

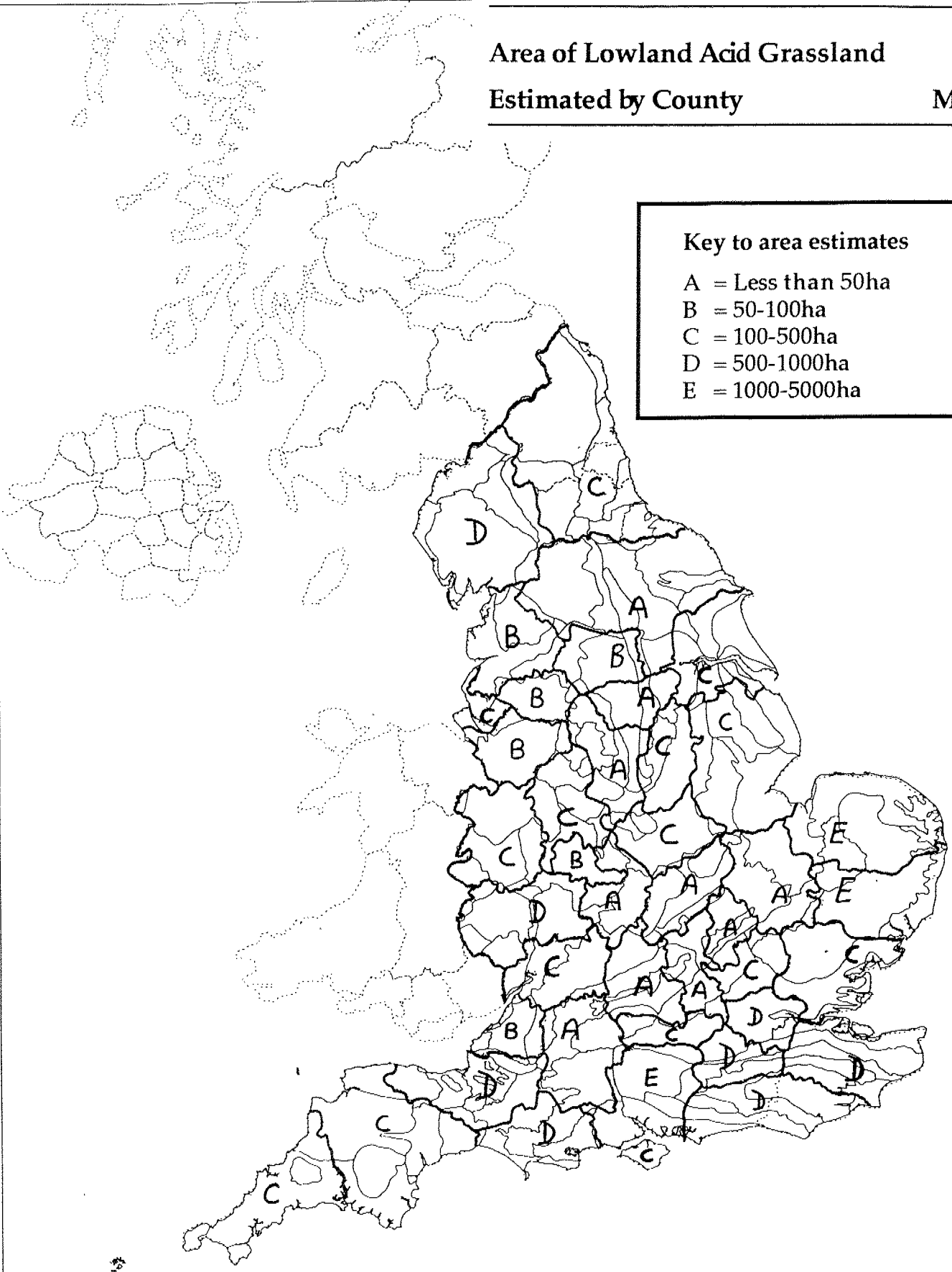
Area of Lowland Acid Grassland

Estimated by County

Map 16

Key to area estimates

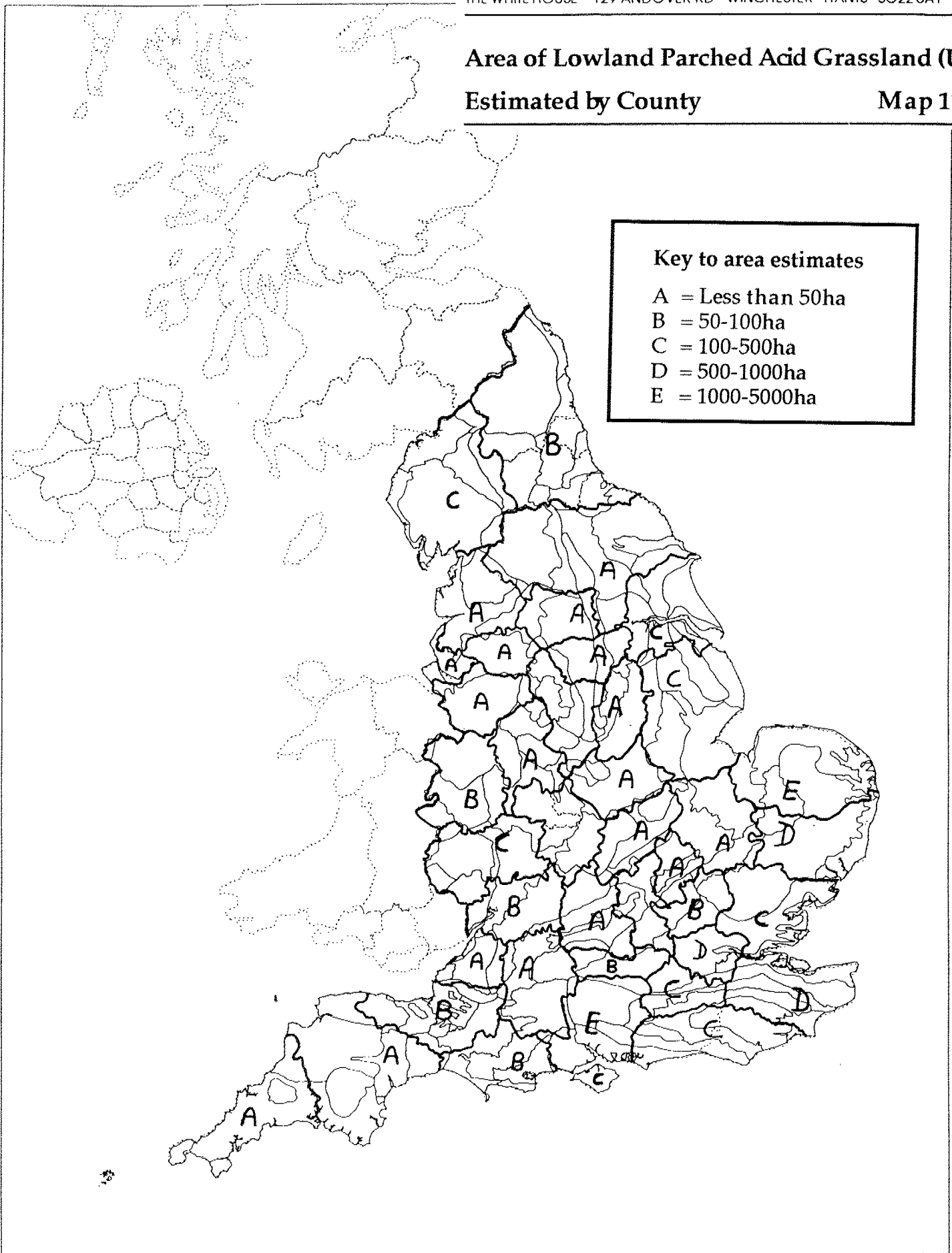
- A = Less than 50ha
- B = 50-100ha
- C = 100-500ha
- D = 500-1000ha
- E = 1000-5000ha



Area of Lowland Parched Acid Grassland (U1)

Estimated by County

Map 17



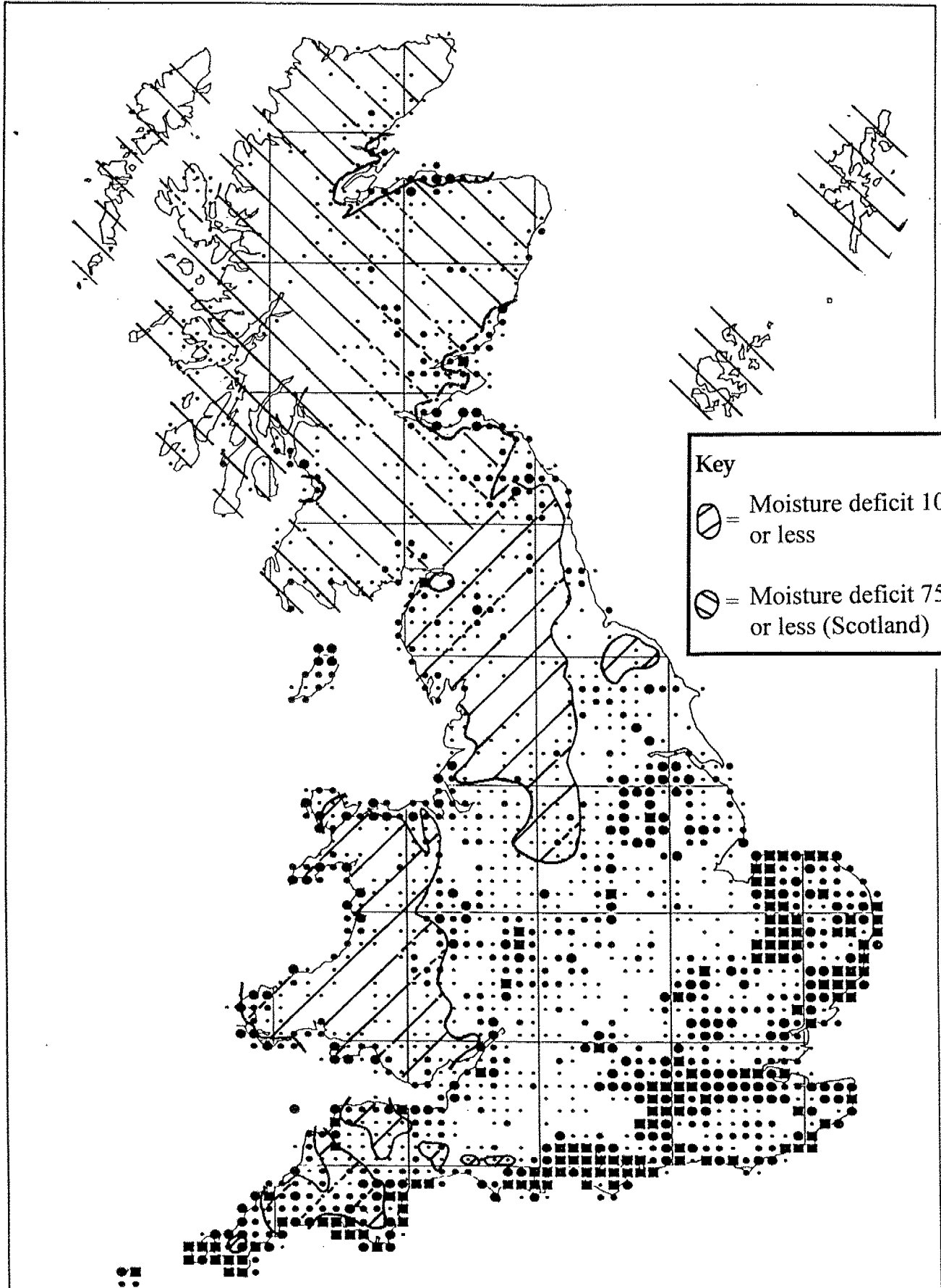
**Key to area estimates**  
A = Less than 50ha  
B = 50-100ha  
C = 100-500ha  
D = 500-1000ha  
E = 1000-5000ha

Moisture Deficit and Distribution of  
Lowland Acid Grassland Species Map 18

Key

- 1 - 2 species
- 3 - 5 species
- 6 - 9 species
- 10 + species

(number of species per 10km grid square)



Key

- = Moisture deficit 100mm or less
- = Moisture deficit 75mm or less (Scotland)

Area of Lowland *Deschampsia flexuosa*

Grassland (U2) Estimated by County Map 19

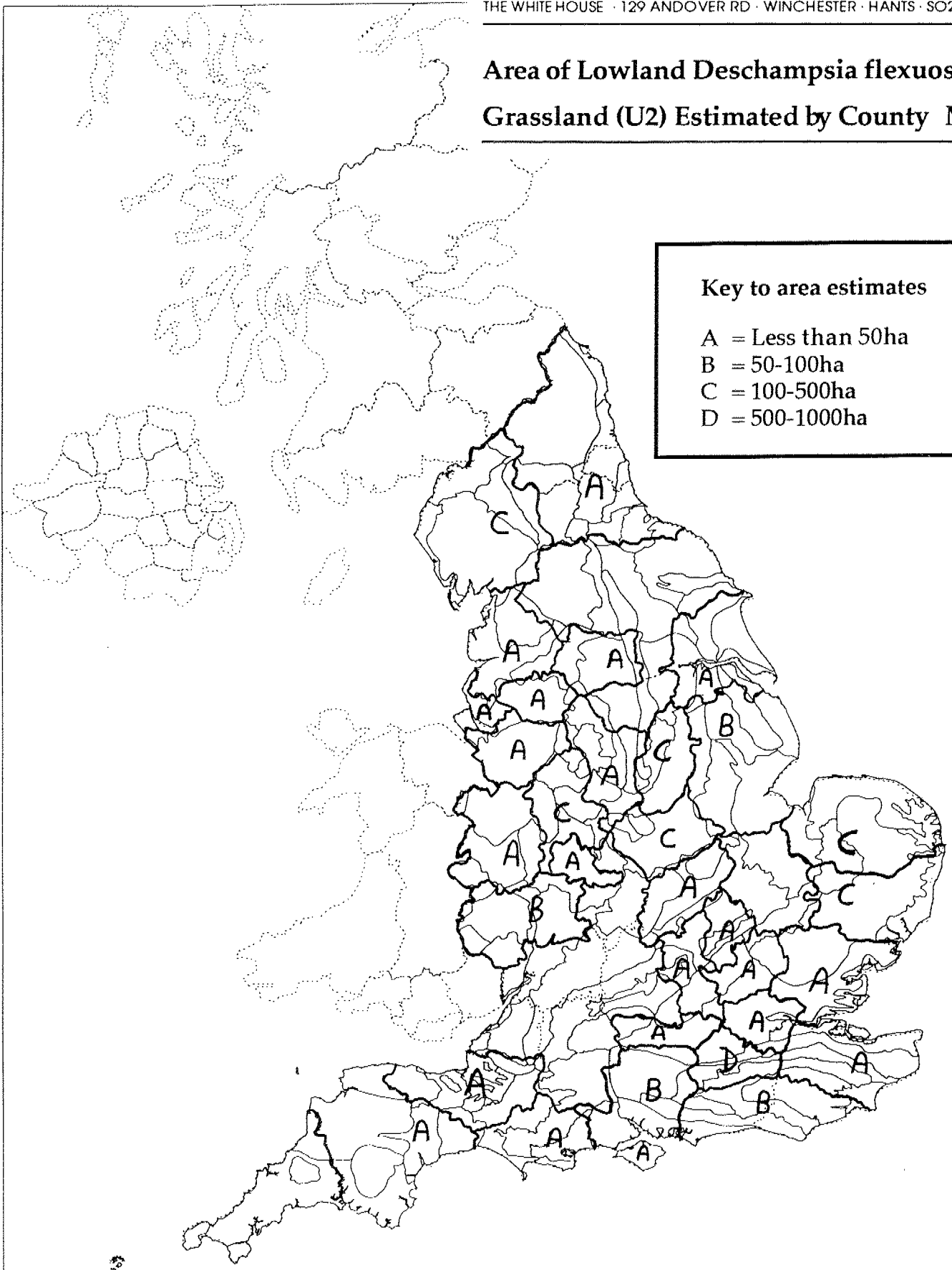
Key to area estimates

A = Less than 50ha

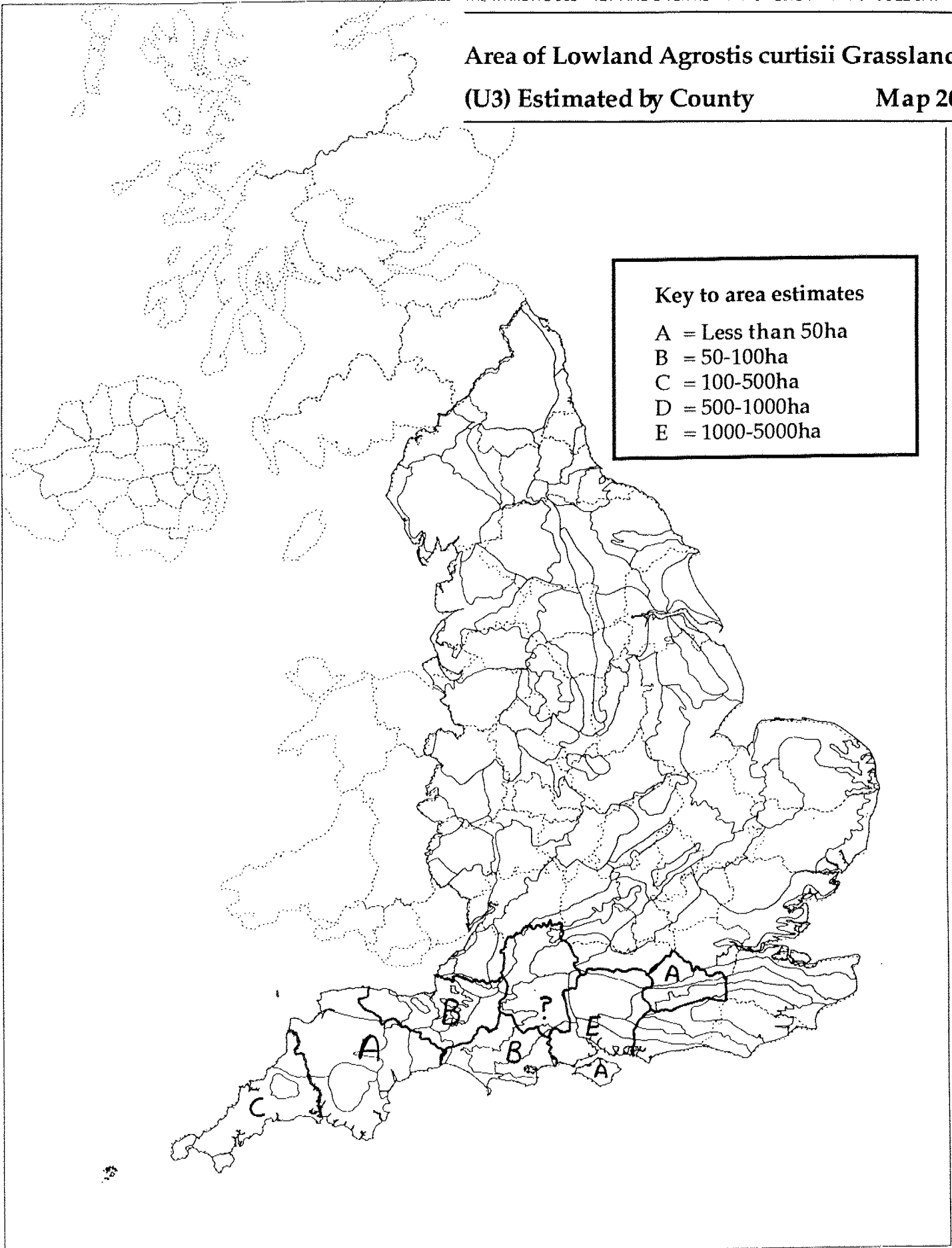
B = 50-100ha

C = 100-500ha

D = 500-1000ha



Area of Lowland *Agrostis curtisii* Grassland  
(U3) Estimated by County Map 20



Area of Lowland Moist Acid Grassland (U4)

Estimated by County

Map 21

Key to area estimates

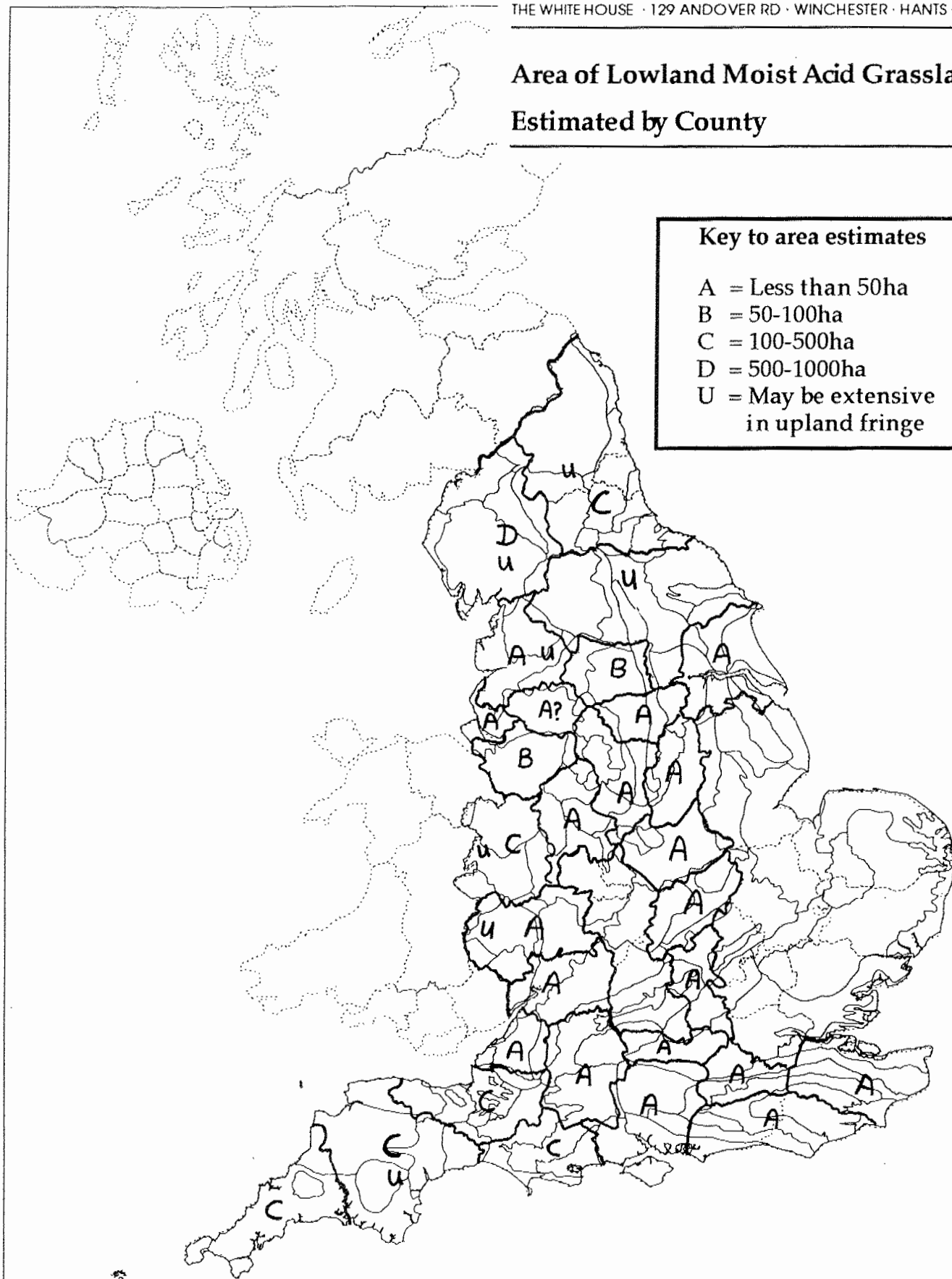
A = Less than 50ha

B = 50-100ha

C = 100-500ha

D = 500-1000ha

U = May be extensive  
in upland fringe

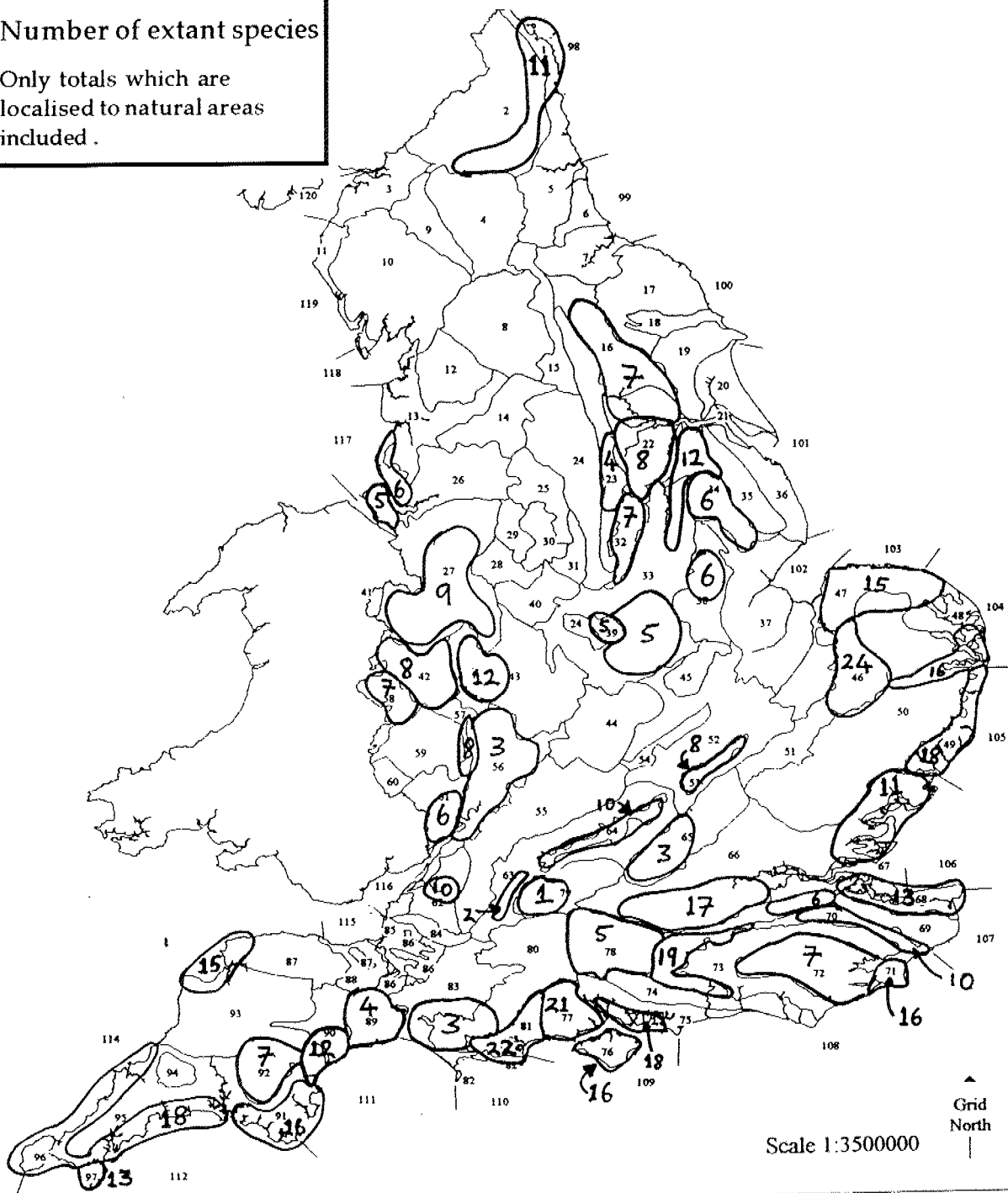


Totals of lowland acid grassland species from Table 1 by Natural Area. Map 22

Key

⑧ = Number of extant species

Only totals which are localised to natural areas included.



- |                                       |  |  |  |                                   |   |
|---------------------------------------|--|--|--|-----------------------------------|---|
| 1. North Northumberland Coastal Plain | 11. West Cumbria Coastal Plain               | 21. Humber Estuary                       | 31. Derbyshire Peak Fringe and Lower Derwent       | 41. Ousestry Uplands              | 51. East Anglian Chalk                      |
| 2. Border Uplands                     | 12. Forest of Bowland                        | 22. Hamberhead Levels                    | 32. Sherwood                                       | 42. Shropshire Hills              | 52. West Anglian Plain                      |
| 3. Solway Basin                       | 13. Lancashire Plain and Valleys             | 23. Southern Magnesian Limestone         | 33. Trent Valley and Rises                         | 43. Midlands Plateau              | 53. Bodfordshire Grassland Ridge            |
| 4. North Pennines                     | 14. Southern Pennines                        | 24. Coal Measures                        | 34. North Lincolnshire Coversands and Clay Valleys | 44. Midland Clay Pastures         | 54. Yarlsey-Whitewood Ridge                 |
| 5. Northumbria Coal Measures          | 15. Pennine Dales Fringe                     | 25. Dark Peak                            | 35. Lancashire Wolds                               | 45. Rockingham Forest             | 55. Cotswolds                               |
| 6. Durham Magnesian Limestone Plateau | 16. Vale of York and Mowbray                 | 26. Urban Mersey Basin                   | 36. Lancashire Coast and Marshes                   | 46. Breckland                     | 56. Severn and Avon Valleys                 |
| 7. Tees Lowlands                      | 17. North York Moors and Hills               | 27. Moors and Meres                      | 37. The Fens                                       | 47. North Norfolk                 | 57. Malvern Hills and Teme Valley           |
| 8. Yorkshire Dales                    | 18. Vale of Pickering                        | 28. Potteries and Charnol Valley         | 38. Lancashire and Rutland Limestone Charnwood     | 48. The Breeds                    | 58. Chon and North West Herefordshire Hills |
| 9. Elen Valley                        | 19. Yorkshire Wolds                          | 29. South West Peak                      | 39. Charnwood                                      | 49. Suffolk Coast and Heaths      | 59. Central Herefordshire                   |
| 10. Cumbria Fells and Dales           | 20. Holderness                               | 30. White Peak                           | 40. Nodwood and South Derbyshire Claylands         | 50. East Anglian Plain            | 60. Black Mountains and Golden Valley       |
| 61. Dean Plateau and Wye Valley       | 71. Romney Marshes                           | 81. Dorset Heath                         | 91. South Devon                                    | 101. Bridlington to Skegness      | 111. Lyme Bay                               |
| 62. Bristol, Avon Valleys and Ridges  | 72. High Weald                               | 82. Isles of Portland and Purbeck        | 92. Dartmoor                                       | 102. The Wash                     | 112. Start Point to Land's End              |
| 63. Thames and Avon Valleys           | 73. Low Weald and Pevensey                   | 83. Wessex Valleys                       | 93. The Culm                                       | 103. Old Hunstanton to Sheringham | 113. Isles of Scilly                        |
| 64. Midvale Ridge                     | 74. South Downs                              | 84. Mendip Hills                         | 94. Bodmin Moor                                    | 104. Sheringham to Lowestoft      | 114. Land's End to Minehead                 |
| 65. Chilterns                         | 75. South Coast Plain and Hampshire Lowlands | 85. Somerset Levels and Moors            | 95. Cornish Kyles and Granates                     | 105. Suffolk Coast                | 115. Bridgewater Bay                        |
| 66. London Basin                      | 76. Isle of Wight                            | 86. Mid Somerset Hills                   | 96. West Pembrokeshire                             | 106. North Kent Coast             | 116. Severn Estuary                         |
| 67. Greater Thames Estuary            | 77. New Forest                               | 87. Emsayr and the Quawlocks             | 97. The Lizard                                     | 107. East Kent Coast              | 117. Liverpool Bay                          |
| 68. North Kent Plain                  | 78. Hampshire Downs                          | 88. Vale of Tarrant and Quantock Fringes | 98. Northumberland Coast                           | 108. Folkestone to Selsey Bill    | 118. Morecambe Bay                          |
| 69. North Downs                       | 79. Berkshire and Marlborough Downs          | 89. Blackdowns                           | 99. Tyne to Tees Coast                             | 109. Solent and Poole Bay         | 119. Cumbrian Coast                         |
| 70. Wesden Greensand                  | 80. South Wessex Downs                       | 90. Devon Redlands                       | 100. Saltsburn to Bridlington                      | 110. South Dorset Coast           | 120. Solway Firth                           |

Lowland Acid Grassland Survey Priorities

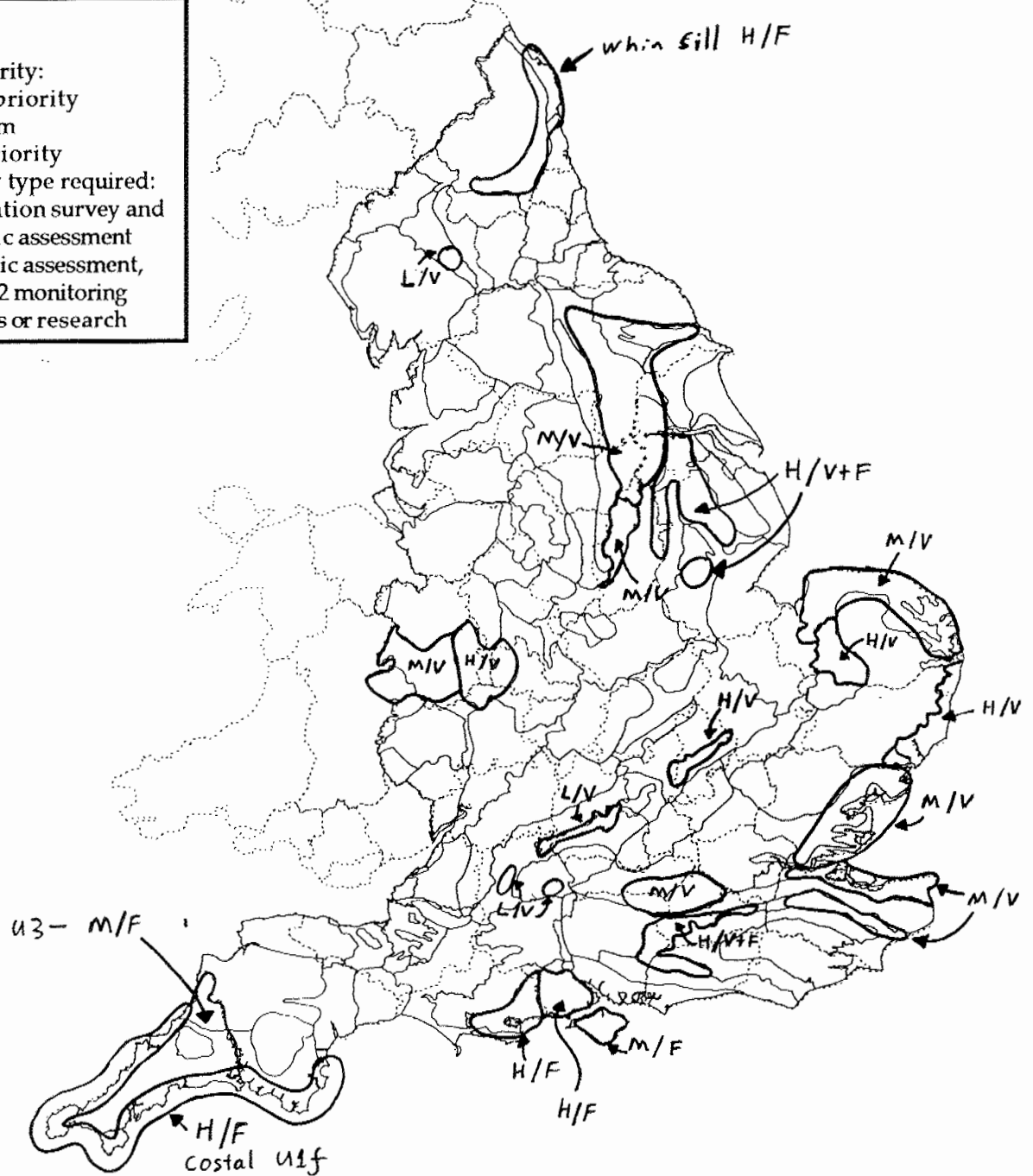
By Counties & Natural Areas

Map 23

**Key**

Survey priority:  
 H = High priority  
 M = Medium  
 L = Low priority

Main survey type required:  
 V = Vegetation survey and floristic assessment  
 F = Floristic assessment, phase 2 monitoring surveys or research





Lowland Acid Grassland Conservation

Value By Natural Areas

Map 24

Key

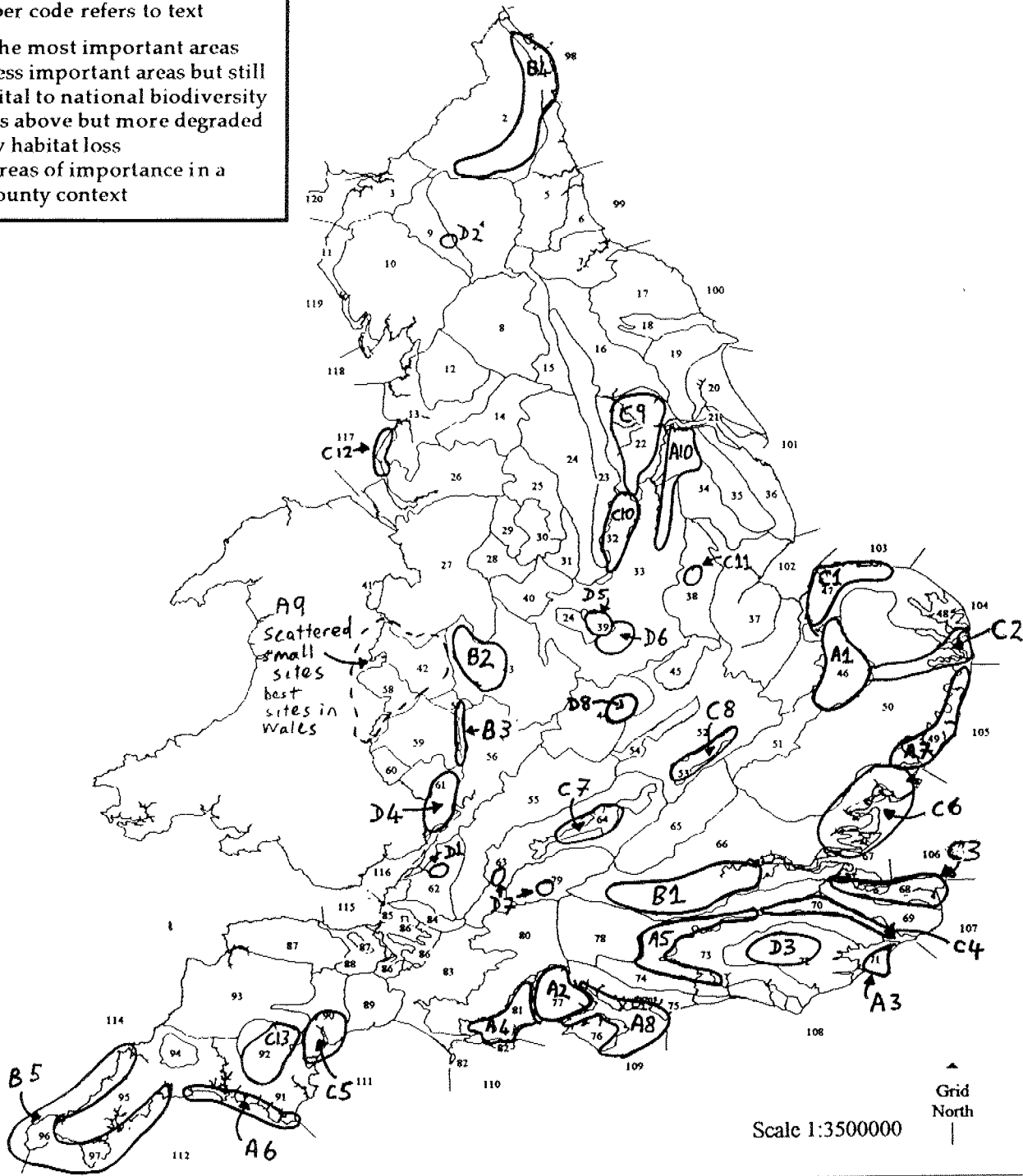
Number code refers to text

A = The most important areas

B = Less important areas but still vital to national biodiversity

C = As above but more degraded by habitat loss

D = Areas of importance in a county context



- |                                       |  |  |   |                                  |   |
|---------------------------------------|--|--|---|----------------------------------|---|
| 1. North Northumberland Coastal Plain | 11. West Cumbria Coastal Plain               | 21. Humber Estuary                       | 31. Derbyshire Peak Fringe and Lower Derwent  | 41. Onsey Uplands                | 51. East Anglian Chalk                      |
| 2. Border Uplands                     | 12. Forest of Bowland                        | 22. Humberhead Levels                    | 32. Sherwood                                  | 42. Sleaford Hills               | 52. West Anglian Plain                      |
| 3. Solway Basin                       | 13. Lancashire Plain and Valleys             | 23. Southern Magnesian Limestone         | 33. Trent Valley and Rises                    | 43. Midlands Plateau             | 53. Bedfordshire Greensand Ridge            |
| 4. North Pennines                     | 14. Southern Pennines                        | 24. Coal Measures                        | 34. North Lincolnshire Coverts and Clay Vales | 44. Midland Clay Features        | 54. Yardley-Whitewood Ridge                 |
| 5. Northumbria Coal Measures          | 15. Pennine Dales Fringe                     | 25. Dark Peak                            | 35. Lincolnshire Wolds                        | 45. Rockingham Forest            | 55. Cotswolds                               |
| 6. Durham Magnesian Limestone Plateau | 16. Vale of York and Mowbray                 | 26. Urban Mersey Basin                   | 36. Lincolnshire Coast and Marshes            | 46. Brockland                    | 56. Severn and Avon Vales                   |
| 7. Tees Lowlands                      | 17. North York Moors and Hills               | 27. Mosses and Akeres                    | 37. The Fens                                  | 47. North Norfolk                | 57. Malvern Hills and Teme Valley           |
| 8. Yorkshire Dales                    | 18. Vale of Pickering                        | 28. Potteries and Chumet Valley          | 38. Lincolnshire and Rutland Limestone        | 48. The Broads                   | 58. Chas and North West Herefordshire Hills |
| 9. Eden Valley                        | 19. Yorkshire Wolds                          | 29. South West Peak                      | 39. Charnwood                                 | 49. Suffolk Coast and Heaths     | 59. Central Herefordshire                   |
| 10. Cumbria Fells and Dales           | 20. Holderness                               | 30. White Peak                           | 40. Needwood and South Derbyshire Claylands   | 50. East Anglian Plain           | 60. Black Mountains and Golden Valley       |
| 61. Dean Plateau and Wye Valley       | 71. Romney Marshes                           | 81. Dorset Heaths                        | 91. South Devon                               | 101. Bridlington to Skegness     | 111. Lyme Bay                               |
| 62. Bristol, Avon Valleys and Ridges  | 72. High Weald                               | 82. Ister of Portland and Purbeck        | 92. Dartmoor                                  | 102. The Wash                    | 112. Start Point to Land's End              |
| 63. Thames and Avon Vales             | 73. Low Weald and Pevensey                   | 83. Wessex Vales                         | 93. The Quins                                 | 103. Old Hamstanton to Shringham | 113. Isles of Scilly                        |
| 64. Malvern Ridge                     | 74. South Downs                              | 84. Mendip Hills                         | 94. Bodmin Moor                               | 104. Sheringham to Lowestoft     | 114. Land's End to Minchard                 |
| 65. Chilterns                         | 75. South Coast Plain and Hampshire Lowlands | 85. Somerset Levels and Moors            | 95. Cornish Killas and Granites               | 105. Suffolk Coast               | 115. Bridgwater Bay                         |
| 66. London Basin                      | 76. Isle of Wight                            | 86. Mid Somerset Hills                   | 96. West Penwith                              | 106. North Kent Coast            | 116. Severn Estuary                         |
| 67. Greater Thames Estuary            | 77. New Forest                               | 87. Elmour and the Quantocks             | 97. The Lizard                                | 107. East Kent Coast             | 117. Liverpool Bay                          |
| 68. North Kent Plain                  | 78. Hampshire Downs                          | 88. Vale of Taunton and Quantock Fringes | 98. Northumberland Coast                      | 108. Folkstone to Selsey Bill    | 118. Morwenstow Bay                         |
| 69. North Downs                       | 79. Berkshire and Marlborough Downs          | 89. Blackdowns                           | 99. Tyne to Tees Coast                        | 109. Solent and Poole Bay        | 119. Cambrian Coast                         |
| 70. Wessex Greensand                  | 80. South Wessex Downs                       | 90. Devon Redlands                       | 100. Saltsburn to Bridlington                 | 110. South Dorset Coast          | 120. Solway Firth                           |

# Tables

**Table 1. Species generally faithful to lowland acid grassland habitats in England**

<b>Grasses</b>	<i>Ornithopus perpusillus</i> (NUD)
<i>Apera interrupta</i> *	<i>Potentilla argentea</i>
<i>Corynephorus canescens</i> **	<i>Sagina subulata</i> (NUD)
<i>Festuca longifolia</i> **	<i>Scleranthus perennis prostratus</i> **
<i>Vulpia ciliata ambigua</i> *	<i>Silene conica</i> *
<b>Other vascular plants</b>	<i>Stellaria pallida</i> (NUD)
<i>Chamaemelum nobile</i> *	<i>Teesdalia nudicaulis</i>
<i>Crassula tillaea</i> *	<i>Thymus serpyllum</i> **
<i>Dianthus deltoides</i> *	<i>Trifolium glomeratum</i> *
<i>Erodium maritimum</i>	<i>Trifolium ornithopodioides</i>
<i>Filago minima</i> (NUD)	<i>Trifolium scabrum</i> (NUD)
<i>Gladiolus illyricus</i> **	<i>Trifolium striatum</i> (NUD)
<i>Herniaria glabra</i> **	<i>Trifolium subterraneum</i> (NUD)
<i>Hypochaeris glabra</i> *	<i>Trifolium suffocatum</i> *
<i>Lotus angustissimus</i> **	<i>Veronica verna</i> **
<i>Lotus subbiflorus</i> *	<i>Vicia lathyroides</i> (NUD)
<i>Medicago minima</i> *	<i>Viola lactea</i> *
<i>Moenchia erecta</i>	

Total number of taxa = 33, \*Nationally scarce species = 12, \*\*Nationally rare = 8

(NUD) = Species not up dated on the Biological Record Centre maps

**Table 2. Species locally characteristic of lowland acid grassland in England but which are also found in other habitats**

<b>Dwarf shrubs</b>	<i>Sagina nodosa</i>
<i>Rosa pimpinellifolia</i>	<i>Scilla autumnalis</i> *
<i>Ulex minor</i>	<i>Scleranthus annuus annuus</i>
<b>Grasses</b>	<i>Scleranthus annuus polycarpus</i>
<i>Aira caryophyllea</i>	<i>Sedum acre</i>
<i>Aira praecox</i>	<i>Sedum anglicum</i>
<i>Cynodon dactylon</i> **	<i>Sedum fosterianum</i> *
<i>Koeleria macrantha</i>	<i>Sherardia arvensis</i>
<i>Poa bulbosus</i> *	<i>Silene nutans</i> *
<b>Other vascular plants</b>	<i>Silene otites</i> **
<i>Allium schoenoprasum</i> *	<i>Spergularia rubra</i>
<i>Aphanes inexpectata</i>	<i>Spiranthes spiralis</i>
<i>Astragalus danicus</i>	<i>Trifolium arvense</i>
<i>Botrychium lunaria</i>	<i>Umbilicus rupestris</i>
<i>Carex arenaria</i>	<i>Veronica spicata spicata</i> **
<i>Carex montana</i> *	<i>Viola canina</i>
<i>Cerastium arvense</i>	<b>Mosses</b>
<i>Cerastium diffusum</i>	<i>Campylopus polytrichoides</i> *
<i>Cerastium semidecandrum</i>	<i>Hypnum lacunosum tectorum</i>
<i>Cuscuta epithymum</i>	<b><i>Leptodontium gemmascens</i></b> **
<i>Dianthus armeria</i> *	<i>Racomitrium elongatum</i>
<i>Echium vulgare</i>	<i>Rhynchostegium megapolitanum</i>
<i>Erigeron acer</i>	<i>Scleropodium tourettii</i>
<i>Erodium cicutarium</i>	<i>Tortula ruralis ruraliformis</i>
<i>Erodium moschatum</i> *	<b>Liverworts</b>
<i>Euphrasia vigursii</i> **	<i>Ptilidium ciliare</i>
<i>Filago vulgaris</i>	<b>Lichens</b>
<i>Gentianella campestris</i>	<b><i>Cladonia arbuscula</i></b>
<i>Gnaphalium luteoalbum</i> **	<i>Cladonia cariosa</i> *
<i>Hypericum linariifolium</i> **	<b><i>Cladonia ciliata</i></b>
<i>Jasione montana</i>	<i>Cladonia crispata</i>
<i>Lepidium heterophyllum</i>	<i>Cladonia foliacea</i>
<i>Medicago polymorpha</i> *	<i>Cladonia gracilis</i>
<i>Muscari neglecta</i> **	<i>Cladonia uncialis</i>
<i>Myosotis ramosissima</i>	<i>Coelocaulon aculeatum</i>
<i>Parentucellia viscosa</i>	<i>Icmadophila ericetorum</i>
<i>Petrorhagia nanteuillii</i> **	<i>Peltigera canina</i> *
<i>Petrorhagia prolifera</i> **	<i>Peltigera rufescens</i>
<i>Plantago coronopus</i>	<i>Usnea articulata</i>
<i>Potentilla neumanniana</i> *	
<i>Radiola linoides</i>	
<b>Total number of taxa = 73, *Nationally scarce species = 13, **Nationally rare = 10</b>	

Table 2 continued

Additional species locally characteristic of parched acid grasslands in Wales
<b>Vascular plants</b>
<i>Gagea bohemica</i> **
<i>Lychnis viscaria</i> **
<i>Potentilla rupestris</i> **
<i>Scleranthus perennis perennis</i> **
<i>Trifolium strictum</i> **
<i>Veronica spicata hybrida</i> *
<b>Mosses</b>
<i>Bartramia stricta</i> **

Table 3. Species of ephemeral ponds often associated with acid grasslands

<b>Vascular plants</b>
<i>Cicendia filiformis</i> *
<i>Galium constrictum</i> **
<i>Illecebrum verticillatum</i> *
<i>Ludwigia palustris</i> **
<i>Pilularia globulifera</i> *
<i>Pulicaria vulgaris</i> **
<b>Mosses</b>
<i>Physcomitrium eurystomum</i> **
<b>Liverworts</b>
<i>Fossombronia foveolata</i> *
<b>Total number of species = 8    * Nationally scarce = 4    **Nationally Rare = 4</b>

Table 4. Species of disturbed acid sandy soils

<b>Vascular plants</b>
<i>Arabis glabra</i> *
<i>Apera spica-venti</i> *
<i>Filago lutescens</i> **
<i>Medicago sativa falcata</i> *
<i>Silene gallica</i> *
<i>Veronica praecox</i>
<i>Veronica triphyllos</i> **
<b>Total number of species = 7    * Nationally scarce = 4    **Nationally Rare = 3</b>

Table 5. Summary of estimated areas of lowland acid grassland by county

County	AG	U1	U1a	U1b	U1c	U1d	U1e	U1f	U2	U2a	U2b	U3	U4	U4a	U4b	U4c	U4d	U4e	U5	U6	SD10	SD11	U20r
Avon	B	A						A					A										
Bedfordshire	A	A		A			A	A															
Berkshire	C	B		A		A	A	B	A	A			A	A									
Buckinghamshire	A								A	A			A										
Cambridgeshire	A	A	A	?		A	A																
Cheshire	B	A				A			A				B										
Cornwall	C	A					+	A				C	C	+	+			+					+
Cumbria	D	C					C		C				D							A			+
Derbyshire	A								A				A		A	A		A	A				
Devon	C	A					A	A	A			A	C	+	+			+					+
Dorset	D	B	?	A	?	A	A	A	A	A		B	C	A	B	?							A
Essex	C	C	?	+		+	+	+	A														
Gloucestershire	C	B		A	?	A	A	A					A	A	A	A	A		A				
Greater London	D	D		+		+	+		A		?												
Greater Manchester	B	A					A	A	A				A?						A				
Hampshire	E	E	A	B	A	D	A	D	B	B		E	A								A	A	C
Hereford & Wores.	D	C	A	+		+	+		B	B			A	A	A								+
Hertfordshire	C	B		+		+	+		A														
Humberside	C	C	A	A	B	A		A	A	A			A	A	A				A	A	A	A	
Isle of Wight	C	C		A				A	A	A		A											+
Kent	D	D	C	B/D		B	B/D	A	A	A			A										
Lancashire	B	A				A			A				A							A			
Leicestershire	C	A		A					C	C			A		A								
Lincolnshire	C	C	+	+		+			B	+											A	A	
Merseyside	C	A		A		A			A				A							A			
NE England	C	B	?	+	?				A				C	+				+					
Norfolk	E	E	+	+	+	+	+		C	C										A		B	A
Northamptonshire	A	A							A	A			A		A								
North Yorkshire	A	A																					
Nottinghamshire	C	A		A			A		C	C			A		A					A		A	
Oxfordshire	A	A		?																			
Shropshire	C	B		+		+	+	+	A	A			C	+						A			
Somerset	D	B							A			B	C										+
South Yorkshire	A	A											A							A			
Staffordshire	C	A		A	?		?		C				A										
Suffolk	E	D	B	C		C	B		C	C												B	A
Surrey	D	C		+		+	+		D			A	A									A	A
Sussex (E & W)	D	C	A	A		A		A	B	B			A	A	A								
Warwickshire	A	?																					
West Midlands	B								A														A
West Yorkshire	B	A					A		A				B							A			
Wiltshire	A	A		?				A	A				?	A									
England	G	F/G	D	E	B	E	E	E	E/F	E/F		E	E	C	C/D	A/B	A	A	C	A	C	B/C	C

A = Less than 50ha, B = 50-100 ha, C = 100-500ha, D = 500-1,000ha, E = 1,000-5,000 ha, F = 5,000-10,000 ha, G = Greater than 10,000 ha

+ = Present but area not known, ? = may be present

**Table 6. Numbers of lowland acid grassland species recorded in selected areas**

County/Area	Avon	Beds	Berks & Oxfordshire			Camb	Cheshire, Gloucs, Her&Worcs, Shrops, Staffs, Warwicks							Cornwall			Cumbria
Natural Area	All	53	66	64	65	All	43	57	61	56	58	42	27	95+96	97	113	All
<b>Grasses</b>																	
<i>Apera interrupta</i>				1		1											
<i>Corynephorus canescens</i>							1										
<i>Festuca longifolia</i>																	
<i>Vulpia ciliata ambigua</i>						1											
<b>Other Vascular Plants</b>																	
<i>Chamaemelum nobile</i>	0		1	0	0		0	0	0	0	0	0	0	1	1	1	
<i>Crassula tillaea</i>						0								1			
<i>Dianthus deltooides</i>	0		0	1			1				1	1	1				0
<i>Erodium maritimum</i>	1						0	0						1	1	1	
<i>Filago minima</i>	1	1	1	1		1	1	1	1		1	1	1	1			1
<i>Gladiolus illyricus</i>																	
<i>Hemiaria glabra</i>						1											1
<i>Hypochaeris glabra</i>	0	0	0	0	1	0	1	1		0		1	1	0			
<i>Lotus angustissimus</i>														1	0		
<i>Lotus subbiflorus</i>														1	1	1	
<i>Medicago minima</i>						1											
<i>Moenchia erecta</i>	1	0	1	0		0	1	1	1	0	1	1	1	1	1		0
<i>Ornithopus perpusillus</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<i>Potentilla argentea</i>	0	1	1	1	0	1	1	1	1	1		1	1				1
<i>Sagina subulata</i>			1											1	1		
<i>Scleranthus perennis</i>																	
<i>Silene conica</i>				1		1	1										0
<i>Stellaria pallida</i>	1	1	1	1		1	1						1	1	0	1	1
<i>Teesdalia nudicaulis</i>	1	1	1	1		0	1	1		0	1	1	1	1			1
<i>Thymus serpyllum</i>						0											
<i>Trifolium glomeratum</i>														1	1	1	
<i>Trifolium ornithopodioides</i>	1		0					1	0	0				1	1	1	
<i>Trifolium scabrum</i>	1		0	0		1			0				0	1	1	1	
<i>Trifolium striatum</i>	1	1		1	1	1	1	1	1	0	1	1	1	1	1	1	1
<i>Trifolium subterraneum</i>	1	1	1	0		1			1	1				1	1	1	
<i>Trifolium suffocatum</i>														1	1	1	
<i>Veronica verna</i>																	
<i>Vicia lathyroides</i>		1		1		1	1				1						1
<i>Viola lactea</i>	0		1	0					0					1	1		
Total no. spp extant	10	8	10	10	3	13	12	8	6	3	7	8	9	18	13	11	8
Total no. spp extinct	5	2	4	6	2	5	2	2	4	6	1	0	2	1	2	0	3
Total no. spp recorded	15	10	14	16	5	18	14	10	10	9	8	8	11	19	15	11	11
Extant spp/all spp	0.7	0.8	0.7	0.6	0.6	0.7	0.9	0.8	0.6	0.3	0.9	1.0	0.8	0.9	0.9	1.0	

1 = Recent record      0 = Apparently extinct

[See end of table for key to Natural Area numbers]

Table 6 continued

County/Area	Derby	Devon					Dorset		Essex	Hampshire					Herts	IoW
	All	89	90	91	92	87+93	81+82	80+83	All	77	70	66	75	78	All	76
Grasses																
<i>Apera interrupta</i>									0							
<i>Corynephorus canescens</i>																
<i>Festuca longifolia</i>																
<i>Vulpia ciliata ambigua</i>							1			1	1		1			1
Other Vascular Plants																
<i>Chamaemelum nobile</i>	0	0	0	1	1	1	1	0	0	1	1	1	1	0	0	1
<i>Crassula tillaea</i>				1			1			1	1	1	1			
<i>Dianthus deltoides</i>	1						1								1	
<i>Erodium maritimum</i>				1		1	1			1			0			
<i>Filago minima</i>	1		1	1	1	1	1		1	1	1	1	1	1	1	1
<i>Gladiolus illyricus</i>							0			1						0
<i>Hemiaria glabra</i>											1					
<i>Hypochoeris glabra</i>			0	0		0	1		0	1	1	0	1			1
<i>Lotus angustissimus</i>			0	1		1	1			1			1			0
<i>Lotus subbiflorus</i>		0	1	1		1	1			1	0		1			
<i>Medicago minima</i>									0							
<i>Moenchia erecta</i>	0	1	1	1	0	1	1	1	1	1	1	1	1		0	1
<i>Ornithopus perpusillus</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<i>Potentilla argentea</i>	1		0	0	1		1		1		1	1	0	1	1	
<i>Sagina subulata</i>		1	1	1	1	1	1			1		0	1			1
<i>Sceleranthus perennis</i>																
<i>Silene conica</i>																
<i>Stellaria pallida</i>	1			1			1		1	1	1	1	1	1		1
<i>Teesdalia nudicaulis</i>	1	0	1	1	1	1	1		0	1	1	1	1		0	
<i>Thymus serpyllum</i>																
<i>Trifolium glomeratum</i>			1	1		1	1	0	1	1	1		0			1
<i>Trifolium ornithopodioides</i>			1	1		1	1	1	1	1	1	1	1		0	1
<i>Trifolium scabrum</i>			1	1		1	1		0	1	1		1			1
<i>Trifolium striatum</i>	1		1	1		1	1		1	1	1	1	1	1	1	1
<i>Trifolium subterraneum</i>		1	1	1		1	1		1	1	1	1	1	0	0	1
<i>Trifolium suffocatum</i>							1		1				1			1
<i>Veronica verna</i>																
<i>Vicia lathyroides</i>							0		1	1	1		1			1
<i>Viola lactea</i>		0	1	1	1	1	1			1		1				1
Total no. spp extant	7	4	12	17	7	15	22	3	11	21	17	12	18	5	5	16
Total no. spp extinct	2	4	4	2	1	1	2	2	6	0	1	2	3	2	5	2
Total no. spp recorded	9	8	16	19	8	16	24	5	17	21	18	14	21	7	10	18
Extant spp/all spp																

1 = Recent record      0 = Apparently extinct

[See end of table for key to Natural Area numbers]



Table 6 continued

County/Area	Kent			Leics		Lincs, Notts, North, South, West Yorkshire							Mersey	
	71	70	68	39	33	33+34	34	38	32	22	16+18+22	24	26a	26b
Grasses														
<i>Apera interrupta</i>						1								
<i>Corynephorus canescens</i>													1	
<i>Festuca longifolia</i>						1								
<i>Vulpia ciliata ambigua</i>	1	1	1											
Other Vascular Plants														
<i>Chamaemelum nobile</i>				0	0						0	0		
<i>Crassula tillaea</i>						1								
<i>Dianthus deltoides</i>					0		0			0	1			0
<i>Erodium maritimum</i>														
<i>Filago minima</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<i>Gladiolus illyricus</i>														
<i>Hemiaria glabra</i>								1						
<i>Hypochaeris glabra</i>	0			0		1	0	0	1	1	0		0	
<i>Lotus angustissimus</i>			1											
<i>Lotus subbiflorus</i>														
<i>Medicago minima</i>	1													
<i>Moenchia erecta</i>	1	1	1	1	1	0			0	0	0	0	0	0
<i>Ornithopus perpusillus</i>	1	1	1	1	1	1	1	1	1	1		1	1	1
<i>Potentilla argentea</i>		1	1	1	1	1	1	1	1	1	0			
<i>Sagina subulata</i>		0												0
<i>Scleranthus perennis</i>														
<i>Silene conica</i>	1													
<i>Stellaria pallida</i>	1	1	1	0	0	1		0		1	1		1	1
<i>Teesdalia nudicaulis</i>	1			0	0	1	1		1	1	1	0	1	0
<i>Thymus serpyllum</i>														
<i>Trifolium glomeratum</i>		1	1											
<i>Trifolium ornithopodioides</i>	1	1	1					0						1
<i>Trifolium scabrum</i>	1		1		0			1			1	1		
<i>Trifolium striatum</i>	1	1	1	1	1	1	1	1	1	1	1	1	0	1
<i>Trifolium subterraneum</i>	1	1	1	0	0	1								0
<i>Trifolium suffocatum</i>	1													
<i>Veronica verna</i>														
<i>Vicia lathyroides</i>	1		1			1	1		1	1	1		1	0
<i>Viola lactea</i>														
Total no. spp extant	14	10	13	5	5	12	6	6	7	8	7	4	6	5
Total no. spp extinct	1	1	0	5	6	1	2	3	1	2	4	3	3	6
Total no. spp recorded	15	11	13	10	11	13	8	9	8	10	11	7	9	11
Extant spp/all spp	0.9	0.9	1.0	0.5	0.5	0.9	0.8	0.7	0.9	0.8	0.6	0.6	0.7	0.5

1 = Recent record      0 = Apparently extinct

[See end of table for key to Natural Area numbers]

Table 6 continued

County/Area	Norfolk & Suffolk				Northants	NE England	Somerset	Surrey			Sussex			Wilts		
	46	47+50	49	50+48				All	1+2	All	70	66	69	70	72	71
Grasses																
<i>Apera interrupta</i>	1	1	1	0												
<i>Corynephorus canescens</i>	1			0												
<i>Festuca longifolia</i>	1															
<i>Vulpia ciliata ambigua</i>	1	1	1	1			1	1								
Other Vascular Plants																
<i>Chamaemelum nobile</i>	0	0	0	0			1	1	1	1	1	1				0
<i>Crassula tillaea</i>	1	1	1	1			1		0							
<i>Dianthus deltoides</i>	1	0	0			1		1	1							
<i>Erodium maritimum</i>							1									
<i>Filago minima</i>	1	1	1	1	0	1	0	1	1	1	1	1				0
<i>Gladiolus illyricus</i>																
<i>Hemiaria glabra</i>	1	0														
<i>Hypochaeris glabra</i>	1	1	1	1	0		1	1	1		1		1			0
<i>Lotus angustissimus</i>																
<i>Lotus subbiflorus</i>																
<i>Medicago minima</i>	1	1	1	0									1			
<i>Moenchia erecta</i>	0	0	1	1	0	1	1	1	1		1	1	1			0
<i>Ornithopus perpusillus</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<i>Potentilla argentea</i>	1	1	1	1		1		1	1		1		0			
<i>Sagina subulata</i>		0				1	1	1	0		0	0				
<i>Scleranthus perennis</i>	1	0			0											
<i>Silene conica</i>	1	1	0	1			1									
<i>Stellaria pallida</i>	1	1	1	1	1	1	1	1				1	1			
<i>Teesdalia nudicaulis</i>	1	1	1	1	0	1	1	1	1		1	0	1	0		
<i>Thymus serpyllum</i>	1															
<i>Trifolium glomeratum</i>	1	0	1	1			0						1			
<i>Trifolium ornithopodioides</i>			1	1			1	1	1	1	1		1			
<i>Trifolium scabrum</i>	1	1	1	1		1	1	1	1		1		1			0
<i>Trifolium striatum</i>	1	1	1	1	1	1	1	1	1	1	1		1	1		
<i>Trifolium subterraneum</i>	1	1	1				1	1	1	1	1	1	1			
<i>Trifolium suffocatum</i>	1		1	1			1						1			
<i>Veronica verna</i>	1		0													
<i>Vicia lathyroides</i>	1	1	1	1		1	1	1	1				1			
<i>Viola lactea</i>							1		0			1				
Total no. spp extant	24	15	18	16	3	11	18	16	13	6	11	7	13	2	1	
Total no. spp extinct	2	7	4	4	5	0	2	0	3	0	1	2	1	3	3	
Total no. spp recorded	26	22	22	20	8	11	20	16	16	6	12	9	14	5	4	
Extant spp/all spp	0.9	0.7	0.8	0.8	0.4	1.0	0.9	1.0	0.8	1.0	0.9	0.8	0.9	0.4	0.3	

1 = Recent record    0 = Apparently extinct

[See end of table for key to Natural Area numbers]

**Key to Natural Area numbers. Old Natural Area codes are in brackets. Some Natural Area names have been abbreviated.**

**Bedfordshire**

53 = Bedfordshire Greensand Ridge (26)

**Berkshire & Oxfordshire**

66 = London Basin (38)  
64 = Midvale Ridge (36)  
65 = Chilterns (34)

**Cheshire, Gloucs, Hereford & Wores, Shrops, Staff, Warwicks**

43 = Midlands Plateau (75)  
57 = Malvern Hills (71)  
61 = Dean Plateau (72)  
56 = Severn & Avon Vales (70)  
58 = Clun (77)  
42 = Shropshire Hills (76)  
27 = Mosses & Meres (79)

**Cornwall**

95 = Killas & Granites (59)  
97 = The Lizard (60)  
113 = Isles of Scilly (M17)

**Devon**

89 = Blackdowns (55)  
90 = Devon Redlands (56)  
91 = South Devon (57)  
92 = Dartmoor (61)  
87+93 = Exmoor/The Culm (62/63)

**Dorset**

81+82 = Dorset Heaths/Isles of Portland and Purbeck (52/53)  
80+83 = South Wessex Downs/Wessex Vales (51/54)

**Hampshire**

77 = New Forest (50)  
70 = Wealden Greensand (46)  
66 = London Basin (38)  
75 = South Coast Plain (48)  
78 = Hampshire Downs

**Isle of Wight**

76 = Isle of Wight

**Kent**

71 = Romney Marshes (42)  
70 = Greensand (46)  
68 = North Kent Plain (40/41)

**Leicestershire**

39 = Charnwood (19)  
33 = Trent Valley and Rises (18)

**Lincs, Notts, North, South, West Yorkshire**

33+34 = N. Lincs Coversands/Trent Valley (part) (16)  
34 = N. Lincs Coversands and Clay Vales (part) (21)  
38 = Lincs Limestone (20)  
32 = Sherwood (17)  
22 = Humberhead Levels (15)  
16+18+22 = Vale of York/Vale of Pickering/Humberhead Levels (8)  
24 = Coal Measures (13)

**Merseyside**

26a = Urban Mersey Basin (Sefton Coast) (86)  
26b = Urban Mersey Basin (The Wirral) (86)

**Norfolk and Suffolk**

46 = Breckland (29)  
47+50 = North Norfolk (30/33)  
49 = Suffolk Coast and Heaths (32)  
50+48 = East Anglian Plain & Broads (River Waveney) (33/31)

**NE England**

1+2 = N. Northumberland Coastal Plain/Border Uplands (Whin Sill) (1/2)

**Surrey**

70 = Wealden Greensand (46)  
66 = London Basin (38)  
69 = North Downs (41)

**Sussex**

70 = Wealden Greensand (46)  
72 = High Weald (44)  
71 = Romney Marshes (42)

**Wiltshire**

64 = Midvale Ridge (36)  
79 = Berkshire Downs (37)

**Table 7 Areas of England ranked by number of lowland acid grassland species**

Extant spp	Area	New/Old Natural Area code
24	Breckland of East Anglia	NA 46/NA29
22	The Dorset Heaths	NA81 & 82/NA52 & 53
21	The New Forest, Hampshire	NA77/NA50
19	Wealden Greensand of Hampshire, Sussex & Surrey	NA70/NA46
18	The Sandlings, East Anglia	NA49/NA32
18	The South Coast Plain, Hampshire	NA75/NA48
18	Somerset (mainly coastal sand dunes)	All NAs in county
18	Cornwall, coastal cliff tops	NA95 & 96/NA59
17	South Devon (mainly coastal cliff top grassland)	NA91/NA57
17	Thames Valley Heaths, Surrey, Berkshire & Hampshire	NA66/NA38
16	Broads & River Waveney, East Anglia	NA50 & 48/NA33 & 31
16	Dungeness, Kent & Sussex	NA71/NA42
16	Isle of Wight	NA76/NA49
15	North Norfolk, including Greensand areas	NA50 & 47/NA30 & 33
15	North coast of Devon	NA87 & 93/NA62 & 63
13	Cambridgeshire	NA46, 51 & 53/NA26, 28 & 29
13	The Lizard, Cornwall	NA97/NA60
13	North Kent Plain	NA68/NA40 & 41
12	Devon Redlands	NA90/NA56
12	Kidderminster Heaths, Her & Worcs, Shrops., Staff.	NA43/NA75
12	Coversand of Lincs, Notts, Yorks	NA33 & 34/NA16
11	Essex (mainly in north east)	NA66/NA50
11	Isles of Scilly, Cornwall	NA113/M17
11	Whin Sill, North East England	NA1 & 2/NA1 & 2
10	Midvale Ridge, Oxfordshire	NA64/NA36
10	Avon	NA62/NA68
10	Wealden Greensand, Kent	NA70/NA46
9	Mosses & Meres, (mainly in Shropshire)	NA27/NA79
8	Cumbria	All NAs in county
8	Bedfordshire Greensand Ridge	NA53/NA26
8	Humberhead Levels in Lincs, Notts, Yorks	South part of NA22/NA15
8	Malvern Hills, Hereford & Worcs	NA57/NA71
8	Shropshire Hills	NA42/NA76
7	Vales of Yorkshire	NA16, 18 & 22/NA8
7	Derbyshire	All NAs in county
7	The High Weald, Sussex	NA72/NA44
7	Dartmoor, Devon	NA92/NA61
7	Sherwood Forest, Notts	NA32/NA17
7	Clun and North West Herefordshire Hills	NA58/NA77
6	Forest of Dean, Gloucs	NA61/NA72
6	Lincolnshire Limestone	NA38/NA20
6	Sefton Coast, Mersey Basin	NA26/NA86
6	Lincolnshire Clay Vales (outside Coversand areas)	NA34/NA21
6	North Downs, Surrey	NA69/NA41
5	Trent Valley and Rises, Leics	NA33/NA18
5	The Wirral, Mersey Basin	NA26/NA86
5	Hertfordshire	All NAs in county
5	Chamwood Forest, Leics	NA39/NA19
5	Hampshire Downs	NA78/NA47
4	Blackdowns, Devon, Somerset, Dorset	NA89/NA55
4	Coal Measures, West Yorkshire	NA24/NA13
3	Severn and Avon Vales, Gloucs, Hereford & Worcs	NA56/NA70
3	Northamptonshire	All NAs in county
3	Chilterns, Berks and Oxfordshire	NA65/NA34
3	Wessex Vales and South Wessex Downs, West Dorset	NA80 & 83/NA51 & 54
2	Greensand outcrops, Thames & Avon Vales, Wilts	NA63/NA36
1	Marlborough Downs, Wilts	NA97/NA37

**Table 8 Provisional indicator species list for lowland dry acid grassland**

<b>Taxa recorded from English acid grassland</b>	<i>Hypericum linariifolium</i>	<i>Trifolium suffocatum</i>
	<i>Hypochaeris glabra</i>	<i>Umbilicus rupestris</i>
<b>Dwarf shrubs</b>	<i>Jasione montana</i>	<i>Veronica spicata spicata</i>
<i>Rosa pimpinellifolia</i>	<i>Lepidium heterophyllum</i>	<i>Veronica verna</i>
<i>Ulex minor</i>	<i>Lotus angustissimus</i>	<i>Vicia lathyroides</i>
<b>Grasses</b>	<i>Lotus subbiflorus</i>	<i>Viola canina</i>
<i>Aira caryophyllea</i>	<i>Medicago minima</i>	<i>Viola lactea</i>
<i>Aira praecox</i>	<i>Medicago polymorpha</i>	<b>Mosses</b>
<i>Apera interrupta</i>	<i>Moenchia erecta</i>	<i>Campylopus polytrichoides</i>
<i>Corynephorus canescens</i>	<i>Muscari neglecta</i>	<i>Hypnum lacunosum tectorum</i>
<i>Cynodon dactylon</i>	<i>Myosotis ramosissima</i>	<i>Leptodontium gemmascens</i>
<i>Festuca longifolia</i>	<i>Ornithopus perpusillus</i>	<i>Racomitrium elongatum</i>
<i>Koeleria macrantha</i>	<i>Parentucellia viscosa</i>	<i>Rhynchostegium megapolitanum</i>
<i>Poa bulbosus</i>	<i>Petrorhagia nanteuillii</i>	<i>Scleropodium tourettii</i>
<i>Vulpia ciliata ambigua</i>	<i>Petrorhagia prolifera</i>	<i>Tortula ruralis ruraliformis</i>
<b>Other vascular plants</b>	<i>Plantago coronopus</i>	<b>Liverworts</b>
<i>Allium schoenoprasum</i>	<i>Potentilla argentea</i>	<i>Ptilidium ciliare</i>
<i>Aphanes inexpectata</i>	<i>Potentilla neumanniana</i>	<b>Lichens</b>
<i>Astragalus danicus</i>	<i>Radiola linoides</i>	<i>Cladonia arbuscula</i>
<i>Botrychium lunaria</i>	<i>Sagina nodosa</i>	<i>Cladonia cariosa</i>
<i>Carex arenaria</i>	<i>Sagina subulata</i>	<i>Cladonia ciliata</i>
<i>Carex montana</i>	<i>Scilla autumnalis</i>	<i>Cladonia crispata</i>
<i>Cerastium arvense</i>	<i>Scleranthus annuus annuus</i>	<i>Cladonia foliacea</i>
<i>Cerastium diffusum</i>	<i>Scleranthus annuus polycarpus</i>	<i>Cladonia gracilis</i>
<i>Cerastium semidecandrum</i>	<i>Scleranthus perennis prostratus</i>	<i>Cladonia uncialis</i>
<i>Chamaemelum nobile</i>	<i>Sedum acre</i>	<i>Coelocaulon aculeatum</i>
<i>Crassula tillaea</i>	<i>Sedum anglicum</i>	<i>Icmadophila ericetorum</i>
<i>Cuscuta epithymum</i>	<i>Sedum fosterianum</i>	<i>Peltigera canina</i>
<i>Dianthus armeria</i>	<i>Sherardia arvensis</i>	<i>Peltigera rufescens</i>
<i>Dianthus deltooides</i>	<i>Silene conica</i>	<i>Usnea articulata</i>
<i>Echium vulgare</i>	<i>Silene nutans</i>	<b>Total number of taxa = 108</b>
<i>Erigeron acer</i>	<i>Silene oites</i>	
<i>Erodium cicutarium</i>	<i>Spergularia rubra</i>	<b>Additional species that could be used in Wales</b>
<i>Erodium maritimum</i>	<i>Spiranthes spiralis</i>	<b>Vascular plants</b>
<i>Erodium moschatum</i>	<i>Stellaria pallida</i>	<i>Gagea bohemica</i>
<i>Euphrasia vigursii</i>	<i>Teesdalia nudicaulis</i>	<i>Lychnis viscaria</i>
<i>Filago minima</i>	<i>Thymus serpyllum</i>	<i>Potentilla rupestris</i>
<i>Filago lutescens</i>	<i>Trifolium arvense</i>	<i>Scleranthus perennis perennis</i>
<i>Filago vulgaris</i>	<i>Trifolium glomeratum</i>	<i>Trifolium strictum</i>
<i>Gentianella campestris</i>	<i>Trifolium ornithopodioides</i>	<i>Veronica spicata hybrida</i>
<i>Gladiolus illyricus</i>	<i>Trifolium scabrum</i>	<b>Mosses</b>
<i>Gnaphalium luteoalbum</i>	<i>Trifolium striatum</i>	<i>Bartramia stricta</i>
<i>Herniaria glabra</i>	<i>Trifolium subterraneum</i>	<b>Total number of taxa = 115</b>

The list is intended primarily to cover parched acid grasslands, NVC community U1. Some species more typical of other types are also included, eg *Gladiolus illyricus*, found in species-rich Bracken stands and *Icmadophila ericetorum* found in U2 grassland, but these other communities generally have lower floristic richness and are not so readily assessed by using this provisional list. Several species are locally typical of high quality examples of U1 grasslands but are normally regarded as calcicoles, but, in at least parts of the country, are more catholic. To include these in the main indicator list could be confusing so they are included below as bonus species.

**Bonus species (all vascular plants)**

*Carduus nutans*  
*Carlina vulgaris*  
*Clinopodium acinos*  
*Linum catharticum*  
*Linum bienne*  
*Thymus polytrichus*  
*Thymus pulegioides*

Habitats with U1 grassland in southern and eastern England containing over 10 species could be regarded as being of high nature conservation significance and those with over 20 as being exceptional sites for their acid grassland flora.

# Appendix 1. Examples of lowland acid grasslands

## Introduction

The following sites were selected as examples of the main types of acid grassland found in lowland England. Some were surveyed by the contractor, others were extracted from existing reports. Quadrat samples of characteristic acid grassland stands are given as well as brief site descriptions. In some cases plant community lists are also included. Full details of the sites surveyed by the contractor have been sent to the relevant Local Teams.

**1. Berkshire: Natural Area 66, London Basin**

Windsor Great Park SSSI and adjacent areas - parkland, U4.

**2. Cornwall and Devon: Natural Areas 91 and 95, South Devon and Cornish Killas and Granites**

Cliff tops on the south coast of Cornwall and Devon - U1f.

**3. Dorset: Natural Area 80, South Wessex Downs**

North Poorton - enclosed pasture - U4.

**4. Gloucestershire: Natural Area 61, Dean Plateau and Wye Valley**

May Hill SSSI - large enclosures, pasture - U1e.

**5. Hampshire: Natural Area 77, New Forest**

The New Forest SSSI and surrounding areas

a. Bolton's Bench - settlement-edge green U1f.

b. Yew Tree Heath, Dibden Enclosure Grazing Strip, Gurnetfields Furzebrake - disturbed and re-seeded areas - U1d.

c. Blackheath, Bistern Warren, Kingstone Common - grassland on free-draining sand - U1b.

d. West of Gurnetfields Furzebrake - grass heath - U3.

e. New Forest site - species-rich bracken - U20a.

**6. Hampshire: Natural Area 70, Wealden Greensand**

Woolmer Forest area - disturbed heathland edge - U1.

**7. Hereford and Worcester: Natural Area 43, Midlands Plateau**

Hurcott Pasture SSSI - enclosed pasture - U1f.

**8. Humberside: Natural Area 34, North Lincolnshire Coversands and Clay Vales**

a. Risby Warren SSSI - grass heath - U1c.

b. Manton Warren and Twigmoor SSSI and adjacent areas - grass heath, stabilised sand dune, arable reversion - U1, SD11b, H11a.

**9. Kent and Sussex (East): Natural Area 71, Romney Marshes**

Dungeness SSSI - non-maritime grassland on shingle - U1a.

**10. Kent: Natural Area 70, Wealden Greensand**

Hatch Park SSSI - parkland - U1.

**11. Suffolk: Natural Area 46, Breckland**

Lakenheath Warren SSSI - heathland - U2a, SD10b.

**12. Sussex (East): Natural Area 74, South Downs**

Burnthouse Down West, Clayton to Offham Escarpment SSSI - acid grassland on drift over chalk - U4b.

The abundance of species in community lists is expressed using the DAFOR scale (**D**ominant, **A**bundant, **F**requent, **O**ccasional, **R**are). The abundance of species in quadrats is expressed using the Domin scale:

1	=	few individuals
2	=	several individuals
3	=	many individuals
4	=	4-10%
5	=	11-25%
6	=	26-33%
7	=	34-50%
8	=	51-75%
9	=	76-90%
10	=	91-100%