	38.6
14	MG1b	Urtica dioica subcommunity	36.1
14	OV23	Lolium perenne-Dactylis glomerata community	34.4
14	OV19	Poa annua-Matricaria maritima community	34.3
15	OV26d	Arrhenatherum elatius-Heracleum sphondylium subcommunity	42.4
15	MG1c	Filipendula ulmaria subcommunity	40.2
15	MG1a	Festuca rubra subcommunity	38.3
15	MG1b	Urtica dioica subcommunity	37.9
15	MG1	Arrhenatherum elatius coarse grassland	37.3
16	W8e	Geranium robertianum subcommunity	41.9
16	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	41.3
16	W24	Rubus fruticosus-Holcus lanatus underscrub	40.7
16	W8a	Primula vulgaris-Glechoma hederacea subcommunity	39.2
16	W8d	Hedera helix subcommunity	39.1
17	S26	Phragmites australis-Urtica dioica fen	40
17	S26d	Epilobium hirsutum subcommunity	38.7

Class	NVC unit	Name	% Similarity
17	OV26	Epilobium hirsutum community	38.2
17	S5	Glyceria maxima swamp	37.7
17	S6	Carex riparia swamp	35.9
18	W24	Rubus fruticosus-Holcus lanatus underscrub	40.8
18	W24a	Cirsium arvense-Cirsium vulgare subcommunity	36.9
18	MG1a	Festuca rubra subcommunity	35.8
18	MG1	Arrhenatherum elatius coarse grassland	35.7
18	W24b	Arrhenatherum elatius-Heracleum sphondylium subcommunity	35.4
19	OV26	Epilobium hirsutum community	42.3
19	OV26d	Arrhenatherum elatius-Heracleum sphondylium subcommunity	38.3
19	S26	Phragmites australis-Urtica dioica fen	36.3
19	OV26b	Phragmites australis-Eupatorium cannabinum subcommunity	35.8
19	OV26c	Filipendula ulmaria-Angelica sylvestris subcommunity	35.6
20	MG1	Arrhenatherum elatius coarse grassland	51.4
20	MG1a	Festuca rubra subcommunity	50.6
20	OV23	Lolium perenne-Dactylis glomerata community	46.4
20	MG1b	Urtica dioica subcommunity	45.5
20	MG1d	Pastinaca sativa subcommunity	42.5
21	W24	Rubus fruticosus-Holcus lanatus underscrub	42.6
21	MG1	Arrhenatherum elatius coarse grassland	40
21	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	39.7
21	W8e	Geranium robertianum subcommunity	39.4
21	W8d	Hedera helix subcommunity	37.9
22	OV26	Epilobium hirsutum community	38.3
22	MG1	Arrhenatherum elatius coarse grassland	37.4
22	MG1c	Filipendula ulmaria subcommunity	36.8
22	OV26d	Arrhenatherum elatius-Heracleum sphondylium subcommunity	36.4
22	W24	Rubus fruticosus-Holcus lanatus underscrub	35.9

Class	NVC unit	Name	% Similarity
23	MG1	Arrhenatherum elatius coarse grassland	39.4
23	OV23	Lolium perenne-Dactylis glomerata community	39
23	MG1a	Festuca rubra subcommunity	38.9
23	MG1d	Pastinaca sativa subcommunity	33
23	OV19	Poa annua-Matricaria maritima community	32.8
24	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	49.9
24	W8e	Geranium robertianum subcommunity	48.9
24	W8b	Anemone nemorosa subcommunity	47.9
24	W8a	Primula vulgaris-Glechoma hederacea subcommunity	47.1
24	W8d	Hedera helix subcommunity	44.7
25	MG1	Arrhenatherum elatius coarse grassland	40.9
25	W24	Rubus fruticosus-Holcus lanatus underscrub	39.7
25	MG1a	Festuca rubra subcommunity	38.7
25	W24b	Arrhenatherum elatius-Heracleum sphondylium subcommunity	35.7
25	MG1c	Filipendula ulmaria subcommunity	35.4
26	MG1	Arrhenatherum elatius coarse grassland	43.2
26	W24b	Arrhenatherum elatius-Heracleum sphondylium subcommunity	41.1
26	MG1a	Festuca rubra subcommunity	40.7
26	W24	Rubus fruticosus-Holcus lanatus underscrub	40.4
26	MG1b	Urtica dioica subcommunity	37.3
27	MG1	Arrhenatherum elatius coarse grassland	44
27	MG1a	Festuca rubra subcommunity	41.8
27	MG1e	Centaurea nigra subcommunity	36.8
27	MG1b	Urtica dioica subcommunity	36.7
27	OV23	Lolium perenne-Dactylis glomerata community	36.3
28	MG1	Arrhenatherum elatius coarse grassland	33.3
28	W24	Rubus fruticosus-Holcus lanatus underscrub	32.3
28	W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	31.2

Class	NVC unit	Name	% Similarity
28	MG1a	Festuca rubra subcommunity	31
28	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	30.5
29	OV23	Lolium perenne-Dactylis glomerata community	48.4
29	OV22b	Cirsium vulgare-Cirsium arvense subcommunity	48
29	MG7	Lolium perenne leys and related grasslands	46.4
29	OV23c	Plantago major-Trifolium repens subcommunity	46.1
29	OV22	Poa annua-Taraxacum officinale community	45.5
30	MG1	Arrhenatherum elatius coarse grassland	30.8
30	MG1a	Festuca rubra subcommunity	29.1
30	MG9a	Poa trivialis subcommunity	28.4
30	MG9	Holcus lanatus-Deschampsia cespitosa grassland	28.3
30	OV23	Lolium perenne-Dactylis glomerata community	27.8
31	OV23	Lolium perenne-Dactylis glomerata community	42.4
31	OV23c	Plantago major-Trifolium repens subcommunity	40.2
31	OV21c	Polygonum aviculare-Ranunculus repens subcommunity	39.6
31	OV21	Poa annua-Plantago major community	38.4
31	MG1	Arrhenatherum elatius coarse grassland	38.3
32	OV26	Epilobium hirsutum community	42.6
32	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	41.4
32	OV26a	Epilobium hirsutum subcommunity	37.6
32	M27c	Juncus effusus-Holcus lanatus subcommunity	36.2
32	OV26b	Phragmites australis-Eupatorium cannabinum subcommunity	35.8
33	MG1c	Filipendula ulmaria subcommunity	41.5
33	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	41
33	MG1	Arrhenatherum elatius coarse grassland	40.9
33	MG9	Holcus lanatus-Deschampsia cespitosa grassland	40.7
33	OV26	Epilobium hirsutum community	40.6
34	MG1	Arrhenatherum elatius coarse grassland	43.1

Class	NVC unit	Name	% Similarity
34	MG1a	Festuca rubra subcommunity	37.7
34	MG1e	Centaurea nigra subcommunity	34.5
34	W24	Rubus fruticosus-Holcus lanatus underscrub	34.4
34	MG1d	Pastinaca sativa subcommunity	34.4
35	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	50.7
35	W8e	Geranium robertianum subcommunity	48.6
35	W8a	Primula vulgaris-Glechoma hederacea subcommunity	45.8
35	W10	Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland	44.1
35	W8b	Anemone nemorosa subcommunity	44
36	W8e	Geranium robertianum subcommunity	46.2
36	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	45.7
36	W9a	typical subcommunity	44.9
36	W9	Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis woodland	43.8
36	W8b	Anemone nemorosa subcommunity	43.5
37	MG5a	Lathyrus pratensis subcommunity	47.6
37	MG5	Cynosurus cristatus-Centaurea nigra grassland	46.1
37	MG1	Arrhenatherum elatius coarse grassland	45.5
37	MG1e	Centaurea nigra subcommunity	44.7
37	MG9	Holcus lanatus-Deschampsia cespitosa grassland	44.6
38	MG1	Arrhenatherum elatius coarse grassland	45.5
38	MG1e	Centaurea nigra subcommunity	42.5
38	MG5a	Lathyrus pratensis subcommunity	41
38	MG1a	Festuca rubra subcommunity	40.8
38	MG5	Cynosurus cristatus-Centaurea nigra grassland	40.4
39	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	47.9
39	W8e	Geranium robertianum subcommunity	47.7
39	W9a	typical subcommunity	47.7
39	W9	Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis woodland	47.2

Class	NVC unit	Name	% Similarity
39	W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	45.3
40	MG1	Arrhenatherum elatius coarse grassland	35.8
40	MG5a	Lathyrus pratensis subcommunity	35.1
40	MG5	Cynosurus cristatus-Centaurea nigra grassland	34.3
40	MG5b	Galium verum subcommunity	33.6
40	SD8	Festuca rubra-Galium verum fixed dune community	33
41	MG10	Holcus lanatus-Juncus effusus rush-pasture	38
41	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	37.8
41	MG9a	Poa trivialis subcommunity	36.5
41	MG9	Holcus lanatus-Deschampsia cespitosa grassland	36.3
41	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	35.8
42	W10	Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland	51.9
42	W10c	Hedera helix subcommunity	50.9
42	W10a	typical subcommunity	49.1
42	W10d	Holcus lanatus subcommunity	47.8
42	W10e	Acer pseudoplatanus-Oxalis acetosella subcommunity	45.1
43	MG5a	Lathyrus pratensis subcommunity	39.5
43	U4b	Holcus lanatus-Trifolium repens subcommunity	39.3
43	MG6b	Anthoxanthum odoratum subcommunity	39.2
43	MG5	Cynosurus cristatus-Centaurea nigra grassland	38.8
43	MG6	Lolium perenne-Cynosurus cristatus grassland	38.6
44	CG2c	Holcus lanatus-Trifolium repens subcommunity	58.3
44	CG3	Bromus erectus grassland	56.5
44	CG2	Festuca ovina-Avenula pratensis grassland	56
44	CG3c	Knautia arvensis-Bellis perennis subcommunity	55.8
44	CG2a	Cirsium acaule-Asperula cynanchica subcommunity	53.2
45	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	43.5
45	W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	41

Class	NVC unit	Name	% Similarity
45	M27c	Juncus effusus-Holcus lanatus subcommunity	39.2
45	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	37.6
45	W7b	Carex remota subcommunity	37.1
46	W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	41.3
46	W9a	typical subcommunity	41.2
46	W9	Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis woodland	41.1
46	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	38.2
46	W8e	Geranium robertianum subcommunity	37.2
47	MG5	Cynosurus cristatus-Centaurea nigra grassland	50.2
47	MG5a	Lathyrus pratensis subcommunity	49.5
47	MG5b	Galium verum subcommunity	48.7
47	MG1	Arrhenatherum elatius coarse grassland	46.9
47	SD8	Festuca rubra-Galium verum fixed dune community	46.5
48	MG9	Holcus lanatus-Deschampsia cespitosa grassland	40.2
48	MG9a	Poa trivialis subcommunity	39.9
48	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	39.7
48	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	38
48	W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	37.3
49	OV27	Epilobium angustifolium community	39.4
49	W10d	Holcus lanatus subcommunity	39.2
49	W10	Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland	38.9
49	W10c	Hedera helix subcommunity	38.7
49	W10a	typical subcommunity	36.6
50	W10	Quercus robur-Pteridium aquilinum-Rubus fruticosus woodland	39.8
50	W9	Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis woodland	37.3
50	W10c	Hedera helix subcommunity	37.2
50	W9a	typical subcommunity	37.2
50	W8	Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland	36.6

Class	NVC unit	Name	% Similarity
51	M22b	Briza media-Trifolium spp. subcommunity	34
51	M22	Juncus subnodulosus-Cirsium palustre fen-meadow	33.4
51	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	32.9
51	MG8	Cynosurus cristatus-Caltha palustris flood-pasture	32.2
51	U4b	Holcus lanatus-Trifolium repens subcommunity	32.1
52	MG5a	Lathyrus pratensis subcommunity	48.4
52	MG5b	Galium verum subcommunity	48.1
52	MG5	Cynosurus cristatus-Centaurea nigra grassland	47.8
52	SD8	Festuca rubra-Galium verum fixed dune community	46.5
52	U4b	Holcus lanatus-Trifolium repens subcommunity	44.6
53	U4b	Holcus lanatus-Trifolium repens subcommunity	46.3
53	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	41.8
53	U4a	typical subcommunity	39.9
53	MG6b	Anthoxanthum odoratum subcommunity	39.9
53	MG6a	typical subcommunity	39.6
54	M27	Filipendula ulmaria-Angelica sylvestris tall-herb fen	51.8
54	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	49.1
54	M23a	Juncus acutiflorus subcommunity	48
54	M27c	Juncus effusus-Holcus lanatus subcommunity	45.9
54	M23b	Juncus effusus subcommunity	45.2
55	U4b	Holcus lanatus-Trifolium repens subcommunity	41.2
55	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	39.9
55	U4a	typical subcommunity	38.3
55	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	36.3
55	U20a	Anthoxanthum odoratum subcommunity	35.4
56	U4b	Holcus lanatus-Trifolium repens subcommunity	47.6
56	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	44.2
56	MG5a	Lathyrus pratensis subcommunity	41.2

Class	NVC unit	Name	% Similarity
56	U4a	typical subcommunity	41
56	CG10a	Trifolium repens-Luzula campestris subcommunity	41
57	M23a	Juncus acutiflorus subcommunity	51
57	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	48.3
57	M23b	Juncus effusus subcommunity	44.6
57	M22b	Briza media-Trifolium spp. subcommunity	42.3
57	M22	Juncus subnodulosus-Cirsium palustre fen-meadow	41.5
58	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	43.1
58	M23a	Juncus acutiflorus subcommunity	41
58	M23b	Juncus effusus subcommunity	40.6
58	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	39
58	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	38.3
59	W11	Quercus petraea-Betula pubescens-Oxalis acetosella woodland	40.4
59	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	39.7
59	W11c	Anemone nemorosa subcommunity	39.3
59	W11d	Stellaria holostea subcommunity	39
59	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	38.9
60	U4b	Holcus lanatus-Trifolium repens subcommunity	46.2
60	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	44.1
60	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	43.8
60	CG10a	Trifolium repens-Luzula campestris subcommunity	42.9
60	M23a	Juncus acutiflorus subcommunity	42.8
61	CG10a	Trifolium repens-Luzula campestris subcommunity	51.3
61	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	49.3
61	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	49.2
61	U4a	typical subcommunity	49.1
61	U4b	Holcus lanatus-Trifolium repens subcommunity	48
62	W16a	Quercus robur subcommunity	43.3

Class	NVC unit	Name	% Similarity
62	W16	Quercus spp.-Betula spp.-Deschampsia flexuosa woodland	40.2
62	W10d	Holcus lanatus subcommunity	38.1
62	W17d	Rhytidiadelphus triquetrus subcommunity	37.4
62	W15	Fagus sylvatica-Deschampsia flexuosa woodland	36.9
63	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	46.6
63	CG10a	Trifolium repens-Luzula campestris subcommunity	46.3
63	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	44.9
63	CG10b	Carex pulicaris-Carex panicea subcommunity	44.8
63	U4b	Holcus lanatus-Trifolium repens subcommunity	44.1
64	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	46.8
64	U4a	typical subcommunity	45.7
64	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	43.8
64	W11	Quercus petraea-Betula pubescens-Oxalis acetosella woodland	42.6
64	CG10a	Trifolium repens-Luzula campestris subcommunity	42.5
65	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	53.2
65	CG10b	Carex pulicaris-Carex panicea subcommunity	52.1
65	CG10a	Trifolium repens-Luzula campestris subcommunity	50.5
65	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	48.6
65	U4b	Holcus lanatus-Trifolium repens subcommunity	46.3
66	U4b	Holcus lanatus-Trifolium repens subcommunity	41.2
66	M23a	Juncus acutiflorus subcommunity	39.5
66	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	38.2
66	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	38.1
66	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	37.3
67	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	51.4
67	U4a	typical subcommunity	49.6
67	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	47.9
67	U4b	Holcus lanatus-Trifolium repens subcommunity	44.8

Class	NVC unit	Name	% Similarity
67	U5	Nardus stricta-Galium saxatile grassland	44.4
68	W11	Quercus petraea-Betula pubescens-Oxalis acetosella woodland	47.4
68	W11a	Dryopteris dilatata subcommunity	47.2
68	W17c	Anthoxanthum odoratum-Agrostis capillaris subcommunity	46.4
68	W11c	Anemone nemorosa subcommunity	44.7
68	W17	Quercus petraea-Betula pubescens-Dicranum majus woodland	43.9
69	CG10b	Carex pulicaris-Carex panicea subcommunity	49.1
69	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	48.1
69	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	47.4
69	U4a	typical subcommunity	46
69	CG10a	Trifolium repens-Luzula campestris subcommunity	45.6
70	W11	Quercus petraea-Betula pubescens-Oxalis acetosella woodland	48.1
70	W11c	Anemone nemorosa subcommunity	47
70	W11b	Blechnum spicant subcommunity	45.1
70	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	43.5
70	W11d	Stellaria holostea subcommunity	42.8
71	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	47.9
71	CG10a	Trifolium repens-Luzula campestris subcommunity	47.3
71	CG10b	Carex pulicaris-Carex panicea subcommunity	46.7
71	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	44
71	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	43.1
72	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	51
72	M23a	Juncus acutiflorus subcommunity	50.5
72	M23b	Juncus effusus subcommunity	48.2
72	M25	Molinia caerulea-Potentilla erecta mire	47.7
72	M6	Carex echinata-Sphagnum recurvum/auriculatum mire	43.4
73	U5	Nardus stricta-Galium saxatile grassland	41.2
73	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	41.1

Class	NVC unit	Name	% Similarity
73	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	40.2
73	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	40
73	CG10a	Trifolium repens-Luzula campestris subcommunity	39.8
74	M23a	Juncus acutiflorus subcommunity	43.4
74	M15	Scirpus cespitosus-Erica tetralix wet heath	42
74	M15a	Carex panicea subcommunity	41.6
74	M23	Juncus effusus/acutiflorus-Galium palustre rush-pasture	41.5
74	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	41.2
75	U16	Luzula sylvatica-Vaccinium myrtillus tall-herb community	44.4
75	U16b	Anthoxanthum odoratum-Festuca ovina subcommunity	43
75	U20b	Vaccinium myrtillus-Dicranum scoparium subcommunity	41.3
75	U2	Deschampsia flexuosa grassland	40.9
75	U4e	Vaccinium myrtillus-Deschampsia flexuosa subcommunity	40.8
76	CG10b	Carex pulicaris-Carex panicea subcommunity	49
76	CG11b	Carex pulicaris-Carex panicea subcommunity	48.5
76	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	48
76	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	47.9
76	CG10a	Trifolium repens-Luzula campestris subcommunity	44.9
77	U6b	Carex nigra-Calypogeia trichomanis subcommunity	25.5
77	U16c	species-poor subcommunity	24.7
77	U2b	Vaccinium myrtillus subcommunity	24.4
77	U20b	Vaccinium myrtillus-Dicranum scoparium subcommunity	22.8
77	U6	Juncus squarrosus-Festuca ovina grassland	22.6
78	CG11b	Carex pulicaris-Carex panicea subcommunity	48.7
78	CG10	Festuca ovina-Agrostis capillaris-Thymus praecox grassland	47
78	CG10b	Carex pulicaris-Carex panicea subcommunity	46.9
78	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	46
78	CG10a	Trifolium repens-Luzula campestris subcommunity	45.5

Class	NVC unit	Name	% Similarity
79	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	50.4
79	CG11b	Carex pulicaris-Carex panicea subcommunity	48.3
79	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	48.1
79	CG11a	typical subcommunity	46.6
79	U5	Nardus stricta-Galium saxatile grassland	46.1
80	U5	Nardus stricta-Galium saxatile grassland	54.8
80	U5a	species-poor subcommunity	53.8
80	U5d	Calluna vulgaris-Danthonia decumbens subcommunity	52.1
80	U5b	Agrostis canina-Polytrichum commune subcommunity	51.5
80	U4a	typical subcommunity	50.4
81	U4a	typical subcommunity	56.5
81	U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	56
81	H10c	Festuca ovina-Anthoxanthum odoratum subcommunity	55.8
81	H10	Calluna vulgaris-Erica cinerea heath	55
81	U4d	Luzula multiflora-Rhytidiadelphus loreus subcommunity	54.3
82	M15	Scirpus cespitosus-Erica tetralix wet heath	48.1
82	M15b	typical subcommunity	47.1
82	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	46.7
82	H10c	Festuca ovina-Anthoxanthum odoratum subcommunity	46.7
82	M15d	Vaccinium myrtillus subcommunity	46.7
83	M15d	Vaccinium myrtillus subcommunity	55.7
83	H10a	typical subcommunity	51.2
83	H10	Calluna vulgaris-Erica cinerea heath	50
83	H12	Calluna vulgaris-Vaccinium myrtillus heath	49.6
83	H12a	Calluna subcommunity	49.4
84	M15d	Vaccinium myrtillus subcommunity	49.8
84	M15c	Cladonia subcommunity	47.2
84	M15	Scirpus cespitosus-Erica tetralix wet heath	46.4

Class	NVC unit	Name	% Similarity
84	M15b	typical subcommunity	46.1
84	U5d	Calluna vulgaris-Danthonia decumbens subcommunity	45.5
85	M15a	Carex panicea subcommunity	57.7
85	M15	Scirpus cespitosus-Erica tetralix wet heath	54.6
85	M15b	typical subcommunity	54
85	M10a	Carex demissa-Juncus bulbosus subcommunity	49.2
85	M15d	Vaccinium myrtillus subcommunity	46.6
86	M15a	Carex panicea subcommunity	50.3
86	M15	Scirpus cespitosus-Erica tetralix wet heath	49.6
86	M15b	typical subcommunity	49
86	CG11	Festuca ovina-Agrostis capillaris-Alchemilla alpina grassland	47.2
86	M15d	Vaccinium myrtillus subcommunity	46.7
87	M15	Scirpus cespitosus-Erica tetralix wet heath	52.3
87	M15b	typical subcommunity	50.7
87	M15a	Carex panicea subcommunity	50
87	M15d	Vaccinium myrtillus subcommunity	48.1
87	M15c	Cladonia subcommunity	41.4
88	M15d	Vaccinium myrtillus subcommunity	56.9
88	U5b	Agrostis canina-Polytrichum commune subcommunity	50.3
88	U5d	Calluna vulgaris-Danthonia decumbens subcommunity	50.2
88	M15	Scirpus cespitosus-Erica tetralix wet heath	49.7
88	U5	Nardus stricta-Galium saxatile grassland	49.5
89	H12	Calluna vulgaris-Vaccinium myrtillus heath	55.5
89	H12a	Calluna subcommunity	53.2
89	H12b	Vaccinium vitis-idaea-Cladonia impexa subcommunity	50.8
89	H10a	typical subcommunity	50
89	H10	Calluna vulgaris-Erica cinerea heath	49.6
90	M15c	Cladonia subcommunity	60.8

Class	NVC unit	Name	% Similarity
90	M15b	typical subcommunity	57.4
90	M15	Scirpus cespitosus-Erica tetralix wet heath	56.7
90	H10b	Racomitrium lanuginosum subcommunity	56.4
90	M15d	Vaccinium myrtillus subcommunity	56.3
91	M15d	Vaccinium myrtillus subcommunity	50.8
91	U5	Nardus stricta-Galium saxatile grassland	49.6
91	H18	Vaccinium myrtillus-Deschampsia flexuosa heath	49.5
91	U5a	species-poor subcommunity	49
91	H10	Calluna vulgaris-Erica cinerea heath	49
92	M15	Scirpus cespitosus-Erica tetralix wet heath	53.6
92	M15b	typical subcommunity	53.5
92	M15d	Vaccinium myrtillus subcommunity	53.2
92	M15a	Carex panicea subcommunity	51.1
92	M15c	Cladonia subcommunity	49.4
93	U7	Nardus stricta-Carex bigelowii grass-heath	58
93	H18c	Empetrum nigrum-Racomitrium lanuginosum subcommunity	57.9
93	U7b	typical subcommunity	56.9
93	U5a	species-poor subcommunity	56.7
93	U7c	Alchemilla alpina-Festuca ovina subcommunity	56.4
94	M15	Scirpus cespitosus-Erica tetralix wet heath	61.3
94	M15b	typical subcommunity	60.7
94	M15d	Vaccinium myrtillus subcommunity	55.6
94	M17	Scirpus cespitosus-Eriophorum vaginatum blanket mire	54.7
94	M15c	Cladonia subcommunity	53.7
95	M19a	Erica tetralix subcommunity	43.8
95	M19	Calluna vulgaris-Eriophorum vaginatum blanket mire	41.4
95	U2b	Vaccinium myrtillus subcommunity	40.9
95	M17c	Juncus squarrosus subcommunity	40.6

Class	NVC unit	Name	% Similarity
95	M15d	Vaccinium myrtillus subcommunity	39
96	M15b	typical subcommunity	59
96	M15a	Carex panicea subcommunity	58.9
96	M15	Scirpus cespitosus-Erica tetralix wet heath	58.4
96	M15c	Cladonia subcommunity	54.2
96	M17b	Cladonia subcommunity	54.1
97	M19a	Erica tetralix subcommunity	60.2
97	M19	Calluna vulgaris-Eriophorum vaginatum blanket mire	58.9
97	M19b	Empetrum nigrum subcommunity	55.1
97	M17c	Juncus squarrosus subcommunity	54.5
97	M15d	Vaccinium myrtillus subcommunity	53.5
98	M15b	typical subcommunity	56
98	M15	Scirpus cespitosus-Erica tetralix wet heath	55.4
98	M17	Scirpus cespitosus-Eriophorum vaginatum blanket mire	53
98	M15c	Cladonia subcommunity	51.4
98	M15d	Vaccinium myrtillus subcommunity	50.8
99	M15	Scirpus cespitosus-Erica tetralix wet heath	57.8
99	M15b	typical subcommunity	57.7
99	M15c	Cladonia subcommunity	54.3
99	M17	Scirpus cespitosus-Eriophorum vaginatum blanket mire	54
99	M17b	Cladonia subcommunity	53.5
100	M15a	Carex panicea subcommunity	55.4
100	M15	Scirpus cespitosus-Erica tetralix wet heath	53.2
100	M15b	typical subcommunity	53
100	M17a	Drosera rotundifolia-Sphagnum spp. subcommunity	52.8
100	M17	Scirpus cespitosus-Eriophorum vaginatum blanket mire	50

Annex 4:

Comparison of northern Ireland and GB grassland vegetation

Comparison of GB/NI Vegetation Types

1. Data sets

1.1. GB data set. This data consisted of 407, 200m^2 grassland quadrats (407) selected from ITE hyperclasses by R.G.H.Bunce. The quadrats coverered the same range of grassland land types in the NI land cover survey. The sample set was unbiased with frequency approximately proportional to land class area.

Table 1. Quadrat frequency in the main GB grassland hyperclasses (named by species frequency).

ITE Hyperclass (code/name)	Frequency
40 (Lolium/Trifolium/Cynosurus)	115
43 (Agrostis/Cerastium/Lolium)	47
29 (Lolium/Trifolium/Poa)	42
31 (Lolium/Trifolium/Cerastium)	34
30 (Lolium/Agrostis/Holcus)	28
56 (Trifolium/Holcus/Cynosurus)	26
51 (Holcus/Ranunculus)	22
52 (Plantago/Lotus/Achillea)	17
65 (Plantago/Festuca/Lotus)	11

1.2. NI data set. This data set consisted of 421, 200m^2 grassland quadrats randomly selected in proportion to the area of grassland land cover types. Grassland land cover types were: the agricultural grasslands types ryegrass (A08), mixed (A09) and other (A11); and the seminatural grasslands species-rich dry (S01), species-rich wet (S02), fen meadow (S65), bent-fescue hill pasture (S03) and calcareous grassland (S06).

2. Analysis strategy

Analysis was by presence/absence because in NI, Domin values were recorded at the 4m^2 quadrat scale. Nomenclature was standardised between the two data sets. Bare ground and total bryophyte cover were edited out of the GB data set. Species with five or more occurrences in each data set were retained for analysis. Classification was by TWINSPAN. Ordination was by DCA

2.1. Joint GB/NI classification

The stopping criteria for the classifications were: to the third level; or <30 quadrats in a group.

2.1.1. Land area proportional quadrat set (105 NI quadrats stratified by grassland land cover type; all 407 GB quadrats). Approximately 20% of the quadrats were from NI (ie. NI quadrats are over-represented in the classification). An area-proportional sample across GB and NI would have given few NI quadrats in the joint classification.

2.1.2. All quadrats. *Note*: each NI grassland land cover type was sampled to the same intensity, regardless of its area (ie. approximately the same number of quadrats were sampled from each land cover type)

2.2. Separate classifications of the GB and NI quadrats

Group centroids on a joint GB and NI data DCA ordination and a Wards dendrogram based on the first four DCA axes were used to display group relationships.

3. Results/conclusions

3.1. Joint land area proportional classification

The GB eutrophic grassland quadrats (group 1 on the dendrogram) and the GB upland grassland quadrats (group 6) form separate groups (Fig. 1). NI quadrats are a major element of group 2 but otherwise are distributed across all other groups.

The 120 quadrats in groups 1 and 2 are characterised by agriculturally preferred species. In this group, 38% are from NI ompared with an expected 20% if there were no hypothesised differences in grasslands between GB and NI.

Because of the area-proportional sample used, NI seminatural grassland are represented by only seven quadrats. These are distributed (not shown) in groups 3, 4 and 5, together with GB quadrats. This highlights the importance of sampling intensity in influencing the interpretation of vegetation data. Similarly, the quadrat composition of group 6 highlights the importance of the influence of landscape stratification for interpretation. The large area of hill land in GB compared with NI gives this vegetation a strong representation in the classification.

3.2 Classification of all quadrats

This classification (Fig. 2) emphasises NI seminatural grasslands ie. reflects the sampling strategy. Groups 1 and 2 represent GB and NI intensive grasslands respectively, with group 3 holding most of the remaining agricultural grasslands. With no hypothesised differences in grasslands between GB and NI, the expected proportion in each group is 50%. Groups 4-7 hold most of the NI species-rich (seminatural) grasslands, with group 5 predominantly representing NI species-rich wet grassland and fen meadow seminatural grasslands. Groups 4, 6 and 7 hold mainly NI seminatural grassland quadrats but have a high proportion of GB quadrats.

3.3 Separate NI/GB classifications

Centroids (Fig 3.) from these separate classifications plotted onto a joint DCA ordination, allow scrutiny of relationships between the vegetation recorded in the two sampling programmes. The first DCA axis is defined by the contrasting distributions of agriculturally preferred species and species of upland/wetland vegetation (Fig. 4). Axis two separates on species characteristic of mineral versus wet peaty soils.

GB centroids have consistently lower loadings on the second axis.

Fig. 1. Joint NI/GB grassland TWINSPAN classification (area-proportional)

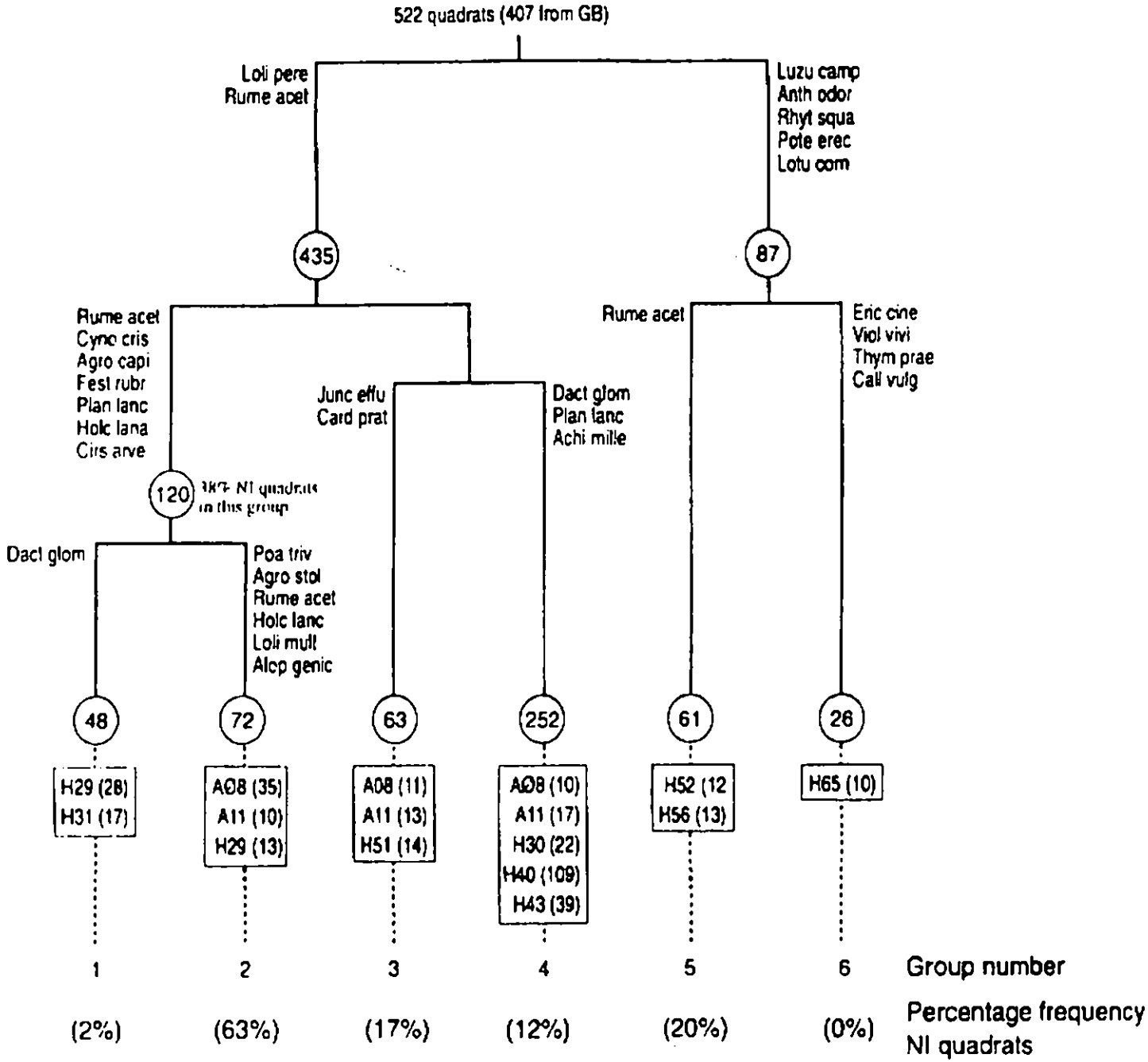


Fig 2. Joint NI/GB grassland TWINSPAN classification of all quadrats (828)

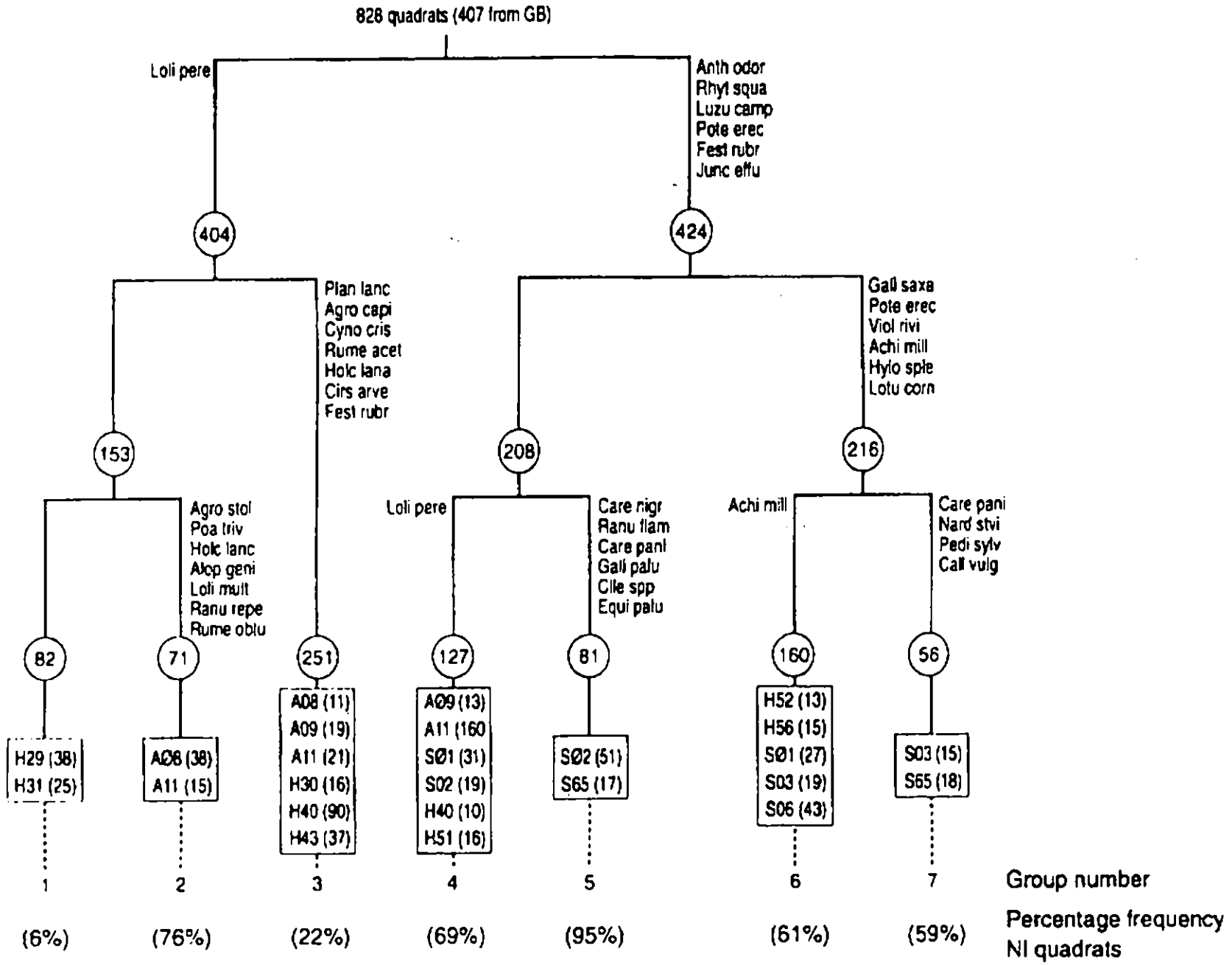
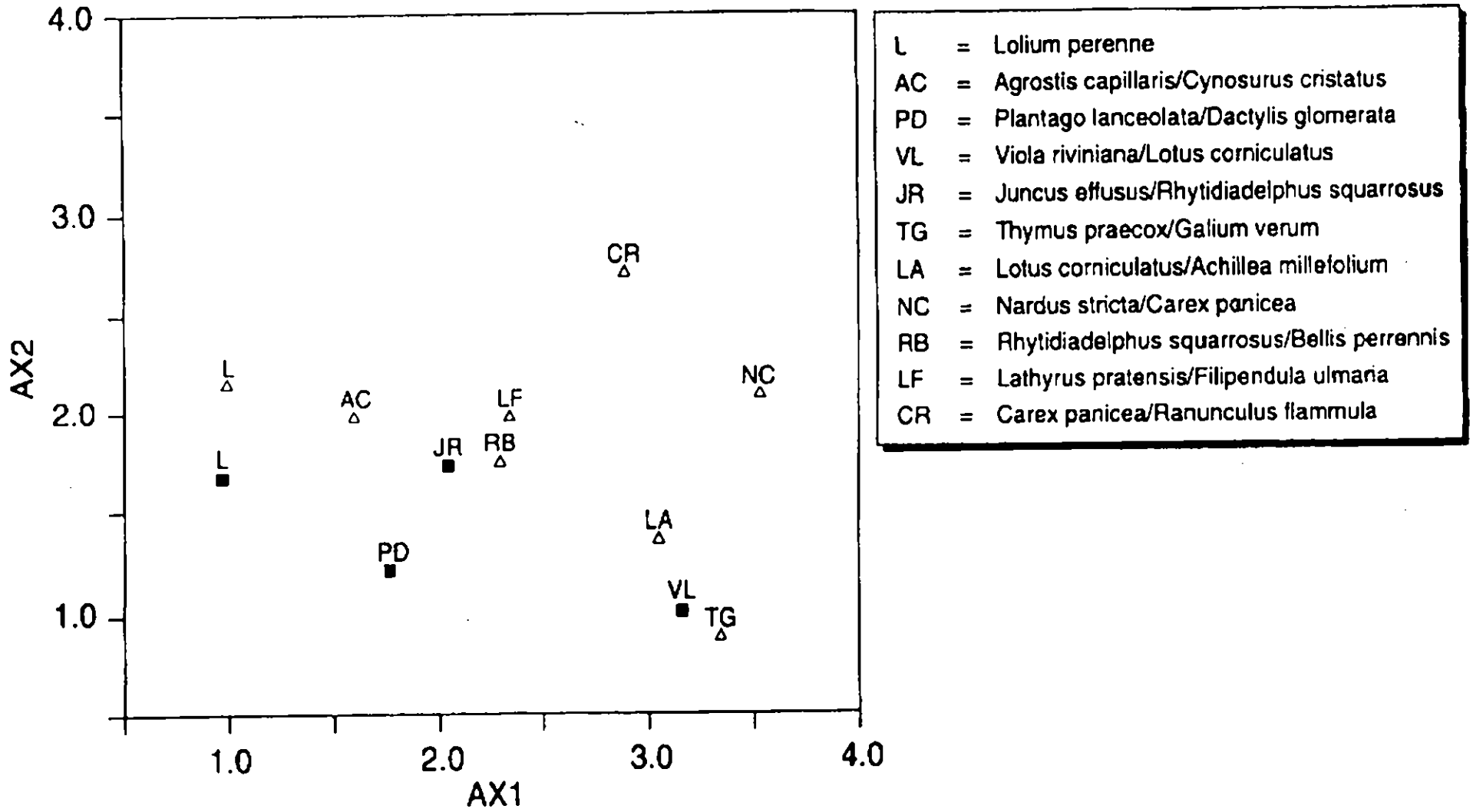


Fig. 3. Centroids of Northern Ireland (▵) and Great Britain (■) grassland classification groups plotted on a DCA ordination of all quadrats.



Annex 5:

Results of testing for change in cover (within-plot abundance) between 1978 and 1990 of individual species. Carried out using the Wilcoxon matched pairs test.

Changes in species cover where each species was recorded at >=5% cover in either 1978 or 1990.

Landscape	Aggregate class	Species name	Direction	Sig
AG	1	*Agrostis stolonifera*	+	*
AG	1	*Avena sativa*	-	**
AG	1	*Hordeum vulgare*	-	***
AG	1	*Matricaria matricarioides*	-	*
AG	1	*Solanum tuberosum*	-	*
AG	2	*Agrostis stolonifera*	+	*
AG	2	*Arrhenathrum elatius*	-	**
AG	2	*Elymus repens*	+	*
AG	2	*Festuca rubra*	+	**
AG	2	*Galium aparine*	+	***
AG	2	*Hedera helix*	+	**
AG	2	*Poa pratensis*	+	*
AG	2	*Potentilla reptans*	+	*
AG	2	*Sambucus nigra*	+	**
AG	3	*Alopecurus geniculatus*	-	**
AG	3	*Dactylis glomerata*	-	*
AG	3	*Festuca rubra*	+	*
AG	3	*Lolium perenne*	-	***
AG	3	*Rubus fruticosus*	+	*
AG	3	*Trifolium pratense*	-	*
AG	3	*Trifolium repens*	-	**
AG	4	*Alopecurus pratensis*	-	*
AG	4	*Galium aparine*	+	**
AG	4	*Ranunculus repens*	+	**
AG	4	*Urtica dioica*	+	**
AG	5	*Agrostis stolonifera*	+	**
AG	5	*Dactylis glomerata*	+	*
AG	5	*Elymus repens*	+	**
AG	5	*Galium aparine*	+	**
AG	5	*Hedera helix*	+	**
MA	4	*Agrostis stolonifera*	+	***
MA	4	*Dactylis glomerata*	-	*
MA	4	*Festuca ovina*	-	**
MA	4	*Festuca rubra*	+	*
MA	4	*Holcus lanatus*	+	**
MA	7	*Agrostis capillaris*	-	**
MA	7	*Festuca vivipara*	+	*
MA	7	*Trifolium repens*	+	*
MA	8	*Calluna vulgaris*	-	*
MA	8	*Trichophorum caespitosum*	-	*
PA	1	*Hordeum vulgare*	-	***
PA	1	*Lolium perenne*	+	**
PA	1	*Poa annua*	+	*
PA	1	*Trifolium repens*	+	**
PA	2	*Arrhenathrum elatius*	-	***
PA	2	*Bromus sterilis*	+	**

PA	2	*Galium aparine*	+	•
PA	2	*Hedera helix*	+	•••
PA	2	*Mercurialis perennis*	+	•
PA	2	*Rubus fruticosus*	+	•
PA	2	*Urtica dioica*	+	•
PA	3	*Agrostis stolonifera*	+	•
PA	3	*Cirsium arvense*	+	•
PA	3	*Festuca rubra*	+	••
PA	3	*Phleum pratense*	-	•••
PA	3	*Poa annua*	-	•••
PA	4	*Crataegus monogyna*	+	•
PA	4	*Festuca ovina*	-	•
PA	4	*Lolium perenne*	+	•
PA	4	*Phleum pratense*	-	•
PA	4	*Rumex acetosa*	+	•
PA	4	*Urtica dioica*	+	•
PA	5	*Agrostis stolonifera*	+	•
PA	5	*Crataegus monogyna*	+	•
PA	5	*Hedera helix*	+	••
PA	5	*Holcus mollis*	-	•
PA	5	*Lolium perenne*	+	•
PA	5	*Rubus fruticosus*	+	•
PA	6	*Agrostis capillaris*	-	•
PA	6	*Agrostis stolonifera*	+	•
PA	6	*Festuca ovina*	-	•
PA	6	*Quercus spp.*	+	•
PA	6	*Rubus fruticosus*	+	•
UP	6	*Galium saxatile*	+	•
UP	6	*Pteridium aquilinum*	-	•
UP	7	*Agrostis capillaris*	-	••
UP	7	*Danthonia decumbens*	-	•
UP	7	*Eriophorum angustifolium*	+	•
UP	7	*Festuca ovina*	-	•
UP	7	*Picea sitchensis*	+	••
UP	8	*Agrostis capillaris*	+	••
UP	8	*Agrostis vinealis*	+	••
UP	8	*Carex echinata*	+	•
UP	8	*Carex panicea*	+	•
UP	8	*Molinia caerulea*	-	•
UP	8	*Picea sitchensis*	+	••

Changes in species cover where each species was recorded at >=5% cover in either 1978 or 1990.

Landscape	Aggregate class	Plot type	Species name	Direction	Sig
AG	1	X	*Agrostis stolonifera*	+	*
AG	1	X	*Lolium perenne*	+	**
AG	2	H	*Arrhenathrum elatius*	-	*
AG	2	H	*Galium aparine*	+	***
AG	2	H	*Sambucus nigra*	+	*
AG	2	R	*Anthriscus sylvestris*	-	**
AG	2	R	*Arrhenathrum elatius*	-	*
AG	2	R	*Festuca rubra*	+	**
AG	2	S	*Galium aparine*	+	*
AG	3	R	*Ranunculus repens*	+	*
AG	3	X	*Alopecurus geniculatus*	-	*
AG	3	X	*Dactylis glomerata*	-	**
AG	3	X	*Lolium perenne*	-	***
AG	3	X	*Trifolium repens*	-	*
AG	4	S	*Galium aparine*	+	*
AG	4	X	*Alopecurus pratensis*	-	*
AG	4	X	*Trifolium repens*	-	*
AG	5	H	*Arrhenathrum elatius*	-	***
AG	5	H	*Corylus avellana*	-	**
AG	5	H	*Crataegus monogyna*	-	***
AG	5	H	*Fraxinus excelsior*	-	*
AG	5	H	*Hedera helix*	-	**
AG	5	H	*Prunus spinosa*	-	***
AG	5	H	*Sambucus nigra*	-	**
AG	5	H	*Urtica dioica*	-	***
MA	3	R	*Festuca rubra*	+	*
MA	3	R	*Poa annua*	-	*
MA	4	R	*Agrostis stolonifera*	+	**
MA	4	S	*Agrostis stolonifera*	+	*
MA	4	X	*Dactylis glomerata*	-	**
MA	4	X	*Festuca ovina*	-	**
MA	4	X	*Festuca rubra*	+	**
MA	4	X	*Ranunculus acris*	+	*
MA	4	X	*Trifolium repens*	+	*
MA	7	X	*Agrostis capillaris*	-	**
MA	7	X	*Holcus lanatus*	+	**
MA	8	X	*Calluna vulgaris*	-	*
MA	8	X	*Empetrum nigrum*	-	**
MA	8	X	*Nardus stricta*	+	*
PA	1	X	*Lolium perenne*	+	***
PA	1	X	*Poa annua*	+	*
PA	2	H	*Agrostis stolonifera*	+	*
PA	2	H	*Galium aparine*	+	**

PA	2	H	*Hedera helix*	+	••
PA	2	H	*Urtica dioica*	+	•
PA	2	R	*Arrhenathrum elatius*	-	•••
PA	2	R	*Bromus sterilis*	+	••
PA	3	R	*Festuca rubra*	+	•
PA	3	R	*Potentilla reptans*	+	•
PA	3	X	*Agrostis stolonifera*	+	•
PA	3	X	*Cirsium arvense*	+	••
PA	3	X	*Cynosurus cristatus*	+	•
PA	3	X	*Poa annua*	-	••
PA	4	R	*Agrostis stolonifera*	+	•
PA	4	R	*Festuca rubra*	+	•
PA	4	S	*Dactylis glomerata*	+	•
PA	4	S	*Juncus effusus*	-	••
PA	4	X	*Agrostis stolonifera*	+	•
PA	4	X	*Lolium perenne*	+	••
PA	4	X	*Rumex acetosa*	+	•
PA	5	H	*Cirsium arvense*	+	•
PA	5	H	*Corylus avellana*	-	•
PA	5	H	*Crataegus monogyna*	+	•
PA	5	H	*Hedera helix*	+	•••
PA	6	S	*Juncus effusus*	-	•
UP	6	X	*Festuca ovina*	-	•
UP	7	S	*Agrostis capillaris*	-	•
UP	7	X	*Danthonia decumbens*	-	•
UP	7	X	*Juncus effusus*	-	•
UP	7	X	*Potentilla erecta*	+	•
UP	8	X	*Agrostis capillaris*	+	•••
UP	8	X	*Molinia caerulea*	-	•

Changes in species cover where each species was recorded at >=5% cover in either 1978 or 1990.

Aggregate class	Plot type	Species name	Direction	Sig
1	X	*Agrostis stolonifera*	+	***
1	X	*Lolium perenne*	+	***
1	X	*Matricaria matricarioides*	-	**
1	X	*Trifolium repens*	+	**
2	H	*Agrostis stolonifera*	+	**
2	H	*Arrhenathrum elatius*	-	*
2	H	*Bromus sterilis*	+	*
2	H	*Festuca rubra*	+	*
2	H	*Galium aparine*	+	***
2	H	*Hedera helix*	+	***
2	R	*Anthriscus sylvestris*	-	*
2	R	*Arrhenathrum elatius*	-	***
2	R	*Festuca rubra*	+	*
2	R	*Holcus lanatus*	-	*
2	S	*Cirsium arvense*	+	*
2	S	*Galium aparine*	+	**
2	S	*Holcus lanatus*	+	*
3	R	*Agrostis stolonifera*	+	*
3	R	*Festuca rubra*	+	***
3	R	*Lolium perenne*	-	*
3	R	*Potentilla reptans*	+	**
3	R	*Ranunculus repens*	+	**
3	X	*Agrostis capillaris*	+	*
3	X	*Agrostis stolonifera*	+	*
3	X	*Alopecurus geniculatus*	-	**
3	X	*Cirsium arvense*	+	***
3	X	*Dactylis glomerata*	-	**
3	X	*Lolium perenne*	-	***
3	X	*Poa annua*	-	*
4	H	*Agrostis stolonifera*	+	*
4	H	*Crataegus monogyna*	+	*
4	R	*Agrostis stolonifera*	+	***
4	R	*Festuca ovina*	-	*
4	R	*Festuca rubra*	+	**
4	S	*Galium aparine*	+	*
4	S	*Urtica dioica*	+	*
4	X	*Agrostis stolonifera*	+	**
4	X	*Festuca ovina*	-	**
4	X	*Lolium perenne*	+	**
5	H	*Bromus sterilis*	+	*
5	H	*Cirsium arvense*	+	*
5	H	*Corylus avellana*	-	**
5	H	*Dactylis glomerata*	+	*
5	H	*Festuca rubra*	+	**
5	H	*Galium aparine*	+	***

5	H	*Glechoma hederacea*	+	•
5	H	*Hedera helix*	+	•••
5	H	*Lolium perenne*	+	•
5	H	*Prunus spinosa*	+	•
6	S	*Agrostis stolonifera*	+	•
6	S	*Festuca rubra*	+	•
6	S	*Juncus effusus*	-	•
7	S	*Agrostis capillaris*	-	••
7	X	*Agrostis capillaris*	-	•
7	X	*Anthoxanthum odoratum*	+	•
7	X	*Carex panicea*	+	•
7	X	*Danthonia decumbens*	-	•
7	X	*Deschampsia flexuosa*	-	•
7	X	*Festuca vivipara*	+	•
7	X	*Holcus lanatus*	+	•••
7	X	*Lolium perenne*	+	•
7	X	*Pteridium aquilinum*	+	•
7	X	*Trifolium repens*	+	•
8	X	*Agrostis capillaris*	+	••
8	X	*Carex panicea*	+	•
8	X	*Galium saxatile*	+	•
8	X	*Holcus lanatus*	+	•
8	X	*Molinia caerulea*	-	••

Changes in species cover where each species was recorded at >=5% cover in either 1978 or 1990. Using plots that remained in the same aggregate class between years.

Aggregate class	Landcsape	Plot type	Species	Change	Sig
1	GB	X	*Matricaria matricarioides*	-	•
2	GB	S	*Epilobium hirsutum*	+	••
2	GB	S	*Galium aparine*	+	•
2	GB	R	*Anthriscus sylvestris*	-	•
2	GB	R	*Arrhenathrum elatius*	-	••
2	GB	R	*Festuca rubra*	+	•
2	GB	R	*Hedera helix*	+	•
2	GB	R	*Holcus lanatus*	-	•
3	GB	R	*Agrostis capillaris*	-	•
3	GB	R	*Festuca rubra*	+	••
3	GB	R	*Plantago major*	+	•
3	GB	R	*Potentilla reptans*	+	•
3	GB	R	*Ranunculus repens*	+	•
3	GB	X	*Cirsium arvense*	+	•
4	GB	R	*Festuca rubra*	+	••
4	GB	X	*Agrostis stolonifera*	+	••
4	GB	X	*Festuca ovina*	-	•
4	GB	X	*Festuca rubra*	+	•
4	GB	X	*Lolium perenne*	+	•
4	GB	X	*Ranunculus acris*	+	•
5	GB	H	*Bromus sterilis*	+	••
5	GB	H	*Galium aparine*	+	•••
5	GB	H	*Hedera helix*	+	•••
5	GB	H	*Prunus spinosa*	+	•••
7	GB	X	*Agrostis capillaris*	-	•
7	GB	X	*Anthoxanthum odoratum*	+	•
7	GB	X	*Holcus lanatus*	+	••
7	GB	X	*Potentilla erecta*	+	•
8	GB	X	*Hylocomium splendens*	+	•••
8	GB	X	*Pleurozium schreberi*	+	••
8	GB	X	*Racomitrium lanuginosum*	+	•
8	GB	X	*Rhytidiadelphus loreus*	+	•••

Changes in species cover where each species was recorded at >=5% cover in either 1978 or 1990. Using plots that remained in the same aggregate class between years.

Landscape	Aggregate class	Plot type	Species	Direction	Sig
AG	2	H	*Galium aparine*	+	*
AG	2	R	*Anthriscus sylvestris*	-	*
AG	2	R	*Festuca rubra*	+	*
AG	4	X	*Agrostis stolonifera*	+	*
AG	4	X	*Trifolium repens*	-	*
AG	5	H	*Bromus sterilis*	+	*
AG	5	H	*Galium aparine*	+	**
AG	5	H	*Hedera helix*	+	*
MA	4	R	*Festuca rubra*	+	*
MA	4	R	*Holcus lanatus*	+	*
MA	4	X	*Dactylis glomerata*	-	*
MA	4	X	*Festuca ovina*	-	**
MA	4	X	*Festuca rubra*	+	**
MA	4	X	*Holcus lanatus*	+	*
MA	4	X	*Poa pratensis*	-	*
MA	4	X	*Ranunculus acris*	+	*
MA	4	X	*Trifolium repens*	+	**
MA	7	X	*Agrostis capillaris*	-	*
MA	7	X	*Holcus lanatus*	+	**
PA	3	X	*Poa annua*	-	**
PA	4	X	*Agrostis stolonifera*	+	*
PA	4	X	*Lolium perenne*	+	*
PA	4	X	*Rumex acetosa*	+	**
UP	7	X	*Agrostis capillaris*	-	*
UP	7	X	*Holcus lanatus*	+	**

Annex 6:

Results of testing for change in frequency (between-plot abundance) between 1978 and 1990 of individual species Computed by McNemar chi-square tests for dependent data in 2-way contingency tables.

Changes in species frequency between 1978 and 1990.

Aggregate class	Species name	Direction	Sig
1	*Agrostis stolonifera*	+	**
1	*Avena fatua*	-	**
1	*Capsella bursa-pastoris*	-	**
1	*Convolvulus arvensis*	-	*
1	*Elymus repens*	+	*
1	*Fallopia convolvulus*	-	**
1	*Galium aparine*	+	**
1	*Hordeum vulgare*	-	**
1	*Lamium purpureum*	-	**
1	*Matricaria matricarioides*	-	**
1	*Myosotis spp.*	-	**
1	*Poa annua*	-	**
1	*Polygonum aviculare*	-	**
1	*Polygonum persicaria*	-	**
1	*Ranunculus repens*	+	*
1	*Senecio vulgaris*	-	**
1	*Stellaria media*	-	**
1	*Veronica arvensis*	-	**
1	*Veronica persica*	-	**
1	*Viola arvensis*	-	*
2	*Alliaria petiolata*	-	**
2	*Anthriscus sylvestris*	-	**
2	*Arrhenathrum elatius*	-	**
2	*Bromus sterilis*	+	**
2	*Cirsium vulgare*	-	**
2	*Crataegus monogyna*	-	**
2	*Dactylis glomerata*	-	**
2	*Epilobium hirsutum*	-	*
2	*Festuca rubra*	+	*
2	*Filipendula ulmaria*	-	**
2	*Galium aparine*	-	**
2	*Glechoma hederacea*	-	**
2	*Heracleum sphondylium*	-	**
2	*Holcus lanatus*	-	**
2	*Holcus mollis*	-	**
2	*Lamium album*	-	**
2	*Poa pratensis*	-	*
2	*Polygonum aviculare*	+	**
2	*Rosa spp.*	-	**
2	*Rumex obtusifolius*	-	**
2	*Silene dioica*	-	*
2	*Stellaria media*	-	*
2	*Urtica dioica*	-	**
3	*Achillea millefolium*	-	**
3	*Anthriscus sylvestris*	+	**
3	*Arrhenathrum elatius*	+	**
3	*Bellis perennis*	-	**
3	*Cerastium fontanum*	-	**
3	*Cirsium vulgare*	-	**
3	*Dactylis glomerata*	-	**
3	*Elymus repens*	+	**
3	*Lolium multiflorum*	-	**
3	*Lolium perenne*	-	**
3	*Matricaria matricarioides*	-	**

3	*Phleum pratense*	-	••
3	*Plantago lanceolata*	-	••
3	*Plantago major*	-	••
3	*Poa annua*	-	••
3	*Poa pratensis*	-	••
3	*Polygonum aviculare*	-	••
3	*Potentilla reptans*	-	••
3	*Ranunculus repens*	-	••
3	*Rumex acetosa*	+	••
3	*Rumex crispus*	-	••
3	*Rumex obtusifolius*	-	••
3	*Stellaria media*	-	••
3	*Taraxacum agg.*	-	••
3	*Trifolium pratense*	-	••
3	*Trifolium repens*	-	••
3	*Urtica dioica*	+	••
4	*Achillea millefolium*	-	••
4	*Agrostis capillaris*	-	••
4	*Agrostis stolonifera*	+	••
4	*Anthoxanthum odoratum*	-	••
4	*Bellis perennis*	-	••
4	*Cardamine pratensis*	-	••
4	*Centaurea nigra*	-	••
4	*Cerastium fontanum*	-	••
4	*Cirsium palustre*	-	••
4	*Cirsium vulgare*	-	••
4	*Cynosurus cristatus*	-	••
4	*Dactylis glomerata*	-	••
4	*Festuca ovina*	-	••
4	*Festuca rubra*	-	•
4	*Galium saxatile*	+	•
4	*Holcus lanatus*	-	••
4	*Holcus mollis*	-	••
4	*Lathyrus pratensis*	-	••
4	*Lolium perenne*	-	••
4	*Lotus corniculatus*	-	••
4	*Phleum pratense*	-	••
4	*Plantago lanceolata*	-	••
4	*Plantago major*	-	••
4	*Poa annua*	-	••
4	*Prunella vulgaris*	-	••
4	*Ranunculus acris*	-	••
4	*Ranunculus repens*	-	••
4	*Rubus fruticosus*	+	••
4	*Rumex acetosa*	-	••
4	*Rumex acetosella*	-	••
4	*Rumex crispus*	-	•
4	*Senecio jacobaea*	-	••
4	*Stellaria media*	+	••
4	*Taraxacum agg.*	-	••
4	*Trifolium pratense*	-	••
4	*Trifolium repens*	-	••
4	*Urtica dioica*	+	••
4	*Veronica chamaedrys*	-	••
4	*Veronica serpyllifolia*	-	••
5	*Acer pseudoplatanus*	-	••
5	*Agrostis stolonifera*	+	••
5	*Alliaria petiolata*	-	•

5	*Arrhenathrum elatius*	-	**
5	*Arum maculatum*	-	**
5	*Brachypodium sylvaticum*	-	**
5	*Bromus sterilis*	+	*
5	*Cirsium arvense*	+	**
5	*Corylus avellana*	-	**
5	*Crataegus monogyna*	-	**
5	*Dactylis glomerata*	+	**
5	*Dryopteris filix-mas*	-	**
5	*Elymus repens*	+	**
5	*Fraxinus excelsior*	-	**
5	*Galium aparine*	-	**
5	*Geranium robertianum*	-	*
5	*Geum urbanum*	-	**
5	*Glechoma hederacea*	-	**
5	*Hedera helix*	-	**
5	*Heracleum sphondylium*	-	**
5	*Holcus lanatus*	+	**
5	*Holcus mollis*	-	**
5	*Hyacinthoides non-scripta*	-	**
5	*Ilex aquifolium*	-	**
5	*Lonicera periclymenum*	-	**
5	*Mercurialis perennis*	-	**
5	*Prunus spinosa*	-	**
5	*Rosa spp.*	-	**
5	*Rubus fruticosus*	-	**
5	*Sambucus nigra*	-	**
5	*Silene dioica*	-	**
5	*Tamus communis*	-	**
5	*Urtica dioica*	-	**
6	*Acer pseudoplatanus*	-	*
6	*Agrostis canina*	-	**
6	*Agrostis capillaris*	-	**
6	*Agrostis stolonifera*	+	**
6	*Athyrium filix-femina*	-	**
6	*Betula spp.*	-	**
6	*Blechnum spicant*	-	**
6	*Calluna vulgaris*	-	*
6	*Chrysosplenium oppositifolium*	-	**
6	*Cirsium palustre*	-	*
6	*Dactylis glomerata*	+	**
6	*Deschampsia cespitosa*	-	*
6	*Deschampsia flexuosa*	-	**
6	*Digitalis purpurea*	-	**
6	*Dryopteris filix-mas*	-	**
6	*Epilobium spp.*	-	**
6	*Erica cinerea*	-	**
6	*Festuca ovina*	-	**
6	*Filipendula ulmaria*	-	**
6	*Galium saxatile*	-	**
6	*Holcus lanatus*	-	*
6	*Holcus mollis*	-	*
6	*Hyacinthoides non-scripta*	-	**
6	*Hypericum pulchrum*	-	**
6	*Lysimachia nemorum*	-	**
6	*Molinia caerulea*	-	*
6	*Oxalis acetosella*	-	**
6	*Picea sitchensis*	-	*
6	*Primula vulgaris*	-	**

6	*Quercus spp.*	-	•
6	*Rubus fruticosus*	-	•
6	*Rumex acetosella*	-	•
6	*Sorbus aucuparia*	-	••
6	*Succisa pratensis*	-	•
6	*Teucrium scorodonia*	-	••
7	*Achillea millefolium*	-	••
7	*Agrostis canina*	-	••
7	*Agrostis capillaris*	-	••
7	*Agrostis stolonifera*	+	••
7	*Agrostis vinealis*	+	••
7	*Anthoxanthum odoratum*	-	••
7	*Blechnum spicant*	-	••
7	*Calluna vulgaris*	-	••
7	*Carex binervis*	+	••
7	*Carex demissa*	+	•
7	*Cirsium palustre*	-	•
7	*Danthonia decumbens*	-	••
7	*Erica tetralix*	+	••
7	*Eriophorum angustifolium*	+	••
7	*Festuca ovina*	-	••
7	*Galium saxatile*	-	••
7	*Juncus effusus*	-	••
7	*Juncus squarrosus*	-	••
7	*Lotus corniculatus*	-	••
7	*Molinia caerulea*	-	••
7	*Nardus stricta*	-	••
7	*Plantago lanceolata*	-	••
7	*Potentilla erecta*	-	••
7	*Prunella vulgaris*	-	•
7	*Ranunculus acris*	-	••
7	*Rumex acetosella*	-	••
7	*Veronica officinalis*	-	••
8	*Agrostis canina*	-	••
8	*Agrostis capillaris*	+	••
8	*Anthoxanthum odoratum*	+	••
8	*Calluna vulgaris*	-	••
8	*Carex binervis*	+	••
8	*Carex nigra*	+	•
8	*Carex panicea*	+	•
8	*Dactylorhiza maculata*	-	••
8	*Drosera rotundifolia*	-	••
8	*Empetrum nigrum*	-	•
8	*Erica cinerea*	-	••
8	*Erica tetralix*	-	••
8	*Eriophorum angustifolium*	-	••
8	*Festuca vivipara*	+	•
8	*Galium saxatile*	+	•
8	*Juncus effusus*	+	••
8	*Juncus squarrosus*	-	•
8	*Myrica gale*	-	••
8	*Narthecium ossifragum*	-	••
8	*Pinguicula vulgaris*	-	•
8	*Succisa pratensis*	+	••
8	*Trichophorum caespitosum*	-	••
8	*Vaccinium myrtillus*	-	••
8	*Viola palustris*	+	••

Changes in species frequency between 1978 and 1990.

Landscape	Aggregate class	Species name	Direction	Sig
AG	1	*Convolvulus arvensis*	-	**
AG	1	*Elymus repens*	-	*
AG	1	*Hordeum vulgare*	-	**
AG	1	*Matricaria matricarioides*	-	**
AG	1	*Poa annua*	-	**
AG	1	*Polygonum aviculare*	-	**
AG	1	*Polygonum persicaria*	-	**
AG	1	*Stellaria media*	-	**
AG	1	*Veronica persica*	-	**
AG	2	*Festuca rubra*	+	*
AG	3	*Cerastium fontanum*	-	**
AG	3	*Dactylis glomerata*	-	*
AG	3	*Holcus lanatus*	-	*
AG	3	*Lolium perenne*	-	**
AG	3	*Phleum pratense*	-	*
AG	3	*Plantago major*	-	*
AG	3	*Poa annua*	-	**
AG	3	*Ranunculus repens*	-	**
AG	3	*Rumex obtusifolius*	-	*
AG	3	*Trifolium repens*	-	**
AG	4	*Agrostis capillaris*	-	*
AG	4	*Cerastium fontanum*	-	**
AG	4	*Plantago lanceolata*	-	*
AG	5	*Bromus sterilis*	+	**
AG	5	*Elymus repens*	+	**
MA	4	*Bellis perennis*	-	*
MA	4	*Festuca rubra*	+	*
MA	4	*Plantago lanceolata*	-	**
MA	4	*Ranunculus repens*	-	**
MA	7	*Nardus stricta*	-	*
PA	1	*Hordeum vulgare*	-	**
PA	1	*Matricaria matricarioides*	-	**
PA	1	*Polygonum aviculare*	-	**
PA	1	*Stellaria media*	-	**
PA	2	*Elymus repens*	+	*
PA	2	*Heracleum sphondylium*	-	*
PA	2	*Rumex obtusifolius*	-	*
PA	3	*Agrostis stolonifera*	+	**
PA	3	*Elymus repens*	+	*
PA	3	*Lolium perenne*	-	**
PA	3	*Poa annua*	-	**
PA	3	*Stellaria media*	-	*
PA	3	*Trifolium repens*	-	**
PA	4	*Achillea millefolium*	-	*
PA	4	*Agrostis capillaris*	-	**
PA	4	*Bellis perennis*	-	**
PA	4	*Centaurea nigra*	-	**

PA	4	*Cerastium fontanum*	-	••
PA	4	*Cynosurus cristatus*	-	••
PA	4	*Holcus lanatus*	-	••
PA	4	*Lotus corniculatus*	-	••
PA	4	*Phleum pratense*	-	••
PA	4	*Plantago lanceolata*	-	••
PA	4	*Plantago major*	-	•
PA	4	*Prunella vulgaris*	-	••
PA	4	*Ranunculus repens*	-	••
PA	4	*Taraxacum agg.*	-	•
PA	4	*Trifolium pratense*	-	••
PA	4	*Trifolium repens*	-	••
PA	5	*Arrhenathrum elatius*	-	•
PA	5	*Elymus repens*	+	••
PA	6	*Agrostis capillaris*	-	••
PA	6	*Agrostis stolonifera*	+	•
PA	6	*Athyrium filix-femina*	-	•
PA	6	*Digitalis purpurea*	-	•
UP	6	*Holcus lanatus*	-	•
UP	7	*Agrostis capillaris*	-	••
UP	7	*Anthoxanthum odoratum*	-	••
UP	7	*Carex binervis*	+	•
UP	7	*Eriophorum angustifolium*	+	•
UP	7	*Festuca ovina*	-	••
UP	7	*Galium saxatile*	-	••
UP	7	*Juncus squarrosus*	-	•
UP	7	*Plantago lanceolata*	-	••
UP	8	*Agrostis canina*	-	•
UP	8	*Agrostis capillaris*	+	••
UP	8	*Calluna vulgaris*	-	••
UP	8	*Carex binervis*	+	••
UP	8	*Carex panicea*	+	•
UP	8	*Dactylorhiza maculata agg.*	-	•
UP	8	*Erica tetralix*	-	••
UP	8	*Eriophorum angustifolium*	-	•
UP	8	*Juncus bulbosus*	+	••
UP	8	*Succisa pratensis*	+	•
UP	8	*Trichophorum caespitosum*	-	•

Changes in species frequency between 1978 and 1990.

Aggregate class	Plot type	Species name	Direction	Sig
1	X	*Avena fatua*	-	*
1	X	*Convolvulus arvensis*	-	**
1	X	*Elymus repens*	-	**
1	X	*Hordeum vulgare*	-	**
1	X	*Lamium purpureum*	-	**
1	X	*Matricaria matricarioides*	-	**
1	X	*Poa annua*	-	**
1	X	*Polygonum aviculare*	-	**
1	X	*Polygonum persicaria*	-	**
1	X	*Stellaria media*	-	**
1	X	*Trifolium repens*	+	*
1	X	*Veronica arvensis*	-	*
1	X	*Veronica persica*	-	**
2	H	*Bromus sterilis*	+	**
2	H	*Cirsium vulgare*	-	**
2	H	*Dactylis glomerata*	-	*
2	H	*Elymus repens*	+	*
2	H	*Hedera helix*	+	**
2	H	*Lolium perenne*	-	*
2	R	*Anthriscus sylvestris*	+	*
2	R	*Bromus sterilis*	+	*
2	R	*Elymus repens*	+	*
2	R	*Lolium perenne*	+	*
2	R	*Ranunculus repens*	+	**
2	R	*Rubus fruticosus*	+	*
2	R	*Sonchus oleraceus*	+	**
2	R	*Taraxacum agg.*	+	*
2	R	*Trifolium repens*	+	*
3	R	*Anthriscus sylvestris*	+	**
3	R	*Cerastium fontanum*	-	**
3	R	*Cirsium vulgare*	-	**
3	R	*Elymus repens*	+	*
3	R	*Festuca rubra*	+	**
3	R	*Lolium perenne*	-	**
3	R	*Matricaria matricarioides*	-	**
3	R	*Poa annua*	-	*
3	R	*Potentilla anserina*	-	**
3	R	*Trifolium repens*	-	**
3	S	*Poa annua*	-	*
3	X	*Agrostis capillaris*	+	*
3	X	*Bellis perennis*	-	*
3	X	*Cynosurus cristatus*	+	*
3	X	*Dactylis glomerata*	-	*
3	X	*Lolium perenne*	-	**
3	X	*Matricaria matricarioides*	-	*
3	X	*Phleum pratense*	-	**
3	X	*Plantago major*	-	**
3	X	*Poa annua*	-	**
3	X	*Ranunculus repens*	-	**
3	X	*Stellaria media*	-	**
3	X	*Trifolium pratense*	-	*
3	X	*Trifolium repens*	-	**

4	H	*Agrostis capillaris*	-	••
4	R	*Agrostis stolonifera*	+	••
4	R	*Matricaria matricarioides*	-	••
4	R	*Plantago lanceolata*	-	•
4	R	*Rumex obtusifolius*	+	•
4	S	*Ajuga reptans*	-	•
4	S	*Cardamine pratensis*	-	•
4	S	*Centaurea nigra*	-	•
4	S	*Cerastium fontanum*	-	•
4	S	*Lathyrus pratensis*	-	••
4	S	*Plantago lanceolata*	-	•
4	S	*Prunella vulgaris*	-	••
4	S	*Ranunculus repens*	-	••
4	S	*Trifolium repens*	-	•
4	S	*Urtica dioica*	+	•
4	X	*Agrostis capillaris*	-	••
4	X	*Agrostis stolonifera*	+	•
4	X	*Bellis perennis*	-	••
4	X	*Centaurea nigra*	-	•
4	X	*Cerastium fontanum*	-	••
4	X	*Cirsium palustre*	-	•
4	X	*Cynosurus cristatus*	-	••
4	X	*Festuca ovina*	-	•
4	X	*Holcus lanatus*	-	••
4	X	*Lathyrus pratensis*	-	••
4	X	*Lotus corniculatus*	-	•
4	X	*Phleum pratense*	-	••
4	X	*Plantago lanceolata*	-	••
4	X	*Poa pratensis*	-	•
4	X	*Ranunculus repens*	-	••
4	X	*Rumex acetosa*	-	•
4	X	*Rumex acetosella*	-	•
4	X	*Stellaria media*	+	•
4	X	*Taraxacum agg.*	-	••
4	X	*Trifolium pratense*	-	••
4	X	*Trifolium repens*	-	••
4	X	*Veronica chamaedrys*	-	••
5	H	*Agrostis stolonifera*	+	••
5	H	*Arum maculatum*	-	••
5	H	*Bromus sterilis*	+	••
5	H	*Elymus repens*	+	••
5	H	*Galium aparine*	+	•
5	H	*Heracleum sphondylium*	-	•
5	X	*Agrostis stolonifera*	+	••
6	S	*Agrostis stolonifera*	+	•
6	S	*Athyrium filix-femina*	-	•
6	S	*Filipendula ulmaria*	-	•
6	X	*Agrostis canina*	-	•
6	X	*Agrostis capillaris*	-	••
6	X	*Festuca ovina*	-	••
6	X	*Holcus lanatus*	-	••
6	X	*Juncus effusus*	+	•
6	X	*Rumex acetosella*	-	••

7	S	*Agrostis capillaris*	-	•
7	S	*Blechnum spicant*	-	•
7	S	*Danthonia decumbens*	-	•
7	S	*Festuca ovina*	-	••
7	S	*Galium saxatile*	-	••
7	S	*Nardus stricta*	-	•
7	S	*Oreopteris limbosperma*	-	•
7	S	*Plantago lanceolata*	-	••
7	S	*Ranunculus acris*	-	•
7	S	*Rumex acetosella*	-	•
7	X	*Agrostis canina*	-	•
7	X	*Agrostis stolonifera*	+	•
7	X	*Agrostis vinealis*	+	••
7	X	*Aira praecox*	+	••
7	X	*Carex binervis*	+	•
7	X	*Dactylorhiza maculata*	6	0
7	X	*Festuca ovina*	-	••
7	X	*Galium saxatile*	-	••
7	X	*Narthecium ossifragum*	+	•
7	X	*Pedicularis sylvatica*	+	••
7	X	*Poa pratensis*	-	••
7	X	*Succisa pratensis*	+	••
8	S	*Agrostis canina*	-	••
8	S	*Erica tetralix*	-	•
8	X	*Agrostis capillaris*	+	•
8	X	*Calluna vulgaris*	-	••
8	X	*Carex binervis*	+	••
8	X	*Carex panicea*	+	•
8	X	*Dactylorhiza maculata*	-	•
8	X	*Erica tetralix*	-	••
8	X	*Festuca vivipara*	+	•
8	X	*Succisa pratensis*	+	•
8	X	*Trichophorum caespitosum*	-	••

Annex 7:

Results of testing for change in total cover and richness of each species group between 1978 and 1990. Carried out using the Wilcoxon matched pairs test.

Changes in total species count per species group between 1978 and 1990.
1978 or 1990. Using plots that may have moved aggregate class between years.

Aggregate class	Landscape	Plot type	Species group	Change	Sig
1	GB	X	Crops or crop edge plants on brown earth soils	-	•••
1	GB	X	Grassland wood edge or scrub plants on brown earths	+	••
1	GB	X	Water edge plants on wet alluvial soils	-	•••
2	GB	H	Grassland or tall grassland plants on brown earth soils	-	••
2	GB	H	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	••
2	GB	H	Grassland, tall grassland plants on wood edges on variable soils	-	•
2	GB	S	Grassland wood edge or scrub plants on brown earths	+	•
2	GB	R	Crops, crop edge or grassland on eutrophic soils	+	•
2	GB	R	Grassland or tall grassland plants on brown earth soils	+	•
2	GB	R	Grassland wood edge or scrub plants on brown earths	+	••
2	GB	R	Wood or wood edge plants on damp fertile brown earths	-	•
3	GB	R	Tall grassland plants on damp gleyed brown earths	-	•
3	GB	R	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	+	•••
3	GB	R	Woods, tall grasslands or wood edge plants on brown earth soils	+	•
3	GB	X	Crop or crop edge plants on fertile soils	+	•••
3	GB	X	Grassland or tall grassland plants on brown earth soils	-	•••
3	GB	X	Grassland or wood edge plants on acid or brown podzolic soils	+	•
3	GB	X	Water edge or aquatic plants on hydromorphic soils	-	•
3	GB	X	Wood or wood edge plants on calcareous or neutral brown earths	+	•
4	GB	R	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	•
4	GB	R	Wood or wood edge plants on damp fertile brown earths	+	•
4	GB	X	Crop or crop edge plants on fertile soils	+	••
4	GB	X	Crops or crop edge plants on brown earth soils	+	•
4	GB	X	Grassland or tall grassland plants on brown earth soils	-	••
4	GB	X	Grassland or wood edge plants on acid or brown podzolic soils	-	•
4	GB	X	Grassland plants on brown earths, often skeletal and calcareous	-	•
4	GB	X	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	•••
4	GB	X	Grassland wood edge or scrub plants on brown earths	-	•••
4	GB	X	Moorland plants on wet peaty gley soils	+	•
4	GB	X	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	-	•••
4	GB	S	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	•
4	GB	S	Grassland wood edge or scrub plants on brown earths	-	•••
4	GB	S	Marsh, wood edge or woodland plants on wet gleyed brown earths	-	•
4	GB	S	Water edge or aquatic plants on hydromorphic soils	-	•
4	GB	S	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	+	••
4	GB	S	Wood or wood edge plants on calcareous or neutral brown earths	+	••
4	GB	S	Woodland or wood edge plants on brown earth soils	+	•
4	GB	S	Woods, tall grasslands or wood edge plants on brown earth soils	+	••
4	GB	H	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	•
4	GB	H	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	-	•
4	GB	H	Woodland or wood edge plants on brown earth soils	+	•
5	GB	H	Crop or crop edge plants on fertile soils	+	•
5	GB	H	Woodland or wood edge plants on brown earth soils	-	•
5	GB	H	Woods, tall grasslands or wood edge plants on brown earth soils	-	•
6	GB	S	Marsh, wood edge or woodland plants on wet gleyed brown earths	-	••
6	GB	S	Wood or wood edge plants on damp fertile brown earths	-	•
6	GB	S	Woodland or wood edge plants on brown earth soils	-	•
6	GB	S	Woodland or woodland edge plants on acid brown earths	-	••
7	GB	S	Bog, water edge or aquatic plant on peaty soils	-	••
7	GB	S	Grassland marsh or water edge plants on moist brown earth or gleyed soils	-	••
7	GB	S	Grassland or wood edge plants on acid or brown podzolic soils	-	••
7	GB	S	Moorland or grassland plants on gley or peaty podzolic soils	-	•
7	GB	S	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	-	•••
7	GB	X	Bog or heath plants on deep, raw peat soils	+	••
7	GB	X	Bog, water edge or aquatic plant on peaty soils	+	•
7	GB	X	Grassland or wood edge plants on acid or brown podzolic soils	-	•
7	GB	X	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	••
8	GB	X	Grassland plants on calcareous brown earths	-	•••
8	GB	X	Grassland wood edge or scrub plants on brown earths	+	•••
8	GB	X	Heath or moorland plants on podzols or brown podzolic soils	-	•••
8	GB	X	Moorland or grassland plants on gley or peaty podzolic soils	+	•
8	GB	X	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	+	•

Changes in total species cover per species group where each species was recorded at >=5% cover in either 1978 or 1990. Using plots that may have moved aggregate class between years.

Aggregate class	Landscape	Plot type	Species group	Change	Sig
1	GB	X	Grassland or tall grassland plants on brown earth soils	+	•••
1	GB	X	Grassland plants on semi-fertile, sometimes rocky, brown earths[&]	+	•
1	GB	X	Grassland wood edge or scrub plants on brown earths	+	•••
1	GB	X	Grassland, tall grassland plants on wood edges on variable soils[&]	+	•
2	GB	H	Woods, tall grasslands or wood edge plants on brown earth soils	+	•••
2	GB	R	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	-	•••
2	GB	S	Woods, tall grasslands or wood edge plants on brown earth soils[&]	+	•
3	GB	R	Grassland or tall grassland plants on brown earth soils	-	••
3	GB	X	Grassland or tall grassland plants on brown earth soils	-	•••
3	GB	X	Grassland, tall grassland plants on wood edges on variable soils[&]	+	•
3	GB	X	Water edge or aquatic plants on hydromorphic soils	-	••
3	GB	X	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths[&]	+	•
4	GB	R	Grassland wood edge or scrub plants on brown earths[&]	+	•
4	GB	S	Water edge or aquatic plants on hydromorphic soils	-	••
4	GB	S	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	+	••
4	GB	S	Woods, tall grasslands or wood edge plants on brown earth soils	+	••
4	GB	X	Grassland or wood edge plants on acid or brown podzolic soils	-	••
4	GB	X	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	••
4	GB	X	Grassland wood edge or scrub plants on brown earths	-	•••
5	GB	H	Crop or crop edge plants on fertile soils	+	••
5	GB	H	Grassland or tall grassland plants on brown earth soils[&]	+	••
5	GB	H	Grassland, tall grassland plants on wood edges on variable soils[&]	+	•
5	GB	H	Woodland edge or scrub plants on brown earth soils[&]	+	••
5	GB	H	Woodland or wood edge plants on brown earth soils	-	•
5	GB	H	Woods, tall grasslands or wood edge plants on brown earth soils*	+	•••
6	GB	S	Grassland marsh or water edge plants on moist brown earth or gleyed soils	-	•
7	GB	S	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	-	••
7	GB	X	Grassland or tall grassland plants on brown earth soils[&]	+	••
7	GB	X	Moorland or grassland plants on gley or peaty podzolic soils[&]	-	••
8	GB	X	Bog or heath plants on deep, raw peat soils[&]	-	••
8	GB	X	Grassland wood edge or scrub plants on brown earths	+	•
8	GB	X	Heath or moorland plants on podzols or brown podzolic soils	-	•••
8	GB	X	Moorland plants on wet peaty gley soils	-	•
8	GB	X	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths[&]	+	••

* Reduced species group count but increased species group cover

[&] Species group changes not detected by analysis of change in species group count

Changes in total species cover per species group where each species was recorded at >=5% cover in either 1978 or 1990. Using plots that may have moved aggregate class between years.

Landscape	Aggregate class	Plot type	Species group	Change	Sig
AG	1	X	Grassland or tall grassland plants on brown earth soils	+	••
AG	1	X	Grassland wood edge or scrub plants on brown earths	+	••
AG	2	R	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	-	••
AG	2	H	Woods, tall grasslands or wood edge plants on brown earth soils	+	•
AG	2	S	Grassland wood edge or scrub plants on brown earths@	+	••
AG	2	S	Woods, tall grasslands or wood edge plants on brown earth soils	+	•
AG	3	X	Grassland or tall grassland plants on brown earth soils	-	•••
AG	3	X	Water edge or aquatic plants on hydromorphic soils	-	•
AG	4	S	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	+	•
AG	4	X	Grassland or wood edge plants on acid or brown podzolic soils	-	•
AG	5	H	Crop or crop edge plants on fertile soils	+	••
AG	5	H	Grassland or tall grassland plants on brown earth soils	+	•
PA	1	X	Grassland or tall grassland plants on brown earth soils	+	•••
PA	1	X	Grassland wood edge or scrub plants on brown earths	+	•••
PA	2	H	Wood edge, tall grassland or grassland plants on brown earths, often humus rich@	+	•
PA	2	H	Woods, tall grasslands or wood edge plants on brown earth soils	+	••
PA	2	R	Crop or crop edge plants on fertile soils@	+	••
PA	2	R	Wood edge, tall grassland or grassland plants on brown earths, often humus rich	-	••
PA	2	R	Wood or wood edge plants on calcareous or neutral brown earths@	+	•
PA	3	X	Grassland or tall grassland plants on brown earth soils	-	•
PA	3	X	Grassland wood edge or scrub plants on brown earths@	+	•••
PA	3	X	Grassland, tall grassland plants on wood edges on variable soils	+	•
PA	6	S	Grassland marsh or water edge plants on moist brown earth or gleyed soils	-	••
PA	4	R	Grassland wood edge or scrub plants on brown earths	+	••
PA	4	R	Woods, tall grasslands or wood edge plants on brown earth soils@	-	••
PA	4	S	Water edge or aquatic plants on hydromorphic soils	-	•
PA	4	X	Grassland or tall grassland plants on brown earth soils@	+	•
PA	5	H	Grassland or tall grassland plants on brown earth soils	+	•
PA	5	H	Grassland, tall grassland plants on wood edges on variable soils	+	•
PA	5	H	Woodland edge or scrub plants on brown earth soils	+	••
PA	5	H	Woods, tall grasslands or wood edge plants on brown earth soils	+	•••
MA	4	R	Grassland wood edge or scrub plants on brown earths	+	•
MA	4	X	Grassland plants on semi-fertile, sometimes rocky, brown earths	-	•
MA	7	S	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	-	•
MA	7	X	Grassland wood edge or scrub plants on brown earths@	+	•
MA	8	X	Heath or moorland plants on podzols or brown podzolic soils	-	••
UP	8	X	Wood, wood edge, scrub, grassland or heath plants on acid or neutral brown earths	+	••
UP	7	X	Moorland or grassland plants on gley or peaty podzolic soils	-	•

@ Species group changes detected after stratifying by landscape and not detected at the GB scale

Annex 8:

Matrices showing turnover, losses and gains between aggregate classes for the four landscape types and the whole of GB between 1978 and 1990. Changing aggregate class membership of plots in between 1978 and 1990 can be expressed by examining whether TWINSPAN classification of all CS plot data resulted in a replicate plot being placed in different aggregate classes in each year.

Matrices showing movement of replicate plots between aggregate vegetation classes between 1978 and 1990

Arable landscape; matrix of change between aggregate classes

		90								
		I	II	III	IV	V	VI	VII	VIII	Total
	I	115	16	16	2					149
	II	4	88	13	6	22	1			134
	III	26	36	60	23	3				148
78	IV	3	13	18	59	8	1			102
	V		25		1	63	3			92
	VI			1	5	2	6			14
	VII				2		2	1	1	6
	VIII			1				2	5	8
	Total	148	178	109	98	98	13	3	6	653

Change 78 to 90

	78	90	78 to 90
I	149	148	-1
II	134	178	44
III	148	109	-39
IV	102	98	-4
V	92	98	6
VI	14	13	-1
VII	6	3	-3
VIII	8	6	-2

Gross movement of fertile grassland to tall grassland.
Movement of infertile grassland to fertile and tall grassland.

Pastural landscape; matrix of change between aggregate classes

		90								
		I	II	III	IV	V	VI	VII	VIII	Total
	I	45	3	23	3					74
	II	1	62	12	11	27	2			115
	III	16	19	87	36	2				160
78	IV	7	24	37	97	5	8	5		183
	V	1	25		2	50	10			88
	VI		3	1	7	6	30	1	1	49
	VII				4		6	14	3	27
	VIII				1		2	2	15	20
	Total	70	136	160	161	90	58	22	19	716

Change 78 to 90

	78	90	78 to 90
I	74	70	-4
II	115	136	21
III	160	160	0
IV	183	161	-22
V	88	90	2
VI	49	58	9
VII	27	22	-5
VIII	20	19	-1

Infertile grassland to tall grassland.
Smaller trend from moorland/grass mosaic to upland wooded.

Marginal Upland landscape; matrix of change between aggregate classes

		90								
		I	II	III	IV	V	VI	VII	VIII	Total
	I	1		3	1					5
	II		4	2	3	1				10
	III	3	2	18	14		1	1		39
78	IV		7	14	71	3	9	6		110
	V					2	2			4
	VI		1			6	21		1	29
	VII				9		5	47	8	69
	VIII				2		1	10	27	40
	Total	4	14	37	100	12	39	64	36	306

Change 78 to 90

	78	90	78 to 90
I	5	4	-1
II	10	14	4
III	39	37	-2
IV	110	100	-10
V	4	12	8
VI	29	39	10
VII	69	64	-5
VIII	40	36	-4

Increase in lowland and upland wooded.
Losses from infertile grassland.

Upland landscape; matrix of change between aggregate classes

		90								
		I	II	III	IV	V	VI	VII	VIII	Total
	I			2						2
	II									0
	III	2		5	4				1	12
78	IV			1	14		3	5		23
	V									0
	VI				1		19	18	4	42
	VII				11		12	78	24	125
	VIII				1		8	36	174	219
	Total	2	0	8	31	0	42	137	203	423

Change 78 to 90

	78	90	78 to 90
I	2	2	0
II	0	0	0
III	12	8	-4
IV	23	31	8
V	0	0	0
VI	42	42	0
VII	125	137	12
VIII	219	203	-16

Loss of heath/bog
to moorland/grass mosaic.

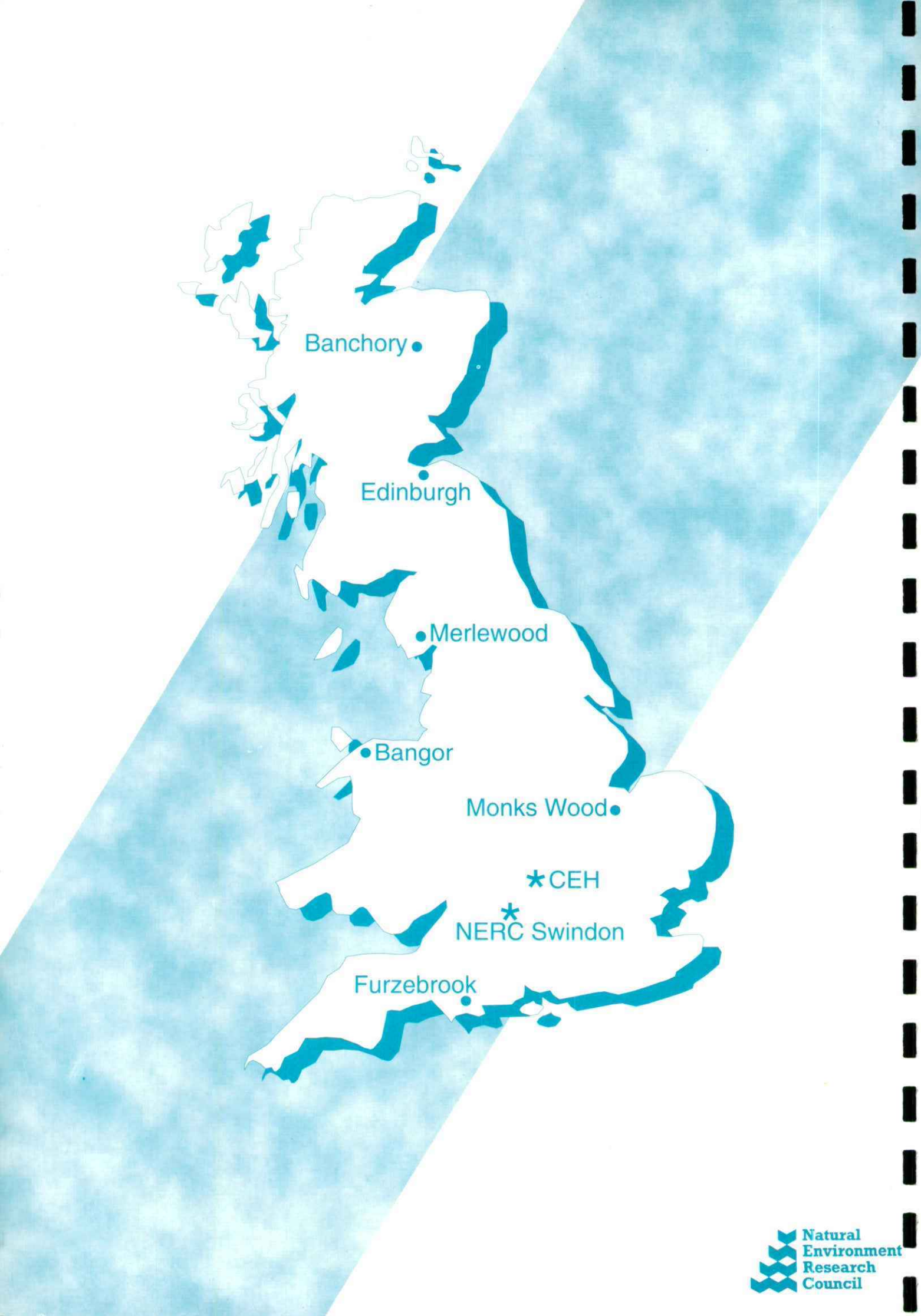
Whole of GB; matrix of change between aggregate classes

		90								
		I	II	III	IV	V	VI	VII	VIII	Total
	I	161	19	44	6					230
	II	5	154	27	20	50	3			259
	III	47	57	170	77	5	1		1	358
78	IV	10	44	70	241	16	21	16		418
	V	1	50		3	115	15			184
	VI		4	2	13	14	76	19	6	134
	VII				26		25	140	36	227
	VIII			1	4		11	50	221	287
	Total	224	328	314	390	200	152	225	264	2097

Change 78 to 90

	78	90	78 to 90
I	230	224	-6
II	259	328	69
III	358	314	-44
IV	418	390	-28
V	184	200	16
VI	134	152	18
VII	227	225	-2
VIII	287	264	-23

Increase in tall grassland and losses from fertile and infertile grassland.
Losses from heath/bog to upland wooded and moorland/grass mosaic.
Losses from tall grassland and infertile grassland to lowland wooded.



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