Development of methods for investigating settlement and land-use using pollen data : a case study from north-east England circa 8000 cal. BC - cal. AD 500.

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Development of Methods for Investigating Settlement and Land-use using Pollen Data:

A Case-study from North-east England, *circa* 8000 cal. BC - cal. AD 500

Volume two of three

Tables and Figures for Chapters 1-8 and
Appendix A, excluding Chapter 7

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Contents

Volume 2

Tables and Figures for Chapters 1-8 and Appendix A, excluding Chapter 7 (the pollen maps for north-east England, *circa* 8000 cal. BC - cal. AD 500) located in Volume 3.

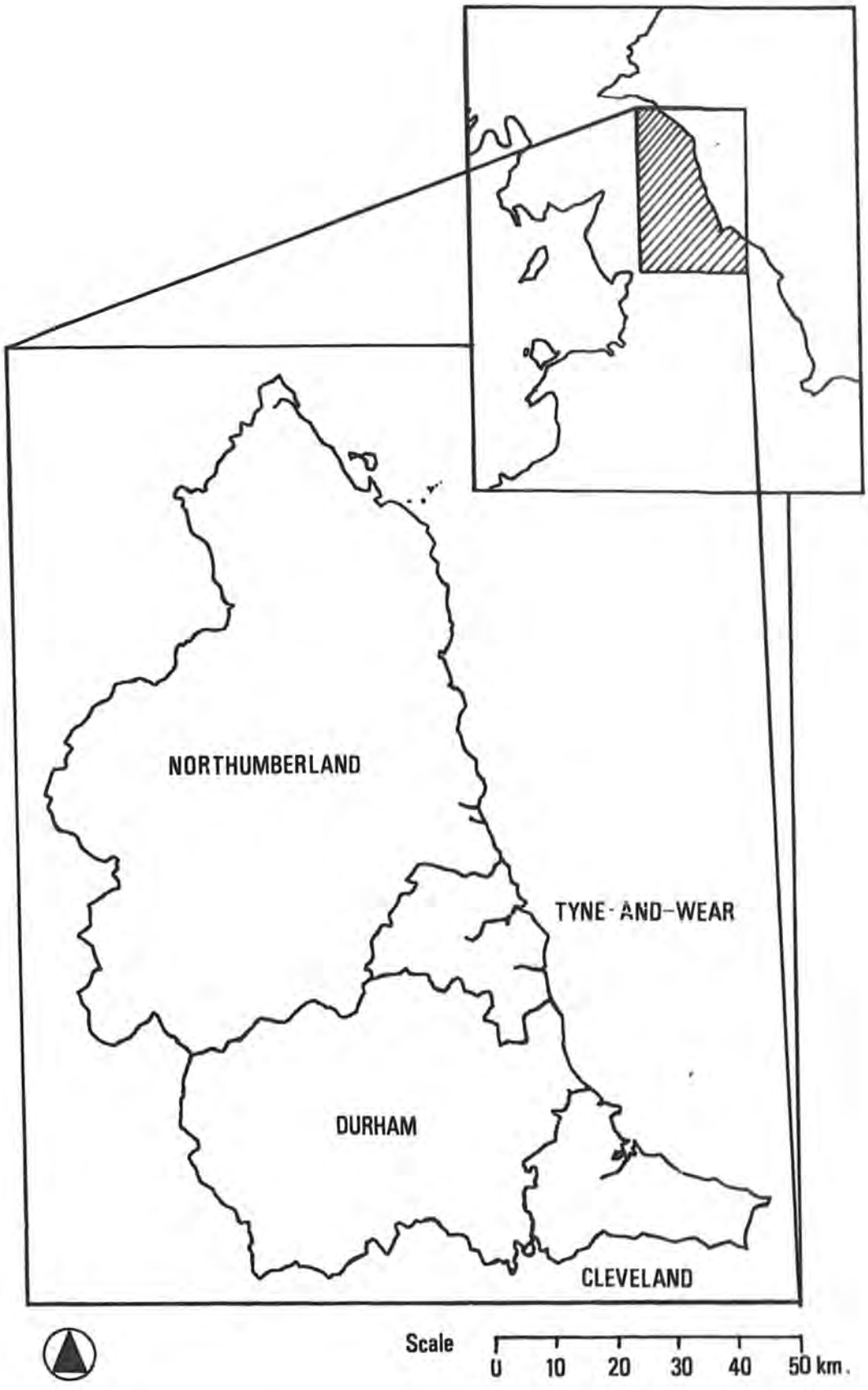
N.B. There are no figures for Chapters 9 and 10 or for Appendices B and C, and no tables for chapters 1, 2, 8, 9 and 10, or for any of the Appendices.

N.B. For tables and figures for Chapter 7 refer to Volume 3.

Tables and Figures for

Chapter 1

Introduction



Map of the Counties of North-East England included in the study area

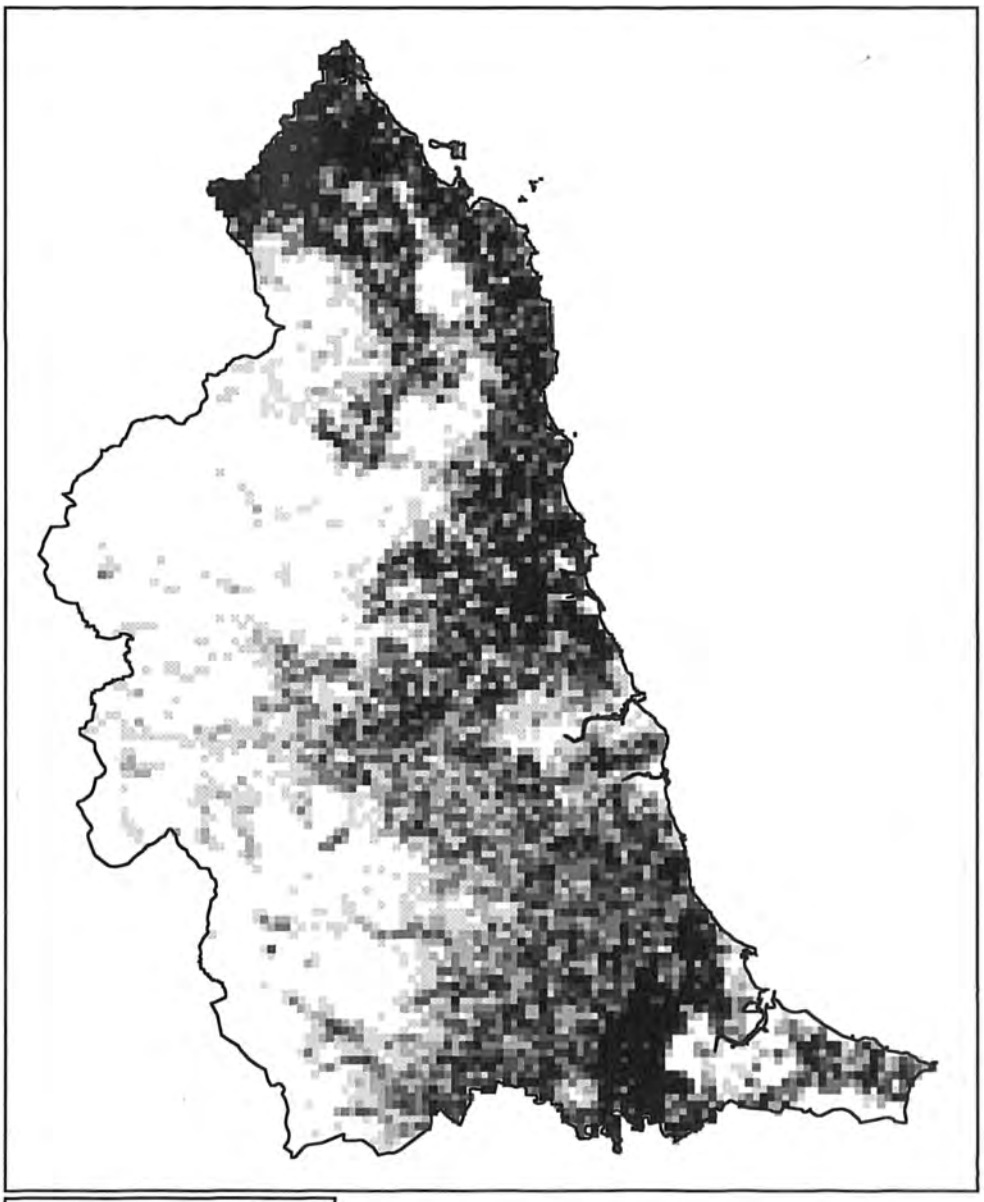
Tables and Figures for

Chapter 2

Background to the study region

Figure 2.1 Map showing present day cover of arable land in north-east England, derived from satellite image data provided for the whole of Great Britain by the Institute of Terrestrial Ecology, Monks Wood. This map corresponds to the tilled land data provided by the ITE.

The present day dominance of arable land in the eastern, lowland areas of the region is clearly evident. Concentrations of arable land are particularly great in the Tees lowlands surrounding the Tees conurbation, in south-east Northumberland around the lower Blyth and Wansbeck, in the coastal lowlands of Northumberland and in the Tweed valley to the north. Arable land extends inland along the Tyne valley, into Teesdale and Weardale and the Till and Breamish valleys in northern Northumberland.



Key:

- 0 – 10%
- 10 – 20%
- 20 – 30%
- 30 – 40%
- 40 – 50%
- 50 – 60%

Arable

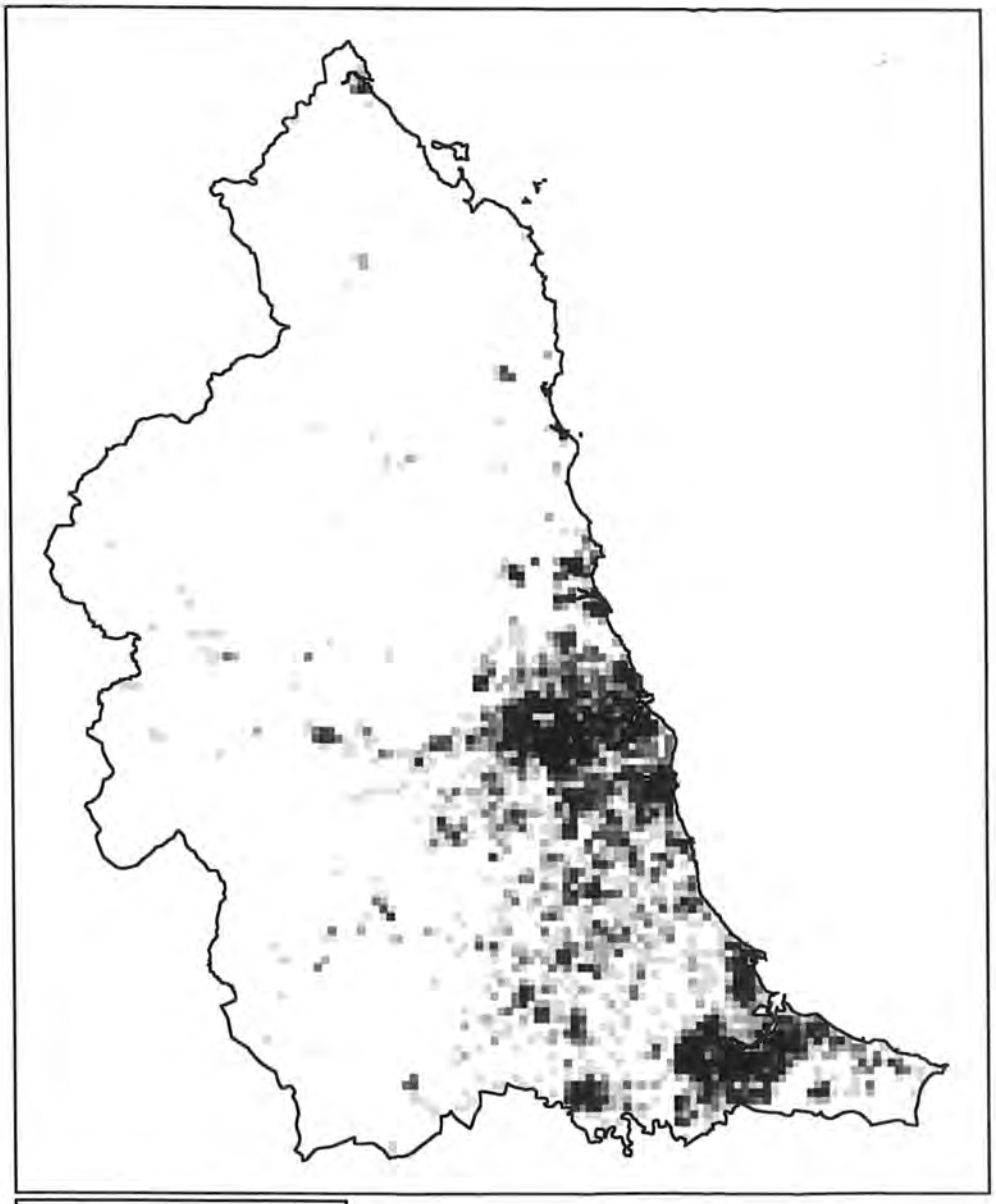
Percentage cover of each 1km grid square.

(includes all tilled land.)

Acknowledgements ITE Monks Wood.

Figure 2.2 Map showing present day cover of built-up land in north-east England. This map combines satellite data for urban, suburban and rural development and industrial land.

There is a clear contrast between the dominance of built-up land and land used for industrial purposes in the lowlands between the Tyne and Tees on the one hand and the relative lack of built up land in the uplands (apart from along the valley bottoms) and across most of Northumberland. Concentrations are particularly marked in the conurbations of the lower Tyne and Tees.



Key:

- 0 –10%
- 10 –20%
- 20 –30%
- 30 –40%
- 40 –50%
- 50 –60%

Built-up Land

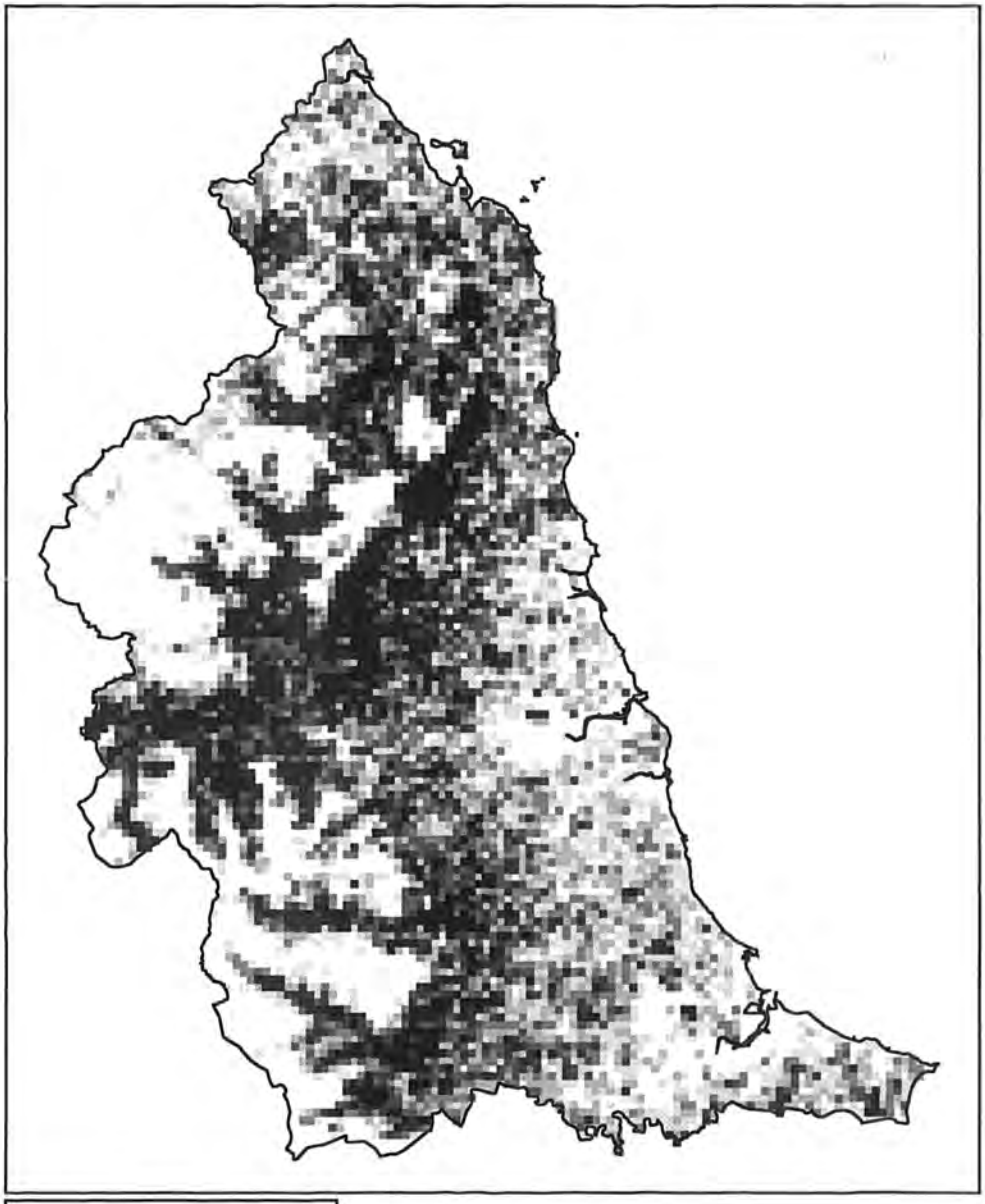
Percentage cover of each 1km grid square.

(includes urban, suburban and rural development and industrial land.)

Acknowledgements ITE Monks Wood.

Figure 2.3 Map showing present day cover of grassland (excluding rough moorland and heath grassland) in north-east England. This map combines satellite data for meadow, verges and mown and grazed turf.

The areas with highest concentrations of meadow, turf and verge grassland are typically located in the foothills at elevations between 100-400 metres a.s.l., above which land cover is dominated by rough grassland (Figure 2.4) and moorland (Figure 2.5). The cover of grassland thins out towards the lowland areas which are more dominated by built up land and arable land.



Key:

- 0 –10%
- 10 –20%
- 20 –30%
- 30 –40%
- 40 –50%
- 50 –60%

Pasture

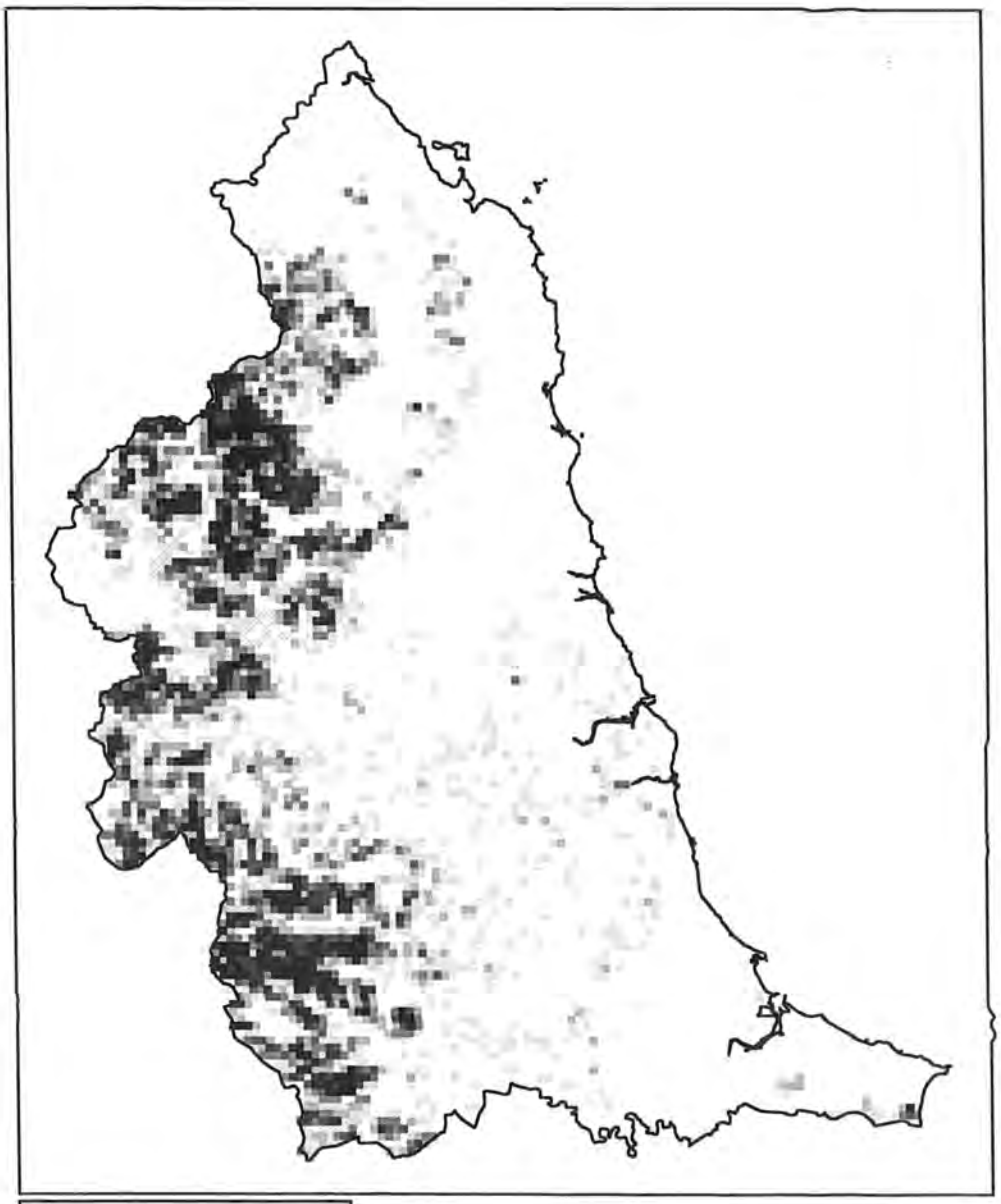
Percentage cover of each 1km grid square.

(Including meadow, verges mown and grazed turf.)

Acknowledgments ITE Monks Wood.

Figure 2.4 Map showing present day cover of rough grassland in north-east England. This map combines satellite data for moorland grass and grass heath.

Rough grassland dominates the land cover in many upland areas of north-east England lying above 400m a.s.l.. This is mostly moorland grass. Gaps in the concentration of rough grassland in the uplands represent those areas where *Calluna* and other dwarf shrub moorland is dominant (Figure 2.5), or those areas under forestry, such as around Kielder Water in south west Northumberland (Figure 2.6). Lower concentrations of rough grassland occur scattered across the Durham lowlands and the coast and mark the occurrence of grass heath, waste land and coastal grassland.



Key:

- 0 –10%
- 10 –20%
- 20 –30%
- 30 –40%
- 40 –50%
- 50 –60%

Rough Pasture

Percentage cover of each 1km grid square.

(includes moorland grass and grass heath.)

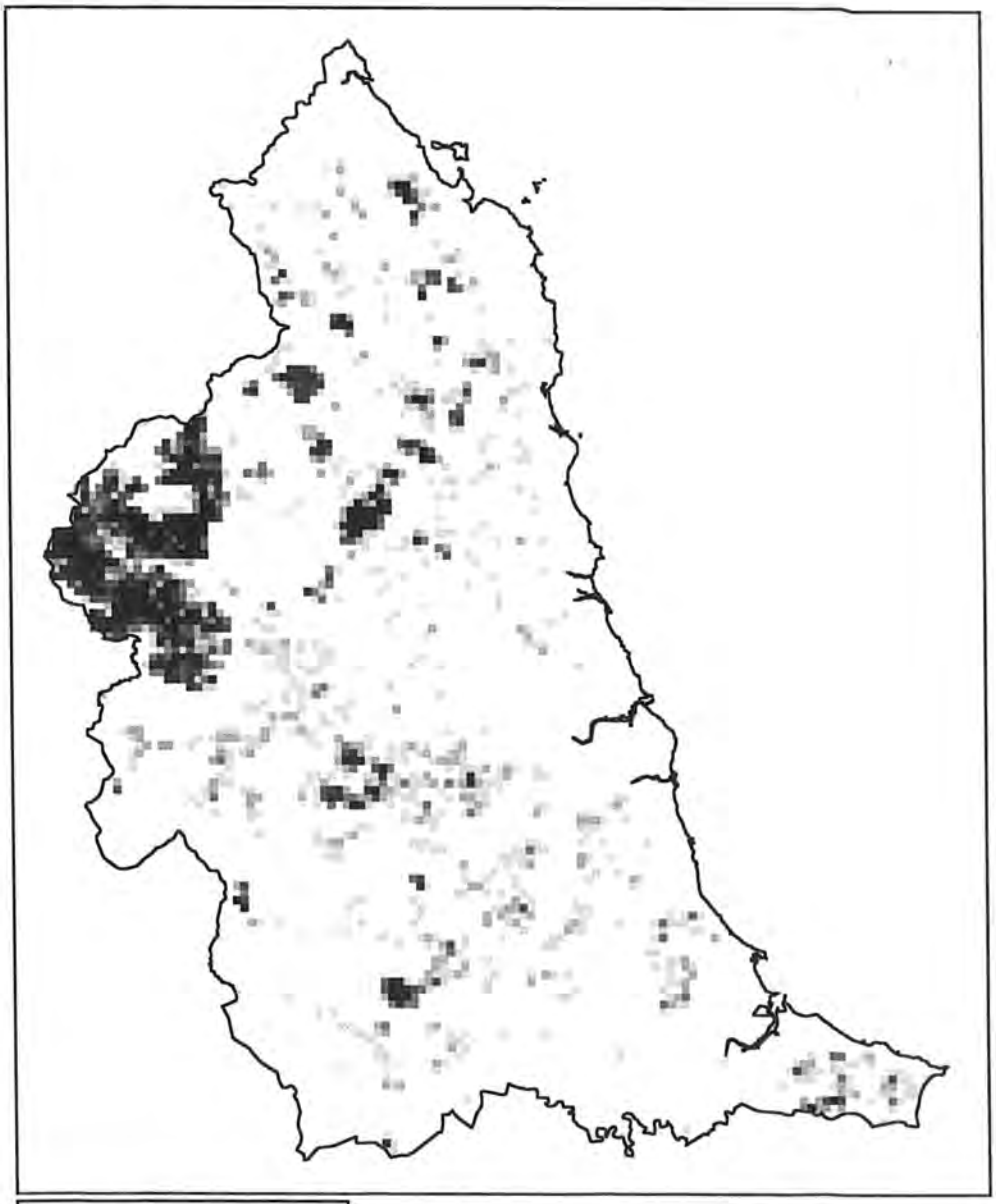
Acknowledgements ITE Monks Wood.

Figure 2.5 Map showing present day cover of dwarf shrub moorland in north-east England. This map corresponds to the satellite data for dwarf shrub moorland, which includes common moorland dwarf shrubs such as *Calluna* (heather), *Erica* (heath), *Ulex* (gorse) and *Cytisus* (broom).

The occurrence of land with dwarf shrub moorland is almost entirely restricted to those areas of upland in the west of the region above 400 m a.s.l. that is not covered by rough moorland grassland (Figure 2.4) or by forestry (Figure 2.6). Concentrations occur in the Northern Pennine uplands, the Cleveland Hills, and the Fell Sandstone Uplands and Border Hills of Northumberland. Outside these areas there is virtually no coverage of dwarf shrub moorland.

Figure 2.6 Map showing present day cover of woodland and forestry in north-east England. This map combines the satellite data provided by the ITE for deciduous and coniferous woodland (including afforested areas) and scrub.

Areas with high woodland cover are distributed quite widely across the north-east of England when compared with other land cover types. Concentrations of woodland occur in the Kielder Water area, in the Fell Sandstone uplands of Northumberland and in the Northern Pennines, where upland land has been afforested by coniferous tree species. Lower concentrations of wooded land scattered across the lowlands and uplands represent smaller or less dense patches of forestry plantation and deciduous woodland or scrub. Woodland is scattered throughout those foothill and lowland areas dominated by meadow and arable land, but is mostly absent from industrialised and urbanised areas.



Key:

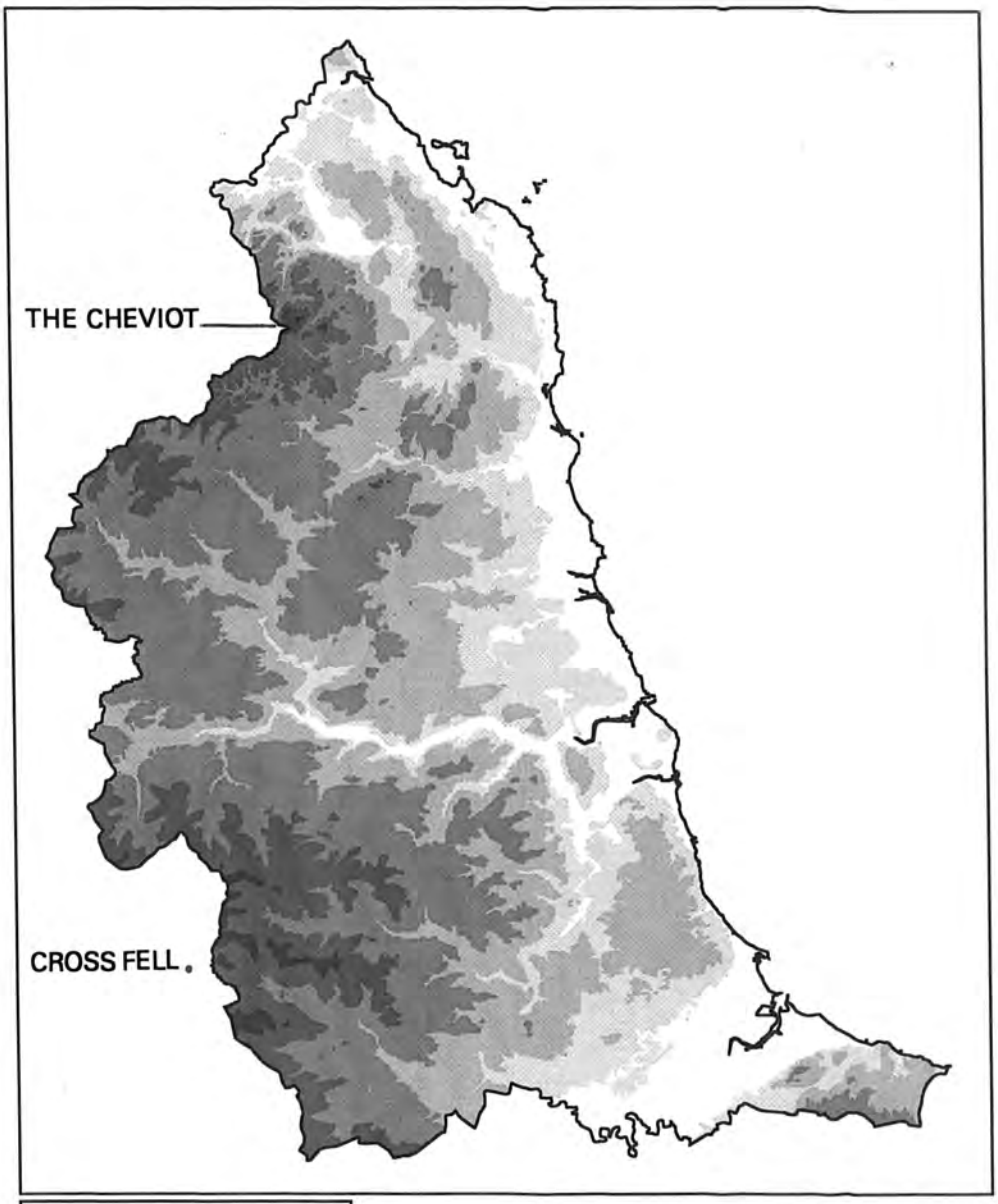
- 0 –10%
- 10 –20%
- 20 –30%
- 30 –40%
- 40 –50%
- 50 –60%

Woodland

Percentage cover of each 1km grid square.

(includes deciduous and coniferous woodland and scrub.)

Acknowledgements ITE Monks Wood.



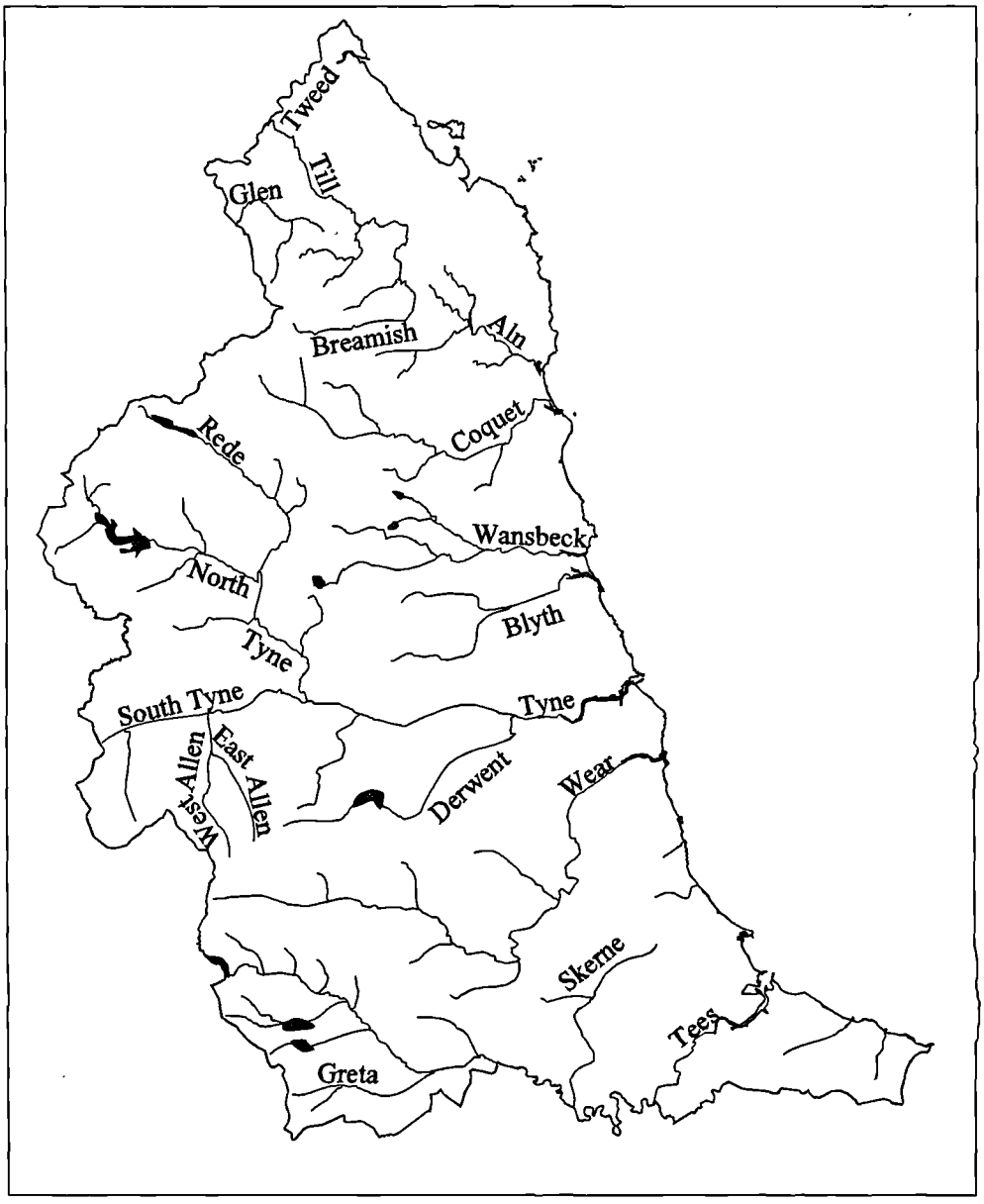
Key:

- 0 –50m
- 50 –100m
- 100 –200m
- 200 –400m
- 400 –600m
- 600 –800m

Relief map of North-East England

Elevation of land measured in metres above sea level.

Figure 2.8



Key:

Reservoir/ lake

River/ stream

Drainage map of North-east England showing main rivers.

Figure 2.9

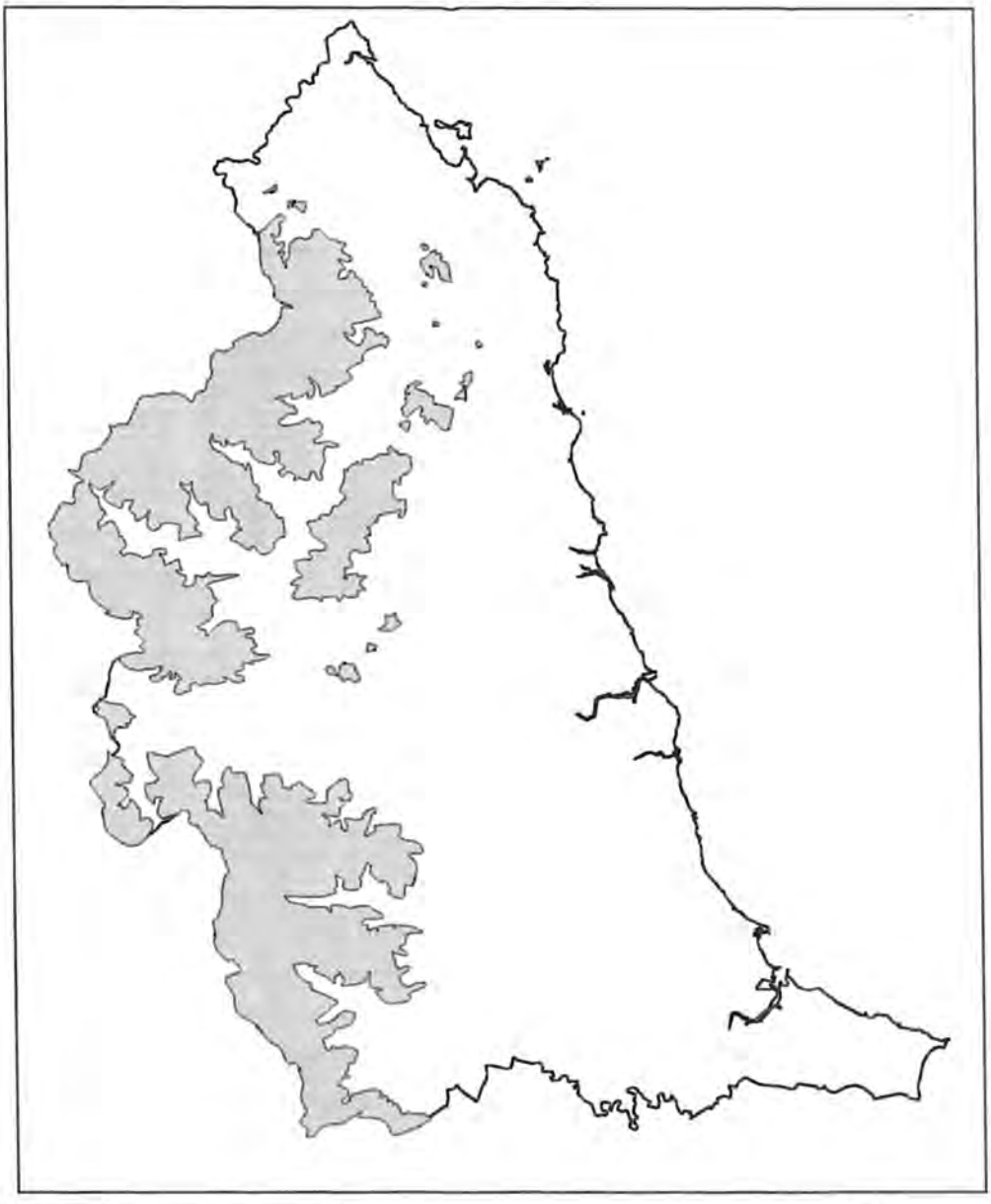
Key:

	Land between 100 - 200m a.s.l.
	Land over 200m a.s.l.
HILLS	Upland area
Valley	Lowland area or valley

Main Geomorphological Regions of North-east England

(After Beaumont 1970 and Swan 1993)

Figure 2.10



Key:

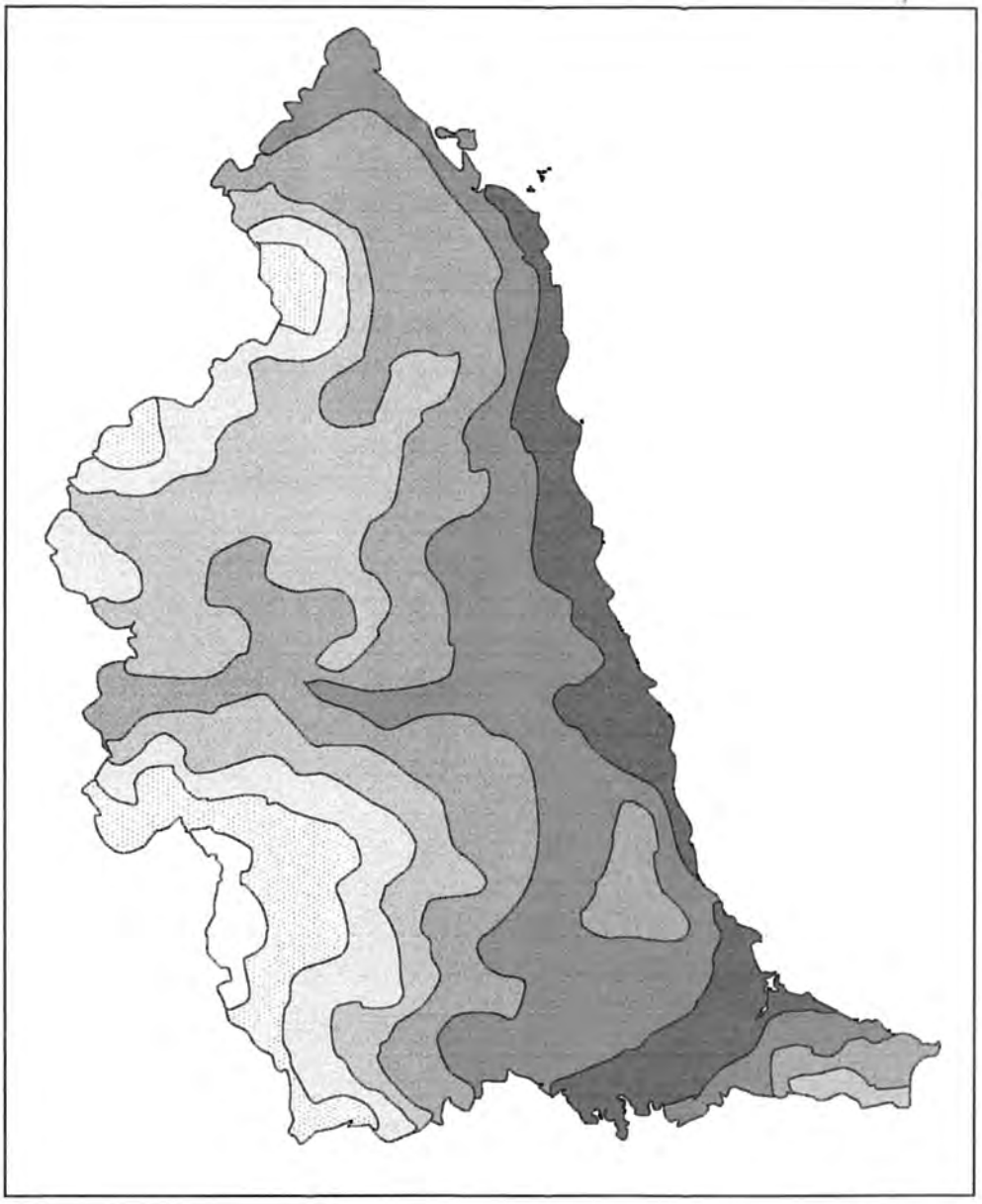
Upland (Extensively farmed)

Lowland (Intensively farmed)

Distribution of upland and lowland in North-east England.
(After Swan 1993)

N.B. The present transition between upland and lowland in Northumberland lies between 200-250m a.s.l. and in County Durham between 350 -400m a.s.l..

Figure 2.11



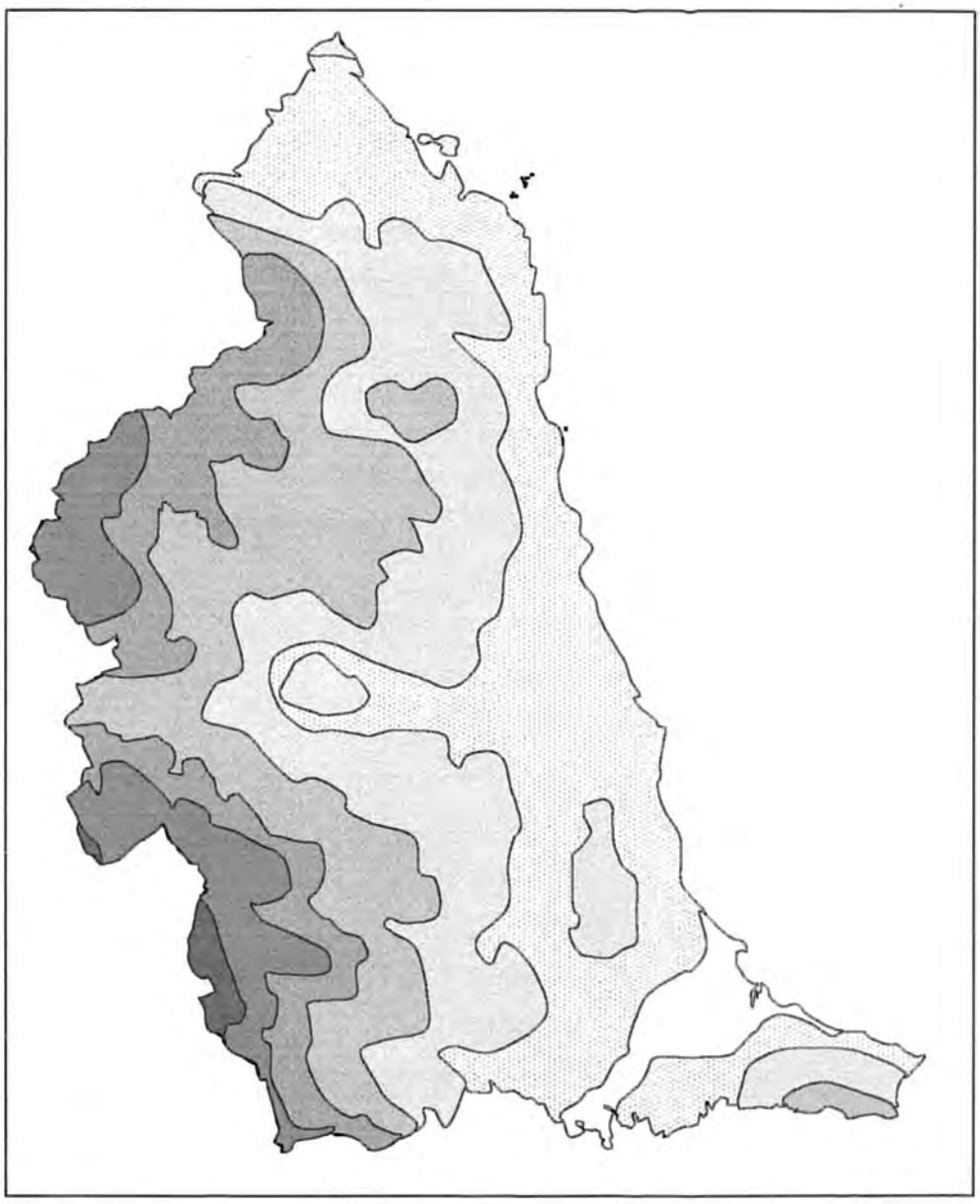
Key:

- < 850°
- 850 - 950°
- 950 - 1050°
- 1050 - 1150°
- 1150 - 1250°
- 1250 - 1350°
- > 1350°

Median accumulated temperature above
0°C (day-degrees),
January to June.

(After Jarvis *et al.* 1984)

Figure 2.12



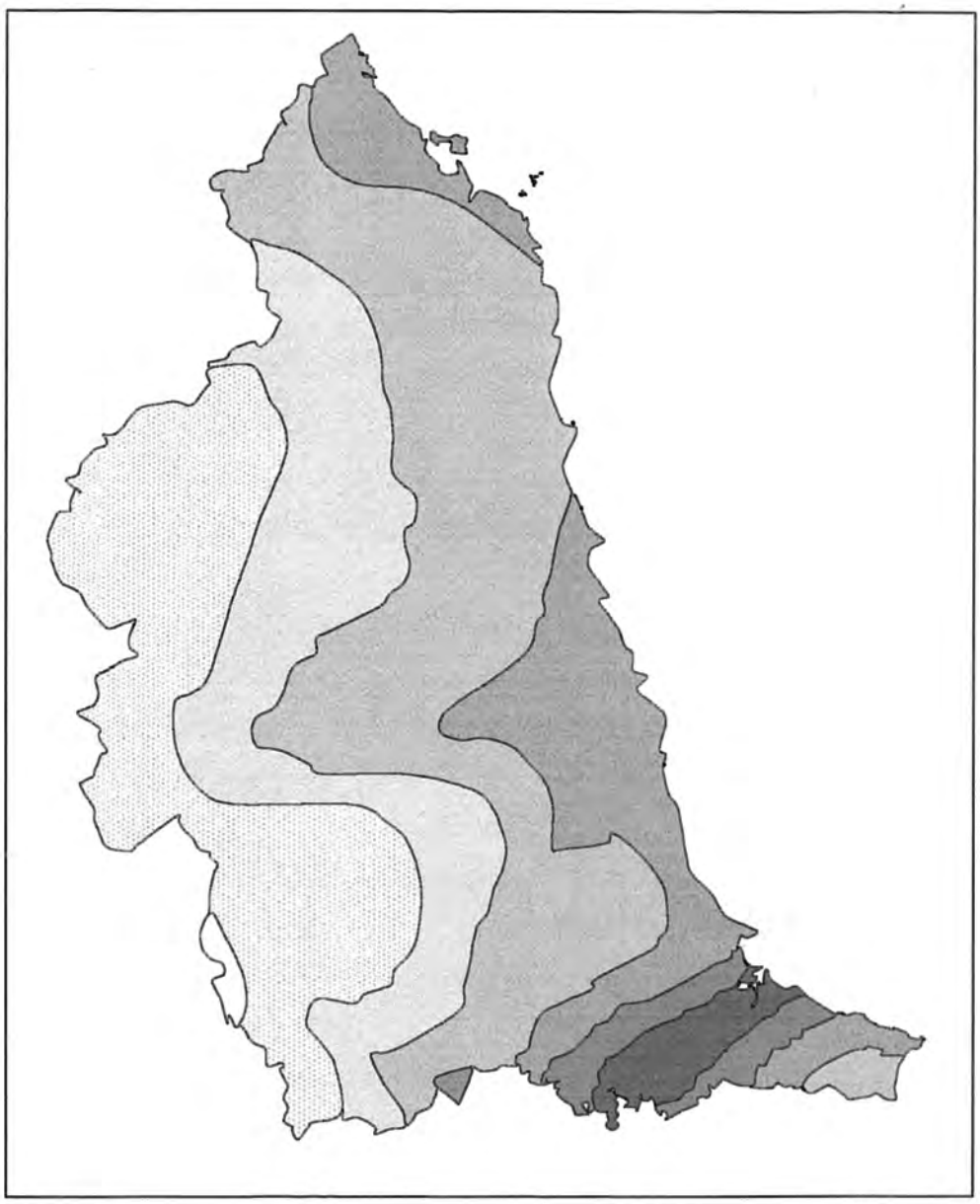
Key:

- < 500 mm
- 500 - 700 mm
- 700 - 800 mm
- 800 - 1000 mm
- 1000 - 1200 mm
- 1200 - 1600 mm
- > 1600 mm

Rainfall:

annual average precipitation (mm)

Figure 2.13



Key:

- < 25 mm
- 25 - 50 mm
- 50 - 75 mm
- 75 - 100 mm
- 100 - 125 mm
- 125 - 150 mm
- > 150 mm

Mean accumulated maximum potential soil moisture deficit (mm)

(After Jarvis *et al.* 1984)

Key to Figure 2.14: Solid geological map of North-east England

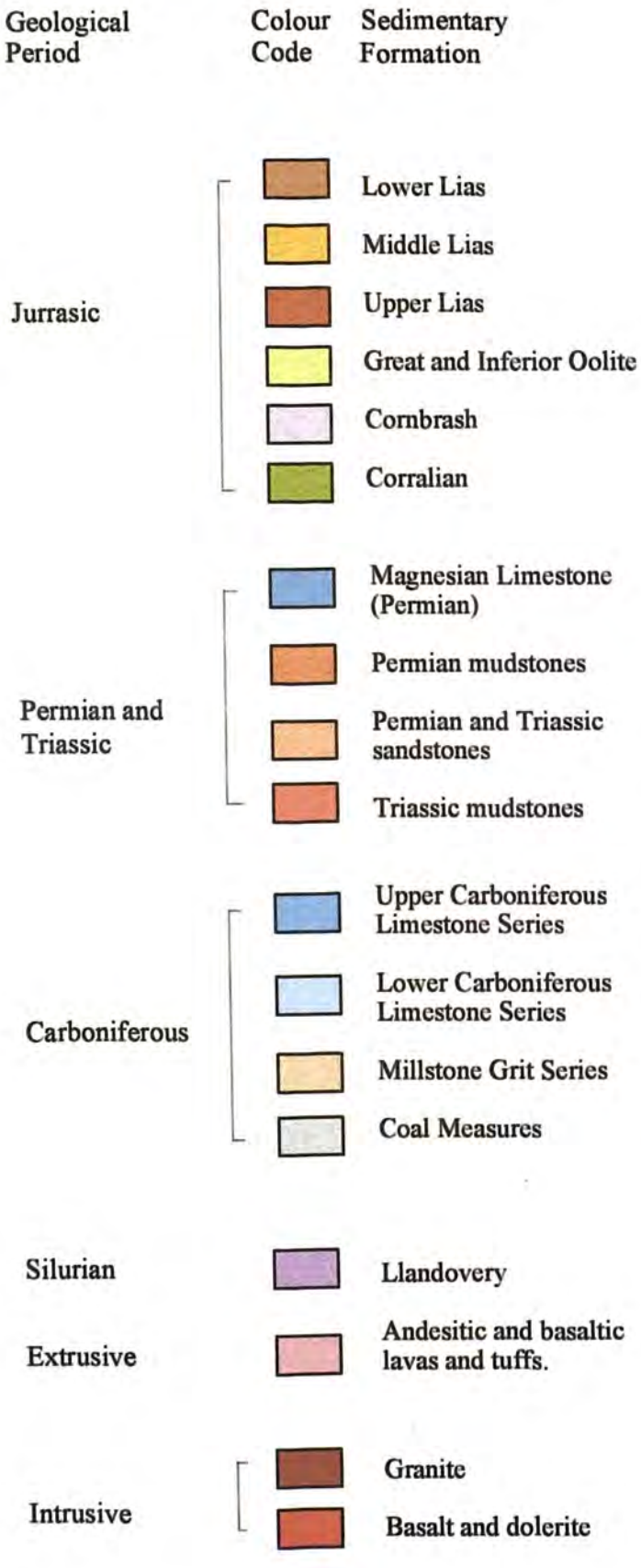
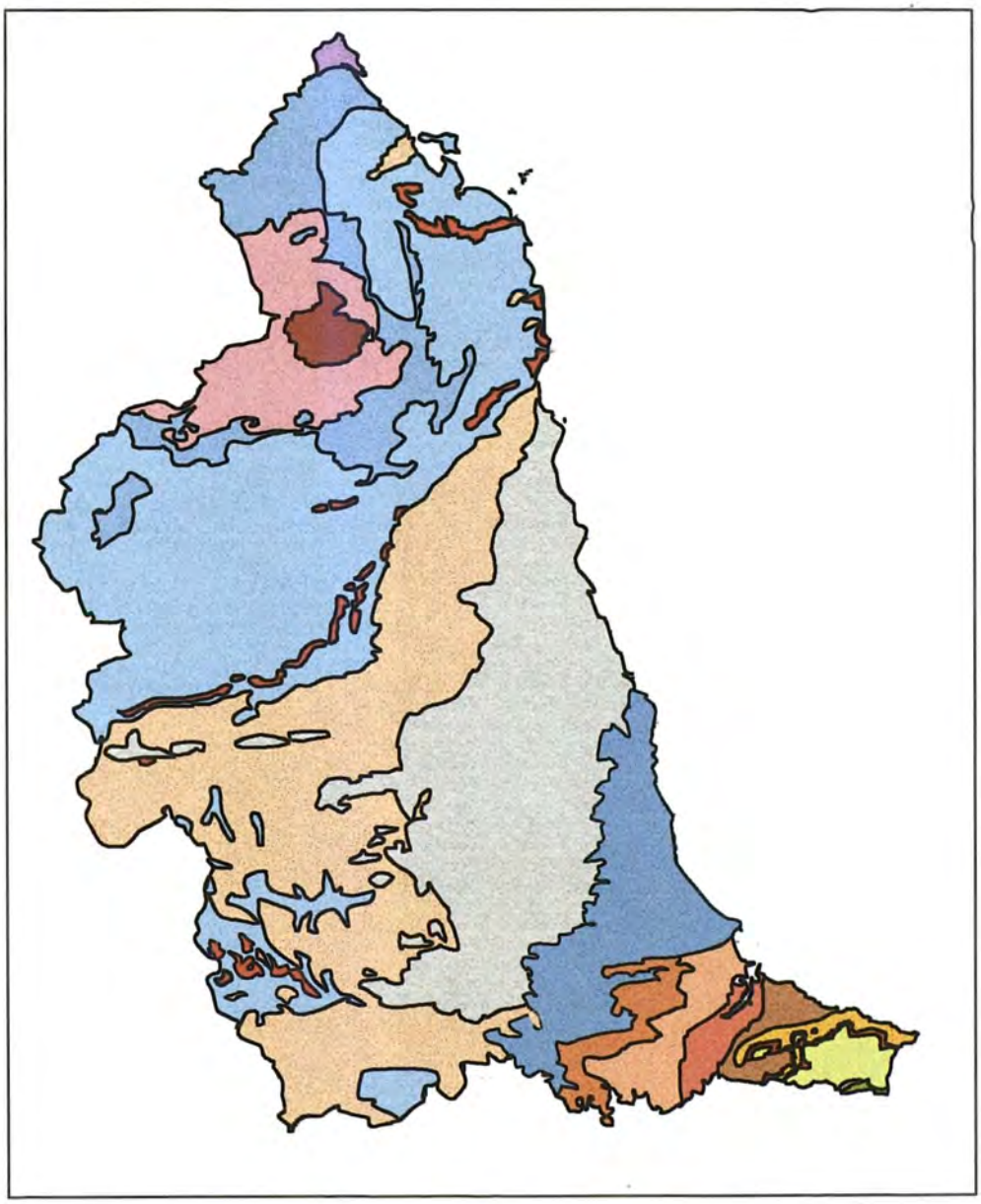


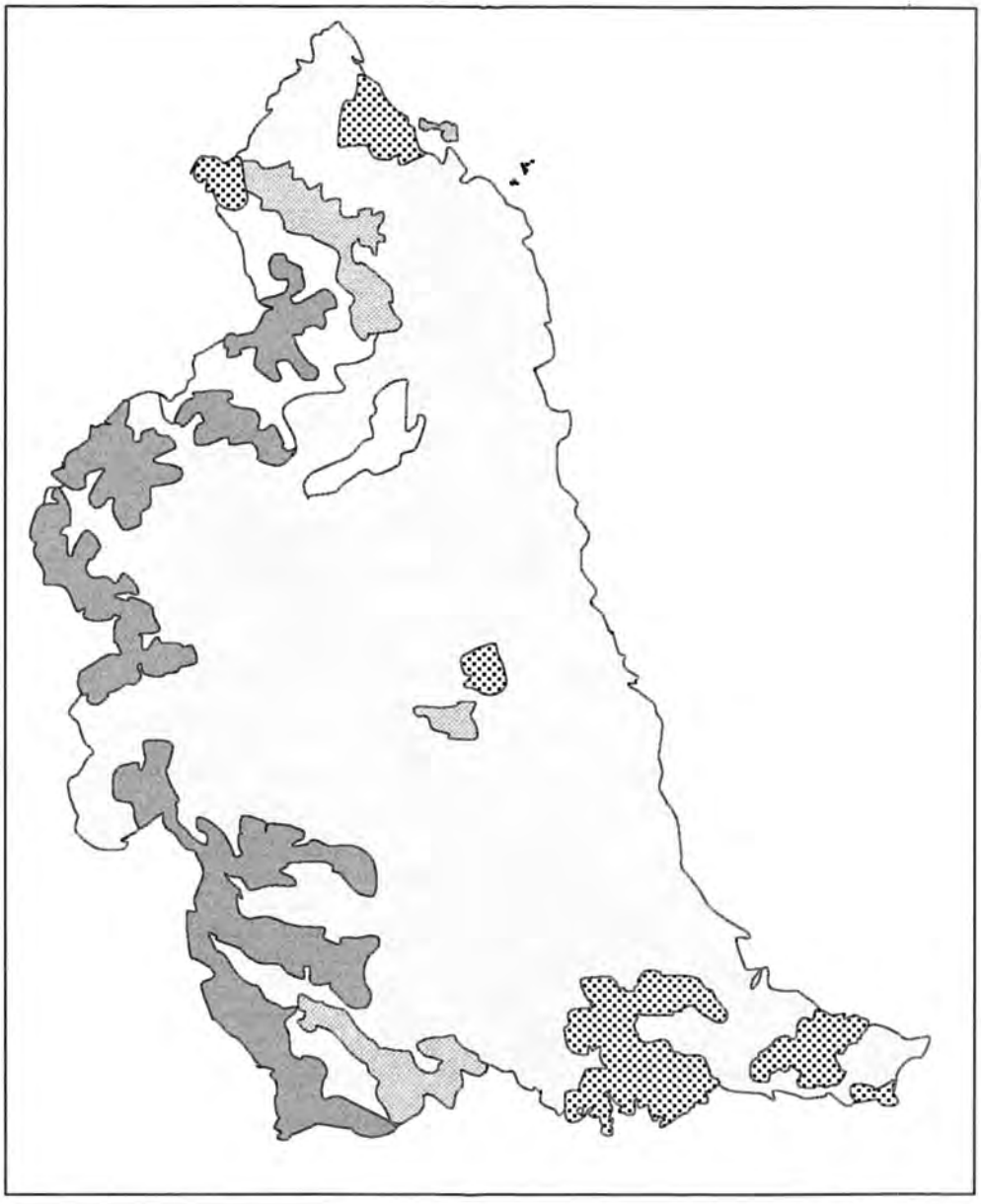
Figure 2.14

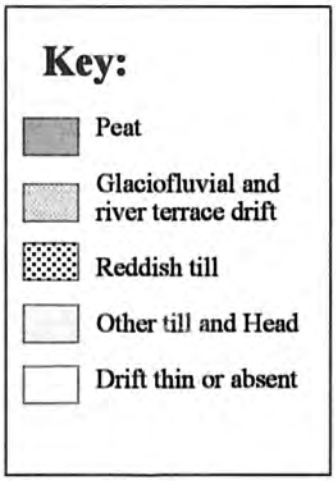


Solid Geological Map

of North-east England.

Figure 2.15





Drift geology map of

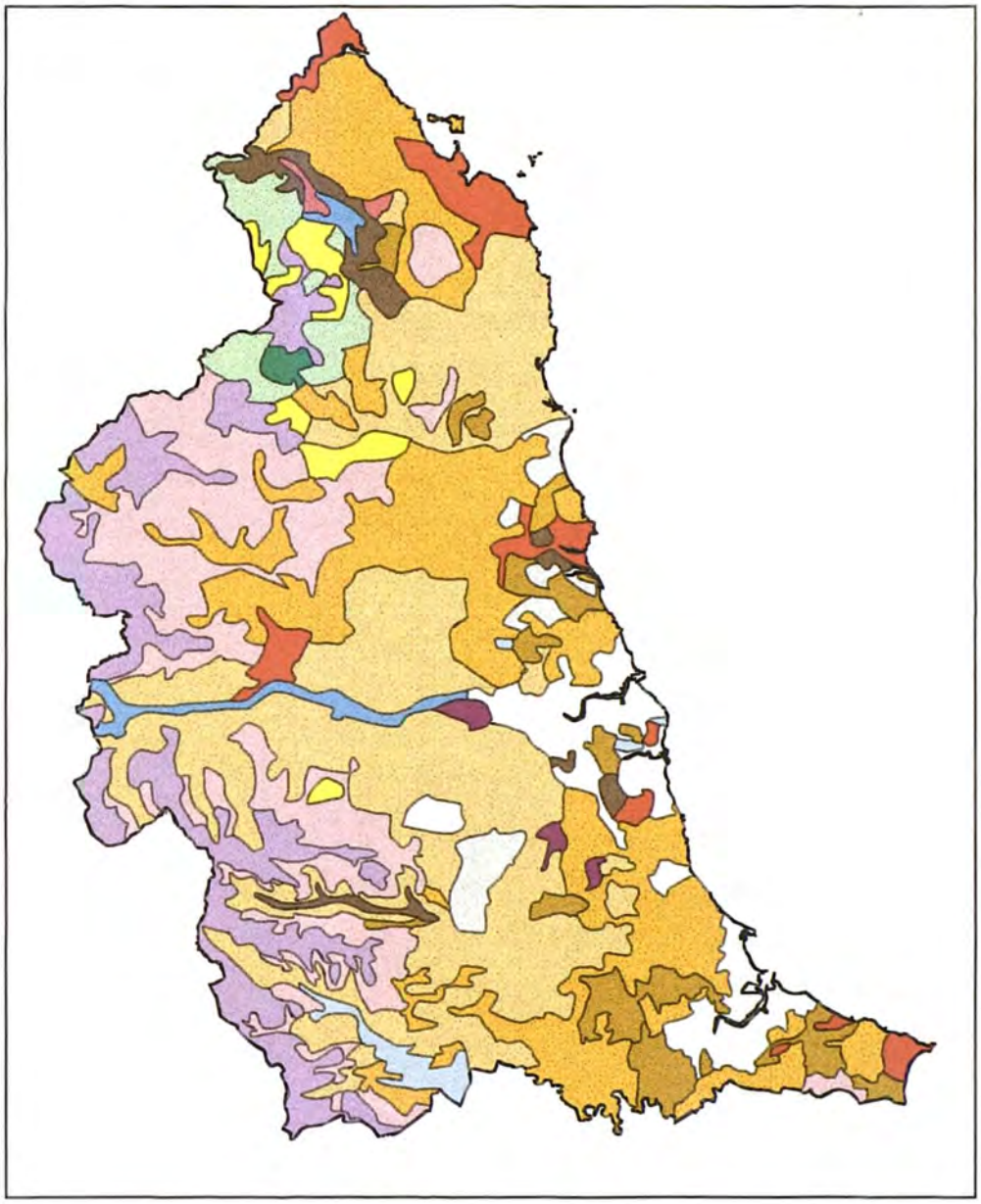
North-east England

(After Jarvis *et al.* 1984)

Key to Figure 2.16: Map showing distribution of soil types across north east England

Colour Code	Soil No.	Soil Name	Soil Description
	U	Unsurveyed	Urban and industrial areas.
	92	Disturbed soils	Restored open cast workings, compacted fine loam and clay, often stony.
	313	Dunwell	Shallow loam.
	511	Aberford	Shallow, locally brashy, well drained calcareous, fine loamy soils over limestone.
	541	Eardiston 2/ Rivington 1/ Wick 1	Well drained, coarse loam.
	542	Nercwys	Deep, fine loam.
	551	Newport 1	Deep, well drained, sandy and coarse loamy soils.
	561	Wharfe/ Alun	Deep stoneless alluvial loam.
	611	Malvern	Well drained, very stony loam.
	651		
	711	Salop/ Dunkeswick	Fine loam over clay soil.
	712	Dale/ Crewe/ Windsor/ Foggathorpe	Clayey and fine, silty soils, often stoneless.
	713	Brickfield 3	Fine loam and clayey soils.
	721	Wilcocks 1	Fine loam over clayey soil with peaty surface horizon.
	1011	Longmoss/ Winter Hill	Thick, very acid peat soils.

Figure 2.16



Map showing distribution of soil types across North-east England.

Tables and Figures for

Chapter 3

The pollen data set: the North-east England Pollen Database

Table 3.1 List of pollen cores entered into the North-east England Pollen Database. N.B. Dated cores are depicted in bold font.

Core No.	Site No.	Core Name	Grid Reference	References
1	1	Akeld Steads	NT 966 305	Borek (1975)
2	2	Arngill Head Brocks 1	NY 834 250	Turner&Hodgson (1979)
3	2	Arngill Head Brocks 2	NY 834 250	Turner & Hodgson (1983)
4	2	Arngill Head Brocks 3	NY 834 250	Turner & Hodgson (1991)
5	3	Bellow Moss	NZ 077 337	Hodgson (1974)
6	4	**Bishop Middleham**	NZ 324 304	Bartley et al. (1976)
7	5	Black Band	NY 809 265	Squires (1970)
8	6	Black Hill	NY 815 280	Squires (1970)
9	7	Black Lough	NU 141 093	Moyle (1980)
10	9	Black Rigg	NY 635 551	Turner & Hodgson (1983)
11	10	Blackshiel Bog 1	NY 733 607	Turner & Hodgson (1979)
12	10	Blackshiel Bog 2	NY 733 607	Turner & Hodgson (1983)
13	10	Blackshiel Bog 3	NY 733 607	Turner & Hodgson (1991)
14	8	**Blackpool Moss**	NT 517 289	Butler (1992)
15	11	**Bollihope Bog**	NY 990 370	Roberts *et al.* (1983)
16	12	**Bonfield Gill Head**	SE 590 958	Simmons & Innes (1981)
17	13	Broad Moss	NT 963 215	Davies & Turner (1979)
18	14	Burnhope Burn	NY 964 457	Turner & Hodgson
19	15	Burnhope Dam	NY 964 457	Turner & Hodgson (1979)
20	16	**Camp Hill Moss**	NU 100 263	Davies & Turner (1979)
21	17	Cold Fell 1	NY 613 546	Turner & Hodgson (1979)
22	17	Cold Fell 2	NY 613 546	Turner & Hodgson (1991)
23	18	Coom Rigg A	NY 670 760	Chapman (1964)

24	18	Coom Rigg B	NY 670 760	Chapman (1964)
25	19	Cowpen Marsh 1	NZ 5062 2462	Tooley (unpublished)
26	20	Cowpen Marsh 2	NZ 5061 2462	Tooley (unpublished)
27	21	Cranberry Bog	NZ 232 545	Kershaw (1967)
28	22	Cronkley Fell	NY 843 287	Squires (1970)
29	23	Cronkley Pastures 1	NY 8571 2880	Squires (1970)
30	24	Cronkley Pastures 2	NY 8572 2880	Squires (1970)
31	25	Crook Burn 1	NY 782 350	Turner & Hodgson (1979)
32	25	Crook Burn 2	NY 782 350	Turner & Hodgson (1983)
33	25	Crook Burn 3	NY 782 350	Turner & Hodgson (1991)
34	26	Cross Fell East	NY 689 345	Turner (1984)
35	27	Cross Fell South	NY 692 341	Turner (1984)
36	28	Cross Fell Slate Sike	NY 706 345	Godwin & Clapham (1951)
37	29	Cross Fell Summit	NY 688 345	Turner (1984)
38	30	Cross Fell West	NY 685 344	Turner (1984)
39	31	Cuthbert's Hill	NY 930 352	Hodgson (1974)
40	32	Dead Crook 1	NY 805 302	Turner *et al.* (1973)
41	33	Dead Crook 2	NY 804 303	Turner *et al.* (1973)
42	33	Dead Crook 3	NY 804 303	Turner *et al.* (1973)
43	34	**Din Moss**	NT 805 315	Hibbert & Switsur (1976)
44	35	Dubby Moss	NY 799 307	Turner *et al.* (1973)
45	36	Dufton Moss A	NY 872 293	Squires (1970)
46	36	Dufton Moss B	NY 872 293	Squires (1970)
47	36	Dufton Moss C	NY 972 293	Squires (1970)
48	37	Edlingham	NU 114 091	Moyle (1980)
49	38	Embleton's Bog	NU 160 140	Bartley (1966)

50	39	Ewe Crag	NZ 695 110	Jones (1971)
51	40	**Fellend Moss**	NY 679 658	Davies & Turner (1979)
52	41	Fortherley Moss 1	NZ 0150 5750	Turner & Hodgson (1981,1991)
53	42	Fortherley Moss 2	NZ 0151 5750	Hodgson (1974)
54	43	Fortherley Wood	NZ 0170 5750	Turner & Hodgson (1981,1983)
55	44	Fox Earth Gill	NY 842 282	Squires (1970)
56	45	Furness Moss	NY 803 305	Turner *et al.* (1973)
57	46	Goosetarn Beck	NZ 017 235	Hodgson (1974)
58	47	Graham's Moss 1	NY 860 531	Turner & Hodgson (1979)
59	47	Graham's Moss 2	NY 860 531	Turner & Hodgson (1983)
60	47	Graham's Moss 3	NY 860 531	Turner & Hodgson (1991)
61	48	Great Eggleshope	NY 948 331	Turner & Hodgson (1979)
62	49	Greenmines	NY 803 265	Squires (1970)
63	50	Green Swang	NY 813 432	Hodgson (1974)
64	51	**Hallowell Moss**	NZ 251 439	Donaldson(1975),
65	52	Hard Hill	NY 727 331	Johnson & Dunham (1963)
66	53	Harthope Moss	NY 868 341	Turner & Hodgson (1979,1991)
67	54	Harthope Quarry	NY 886 347	Turner & Hodgson (1983)
68	56	Hartlepool Bay 4	NZ 5180 3180	Tooley (unpublished)
69	56	Hartlepool Bay 6	NZ 5185 3185	Tooley (unpublished)
70	57	Hartlepool Slake	NZ 5182 3418	Tooley (unpublished)
71	58	Hedleyhope	NZ 139 412	Hodgson (1974)
72	59	Herdship Fell	NY 803 340	Godfree (1975)
73	60	High Banks Moss 1	NY 756 499	Turner & Hodgson (1979)
74	60	High Banks Moss 2	NY 756 499	Turner & Hodgson (1991)
75	61	Hisehope Burn	NZ 017 459	Godfree (1975)

76	62	Howden Moss	NY 860 265	Simpson (1976)
77	63	**Hutton Henry**	NZ 410 350	Bartley *et al.* (1976)
78	64	James' Hill	NY 925 321	Turner & Hodgson (1979)
79	65	John's Burn	NY 774 354	Godfree (1975)
80	66	Kennel Hall Knowe	NY 667 898	Davies (1978)
81	67	Kildale Hall 1	NZ 609 097	Jones (1971)
82	67	Kildale Hall 2	NZ 609 097	Jones (1971)
83	68	Kilhope Law 1	NY 796 441	Turner & Hodgson (1979,1991)
84	69	Kilhope Law 2	NY 819 444	Godfree (1975)
85	70	Knock Ridge 1	NY 740 303	Turner & Hodgson (1979)
86	70	Knock Ridge 2	NY 740 303	Turner & Hodgson (1991)
87	71	Knoutberry 1	NY 799 418	Turner & Hodgson (1983)
88	71	Knoutberry 2	NY 799 418	Turner & Hodgson (1991)
89	72	Lamb Shield 1	NZ 024 489	Turner & Hodgson (1981,1983,1991)
90	73	Lamb Shield 2	NZ 024 488	Turner & Hodgson (1979)
91	74	Lilburn Steads	NU 026 234	Jones (unpublished)
92	75	Linton Loch A	NT 793 254	Mannion (1978)
93	76	Little Punchard Head	NY 959 028	Hall (1979)
94	77	Long Crag	NY 835 255	Squires (1970)
95	78	Longlee Moor	NU 156 195	Bartley (1966)
96	79	Long Moss	NY 865 598	Hodgson (1974)
97	80	Low Stublick 1	NY 865 604	Turner & Hodgson (1979,1983)
98	80	Low Stublick 2	NY 865 604	Turner & Hodgson (1991)
99	81	Melmerby Fell 1	NY 648 385	Turner & Hodgson (1983)
100	81	Melmerby Fell 2	NY 648 385	Turner & Hodgson (1991)
101	82	Mickle Fell	NY 810 249	Squires (1970)

102	83	Mickleton Moor 1	NY 810 249	Turner & Hodgson (1979)
103	83	Mickleton Moor 2	NY 810 249	Turner & Hodgson (1991)
104	84	Midgeholme Mire	NY 610 655	Innes (unpublished)
105	85	Milburn Forest	NY 718 320	Godfree (1975)
106	86	Mire Holes	NY 849 267	Squires (1970)
107	87	**Mordon Carr**	NZ 321 253	Bartley *et al.* (1976)
108	88	Moss Mire North	NZ 026 215	Hodgson (1974)
109	89	Moss Mire South	NZ 026 215	Hodgson (1974)
110	90	**Mow Law A**	NT 8216 1788	Tipping (unpublished)
111	91	**Mow Law B**	NT 8214 1765	Tipping (unpublished)
112	92	Mown Meadows	NZ 053 466	Hodgson (1974)
113	93	Muckle Moss	NY 805 666	Pearson (1960)
114	94	**Neasham Fen**	NZ 332 116	Bartley *et al.* (1976)
115	95	Pawlaw Pike 1	NZ 010 323	Turner & Hodgson (1983)
116	96	Pawlaw Pike 2	NZ 010 323	Turner & Hodgson (1991)
117	97	Pity Me	NZ 266 451	Turner (unpublished)
118	98	**Pow Hill**	NZ 012 516	Turner & Hodgson (1979,1981,1991)
119	99	**Quarry Knowe**	NT 8405 1685	Tipping (unpublished)
120	100	Quickcleugh A	NY 883 468	Turner & Hodgson (1983,1991)
121	100	Quickcleugh B	NY 883 468	Turner & Hodgson (1979)
122	101	**Quick Moss**	NY 852 422	Rowell & Turner (1985)
123	102	Sally Grain	NY 792 392	Turner & Hodgson (1979)
124	103	**Scaleby Moss**	NY 431 635	Godwin *et al.* (1957), Walker (1966)
125	104	Scraith Head 1	NY 794 367	Turner & Hodgson (1979)
126	104	Scraith Head 2	NY 794 367	Turner & Hodgson (1983)
127	104	Scraith Head 3	NY 794 367	Turner & Hodgson (1991)

128	105	Seamer Carrs	NZ 487 097	Jones (1971)
129	106	Seven Hills	NY 969 125	Hodgson (1974)
130	107	Shaking Moss 1	SD 794 894	Turner & Hodgson (1983)
131	108	Shivery Hill	NY 816 457	Hodgson (1974)
132	109	Shot Moss 1	NY 831 195	Turner & Hodgson (1979)
133	109	Shot Moss 2	NY 831 195	Turner & Hodgson (1991)
134	110	Sikehead	NY 962 469	Hodgosn (1974)
135	111	Silverband	NY 709 310	Turner (1984)
136	112	**Site W**	NY 814 290	Turner *et al.* (1973)
137	113	Smiddy Shaw	NZ 047 462	Godfree (1975)
138	114	**Sourhope**	NT 859 198	Tipping (unpublished)
139	115	South Cornsay	NZ 125 398	Hodgson (1974)
140	116	Stanley Moss	NZ 146 386	Hodgson (1974)
141	117	Staple Moss 1	NY 835 240	Turner & Hodgson (1979,1983)
142	117	Staple Moss 2	NY 835 240	Turner & Hodgson (1991)
143	118	**Steng Moss**	NY 965 913	Davies & Turner (1979)
144	119	**Steward Shield**	NY 980 440	Roberts *et al.* (1973)
145	120	Summerlodge Tarn 1	SD 951 948	Turner & Hodgson (1983,1991)
146	121	**Swindon Hill**	NT 842 187	Tipping (unpublished)
147	122	Teeshead 1	NY 699 340	Turner (1984)
148	122	Teeshead 2	NY 699 340	Turner (1984)
149	123	**The Dod**	NT 472 060	Shennan & Innes (1987)
150	124	**The Lough**	NU 138 430	Leicester Archaeology Dept
151	125	Thornhope Burn	NZ 030 404	Hodgson (1974)
152	126	**Thorpe Bulmer**	NZ 453 354	Bartley *et al.* (1976)
153	127	Tinkler's Sike 1	NY 818 290	Turner *et al.* (1973)

154	127	**Tinkler's Sike**	NY 818 290	Turner *et al.* (1973)
155	128	Tranmire Slack	NZ 766 119	Jones (1971)
156	129	Trickley Wood	NU 024 270	Turner (1968)
157	130	**Valley Bog**	NY 763 331	Chambers (1978)
158	131	Vindolanda 1	NY 763 661	Davies (1978)
159	132	Waldridge	NZ 295 378	Hodgson (1974)
160	133	Wanister Bog	NZ 253 494	Hodgson (1974)
161	134	Weelfoot Moss	NY 814 291	Turner *et al.* (1973)
162	135	Weelhead Moss 1	NY 812 301	Turner *et al.* (1973)
163	136	Weelhead Moss 2	NY 8070 3040	Turner *et al.* (1973)
164	137	Weelhead Moss 3	NY 8071 3041	Turner *et al.* (1973)
165	138	**Weelhead Moss**	NY 8071 3042	Turner *et al.* (1973)
166	139	West Hartlepool 3	NZ 517 320	Tooley (unpublished)
167	140	**West Hartlepool 19**	NZ 5209 3138	Tooley (unpublished)
168	141	West House	NZ 634 196	Jones (1971)
169	142	White House	NZ 028 236	Hodgson (1974)
170	143	Whitfield Lough 1	NY 724 541	Turner & Hodgson (1979)
171	143	Whitfield Lough 2	NY 724 541	Turner & Hodgson (1991)
172	144	Woldgill Burn 1	NY 652 454	Turner & Hodgson (1979)
173	144	Woldgill Burn 2	NY 652 454	Turner & Hodgson (1983)
174	144	Woldgill Burn 3	NY 652 454	Turner & Hodgson (1991)
175	145	Wolfscleugh	NY 867 438	Godfree (1975)
176	146	Wolsingham	NZ 041 414	Hodgson (1974)
177	147	Woodland	NZ 078 268	Hodgson (1974)
178	148	Wooler Water A	NT 996 268	Clapperton *et al.* (1971)
179	148	Wooler Water B	NT 996 268	Clapperton *et al.* (1971)
180	149	**Yetholm Lough**	NT 803 277	Tipping (unpublished)

Table 3.2 List of pollen cores not included in the pollen database for reasons outlined in section 3.1.1.

Core Name	Grid Reference	References
Abbot Moss	NY 511 434	Walker (1966)
Askrigg Common	SD 941 935	Hall (1979)
Beanrig Moss	NT 517 293	Webb & Moore (1982)
Beldon Bottoms	SD 968 945	Hall (1979)
Bink Moss	not available	Turner (unpublished)
Black Moss	not available	Turner (unpublished)
Blackpool Moss 2	NT 517 289	Webb & Moore (1982)
Black Hill	not available	Turner (unpublished)
Bog Hill	NY 769 328	Johnson & Dunham (1963)
Bolton Fell Moss	NY 490 690	Barber (1981)
Bradford Kaims	NU 160 310	Bartley (1966)
Broadgate Fell	NY 900 850	Blackburn (1953)
Brown Dod	not availble	Turner (unpublished)
Burtree Lane	NZ 268 189	Bellamy *et al.* (1966)

Catton Carr	NY 828 577	Raistrick & Blackburn (1932)
Cock Lake	not available	Turner (unpublished)
Collier Gill	NZ 786 009	Simmons (1969)
Colt Crag	NY 930 780	Raistrick & Blackburn (1932)
Cotterend Tarn 1	SD 816 938	Hall (1979)
Cotterend Tarn 2	SD 816 938	Turner (unpublished)
Fleet Moss	SD 862 834	Hall (1979)
Fog Close	NY 870 062	Hall (1979)
Foolsike Moss	NY 811 297	Turner *et al.* (1973)
Fozy Moss	NY 830 714	Dumayne (1994)
Green Combs	NY 799 348	Hodgson (1974)
Hartley Moor	not available	Turner (unpublished)
Hartside Height	not available	Turner (unpublished)
Heathery Burn	NY 900 480	Raistrick & Blackburn (1931)
How Top Moss	not available	Turner (unpublished)
Kilhope Moor	NY 796 441	Raistrick & Blackburn (1932)
Kitchen Moss	NT 165 608	Newey (1969)
Ladybridge Slack	NZ 804 018	Simmons (1969)

Linton Loch B	NT 793 254	Mannion (1978)
Little Punchard Head 1	NY 959 028	Hall (1979)
Long Moss 2	not available	Turner (unpublished)
Mickle Shoulder	NY 819 248	Raistrick & Blackburn (1932)
Moorthwaite Tarn	NY 510 510	Walker (1966)
Moss Swang	NY 806 035	Simmons (1969)
Neasham Brick Pit	NZ 334 511	Blackburn (1952)
Newbiggin Carr	NY 880 310	Bartley *et al.* (1976)
North Gill A	NZ 726 007	Simmons (1969)
North Gill B	NZ 726 007	Simmons (1969)
Nunstainton Carrs	NZ 320 295	Bartley *et al.* (1976)
Prestwick Carr	NZ 180 720	Raistrick & Blackburn (1932)
Quickcleugh C	NY 883 468	Godfree (1975)
Romaldkirk	NY 991 230	Bellamy *et al.* (1966)
Shaking Moss 2	SD 794 894	Hall (1979)
Side Moss	NT 285 555	Newey (1969)
Simy Folds	NY 888 277	Donaldson (1983)

Slapestone Sike	NY 818 305	Turner *et al.* (1973)
Stanhope Common	NY 978 443	McDonald (1993)
Summerlodge Tarn 2	SD 951 948	Hall (1979)
Threepwood Moss	NT 425 515	Mannion (1978b)
Upper Eddleston Valley	NT 242 537	Newey (1969)
Upper Valley Bog	NY 763 331	Johnson & Dunham (1963)
Vindolanda 2	NY 770 664	Manning (unpublished)
Walby Vallum	not available	Davies (unpublished)
Walton Moss	NY 504 667	Dumayne (1994)
Waskerley	NZ 042 460	Raistrick & Blackburn (1932)
White Beacon Haggs	SD 893 951	Hall (1979)
Widdybank Fell	NY 814 294	Turner *et al.* (1973)
Widdybank Moss	NY 825 295	Turner *et al.* (1973)

Table 3.3 Reasons for pollen cores not being entered into the pollen database.

Reason why core not entered into NEEPD:	Number of Cores:
Taxa recorded in insufficient detail	13
Good core already available for same site	13
Data only available for tree pollen	11
No grid reference available for core site	11
Outside study region	9
Core timespan too early (pre 8000 cal. BC)	3
Insufficient data to convert from pollen sum	2
Insufficient levels or data to assign dates	1
Diagram too unclear to read off data	1
Total number of cores not entered into NEEPD	**64**

Table 3.4 A typical example of the taxonomic level to which herb pollen taxa are identified by pollen workers in north-east England.

Taxonomic level of identification

Family level	*Sub-family level*	*Genus level*	*Species level*
Compositae	Compositae Liguliflorae/ Compositae Cichorioidae	*Arctium*	
		Centaurea	
		Cirsium	
		Taraxacum	
	Compositae Tubuliflorae/ Compositae Asteroidae	*Artemisia*	
		Bellis	
		Matricaria	
Caryophyllaceae			
Chenopodiaceae			
(Cistaceae)		*Helianthemum*	
Cruciferae			
(Dipsacaceae)		*Succisa*	
Gramineae		*Cerealia*-type	
(Onagraceae)		*Epilobium*	
(Plantaginaceae)		*Plantago*	*Plantago lanceolata*
			Plantago major/media
(Plumbaginaceae)		*Armeria*	
Polygonaceae		*Polygonum*	

Table 3.4 continued ....

Family level	*Family sub-group level*	*Genus level*	*Species level*
Ranunculaceae		*Caltha* *Ranunculus* *Thalictrum*	
Rosaceae		*Filipendula* *Potentilla*	
Rubiaceae			
		Rumex	*Rumex acetosa* *Rumex acetosella* or *Rumex acetosa/acetosella-type*
Saxifragaceae			
(Urticaceae)		*Urtica*	
Umbelliferae			
(Valerianaceae)		*Valeriana*	

Table 3.5 List of tables comprising the North-east England Pollen Database, created using the Paradox relational database package.

N.B. See Appendix A for a more detailed guide to the contents and structure of each table mentioned below.

Type of table	*Table name*	*Subject matter of table*
Pollen site tables	**SITELOC**	Information about location of pollen sites (e.g. Grid reference, elevation.)
	SITEDESC	Background information about pollen sites (e.g. bedrock geology, soil type, pollen catchment size, modern vegetation.)
Entity (pollen core) tables	**ENTITY**	Information about each "entity" or individual core. There may be more than one pollen core per site. (e.g. core number, date core was taken.)
	ENTITY&&	Additional notes about each entity.
	ENTSIZE	Dimensions of each core/section.
	ENTDATA	Source and type of pollen data available for each entity.
	SEDIMENT	Information on sediment lithology.
	P_PREP&&	Notes on pollen preparation.
Pollen workers tables	**WORKERS**	Information about pollen workers (whether pollen analysts, authors of publications, fieldworkers)
	ADDRESS	Contact addresses of pollen workers
Publications tables	**PUBLCIT**	General information about all types of publications relevant to the pollen sites studied (e.g. publication title, year of publication, author(s).)
	PUBLENT	A table cross-referencing individual cores with their relevant publications.

Pollen data tables	**SAMPLE**	A table containing information about pollen sample depth for each entity.
	COUNTS	A table listing pollen count information for each taxon for each sample level from each entity.
	TAXA	A look-up table for taxon names.
	GROUP	A table listing the major groups to which each pollen taxon is assigned (e.g. *Plantago lanceolata* is assigned to the family *Plantago*.)
Dating tables	**C14**	A table containing radiocarbon dating information.
	AGEDEPTH	Age estimates for each sample depth from each entity.
	AGEBASIS	*Dates used to establish the age-depth* relationship.
	SYNEVENT	Dates from commonly occurring pollen events.
	CALEVENT	Calibrated dates for these events.
	EVENT	Name and nature of pollen events.
	PUBLEVNT	Published information referring to each event.
	DATING&&	Additional notes on dating.

Table 3.6 Format of pollen data available for pollen cores entered into the NEEPD.

	Type of pollen data available	Number of Cores	% total Cores
Raw Counts	Raw count sheets	114	63.3%
	Computer printout	25	13.9%
	Published tables of raw counts	1	0.5%
	On disk in Tilia format	6	3.3%
	Total Raw Count Data:	**146**	**81.1%**
Pollen Sum Data	Published pollen diagrams		
	% total tree pollen	23	12.8%
	%total dry land pollen	8	4.4%
	other pollen sums	1	0.5%
	Published tables		
	% total tree pollen	2	1.1%
	Total Pollen Sum Data	**34**	**18.9%**
	Total Pollen Cores:	**180**	**100%**

Table 3.7 Some radiocarbon dates and their calibrated midpoint dates (cal. years BC/AD) for cores in the North-east England Pollen Database.

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Bishop Middleham	100	GaK-2070	6760 ± 120	5850-5440 cal. BC	5645 cal. BC	5850-5440 cal. BC
	80	GaK-2071	5180 ± 110	4250-3750 cal. BC	4000 cal. BC	4250-3720 cal. BC
	60	GaK-2072	3660 ± 80	2210-1870 cal. BC	2040 cal. BC	2280-1780 cal. BC
	40	GaK-2073	3360 ± 80	1780-1450 cal. BC	1615 cal. BC	1870-1450 cal. BC
Blackpool Moss	255	GU 2267	3250 ± 60	1670-1410 cal. BC	1540 cal. BC	1670-1410 cal. BC
	180	GU 2266	3760 ± 140	2500-1860 cal. BC	2180 cal. BC	2560-1770 cal. BC
	130	GU 2265	3200 ± 70	1630-1300 cal. BC	1465 cal. BC	1630-1300 cal. BC
	105	GU 2264	2270 ± 50	329-200 cal. BC	264 cal. BC	396-200 cal. BC
	80	GU 2263	800 ± 50	cal. AD 1159-1298	cal. AD 1228	cal. AD 1159-1298
	55	GU 2262	1180 ± 50	cal. AD 764-985	cal. AD 874	cal. AD 718-985
Bollihope Bog	148	GaK-3/031	1730 ± 100	cal. AD 110-540	cal. AD 325	cal. AD 110-540
	108	GaK-3/030	80 ± 80	cal. AD 1800-1955	cal. AD 1877	cal. AD 1670-1955
	80	GaK-3/029	170 ± 80	cal. AD 1630-1955	cal. AD 1792	cal. AD 1630-1955
Bonfield Gill Head	79	HAR-4225	5670 ± 90	4720-4340 cal. BC	4530 cal. BC	4720-4340 cal. AD
	57	HAR-4226	5170 ± 90	4170-3780 cal. BC	3975 cal. BC	4230-3780 cal. BC
	40	HAR-4229	3660 ± 80	2210-1870 cal. BC	2040 cal. BC	2280-1780 cal. BC
Camp Hill Moss	120.25	HAR-1945	3510 ± 70	1980-1670 cal. BC	1825 cal. BC	2020-1640 cal. BC
	99.25	HAR-1946	3110 ± 80	1520-1130 cal. BC	1325 cal. BC	1520-1130 cal. BC
	79.75	HAR-1947	2670 ± 70	1000-760 cal. BC	880 cal. BC	1000-560 cal. BC
	53.25	HAR-1948	640 ± 80	cal. AD 1250-1440	cal. AD 1345	cal. AD 1250-1440

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Din Moss	370	Q-1074	8940 ± 170	8270-7570 cal. BC	8270 cal. BC	8340-7570 cal. BC
	320	Q-1073	8680 ± 170	8040-7420 cal. BC	7730 cal. BC	8040-7420 cal. BC
	288	Q-1072	7670 ± 150	6790-6180 cal. BC	6485 cal. BC	7000-6180 cal. BC
	250	Q-1071	7360 ± 140	6430-5950 cal. BC	6190 cal. BC	6430-5950 cal. BC
	246	Q-1070	7150 ± 120	6190-5720 cal. BC	5955 cal. BC	6190-5720 cal. BC
	242	Q-1069	6860 ± 100	5880-5570 cal. BC	5725 cal. BC	5940-5530 cal. BC
	190	Q-1068	6780 ± 100	5810-5450 cal. BC	5630 cal. BC	5810-5450 cal. BC
	186	Q-1067	6710 ± 100	5740-5430 cal. BC	5585 cal. BC	5740-5430 cal. BC
	182	Q-1066	6530 ± 100	5590-5280 cal. BC	5435 cal. BC	5590-5280 cal. BC
	108	Q-1065	6010 ± 100	5140-4690 cal. BC	4915 cal. BC	5210-4690 cal. BC
	60	Q-1064	5440 ± 70	4400-4210 cal. BC	4305 cal. BC	4450-4080 cal. BC
	56	Q-1063	5390 ± 70	4350-4040 cal. BC	4195 cal. BC	4350-4040 cal. BC
	52	Q-1062	5340 ± 70	4330-4030 cal. BC	4180 cal. BC	4330-4000 cal. BC
Fellend Moss	320	SRR-877	3688 ± 60	2200-1890 cal. BC	2045 cal. BC	2270-1890 cal. BC
	175.5	SRR-876	1948 ± 45	38 cal. BC-	cal. AD 54	38 cal. BC-
	131.5	SRR-875	1330 ± 40	cal. AD 650-780	cal. AD 715	cal. AD 650-780
	103.5	SRR-874	945 ± 40	cal. AD 1017-1191	cal. AD 1104	cal. AD 1017-1191
	63.5	SRR-873	434 ± 45	cal. AD 1413-1522	cal. AD 1467	cal. AD 1413-1629
Hallowell Moss	280	SRR-419	4938 ± 60	3810-3630 cal. BC	3720 cal. BC	3940-3630 cal. BC
	244	SRR-418	3645 ± 60	*2150-1880 cal. BC*	*2015 cal. BC*	*2190-1780 cal. BC*
	153	SRR-417	2432 ± 60	600-400 cal. BC	500 cal. BC	760-400 cal. BC
	133	SRR-416	2233 ± 80	410-50 cal. BC	230 cal. BC	410-50 cal. BC
	90	SRR-415	1956 ± 70	100 cal. BC-	cal. AD 65	100 cal. BC-
	80	SRR-414	1782 ± 60	cal. AD 120-400	cal. AD 260	cal. AD 120-400
	73	SRR-413	1355 ± 50	cal. AD 612-781	cal. AD 696	cal. AD 612-781
	71	SRR-412	1522 ± 65	cal. AD 420-650	cal. AD 535	cal. AD 420-650

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Hutton Henry	385	SRR-601	3544 ± 80	2040-1680 cal. BC	1860 cal. BC	2130-1680 cal. BC
	155	SRR-600	1842 ± 70	cal. AD 50-380	cal. AD 215	cal. AD 50-180
Kildale Hall	84	GaK-2707	10350 ± 200	10690-9260 cal. BC	9975 cal. BC	10690-9160 cal. BC
Mordon Carr	342.5	SRR-478	8689 ± 50	7741-7571 cal. BC	7656 cal. BC	7898-7550 cal. BC
	300	SRR-477	7759 ± 67	6710-6420 cal. BC	6565 cal. BC	6710-6420 cal. BC
	202.5	SRR-476	5235 ± 70	4240-3940 cal. BC	4090 cal. BC	4240-3820 cal. BC
	195	SRR-475	5305 ± 55	4250-3990 cal. BC	4120 cal. BC	4310-3990 cal. BC
	143.5	SRR-579	4736 ± 85	3700-3340 cal. BC	3520 cal. BC	3700-3340 cal. BC
	117.5	SRR-474	4543 ± 70	3380-3030 cal. BC	3205 cal. BC	3500-2930 cal. BC
Neasham Fen	532.5	SRR-104	8202 ± 95	7480-7000 cal. BC	7210 cal. BC	7480-6810 cal. BC
	412.5	SRR-103	6962 ± 90	5960-5640 cal. BC	5800 cal. BC	5960-5640 cal. BC
	337.5	SRR-102	5468 ± 80	4460-4210 cal. BC	4335 cal. BC	4460-4080 cal. BC
	247.5	SRR-101	3242 ± 70	1680-1390 cal. BC	1535 cal. BC	1680-1390 cal. BC
	142.5	SRR-100	2488 ± 75	780-410 cal. BC	595 cal. BC	780-410 cal. BC
	137.5	SRR-99	2538 ± 50	805-498 cal. BC	651 cal. BC	805-426 cal. BC
	107.5	SRR-98	2850 ± 60	1160-840 cal. BC	1000 cal. BC	1200-840 cal. BC
	102.5	SRR-97	2804 ± 80	1160-810 cal. BC	985 cal. BC	1160-810 cal. BC
	57.5	SRR-96	1213 ± 60	cal. AD 680-960	cal. AD 820	cal. AD 680-960

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Pow Hill	217	SRR-1415	8670 ± 70	7900-7540 cal. BC	7720 cal. BC	7900-7540 cal. BC
	171	SRR-1414	7210 ± 50	6079-5957 cal. BC	6018 cal. BC	6161-5957 cal. BC
	120	SRR-1413	6550 ± 40	5526-5422 cal. BC	5474 cal. BC	5570-5346 cal. BC
	101	SRR-1412	5300 ± 40	4230-4033 cal. BC	4131 cal. BC	4230-3998 cal. BC
	81	SRR-1411	4700 ± 50	3542-3361 cal. BC	3451 cal. BC	3627-3361 cal. BC
	57	SRR-1410	4310 ± 40	3031-2876 cal. BC	2953 cal. BC	3031-2786 cal. BC
Quick Moss	288	No	8010 ± 75	7060-6610 cal. BC	6835 cal. BC	7140-6610 cal. BC
	232	information	6120 ± 50	5143-4921 cal. BC	5032 cal. BC	5212-4921 cal. BC
	190	provided.	4900 ± 50	3788-3628 cal. BC	3708 cal. BC	3788-3543 cal. BC
	146		3130 ± 50	1466-1266 cal. BC	1366 cal. BC	1509-1266 cal. BC
	112		2429 ± 50	598-397 cal. BC	497 cal. BC	762-397 cal. BC
	54		2035 ± 50	164 cal. BC-cal.AD 75	45 cal. BC	164 cal. BC-cal. AD 75
	46		1470 ± 50	cal. AD 531-666	cal. AD 135	cal. AD 451-666
Scaleby Moss	439	Q-154	9557 ± 209	9190-8080 cal. BC	8635 cal. BC	9190-8080 cal. BC
	438	Q-155	9740 ± 183	9280-8430 cal. BC	8855 cal. BC	9590-8430 cal. BC
	385	Q-162	8809 ± 192	8200-7480 cal. BC	7840 cal. BC	8200-7480 cal. BC
	383	Q-161	9002 ± 194	8420-7570 cal. BC	7995 cal. BC	8420-7570 cal. BC
	261	Q-167	7354 ± 146	6450-5950 cal. BC	6200 cal. BC	6450-5890 cal. BC
	260	Q-165	7425 ± 350	7050-5580 cal. BC	6315 cal. BC	7050-5580 cal. BC
	259	Q-166	6948 ± 131	6010-5580 cal. BC	5795 cal. BC	6010-5580 cal. BC
	151	Q-173	4987 ± 122	4040-3510 cal. BC	3775 cal. BC	4040-3510 cal. BC
	150	Q-171	4925 ± 134	3980-3490 cal. BC	3735 cal. BC	3980-3370 cal. BC
	149	Q-172	4980 ± 119	4000-3510 cal. BC	3755 cal. BC	4000-3510 cal. BC

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Site W	Base	GaK-2920	3370 ± 110	1920-1420 cal. BC	1680 cal. BC	1920-1420 cal. BC
Steng Moss	257	SRR-1045	3594 ± 45	2038-1865 cal. BC	1944 cal. BC	2113-1775 cal. BC
	213	SRR-1044	3015 ± 45	1393-1119 cal. BC	1256 cal. BC	1393-1119 cal. BC
	181	SRR-1043	2586 ± 45	828-752 cal. BC	681 cal. BC	828-534 cal. BC
	152.25	SRR-1042	2528 ± 35	743-527 cal. BC	661 cal. BC	796-527 cal. BC
	117.5	Q-1520	1970 ± 60	100 cal. BC-cal. AD 210	cal. AD 55	100 cal. BC-cal. AD 210
	83.5	Q-1519	1490 ± 60	cal. AD 440-660	cal. AD 550	cal. AD 440-660
Steward Shield	41	GaK-3/033	2060 ± 120	370 cal. BC-cal. AD 150	80 cal. BC	370 cal. BC-cal. AD 210
The Dod	155	GU-1648	7370 ± 190	6500-5820 cal. BC	6160 cal. BC	6540-5820 cal. BC
		GU-1647	4655 ± 80	3630-3300 cal. BC	3370 cal. BC	3630-3110 cal. BC
	103	GU-1634	3600 ± 85	2150-1740 cal. BC	1965 cal. BC	2190-1740 cal. BC
	98	GU-1633	1658 ± 85	cal. AD 220-600	cal. AD 410	cal. AD 220-600
	95	GU-1645	1675 ± 75	cal. AD 210-560	cal. AD 385	cal. AD 210-560
The Lough	105	No	information	*provided.*	cal. AD 721	No information.
	75				cal. AD 1332	

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Thorpe Bulmer	390	SRR-404	2064 ± 60	200 cal. BC-cal. AD 80	60 cal. BC	200 cal. BC-cal. AD 80
	366	GaK-3713	1730 ± 120	cal. AD 70-590	cal. AD 330	cal. AD 70-590
	345	SRR-405	852 ± 60	cal. AD 1150-1280	cal. AD 1215	cal. AD 1040-1280
Tinkler's Sike	135	GaK-2031	9900 ± 190	10170-8840 cal BC	9505 cal. BC	10170-8600 cal. BC
	120	GaK-2030	8250 ± 280	7730-6540 cal. BC	7135 cal. BC	7890-6540 cal. BC
	70	GaK-2029	6150 ± 160	5380-4720 cal. BC	5050 cal. BC	5340-4720 cal. BC
	44	GaK-2028	3390 ± 90	1890-1490 cal. BC	1690 cal. BC	1890-1450 cal. BC
	14	GaK-2027	2570 ± 80	830-420 cal. BC	625 cal. BC	830-420 cal. BC
Valley Bog	515	SRR-95	6779 ± 75	5760-5520 cal. BC	5640 cal. BC	5760-5520 cal. BC
	505	SRR-94	6714 ± 75	5680-5450 cal. BC	5565 cal. BC	5680-5450 cal. BC
	428.5	SRR-93	5945 ± 50	4933-4752 cal. BC	4842 cal. BC	4933-4723 cal. BC
	432.5	SRR-92	5950 ± 60	4960-4700 cal. BC	4830 cal. BC	4960-4700 cal. BC
	315	SRR-91	4794 ± 55	3690-3500 cal. BC	3595 cal. BC	3690-3380 cal. BC
	305	SRR-90	4596 ± 60	3390-3100 cal. BC	3245 cal. BC	3510-3100 cal. BC
	160	SRR-89	2175 ± 45	368-92 cal. BC	230 cal. BC	368-69 cal. BC
	155	SRR-88	2212 ± 55	390-120 cal. BC	255 cal. BC	390-120 cal. BC
Weelhead Moss	359	GaK-2918	10020 ± 210	10400-8930 cal. BC	9665 cal. BC	10400-8720 cal. BC
	337	SSR-1	8057 ± 85	7260-6650 cal. BC	6955 cal. BC	7260-6650 cal. BC
	287	GaK-2917	8070 ± 170	7430-6550 cal. BC	6990 cal. BC	7430-6550 cal. BC
	239	SRR-2	6202 ± 70	5260-4960 cal. BC	5110 cal. BC	5260-4960 cal. BC

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Weelhead Moss continued.	209	GaK-2916	5770 ± 110	4840-4440 cal. BC	4640 cal. BC	4840-4370 cal. BC
	203	GaK-2915	5220 ± 120	4330-3780 cal. BC	4055 cal. BC	4330-3780 cal. BC
	127	GaK-2914	4000 ± 110	2780-2200 cal. BC	2490 cal. BC	2870-2200 cal. BC
	70	GaK-2913	3150 ± 100	1630-1130 cal. BC	1380 cal. BC	1630-1130 cal. BC
West Hartlepool 19	59.5	No	6180 ± 100	5290-4900 cal. BC	5095 cal. BC	5290-4850 cal. BC
	53.5	information	5975 ± 120	5140-4570 cal. BC	4855 cal. BC	5210-4570 cal. BC
	24	provided.	5530 ± 90	4560-4220 cal. BC	4390 cal. BC	4560-4150 cal. BC
	11		4945 ± 50	3806-3640 cal. BC	3723 cal. BC	3909-3640 cal. BC
	4		4770 ± 50	3649-3497 cal. BC	3573 cal. BC	3649-3377 cal. BC
West House	320	GaK-2706	6650 ± 290	6030-4950 cal. BC	5490 cal. BC	6030-4950 cal. BC

Table 3.8 Some radiocarbon dates and their calibrated midpoint dates (cal. years BC/AD) for cores not included in the NEEPD, on account of their falilure to meet the criteria for entry. The dates from these cores are, however, useful for creating a framework for dating non-dated sites.

Core Name	*Depth (cm)*	*Lab. Code*	*Radiocarbon date (years BP)*	*Calibrated range with highest probability*	*Calibrated mid-point*	*Calibrated total range*
Bolton Fell Moss	104	Hv-3085	1860 ± 60	cal. AD 20-50	cal. AD 35	cal. AD 20-280
Fozy Moss	238	SRR-4540	3255 ± 40	1615-1427 cal. BC	1521 cal. BC	1615-1427 cal. BC
	152	SRR-4539	1820 ± 45	cal. AD 113-268	cal. AD 190	cal. AD 87-336
North Gill 1a	79	SRR-3635	5105 ± 45	3978-3795 cal. BC	3886 cal. BC	3978-3795 cal. BC
	75	SRR-3869	5680 ± 50	4623-4424 cal. BC	4523 cal. BC	4680-4424 cal. BC
	74	SRR-3634	5515 ± 45	4458-4317 cal. BC	4387 cal. BC	4458-4256 cal. BC
	60	SRR-3868	4640 ± 50	3531-3310 cal. BC	3420 cal. BC	3619-3127 cal. BC
	59	SRR-3632	3600 ± 45	2040-1870 cal. BC	1955 cal. BC	2118-1778 cal. BC
Simy Folds	95	HAR-4076	5920 ± 100	5040-4540 cal. BC	4790 cal. BC	5040-4540 cal. BC
	50	HAR-3791	2440 ± 80	780-390 cal. BC	585 cal. BC	780-390 cal. BC
Walton Moss	188	SRR-4531	2000 ± 40	67 cal. BC-	cal. AD 11	67 cal. BC-
	168	SRR-4530	1925 ± 40	cal. AD 9-149	cal. AD 79	cal. AD 9-149

Table 3.9 Radiocarbon dates and calibrated midpoint dates for commonly occurring events in the tree and shrub pollen curves from north-east England.

Event	Core:	Radiocarbon date	Calibrated mid point of date range with highest probability	Calibrated total range
Ulmus decline	Bishop Middleham	5180 ± 110 BP	4000 cal. BC	4250-3720 cal. BC
	Bonfield Gill Head	4890 ± 80 BP	3660 cal. BC	3980-3390 cal. BC
	Din Moss	5440 ± 70 BP	4305 cal. BC	4450-4080 cal. BC
	Mordon Carr	5305 ± 55 BP	4120 cal. BC	4310-3990 cal. BC
	Neasham Fen	5468 ± 80 BP	4335 cal. BC	4460-4080 cal. BC
	North Gill 1A	4640 ± 50 BP	3420 cal. BC	3619-3127 cal. BC
	North Gill 8	3645 ± 45 BP	1975 cal. BC	2135-1887 cal. BC
	North Gill 9	5690 ± 45 BP	4539 cal. BC	4682-4400 cal. BC
	Quick Moss	4900 ± 50 BP	3708 cal. BC	3788-3543 cal. BC
	Scaleby Moss	4925 ± 134 BP	3735 cal. BC	3980-3370 cal. BC
	Valley Bog	4794 ± 55 BP	3595 cal. BC	3690-3380 cal. BC
	Weelhead Moss	5220 ± 120 BP	4055 cal. BC	4330-3780 cal. BC
	Yetholm Loch	5775 BP	4634 cal. BC	4686-4582 cal. BC

Event	Core	Radiocarbon date	Calibrated mid point of date range with highest probability	Calibrated total range (95% limit)
Alnus rise	Din Moss	6780 ± 100 BP	5630 cal. BC	5810-5450 cal. BC
	Mordon Carr	7759 ± 67 BP	6565 cal. BC	6710-6420 cal. BC
	Pow Hill	5300 ± 40 BP	4131 cal. BC	4230-3998 cal. BC
	Quick Moss	6120 ± 50 BP	5032 cal. BC	5212-4921 cal. BC
	Scaleby Moss	7425 ± 350 BP	6315 cal. BC	7050-5580 cal. BC
	The Dod	7370 ± 190 BP	6160 cal. BC	6540-5820 cal. BC
	Tinkler's Sike	6150 ± 160 BP	5050 cal. BC	5380-4720 cal. BC
	Valley Bog	6779 ± 75 BP	5640 cal. BC	5760-5520 cal. BC
	Weelhead Moss	6202 ± 70 BP	5110 cal. BC	5260-4960 cal. BC
	Yetholm Loch	7100 BP	5957 cal. BC	5968-5889 cal. BC

Event	Core	Radiocarbon date	Calibrated mid point of date range with highest probability	Calibrated total range (95% limit)
Corylus rise	Din Moss	9275 ± 170 BP	8350 cal. BC	8930-7980 cal. BC
	Mordon Carr	8689 ± 50 BP	7656 cal. BC	7898-7550 cal. BC
	Neasham Fen	9082 ± 90 BP	8110 cal. BC	8340-7950 cal. BC
	Scaleby Moss	9557 ± 209 BP	8635 cal. BC	9190-8080 cal. BC

Table 3.10 Number of pollen cores with levels in each of the 500 year time periods used in this study. (Chapter 4 gives more information about the time periods chosen.)

Time Period (in calibrated years BC/AD)	Number of Cores	% of total Cores
cal. AD 1500 - present	48	26.7%
cal. AD 1000 - 1500	53	29.4%
cal. AD 500 - 1000	54	30.0%
cal. AD 70 - 500	61	33.9%
500 - cal. AD 70	72	40.0%
1000 - 500 cal. BC	64	35.6%
1500 - 1000 cal. BC	71	39.4%
2000 - 1500 cal. BC	80	44.4%
2800 - 2300 cal. BC	84	46.7%
3800 - 3300 cal. BC	105	58.3%
5500 - 5000 cal. BC	84	46.7%
6800 - 6300 cal. BC	83	46.1%
7800 - 7300 cal. BC	66	36.7%
8500 - 8000 cal. BC	39	21.7%
9000 - 8500 cal. BC	31	17.2%

Table 3.11 Distribution of pollen cores entered into the NEEPD by county

County:	*Number of Cores*	*Percentage of total Cores*
Cores within region		
Northumberland	38	21.1%
Tyne & Wear	1	0.5%
County Durham	84	46.7%
Cleveland	9	5%
	132	**73.3%**
Cores outside region		
Scottish Borders	9	5%
Cumbria	30	16.7%
North Yorkshire	9	5%
	48	**26.7%**
Total Cores:	**180**	**100%**

Table 3.12 Distribution of dated cores entered into the NEEPD by county

County	*Number of dated cores:*	*% total cores in county:*
Northumberland	5	13.1%
Tyne & Wear	-	-
County Durham	13	15.5%
Cleveland	2	22.2%
Scottish Borders	8	88.9%
Cumbria	2	6.7%
North Yorkshire	2	22.2%
Total dated cores:	**32**	**17.8%**

Table 3.13 Distribution of pollen cores entered into the NEEPD by elevation.

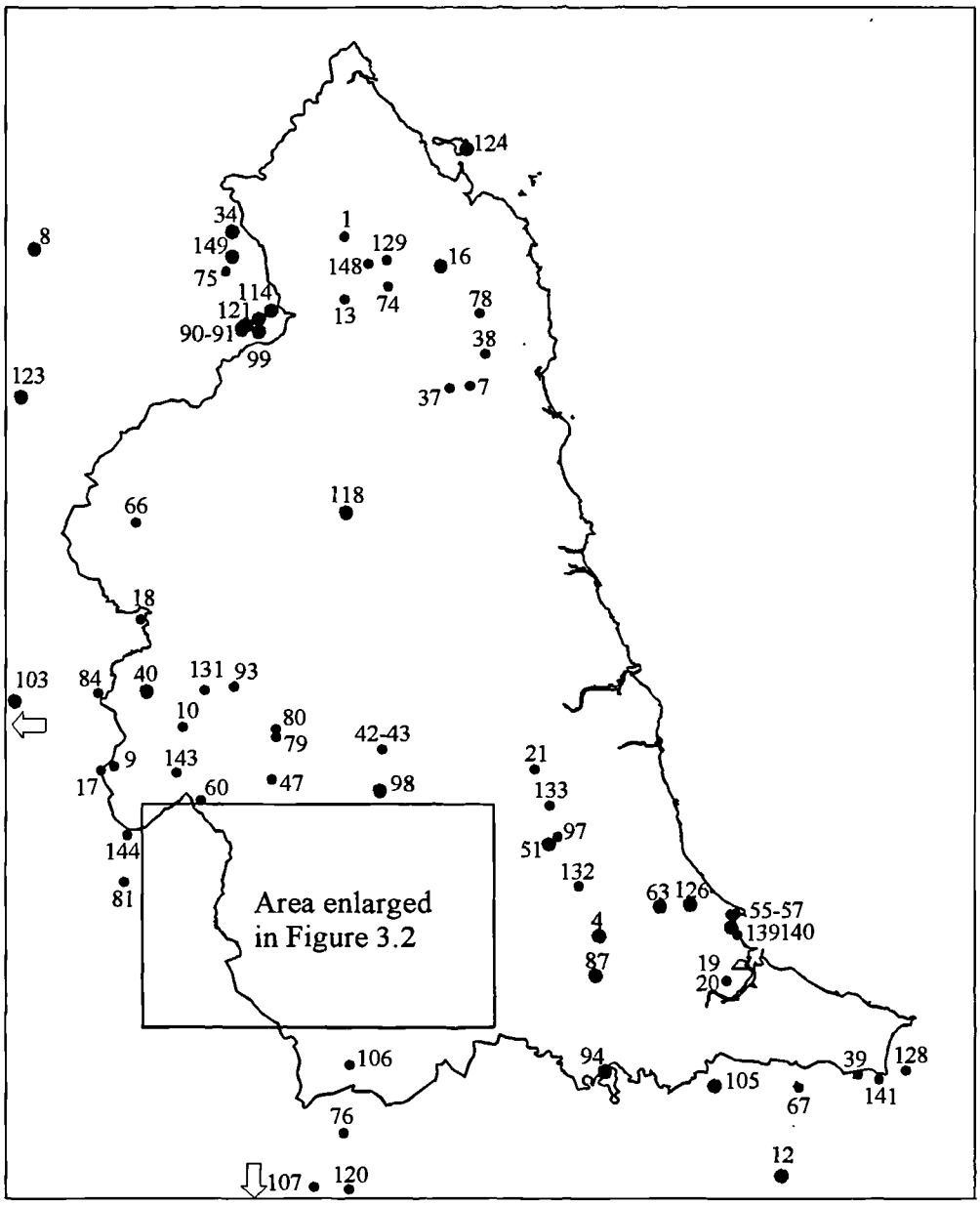
Elevation bands (metres above sea level)	*Number of core sites:*	
0-99	21	**Lowland**
100-199	16	**(20.6%)**
200-299	19	
300-399	26	
400-499	29	
500-599	28	**Upland**
600-699	27	**(79.4%)**
700-799	10	
> 800 metres	4	
Total sites:	180	

Table 3.14 Distribution of pollen cores entered into the NEEPD in the uplands and lowlands of the region, and by county

County	Upland/Lowland	Number of Cores	Number of dated Cores	% of Number of Cores
Northumberland	upland	26	3	11.5%
	lowland	12	2	16.7%
Tyne & Wear	lowland	1	-	-
County Durham	upland	75	8	10.7%
	lowland	8	5	62.5%
Cleveland	lowland	9	2	22.2%
Scotland	upland	7	7	100%
	lowland	2	1	50%
Cumbria	upland	29	1	3.4%
	lowland	2	1	50%
North Yorkshire	upland	6	1	16.7%
	lowland	3	1	33.3%
	Total Cores:	**180**	**32**	**17.8%**

Table 3.15 Distribution of pollen cores entered into the NEEPD by solid (bedrock) geology.

Geological Period:	*Bedrock geology:*	*Number of Cores:*
Jurassic	Kimmeridge Clay/Corallian	1
	Great & Inferior Oolite	2
	Upper Lias	3
Triassic	Triassic mudstones	3
	Bunter sandstones	7
Permian	Magnesian limestone	4
Carboniferous	Coal measures	11
	Millstone Grit series	77
	Carboniferous Limestone series	44
Silurian	Llandovery	1
Ordovician	Llanvrin & Arenig	2
Igneous	Granite	1
	Andesite	6
	Rhyolite	3
	Whin Sill dolerite	15
	Total Cores:	**180**



Key:

106 ● Dated pollen core

106 • Non-dated pollen core

Fig. 3.1

Location of pollen sites in the North-east England Pollen Database

N.B. Key to pollen site codes on following pages.

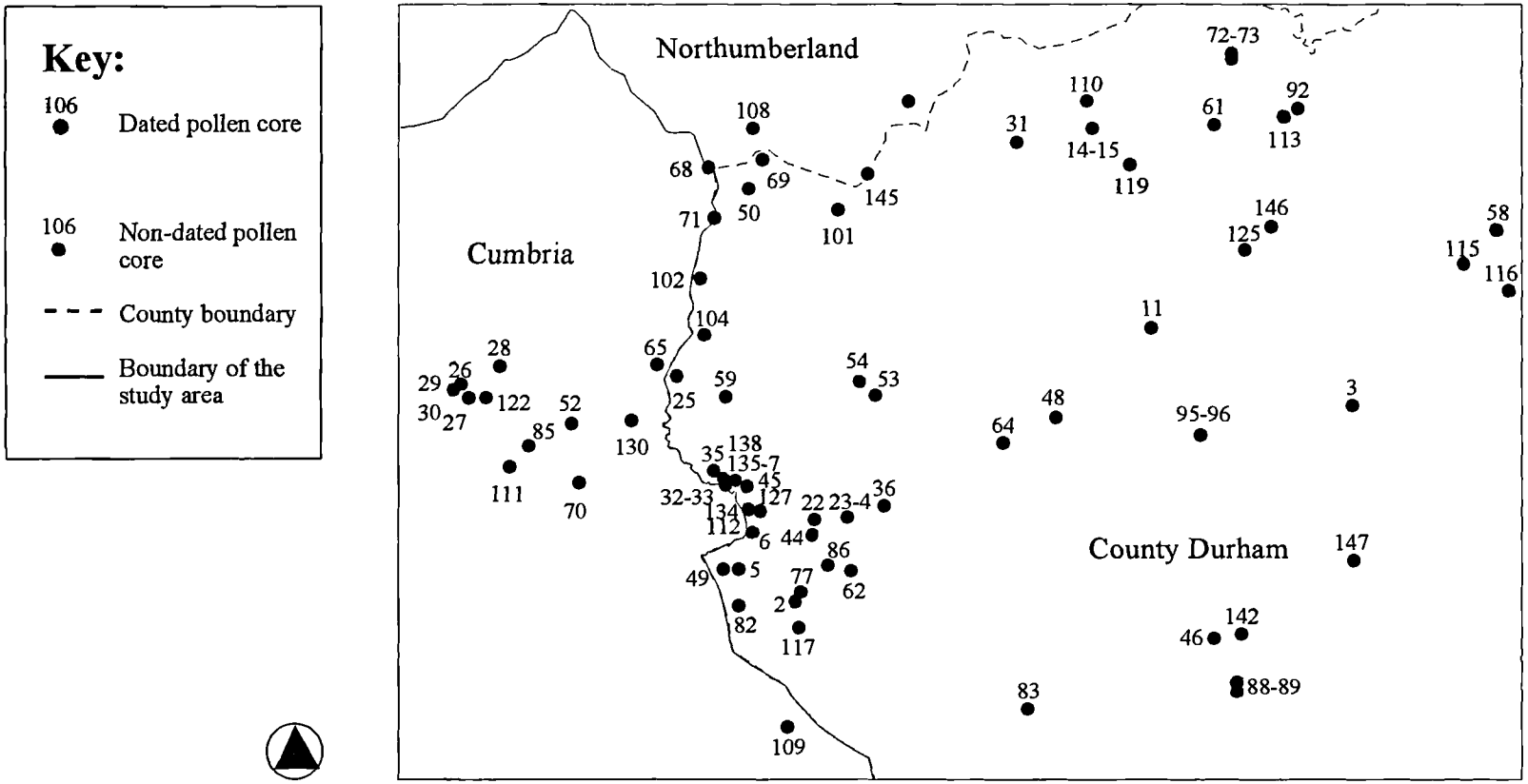


Fig. 3.2

Location of pollen sites in the North-east England Pollen Database.
Inset focusing in upon Upper Teesdale and Upper Weardale.

N.B. Key to pollen site codes in this Figure is the same key as for Figure 3.1., on following pages.

Key to Figures 3.1 and 3.2

Location of pollen sites in the North-east England Pollen Database.

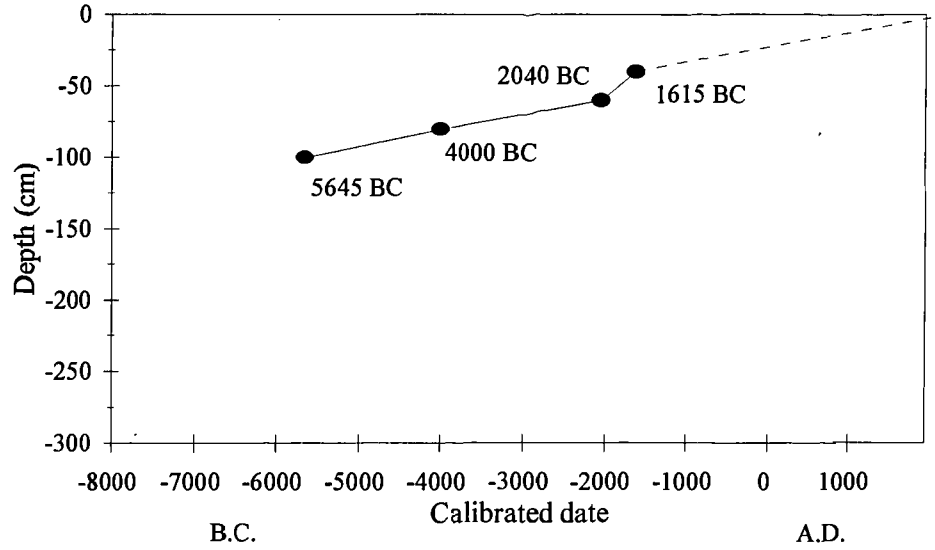
N.B. Bold font indicates dated sites. Italics indicate sites in the inset Figure 3.2.

No.	Pollen site name	No.	Pollen site name	No.	Pollen site name
1	Akeld Steads	*33*	*Dead Crook 2*	*65*	*John's Burn*
2	*Arngill Head Brocks*	**34**	**Din Moss**	66	Kennel Hall Knowe
3	*Bellow Moss*	*35*	*Dubby Moss*	67	Kildale Hall
4	**Bishop Middleham**	*36*	*Dufton Moss*	*68*	*Kilhope Law 1*
5	*Black Band*	37	Edlingham	*69*	*Kilhope Law 2*
6	*Black Hill*	38	Embleton's Bog	70	Knock Ridge
7	Black Lough	39	Ewe Crag Slack	*71*	*Knoutberry*
8	**Blackpool Moss**	**40**	**Fellend Moss**	*72*	*Lamb Shield 1*
9	Black Rigg	41	Fortherley Moss 1	*73*	*Lamb Shield 2*
10	Blackshiel Bog	42	Fortherley Moss 2	74	Lilburn Steads
11	***Bollihope Bog***	43	Fortherley Wood	75	Linton Loch
12	**Bonfield Gill Head**	*44*	*Fox Earth Gill*	76	Little Punchard Head
13	Broad Moss	*45*	*Furness Moss*	*77*	*Long Crag*
14	*Burnhope Burn*	*46*	*Goosetarn Beck*	78	Longlee Moor
15	*Burnhope Dam*	47	Graham's Moss	79	Long Moss
16	**Camp Hill Moss**	*48*	*Great Eggleshope*	80	Low Stublick
17	Cold Fell	*49*	*Greenmines*	81	Melmerby Fell
18	Coom Rigg	50	Green Swang	82	Mickle Fell
19	Cowpen Marsh 1	**51**	**Hallowell Moss**	*83*	*Mickleton Moor*
20	Cowpen Marsh 2	*52*	*Hard Hill*	84	Midgeholme Mire
21	Cranberry Bog	*53*	*Harthope Moss*	*85*	*Milburn Forest*
22	*Cronkley Fell*	*54*	*Harthope Quarry*	*86*	*Mire Holes*
23	*Cronkley Pastures 1*	55	Hartlepool Bay 4	**87**	**Mordon Carr**
24	*Cronkley Pastures 2*	56	Hartlepool Bay 6	*88*	*Moss Mire North*
25	*Crook Burn*	57	Hartlepool Slake	*89*	*Moss Mire South*
26	*Cross Fell East*	*58*	*Hedleyhope*	**90**	**Mow Law A**
27	*Cross Fell South*	*59*	*Herdship Fell*	**91**	**Mow Law B**
28	*Cross Fell Slate Sike*	60	High Banks Moss	*92*	*Mown Meadows*
29	*Cross Fell Summit*	*61*	*Hisehope Burn*	93	Muckle Moss
30	*Cross Fell West*	*62*	*Howden Moss*	**94**	**Neasham Fen**
31	*Cuthbert's Hill*	**63**	**Hutton Henry**	*95*	*Pawlaw Pike 1*
32	*Dead Crook*	*64*	*James' Hill*	*96*	*Pawlaw Pike 2*

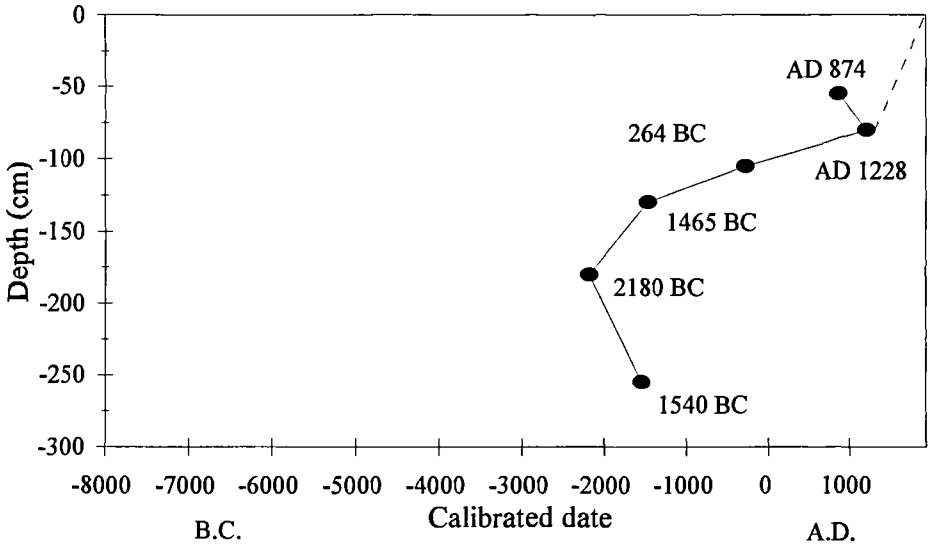
Continued on next page.

Key to Figures 3.1 and 3.2 continued.

No.	Pollen site name
97	Pity Me
98	**Pow Hill**
99	**Quarry Knowe**
100	*Quickcleugh*
101	***Quick Moss***
102	*Sally Grain*
103	**Scaleby Moss**
104	*Scraith Head*
105	**Seamer Carrs**
106	Seven Hills
107	Shaking Moss
108	*Shivery Hill*
109	*Shot Moss*
110	*Sikehead*
111	*Silverband*
112	***Site W***
113	*Smiddy Shaw*
114	**Sourhope**
115	*South Cornsay*
116	*Stanley Moss*
117	*Staple Moss*
118	**Steng Moss**
119	***Steward Shield Meadow***
120	Summerlodge Tarn
121	**Swindon Hill**
122	*Teeshead*
123	**The Dod**
124	**The Lough**
125	*Thornhope Burn*
126	**Thorpe Bulmer**
127	*Tinkler's Sike*
128	Tranmire Slack
129	Trickley Wood
130	***Valley Bog***
131	Vindolanda
132	Waldridge
133	Wanister Bog
134	*Weelfoot Moss*
135	*Weelhead Moss 1*
136	*Weelhead Moss 2*
137	*Weelhead Moss 3*
138	***Weelhead Moss***
139	West Hartlepool 3
140	**West Hartlepool 19**
141	West House
142	White House
143	Whitfield Lough
144	Woldgill Burn
145	Wolfscleugh
146	*Wolsingham Park Moor*
147	Woodland
148	Wooler Water
149	**Yetholm Loch**

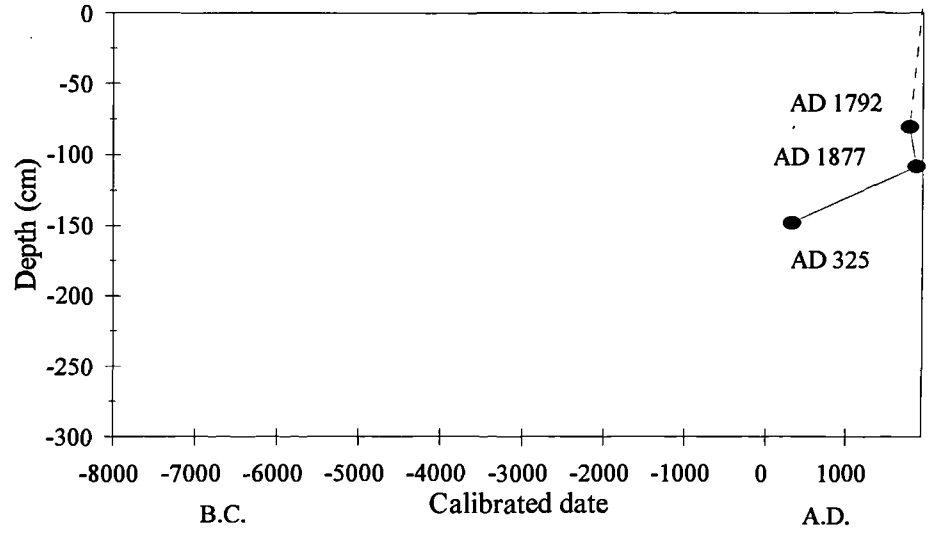


Age-depth curve for Bishop Middleham

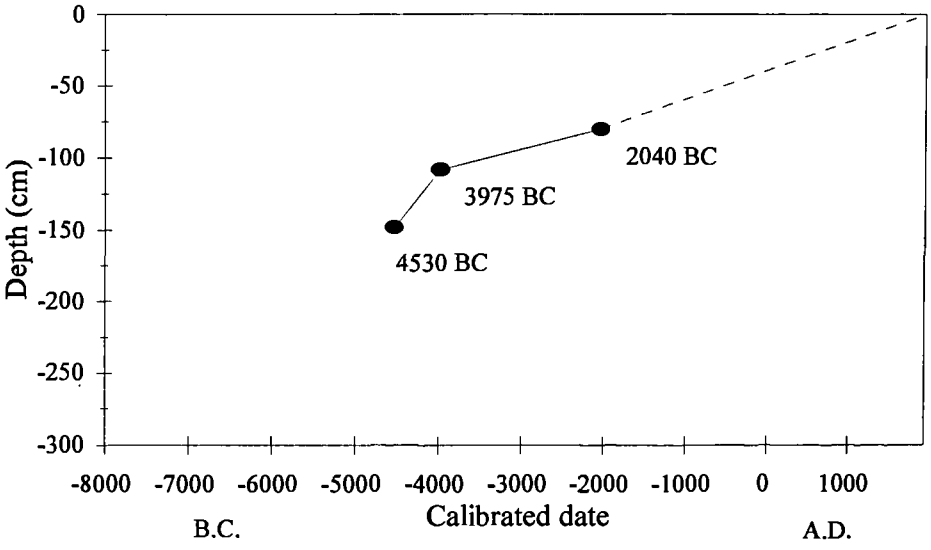


Age-depth curve for Blackpool Moss

Figure 3.3 Age-depth curves for dated sites in the North-east England Pollen Database

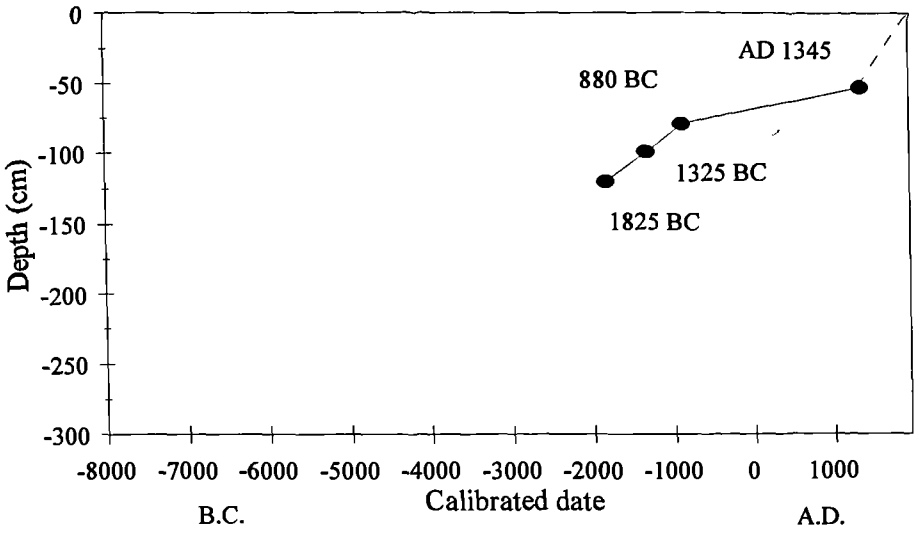


Age-depth curve for Bollihope Bog

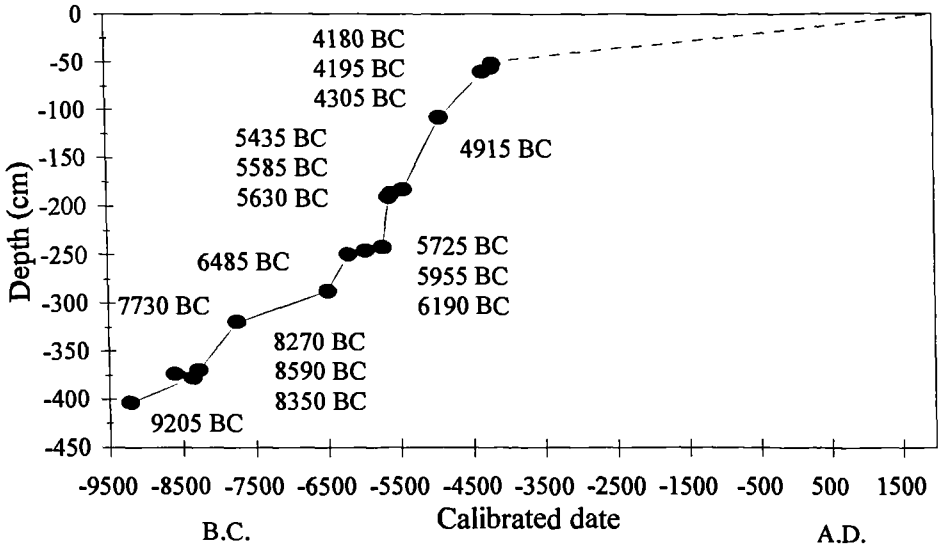


Age-depth curve for Bonfield Gill Head

Figure 3.3 continued.

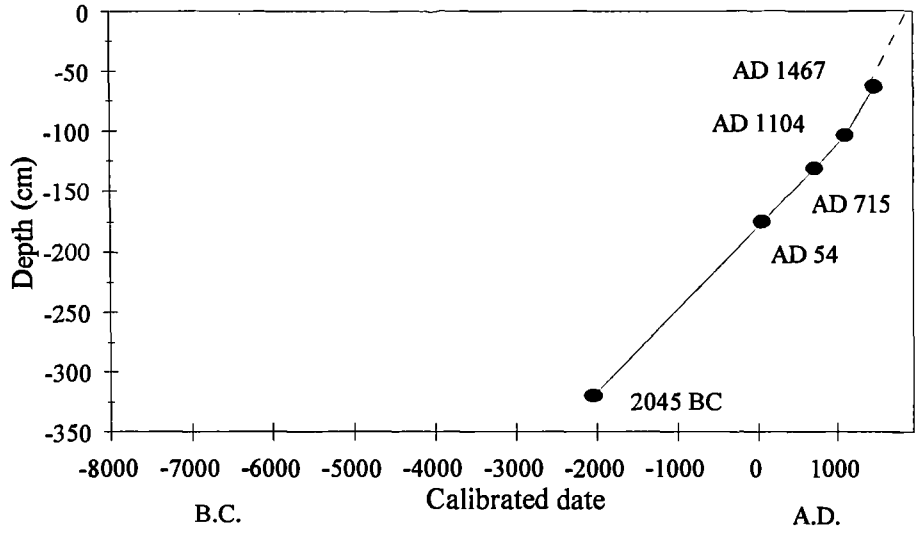


Age-depth curve for Camp Hill Moss

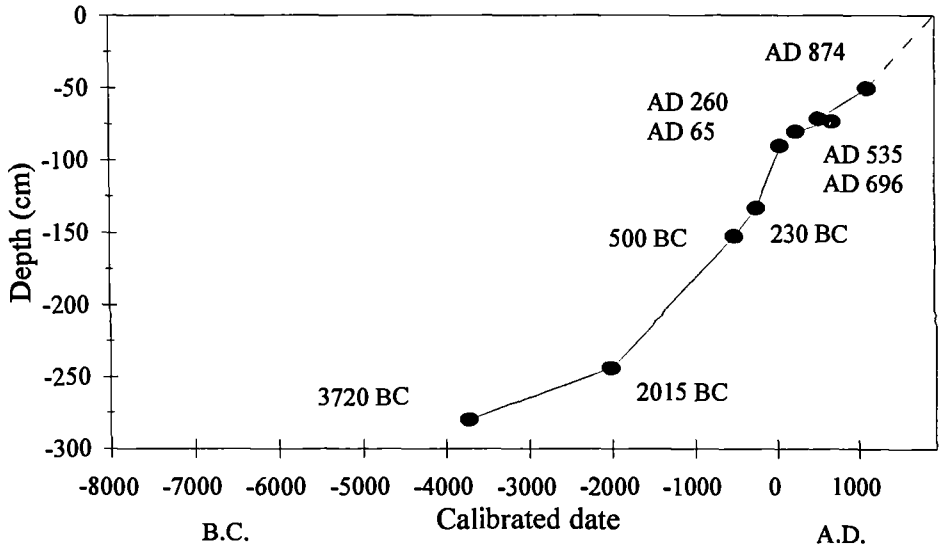


Age-depth curve for Din Moss

Figure 3.3 continued.

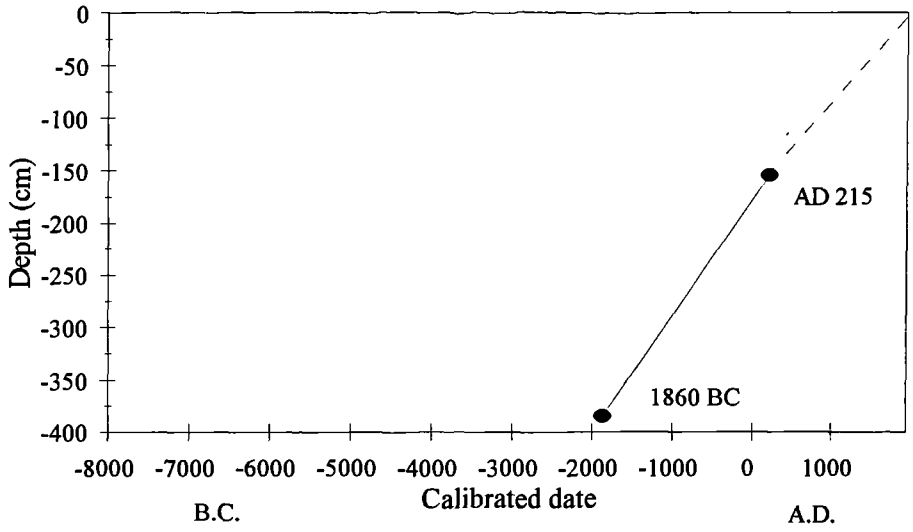


Age-depth curve for Fellend Moss

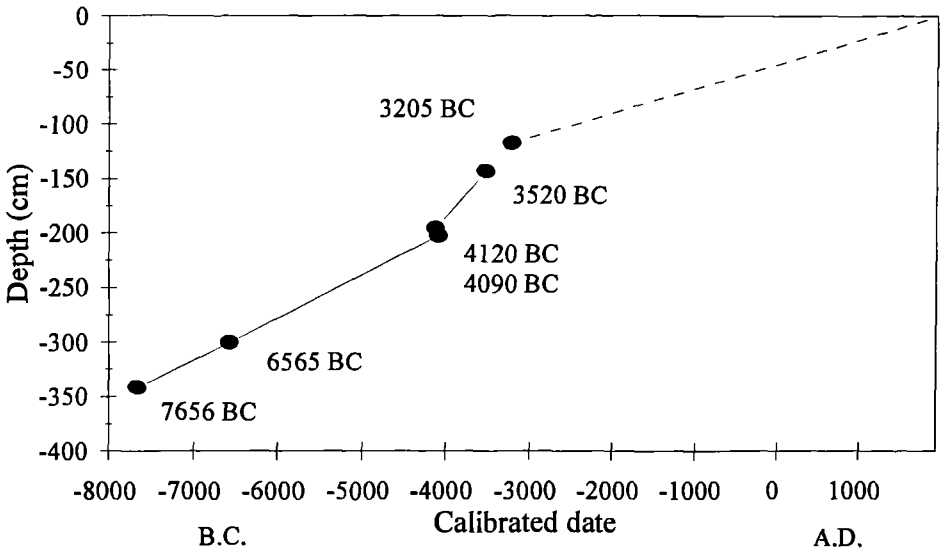


Age-depth curve for Hallowell Moss

Figure 3.3 continued.

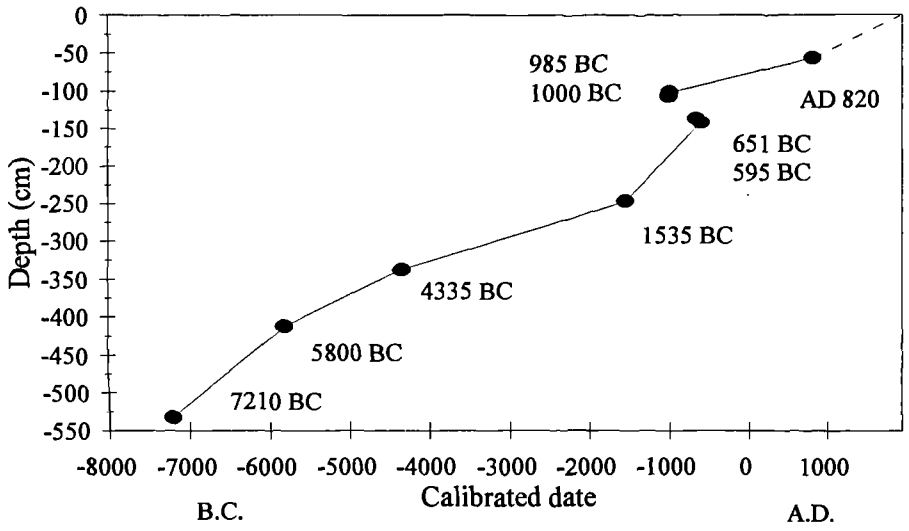


Age-depth curve for Hutton Henry

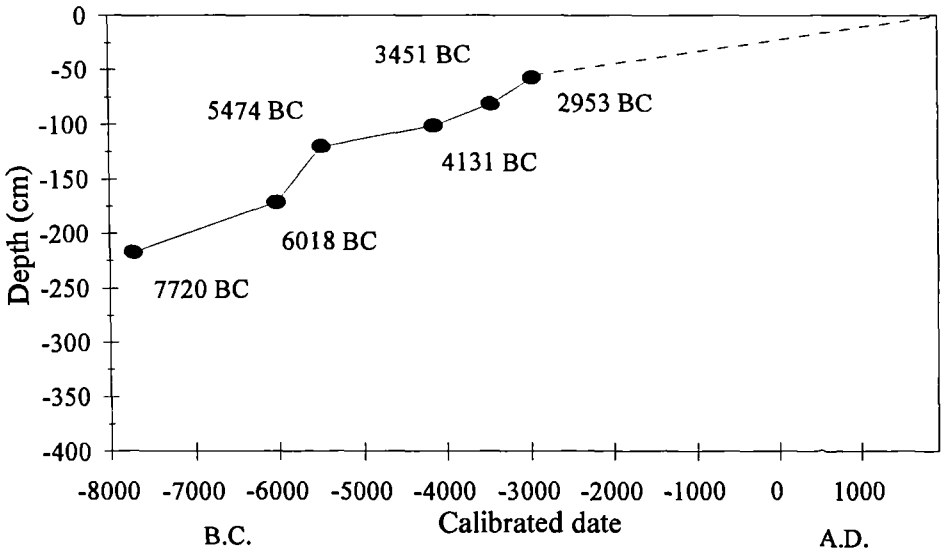


Age-depth curve for Mordon Carr

Figure 3.3 continued.

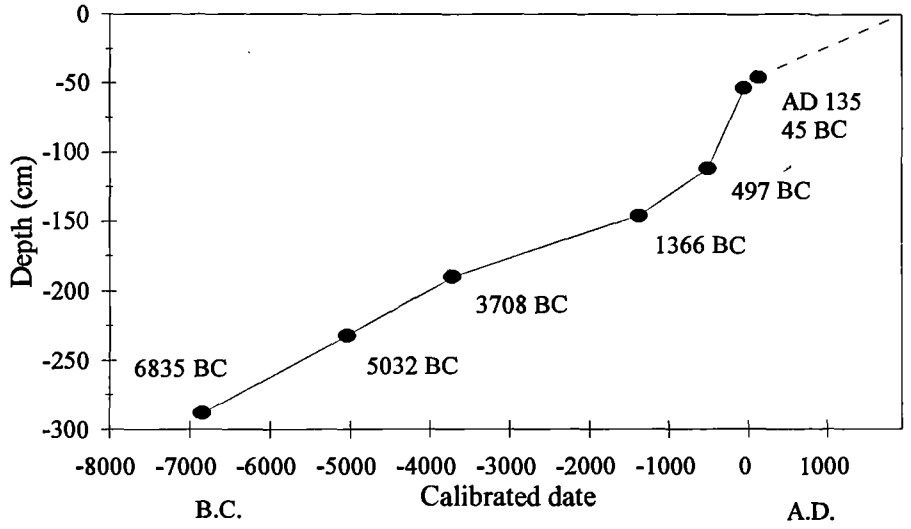


Age-depth curve for Neasham Fen

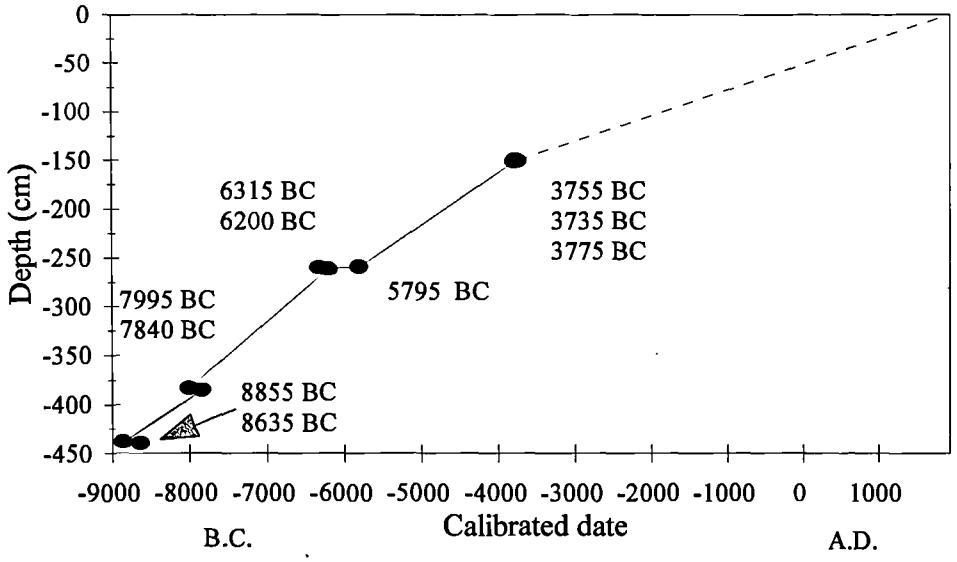


Age-depth curve for Pow Hill

Figure 3.3 continued.

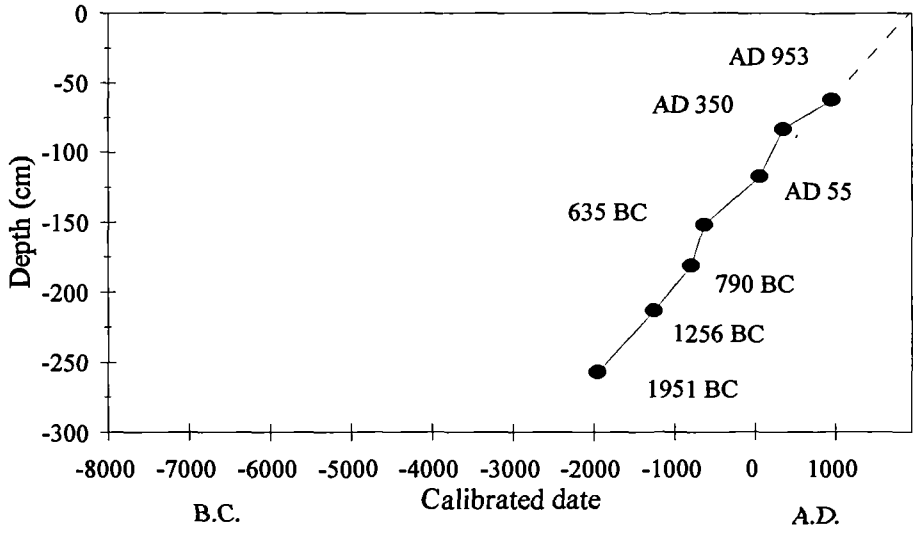


Age-depth curve for Quick Moss

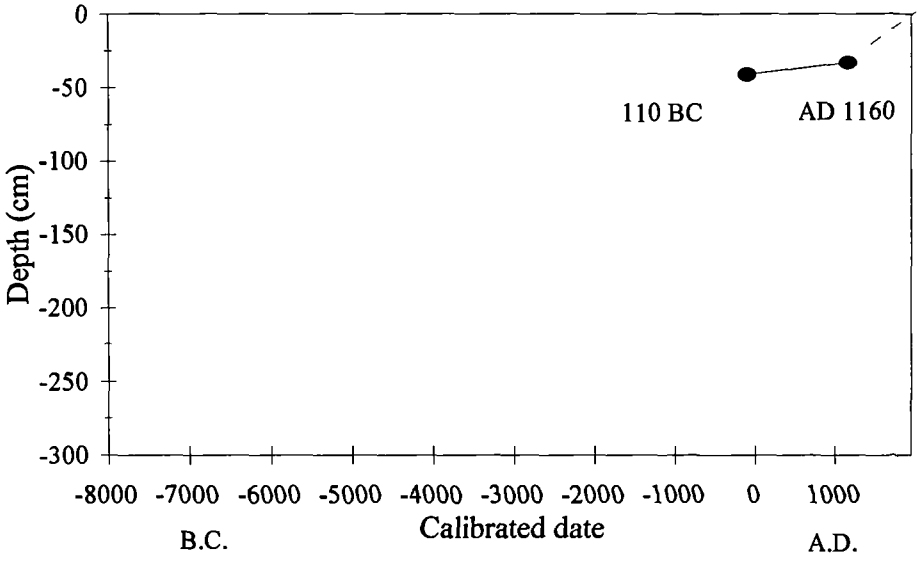


Age-depth curve for Scaleby Moss

Figure 3.3 continued.

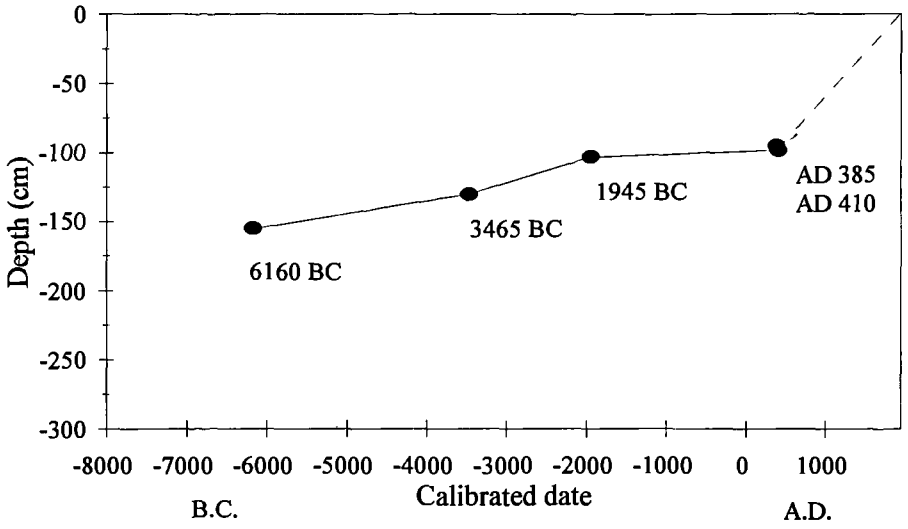


Age-depth curve for Steng Moss

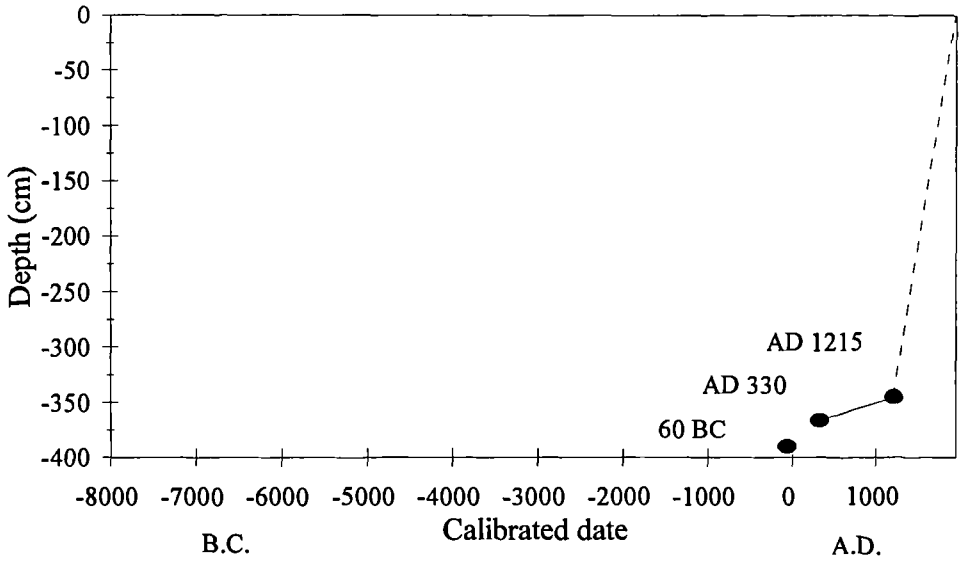


Age-depth curve for Steward Shield

Figure 3.3 continued.

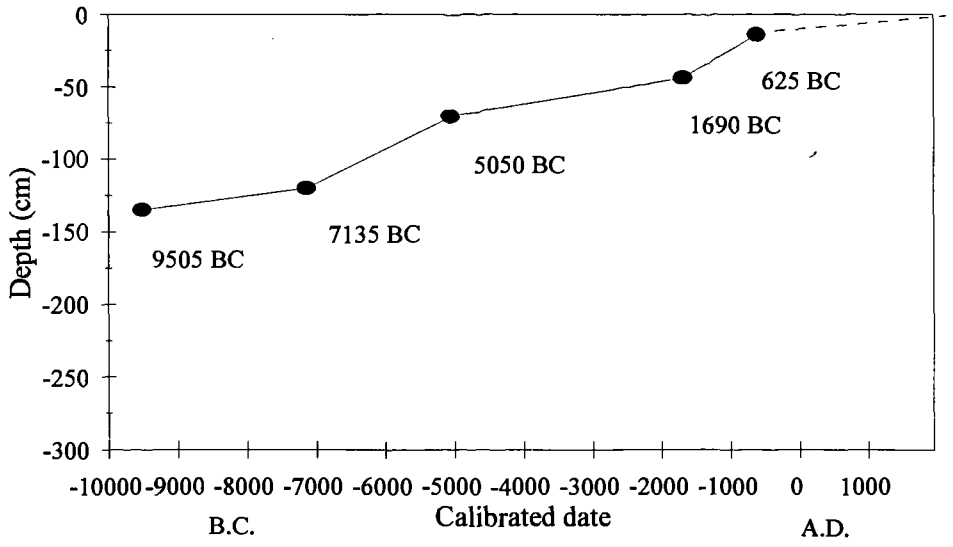


Age-depth curve for The Dod

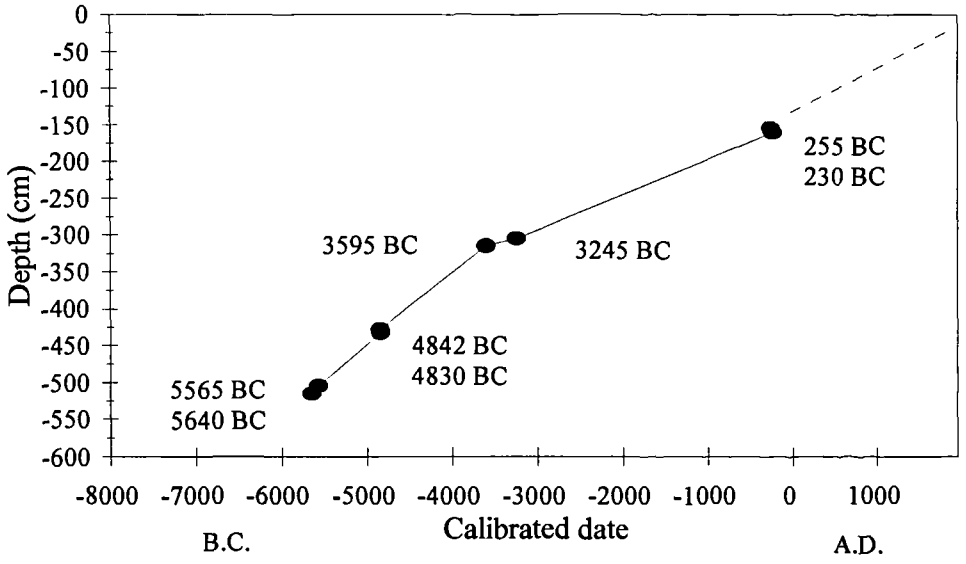


Age-depth curve for Thorpe Bulmer

Figure 3.3 continued.

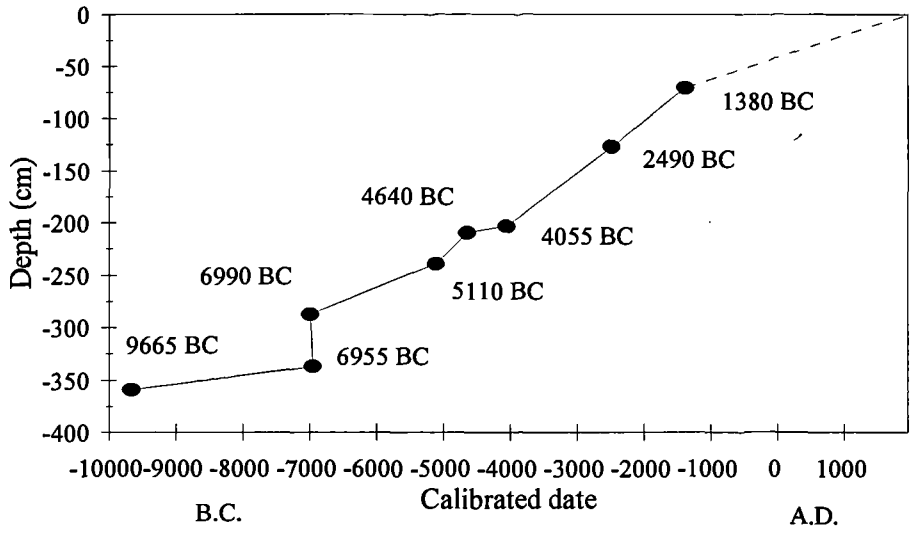


Age-depth curve for Tinkler's Sike

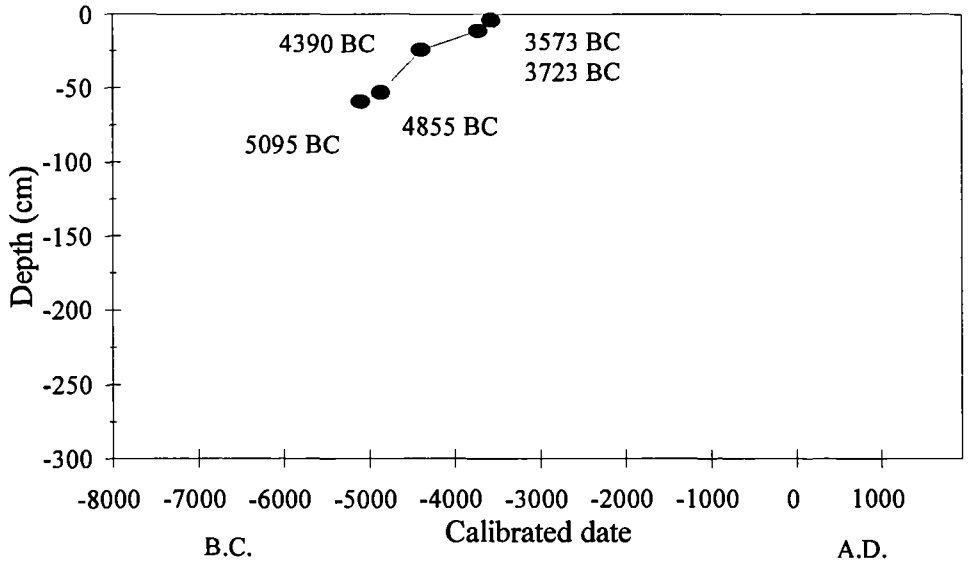


Age-depth curve for Valley Bog

Figure 3.3 continued.



Age-depth curve for Weelhead Moss



Age-depth curve for West Hartlepool 19

Figure 3.3 continued.

Tables and Figures for

Chapter 4

The archaeological data set

Table 4.1 Radiocarbon dates for Mesolithic archaeological sites in the north-east and surrounding regions.

N.B. Each radiocarbon date has been calibrated using the Calib3 program (Stuiver and Reimer: 1993). The 'calibrated mid-point', the mid-point of the date range produced by calibration, is given. Where more than one date range is produced by calibration, the mid-point with the highest probability is used.

Name of site	Radiocarbon date BP ? = laboratory unknown	Calibrated midpoint BC/AD	Notes
Filpoke Beacon	? 8760 ± 140	7772 cal. BC	Earliest known Late Mesolithic type lithic assemblage.
Monk Moors and Williamson's Moss, Eskmeals, Cumbria	BM-1216, 6752 ± 156	5642 cal. BC	Mesolithic occupation site with hearths and other features on postglacial raised shoreline, with associated Late Mesolithic lithics. *Radiocarbon* **24** (1982)
Seamer Carr, Vale of Pickering, North Yorkshire	BM-2350, 9790 ± 180	9188 cal. BC	Wild horse mandible from mesolithic site in peat deposits. *Radiocarbon* **29** (1987)
	CAR-195, 9480 ± 110	8655 cal. BC	Birch branch.
	CAR-196, 9100 ± 100	8153 cal. BC	Faunal remains. *Radiocarbon* **27** (1985)
	BM-1841, 8620 ± 80	7698 cal. BC	Bos primigenius bone *Radiocarbon* **24** (1982)
Star Carr, Vale of Pickering, North Yorkshire	Q-14, 9557 ± 210	8669 cal. BC	Bos primigenius bone *Radiocarbon* **1** (1959) p.69

Table 4.2 Radiocarbon dates for Neolithic archaeological sites in the north-east and surrounding regions.

Name of site	Radiocarbon date BP	Calibrated midpoint BC/AD	Notes
Callis Wold, Bishop Witton, Yorkshire.	BM-1167, 4803 ± 71 BM-1170, 4933 ± 64	3540 cal. BC 3740 cal. BC	Neolithic platform burial with Towthorpe Ware pottery. *Radiocarbon* **24** (1982) p.152
East Heslerton, Malton, North Yorkshire	HAR-7029, 4920 ± 90 HAR-7030, 5020 ± 70 HAR-7031, 5020 ± 110 HAR-7032, 4640 ± 70	3731 cal. BC 3811 cal. BC 3791 cal. BC 3366 cal. BC	Charcoal from long barrow belonging to Yorkshire Long Barrow Group. *Radiocarbon* **32** (1990) p.180-181
Kemp Howe, Cowlam, Yorks.	HAR-8778, 4870 ± 90 HAR-8779, 4330 ± 100	3642 cal. BC 2978 cal. BC	Mortuary enclosure. Mortuary enclosure *Radiocarbon* **33** (1991) p.106
Langdale Pikes, Cumbria	BM-676, 4474 ± 52 BM-281, 4680 ± 135	3136 cal. BC 3370 cal. BC	Group IV Neolithic stone axe working site. *Radiocarbon* **18** (1976) p.25 *Radiocarbon* **11** (1969) p.288
Meldon Bridge, Peebleshire, Borders, Scotland	Radiocarbon dates not given in publication.	five dates ranging from 2236 - 2132 cal. BC.	Contexts with later Neolithic Peterborough Ware. (Ferrell 1990)
Milfield North, Northumberland	BM-1650, 3740 ± 50 BM-1652, 3770 ± 50 BM-1653, 3610 ± 80	2130 cal. BC 2322 cal. BC 1966 cal. BC	Pits with Grooved Ware pottery. *Radiocarbon* **24** (1982)
Raisthorpe Manor, Thixendale, North Yorkshire	HAR-8783, 5070 ± 60	3845 cal. BC	Long barrow *Radiocarbon* **33** (1991) p.106
Seamer Moor, Vale of Pickering, Yorks.	HAR-8785, 5260 ± 100 HAR-8786, 4990 ± 90	4099 cal. BC 3803 cal. BC	Final deposition of barrow mound. Grave pit in long barrow. *Radiocarbon* **33** (1991) p.106
Street House Farm, Loftus, Cleveland	BM-1966, 4720 ± 60 BM-1967, 4620 ± 60 BM-1968, 4690 ± 60 BM-1969, 4720 ± 50 BM-2011, 4630 ± 80 BM-2012, 4610 ± 80 BM-2013, 4510 ± 90 BM-2014, 4630 ± 70 BM-2060, 4500 ± 130	3499 cal. BC 3359 cal. BC 3489 cal. BC 3499 cal. BC 3363 cal. BC 3334 cal. BC 3208 cal. BC 3362 cal. BC 3250 cal. BC	Neolithic mortuary structure. *Radiocarbon* **25** (1983)
Thirlings, Northumberland	HAR-1450, 4270 ± 100 HAR-1451, 4080 ± 130 HAR-877, 5230 ± 150	2917 cal. BC 2562 cal. BC 4027 cal. BC	Late Neolithic pit with pottery and saddle quern. *Radiocarbon* **30** (1988) Pit with later Neolithic Peterborough Ware. Pit with earlier Neolithic Grimston ware. Miket (1976)

Whitton Hill, Northumberland	Radiocarbon dates not given in publication.	1850 cal. BC	Cremation burial at hengiform monument accompanied by later Neolithic Peterborough Ware. Ferrell (1990) Miket (1985)

Table 4.3 Radiocarbon dates for Bronze Age and earliest Iron Age period archaeological sites in the north-east and surrounding regions.

Name of site	Radiocarbon date BP	Calibrated midpoint BC/AD	Notes
Bracken Rigg, Durham	HAR 2414, 3180 ± 60	1451 cal. BC	Open settlement
Callis Wold, Bishop Witton, Yorkshire	BM-1168, 3794 ± 70 BM-1169, 3677 ± 68	2220 cal. BC 2077 cal. BC	Beaker burial. *Radiocarbon* **24** (1982) p.152
Cot Nab, Kirkby Underdale, North Yorkshire	HAR-8516, 3530 ± 140	1894 cal. BC	Early Bronze Age burial
Crawley Edge, Stanhope, Weardale, Co. Durham	HAR-3323, 3350 ± 90 HAR-3322, 3400 ± 80		Cairn from cairnfield on Crawley Edge, associated with Collared Urn and tubular jet beads.
Dubby Sike, Upper Teesdale, Co. Durham	HAR-2414, 3180 ± 60	1451 cal. BC	Posthole from circular house associated with Middle Bronze Age artefacts. Coggins and Fairless (1984)
Ewanrigg, Cumbria	HAR-9460, 2970 ± 60	1192 cal. BC	Charcoal from earliest feature from the site, *Radiocarbon* **34** (1992), p.47-76
Gnipe Howe, Whitby, North Yorkshire	HAR-8773, 3440 ± 90 HAR-8774, 3910 ± 120 HAR-8787, 3500 ± 90	1740 cal. BC 2424 cal. BC 1786 cal. BC	Urn burial Earlier cremation cist associated with Food Vessel pottery *Radiocarbon* **33** (1991) p. 106
Green Knowe, Borders	?, 2934 ± 45 ?, 3155 ± 105 ?, 2975 ± 36 ?, 3045 ± 130 ?, 2922 ± 87 ?, 2998 ± 124 ?, 2731 ± 75	1129 cal. BC 1399 cal. BC 1176 cal. BC 1124 cal. BC 1190 cal. BC 908 cal. BC	Charcoal, platform 2, later house Charcoal, platform 2, later house Charcoal, platform 2, earlier house Charcoal, platform 2, earlier house Charcoal, platform 2, initial phase Charcoal, platform 2, initial phase Charcoal, platform 8
Hallshill, Elsdon, Northumberland	HAR-8183, 2960 ± 60 HAR-8184, 3130 ± 60 HAR-4800, 2780 ± 80 HAR-8185, 2710 ± 70	1187 cal. BC 1370 cal. BC 963 cal. BC 894 cal. BC	Antecedes timber building. " " " " " " " From same building. Bronze Age pit prior to construction of timber building. *Radiocarbon* **32** (1990) p.192 van der Veen (1992)

Heslerton Parish, Vale of Pickering, Yorkshire	HAR-6631, 3510 ± 80 HAR-8241, 3510 ± 40 HAR-8325, 3640 ± 40 HAR-8326, 3440 ± 40 HAR-8413, 3440 ± 60 HAR-8414, 2980 ± 80 HAR-8415, 3470 ± 60 HAR-8416, 4010 ± 80 HAR-8417, 2780 ± 80 HAR-6630, 4060 ± 80 HAR-6690, 3840 ± 40 HAR-8414, 2980 ± 80 HAR-8417, 2780 ± 80	1827 cal. BC 1812 cal. BC 2009 cal. BC 1753 cal. BC 1712 cal. BC 1171 cal. BC 1776 cal. BC 2576 cal. BC 963 cal. BC 2619 cal. BC 2298 cal. BC 1171 cal. BC 963 cal. BC	Human bone from Beaker burial *Radiocarbon* **34** (1992) p. 916-927 Human bone from burial. *Radiocarbon* **33** (1991) p.94 Primary burial. *Radiocarbon* **30** (1988) Infant burial in EBA barrow. Domestic rubbish pit *Radiocarbon* **3** (1991), 87-113.
Lookout Plantation, Northumberland	?, 3410 ± 80 ?, 3370 ± 80 ?, 3230 ± 110 ?, 3090 ± 30	1705 cal. BC 1663 cal. BC 1484 cal. BC 1339 cal. BC	Open settlement.
Millfield North, Wooler, Northumberland	BM-1149, 3774 ± 39 BM-1150, 3801 ± 62 HAR-1199, 3750 ± 80	2174 cal. BC 2244 cal. BC 2187 cal. BC	*Ditch fill of henge monument* associated with Beaker artefacts and Food Vessel pottery. Sample associated with Early Bronze Age Food Vessel. *Radiocarbon* **21** (1979) p.346
Ruchlaw Mains, East Lothian, Scotland	GU-1356, 3720 ± 80	2140 cal. BC	Human bone from Beaker burial. *Radiocarbon* **34** (1992) p. 916-927
Simy Folds, Upper Teesdale	?, 3200 ± 100	1451 cal. BC	Early phase of bronze age settlement at Simy Folds. (Coggins: 1985)
Street House Farm, Loftus, Cleveland	BM-2007, 3220 ± 45 BM-2008, 2485 ± 45 BM-2009, 3360 ± 50 BM-2010, 3170 ± 45	1501 cal. BC 598 cal. BC 1631 cal. BC 1418 cal. BC	Layer between Bronze Age cairn and neolithic mound. *Radiocarbon* **25** (1983)
Street House Wossit, Loftus, Cleveland	BM-2566, 3740 ± 60 BM-2567, 3700 ± 50	2133 cal. BC 2066 cal. BC	Cremations in Collared Urns preceding construction of palisade enclosure. *Radiocarbon* **33** (1991)
Thwing, Paddock Hill, Yorkshire Wolds, North Yorkshire	HAR-1398, 2900 ± 70 OxA-2542, 2920 ± 100 OxA-2687, 2770 ± 70 (selected dates from a range of similar dates from this site).	1099 cal. BC 1120 cal. BC 957 cal. BC	Charcoal beneath timber revetted rampart. Charcoal from timbers in trough. " " " "
West Heslerton, Vale of Pickering, Yorkshire	HAR-6631, 3510 ± 80	1827 cal. BC	Human bone from Beaker burial. *Radiocarbon* **34** (1992) p. 916-927

Wetwang Slack, Vale of Pickering, Yorkshire.	HAR-4426, 3900 ± 100	2328 cal. BC	Human bone from Beaker burial. *Radiocarbon* **34** (1992) p. 916-927
Whitton Hill, Northumberland	BM-2203, 4820 ± 80 BM-2204, 2860 ± 90 BM-2205, 3610 ± 45 BM-2206, 3740 ± 50 BM-2264, 2880 ± 310 BM-2265, 3680 ± 80 BM-2266, 3660 ± 50 BM-2267, 2770 ± 170	3573 cal. BC 1056 cal. BC 1953 cal. BC 2130 cal. BC 1118 cal. BC 2034 cal. BC 2033 cal. BC 908 cal. BC	Charcoal from earliest phase. Rest of samples from cremations, burials and ditches in prehistoric earthworks. *Radiocarbon* **27** (1985), p.508-524.

Table 4.4 Radiocarbon dates for Iron Age and Roman period archaeological sites in the north-east and surrounding regions.

Name of site	Radiocarbon date BP	Calibrated midpoint BC/AD	Notes
Ampleforth Moor, North Yorks	BM-368, 2487 ± 90 BM-369, 2532 ± 90	600 cal. BC 615 cal. BC	Both samples beneath barrows with coarse ware.
Belling Law, Northumberland	HAR 1393, 1670 ± 70 HAR 1394, 2110 ± 80	cal. AD 390 150 cal. BC	Stone house. Timber house from palisade enclosure.
Brough Law, Northumberland	I-5315, 2195 ± 90	200 cal. BC	Beneath rampart of hillfort.
Broxmouth, Borders	GU-1069, 1740 ± 70	cal. AD 284	Animal bone in midden in derelict stone house.
	GU-1504, 1980 ± 85	cal. AD 26	Animal bone above Period VII road
	GU-1506, 2005 ± 60	cal. BC 17	Animal bone above Period VII road
	GU-1497, 2005 ± 60	cal. BC 17	Animal bone in midden in derelict stone house.
	GU-1499, 2030 ± 60	33 cal. BC	Animal bone in midden in derelict stone house.
	GU-1206, 2045 ± 105	108 cal. BC	Charcoal from stone house.
	GU-1498, 2050 ± 100	80 cal. BC	Animal bone in midden in derelict stone house.
	GU-1503, 2095 ± 70	119 cal. BC	Animal bone above Period VII road
	GU-1226, 2145 ± 70	185 cal. BC	Charcoal from Period VI/VII
	GU-1070, 2180 ± 60	215 cal. BC	Animal bone Period VI/VII
	GU-1199, 2105 ± 50	167 cal. BC	Charcoal from gate post
	GU-1144, 2200 ± 65	221 cal. BC	Bone from Period VI/VII burial
	GU-1225, 2250 ± 50	288 cal. BC	Charcoal, Period VI
	GU-1197, 2320 ± 60	356 cal. BC	Charcoal in ditch of Period VI
	GU-1361, 2335 ± 65	477 cal. BC	Animal bone from trench fill
	GU-1501, 2365 ± 80	485 cal. BC	Animal bone, overlying Period IV
	GU-1358, 2375 ± 60	513 cal. BC	Animal bone, Period II
	GU-1359, 2380 ± 55	565 cal. BC	Animal bone, Period III
	GU-1201, 2470 ± 65	596 cal. BC	Charcoal, Period III
	GU-1202, 2520 ± 55	605 cal. BC	Charcoal from timber
	GU-1205, 2570 ± 60	670 cal. BC	Animal bone, overlying Period III
Castle Hill, Almondbury, West Yorkshire	HAR-83, 2410 ± 110 HAR-84, 2470 ± 130 I-4542, 2505 ± 100	500 cal. BC 523 cal. BC 607 cal. BC	Iron age defences. Bivallate fort. Uppermost ramparts *Radiocarbon* **14** (1972), p132
Catterick, North Yorkshire	HAR-5275, 1870 ± 70 HAR-5740, 1900 ± 80	cal. AD 170 cal. AD 187	Human bone. Pre-Roman burial, *Radiocarbon* **30** (1988), p.319-340
Chester House, Northumberland.	GrN-15707, 2280 ± 50 GrN-15708, 2360 ± 60 OxA-1743, 2030 ± 70 GrN-15709, 2530 ± 80	299 cal. BC 505 cal. BC 34 cal. BC 612 cal. BC	All samples from chaff and charcoal analysed by van der Veen (1992).

Dalton Parlours, West Yorkshire	HAR-6714, 1780 ± 80 HAR-6716, 2090 ± 80	cal. AD 251 143 cal. BC	Human bone from burial Animal bone from enclosure *ditch.*
Dod Law West, Northumberland	GrN-15674, 2235 ± 35 GrN-15675, 2215 ± 35 GrN-15676, 2095 ± 30 OxA-1734, 1960 ± 70 OxA-1735, 1970 ± 70 GrN-15677, 2265 ± 35 OxA-1736, 1910 ± 80	289 cal. BC 277 cal. BC 110 cal. BC cal. AD 64 cal. AD 55 297 cal. BC cal. AD 187	All samples from chaff and charcoal analysed by van der Veen (1992).
Dubby Sike, Durham	HAR-6552, 2170 ± 100 HAR-6557, 1830 ± 100 HAR-6500, 2040 ± 70 HAR-6551, 2110 ± 90	171 cal. BC cal. AD 227 38 cal. BC 151 cal. BC	Charcoal from beneath ring cairn. Under paving of west house group. *Radiocarbon* **30** (1988), p.297-317 Pit in kerb cairn. Under paving of east house group. Coggins and Gidney (1988)
The Dunion, Roxburgh, Borders	GU-2176, 2120 ± 110 GU-2175, 2120 ± 50 GU-2174, 2090 ± 150 GU-2172, 2080 ± 50 GU-2178, 2000 ± 55 GU-2171, 1970 ± 80 GU-2173, 1910 ± 150	138 cal. BC 177 cal. BC 81 cal. BC 71 cal. BC cal. AD 26 cal. AD 34 cal. AD 43	Pit Hollow beside rampart Occupation layer Drainage ditch Quern pit Floor Drainage gulley
Eildon Hill North, Borders	GU-2190, 2760 ± 50 GU-2370, 2870 ± 50 GU-2198, 2620 ± 60 GU-2197, 2680 ± 130 GU-2372, 1780 ± 50 GU-2196, 1820 ± 60 GU-2373, 2600 ± 50 GU-2193, 2650 ± 60 GU-2195, 2750 ± 50 GU-2191, 1760 ± 50 GU-2371, 2000 ± 130 GU-2192, 2200 ± 60	907 cal. BC 1051 cal. BC 725 cal. BC 773 cal. BC cal. AD 264 cal. AD 228 cal. AD 488 752 cal. BC 863 cal. BC cal. AD 275 20 cal. BC 224 cal. BC	Wood from pre-rampart phase Wood from pre-rampart phase House Platform 3 Pit under rampart House Platform 2 House Platform 2 House Platform 1, episode 1 House Platform 1, episode 1 House Platform 1, episode 1 House Platform 1, episode 2 House Platform 1, episode 2 House Platform 1, episode 2
Forcegarth Pasture North, Upper Teesdale, Co. Durham	HAR-864, 1810 ± 70	cal. AD 238	Charcoal from floor of central house, *Radiocarbon* **21** (1979), p.358-383
Forcegarth Pasture South, Upper Teesdale, Co. Durham	HAR-1447, 1740 ± 90	cal. AD 310	Charcoal from timber house, *Radiocarbon* **21** (1979), p.358-383
Hartburn, Northumberland	I-6300, 1985 ± 175 I-6301, 1885 ± 90	cal. AD 14 cal. AD 213	Waterlogged twigs from bottom of ditch. Charcoal associated with destruction of stone house.
Heslerton, North Yorkshire	HAR-6517, 2280 ± 80	318 cal. BC	Human bone from burial *Radiocarbon* **30** (1988), 297-317
Huckhoe, Northumberland	GaK-1388, 2460 ± 40	588 cal. BC	Burnt wood from double palisade of curvilinear enclosure.
Ingram Hill, Northumberland	I-5316, 2170 ± 90	189 cal. BC	Charcoal possibly post-dating palisaded enclosure.

Kennel Hall Knowe, Northumberland	HAR-1943, 2050 ± 90 HAR-1937, 1950 ± 70 HAR-1941, 1920 ± 110 HAR-1938, 1710 ± 160	111 cal. BC cal. AD 72 cal. AD 104 cal. AD 344	Charcoal post-dating first phase of palisaded enclosure. Charcoal from beneath stone house Charcoal from house. Carbonised wood from fill of trench of third phase of enclosure.
Ledston, West Yorkshire	HAR-2805, 2080 ± 100 HAR-2825, 2270 ± 70	124 cal. BC 491 cal. BC	Bone from base of storage pit. Charcoal from burial in post hole.
Murton High Crags, Northumberland	HAR-6201, 2960 ± 80 HAR-6202, 2130 ± 80 HAR-6200, 2060 ± 100 GrN-15672, 3160 ± 50 OxA-1740, 1910 ± 70 OxA-1741, 1960 ± 70 OxA-1742, 2000 ± 70	1161 cal. BC 161 cal. BC 114 cal. BC 1414 cal. BC cal. AD 177 cal. AD 64 16 cal. BC	All samples from chaff and charcoal analysed by van der Veen (1992).
North Belton Farm, Dunbar, Borders	GU-2718, 1880 ± 50 GU-1530, 1530 ± 180	cal. AD 167 cal. AD 505	Burial 1 Burial 2 The site is an iron age cist.
Rock Castle, Gatherley Moor, North Yorkshire	GrN-15668, 2940 ± 90 OxA-1738, 2020 ± 70 OxA-1739, 2000 ± 70 GrN-15669, 2480 ± 60 GrN-15670, 2420 ± 50 GrN-15671, 2575 ± 35 OxA-1737, 1970 ± 70 OxA-2132, 1920 ± 70	1151 cal. BC 30 cal. BC 16 cal. BC 598 cal. BC 578 cal. BC 685 cal. BC cal. AD 55 cal. AD 147	All samples from chaff and charcoal analysed by van der Veen (1992).
Roxby, North Yorkshire	BM-2207AR, 2180 ± 180	271 cal. BC	Charcoal from post hole with associated iron age pottery.
South Shields, Tyne and Wear	?, 2175 ± 55 ?, 2280 ± 65 ?, 2170 ± 55 ?, 2215 ± 55	213 cal. BC 294 cal. BC 212 cal. BC 249 cal. BC	Charred wheat samples from iron age roundhouse and exterior burnt area, underlying Roman fort (Hodgson, *Archaeology North* **8**, p.30-34)
Standrop Rigg, Northumberland	HAR-3399, 2360 ± 70 HAR-3538, 3000 ± 80 HAR-3981, 2300 ± 70	484 cal. BC 1206 cal. BC 350 cal. BC	Unenclosed settlement.
Stanwick, North Yorkshire	GrN-15664, 2320 ± 35 GrN-15665, 1990 ± 60 GrN-15666, 1990 ± 20 GrN-15667, 1995 ± 35 OxA-3377, 2060 ± 65 OxA-3378, 2080 ± 65 OxA-3379, 2090 ± 70 OxA-3380, 2050 ± 65 OxA-3381, 2140 ± 65 OxA-3382, 1720 ± 60 GX-15595, 1935 ± 90 GX-15594, 1320 ± 90	333 cal. BC cal. AD 10 cal. AD 85 cal. AD 17 60 cal. BC 138 cal. BC 143 cal. BC 43 cal. BC 184 cal. BC cal. AD 295 cal. AD 84 cal. AD 768	Charcoal, wheat and barley chaff and grain, and peat in ditches.
Thirlings, Northumberland	HAR-6240, 2060 ± 150	40 cal. BC	From post hole of building foundation *Radiocarbon* **30** (1988), p.297-317.

Thornborough Scar, Northumberland	GrN-12607, 1655 ± 40 GrN-12608, 1750 ± 40 GrN-15679, 2060 ± 35 OxA-2130, 1630 ± 70 GrN-15678, 2530 ± 35 OxA-2131, 1690 ± 70	cal. AD 399 cal. AD 314 73 cal. BC cal. AD 427 660 cal. BC cal. AD 381	van der Veen (1992).
Thorpe Thewles, Cleveland	GrN-15659, 2200 ± 50 OxA-1731,2305 ± 70 GrN-15658, 2205 ± 35 OxA-1732, 2190 ± 70 OxA-1733, 2040 ± 70 GrN-15660, 2130 ± 60 GrN-15661, 2720 ± 80 GrN-15662, 2410 ± 80 GrN-15663, 2300 ± 35 TL date 485 BC TL date 135 BC	242 cal. BC 353 cal. BC 271 cal. BC 215 cal. BC 38 cal. BC 180 cal. BC 903 cal. BC 526 cal. BC 305 cal. BC	Charcoal, chaff and grain from Phases 1-IV of the site. Phase II rectangular enclosure Phase III open nucleated site

Table 4.5 Number of entries in each category of archaeological evidence in the total archaeological database.

	Category	No.	Percentage of total entries
Artefacts	lithics	705	21.1%
	metalwork	178	5.3%
	pottery	42	1.2%
	querns	59	1.8%
	Total artefacts	**984**	**29.4%**
Sites	burials	358	10.7%
	landscape features	242	7.2%
	industrial	12	0.4%
	military	236	7.1%
	monuments	70	2.1%
	religious	10	0.2%
	rock art	107	3.2%
	settlement	1285	38.4%
	other sites	42	1.3%
	Total sites	**2362**	**70.6%**
	Total entries	**3346**	**100**

Table 4.6 Number of entries of each category and type for the Mesolithic and Neolithic periods in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
Mesolithic	Lithics	Lithic finds and scatters	302	100%
		Mesolithic entries	**302**	**100%**
Neolithic	**Lithics**	Lithic finds and scatters	41	9.2%
		Leaf arrowhead	24	5.4%
		Oblique arrowhead	1	0.2%
		Transverse arrowhead	7	1.5%
		Stone axe	213	47.8%
		Battle-axe	11	2.5%
		Mace-head	6	1.3%
		Axe-hammer	33	7.4%
		Total lithics	**336**	**75.3%**
	Pottery	Grimston Ware	3	0.7%
		Grooved Ware	2	0.4%
		Peterborough Ware	4	0.9%
		Other (unspecified)	7	1.6%
		Total pottery	**16**	**3.6%**
	Burial	**Burial**	**24**	**5.4%**
	Monuments	Henge	13	2.9%
		Standing stone(s)	32	7.2%
		Stone circle	25	5.6%
		Total monuments	**70**	**15.7%**
		Neolithic entries	**446**	**100%**

Table 4.7 Number of entries of each category and type for the early Bronze Age period in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
EBA	**Lithics**	Lithic finds and scatters	5	0.5%
		Barbed and tanged arrowhead	51	5.4%
		Projectile point	1	0.1%
		Axe	4	0.4%
		Total lithics	**61**	**6.5%**
	Metalwork	Dagger	1	0.1%
		Flanged axe	2	0.2%
		Flat axe	19	2%
		Halberd	1	0.1%
		Mould for flat axe	2	0.2%
		Tanged spearhead	1	0.1%
		Total metalwork	**26**	**2.8%**
	Pottery	Beaker	5	0.5%
		Bucket Urn	3	0.3%
		Collared Urn	5	0.5%
		Food Vessel	3	0.3%
		Other urn	3	0.3%
		Other pottery	1	0.1%
		Total pottery	**20**	**2.1%**
	Burial	**Burial**	**310**	**32.9%**
	Landscape feature	Cairnfield	119	12.6%
		Field system	123	13%
		Total landscape features	**242**	**25.7%**
	Rock Art	**Cup (and ring)marked stones**	**107**	**11.3%**
	Settlement	**Open settlement**	**176**	**18.7%**
		Total EBA entries	**942**	**100%**

Table 4.8 Number of entries of each category and type for the middle Bronze Age period in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
MBA	**Lithics**	Leaf arrowhead	6	0.7%
		Total lithics	**6**	**0.7%**
	Metalwork	Axe	17	2.1%
		Flanged axe	4	0.5%
		Gold	2	0.2%
		Hoard	7	0.9%
		Palstave	5	0.6%
		Rapier	8	1%
		Shield	2	0.2%
		Spearhead	13	1.6%
		Other metalwork	3	0.4%
		Total metalwork	**61**	**7.5%**
	Pottery	Bucket Urn	3	0.4%
		Collared Urn	5	0.6%
		Food Vessel	3	0.4%
		Other urn	3	0.4%
		Other pottery	1	0.1%
		Total pottery	**15**	**1.9%**
	Burial	**Burial**	**310**	**38.3%**
	Landscape feature	Cairnfield	119	14.7%
		Field system	123	15.2%
		Total landscape features	**242**	**29.9%**
	Settlement	**Open settlement**	**176**	**21.7%**
		Total MBA entries	**810**	**100%**

Table 4.9 Number of entries of each category and type for the late Bronze Age period in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
LBA	**Metalwork**	Celt	1	0.1%
		Flanged axe	2	0.2%
		Gold	6	0.6%
		Hoard	20	2.1%
		Knife	3	0.3%
		Rapier	2	0.2%
		Socketed axe	31	3.2%
		Spearhead	19	2%
		Sword	7	0.7%
		Total metalwork	**91**	**9.4%**
	Pottery	**Pottery**	**1**	**0.1%**
	Querns	**Saddle querns**	**11**	**1.1%**
	Landscape feature	**Field system**	**123**	**12.7%**
	Settlement	Curvilinear settlement	563	58.3%
		Open settlement	176	18.2%
		Total settlement	**739**	**76.5%**
		Total LBA entries	**965**	**100%**

Table 4.10 Number of entries of each category and type for the Iron Age period in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
Iron Age	**Settlement**	Curvilinear	563	44.8%
		Enclosed	44	3.5%
		Open	2	0.2%
		Rectilinear	477	37.9%
		Total settlement	**1086**	**86.3%**
	Landscape feature	**Field system**	**123**	**9.8%**
	Burial	**Burial**	**5**	**0.4%**
	Pottery	**Pottery**	**6**	**0.5%**
	Querns	Saddle querns	11	0.9%
		Beehive querns	27	2.1%
		Total querns	**38**	**3.0%**
		Total Iron Age entries	**1258**	**100%**

Table 4.11 Number of entries of each category and type for the Roman period in the archaeological database.

Period	Category	Type	No.	Percentage of sites in each period
Roman	**Settlement**	Enclosed	44	4.2%
		Open	2	0.19%
		Rectilinear	477	46.0%%
		Total settlement	**546**	**52.7%**
	Military	camps	49	4.7%
		forts	23	2.2%
		fortlets	7	0.7%
		milecastles	47	4.5%
		signal towers	5	0.5%
		turrets	96	9.3%
		bath houses	9	0.9%
		temples	10	1%
		Total military	**236**	**22.7%**
	Burial	**Burials**	**19**	**1.8%**
	Industrial	**Industrial sites**	**11**	**1.1%**
	Other	Roman road sections	16	1.5%
		Milestones	7	0.7%
		Bridges	10	1%
	Querns	**Querns**	**48**	**4.6%**
		Total Roman entries	**1036**	**100%**

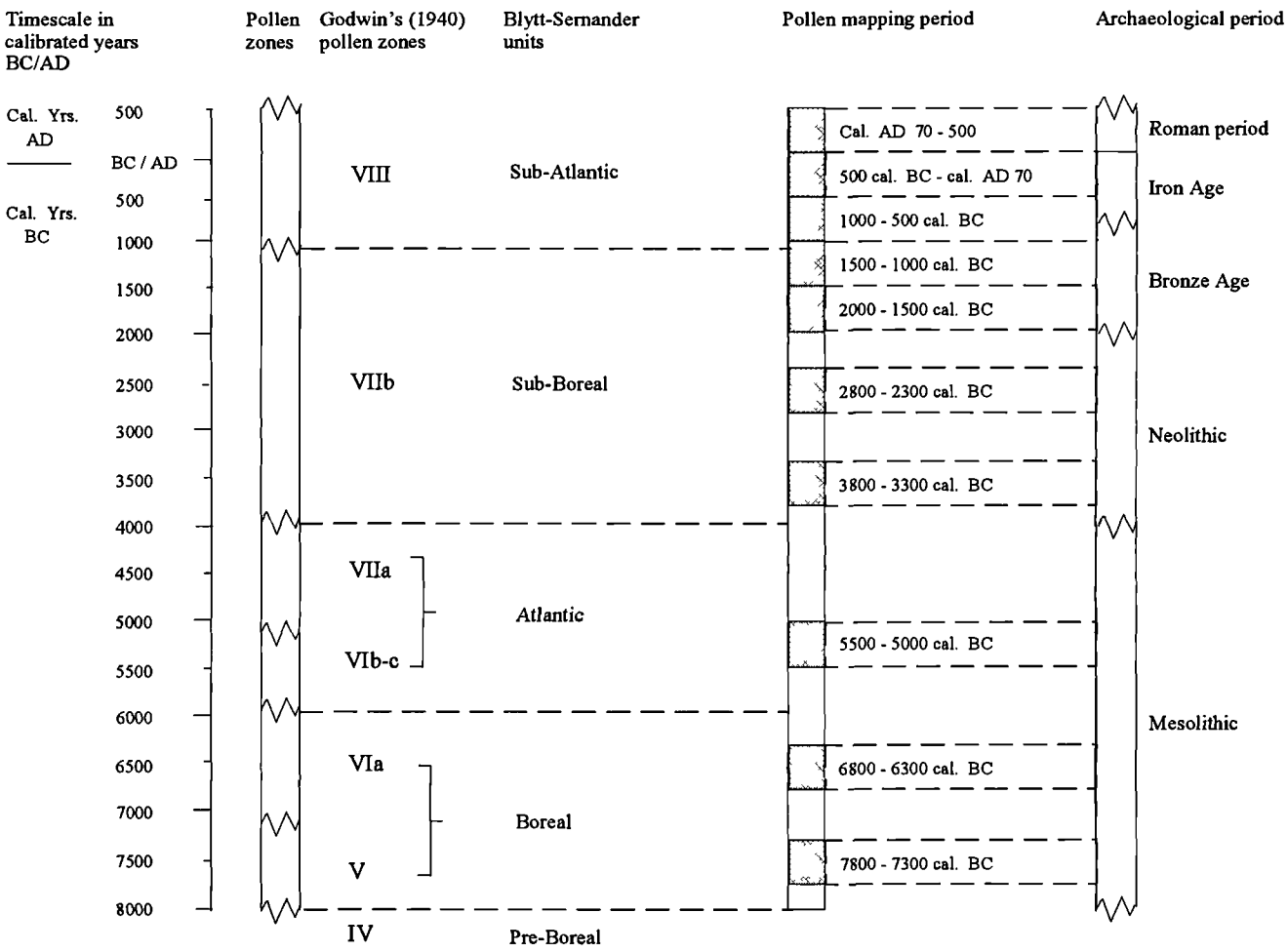
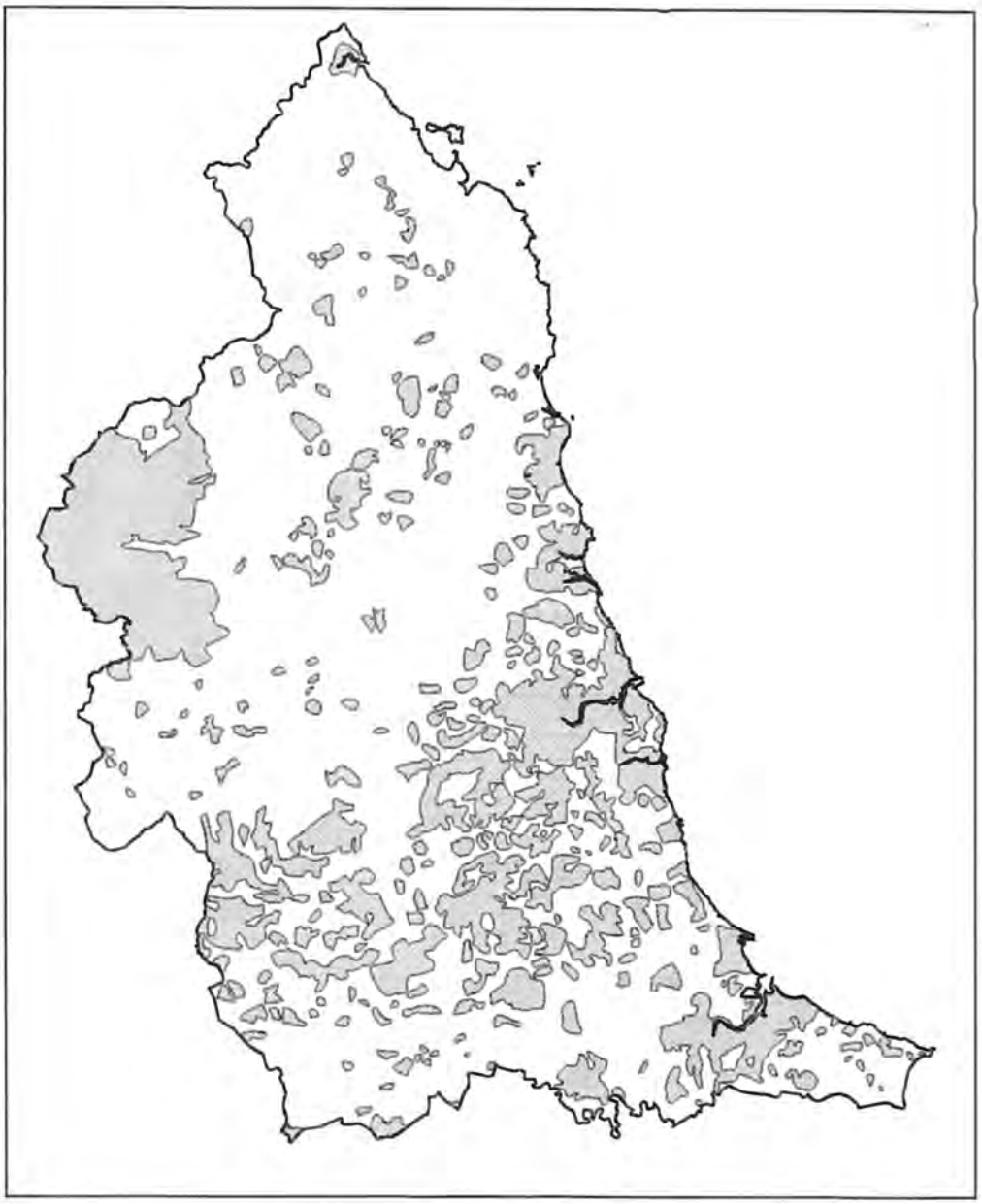


Figure 4.1 Diagram showing the relationship between archaeological periods referred to in the text, the 500-year periods used for pollen mapping, Godwin's (1940) pollen zones and the Blytt-Sernander terminology used to refer to these zones. All dates are in calibrated years BC/AD. Note that the symbol ∿∿ indicates that the beginning or end of a zone or period cannot be assigned a fixed date.

Figure 4.2

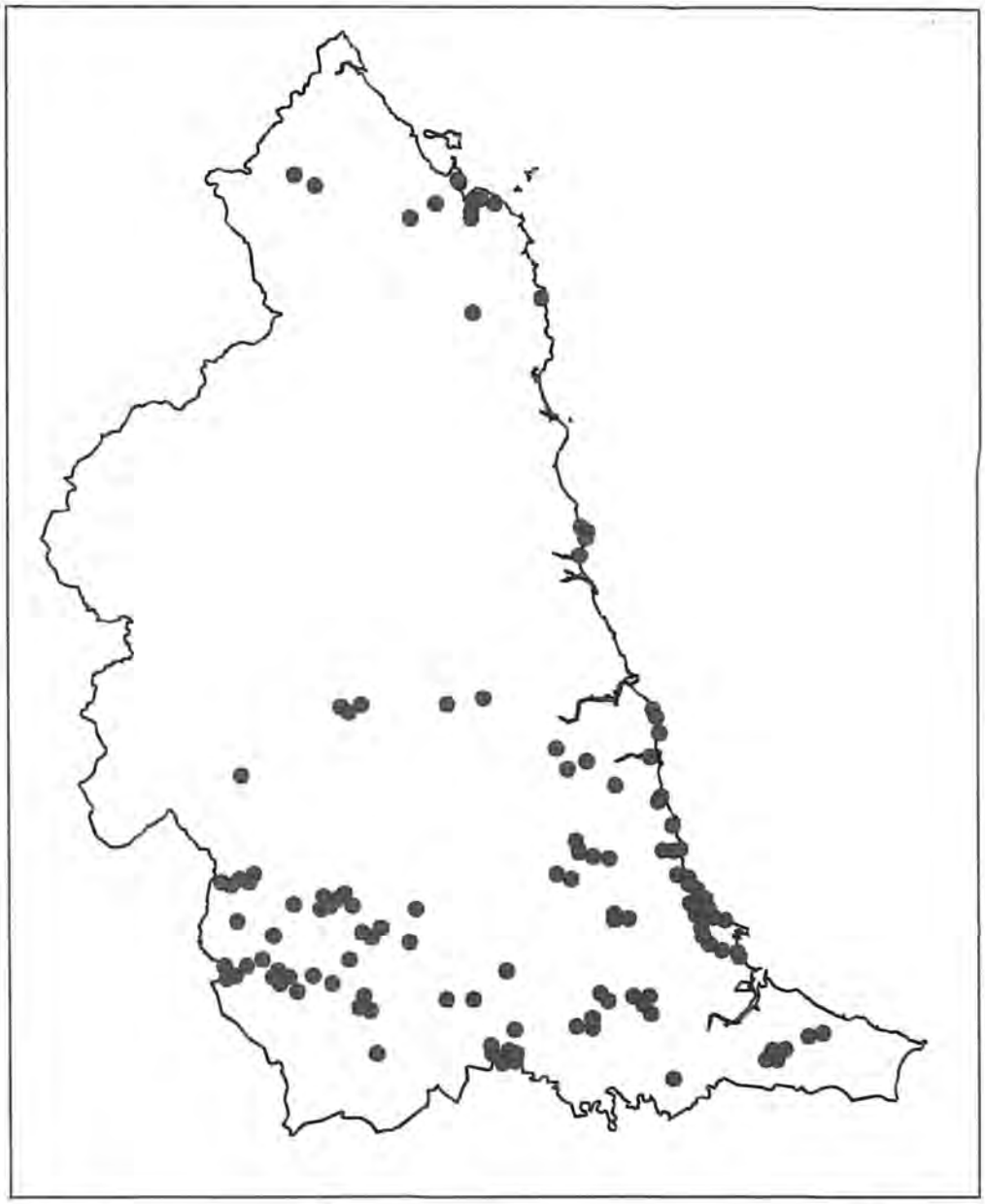


Key:

Destroyed land

Distribution of land destroyed by urbanisation, extractive industries and forestry.

Figure 4.3



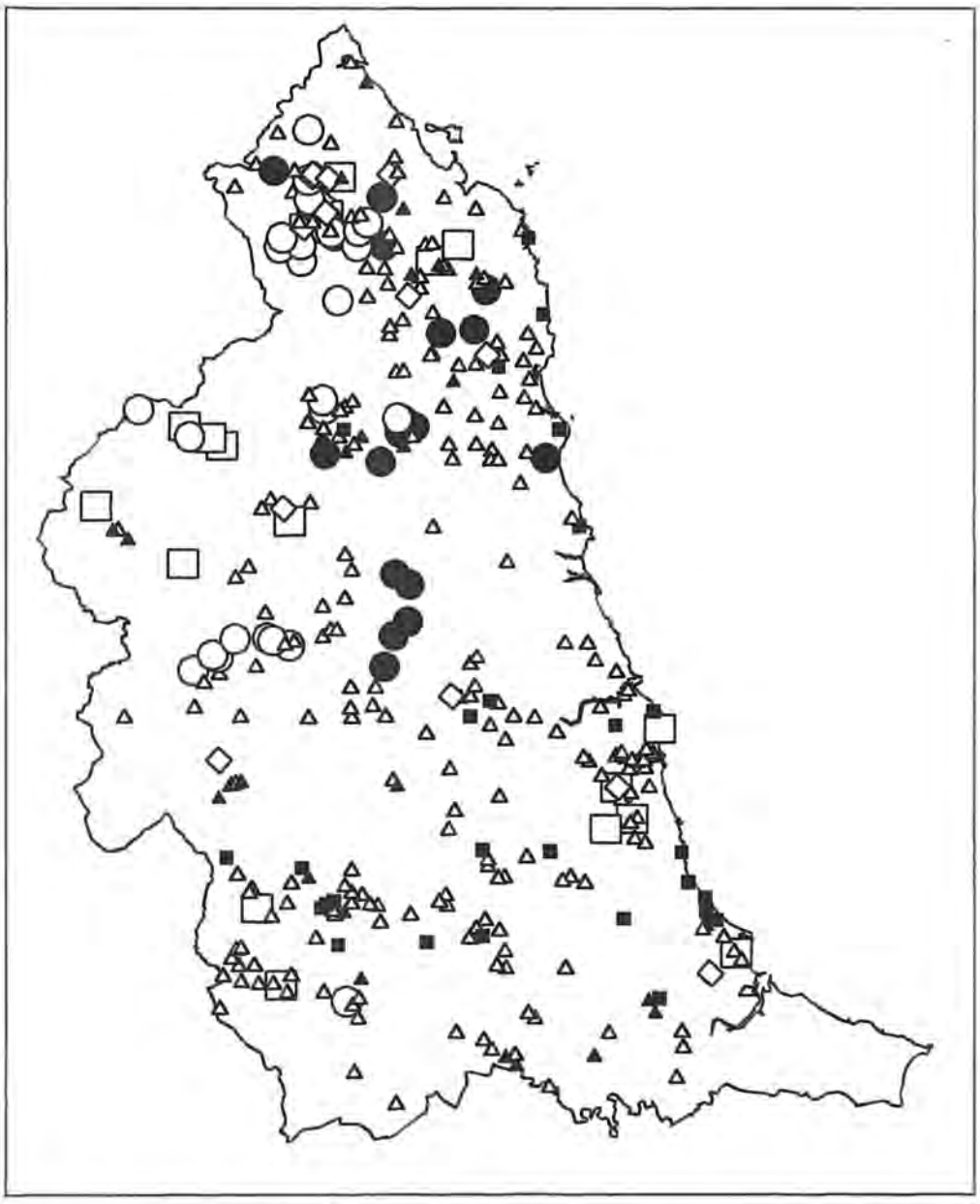
Key:

- Lithic scatter or single find.

Mesolithic

Distribution of archaeological evidence for settlement and land-use.

Figure 4.4



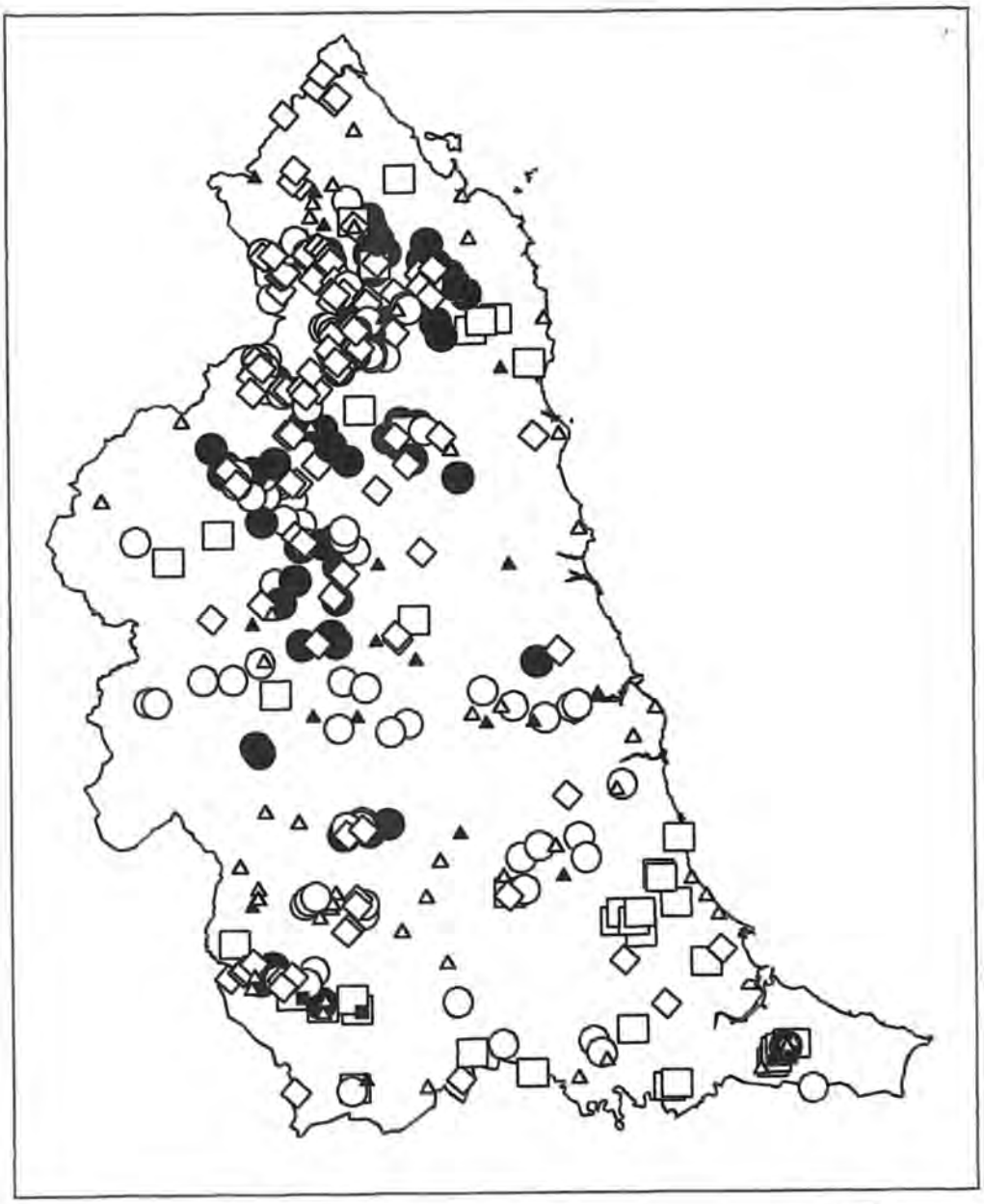
Key:

- Stone/ flint axe
- Flint find/ scatter
- Flint arrowhead
- Pottery
- Burial
- Stone circle/ henge
- Standing stone(s)

Neolithic

Distribution of archaeological evidence for settlement and land-use.

Figure 4.5



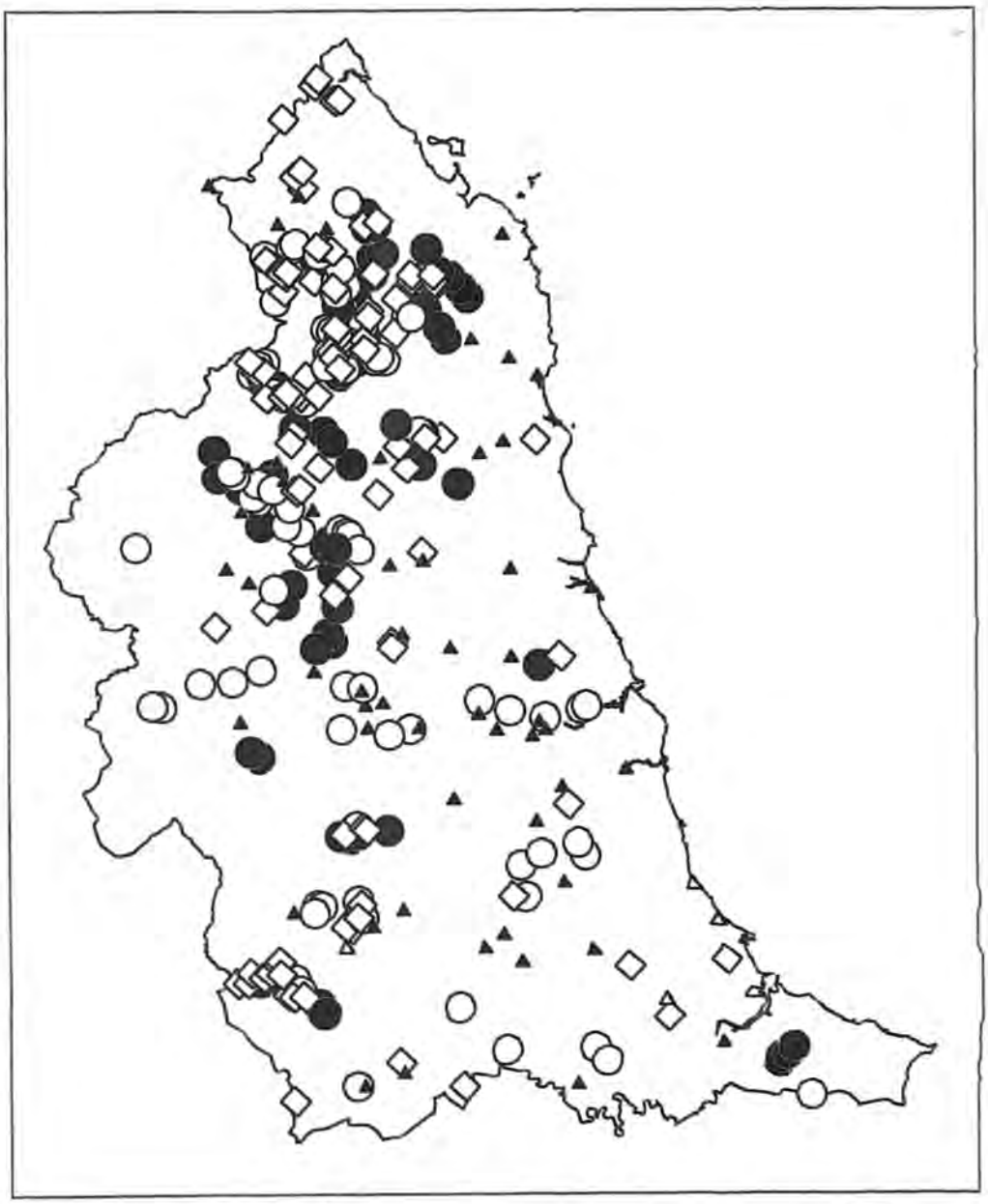
Key:

- Lithics
- Metalwork
- Pottery
- Open settlement
- Burial
- Field system
- Cairnfield/ cairn

Early Bronze Age

Distribution of archaeological evidence for settlement and land-use.

Figure 4.6



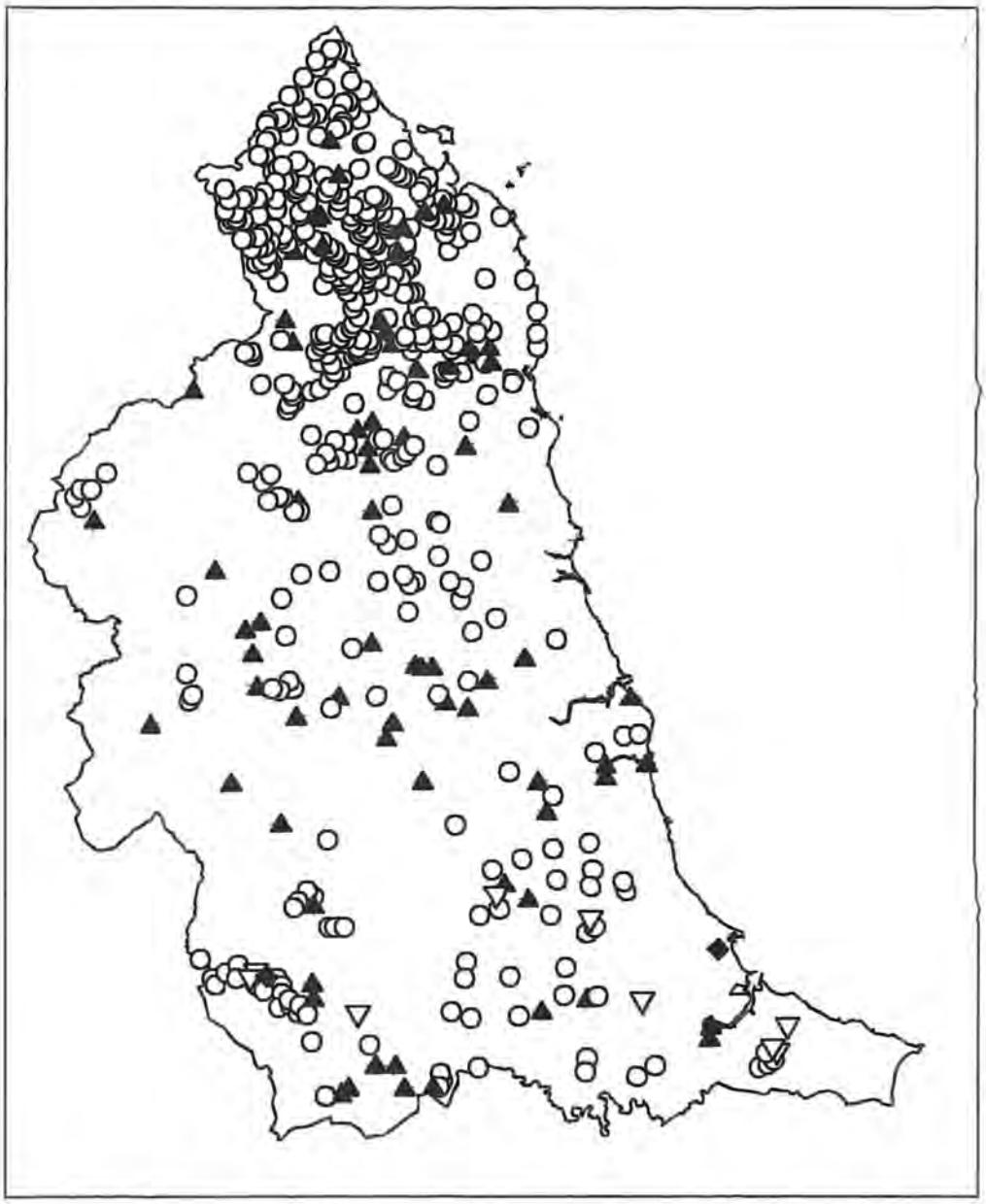
Key:

- △ Lithics
- ▲ Metalwork
- ■ Pottery
- ◇ Open settlement
- □ Burial
- ○ Field system
- ● Cairnfield/ cairn

Middle Bronze Age

Distribution of archaeological evidence for settlement and land-use.

Figure 4.7



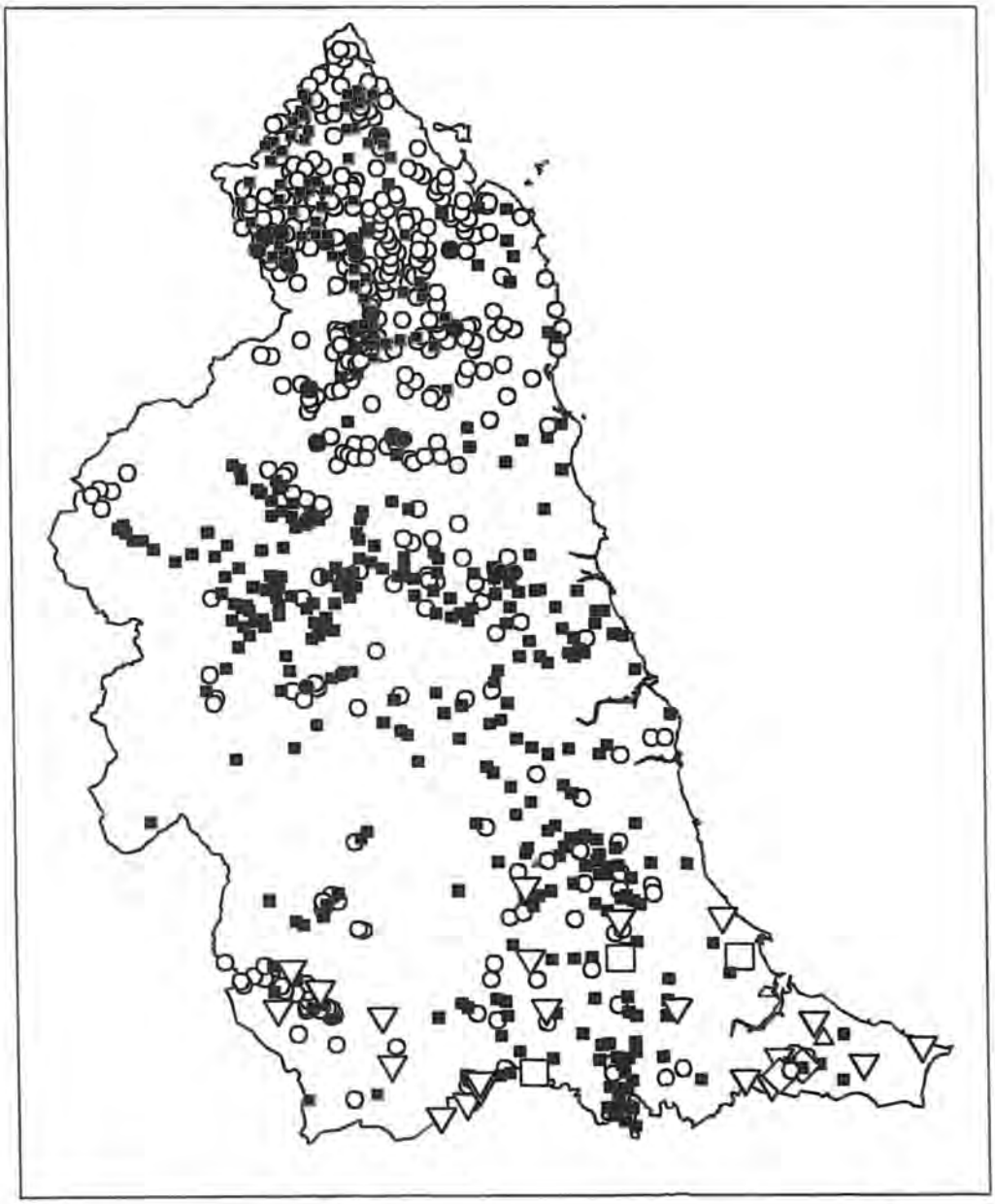
Key:

- ▽ Querns
- ▲ Metalwork
- ◆ Pottery
- ○ Curvilinear settlement

Late Bronze Age

Distribution of archaeological evidence for settlement and land-use.

Figure 4.8



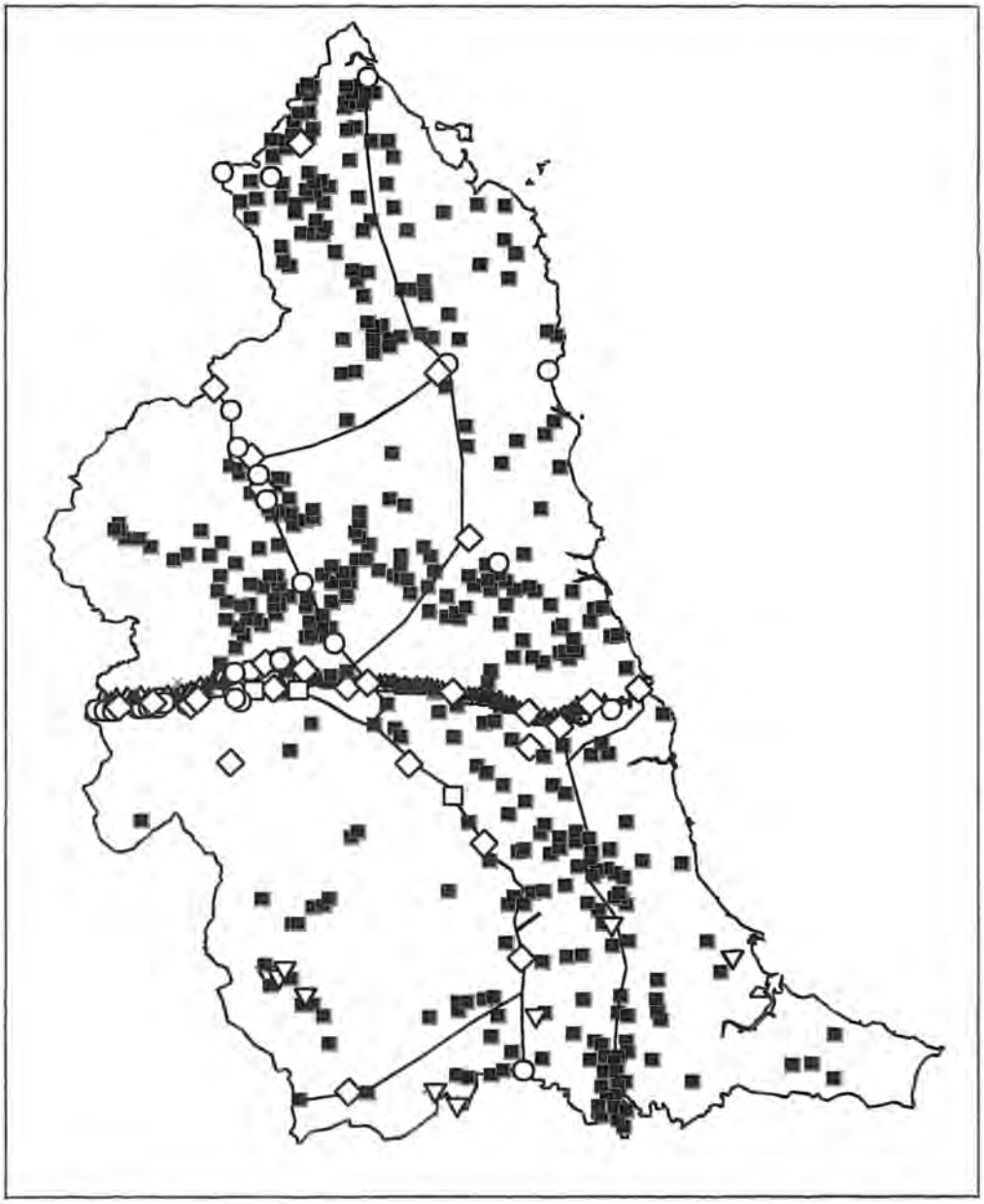
Key:

- Querns
- Metalwork
- Pottery
- Burial
- Rectilinear settlement
- Curvilinear settlement
- Enclosed settlement

Iron Age

Distribution of archaeological evidence for settlement and land-use.

Figure 4.9



Key:

- Querns
- Rectilinear settlement
- Signal tower
- Camp
- Fort/ fortlet
- Milecastle
- Turret
- Road

Roman Period

Distribution of archaeological evidence for settlement and land-use.

Tables and Figures for

Chapter 5

Methods I: Palynological approaches for identifying land-use

Table 5.1 List of cores with recorded cereal pollen, level of taxonomic detail identified to, and dates interpolated for levels over the last 500 years with recorded cereal pollen (given as calibrated midpoint dates AD)

Core name:	Dates of occurrence:	Level of identification:
Bishop Middleham	AD 1498	*Cerealia*-type
Black Lough	AD 1636, 1783-1845	*Cerealia*-type
Bollihope Bog	AD 1700, 1757, 1797-1831, 1865, 1899-1933.	*Cerealia*-type
Broad Moss	AD 1690-1735, 1916-1938	*Cerealia*-type
Camp Hill Moss	AD 1547, 1840-1950	*Cerealia, Avena, Hordeum, Secale, Triticum.*
Coom Rigg A	AD 1572	*Cerealia*-type
Coom Rigg B	AD 1680	*Cerealia*-type
Cowpen Marsh	most recent occurrence 2265 BC	*Cerealia*-type
Cronkley Pastures	AD 1610-1950	*Cerealia*-type
Cross Fell East	most recent occurrence 304 BC	*Cerealia*-type
Cross Fell South	most recent occurrence AD 195	*Cerealia*-type
Cross Fell Summit	most recent occurrence AD 1029	*Cerealia*-type
Cross Fell West	AD 1563	*Cerealia*-type
Din Moss	most recent occurrence 1828 BC	*Cerealia*-type
Edlingham	AD 1625-1917	*Cerealia*-type
Ewe Crag A	AD 1560-1950	*Cerealia, Avena, Hordeum, Secale, Triticum*
Fellend Moss	AD 1538, 1697, 1886-1942	*Cerealia, Avena, Hordeum, Secale, Triticum*

Core name:	Dates of occurrence:	Level of identification:
Fortherley Wood	AD 1902	*Cerealia*-type
Fox Earth Gill	most recent occurrence AD 1171	*Cerealia*-type
Hallowell Moss	AD 1491-1934	*Cerealia*-type
Hartlepool Bay 4	most recent occurrence AD 328	*Cerealia*-type
Hartlepool Bay 6	most recent occurrence 391 BC	*Cerealia*-type
Howden Moss	most recent occurrence AD 1339	*Cerealia*-type
Hutton Henry	most recent occurrence 471 BC	*Cerealia*-type
Kildale Hall A	most recent occurrence 5140 BC	*Cerealia*-type
Lamb Shield	most recent occurrence AD 1266	*Cerealia*-type
Mickle Fell	AD 1499-1950	*Cerealia*-type
Midgeholme Mire	AD 1578-1671, 1857	*Cerealia*-type
Mire Holes	AD 1672	*Cerealia*-type
Mordon Carr	AD 1950	*Cerealia*-type
Mow Law A	AD 1762-1790, 1808-1817, 1854, 1881, 1899.	*Cerealia, Avena/Triticum, Hordeum, Secale.*
Mow Law B	most recent occurrence AD 1120	*Cerealia, Avena/Triticum, Hordeum, Secale.*
Muckle Moss	AD 1551-1896	*Cerealia*-type
Neasham Fen	most recent occurrence 843 BC	*Cerealia*-type
Pow Hill	most recent occurrence AD 841	*Cerealia*-type

Core name:	Dates of occurrence:	Level of identification:
Quarry Knowe	AD 1688, 1722-1740, 1775-1780, 1803, 1820, 1837-1860, 1886, 1923.	*Cerealia, Avena/Triticum, Hordeum, Secale.*
Quick Moss	AD 1716	*Cerealia*-type
Scaleby Moss A	most recent occurrence 1362 BC	*Cerealia*-type
Seamer Carr	AD 1462	*Cerealia, Avena, Hordeum , Secale, Triticum.*
Steng Moss	AD 1576, 1825	*Cerealia*-type
Steward Shield Meadow	AD 1573-1706, 1773-1795, 1861-1905, 1950.	*Cerealia*-type
Swindon Hill	AD 1508-1610, 1635, 1673-	*Cerealia, Avena/Triticum,*
Teeshead	most recent occurrence AD 342	*Cerealia*-type
The Dod	AD 1640-1672, 1786-1917	*Cerealia*-type
The Lough	AD 1497-1620	*Cerealia*-type
Thorpe Bulmer	AD 1526-1823	*Cerealia*-type
Tranmire Slack	AD 1671-1950	*Cerealia, Avena sativa,*
Trickley Wood	AD 1562-1756	*Cerealia*-type
Valley Bog	most recent occurrence AD 783	*Cerealia*-type
Vindolanda 1	most recent occurrence AD 125	*Cerealia*-type
Weelhead Moss 1	most recent occurrence 220 BC	*Cerealia*-type
Weelhead Moss dated site	most recent occurrence 450 BC	*Cerealia*-type
West Hartlepool 19	most recent occurrence 3594	*Cerealia*-type
West House	AD 1496-1950	*Cerealia, Avena, Hordeum,*
Yetholm Loch	AD 1500-1918	*Cerealia, Avena/Triticum*

Table 5.2 Values for *Cerealia*-type pollen in recent levels of pollen cores (averaged over the last 500 years) from north-east England and the agricultural land potential of land around each core site

Site:	*Cerealia*-type pollen (% tdlp)	agricultural land potential
Bishop Middleham	0.2	Grade 4
Black Lough	0.13	Grade 5
Bollihope Bog	0.27	Grade 5
Broad Moss	0.57	Grade 5
Camp Hill Moss	0.22	Grade 5
Coom Rigg A	0.22	Grade 5
Coom Rigg B	0.22	Grade 5
Cronkley Pastures	0.07	Grade 4
Cross Fell West	0.65	Grade 5
Dufton Moss A	0.26	Grade 4
Edlingham	1.95	Grade 3
Ewe Crag	0.48	Grade 5
Fellend Moss	0.24	Grade 4
Hallowell Moss	0.67	Grade 3
Long Crag	0.09	Grade 5
Mickle Fell	0.53	Grade 5
Midgeholme Moss	0.35	Grade 4
Mire Holes	0.19	Grade 5
Mordon Carr	2.15	Grade 4
Mow Law A	0.00	Grade 5
Muckle Moss	0.67	Grade 5

Site:	*Cerealia*-type pollen (% tdlp)	agricultural land potential
Quarry Knowe	0.18	Grade 5
Quick Moss	0.03	Grade 5
Steward Shield	0.23	Grade 4
The Dod	0.31	Grade 5
The Lough	3.34	Grade 3
Thorpe Bulmer	1.21	Grade 3
Tranmire Slack	1.31	Grade 5
Trickley Wood	1.73	Grade 4
West House	0.20	Grade 5
Yetholm Loch	0.9	Grade 3

Table 5.3 Arable:pastoral and agricultural:arable indices

Publication	*Pastoral indicator types*	*Arable indicator types*
Steckhan (1961), Lange (1975)	*Plantago lanceolata*	*Plantago lanceolata* + *Cerealia*
Kramm (1978)	non-cultivated Gramineae + *Cerealia*	non-cultivated Gramineae.
Turner (1964)	*Plantago*	*Plantago* + Compositae + *Cerealia* + Cruciferae + *Artemisia* + Chenopodiaceae.
Roberts, Turner & Ward (1973)	*Plantago lanceolata* + *Artemisia* + *Rumex* + Ranunculaceae.	*Plantago lanceolata* + *Artemisia* + *Rumex* + Ranunculaceae + *Cerealia* + Chenopodiaceae + Cruciferae + *Vicia* + *Polygonum* + *Centaurea cyanus* + Knautia + *Trifolium* + *Centaurium.*
Donaldson & Turner (1977)	*Plantago lanceolata* + *Rumex acetosa/acetosella*-type + Ranunculus spp. + Compositae-*Bellis*-type.	Plantago lanceolata + Rumex *acetosa/acetosella*-type + *Ranunculus spp.* + *Compositae-Bellis*-type + *Cerealia*-type + Compositae-excluding-*Bellis*-type + Cruciferae + *Polygonum* spp. + *Trifolium* spp..
Brown (1977)	*Plantago lanceolata* + *Plantago major/media* + *Rumex acetosella* + *Rumex acetosa.*	*Plantago lanceolata* + *Plantago major/media* + *Rumex acetosella* + *Rumex acetosa* +Compositae Liguliflorae + Compositae Tubuliflorae + Cruciferae + Caryophyllaceae + *Rumex/Oxyria*-type.
Riezebos & Slotboom (1978)	Gramineae + Leguminosae + *Plantago lanceolata.*	Gramineae + Leguminosae + *Plantago lanceolata* + *Cerealia* + *Fagopyrum* + *Linum* + *Rumex* + *Artemisia* + *Centaurea.*
	Arable indicator types	*Agricultural indicator types*
Fenton-Thomas (1992)	Chenopodiaceae + Cruciferae + Compositae Liguliflorae + Compositae Tubuliflorae + *Artemisia* + *Plantago major* + *Centaurea* + *Cerealia* + *Cannabis*	Ranunculus + *Plantago lanceolata* + *Rumex* + Chenopodiaceae + Cruciferae + Compositae Liguliflorae + Compositae Tubuliflorae + *Artemisia* + *Plantago major* + *Centaurea* + *Cerealia* + *Cannabis*

Table 5.4 Number of pollen sites with arable scores from any index in each Agricultural Land Classification Grade.

Agricultural Land Classification	*Number of cores with levels dated to the last 500 years*	*Number of cores with arable scores for any index*	*Percentage of arable sites of total sites in each Grade*
Grade 3	11	8	72%
Grade 4	8	3	37%
Grade 5	29	4	14%
total	48	15	

Table 5.5 List of pollen cores with levels dated to the last 500 years, with arable scores from any index.

Agricultural Land Classification Grade	*Pollen core name*	*Indices with arable scores*	*Notes*
Grade 3	Akeld Steads	Brown, Turner	
	Cranberry Bog	Brown, Turner	
	Din Moss	Turner	
	Edlingham	Brown, Donaldson & Turner, Roberts *et al.*, Turner	
	Hartlepool Bay 6	Turner	Urban and coastal site
	Thorpe Bulmer	Turner	Grade 2 land to north of site
	West House	Brown, Donaldson & Turner, Turner	
	Yetholm Loch	Turner	
Grade 4	Bishop Middleham	Brown, Donaldson & Turner, Turner	
	Cronkley Pastures	Donaldson & Turner	
	Mordon Carr	Brown, Donaldson & Turner, Roberts *et al.*, Steckhan, Lange.	Site area surrounded by Grade 3 land.
Grade 5	Coom Rigg A	Brown, Turner	
	Linton Loch A	Brown, Donaldson & Turner, Turner	Grade 4 and 3 land close by. Lake site with large pollen catchement area.
	Mickle Fell	Turner	
	Muckle Moss	Brown, Donaldson & Turner	Grade 4,3 and 2 land nearby to south, in Tyne corridor.

Table 5.6 Selected modern day land-use types across north-east England and typical vegetation composition, based upon published vegetation survey material

Land-use type	Land-use code (used in Table 5.7)	Category	Typical vegetation composition (based upon published vegetation survey data) N.B. Scores based on cover of vegetation survey quadrat (using a 1-10 rating of abundance)
Moorland	A	*Calluna* moor, sheep grazed	*Calluna vulgaris 9, Deschampsia flexuosa 6, Hypnum jutlandicum 5, Campylopus pyriformis 4, Campylopus introflexus 3,Dicranum scoparium 3, Pohlia nutans 3, Vaccinium myrtillus 1, Cladonia chlorophaea 1, Cladonia coccifera 1.*
	B	Old acidic pasture	*Nardus stricta 7, Agrostis vinealis 5, Holcus lanatus 3, Anthoxanthum odoratum 4, Agrostis capillaris 4, Juncus conglomeratus 4, Potentilla erecta 3, Rhytidiadelphus squarrosus 3, Calliergon cuspidatum 3, Pseudoscleropodum purum 3, Ranunculus acris 1, Deschampsia cespitosa 2, Juncus effusus 1, Carex ovalis 1, Cirsium palustre 1, Luzula multiflora 2, Danthonia decumbens 3, Carex panicea 4, Platanthera chlorantha 1, Platanthera bifolia 1, Prunella vulgaris 3, Pedicularis sylvatica 3, Lophocolea bidentata 2, Taraxacum Sect. Spectabilia 1, Atrichum undulatum 1, Polytrichum commune 1.*

Meadow	I	Hay meadow - traditional	*Anthoxanthum odoratum 4, Festuca rubra 6, Cynosurus cristatus 4, Trifolium repens 3, Lolium perenne 2, Trifolium pratense 4, Avenula pubescens 1, Rumex acetosa 3, Alchemilla glabra 3, Ranunculus acris 3, Holcus lanatus 1, Plantago lanceolata 4, Conopodium majus 2, Ranunculus bulbosus 1, Cerastium fontanum 3, Rhinanthus minor 1, Alchemilla xanthochlora 1, Taraxacum Sect. Ruderalia 1, Veronica chamaedrys 2, Hypochoeris radicata 1, Geranium sylvaticum 1, Poa trivialis 4, Polygonum bistorta 4, Ranunculus repens 3, Luzula multiflora 2, Alopecurus pratensis 4, Euphrasia arctica borealis 3, Dactylis glomerata 2, Lathyrus pratensis 1.*
	H	Pasture grazed and manured by cattle	*Agrostis capillaris 5, Anthoxanthum odoratum 1, Bellis perennis 2, Bromus hordaceus hordaceus 2, Cerastium fontanum 3, Cynosurus cristatus 5, Dactylis glomerata 2, Holcus lanatus 4, Lathyrus pratensis 1, Lolium perenne 3, Phleum pratense 3, Plantago lanceolata 3, Ranunculus acris 3, Rumex acetosa 2, Trifolium pratense 3, Trifolium repens 2, Trisetum flavescens 4, Brachythecium rutabulum 2, Achillea millefolium 2, Cirsium arvense 2, Festuca pratensis 4, Festuca rubra 4, Leontodon autumnalis 2, Poa pratensis 2, Poa trivialis 5, Veronica chamaedrys 1.*

		J	Magnesium limestone pasture	*Carex flacca 4, Festuca rubra 7, Festuca tenuifolia 7, Centaurea nigra 1, Trifolium pratense 3, Leucanthemum vulgar 1, Plantago media 3, Plantago lanceolata 4, Holcus lanatus 2, Centaurea scabiosa 2, Dactylis glomerata 2, Prunella vulgaris 1, Hypochoeris radicata 1, Ranunculus acris 1, Taraxacum Sect. Ruderalia 1, Achillea millefolium 2, Bellis perennis 3, Calliergon cuspidatum 1, Galium verum 1, Cynosurus cristatus 3, Lolium perenne 3, Stachys officianalis 3, Sanguisorba minor 3, Anthoxanthum odoratum 1, Ranunculus bulbosus 4, Primula veris 4, Carex caryophyllea 3, Poa pratensis 2.*
	-		Magnesium limestone grassland	*Sesleria albicans 6, Sanguisorba minor 4, Avenula pubescens 5, Helianthemum nummularium 1, Avenula pratensis 1, Scabiosa columbaria 1, Viola hirta 1, Gentianella amarella 1, Dactylis glomerata 1, Daucus carota 1, Carex flacca 4, Thymus praecox arcticus 1, Linum catharticum 1, Lotus corniculatus 4, Briza media 1, Centaurea nigra 1, Koeleria macrantha 4, Carex caryophyllea 4, Euphrasia nemorosa 1, Prunella vulgaris 1, Brachypodium sylvaticum 1, Medicago lupulina 1, Plantago lanceolata 1, galium verum 1.*
Arable land and field margins	N		Arable -barley stubble field	*Myosotis arvensis 3, Polygonum aviculare 3, Poa trivialis 4, Stellaria media 2, Taraxacum Sect. Ruderalia 1, Cirsium arvense 1, Senecio vulgaris 1, Veronica persica 2, Lapsana communis 1, Matricaria perforata 3, Lamium purpureum 1.*
	M		Trampled ground - farm gateway	*Plantago major 1, Poa annua 3, Chamomilla suavoelens 3, Agrostis stolonifera 2, Juncus bufonius 1.*

	L		Cart tracks - nitrogen rich	*Poa trivialis 6, Capsella bursa-pastoris 4, Ranunculus repens 2, Lolium perenne 3, Stellaria media 6, Chamomilla suaveolens 3, Plantago major 3.*
Waste/ disturbed ground	-		Waste ground and rubbish tips (nitrophilous communties)	*Poa annua 1, Poa trivialis 3, Capsella bursa-pastoris 2, Senecio vulgaris 2, Cirsium arvense 2, Atriplex patula 2, Polygonum aviculare1, Matricaria perforata 3, Sinapsis arvensis1, Sisymbrium officianale 1, Tussilago farfara 1, Urtica dioica 1, Artemisia vulgaris6, Chamomilla suaveolens 2, Elymus repens 3, Lolium perenne 1, Hordeum marinum 1, Cirsium vulgare 1, Dactylis glomerata 2, Arrhenatherum elatius 2, Stachys sylvatica 1, Melilotus altissima 1, Fumaria officianalis 1, Conium maculatum 1, Heracleum sphondylium 1, Sonchus asper 1, Galium aparine 2, Rumex obtusifolius 2, Chenopodium album 6.*
		K	Railway ballast and rubble	*Plantago lanceolata 2, Cerastium fontanum triviale 1, Dactylis glomerata 1, Lolium perenne 4, Chamerion angustifolium 3, Holcus lanatus 3, Trifolium campestre 1, Lotus corniculatus 1, Bellis perennis 3, Tussilago farfara 3, Taraxacum Sect. Ruderalia 2, Trifolium repens 4, Trifolium pratense 1, Trifolium hybridum 1, Senecio squalidus 2, Plantago major 3, Medicago lupulina 3, Hordeum murinum 2, Cirsium vulgare 1, Cirsium arvense 1, Reseda lutea 2, Reseda luteola 1.*

Wet heaths/ mires/ bogs/ flushes	C	Blanket mire	*Calluna vulgaris 7, Eriophorum vaginatum 7, Hypnum jutlandicum 4, Dicranum scoparium 1, Pleurozium shreberi 6, Vaccinium myrtillus 2, Rubus chamaemorus 2, Eriophorum angustifolium 2, Rhytidiadelphus loreus 1, Sphagnum subnitens 2, Sphagnum capillifolium 2, Sphagnum papillosum 5, Barbilophozia floerkei 3, Sphagnum magellanicum 2, Empetrum nigrum 3, Cladonia portentosa 1, Cladonia coccifera 1, Erica tetralix 1, Plagiothecium undulatum 2.*
	E	Fen-meadow/ marsh/ flush	*Deschampsia cespitosa 5, Holcus lanatus 5, Juncus effusus 4, Juncus acutiflorus 5, Ranunculus repens 3, Filipendula ulmaria 4, Stellaria graminea 1, Cirsium palustre 2, Agrostis stolonifera 5, Lotus uliginosus 2, Brachythecium rutabulum 1, Calliergon cuspidatum 1, Juncus conglomeratus 1, Carex nigra 4, Galium uliginosum 1, Succisa pratensis 2, Rumex acetosa 1, Equisetum palustre 2, Potentilla palustris 2, Menyanthes trifoliata 3, Angelica sylvestris 1, Viola palustris 1, Eurhynchium praelongum 1.*
	D	Wet mires	*Eriophorum angustifolium 5, Juncus effusus 1, Polytrichum commune 1, Sphagnum auric./auric. 8, Carex echinata 4, Juncus squarrosus 1, Juncus bulbosus 2, Carex nigra 1, Potamogeton polygonifolius 3, Viola palustris 3, Potentilla erecta 2, Eriophorum vaginatum 3, Nardus stricta 3, Anthoxanthum odoratum 4, Festuca tenuifolia 1, Festuca rubra 3, Carex demissa 1.*
Upland grassland	G	Acidic grassland	*Vaccinium myrtillus 6, Galium saxatile 4, Pseudoscleropodium purum 3, Holcus mollis 9, Eurynchium praeolongum 4, Rhytidiadelphus squarrosus 4.*

	F	Upland damp road verge	*Filipendula ulmaria 4, Arrhenatherum elatius 7, Centaurea nigra 2, Dactylis glomerata 4, Lathyrus pratensis 2, Plantago lanceolata 2, Veronica chamaedrys 2, Eurhynchium praelongum 3, Conopodium majus 2, Heracleum sphondylium 1, Geranium pratense 4, Alchemilla glabra 2, Vicia sepeium 2, Rumex acetosa 2, Festuca rubra 3, Stellaria holostea 3, Geum rivale 3, Brachythecium rutabulum 4, Cruciata laevipes 4.*

Land-use category

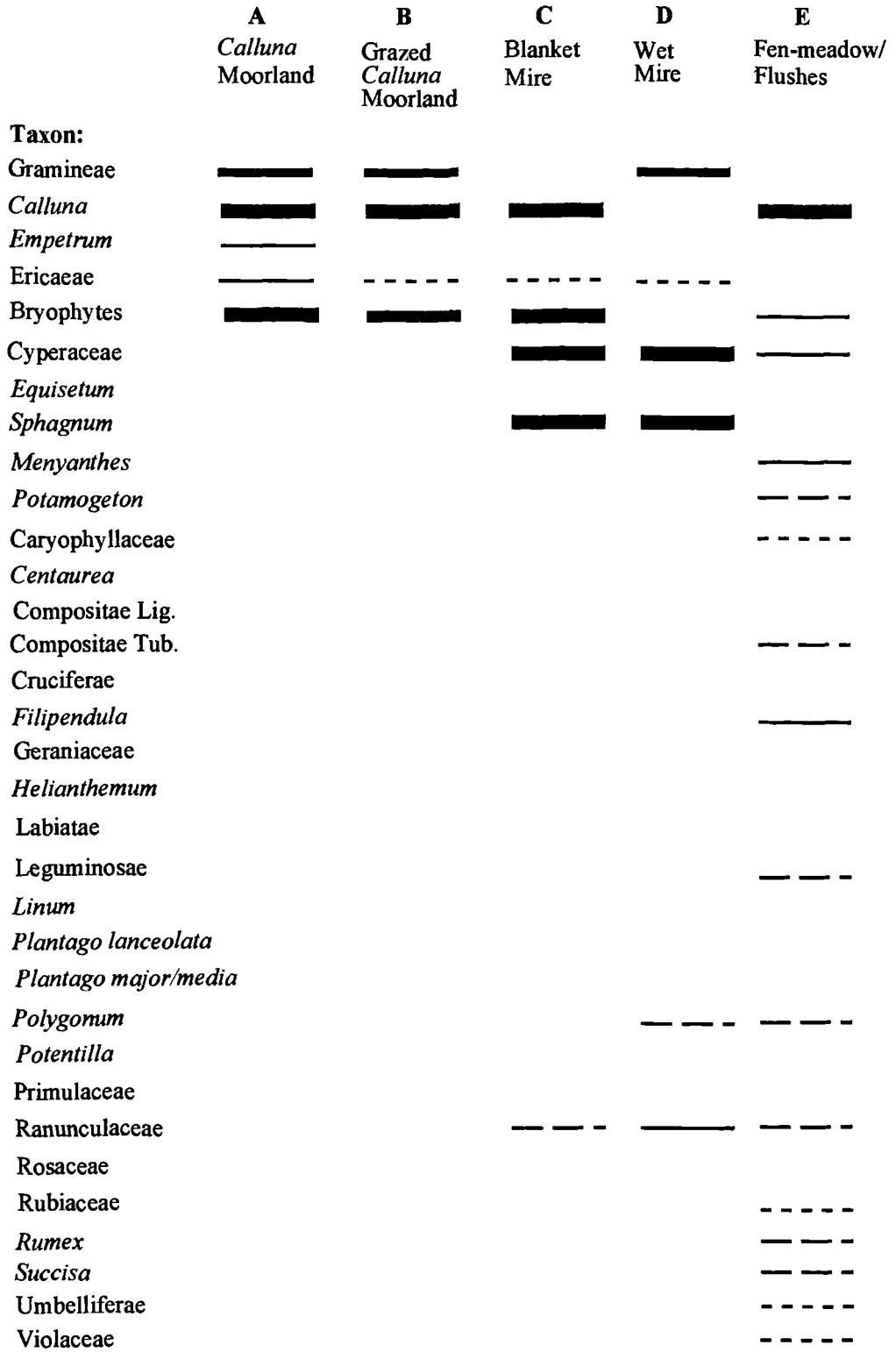


Table 5.7 Suggested pollen rain for selected plant communities found across north-east England. The table is based upon vegetation survey data in Table 5.6. Taxonomic level used is that commonly used by pollen workers. Abundance of each pollen taxon is estimated using information about pollen productivity, dispersal and preservation of each type, on a scale of 1-5, indicated by line thickness.

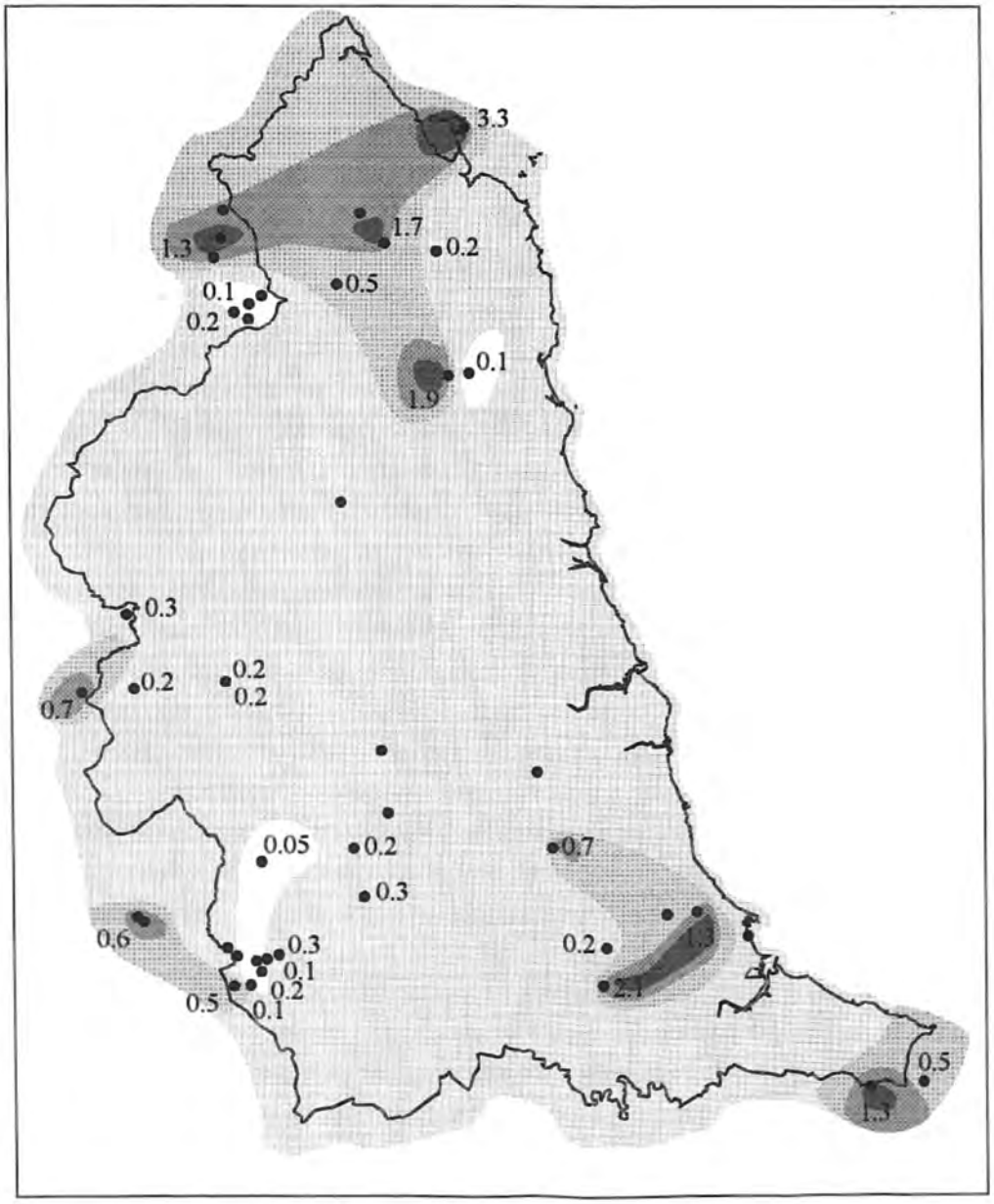
Land-use category

Taxon:	F Damp Road verge	G Acidic Grassland	H Cattle Grazed Pasture	I Traditionally Managed Hay meadow	J Limestone Pasture
Gramineae	▬▬	▬▬	▬▬	▬▬	▬▬
Calluna					
Empetrum					
Ericaeae					
Bryophytes	▬▬	———	- - - - -		
Cyperaceae		———			———
Equisetum					
Sphagnum					
Menyanthes					
Potamogeton					
Caryophyllaceae	- - - - -		— — -	- - - - -	
Centaurea	- - - - -				— — -
Compositae Lig.			— — -		— — -
Compositae Tub.		— — -	———	———	— — -
Cruciferae					
Filipendula	———				
Geraniaceae	— — -			- - - - -	
Helianthemum					
Labiatae		- - - - -			- - - - -
Leguminosae	———		— — -	———	— — -
Linum					
Plantago lanceolata	— — -		———	———	———
Plantago maj./med.					———
Polygonum				— — -	
Potentilla		———			
Primulaceae					— — -
Ranunculaceae		- - - - -	— — -	———	
Rosaceae	- - - - -				———
Rubiaceae	— — -				- - - - -
Rumex	— — -		———	———	
Scrophulariaceae	- - - - -	- - - - -	- - - - -	- - - - -	
Succisa					
Umbelliferae	- - - - -			- - - - -	
Violaceae					

Land-use category

Taxon:	K Railway Ballast/ Rubble	L Cart Tracks	M Trampled Farm Gateway	N Barley Stubble
Gramineae	▬▬	▬▬	▬▬	▬▬
Calluna				
Empetrum				
Ericaceae				
Bryophytes				
Cyperaceae				
Equisetum				
Sphagnum				
Menyanthes				
Potamogeton				
Caryophyllaceae	- - - - -	▬▬		- - - - -
Centaurea				
Compositae Lig.	▬▬	— — -	— — -	———
Compositae Tub.	———			———
Cruciferae		———		
Filipendula				
Geraniaceae				
Helianthemum				
Labiatae				
Leguminosae	▬▬			
Linum				
Plantago lanceolata	———			
Plantago maj./med.	———	———	———	
Polygonum				— — -
Potentilla				
Primulaceae				
Ranunculaceae		— — -		
Rosaceae				
Rubiaceae				
Rumex				
Scrophulariaceae				- - - - -
Succisa				
Umbelliferae				
Violaceae				

Figure 5.1



Key:

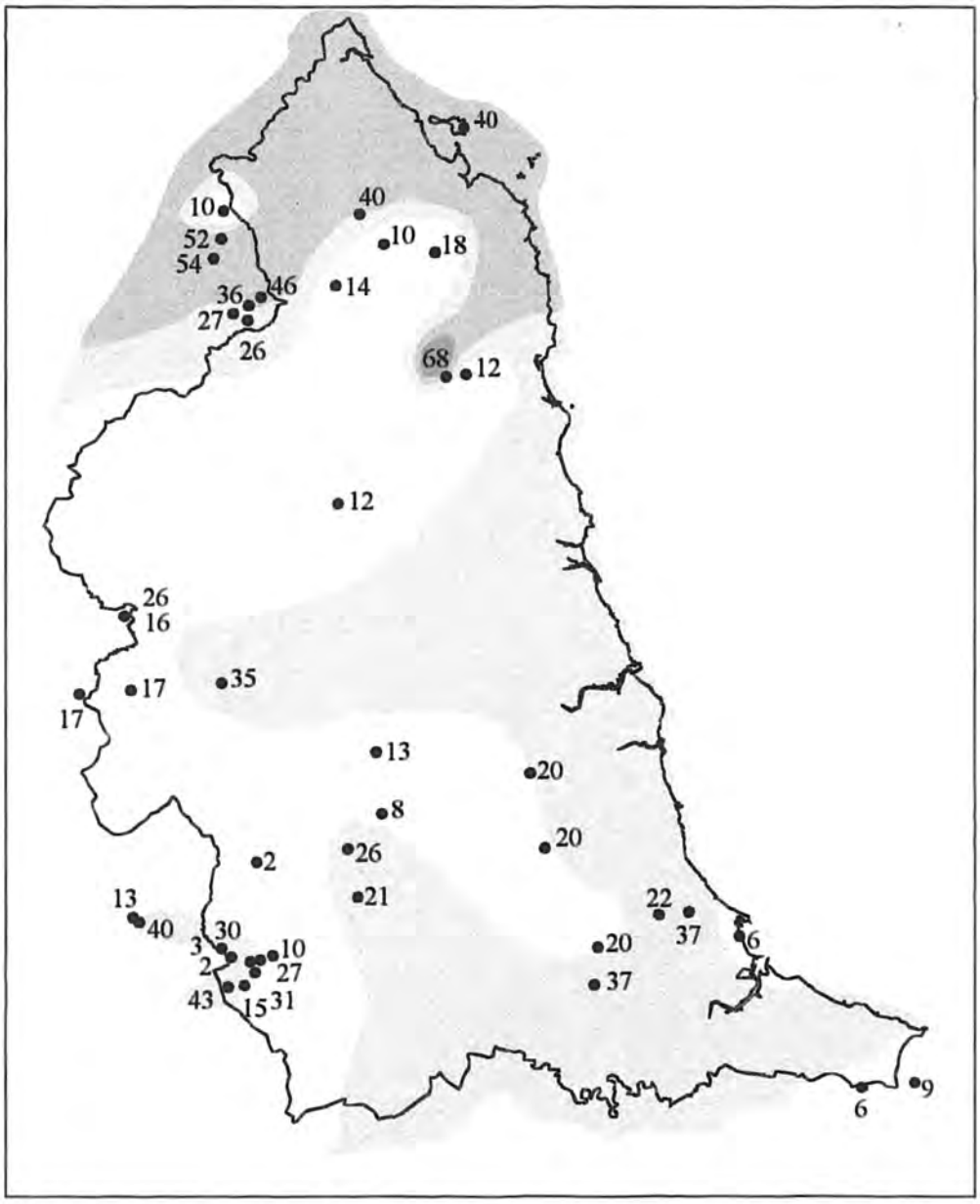
- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6%
- 0.6 - 0.8 %
- > 0.8 %

Cerealia - type

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.2



Key:

0 - 20 %

20 - 40 %

40 - 60 %

60 - 80 %

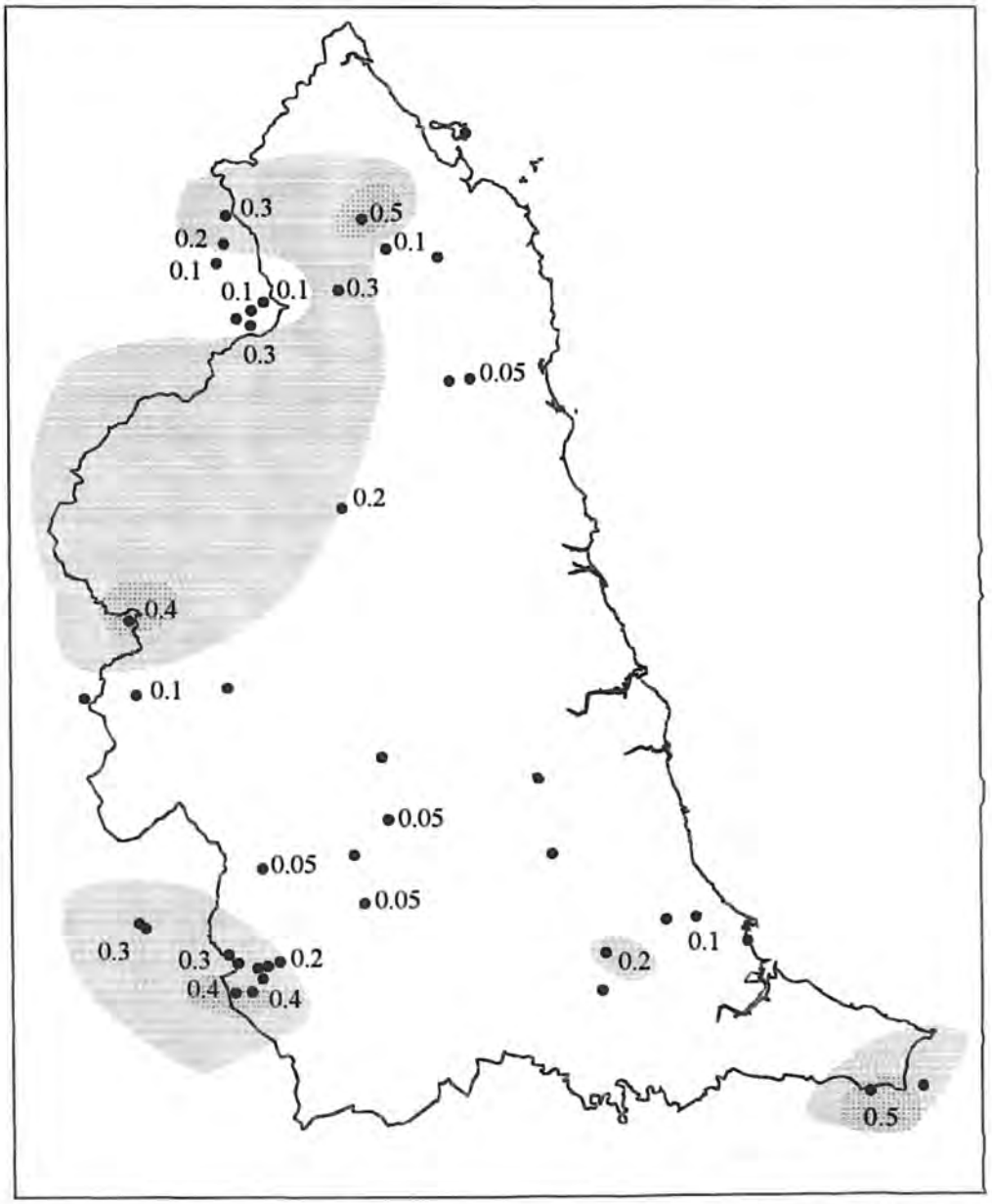
80 - 100 %

Gramineae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.3



Key:

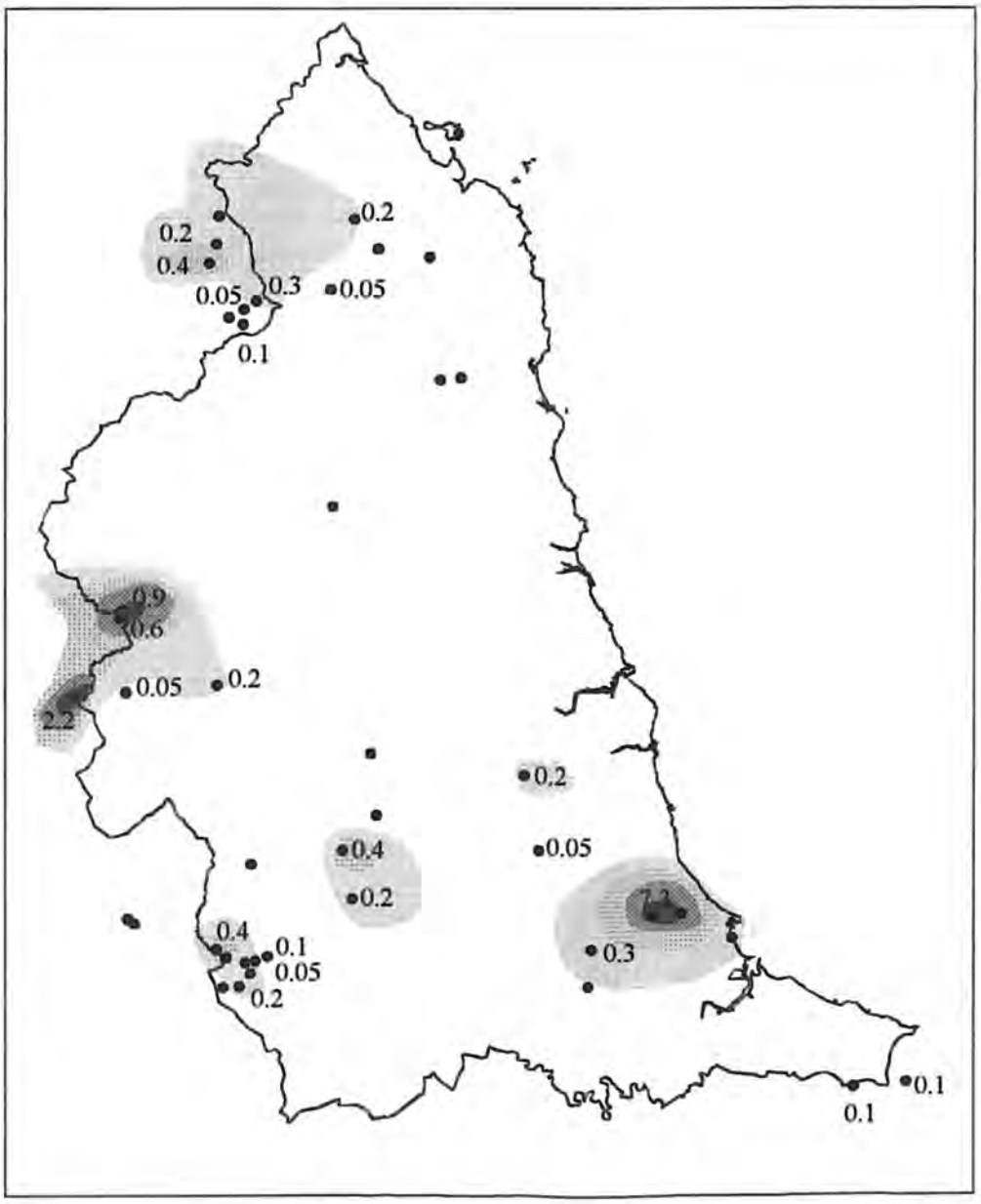
- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Artemisia

***circa* 1500 - present day**

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.4



Key:

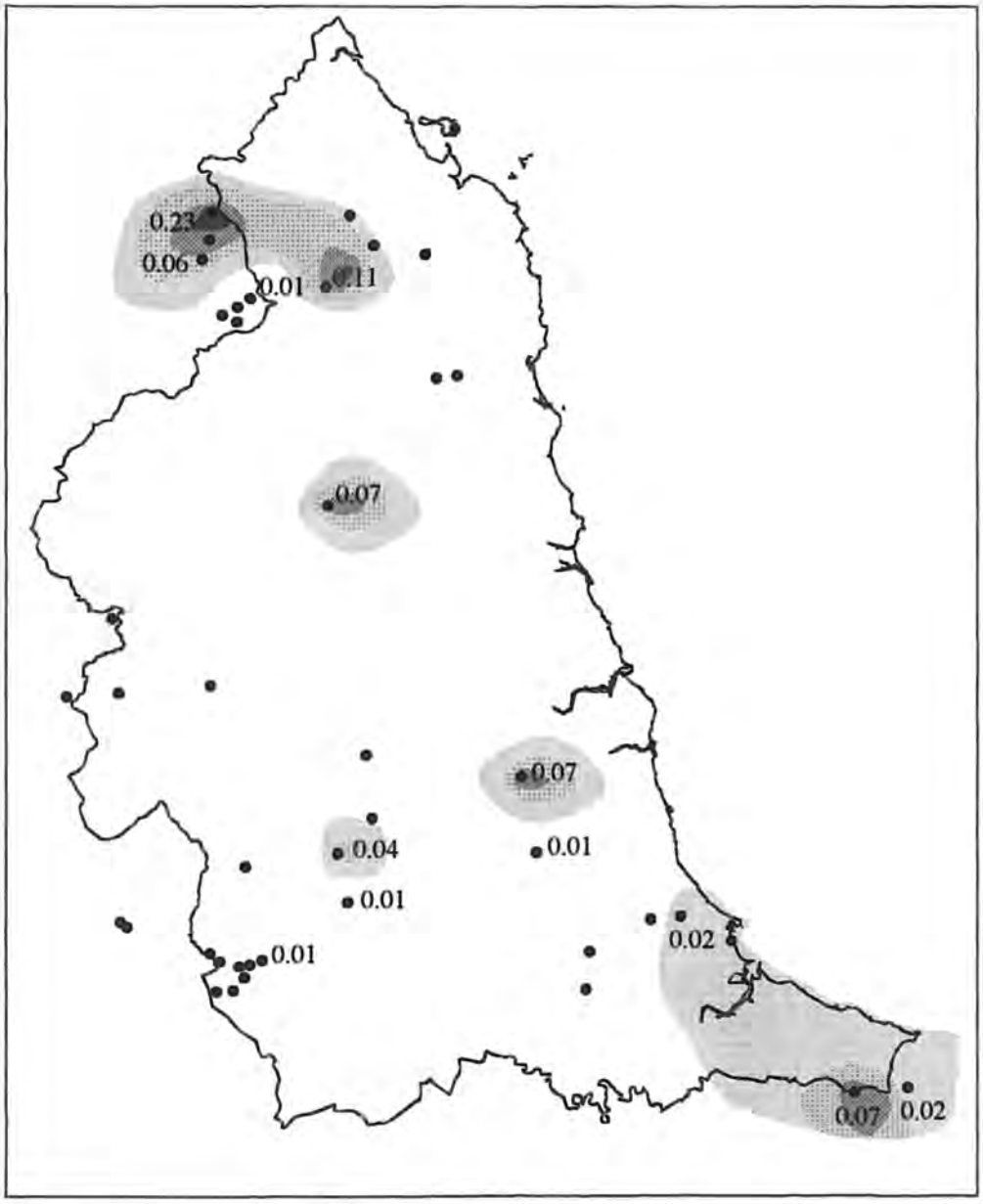
- 0 - 0.2%
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Caryophyllaceae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.5



Key:

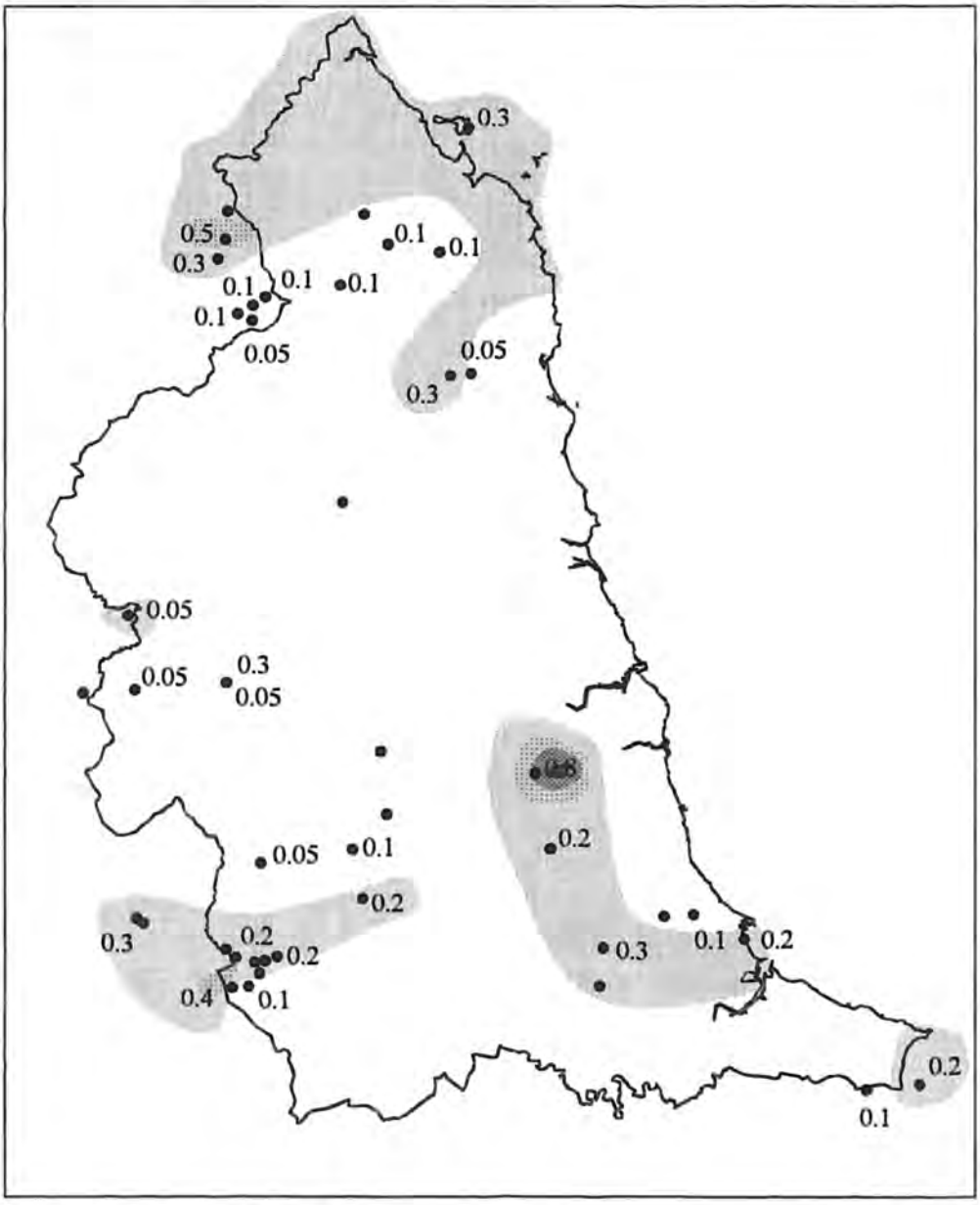
- 0 - 0.02 %
- 0.02 - 0.04 %
- 0.04 - 0.06 %
- 0.06 - 0.08 %
- > 0.08 %

Centaurea

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.6



Key:

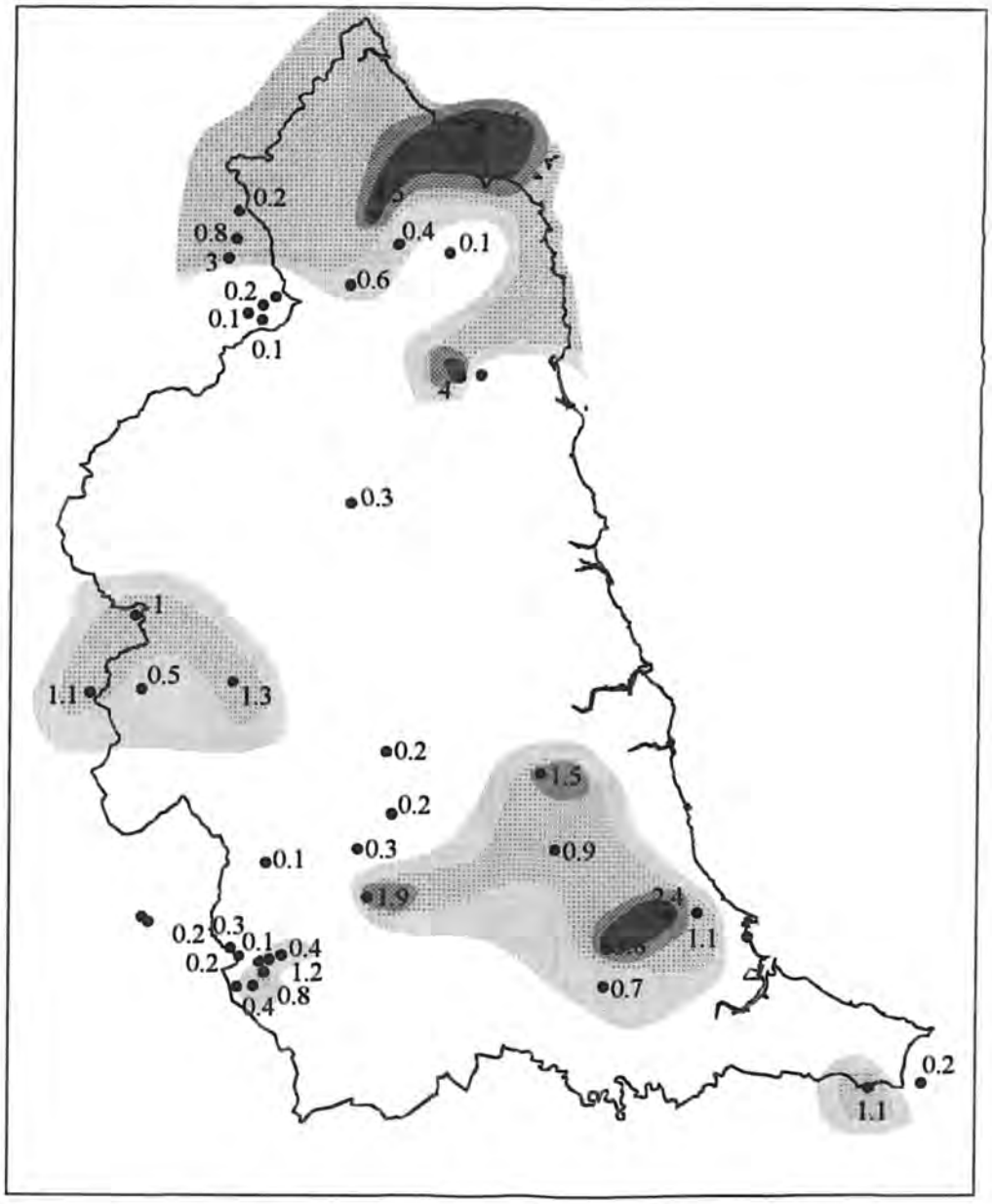
- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Chenopodiaceae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.7



Key:

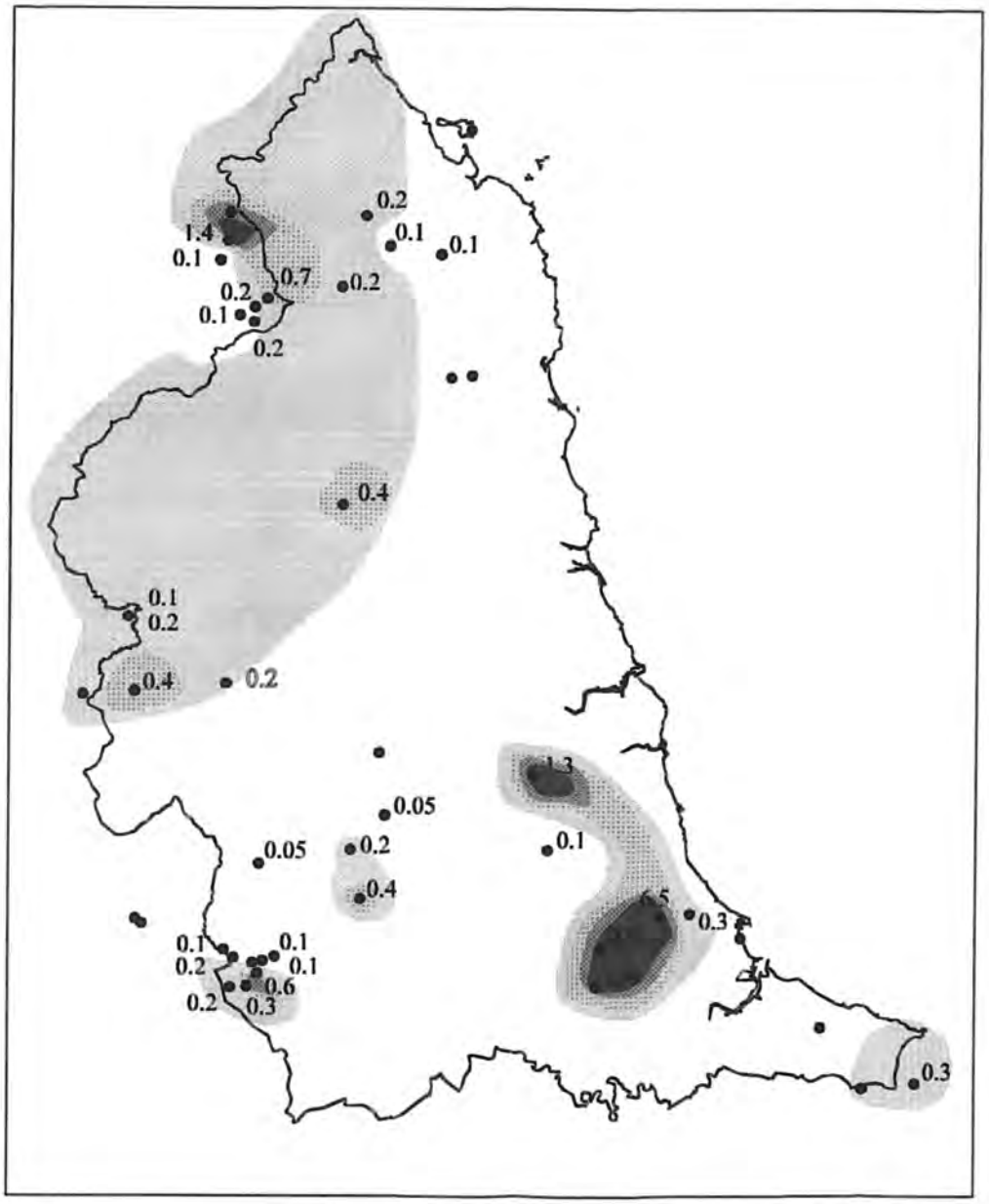
- 0 - 20 %
- 20 - 40 %
- 40 - 60 %
- 60 - 80 %
- 80 - 100 %

Compositae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.8



Key:

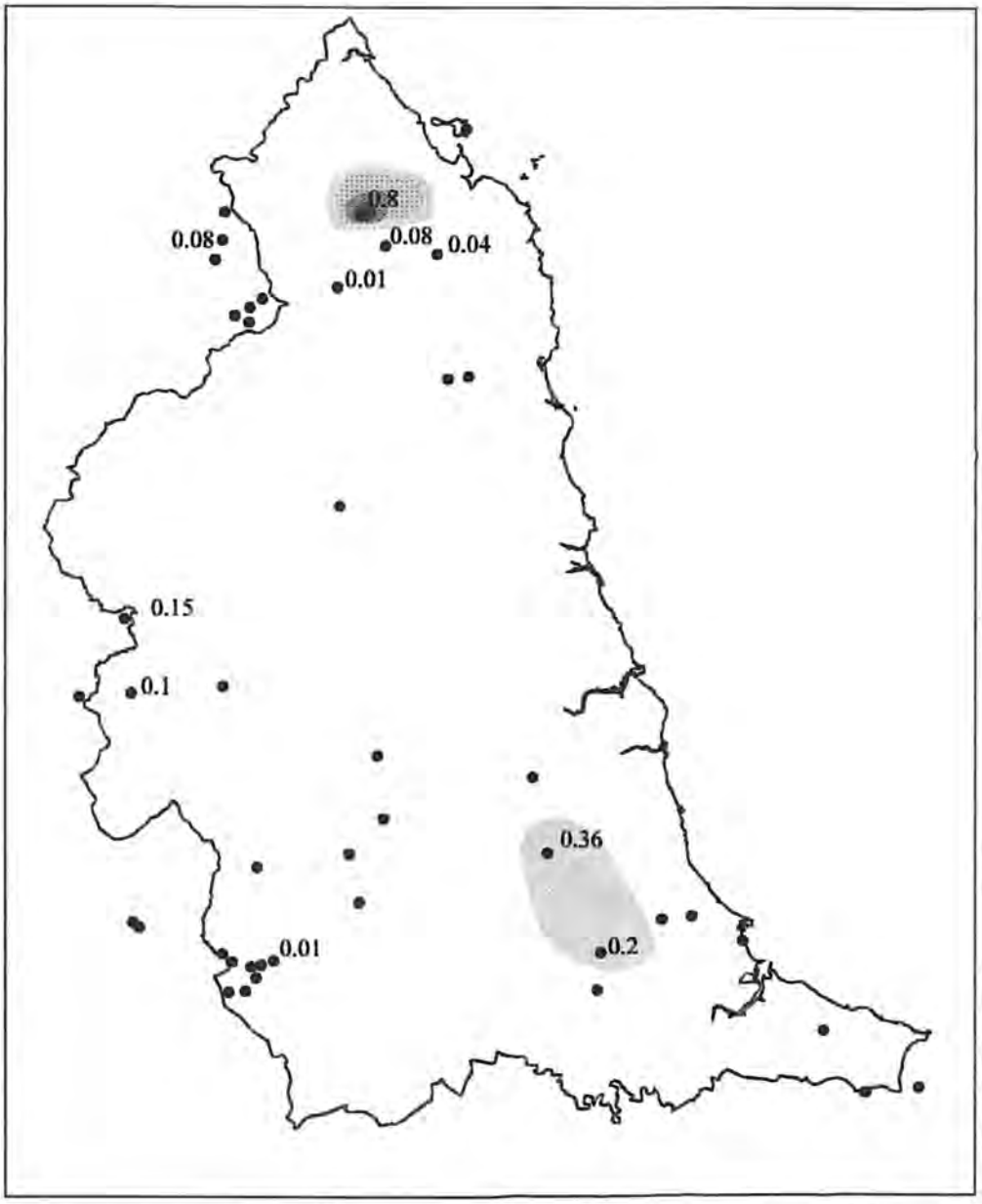
- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Cruciferae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.9



Key:

- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Leguminosae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.10

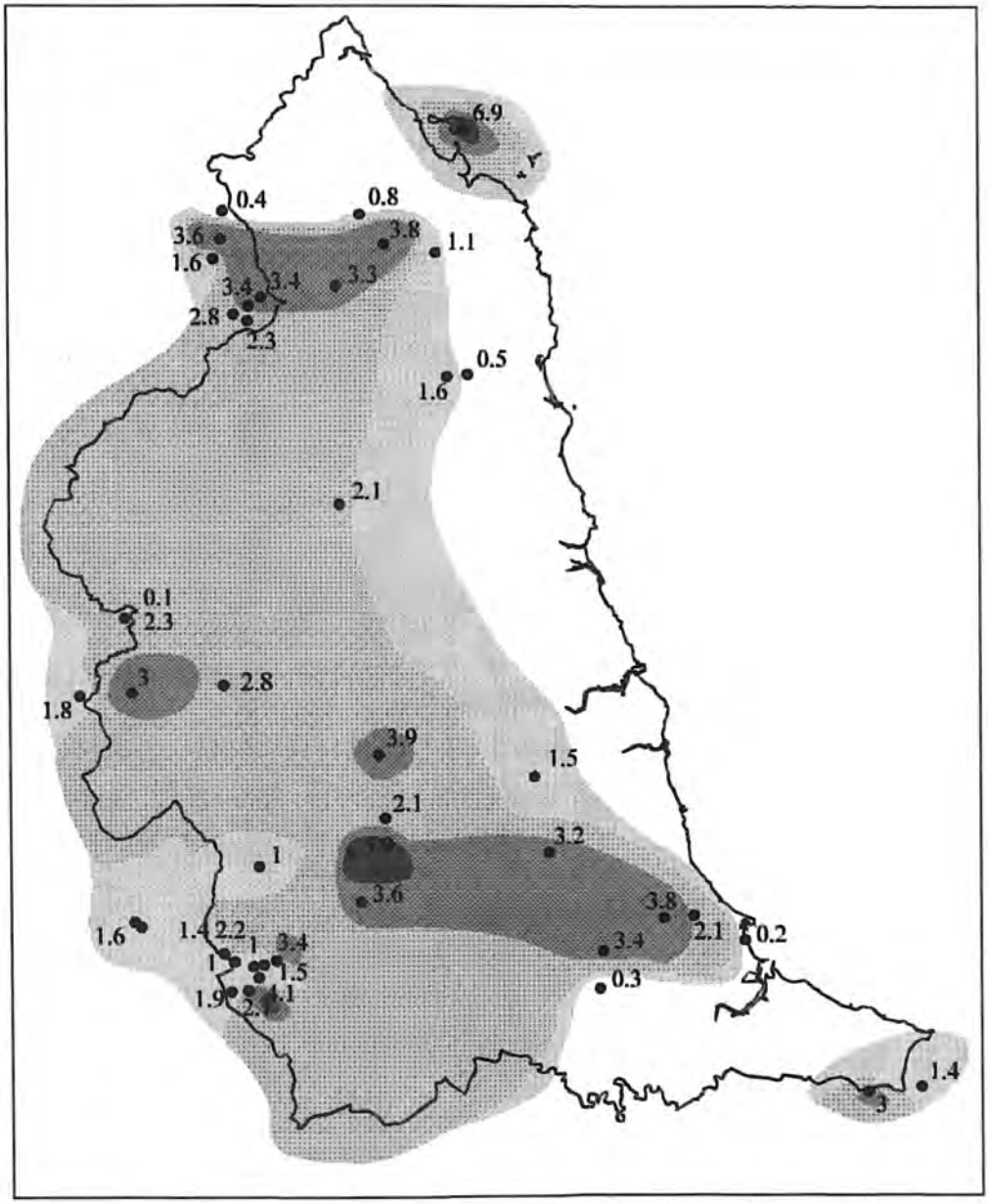
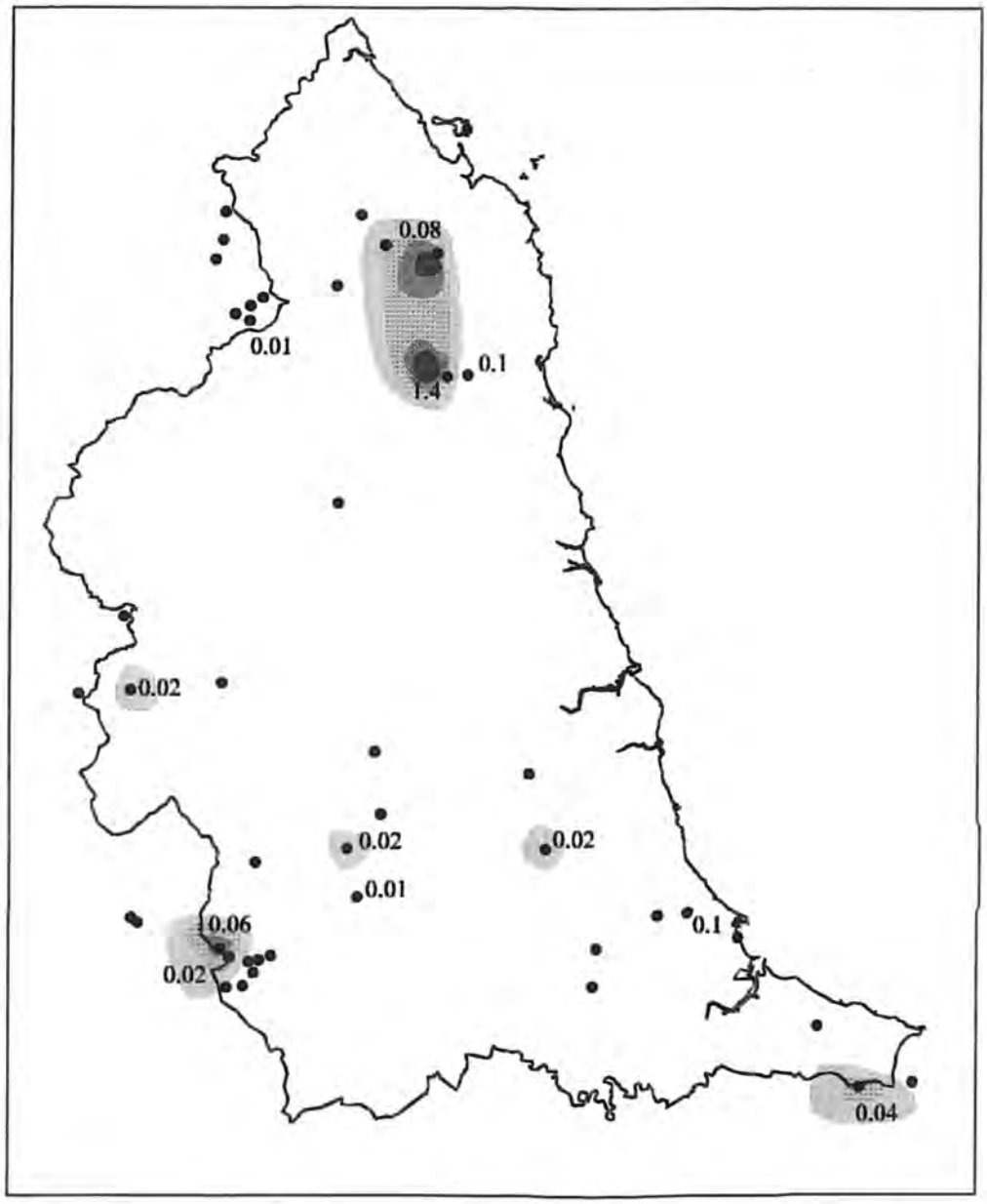

6.9
0.4
0.8
3.6
3.8
1.1
1.6
3.4
3.4
3.3
2.8
1.3
0.5
1.6
2.1
0.1
2.3
3
2.8
1.8
3.9
1.5
2.1
3.2
1
3.6
3.8
1.6
1.4
2.2
1
3.4
2.1
0.2
3.4
1
1.5
0.3
1.9
4.1
1.4
3
Key:
0 - 1 %
1 - 2 %
2 - 3 %
3 - 4 %
> 4 %
Plantago
circa 1500 - present day
N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.11



Key:

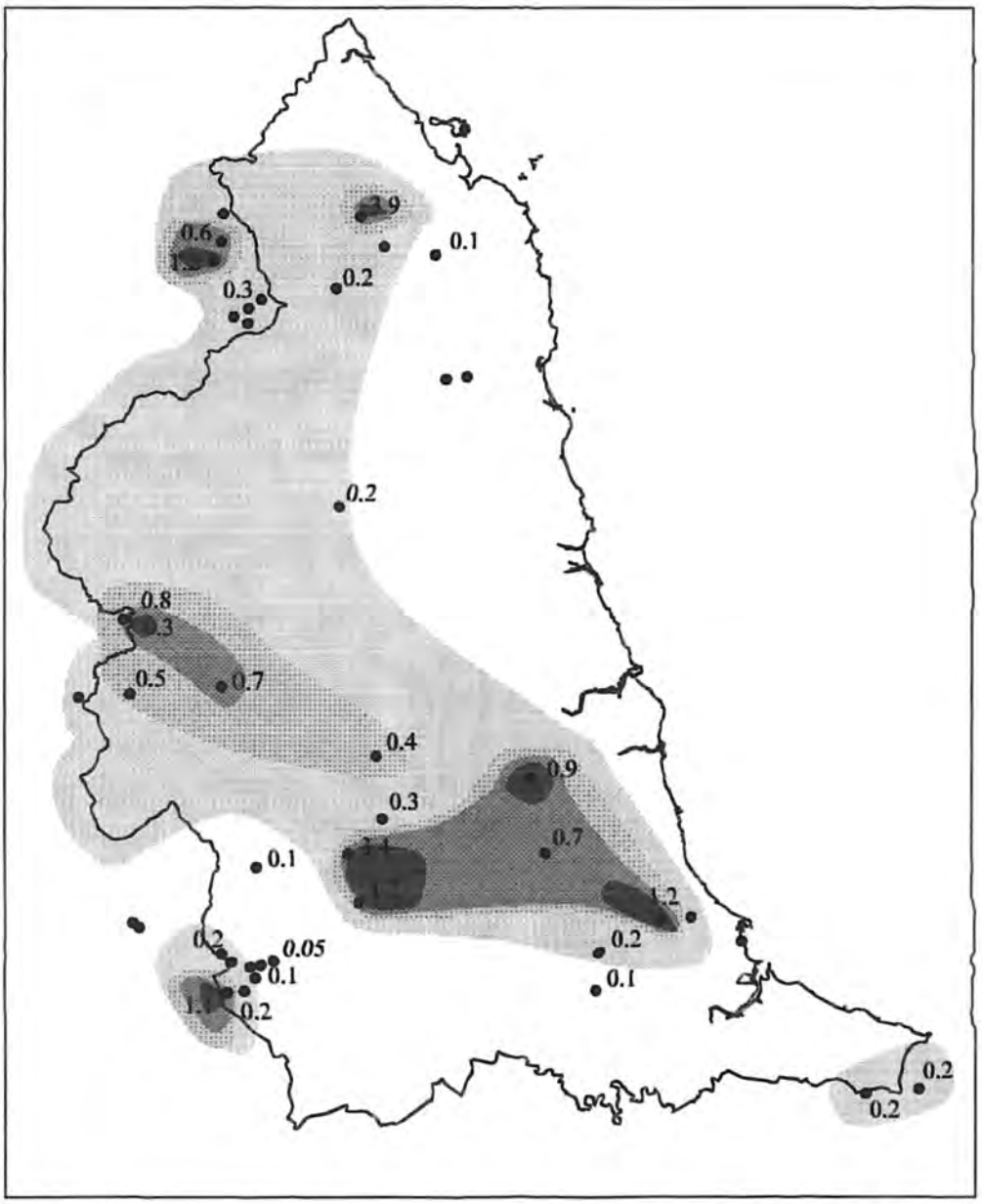
- 0 - 0.02 %
- 0.02 - 0.04 %
- 0.04 - 0.06 %
- 0.06 - 0.08 %
- > 0.08 %

Polygonum

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.12



Key:

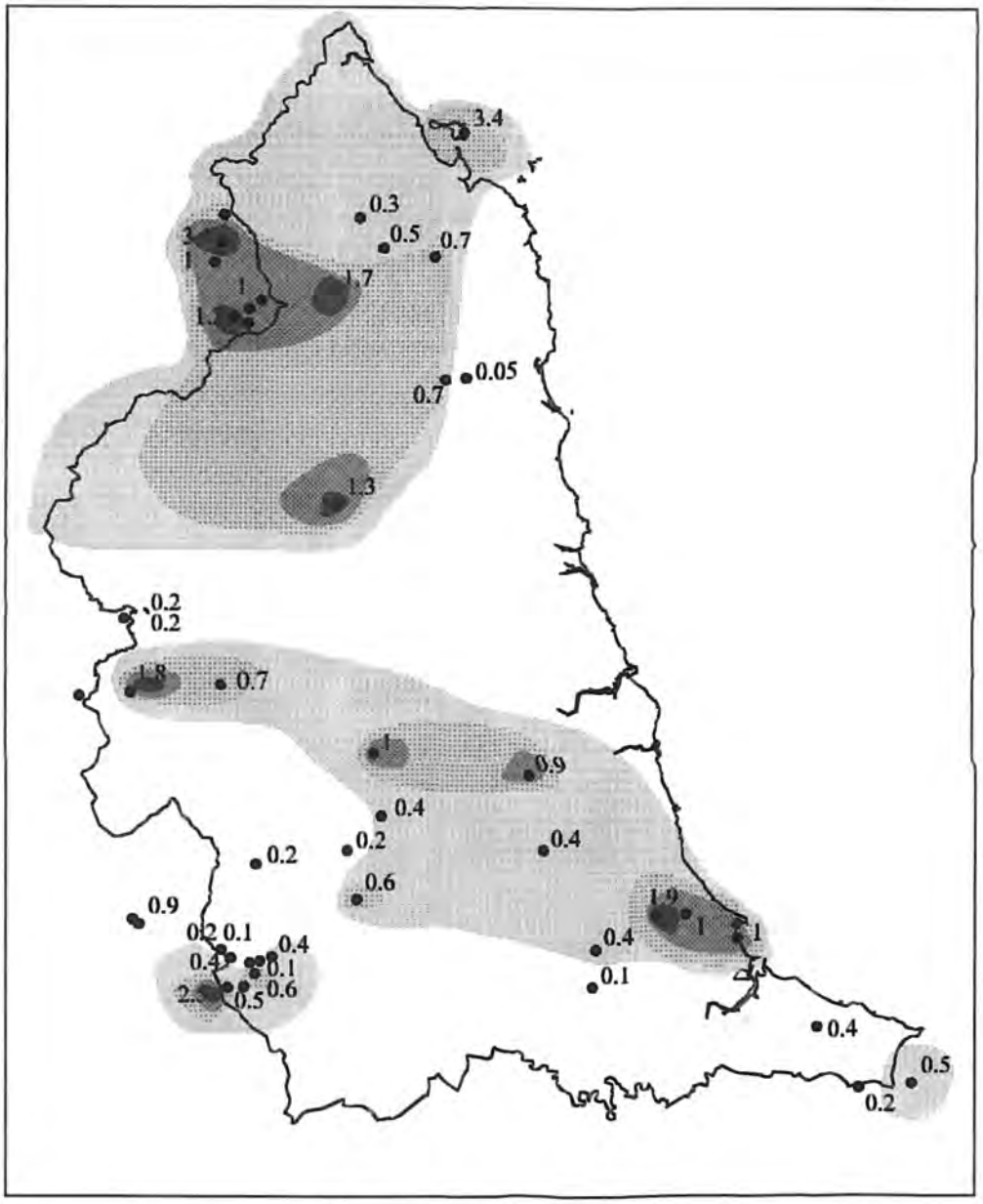
- 0 - 0.2 %
- 0.2 - 0.4 %
- 0.4 - 0.6 %
- 0.6 - 0.8 %
- > 0.8 %

Ranunculaceae

circa 1500 - present day

N.B. Pollen values expressed as a percentage of total dry land pollen.

Figure 5.13



Key:

- 0 - 0.3 %
- 0.3 - 0.6 %
- 0.6 - 0.9 %
- 0.9 - 1.2 %
- > 1.2 %

Rumex

***circa* 1500 - present day**

N.B. Pollen values expressed as a percentage of total dry land pollen.

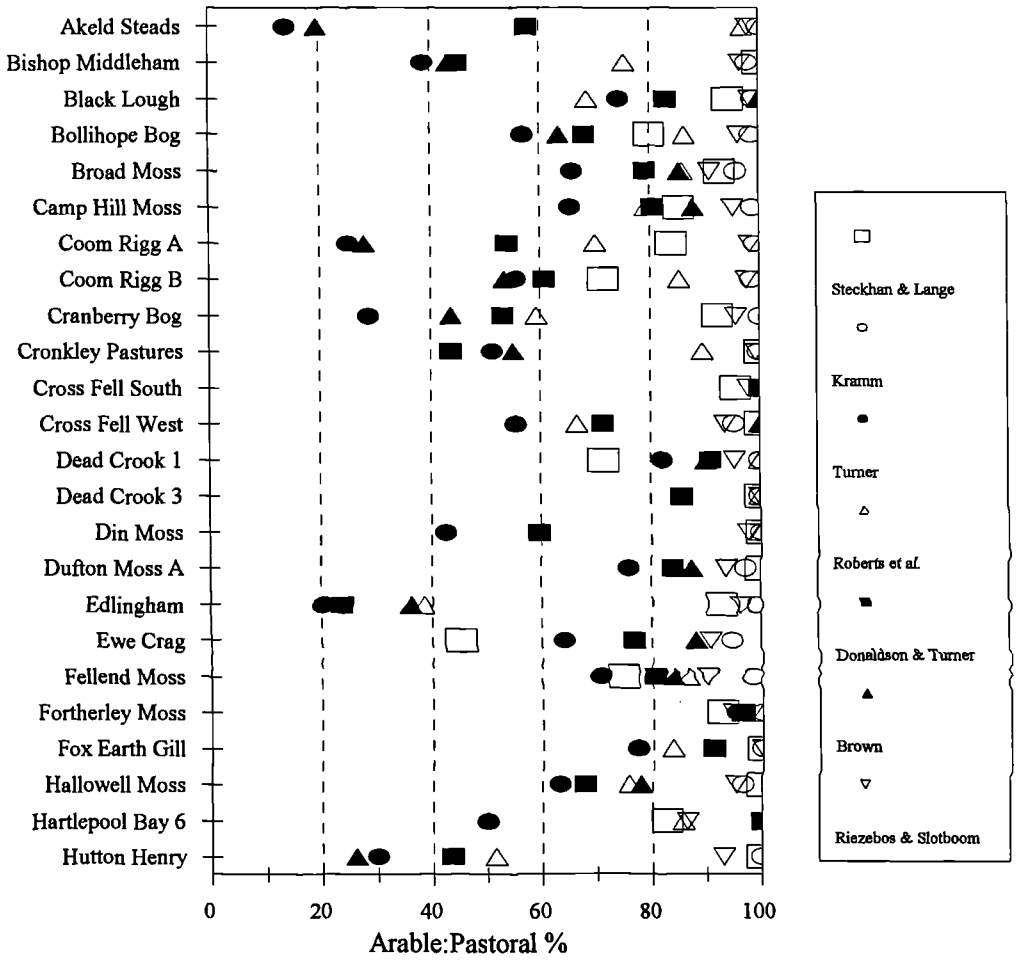


Fig. 5.14 Comparison of scores for different arable:pastoral indices. Scores are calculated for cores with levels dated to the last 500 years from north-east England. Note that "arable" scores are low (< 50%) and "pastoral" scores are high (> 50%).

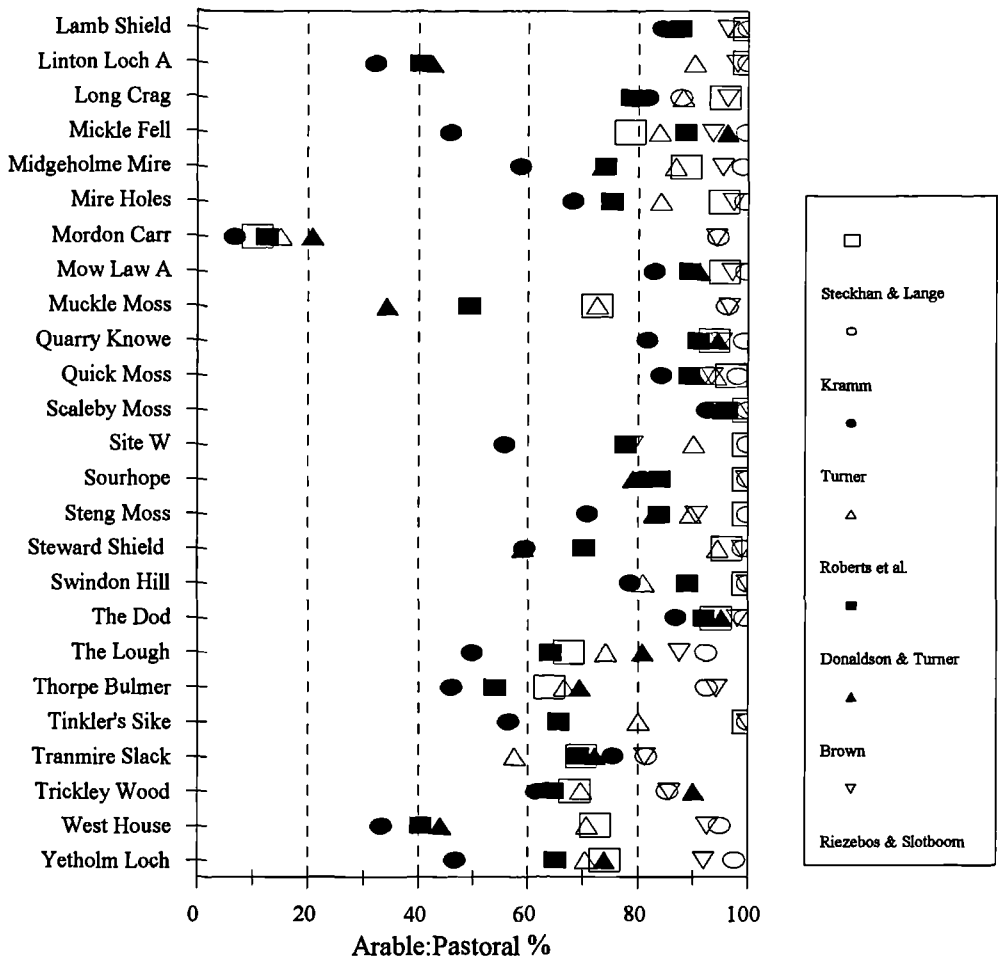


Fig. 5.14 Continued from previous page.

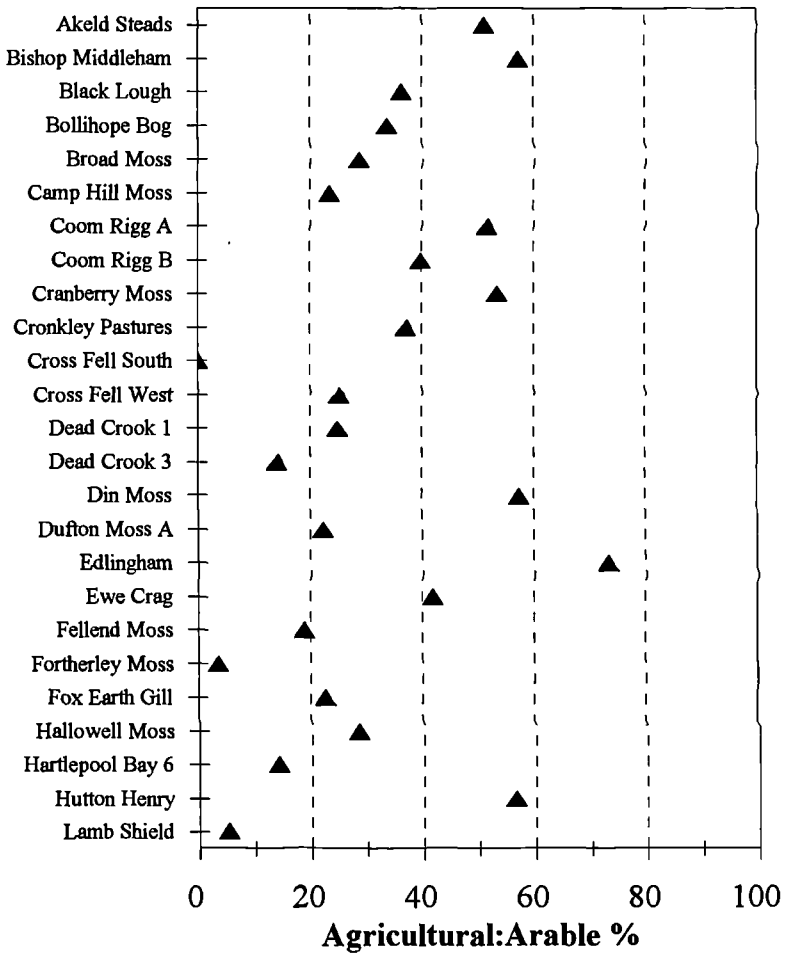


Fig. 5.15 Comparison of scores for Fenton-Thomas' (1992) agricultural:arable index. Scores are calculated for cores with levels dated to the last 500 years from north-east England. Note that unlike for arable:pastoral index scores, "arable" scores are high (> 50%) whilst non-arable, "agricultural" scores are low (< 50%).

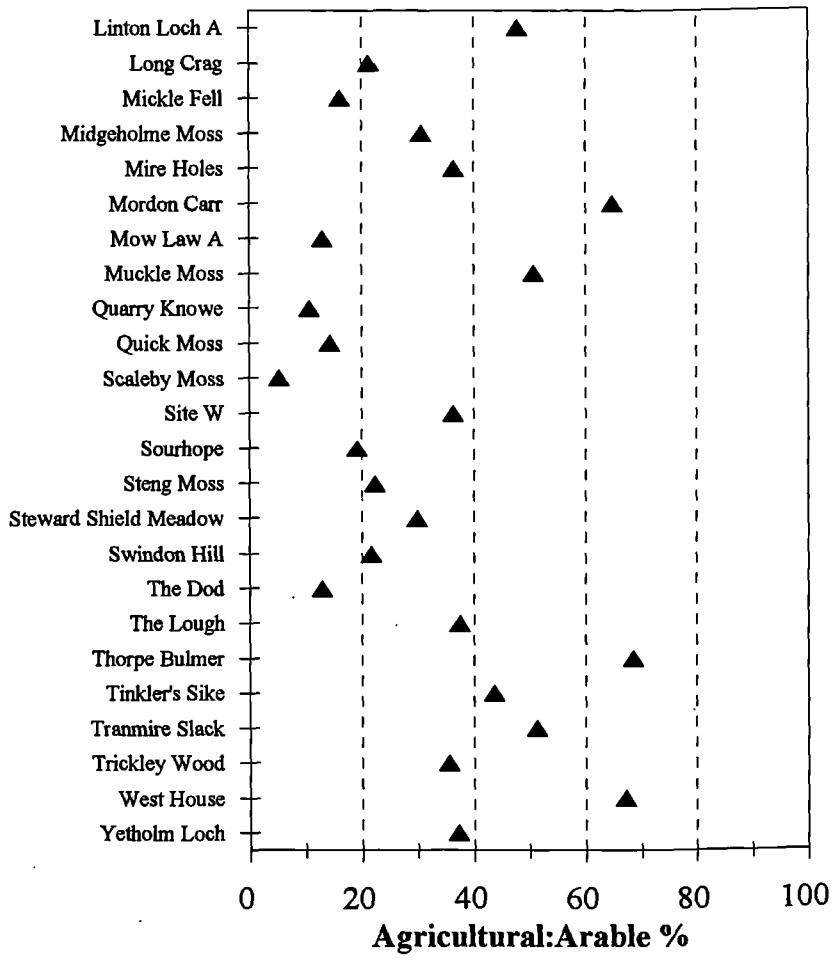
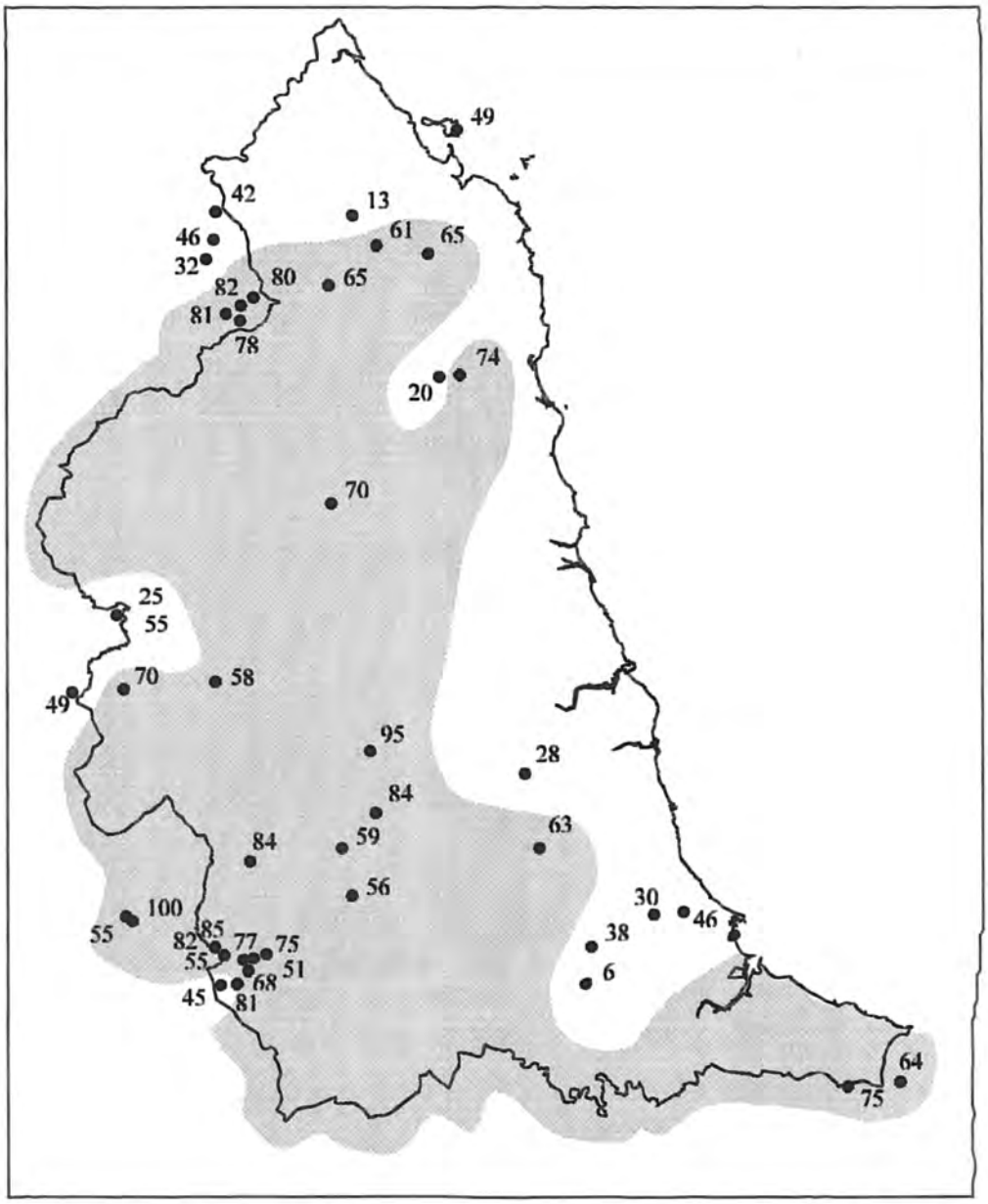


Fig. 5.15 Continued from previous page.

Figure 5.16



Key:

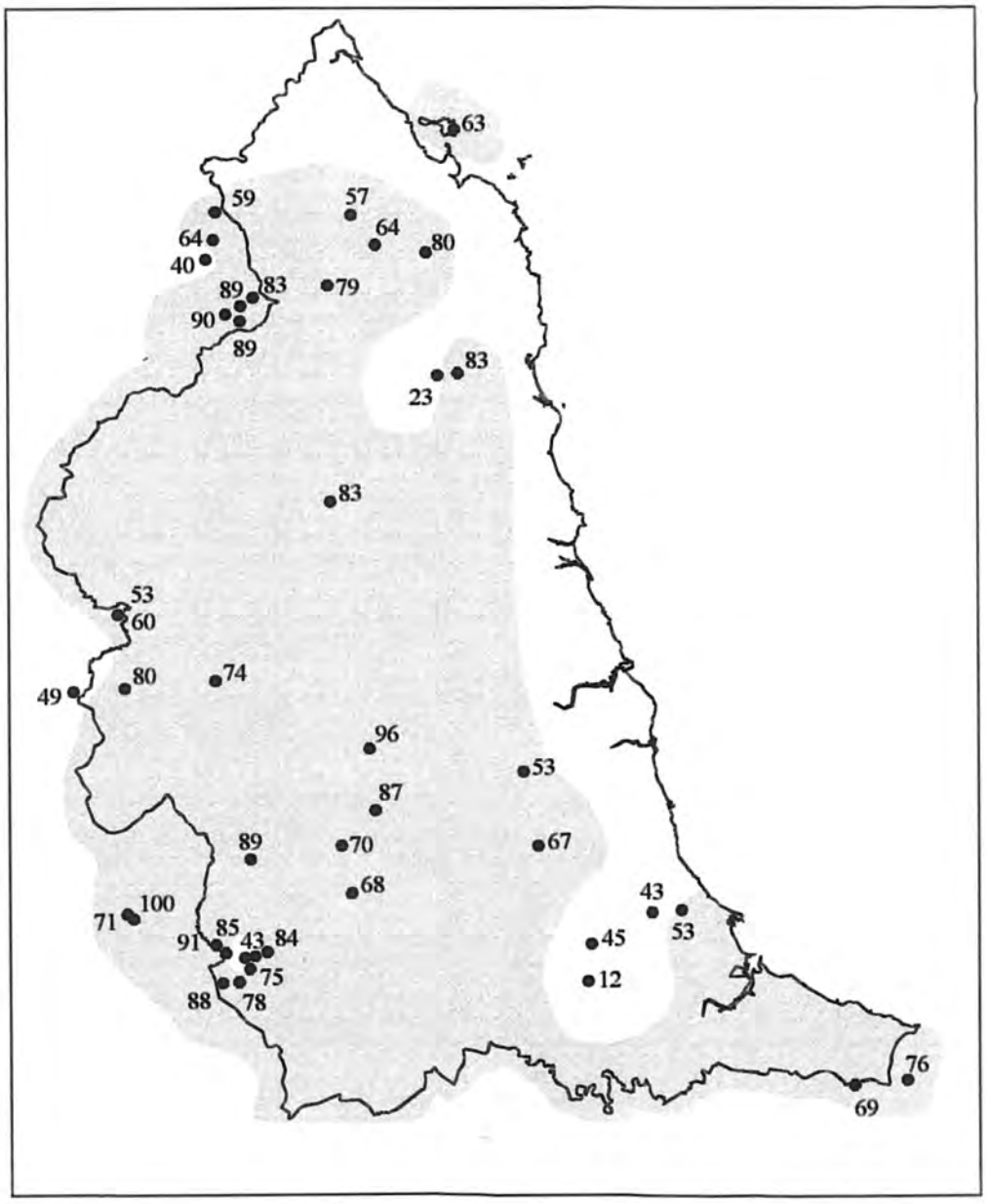
< 50%

> 50%

Turner's (1964) arable:pastoral index

***circa* 1500 - present day**

Figure 5.17



Key:

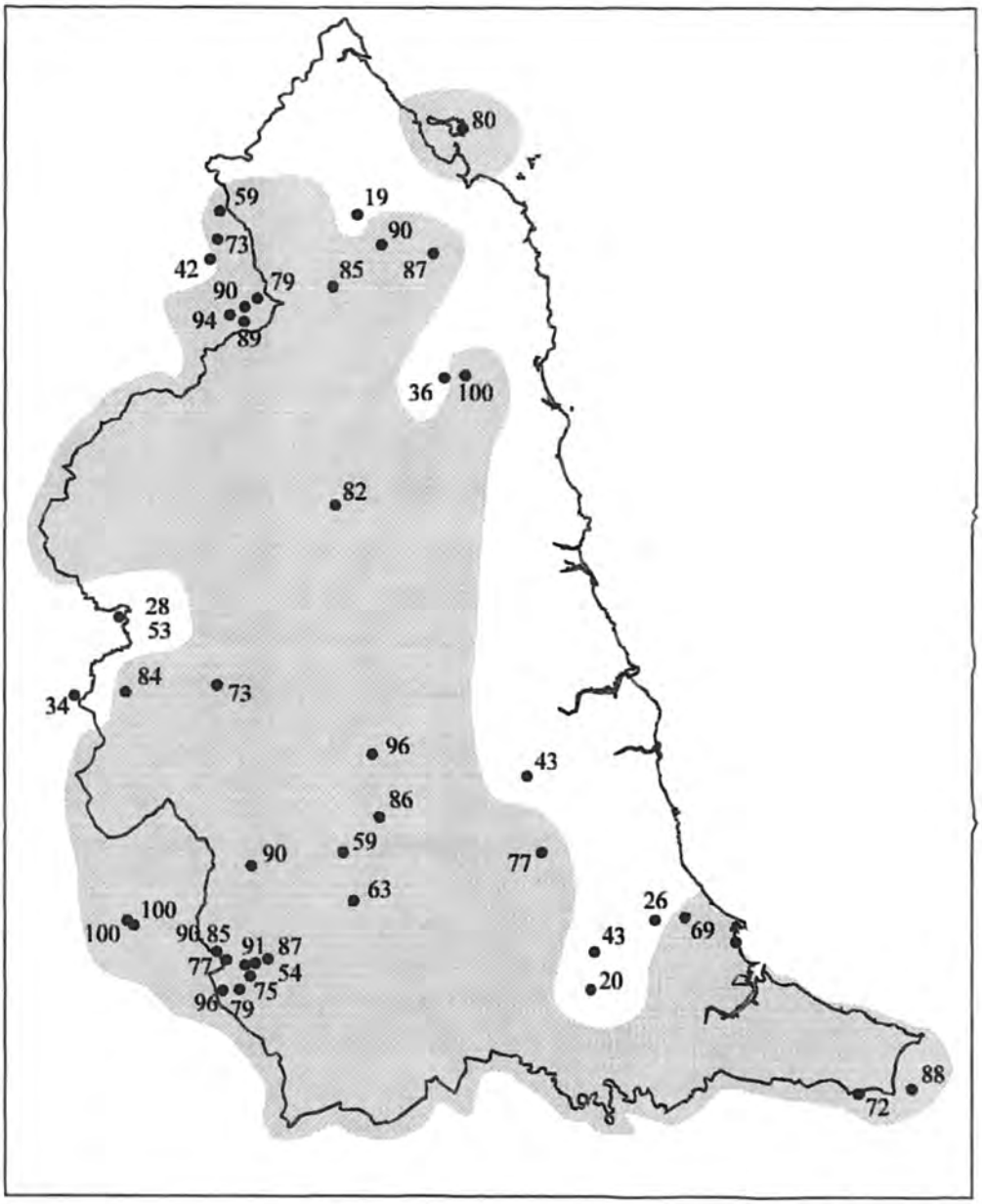
< 50%

> 50%

Donaldson and Turner's (1977) arable:pastoral index

***circa* 1500 - present day**

Figure 5.18



Key:

< 50 %

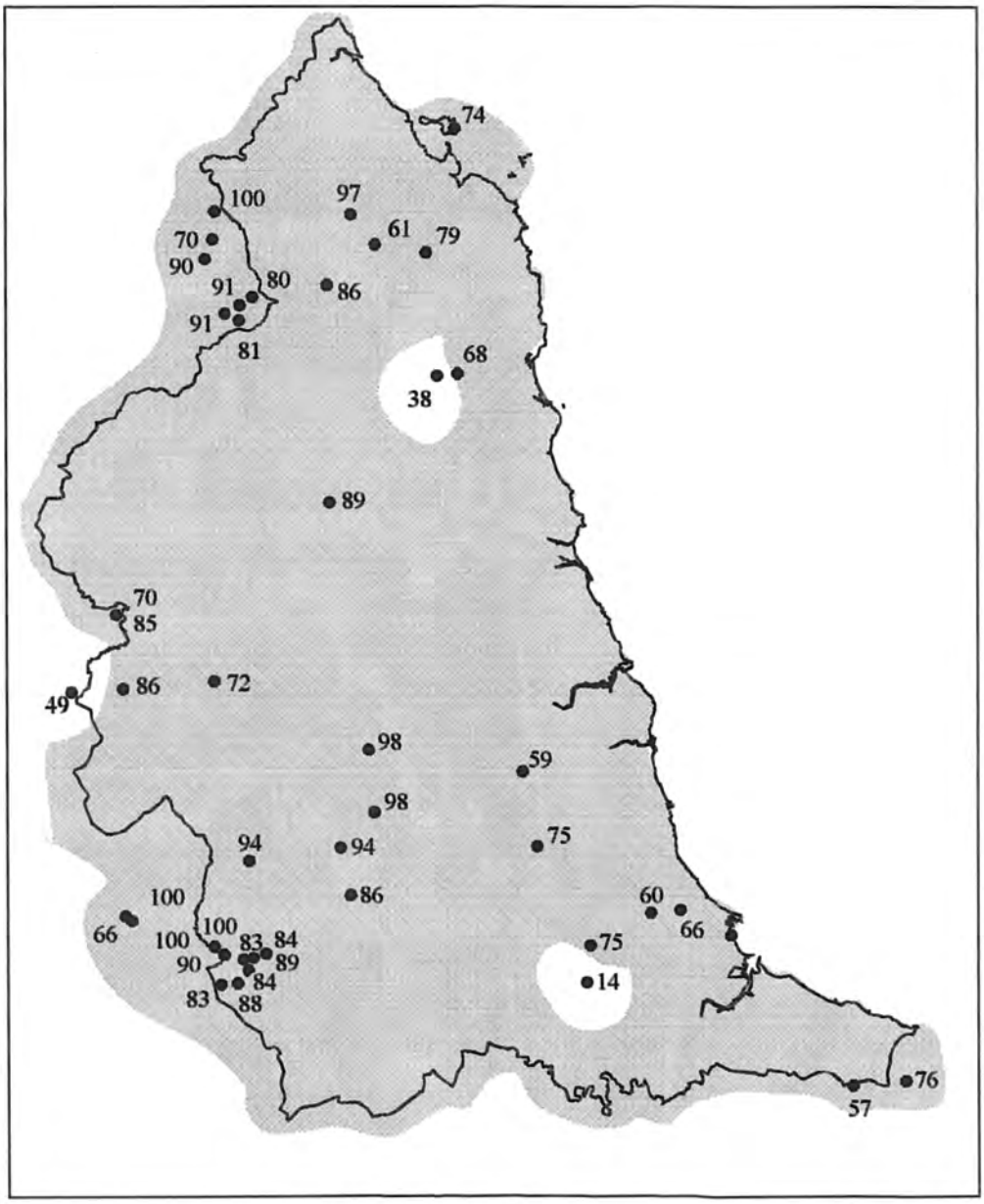
> 50 %

Brown's (1977) arable:pastoral index

circa 1500 - present day

N.B. Scores indicate arable pollen as a percentage of arable plus pastoral pollen

Figure 5.19



Key:

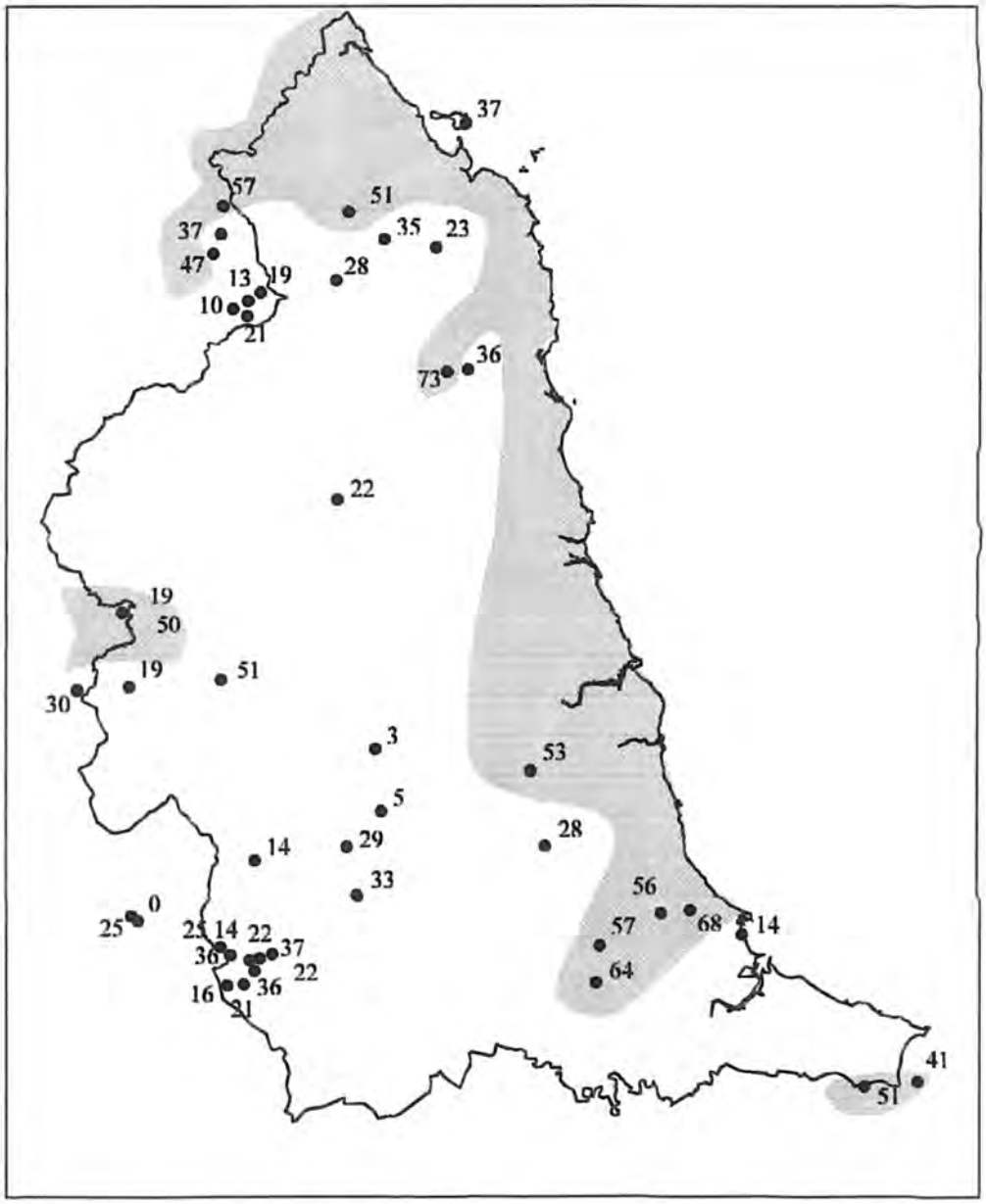
< 50%

> 50%

Roberts *et. al.* (1983) arable:pastoral index

***circa* 1500 - present day**

Figure 5.20



Key:

< 50%

> 50%

Fenton-Thomas' (1992) agricultural:arable index

***circa* 1500 - present day**

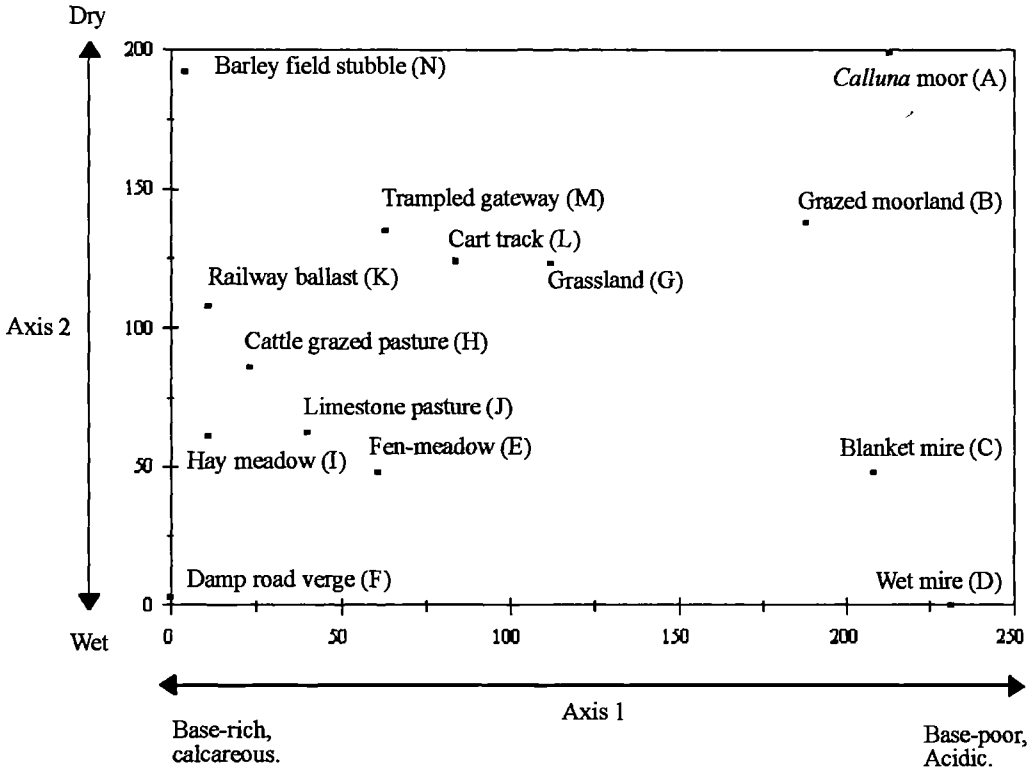


Fig. 5.21 DECORANA plot of scores for estimated pollen rain of the 14 land-use types in Table 5.7

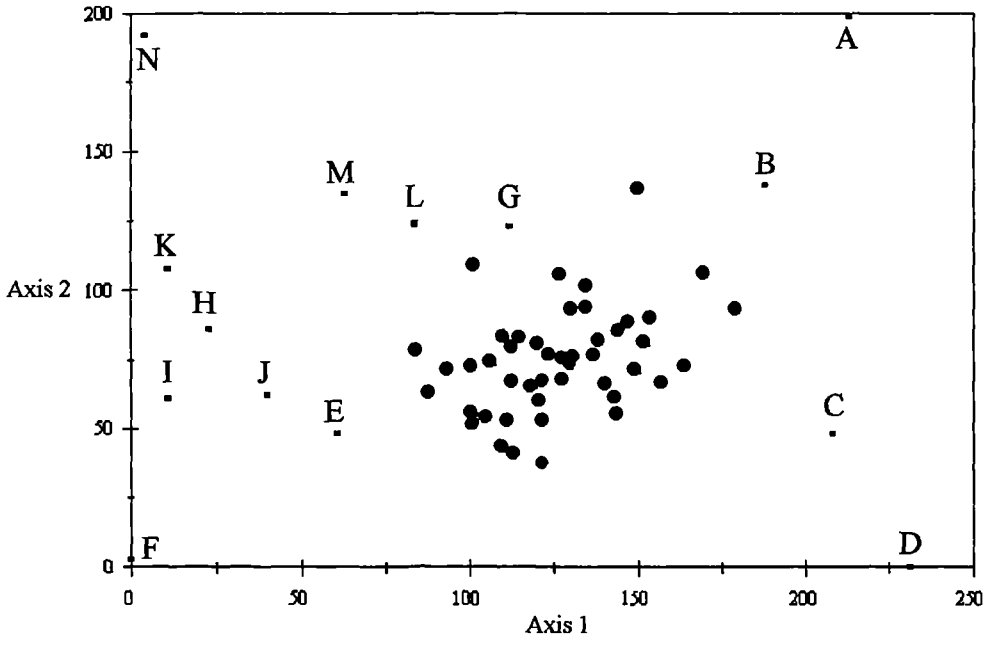


Fig. 5.22 The same DECORANA plot as Fig. 5.21, with the scores for the pollen cores added.

Tables and Figures for

Chapter 6

Methods II: Combined pollen and archaeological approaches for reconstructing settlement and land-use

Table 6.1 Catchment area size for each pollen site modified for each period. (Key at end of table)

Pollen Site Name:	modern day	M	N	BA/EIA	IA	RB
Akeld Steads	E	L	L	E	E	E
Arngill Head Brocks	R	E	E	R	R	R
Bellow Moss	R	E	E	R	R	R
Bishop Middleham	E	L	L	E	E	E
Black Band	R	E	E	R	R	R
Black Hill	R	E	E	R	R	R
Black Lough	R	E	E	R	R	R
Black Rigg	R	E	E	R	R	R
Blackshiel Bog	E	E	E	E	E	E
Bollihope Bog	E	L	L	L	L	E
Burnhope Burn	E	E	E	E	E	E
Camp Hill Moss	E	E	E	E	E	E
Cold Fell	R	E	E	R	R	R
Coom Rigg	R	E	E	R	R	R
Cowpen Marsh	R	R	R	R	R	R
Cranberry Bog	E	E	E	E	E	E
Cronkley Fell	R	E	E	R	R	R
Cronkley Pastures	E	E	E	E	E	E
Crook Burn	R	E	E	E	E	E
Cuthbert's Hill	R	E	E	R	R	R
Dead Crook	R	E	E	E	E	E
Dubby Moss	R	E	E	R	R	R
Dufton Moss	R	E	E	R	R	R
Edlingham	E	L	L	L	L	E
Embleton's Bog	E	L	L	L	L	E
Fellend Moss	E	L	L	L	L	E
Fortherley Moss	E	L	L	L	L	E
Fox Earth Gill	E	E	E	E	E	E
Furness Moss	R	E	E	R	R	R
Goosetarn Beck	R	E	E	R	R	R
Graham's Moss	R	E	E	R	R	R
Great Eggleshope Beck	R	E	E	R	R	R
Greenmines	R	E	E	R	R	R
Green Swang	R	E	E	R	R	R
Hallowell Moss	E	L	L	L	L	E
Harthope Moss	R	E	E	R	R	R
Harthope Quarry	R	E	E	R	R	R
Hartlepool Bay 4 & 6	R	R	R	R	R	R
Hartlepool Slake	R	R	R	R	R	R
Hedleyhope	R	E	E	R	R	R
Herdship Fell	R	E	E	R	R	R
High Banks Moss	R	E	E	R	R	R

Table 6.1 continued.

Pollen Site Name:	catchment type	M	N	BA/EIA	IA	RB
Hisehope Burn	R	E	E	R	R	R
Howden Moss	R	E	E	R	R	R
Hutton Henry	E	L	L	E	E	E
James' Hill	R	E	E	R	R	R
John's Burn	R	E	E	R	R	R
Kennel Hall Knowe	L	L	L	L	L	L
Kilhope Law	R	E	E	R	R	R
Knock Ridge	R	E	E	R	R	R
Knoutberry	R	E	E	R	R	R
Lamb Shield	E	L	L	L	L	E
Lilburn Steads	E	L	L	L	L	E
Long Crag	R	R	R	R	R	R
Longlee Moor	E	L	L	L	L	E
Long Moss	R	E	E	R	R	R
Low Stublick	R	E	E	R	R	R
Melmerby Fell	R	E	E	R	R	R
Mickle Fell	R	R	R	R	R	R
Milburn Forest	R	E	E	R	R	R
Mire Holes	R	E	E	R	R	R
Mordon Carr	E	L	L	L	L	E
Moss Mire North/South	R	E	E	R	R	R
Mown Meadows	R	E	E	R	R	R
Muckle Moss	R	E	E	R	R	R
Neasham Fen	E	L	L	L	L	L
Pawlaw Pike	R	E	E	R	R	R
Pity Me	E	E	E	E	E	E
Pow Hill	E	L	L	L	L	E
Quickcleugh	R	E	E	R	R	R
Quick Moss	R	E	E	R	R	R
Sally Grain	R	E	E	R	R	R
Scraith Head	R	E	E	R	R	R
Seven Hills	E	L	L	L	L	E
Shaking Moss	R	R	R	R	R	R
Shivery Hill	R	E	E	R	R	R
Shot Moss	R	E	E	R	R	R
Sikehead	R	E	E	R	R	R
Silverband	R	E	E	R	R	R
Site W	R	E	E	R	R	R
South Cornsay	E	L	L	L	L	E
Stanley Moss	E	L	L	L	L	E
Staple Moss	R	E	E	R	R	R
Steng Moss	R	E	E	R	R	R

Table 6.1 continued.

Pollen Site Name:	catchment type	M	N	BA/EIA	IA	RB
Steward Shield Meadow	E	L	L	L	E	E
The Lough	R	R	R	R	R	R
Thornhope Burn	R	E	E	R	R	R
Thorpe Bulmer	E	L	L	L	L	E
Tinkler's Sike	R	E	E	R	R	R
Trickley Wood	L	E	E	E	E	E
Vindolanda	L	L	L	L	L	L
Waldridge	R	E	E	R	R	R
Wanister Bog	E	L	L	L	L	E
Weelfoot Moss	R	E	E	R	R	R
Weelhead Moss	R	E	E	R	R	R
West Hartlepool 3	R	R	R	R	R	R
West Hartlepool 19	R	R	R	R	R	R
White House	R	E	E	R	R	R
Whitfield Lough	R	R	R	R	R	R
Woldgill Burn	R	E	E	R	R	R
Wolfscleugh	R	E	E	R	R	R
Wolsingham Park Moor	R	E	E	R	R	R
Woodland	R	E	E	R	R	R
Wooler Water	R	R	R	R	R	R

Key:

Periods:

M	Mesolithic
N	Neolithic
BA/EIA	Bronze Age and Earliest Iron Age
IA	Iron Age
RB	Roman period

Catchment sizes:

L	Local (under a hundred metres radius)
E	Extra-local (under a few hundred metres radius)
R	Regional (over a few hundred metres radius)

Table 6.2 Total number of archaeological sites in pollen catchment in each period (For key to column headings see end of table).

Pollen Site Name:	(all periods)M	N	EB	MB	LB/EIA	IA	RB
Akeld Steads	2	0	2	0	0	0	0	0
Arngill Head Brocks	35	5	4	9	8	10	2	3
Bellow Moss	7	2	2	2	0	0	0	0
Bishop Middleham	2	0	0	1	0	0	1	0
Black Band	23	5	4	7	4	6	0	1
Black Hill	30	5	8	9	4	7	0	1
Black Lough	24	0	5	7	0	9	0	2
Black Rigg	0	0	0	0	0	0	0	0
Blackshiel Bog	1	0	0	0	*0*	*1*	*0*	*0*
Bollihope Bog	1	0	0	1	1	0	0	0
Burnhope Burn	1	0	0	0	0	1	0	0
Camp Hill Moss	15	1	5	6	2	2	0	0
Cold Fell	0	0	0	0	0	0	0	0
Coom Rigg	1	0	1	0	0	0	0	0
Cowpen Marsh	4	1	0	0	1	2	0	0
Cranberry Bog	2	0	0	0	0	1	1	1
Cronkley Fell	112	15	14	27	23	27	10	22
Cronkley Pastures	4	0	0	2	1	2	0	0
Crook Burn	6	4	0	1	0	1	0	0
Cuthbert's Hill	11	0	0	3	4	5	0	0
Dead Crook	26	6	6	7	4	7	0	0
Dubby Moss	22	8	6	5	4	3	0	0
Dufton Moss	101	13	11	27	22	23	8	23
Edlingham	0	0	0	0	0	0	0	0
Embleton's Bog	6	0	2	0	0	4	0	0
Fellend Moss	54	0	1	4	3	0	0	49
Fortherley Moss	4	0	1	0	0	*1*	*1*	*1*
Fox Earth Gill	89	13	12	18	17	20	7	21
Furness Moss	9	2	3	0	0	1	0	1
Goosetarn Beck	26	7	8	8	0	1	1	1
Graham's Moss	7	2	2	1	0	1	0	0
Great Eggleshope Beck	26	4	5	7	3	7	0	0
Greenmines	17	4	3	5	2	5	0	0
Green Swang	14	8	3	2	0	0	0	0
Hallowell Moss	0	0	0	0	0	0	0	0
Harthope Moss	27	4	8	9	6	1	4	5
Harthope Quarry	15	3	4	4	4	0	3	3
Hartlepool Bay 4 & 6	20	6	7	1	0	1	2	3
Hartlepool Slake	45	25	7	2	2	1	3	2
Hedleyhope	11	0	4	4	0	0	2	3
Herdship Fell	10	4	4	1	0	1	0	0
High Banks Moss	0	0	0	0	0	0	0	0

Table 6.3 continued.

Pollen Site Name:	(all periods)	M	N	EB	MB	LB/EIA	IA	RB
Hisehope Burn	21	0	1	18	12	0	2	2
Howden Moss	105	13	8	29	24	28	8	22
Hutton Henry	0	0	0	0	0	0	0	0
James' Hill	22	5	3	7	7	1	4	4
John's Burn	5	4	0	0	0	1	0	0
Kennel Hall Knowe	3	0	1	0	0	0	1	1
Kilhope Law	8	5	1	1	0	0	0	0
Knock Ridge	12	7	0	0	0	5	0	0
Knoutberry	9	6	1	1	0	0	0	0
Lamb Shield	1	0	0	1	0	0	0	0
Lilburn Steads	3	0	0	1	0	2	0	0
Long Crag	47	5	5	10	9	14	1	10
Longlee Moor	4	2	0	2	0	0	0	0
Long Moss	0	0	0	0	0	0	0	0
Low Stublick	4	0	1	2	0	0	1	1
Melmerby Fell	0	0	0	0	0	0	0	0
Mickle Fell	14	4	3	4	2	3	0	0
Milburn Forest	14	8	0	0	0	6	0	0
Mire Holes	88	13	9	19	17	20	8	22
Mordon Carr	14	5	1	0	0	4	4	4
Moss Mire N/S	18	8	3	3	0	1	1	2
Mown Meadows	2	0	0	2	0	0	0	0
Muckle Moss	63	0	8	2	3	3	2	49
Neasham Fen	2	0	0	0	0	0	2	2
Pawlaw Pike	20	5	1	4	5	5	0	1
Pity Me	0	0	0	0	0	0	0	0
Pow Hill	0	0	0	0	0	0	0	0
Quickcleugh	6	2	1	2	0	0	0	0
Quick Moss	19	8	5	4	0	0	1	1
Sally Grain	6	5	0	1	0	0	0	0
Scraith Head	8	6	0	2	0	0	0	0
Seven Hills	2	0	0	0	0	0	1	1
Shaking Moss	0	0	0	0	0	0	0	0
Shivery Hill	9	6	1	1	0	0	0	0
Shot Moss	0	0	0	0	0	0	0	0
Sikehead	20	0	1	17	13	1	1	1
Silverband	17	7	0	1	0	9	0	0
Site W	35	5	9	10	4	7	2	4
South Cornsay	1	0	1	0	0	0	0	0
Stanley Moss	0	0	0	0	0	0	0	0
Staple Moss	17	3	3	5	1	3	1	3
Steng Moss	21	0	2	10	5	2	6	6
Steward Shield	0	0	0	0	0	0	0	0

Table 6.3 continued.

Pollen Site Name:	all periods	M	N	EB	MB	LB/EIA	IA	RB
The Lough	3	0	1	1	0	1	0	0
Thornhope Burn	18	2	10	4	6	0	0	0
Thorpe Bulmer	0	0	0	0	0	0	0	0
Tinkler's Sike	39	5	10	9	5	10	3	5
Trickley Wood	2	0	0	0	0	2	0	0
Vindolanda	3	0	0	0	0	0	0	3
Waldridge	23	2	3	2	1	5	7	9
Wanister Bog	30	6	2	5	4	3	11	12
Weelfoot Moss	30	5	9	7	3	5	2	4
Weelhead Moss	28	6	8	7	4	7	0	0
West Hartlepool 3	18	6	6	1	0	1	1	2
West Hartlepool 19	21	5	7	1	0	1	3	3
White House	26	7	8	8	0	1	1	1
Whitfield Lough	0	0	0	0	0	0	0	0
Woldgill Burn	0	0	0	0	0	0	0	0
Wolfscleugh	14	5	5	2	0	0	1	1
Wolsingham Park	6	0	4	1	1	0	0	0
Woodland	7	2	0	1	0	0	4	4
Wooler Water	159	0	11	80	24	62	6	6

Key to column headings:

M	Mesolithic
N	Neolithic
EB	Early Bronze Age
MB	Middle Bronze Age
LB/EIA	Late Bronze Age and earliest Iron Age
IA	Iron Age
RB	Roman period

Table 6.3 Number of each type of Mesolithic and Neolithic archaeological site in each pollen catchment area.

Pollen Site Name:	Mesolithic	Neolithic				
	lithics	lithics	stone axe	monument	burial	pottery
Akeld Steads	0	0	1	1	0	0
Arngill Head Brocks	5	0	4	0	0	0
Bellow Moss	2	1	2	0	0	0
Bishop Middleham	0	0	0	0	0	0
Black Band	5	0	4	0	0	0
Black Hill	5	0	8	0	0	0
Black Lough	0	1	5	0	0	0
Black Rigg	0	0	0	0	0	0
Blackshiel Bog	0	0	0	0	0	0
Bollihope Bog	0	0	0	0	0	0
Burnhope Burn	0	0	0	0	0	0
Camp Hill Moss	1	1	5	0	0	0
Cold Fell	0	0	0	0	0	0
Coom Rigg	0	0	0	1	0	0
Cowpen Marsh	1	0	0	0	0	0
Cranberry Bog	0	0	0	0	0	0
Cronkley Fell	15	0	13	0	1	0
Cronkley Pastures	0	0	0	0	0	0
Crook Burn	4	0	0	0	0	0
Cuthbert's Hill	0	2	0	0	0	0
Dead Crook	6	0	6	0	0	0
Dubby Moss	8	0	6	0	0	0
Dufton Moss	13	0	11	0	0	0
Edlingham	0	0	0	0	0	0
Embleton's Bog	0	0	1	0	0	1
Fellend Moss	0	0	1	0	0	0
Fortherley Moss	0	1	1	0	0	0
Fox Earth Gill	13	0	11	0	1	0
Furness Moss	2	2	2	0	0	1
Goosetarn Beck	7	0	6	2	0	0
Graham's Moss	2	1	2	0	0	0
Great Eggleshope	4	3	4	1	0	0
Greenmines	4	0	3	0	0	0
Green Swang	8	1	3	0	0	0
Hallowell Moss	0	0	0	0	0	0
Harthope Moss	4	0	7	0	1	0
Harthope Quarry	3	0	2	1	1	0
Hartlepool Bay 4 & 6	6	1	4	0	2	1

Table 6.3 continued.

Pollen Site Name:	Mesolithic	Neolithic				
	lithics	lithics axe	stone	monument	burial	pottery
Hartlepool Slake	25	4	5	0	2	0
Hedleyhope	0	0	4	0	0	0
Herdship Fell	4	0	4	0	0	0
High Banks Moss	0	0	0	0	0	0
Hisehope Burn	0	0	1	0	0	0
Howden Moss	13	0	7	0	1	0
Hutton Henry	0	0	0	0	0	0
James' Hill	5	1	2	1	0	0
John's Burn	4	0	0	0	0	0
Kennel Hall Knowe	0	1	1	0	0	0
Kilhope Law	5	1	1	0	0	0
Knock Ridge	7	0	0	0	0	0
Knoutberry	6	1	1	0	0	0
Lamb Shield	0	0	0	0	0	0
Lilburn Steads	0	0	0	0	0	0
Long Crag	5	0	5	0	0	0
Longlee Moor	2	0	0	0	0	0
Long Moss	0	0	0	0	0	0
Low Stublick	0	0	1	0	0	0
Melmerby Fell	0	0	0	0	0	0
Mickle Fell	4	0	3	0	0	0
Milburn Forest	8	0	0	0	0	0
Mire Holes	13	0	8	0	1	0
Mordon Carr	5	0	1	0	0	0
Moss Mire North/South	8	0	3	0	0	0
Mown Meadows	0	0	0	0	0	0
Muckle Moss	0	0	3	5	0	0
Neasham Fen	0	0	0	0	0	0
Pawlaw Pike	5	2	1	0	0	0
Pity Me	0	0	0	0	0	0
Pow Hill	0	0	0	0	0	0
Quickcleugh	2	1	1	0	0	0
Quick Moss	8	1	4	0	1	0
Sally Grain	5	0	0	0	0	0
Scraith Head	6	0	0	0	0	0
Seven Hills	0	0	0	0	0	0
Shaking Moss	0	0	0	0	0	0
Shivery Hill	6	1	1	0	0	0
Shot Moss	0	0	0	0	0	0

Table 6.3 continued.

Pollen Site Name:	Mesolithic	Neolithic				
	lithics	lithics	stone axe	monument	burial	pottery
Sikehead	0	0	1	0	0	0
Silverband	7	0	0	0	0	0
Site W	5	0	9	0	0	0
South Cornsay	0	0	1	0	0	0
Stanley Moss	0	0	0	0	0	0
Staple Moss	3	0	3	0	0	0
Steng Moss	0	0	2	0	0	0
Steward Shield Meadow	0	0	0	0	0	0
The Lough	0	0	1	0	0	0
Thornhope Burn	2	0	10	0	0	0
Thorpe Bulmer	0	0	0	0	0	0
Tinkler's Sike	5	0	10	0	0	0
Trickley Wood	0	0	0	0	0	0
Vindolanda	0	0	0	0	0	0
Waldridge	2	0	3	0	0	0
Wanister Bog	6	1	2	0	0	0
Weelfoot Moss	5	0	9	0	0	0
Weelhead Moss	6	0	8	0	0	0
West Hartlepool 3	6	1	4	0	1	1
West Hartlepool 19	5	1	4	0	2	1
White House	7	0	6	2	0	0
Whitfield Lough	0	0	0	0	0	0
Woldgill Burn	0	0	0	0	0	0
Wolfscleugh	5	1	5	0	0	0
Wolsingham Park Moor	0	0	4	0	0	0
Woodland	2	0	0	0	0	0
Wooler Water	0	0	7	4	0	0

Table 6.4 Number of each type of Bronze Age and earliest Iron Age archaeological site in each pollen catchment area.

Pollen Site Name:	EBA/MBA			LBA/EIA		
	pottery	metalwork	lithics	pottery	metalwork	settlement
Akeld Steads	0	0	0	0	0	0
Arngill Head Brocks	0	2	1	1	0	9
Bellow Moss	0	0	0	0	0	0
Bishop Middleham	0	0	0	0	0	0
Black Band	0	0	0	0	0	6
Black Hill	0	0	0	0	0	7
Black Lough	0	0	0	0	2	7
Black Rigg	0	0	0	0	0	0
Blackshiel Bog	0	0	0	0	0	0
Bollihope Bog	0	0	0	0	0	0
Burnhope Burn	0	0	0	0	0	1
Camp Hill Moss	0	0	0	0	0	2
Cold Fell	0	0	0	0	0	0
Coom Rigg	0	0	0	0	0	0
Cowpen Marsh	0	1	0	0	2	0
Cranberry Bog	0	0	0	0	0	1
Cronkley Fell	0	2	2	1	0	26
Cronkley Pastures	0	0	0	0	0	2
Crook Burn	0	0	0	0	0	1
Cuthbert's Hill	0	0	1	0	0	5
Dead Crook	0	0	0	0	0	7
Dubby Moss	0	0	0	0	0	3
Dufton Moss	0	1	1	1	0	22
Edlingham	0	0	0	0	0	0
Embleton's Bog	0	0	0	0	1	2
Fellend Moss	0	0	0	0	0	0
Fortherley Moss	0	0	0	0	1	0
Fox Earth Gill	0	2	1	1	0	19
Furness Moss	0	0	0	0	1	0
Goosetarn Beck	0	0	0	0	0	1
Graham's Moss	0	0	0	0	1	0
Great Eggleshope Beck	0	0	0	0	1	5
Greenmines	0	0	0	0	0	5
Green Swang	0	0	0	0	0	0
Hallowell Moss	0	0	0	0	0	0
Harthope Moss	0	0	0	0	0	1
Harthope Quarry	0	1	0	0	0	0
Hartlepool Bay 4 & 6	0	0	0	1	0	0
Hartlepool Slake	0	0	1	1	0	0
Hedleyhope	0	0	0	0	0	0

Table 6.4 continued.

Pollen Site Name:	EBA/MBA			LBA/EIA		
	pottery	metalwork	lithics	pottery	metalwork	settlement
Herdship Fell	0	0	0	0	0	1
High Banks Moss	0	0	0	0	0	0
Hisehope Burn	0	0	0	0	0	0
Howden Moss	0	2	1	1	0	27
Hutton Henry	0	0	0	0	0	0
James' Hill	0	0	1	0	0	1
John's Burn	0	0	0	0	0	1
Kennel Hall Knowe	0	0	0	0	0	0
Kilhope Law	0	0	0	0	0	0
Knock Ridge	0	0	0	0	0	5
Knoutberry	0	0	0	0	0	0
Lamb Shield	0	0	0	0	0	0
Lilburn Steads	0	0	0	0	0	2
Long Crag	0	2	1	1	0	13
Longlee Moor	0	0	0	0	0	0
Long Moss	0	0	0	0	0	0
Low Stublick	0	0	0	0	0	0
Melmerby Fell	0	0	0	0	0	0
Mickle Fell	0	0	0	0	0	3
Milburn Forest	0	0	0	0	0	6
Mire Holes	0	2	1	1	0	19
Mordon Carr	0	0	0	0	2	2
Moss Mire North/South	0	0	0	0	0	1
Mown Meadows	0	0	0	0	0	0
Muckle Moss	0	1	0	0	0	3
Neasham Fen	0	0	0	0	0	0
Pawlaw Pike	0	1	1	0	0	5
Pity Me	0	0	0	0	0	0
Pow Hill	0	0	0	0	0	0
Quickcleugh	0	0	0	0	0	0
Quick Moss	0	0	0	0	0	0
Sally Grain	0	0	0	0	0	0
Scraith Head	0	0	0	0	0	0
Seven Hills	0	0	0	0	0	0
Shaking Moss	0	0	0	0	0	0
Shivery Hill	0	0	0	0	0	0
Shot Moss	0	0	0	0	0	0
Sikehead	0	0	0	0	0	1
Silverband	0	0	0	0	0	9
Site W	0	0	0	0	0	7
South Cornsay	0	0	0	0	0	0

Table 6.4 continued.

Pollen Site Name:	EBA/MBA			LBA/EIA		
	pottery	metalwork	lithics	pottery	metalwork	settlement
Stanley Moss	0	0	0	0	0	0
Staple Moss	0	0	0	0	0	3
Steng Moss	0	1	0	0	0	1
Steward Shield	0	0	0	0	0	0
The Lough	0	0	0	0	1	0
Thornhope Burn	0	2	0	0	0	0
Thorpe Bulmer	0	0	0	0	0	0
Tinkler's Sike	0	0	0	1	0	9
Trickley Wood	0	0	0	0	0	2
Vindolanda	0	0	0	0	0	0
Waldridge	0	1	0	0	0	5
Wanister Bog	0	1	0	0	1	2
Weelfoot Moss	0	0	0	0	0	5
Weelhead Moss	0	0	0	0	0	7
West Hartlepool 3	0	0	0	1	0	0
West Hartlepool 19	0	0	0	1	0	0
White House	0	0	0	0	0	1
Whitfield Lough	0	0	0	0	0	0
Woldgill Burn	0	0	0	0	0	0
Wolfscleugh	0	0	0	0	0	0
Wolsingham Park Moor	0	1	0	0	0	0
Woodland	0	0	0	0	0	0
Wooler Water	0	0	0	0	0	61

Table 6.5 Number of each type of Iron Age archaeological site in each pollen catchment area.

Pollen Site Name:	metalwork	pottery	querns	burial	settlement
Akeld Steads	0	0	0	0	0
Arngill Head Brocks	0	0	1	0	1
Bellow Moss	0	0	0	0	0
Bishop Middleham	0	0	0	1	0
Black Band	0	0	0	0	0
Black Hill	0	0	0	0	0
Black Lough	0	0	0	0	0
Black Rigg	0	0	0	0	0
Blackshiel Bog	0	0	0	0	0
Bollihope Bog	0	0	0	0	0
Burnhope Burn	0	0	0	0	0
Camp Hill Moss	0	0	0	0	0
Cold Fell	0	0	0	0	0
Coom Rigg	0	0	0	0	0
Cowpen Marsh	0	0	0	0	0
Cranberry Bog	0	0	0	0	1
Cronkley Fell	0	1	2	0	7
Cronkley Pastures	0	0	0	0	0
Crook Burn	0	0	0	0	0
Cuthbert's Hill	0	0	0	0	0
Dead Crook	0	0	0	0	0
Dubby Moss	0	0	0	0	0
Dufton Moss	0	1	1	0	6
Edlingham	0	0	0	0	0
Embleton's Bog	0	0	0	0	0
Fellend Moss	0	0	0	0	0
Fortherley Moss	0	0	0	0	1
Fox Earth Gill	0	1	1	0	5
Furness Moss	0	0	0	0	0
Goosetarn Beck	0	0	1	0	0
Graham's Moss	0	0	0	0	0
Great Eggleshope Beck	0	0	0	0	0
Greenmines	0	0	0	0	0
Green Swang	0	0	0	0	0
Hallowell Moss	0	0	0	0	0
Harthope Moss	0	0	0	0	4
Harthope Quarry	0	0	0	0	3
Hartlepool Bay 4 & 6	0	1	0	0	1
Hartlepool Slake	0	2	0	1	0
Hedleyhope	0	0	0	0	2
Herdship Fell	0	0	0	0	0
High Banks Moss	0	0	0	0	0

Table 6.5 continued.

Pollen Site Name:	metalwork	pottery	querns	burial	settlement
Hisehope Burn	0	0	0	0	2
Howden Moss	0	1	1	0	6
Hutton Henry	0	0	0	0	0
James' Hill	0	0	0	0	4
John's Burn	0	0	0	0	0
Kennel Hall Knowe	0	0	0	0	1
Kilhope Law	0	0	0	0	0
Knock Ridge	0	0	0	0	0
Knoutberry	0	0	0	0	0
Lamb Shield	0	0	0	0	0
Lilburn Steads	0	0	0	0	0
Long Crag	0	0	0	0	1
Longlee Moor	0	0	0	0	0
Long Moss	0	0	0	0	0
Low Stublick	0	0	0	0	1
Melmerby Fell	0	0	0	0	0
Mickle Fell	0	0	0	0	0
Milburn Forest	0	0	0	0	0
Mire Holes	0	1	1	0	6
Mordon Carr	0	0	0	0	4
Moss Mire North/South	0	0	1	0	0
Mown Meadows	0	0	0	0	0
Muckle Moss	0	0	0	0	2
Neasham Fen	0	0	0	0	2
Pawlaw Pike	0	0	0	0	0
Pity Me	0	0	0	0	0
Pow Hill	0	0	0	0	0
Quickcleugh	0	0	0	0	0
Quick Moss	0	0	0	0	1
Sally Grain	0	0	0	0	0
Scraith Head	0	0	0	0	0
Seven Hills	1	0	0	0	0
Shaking Moss	0	0	0	0	0
Shivery Hill	0	0	0	0	0
Shot Moss	0	0	0	0	0
Sikehead	0	0	0	0	1
Silverband	0	0	0	0	0
Site W	0	0	0	0	2
South Cornsay	0	0	0	0	0
Stanley Moss	0	0	0	0	0
Staple Moss	0	0	0	0	1
Steng Moss	0	0	0	0	6
Steward Shield Meadow	0	0	0	0	0

Table 6.5 continued.

Pollen Site Name:	metalwork	pottery	querns	burial	settlement
The Lough	0	0	0	0	0
Thornhope Burn	0	0	0	0	0
Thorpe Bulmer	0	0	0	0	0
Tinkler's Sike	0	0	0	0	3
Trickley Wood	0	0	0	0	0
Vindolanda	0	0	0	0	0
Waldridge	0	0	1	0	6
Wanister Bog	0	0	0	0	11
Weelfoot Moss	0	0	0	0	2
Weelhead Moss	0	0	0	0	0
West Hartlepool 3	0	1	0	0	0
West Hartlepool 19	0	2	0	1	0
White House	0	0	1	0	0
Whitfield Lough	0	0	0	0	0
Woldgill Burn	0	0	0	0	0
Wolfscleugh	0	0	0	0	1
Wolsingham Park Moor	0	0	0	0	0
Woodland	0	0	0	0	4
Wooler Water	0	0	0	0	6

Table 6.6 Number of archaeological sites in pollen catchment area, Roman period.

Pollen Site Name:	military	roads	industrial	settlement	querns	metalwork
Akeld Steads	0	0	0	0	0	0
Arngill Head Brocks	0	0	0	0	1	1
Bellow Moss	0	0	0	0	0	0
Bishop Middleham	0	0	0	0	0	0
Black Band	0	0	0	0	0	1
Black Hill	0	0	0	0	0	1
Black Lough	2	0	0	0	0	0
Black Rigg	0	0	0	0	0	0
Blackshiel Bog	0	0	0	0	0	0
Bollihope Bog	0	0	0	0	0	0
Burnhope Burn	0	0	0	0	0	0
Camp Hill Moss	0	0	0	0	0	0
Cold Fell	0	0	0	0	0	0
Coom Rigg	0	0	0	0	0	0
Cowpen Marsh	0	0	0	0	0	0
Cranberry Bog	0	0	0	0	0	0
Cronkley Fell	0	0	1	0	12	2
Cronkley Pastures	0	0	0	0	0	0
Crook Burn	0	0	0	0	0	0
Cuthbert's Hill	0	0	0	0	0	0
Dead Crook	0	0	0	0	0	0
Dubby Moss	0	0	0	0	0	0
Dufton Moss	0	0	1	0	14	2
Edlingham	0	0	0	0	0	0
Embleton's Bog	0	0	0	0	0	0
Fellend Moss	41	3	0	2	0	0
Fortherley Moss	0	0	0	0	0	0
Fox Earth Gill	0	0	1	0	13	2
Furness Moss	1	0	0	0	0	0
Goosetarn Beck	0	0	0	0	1	0
Graham's Moss	0	0	0	0	0	0
Great Eggleshope Beck	0	0	0	0	0	0
Greenmines	0	0	0	0	0	0
Green Swang	0	0	0	0	0	0
Hallowell Moss	0	0	0	0	0	0
Harthope Moss	0	0	0	0	1	0
Harthope Quarry	0	0	0	0	0	0
Hartlepool Bay 4 & 6	0	0	0	0	2	0
Hartlepool Slake	0	0	0	0	2	0
Hedleyhope	0	0	0	1	0	0
Herdship Fell	0	0	0	0	0	0
High Banks Moss	0	0	0	0	0	0
Hisehope Burn	0	0	0	0	0	0

Table 6.6 continued.

Pollen Site Name:	military	roads	industrial	settlement	querns	metalwork
Howden Moss	0	0	1	0	13	2
Hutton Henry	0	0	0	0	0	0
James' Hill	0	0	0	0	0	0
John's Burn	0	0	0	0	0	0
Kennel Hall Knowe	0	0	0	0	0	0
Kilhope Law	0	0	0	0	0	0
Knock Ridge	0	0	0	0	0	0
Knoutberry	0	0	0	0	0	0
Lamb Shield	0	0	0	0	0	0
Lilburn Steads	0	0	0	0	0	0
Long Crag	0	0	0	0	8	1
Longlee Moor	0	0	0	0	0	0
Long Moss	0	0	0	0	0	0
Low Stublick	0	0	0	0	0	0
Melmerby Fell	0	0	0	0	0	0
Mickle Fell	0	0	0	0	0	0
Milburn Forest	0	0	0	0	0	0
Mire Holes	0	0	1	0	13	2
Mordon Carr	0	0	0	0	0	0
Moss Mire North/South	0	0	0	0	2	0
Mown Meadows	0	0	0	0	0	0
Muckle Moss	32	5	4	1	0	0
Neasham Fen	0	0	0	0	0	0
Pawlaw Pike	0	0	1	0	0	0
Pity Me	0	0	0	0	0	0
Pow Hill	0	0	0	0	0	0
Quickcleugh	0	0	0	0	0	0
Quick Moss	0	0	0	0	0	0
Sally Grain	0	0	0	0	0	0
Scraith Head	0	0	0	0	0	0
Seven Hills	0	0	0	1	0	0
Shaking Moss	0	0	0	0	0	0
Shivery Hill	0	0	0	0	0	0
Shot Moss	0	0	0	0	0	0
Sikehead	0	0	0	0	0	0
Silverband	0	0	0	0	0	0
Site W	0	0	0	0	1	1
South Cornsay	0	0	0	0	0	0
Stanley Moss	0	0	0	0	0	0
Staple Moss	0	0	0	0	1	1
Steng Moss	0	0	0	0	0	0
Steward Shield Meadow	0	0	0	0	0	0
The Lough	0	0	0	0	0	0

Table 6.6 continued.

Pollen Site Name:	military	roads	industrial	settlement	querns	metalwork
Thornhope Burn	0	0	0	0	0	0
Thorpe Bulmer	0	0	0	0	0	0
Tinkler's Sike	0	0	0	0	1	1
Trickley Wood	0	0	0	0	0	0
Vindolanda	1	0	0	0	0	0
Waldridge	0	0	0	0	3	0
Wanister Bog	0	0	1	0	0	0
Weelfoot Moss	0	0	0	0	1	1
Weelhead Moss	0	0	0	0	0	0
West Hartlepool 3	0	0	0	1	1	0
West Hartlepool 19	0	0	0	1	2	0
White House	0	0	0	0	1	0
Whitfield Lough	0	0	0	0	0	0
Woldgill Burn	0	0	0	0	0	0
Wolfscleugh	0	0	0	0	0	0
Wolsingham Park Moor	0	0	0	0	0	0
Woodland	0	0	0	0	0	0
Wooler Water	0	0	0	0	0	0

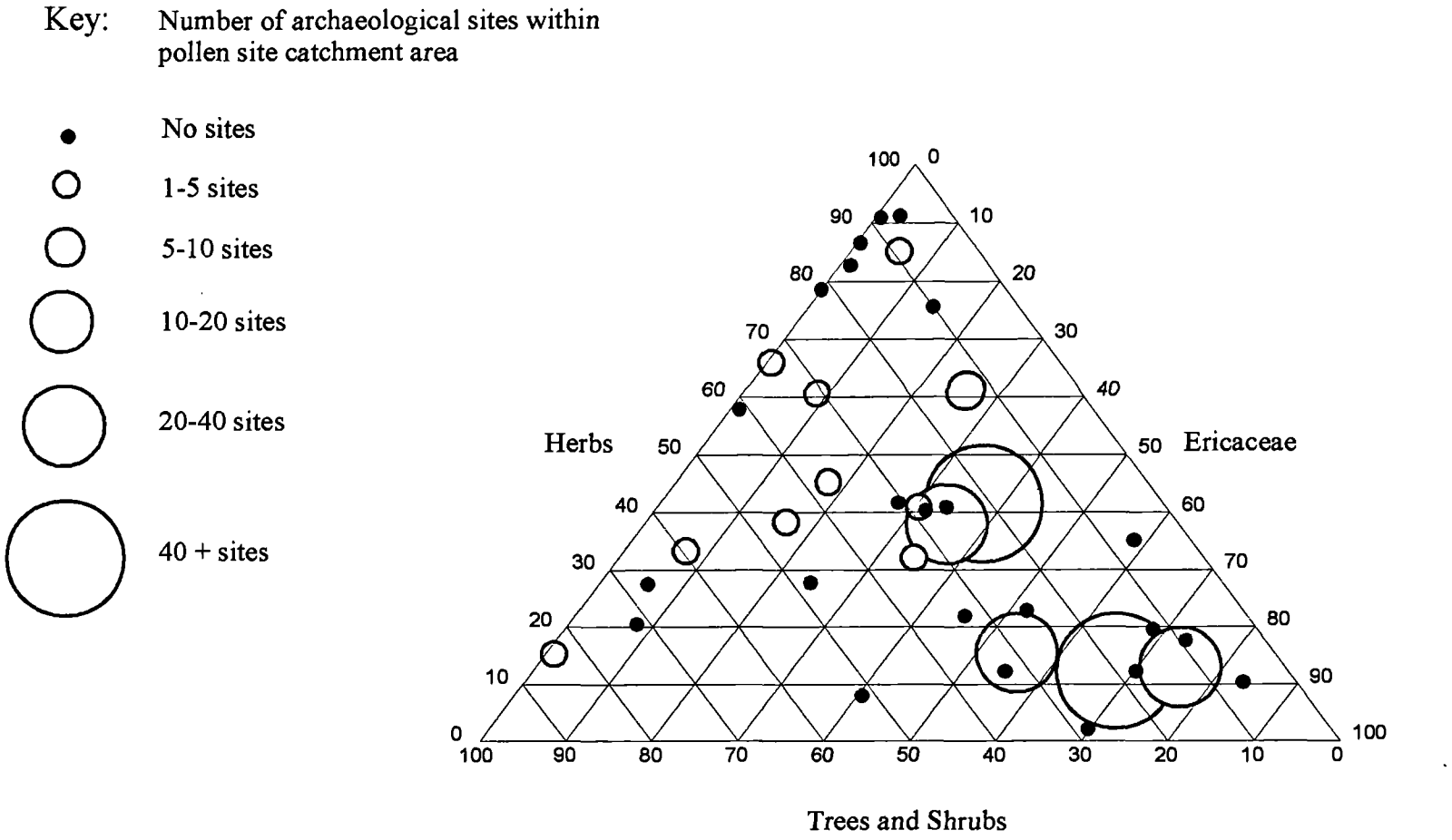
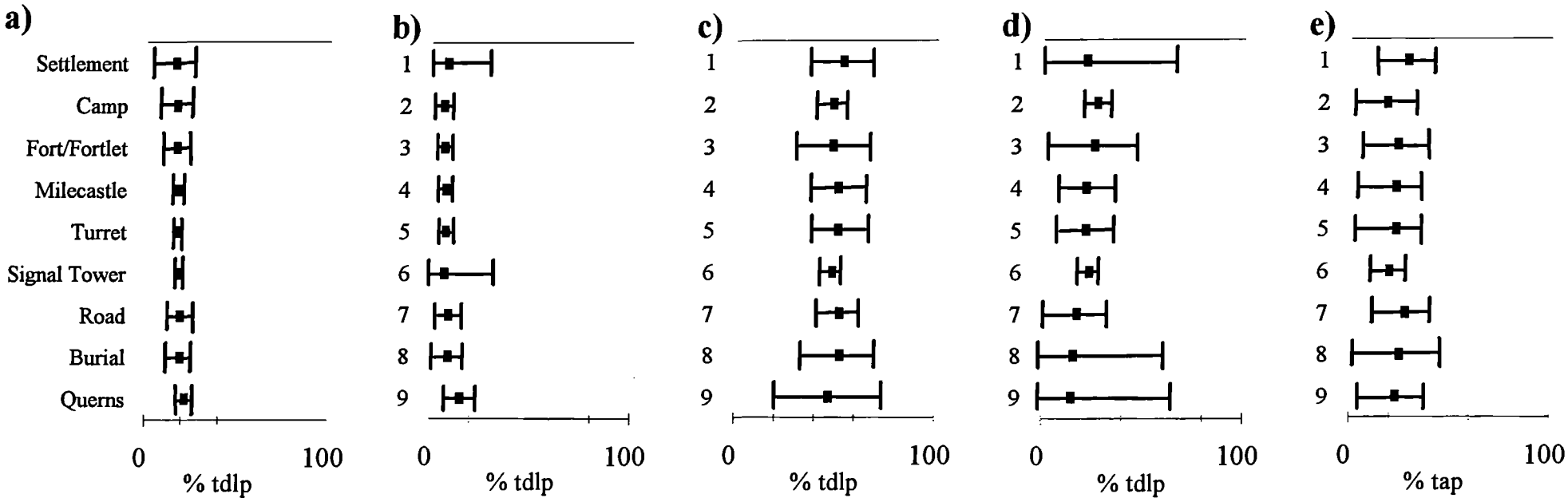


Fig. 6.1 Example of a triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values (expressed as a p ercentage of total dry land pollen.)

Fig. 6.2 Sample graphs showing the presentation of mean interpolated pollen values for different classes of archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

Tables and Figures for

Chapter 8

Results II: Combined pollen and archaeological approaches for reconstructing settlement and land-use

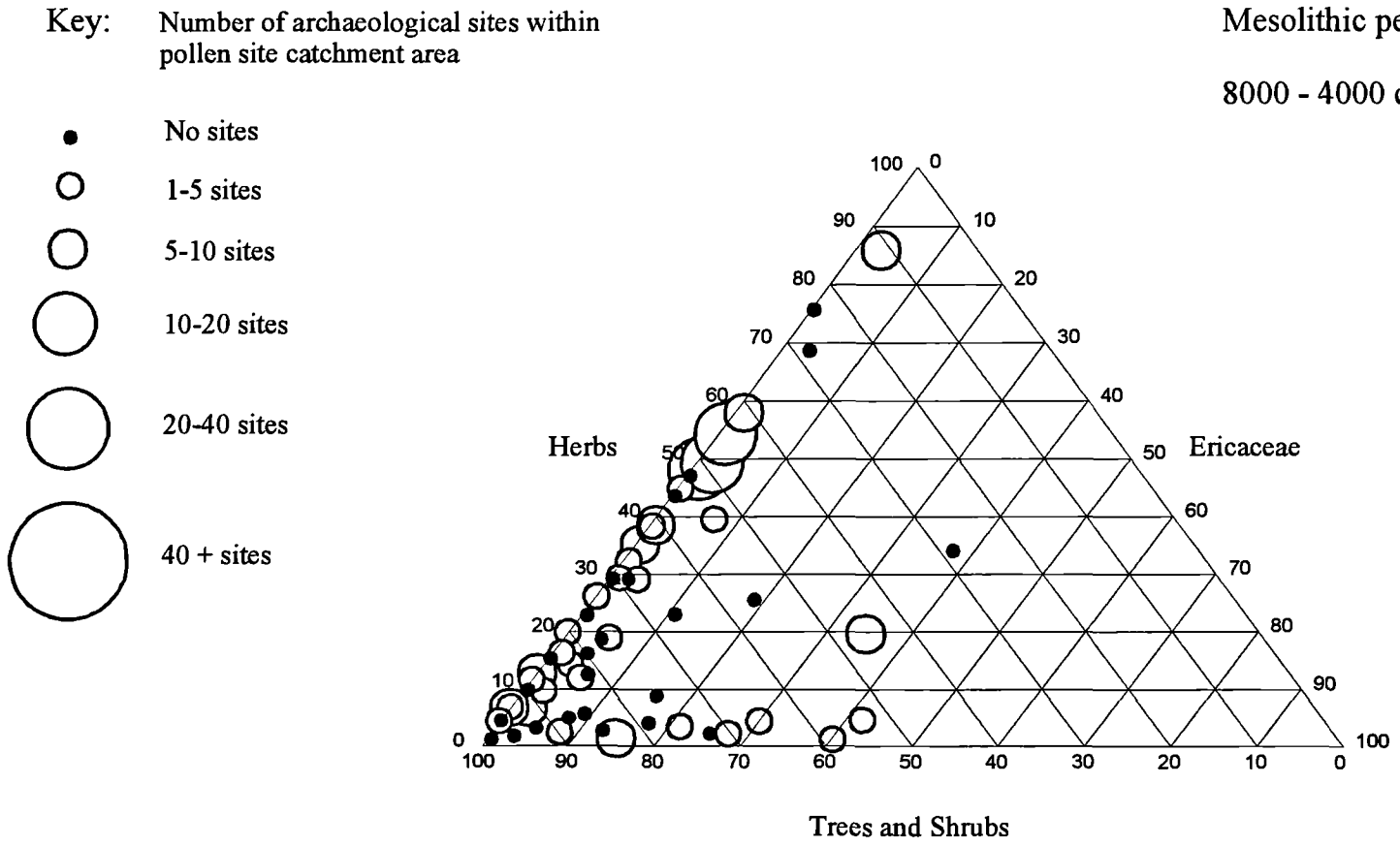
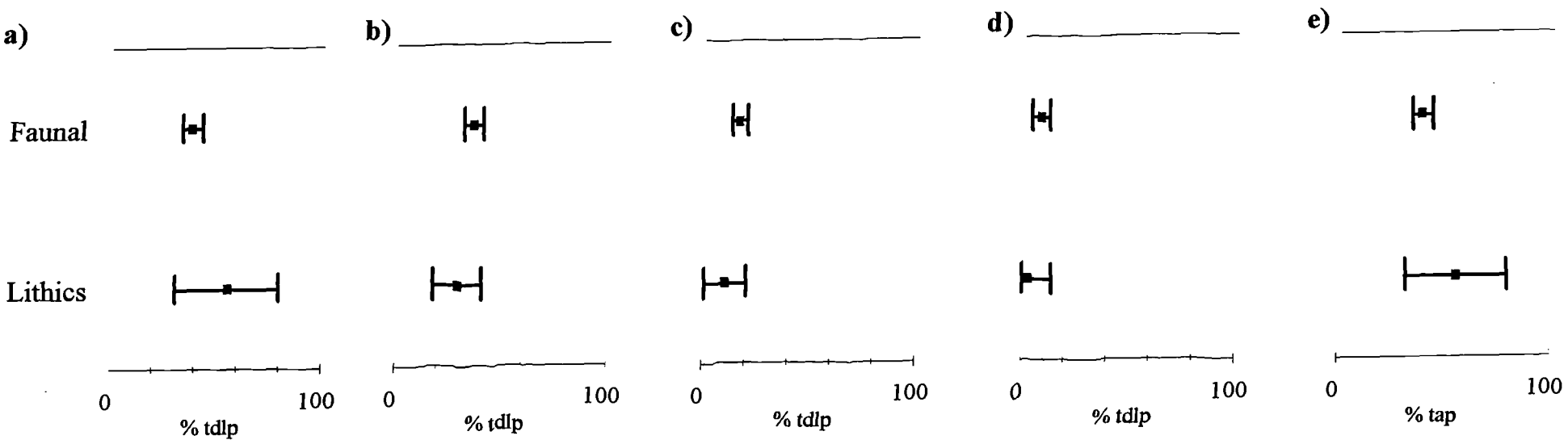


Fig. 8.1 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the Mesolithic period (expressed as a percentage of total dry land pollen.)

Fig. 8.2 Mean interpolated pollen values for different classes of Mesolithic archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

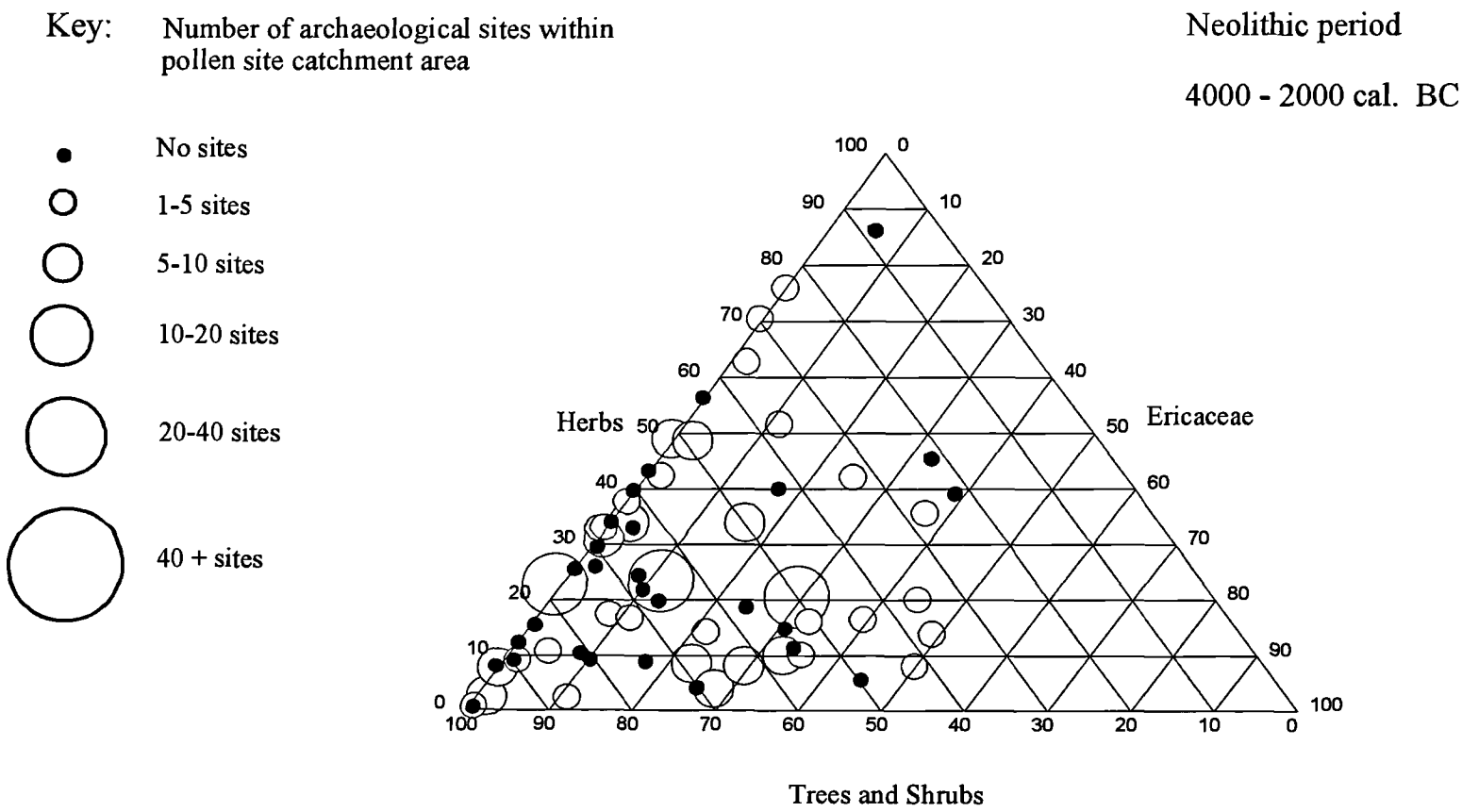
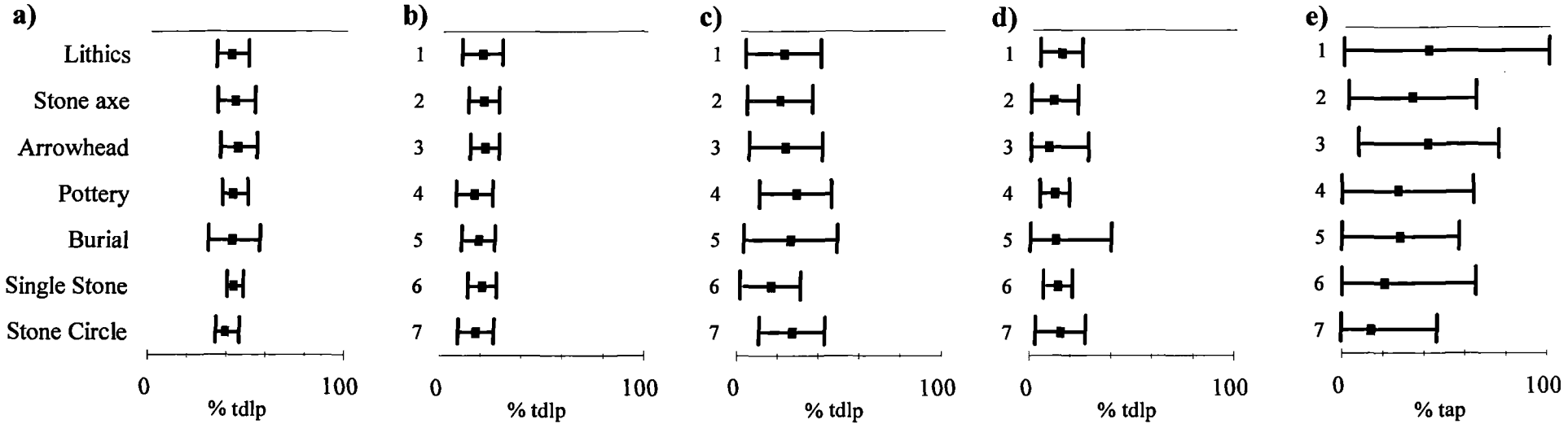


Fig. 8.3 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the Neolithic period (expressed as a percentage of total dry land pollen.)

Fig. 8.4 Mean interpolated pollen values for different classes of Neolithic archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

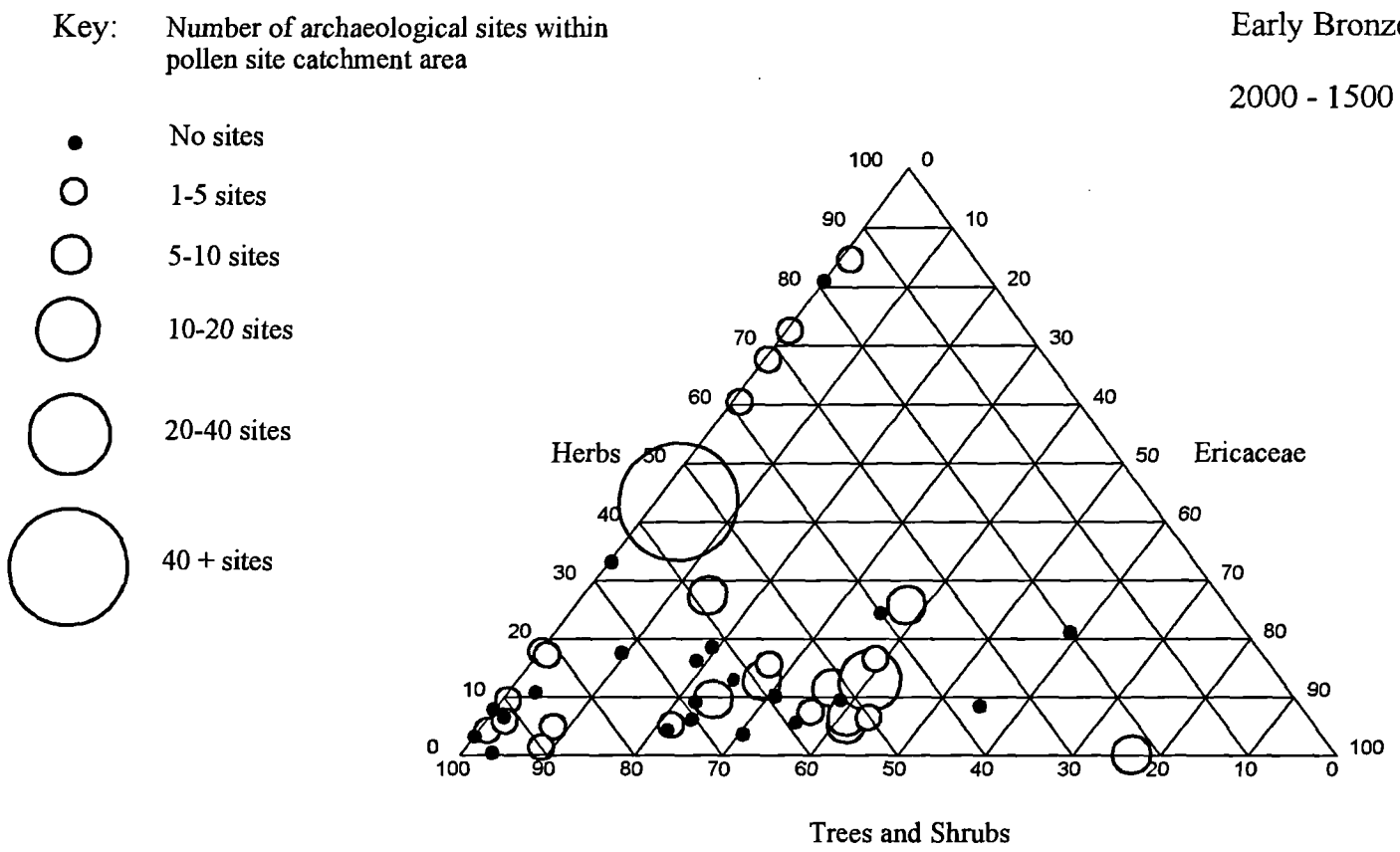


Fig. 8.5 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the early Bronze Age period (expressed as a percentage of total dry land pollen.)

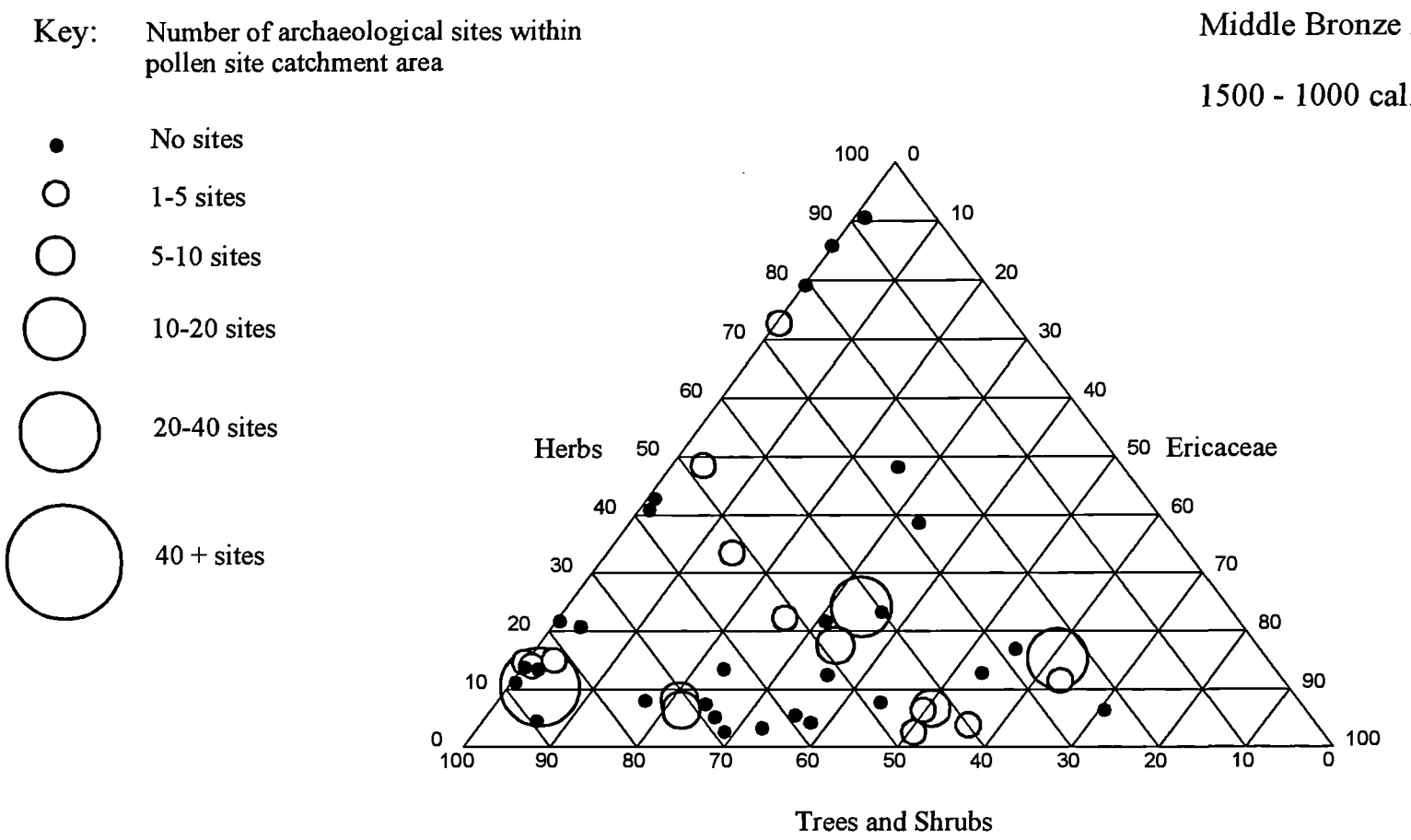


Fig. 8.6 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the middle Bronze Age period (expressed as a percentage of total dry land pollen.)

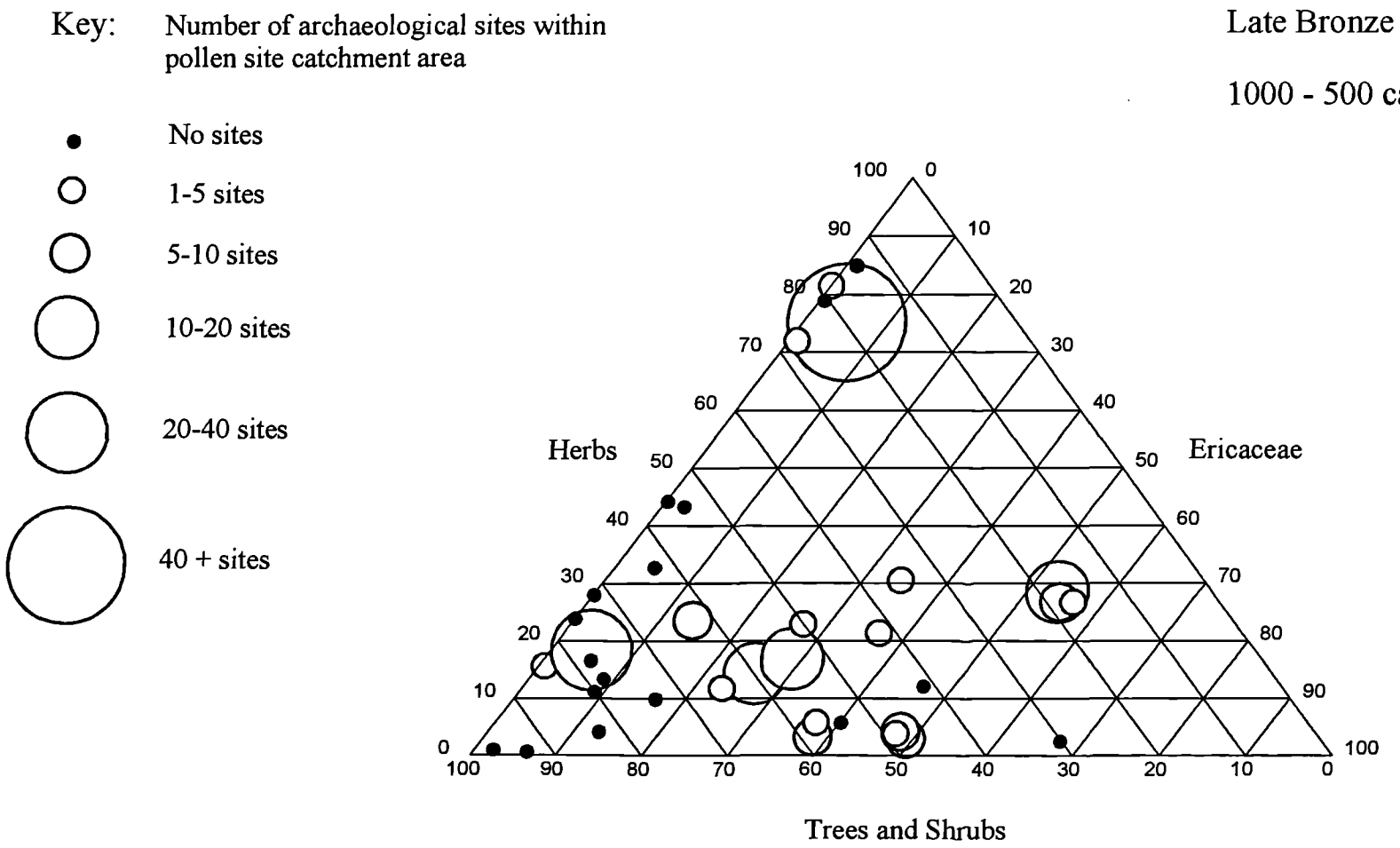
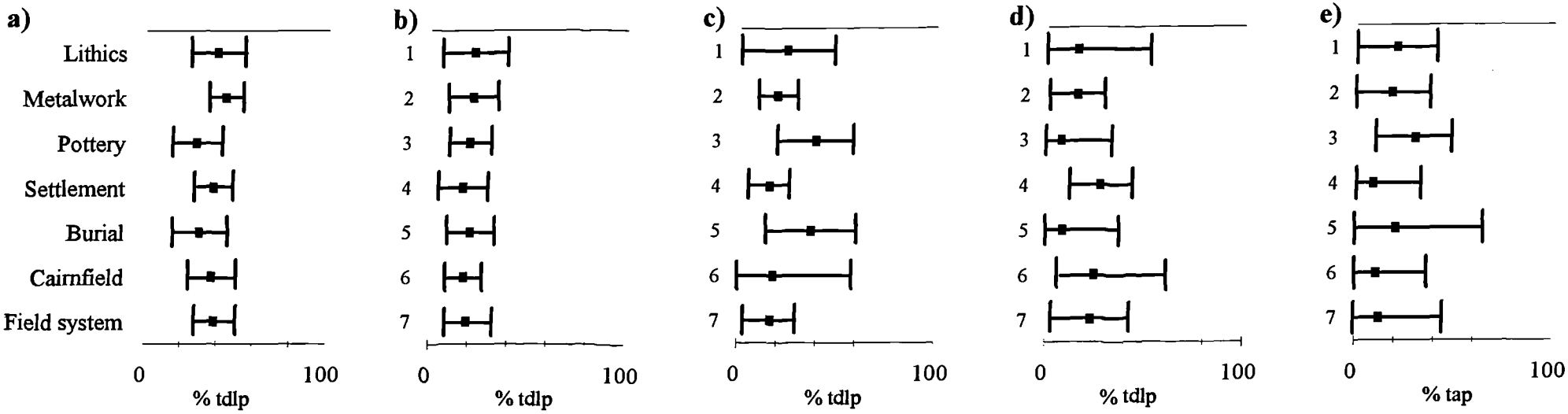


Fig. 8.7 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the late Bronze Age period (expressed as a percentage of total dry land pollen.)

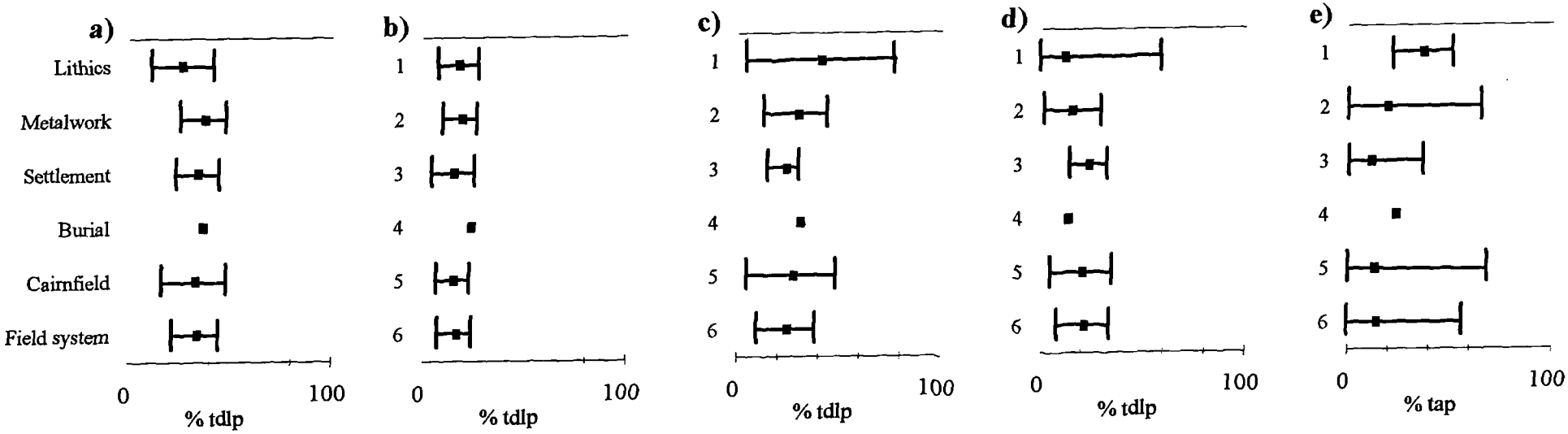
Fig. 8.8 Mean interpolated pollen values for different classes of early Bronze Age archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

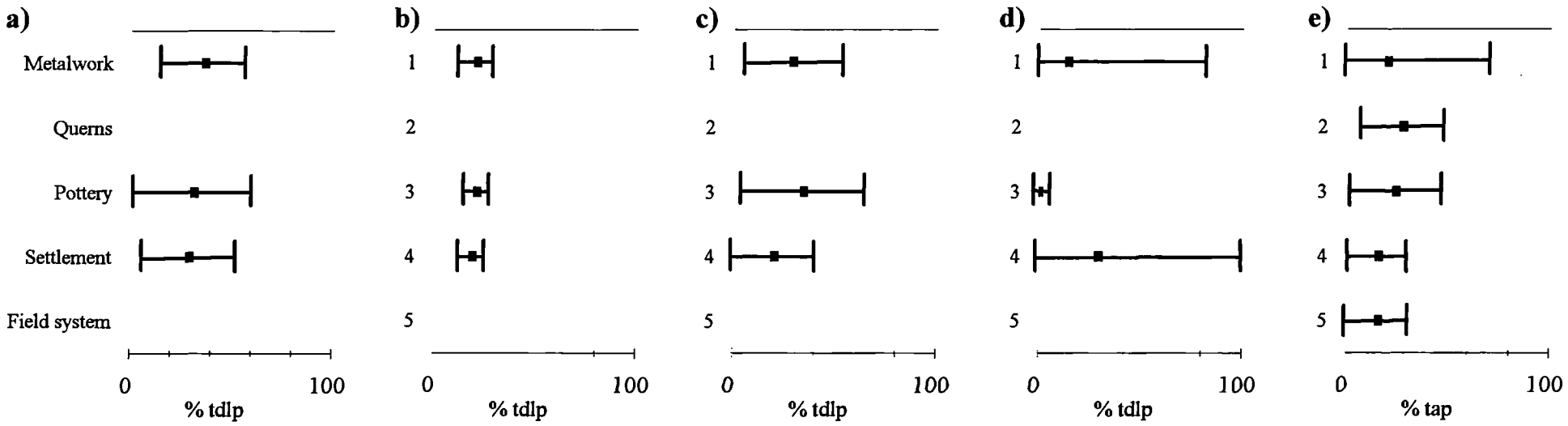
Fig. 8.9 Mean interpolated pollen values for different classes of middle Bronze Age archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

Fig. 8.10 Mean interpolated pollen values for different classes of late Bronze Age archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

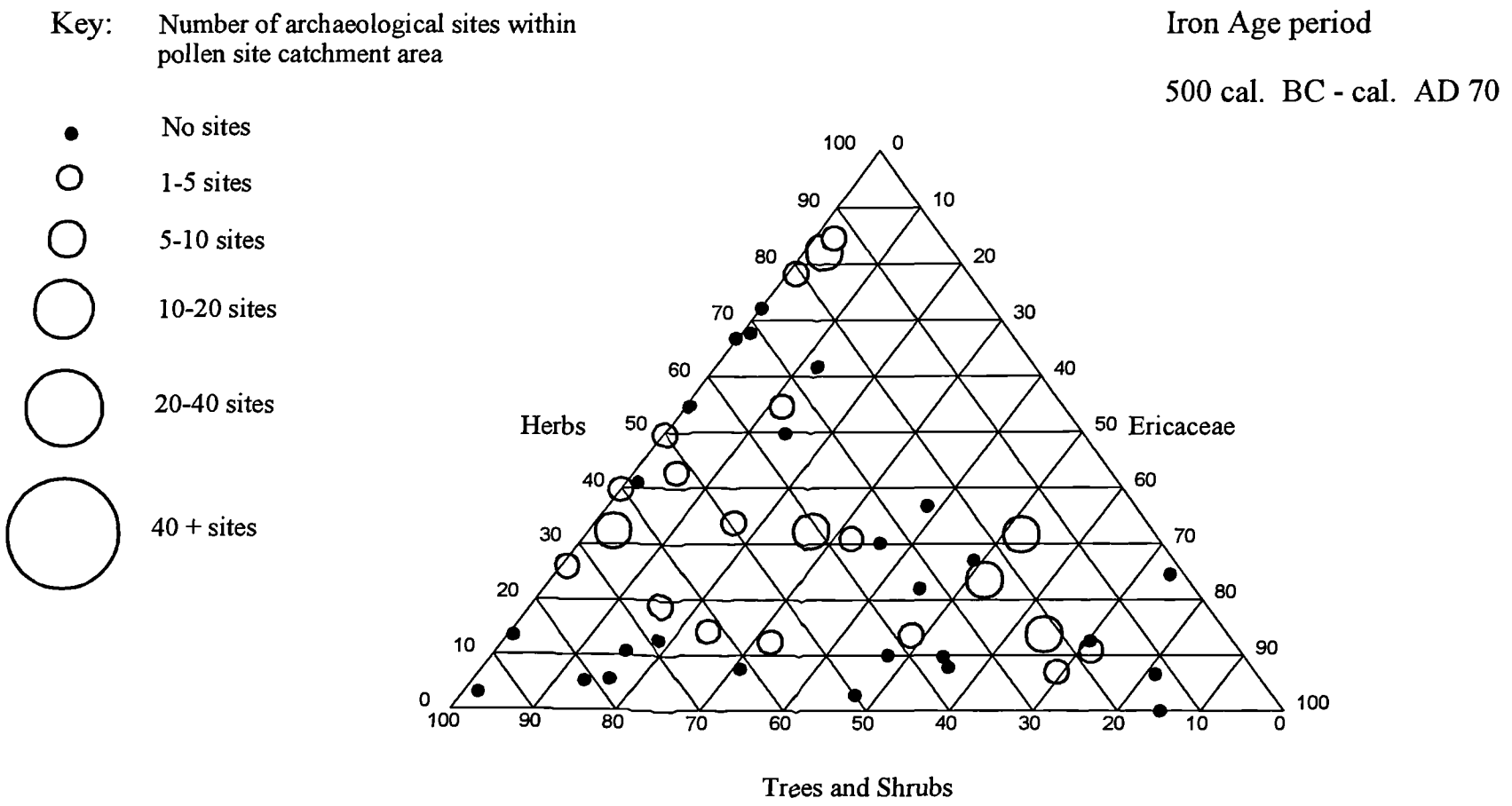


Fig. 8.11 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the Iron Age period (expressed as a percentage of total dry land pollen.)

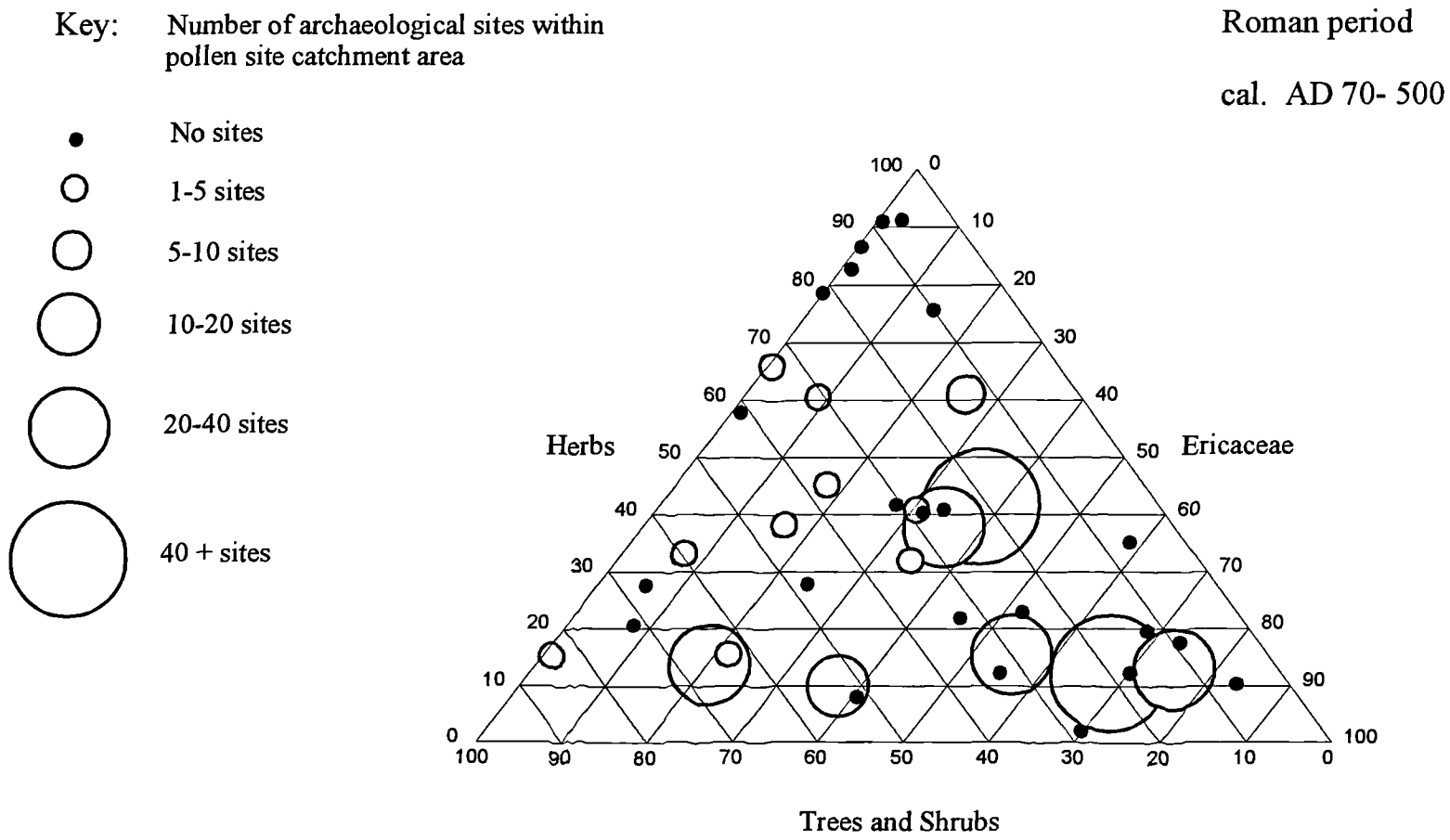
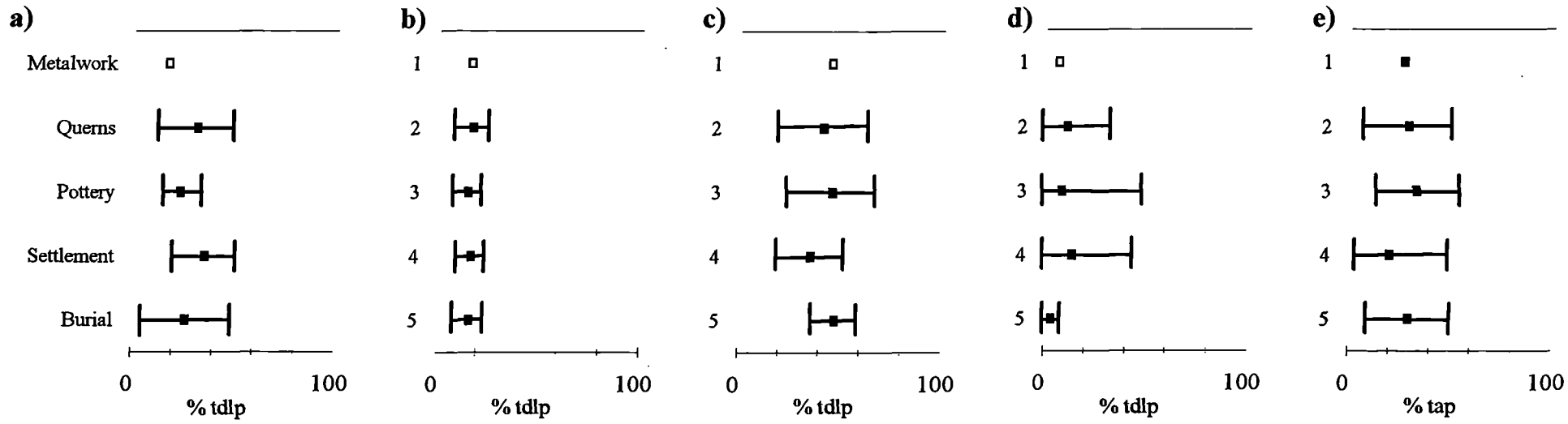


Fig. 8.12 Triangular ordination plot showing the relationship between number of archaeological sites within the catchment area of each pollen site and averaged tree and shrub, herb and Ericaceae pollen values for the Roman period (expressed as a percentage of total dry land pollen.)

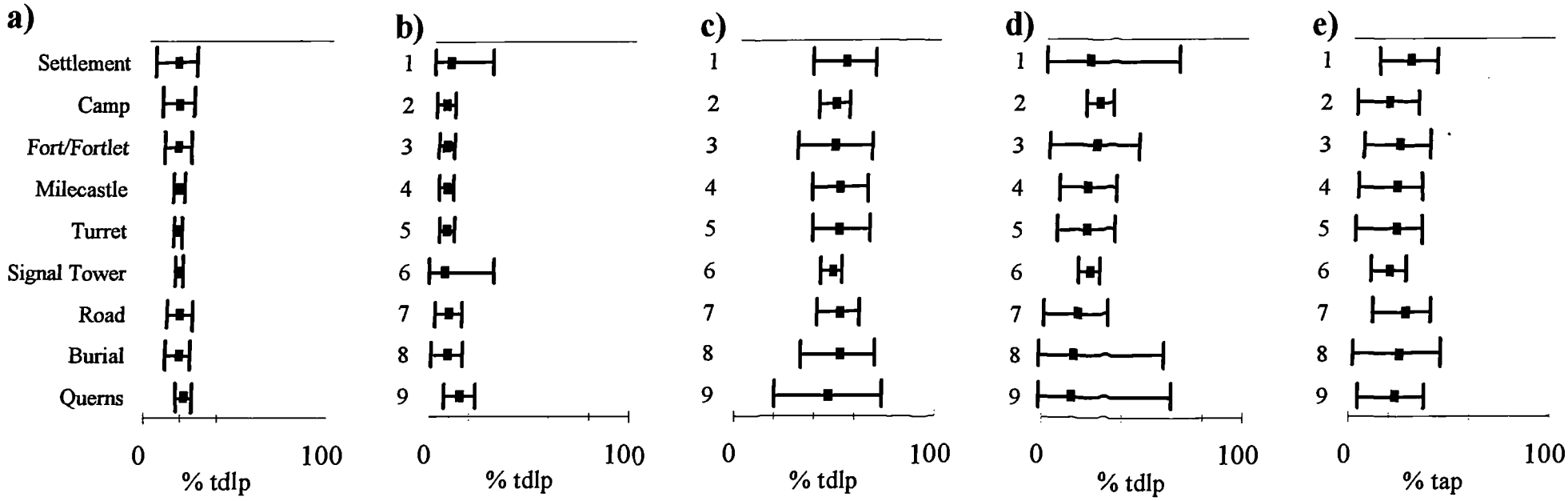
Fig. 8.13 Mean interpolated pollen values for different classes of Iron Age archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

Fig. 8.14 Mean interpolated pollen values for different classes of Roman period archaeological evidence (showing 95% confidence limits)



a) Total Trees
b) Total Shrubs
c) Total Herbs
d) Total Ericaceae
e) Agricultural: Arable Index scores

% tdlp: percentage of total dry land pollen
% tap: arable pollen as a percentage of total agricultural pollen

Tables and Figures for

Appendix A

Continued on following page.

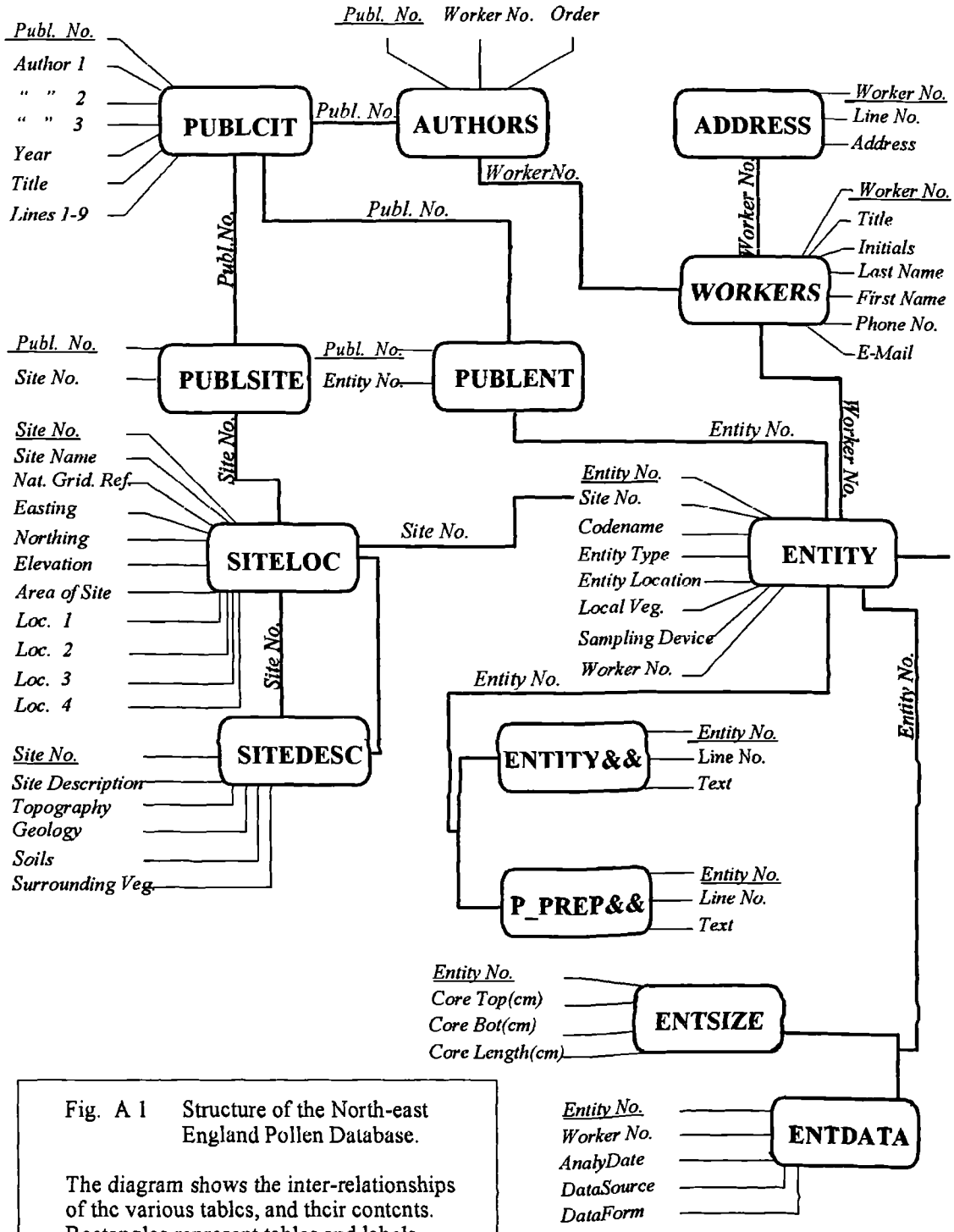


Fig. A 1 Structure of the North-east England Pollen Database.

The diagram shows the inter-relationships of the various tables, and their contents. Rectangles represent tables and labels attached to the tables are fields. Underlined field names are Primary Keys. Labels on lines linking tables are Foreign Keys.

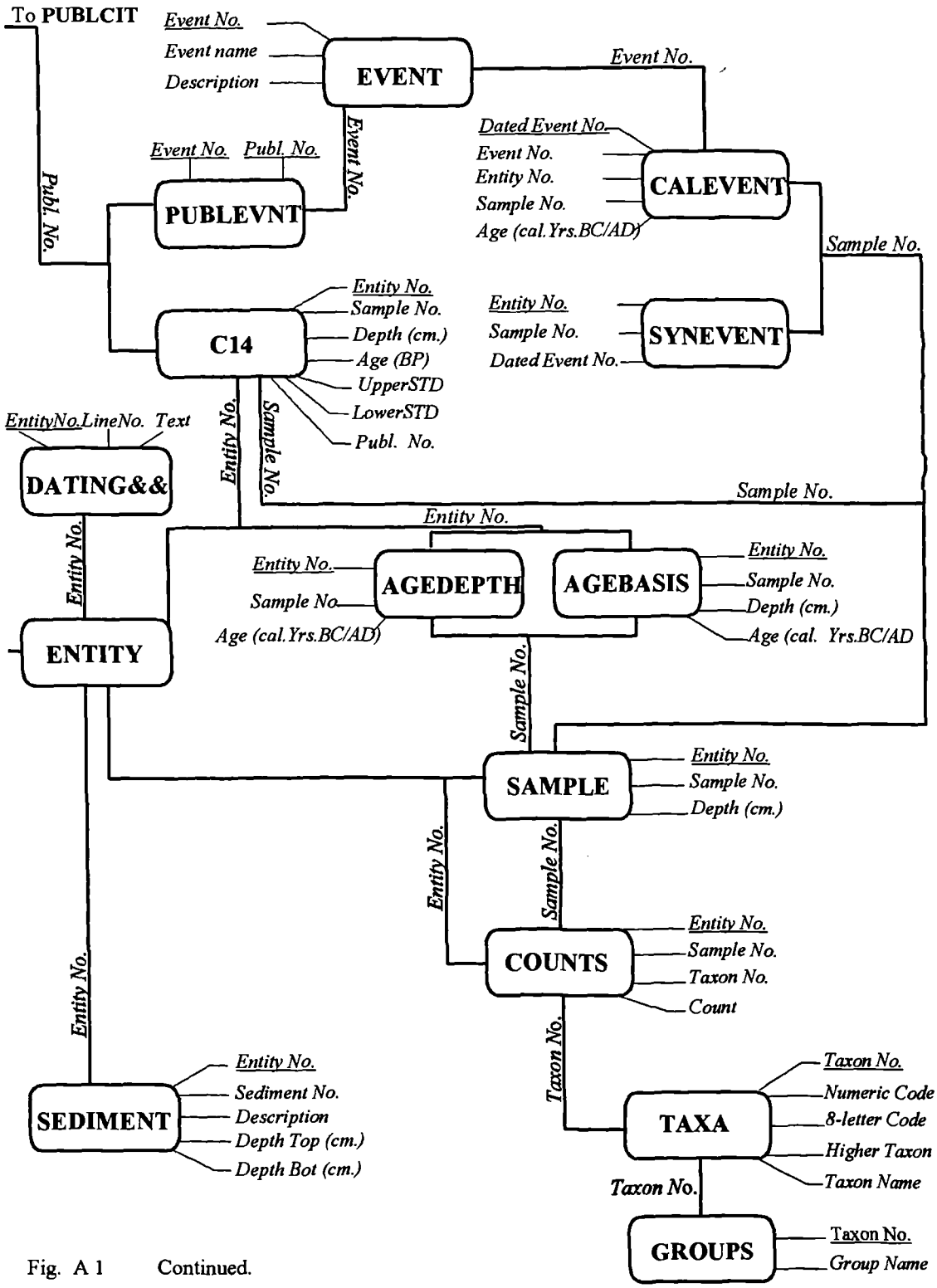


Fig. A 1 Continued.