39. Sussex (East and West Sussex)

39.1 Physical

Geology

The counties of East and West Sussex are dominated by the southern half of the Wealden anticline. In the centre of the anticline the clays, sands and sandstones of the Lower Cretaceous Hastings Beds underlie the High Weald. This is surrounded by the low-lying Weald Clays, with the Lower Greensand, Gault Clay and Upper Greensand forming narrow bands below the Chalk scarp. The Lower Greensand contain acidic sands and are widest to the west of the county.

The south is dominated by the Chalk scarp of the South Downs. The small areas of Tertiary sands and clays on the south eastern coastal plain area obscured by terrace deposits with much loess. The coast includes dune and shingle complexes, with significant shingle beaches at Rye Harbour (TQ91), the Crumbles, Pevensey (TQ6401-6402) and Pagham Harbour (SZ8796).

Soils

In the High Weald the most extensive areas of acid soils have developed on the Ashdown Sands, where podzolic soils that are reasonably water retentive dominate in the Ashdown Forest area. Soils on the Lower Greensand are generally much more freely draining with podzolic soils dominant on the Folkestone Beds & the Hythe Beds, and brown sands on the Sandgate and Bargate Beds. In other areas, dry acid soils are more limited in extent and are often associated with drift deposits. Reasonably large areas of shallow rankers are developed on some of the shingle beaches (**Map 1b**).

39.2 Landscape history

19th Century

In the early 19th century the Lower Greensand outcrops west of Storrington supported many heathland commons. Heathland commons with pasture woodlands were widespread in the High Weald.

Current landscapes and Natural Areas

In the High Weald Natural Area (NA72), with the exception of the extensive heathland of Ashdown Forest and a few other fragments, most of the heathland in this Area has been lost, with the remaining areas ungrazed or under grazed, and woodland is the predominant semi-natural vegetation.

The Low Weald and Pevensey Natural Area (NA73) is dominated by heavy soils with extensive areas of woodland. The heathlands of the Lower Greensand within the Wealden Greensand Natural Area (NA70) have survived to a much greater degree, with extensive, if ungrazed, heaths and acid grassland still present on the Folkstone Beds. Those on the Hythe Beds have mostly been replaced by woodland and plantation.

The South Downs Natural Area (NA74) still has important areas of unimproved calcicolous grassland on the scarps but little grassland survives on the less steep dip slopes, whilst the South Coast Plain and Hampshire Lowlands Natural Area (NA75) in Sussex is dominated by intensive farmland. The latter Area includes shingle beaches as does the Low Weald (NA73) and the Romney Marsh Area Natural Area (NA71), which has large areas of stable shingle beach.

39.3 Existing information

Flora

The coincidence maps (**Map 2-4**) of lowland acid grassland species listed in **Table 1** show high concentrations recorded from the Greensand and from the coast, whilst the High Weald has a markedly lower concentration of these species. Declines are evident from inspection of the recent records, but areas of interest still survive on the Greensand and along the coast.

Useful sources on the acid grassland flora of Sussex are the *Sussex plant atlas* (Hall 1980, Briggs 1990) and *The habitats and vegetation of Sussex* (Rose 1995a), which gives a more up-to-date account. The distributions of *Galium saxatile* and *Rumex acetosella* given in Hall (1980) indicate that there is widespread potential for acid grassland in the High Weald (NA72) and the Greensand (NA70) with scattered records across the cap of the South Downs (NA74). Both these species are scarce in the South Coast Plain (NA75) and the Low Weald (NA73).

A single inland area is picked out as being of special significance; the Folkstone Bed heathlands. Here on the Lower Greensand between Iping Common (SU8421) and Sullington Warren (TQ0914) there are frequent records of specialist acid grassland species including *Agrostis curtisii, Moenchia erecta, Cerastium arvense, Botrychium lunaria, Carex arenaria, Hypochaeris glabra* and *Teesdalia nudicaulis*. Sites mentioned include Midhurst Common (SU8720), Heyshott Common (SU9019), Coates Common (TQ0017), Wiggonholt Common (TQ0616), Parham Park (TQ0514), Hurston Warren (TQ0716) and Sullington Warren (TQ0914).

On the Hythe beds only Petworth Park (SU2296) has any records of acid grassland species. Rose (1995a) records that many of the sites have deteriorated in recent years due to lack of sufficient grazing, partly because of the decline of rabbit grazing. A total of eleven lowland acid species have been recorded in this area but one, *Sagina subulata*, has not been recorded recently (**Table 6** and extract below).

The High Weald is less rich in acid grassland species, with seven species recorded recently and two possible extinctions (**Table 6** and extract below). The area does have some species of damper soils, including *Viola lactea* and *Cicendia filiformis*, but few specific sites are mentioned in the literature other than Chailey Common and Ashdown Forest.

The sites with the highest number of records of acid grassland species listed in **Table 1** are, however, grasslands that have developed on stabilised shingle at Rye Harbour (TQ91), the Crumbles, Pevensey (TQ6401-6402) and Pagham Harbour (SZ8796). The former includes recent records for thirteen species (**Table 6** and extract below) with one possible extinction. The description in Rose (1995a) of the Crumbles grassland indicates that this is Festuca-Agrostis-Rumex Grassland Cornicularia-Cladonia sub-community (U1a), and that this community also occurs at Pagham Harbour where the RDB *Petrorhagia nabteuillii* is frequent.

Fauna

One acid grassland site on the Lower Greensand supports the only native surviving colony of the Field Cricket (*Gryllus campestris*) in the UK. Wheatear, once abundant on the Downs, now only regularly breeds on shingle areas in Rye Harbour (which include parched acid grassland). Here most pairs nest in artificial burrows (James, 1996).

Habitat surveys

The East and West Sussex County Grassland Inventories indicate that little survey work has been carried out on acid grasslands by English Nature. None of the known sites of high interest indicated by the review of floristic data have been surveyed and sites in the Inventories appear to have been recorded as part of surveys that were directed at neutral and chalk grasslands. The Chalk grassland dataset contains 10.4ha of U4b, including mosaics and 0.25 of U1d in West Sussex, and in East Sussex 9.3ha of U4a, 7ha of U4b and 1ha of U1. From the East Sussex report on Chalk grassland (Steven and Muggeridge, 1992), it seems that U4 may have been mis-identified in some cases; some stands described as U4 had *Rumex acetosella* noted as abundant and hence are therefore more likely to be stands of U1, probably U1e. Selected data from Burnthouse Down is given in Volume I, Appendix 1, to illustrate U4 on drift occurring over Chalk.

Petworth Park (Sanderson, 1994b)

During a lichen survey of Petworth, a large landscape park, the grassland was found to include approximately 150ha of acid grassland. It was referable to Festuca-Agrostis-Rumex Grassland Potentilla-Galium sub-community (U1e). The stand is probably the largest acid grassland in Sussex but the U1e is species-poor, as is typical of this type of acid grassland, although *Chamaemelum nobile* was seen and *Moenchia erecta* has been recorded. The deer grazed pasture was typically rather matted and coarse and would probably benefit from summer cattle grazing.

Biological survey of common land (Finch et al 1994 & Finch & Aitchison 1994)

The biological survey of common land (Finch *et al* 1994 & Finch & Aitchison 1994) records 40ha of unimproved acidic grassland in East Sussex and 31ha in West Sussex. This total includes grasslands with *Arrhenatherum, Molinia, Deschampsia cespitosa* and *Juncus* dominant, but excludes acid grassland with some Heather, so has little relevance to the current report. Semi-improved acid grassland is defined as grasslands containing *Lolium* so are also beyond the scope of this review.

Coastal shingle (Sneddon & Randall 1994; Williams & Cooke 1993)

It is clear from Rose (1995a) that the stabilised shingle grassland in Sussex is similar to that at Dungeness described in Ferry *et al* (1990). The grassland is predominately comprised of communities closest to parched acid grassland (U1) but with maritime grasslands (MC5 & MC8) present where an influence of salt spray occurs.

The Shingle Survey of Great Britain (Sneddon & Randall, 1994) examined three sites and Williams & Cooke (1993) examined all the non-SSSI shingle on the Sussex coast. The latter survey noted that the best site examined, The Crumbles, included similar stabilised grassland to Dungeness. Quadrat data from this survey indicates that U1f is present. Quadrat data also indicates the presence of U1d at Pagham Harbour.

The data in Sneddon & Randall (1994) is difficult to interpret. From their descriptions the stable shingle grassland of Rye Harbour includes U1f and U1d. Data from the former is actually assigned to U1f but data on the latter is assigned to Ammophila-Festuca Semi-fixed Dune (SD7) in spite of the absence of *Ammophila*.

Summary of consultations with Local Team Conservation Officers

The coastal shingle grasslands are floristically rich and important. It is estimated that approximately 100ha of parched acid grassland (U1) occurs along the coast, with much of it lichen-rich U1a, U1d and U1f (Dr. Rose, pers. comm. 1996). The largest site is Rye Harbour with other sites of interest

including Pagham where a lichen flora is present that includes *Usnea articulata*, *Cladonia foliacea* and *Ramalina farinacea* .

Inland the most floristically rich grasslands are on the Lower Greensand. These grasslands are mostly associated with heathland although rich areas also occur in parklands. The ancient deer park of Parham Park includes an area of U1b grassland, with abundant *Carex arenaria*, and recently a rich area of U1b has been found in a fragment of the landscape park of Cowdray Park (SU913 222), with *Teesdalia*, *Viola canina* and *Moenchia erecta* present.

The heathland areas have suffered a drastic decline of quality in recent decades but Hurston Warren golf course is still good in localised areas as a result of mowing. Beyond the main area in the west, a little U1 survives on the Greensand at Lodge Hill, Ditchling (TQ322157). Beyond the atypical Petworth Park with its c150ha of U1e, less than 50ha of U1 probably survives on the Greensand. This is most likely to be U1b although U1d may also be present. A little *Agrostis curtisii* is present on Iping Common but does not form an area of U3. *Deschampsia flexuosa* invasion is scarce and the area of U2 is less than that of U1. The River Arun draining from the Lower Greensand has patches of U1 on the flood plain, but these are not species-rich.

The Low Weald has very little acid grassland but one site examined by the author, Henfield Common (TQ2215), has an area of reasonably well-developed U4. This represents an in interesting repeat of observations from other south eastern counties, with U4 confined to well drained acid clay soils.

The High Weald has acid grassland associated with heathland at Ashdown Forest and the Chailey commons, and a few fragments exist elsewhere. Ashdown Forest is currently under-grazed and its dry acid grasslands are in poor condition. Much of the area is on wet impervious soils but the ridge tops do have dry grasslands. Deschampsia flexuosa grassland (U2), often with much *Molinia*, dominates, whilst rank *Festuca-Agrostis* grasslands occur on road verges and elsewhere. Where identifiable, these stands are apparently U1f. Other fragments and the Chailey commons have mixtures of U2 and U1e.

Grazing has been experimentally reintroduced into a large enclosure in Ashdown Forest but this does not include any dry grassland. Few coastal or heathland acid grasslands are grazed but restoration projects have begun on the heathlands and rabbit grazing is adequate on many coastal sites.

39.4 Summary of resource

Extent and composition

There is probably just over 500ha of acid grassland in Sussex, with parched acid grassland (U1) dominant. Species-rich parched acid grassland (U1a, U1b, U1d & U1f) is confined to coastal shingle structures and the heathlands and parklands of the Lower Greensand. Less rich grassland is a significant part of the habitat mosaics of the High Weald heathlands, with fragments elsewhere.

Conservation value

The best coastal and the Greensand parched acid grasslands are of high conservation value. The Greensand grasslands are best regarded as an integral part of the heathland complex extending from Surrey to Sussex, through Hampshire. The grasslands here are a significant part of one of the most important lowland heathland areas in England.

39.5 Future requirements for survey and conservation

Survey

The surveying of the Lower Greensand acid grasslands at a Phase 2 level along with those of Surrey is a very high national priority.

Conservation

The restoration of extensive grazing to the Lower Greensand heaths is a priority; the decline of rabbit grazing has reduced the extent and quality of the grasslands here. Grazing management is already planned for Iping Common and other areas. On some smaller sites, mowing may be enough to encourage adequate rabbit grazing. On other sites, where the grassland is found on road verges, any fencing schemes should include these areas. Acid grassland is likely to be relatively easy to create from arable reversion on the Lower Greensand.

39.6 References

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Extract from Table 6 for Sussex: occurrence of plant species generally faithful to lowland acid grassland

County: Sussex (East and West)			
Natural Areas:	**70**	**72**	**71**
Chamaemelum nobile	1	1	
Filago minima	1	1	
Hypochaeris glabra	1		1
Medicago minima			1
Moenchia erecta	1	1	1
Ornithopus perpusillus	1	1	1
Potentilla argentea	1		0
Sagina subulata	0	0	
Stellaria pallida		1	1
Teesdalia nudicaulis	1	0	1
Trifolium glomeratum			1
Trifolium ornithopodioides	1		1
Trifolium scabrum	1		1
Trifolium striatum	1		1
Trifolium subterraneum	1	1	1
Trifolium suffocatum			1
Vicia lathyroides			1
Viola lactea		1	
Total no. of species extant	**11**	**7**	**13**
Total no. of species extinct	**1**	**2**	**1**
Total no. of species recorded	**12**	**9**	**14**

70 =Wealden Greensand
72 = High Weald
71 = Romney Marshes

1 = Recent record
0 = Apparently extinct

Sussex acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
WS Grassland Inventory		1987-62	Calcicolous, Enc. relic, Meadow	Heathland & shingle areas not covered	11	292.5	153.9	7.2		
ES Grassland Inventory		1989-91	Calcicolous, Common, Meadow	Heathland & shingle areas not covered	6	354.3	153.0	NI		
Grassland: Sussex Total					17	646.8	306.9	7.2		
WS Heathland Inventory		1981-92	Heathland and Enclosure relic	Most dry heath on Lower Greensand	45	2240.0			310.3	
ES Heathland Inventory		1982-89	Heathland and Enclosure relic	Majority of dry heath in Ashdown forest	14	6016.0			454.5	
Heathland: Sussex Total					76	8902.8			764.8	
Petworth Park BSA	SU965230	1994	Parkland	Notes on grassland in lichen survey	1	250.0	235.0	156.0		
EN Phase 2 W Sussex		198892		Allwright, (1988) & Steven (1992)				26.0		
EN Phase 2 E Sussex		1990,92		Steven & Muggeridge1992 & Steven 1990b				23.0		
Estimates, classes		1996		Dr Francis Rose				C		

Survey Name	U1	U1a	U1b	U1c	U1d	U1e	U1f	U2	U2a	U2b	U3	U4	U4a	U4b	U4c	U4d	U4e	U5	U6	SD10	SD11	U20r
WS Grass Inv.																						
ES Grass Inv.																						
Grass Totals																						
WS Heath Inv.																						
ES Heath Inv.																						
Heath Totals																						
Petworth Park	156.0					156.0																
EN Phase 2 W Sussex	7.0				0.25							19.0		10.4								
EN Phase 2 E Sussex	1.0											22.0	9.3	7								
Estimates, class	C	A	A		A	C	A	B	B			A	A	A								

Key

Column headings

GR = Grid reference if relevant
No Sites = Number of sites
Site Area = Area of sites
GR Area = Area of grassland
A G Area = Area of acid grassland
H Area = Area of dry heath
LHA = Area of lichen heath
NI = No information
NA = Natural Area
U1-U20r = NVC communities/sub-communities

Area estimates

A = Less than 50 ha
B = 50-100 ha
C = 100-500 ha
D = 500-1,000 ha,
E = 1,000-5,000 ha
F = 5,000-10,000 ha
G = Greater than 10,000 ha
+ = Present but no area given
? = Possibly present

40. Warwickshire

40.1 Physical

Geology

The south of the county includes Jurassic Lias clays, and Permian and Triassic sandstones and mudstones dominate the rest of the county. In the north west, small areas of Coal Measures occur.

Soils

The soil map does not record any areas dominated by acid soils. (**Map 1c**)

40.2 Landscape history

19th Century

The 1830's 1 inch OS maps show a largely enclosed landscape.

Current landscapes and Natural Areas

In the north the county includes part of the Midlands Plateau Natural Area (NA43) and in the south, part of the Cotswolds (NA55). Between these Areas are the Severn and Avon Vales Natural Area (NA56) and the Midland Clay Pastures (NA44).

40.3 Existing information

Flora

The coincidence maps (**Maps 2-4**) of lowland acid grassland species listed in **Table 1** show a slight concentration in the Severn Valley, but there are few recent records from this area. The best square shown is SP26. The area has suffered a very marked decline in recent decades. A list of species found in the Severn Valley are listed in **Table 6** and the relevant extract is shown below.

Habitat surveys

The Grassland and Heathland Inventories records a few areas of acid grassland and heathland, mainly in the Midlands Plateau Natural Area. Nothing has been recorded in SP26.

Summary of consultations with Local Team Conservation Officers

A few fragments of acid grassland occur in the north on Coal Measure outcrops, but the area is very limited. The Midlands Clay Pastures may include some areas of U1.

40.4 Summary of resource

Extent and composition

Little is known about the composition, location or interest of acid grassland in the county.

Conservation value

The limited amount of acid grassland that is known is unlikely to be of more than local interest.

40.5 Future requirements for survey and conservation

Survey

There are no priorities for Phase 2 survey but the possible presence of acid grassland in SP26 could be investigated.

Conservation

No high priorities have emerged.

Extract from Table 6 for Warwickshire: occurrence of plant species generally faithful to lowland acid grassland

County: Warwickshire	
Natural Area:	**56**
Chamaemelum nobile	0
Hypochaeris glabra	0
Moenchia erecta	0
Ornithopus perpusillus	1
Potentilla argentea	1
Teesdalia nudicaulis	0
Trifolium ornithopodioides	0
Trifolium striatum	0
Trifolium subterraneum	1
Total no. of species extant	**3**
Total no. of species extinct	**6**
Total no. of species recorded	**9**

56 = Severn and Avon Vales

1 = Recent record
0 = Apparently extinct

Warwickshire acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1979-86	Field, Common	Few sites recorded	5	67.5	3.2	3.2		
Heathland Inventory		1982-93	Common, Enclosure relic	Mainly in or near NA43	9	266.0			16.1	
Estimates, classes		1996		Chris Walker, English Nature				A		

Survey Name	U1	U1a	U1b	U1c	U1d	U1e	U1f	U2	U2a	U2b	U3	U4	U4a	U4b	U4c	U4d	U4e	U5	U6	SD10	SD11	U20r
Grassland Inv.																						
Heathland Inv.																						
Estimates, class	?																					

Key

Column headings
GR = Grid reference if relevant
No Sites = Number of sites
Site Area = Area of sites
GR Area = Area of grassland
A G Area = Area of acid grassland
H Area = Area of dry heath
LHA = Area of lichen heath
NI = No information
NA = Natural Area
U1-U20r = NVC communities/sub-communities

Area estimates
A = Less than 50 ha
B = 50-100 ha
C = 100-500 ha
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F = 5,000-10,000 ha
G = Greater than 10,000 ha
+ = Present but no area given
? = Possibly present

41. West Midlands

41.1 Physical

Geology

The county is underlain by Permian and Triassic sandstones and mudstones which surround large outcrops of Coal Measures.

Soils

Much of the county is heavily urbanised and lacks soil information. Brown sands and podzols are dominant in and near Sutton Park (**Map 1c**).

41.2 Landscape history

19th Century

The 1830's 1 inch OS maps show Sutton Park and its associated heathland, plus enclosed common land to the south west.

Current landscapes and Natural Areas

The county lies within the Midlands Plateau Natural Area (NA43) Since the 1830's the West Midlands has become increasingly urbanised but some heathland survives as parkland.

41.3 Existing information

Flora

The coincidence maps (**Maps 2-4**) of lowland acid grassland species listed in **Table 1** show that some species have been recorded in the past but there are few recent records.

Habitat surveys

The Grassland and Heathland Inventories record large areas of heath and acid grassland in Sutton Park and small fragments elsewhere.

Summary of consultations with Local Team Conservation Officers

Over 50ha of U2, U4 and U5 occurs in the medieval deer park of Sutton Park. The grassland grades from wetter Molinia areas through U5 *Nardus* grassland on gentle slopes to U4 *Agrostis-Festuca* grassland in drier areas. The U2 occurs in less intensively grazed areas. Only fragments of acid grassland survive beyond Sutton Park.

41.4 Summary of resource

Extent and composition

The only sizeable area of acid grassland is in Sutton Park.

Conservation value

Sutton Park is a remarkable survival of a complex of heathland, grassland, wetland and pasture woodland in an urban context, and it has been designated as a National Nature Reserve.

41.5 Future requirements for survey and conservation

Survey

No obvious priorities for survey.

Conservation

Parts of Sutton Park may be under-grazed and the habitat quality would be improved by the restoration of grazing by livestock.

West Midlands acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1986-91	Park, Enclosure relic, Field	Large area in Sutton Park	5	994.3	72.0	72.0		
Heathland Inventory		1989-91	Park, Enclosure relic, Waste	Large area in Sutton Park	21	1099.0			289.4	
Estimates, classes		1996		Chris Walker, English Nature				B		

Survey Name	U1	U1a	U1b	U1c	U1d	U1e	U1f	U2	U2a	U2b	U3	U4	U4a	U4b	U4c	U4d	U4e	U5	U6	SD10	SD11	U20r
Grassland Inv.																						
Heathland Inv.																						
Estimates, class								A				+						A				

Key

Column headings
GR = Grid reference if relevant
No Sites = Number of sites
Site Area = Area of sites
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F = 5,000-10,000 ha
G = Greater than 10,000 ha
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? = Possibly present

42. West Yorkshire

42.1 Physical

Geology

The Pennines to the west and north of the county are composed of Millstone Grit and a wide exposure of the Coal Measures. The eastern edge of the county includes part of a narrow band of Magnesian Limestone.

Soils

To the west, the Pennines have upland soils, and surface water gleys dominate over the Coal Measures. To the east, beyond Doncaster, the recent deposits include areas of brown sands (**Map 1e**).

42.2 Landscape history

19th Century

The 1840's 1 inch OS map shows a largely enclosed lowland landscape.

Current landscapes and Natural Areas

The Natural Areas of the region closely follow the geology. The uplands to the west are part of the Southern Pennines Natural Area (NA14) and the Dark Peak Natural Area (NA25). The centre of the county is occupied by the Coal Measures Natural Area (NA24), and the Southern Magnesian Limestone Natural Area (NA23) lies to the east. The Coal Measures Area has become highly urbanised.

42.3 Existing information

Flora

The coincidence maps (**Maps 2-4**) of lowland acid grassland species listed in **Table 1** show that a few species have been recorded from the Coal Measures. The West Yorkshire Atlas (Lavin & Wilmore, 1994) records seven acid grassland species, three of which are extinct (**Table 6** and relevant data extracted below). These include *Chamaemelum nobile* which has not been seen as a native since 1775. The extant species are all described as rare, and have been seen only a few times, either on waste land or sandy acid grassland and heath.

Habitat surveys

The Grassland Inventory includes 47 sites from which acid grassland has been recorded, just over half of which are records from fields and waste land in the lowland Coal Measures. The Heathland Inventory records heath in two woodland sites.

Three of the West Yorkshire Districts, Kirklees, Calderdale and Bradford, have been surveyed for enclosed grasslands. The Humber to Pennines Local Team provided a summary of the areas surveyed. The combined figures for acid grassland found are: U1, 14.2ha; U2, 0.6ha and U4, 17.9ha giving a total of 32.7ha of acid grassland. The total given for surveyed acid grassland is the much higher figure of 89.4ha. It is not clear what were communities in the unclassified acid grasslands.

The Atlas includes an account of the vegetation of the area by Rodwell (1994). The upland moors include extensive areas of Festuca-Agrostis-Galium grassland (U4) and Nardus-Galium grassland (U5), especially when heavily grazed by sheep.

On the lower ground, small areas of dry acid grassland can be found among heath and developing woodland. These grasslands usually mark out exposures of Coal Measure sandstones and include stretches of U4 and Deschampsia flexuosa grassland (U2) and, locally, in droughty soils, patches of parched acid grassland (Festuca-Agrostis-Rumex grassland (U1).

The U1 grasslands can be found on soil heaps of bell pits and ancient coal mines. There is an attractive mosaic of heath, acid grassland and scrub at Seckar Wood near Wakefield. Lists of associated species in the flora indicate that Galium-Potentilla sub-community (U1e) is the main sub-community present.

Summary of consultations with Local Team Conservation Officers

Three of the five West Yorkshire Districts have been surveyed for enclosed grasslands, and cover the West Yorkshire part of the Southern Pennines Natural Area and a sizeable amount of the Coal Measures Natural Area. Extrapolating from the existing information it is considered that the current resource of lowland acid grassland is certainly over 50ha, possibly over 100ha but unlikely to be over 200ha. U1 and U4 are of similar percentage (contradicting Rodwell (1994)), whilst there is a much smaller area of U2. U5 and U20 occur but their extent is not known.

In the South Pennines, upland fringe acid grassland occurring below 300m is important as a feeding ground for internationally important populations of waders breeding on the moors, with both seed and invertebrates utilised. In the Coal Measure Natural Area, spoil tips, urban commons, mosaics of heathland and parkland contain acid grassland, that comprises a mix of U2, U4, U5, U20 with H8, H9 & H12.

42.4 Summary of resource

Extent and composition

The lowland acid grassland resource of West Yorkshire consists of small, fragmented, sites with a very limited flora and a particularly reduced lowland element. The enclosed grasslands of the South Pennines are ecologically part of the wider ecosystem of the Pennine Moors and are clearly best regarded as upland fringe grassland. From the above data, between 50-100ha of lowland acid grassland would appear to be the best estimate of its extent.

Conservation value

The upland fringe sites, in both ecological and land use terms, are best regarded as an integral part of the upland pastoral system that supports internationally important breeding wader populations. Otherwise, the truly lowland acid grasslands would appear to be of only local interest.

42.5 Future requirements for survey and conservation

Survey

The English Nature Local Team hopes to obtain a complete survey of the other two Districts of West Yorkshire. They also consider that the upland acid grassland fringes in the South Pennines in Greater Manchester and Lancashire require survey as a key priority because of their vulnerability to improvement and changes in agricultural practice, such as hay making to silage production. The survey of the lowland acid grassland of the two remaining Districts in West Yorkshire has a low

priority at a national level. Survey of upland fringe grassland is best prioritised in terms of the impacts of the threats to the ecology and the pastoral system of the adjacent upland.

Conservation

There are no obvious national priorities for lowland acid grassland conservation in West Yorkshire.

42.6 References

LAVIN, J.C. & WILMORE, G.T.D. 1994. *The West Yorkshire plant atlas.* Bradford: Bradford Metropolitan Council.

RODWELL, J.S. 1994. The vegetation of West Yorkshire. *In*: J.C. LAVIN & G. T. D. WILMORE, eds. *The West Yorkshire plant atlas*, pp. 8-19. Bradford: Bradford Metropolitan Council.

Extract from Table 6 for West Yorkshire: occurrence of plant species generally faithful to lowland acid grassland

County: West Yorkshire	
Natural Area:	**24**
Chamaemelum nobile	0
Filago minima	1
Moenchia erecta	0
Ornithopus perpusillus	1
Teesdalia nudicaulis	0
Trifolium scabrum	1
Trifolium striatum	1
Total no. of species extant	**4**
Total no. of species extinct	**3**
Total no. of species recorded	**7**

24 =Coal Measures

1 = Recent record
0 = Apparently extinct

West Yorkshire acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1987-94	Field, Waste	Small fields in NA 24 and fringes of NA14	47	146.5	32.5	7.2		
Heathland Inventory		NI		Two woodland SSSIs	2	61.1			8.1	
Phase 2 Surveys		1993-96		Phase 2 surveys of Kirklees, Calderdale and Bradford				89.4		
Estimates, classes		1996		Colin Newlands, English Nature				B		

Survey Name	U1	U1a	U1b	U1c	U1d	U1e	U1f	U2	U2a	U2b	U3	U4	U4a	U4b	U4c	U4d	U4e	U5	U6	SD10	SD11	U20r
Grassland Inv.																						
Heathland Inv.																						
Phase 2 Survey	14.2							0.6				17.9										
Estimates, class	A					A		A				B						A				

Key

Column headings
GR = Grid reference if relevant
No Sites = Number of sites
Site Area = Area of sites
GR Area = Area of grassland
A G Area = Area of acid grassland
H Area = Area of dry heath
LHA = Area of lichen heath
NI = No information
NA = Natural Area
U1-U20r = NVC communities/sub-communities

Area estimates
A = Less than 50 ha
B = 50-100 ha
C = 100-500 ha
D = 500-1,000 ha,
E = 1,000-5,000 ha
F = 5,000-10,000 ha
G = Greater than 10,000 ha
+ = Present but no area given
? = Possibly present