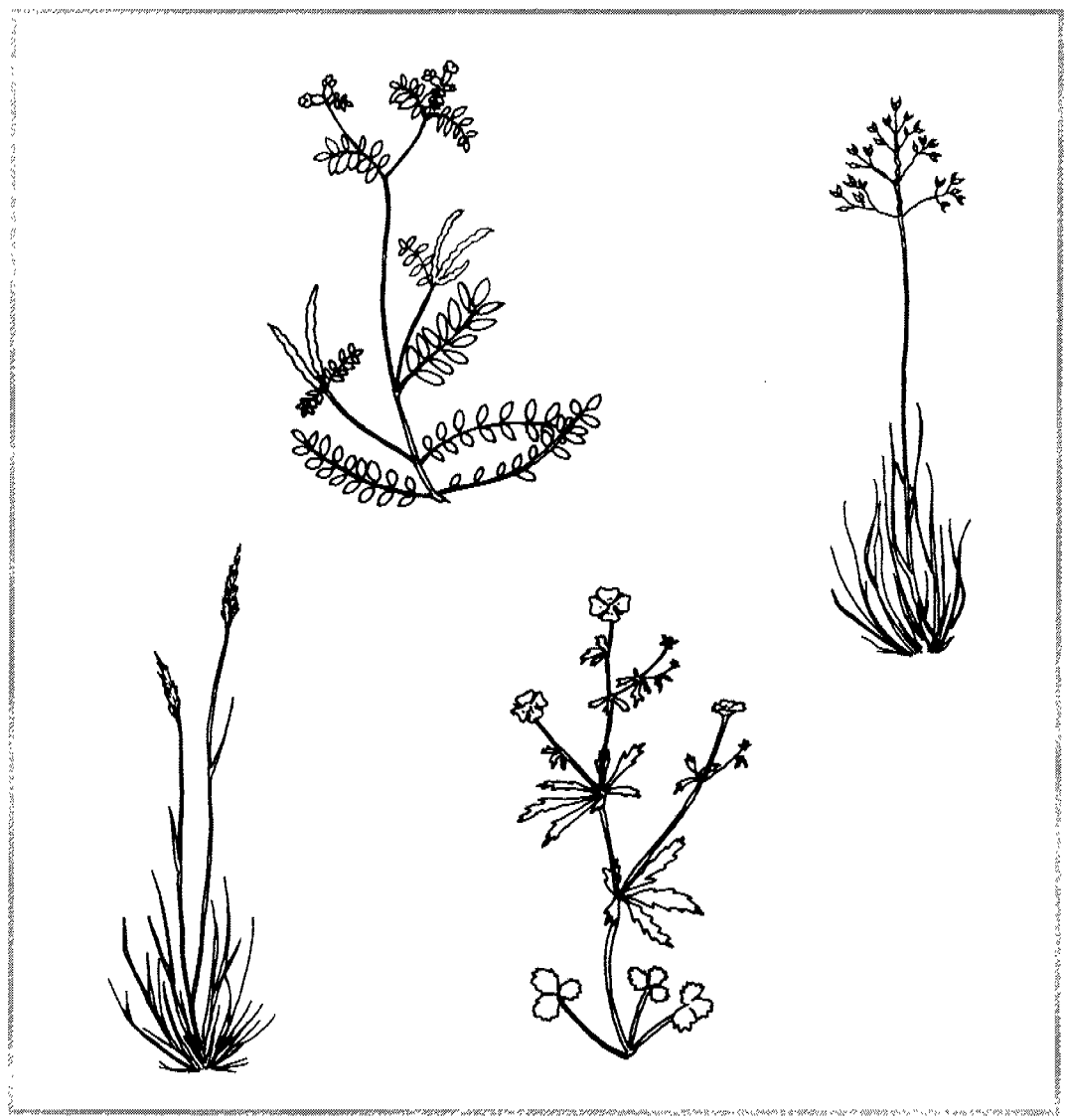
ENGLISH NATURE

A review of the extent, conservation interest and management of lowland acid grassland in England

Volume II: County descriptions

No. 259 - English Nature Research Reports



working today
for nature tomorrow

English Nature Research Reports

Number 259

A review of the extent, conservation interest and management of lowland acid grassland in England

Volume II (County descriptions)

N.A. Sanderson
(Ecological Planning and Research)

ISSN 0967-876X

A review of the extent, conservation interest and management of lowland acid grassland in England

Volume II

English Nature Contract VT2.1C

Commissioned from Ecological Planning & Research
129 Andover Road
Winchester
Hants SO22 6AY

Main Author
N.A. Sanderson BSc MSc

Contents

1. Introduction

This volume describes the general distribution of lowland acid grassland on a county by county basis. All English counties are included and are described in alphabetical order except for Cleveland, Durham, Northumberland and Tyne and Wear which are amalgamated under the single heading of North East England, and East and West Sussex which are combined under the heading of Sussex. The county boundaries used in the review pre-date the 1997 local government re-organisation.

A description of the type of information summarised under each heading in the county accounts is given in Appendix 1 of this volume, along with an explanation of the fields in the county spreadsheets (Appendix 2). The Local Team staff and others consulted about each county are listed in Appendix 3 and the questionnaire on which the consultations were based is given in Appendix 4. The accounts also incorporate the contractor's own experience and observations.

Note: The following maps, which are in Volume I, are referred to throughout the county accounts.

- Maps 1a, 1b, 1c, 1d, 1e, 1f: Soil associations in which acid soils dominate, shown using old Natural Areas (1996) boundaries.
- Maps 2-4: Distribution of lowland acid grassland plant species listed in **Table 1**.
- Maps 5-7: Distribution of plant species of ephemeral ponds associated with acid grassland.
- Maps 8-10: Distribution of plant species associated with disturbed sandy soils.
- Maps 11-13: Distribution maps of *Carex arenaria Agrostis curtisii* and *Viola lutea*.
- Map 14: Old Natural Area boundaries (1996) used for Maps 1a-1f.
- Map 15: New Natural Area boundaries (1997).

Extracts from **Table 6** (in Volume I) are given in most county accounts in Volume II. Other Tables referred to in the text are also to be found in Volume I.

The Inventories referred to throughout Volume II are:

ENGLISH NATURE. 1992-1996. *The Grassland Inventory*. Peterborough: English Nature (46 volumes).

ENGLISH NATURE AND THE ROYAL SOCIETY FOR THE PROTECTION OF BIRDS. 1994-1996. *The Lowland Heathland Inventory*. Peterborough: English Nature (19 volumes).

2. Avon

2.1 Physical

Geology

The area has a complex geology with outcrops of hard Carboniferous limestones and sandstones outcropping through soft Triassic mudstones and Jurassic Lower Lias deposits.

Soils

The soil map shows that no soil associations dominated by podzols or brown sands occur in the county (Map 1c). Shallow limestone soils and calcareous clays are widespread.

2.2 Landscape history

19th Century

In the early 19th century a scatter of small commons existed north of the River Avon, many of which still survive in some form. To the south of the river there were extensive commons on the limestone hills, of which only Felton Common survives.

Current landscapes and Natural Areas

The county is largely within by the Bristol Avon Ridges and Valleys Natural Area (62) which is based on the area of great geological diversity north of the Mendips. This Area includes Bristol and is much affected by urban expansion, but still includes patches of important habitat, eg in the Avon Gorge and in the Gordano Valley.

Small unenclosed commons still survive in the more rural parts of the county. Some of these are on acid soils, lying on drift over limestone and Carboniferous sandstone, and can support acid grassland (Hedley & Aitchison, 1991). Avon also includes parts of the Severn and Avon Vales (56), Cotswolds (55), Somerset Levels and Moors (85) and the Mendip Hills (24) Natural Areas. In the latter Natural Area some areas of limestone are capped with acidic soils.

2.3 Existing information

Flora

A small concentration of the acid grassland species listed in **Table 1** is recorded by the coincidence maps (Maps 2-4), centred on grid squares ST56 and 66. The Flora of Somerset (Roe, 1981) covers the southern part of Avon but is not very informative for the county. Examination of the distribution maps indicates that about 14 characteristic species have been recorded from Avon, with four not recorded recently (**Table 6** & relevant extract given below).

Habitat surveys

The Grassland and Heathland Inventories indicate small areas of acidophilous vegetation on the Mendip Hills (NA84) and in the Bristol Avon Ridges and Valleys (NA62). Many of these are described in Biological Surveys of Common land (Hedley & Aitchison, 1991 & Hedley & Aitchison, 1992).

Biological survey of common land. No 21 (Hedley & Aitchison, 1991)

The common land survey recorded 33.79ha of unimproved acid grassland, representing 3% of the area of common land as opposed to 0.03% of the county. All of this was regarded as parched acid grassland (Festuca-Agrostis-Rumex grassland, U1).

The survey also recorded 54.88 ha of semi-improved acid grassland; 42.29 ha of this total was recorded from Westerleigh Common (CL60) (ST700820) which from the description, appears to be mostly Lolium-Cynosurus Grassland Anthoxanthum sub-community MG6b. Much of the rest does appear to be acid grassland, meaning that approximately 50ha of the acid grassland present in Avon occurs on commons.

There are two main areas where acid grassland has been recorded; small patches east of Bristol on commons over Carboniferous sandstone, and on commons to the south. The former group are centred on Siston Common (CL29) (ST665744) and contain small patches of what appear to be the Hypochaeris radicata sub-community (U1f) of U1 grassland. Species of interest noted include *Filago minima, Ornithopus perpusillus* and *Trifolium striatum.*

To the south, Felton Common (CL9) (ST520650) is a medium-sized common occurring on acid drift and limestone. The description and personal experience (N A Sanderson) suggest that this is Festuca-Agrostis-Galium grassland (U4) rather than parched acid grassland (U1). About 27ha of acid grassland has been recorded here.

Biological survey of common land. No 22 (Hedley & Aitchison, 1992)

On the southern boundary of Avon a large area of common land on the Mendips is registered in Somerset but is partly in Avon. This includes small areas of acid grassland, probably Festuca-Agrostis-Galium grassland (U4), on drift over limestone.

Summary of consultations with Local Team Conservation Officers

There has been a Phase I survey of Avon, carried out between 1986 and 1989, which recorded 39.6 ha of unimproved acidic grassland. Most of this is located in the centre of the county on the acidic Coal Measures. The figure does not include the small areas of acid grassland on drift over limestone found in those parts of the Mendips in Avon. Overall there is probably 50-100 ha of acid grassland in the county with the actual figure likely to be nearer 50 than 100 ha.

2.4 Summary of resource

Extent and composition

The area of acid grassland in Avon is likely to be very limited, and is probably not much over 50ha. This includes small stands of parched acid grassland (Festuca-Agrostis-Rumex grassland, U1) on commons lying over Coal Measure sandstones in the Bristol Avon Ridges and Valleys (NA62), and moist acid grassland (Festuca-Agrostis-Galium grassland, U4) on drift over limestone in the Mendip Hills (NA84).

Conservation value

The stands of U1 are probably still of some floristic interest at a county level and the acid grasslands on the Mendips are part of a limestone grassland complex of national value.

2.5 Future requirements for survey and conservation

Survey

There would appear to be no urgent requirements for acid grassland survey in the county.

Conservation

Personal observation suggests that the stands of U1 in the semi-urban commons west of Bristol will need active conservation if they are to survive the current lack of grazing, or under-grazing, which are allowing coarse vegetation to dominate.

2.6 References

HEDLEY, S. & AITCHISON, J. W. 1991. *Biological survey of common land No 21: Avon.* Peterborough: English Nature.

HEDLEY, S. & AITCHISON, J. W. 1992. *Biological survey of common land. No 22: Somerset.* Peterborough: English Nature.

ROE, R.G.B. 1981. *The flora of Somerset.* Taunton: Somerset Archaeological and Natural History Society.

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

County: Avon	
Natural Areas:	**All**
Chamaemelum nobile	0
Erodium maritimum	1
Filago minima	1
Hypochaeris glabra	0
Moenchia erecta	1
Ornithopus perpusillus	1
Potentilla argentea	0
Stellaria pallida	1
Teesdalia nudicaulis	1
Trifolium ornithopodioides	1
Trifolium scabrum	1
Trifolium striatum	1
Trifolium subterraneum	1
Viola lactea	0
Total no. of species extant	**10**
Total no. of species extinct	**4**
Total no. of species recorded	**14**

1 = Recent record
0 = Apparently extinct

Avon acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1984-91	Drift/calc, Common, Field	Small areas in NA 84 & 85	8	472.2	37.3	7.7		
Heathland Inventory		1983-94	Drift/calc, Common	Small areas in NA 84 & 85	5	269.0			13.3	
Commons Survey		1991	Drift/calc, Common	Covers much of known acid grssland	c8			c50		
Estimate, classes		1996		Neil Sanderson, EPR and Basil Greenwood, 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.																						
Commons	c23						c20					c30										
Estimate, class	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

3. Bedfordshire

3.1 Physical

Geology

Bedfordshire is dominated by Cretaceous and Jurassic limestones and clays, with acidic sands confined to the outcrop of the Lower Greensand that crosses the county from the south west to the north east. Drift deposits include glacial and river gravel and clay with flints, which may also give rise to acidic soils.

Soils

The brown sand-dominated soil associations closely follow the outcrop of the Lower Greensand (**Map 1d**).

3.2 Landscape history

19th Century

The 1830's 1 inch OS map shows that considerable Lower Greensand heathland had already been enclosed by the early part of the 19th century. However, some small areas of heath are marked, with the largest occurring at Sandy.

Current landscapes and Natural Areas

North of the Chalk of the Chilterns (NA 65) and East Anglian Chalk (NA 51) Natural Areas, the county is mostly part of the West Anglian Plain Natural Area (NA52), occurring on gently rolling Jurassic clays and limestones. The distinctive low Greensand ridge of the Bedfordshire Greensand Ridge Natural Area (NA53) still supports relics of the now enclosed Greensand heaths. Here only small areas of unimproved grassland and heathland have survived intensive agriculture and conifer planting.

3.3 Existing information

Flora

The coincidence map of the acid grassland species listed in **Table 1** (**Map 2**) shows a significant concentration of such species on the Greensand Ridge but with high losses indicated by a comparison of the post-1970 map of scarce and rare species (**Map 4**) with the map of all records for these species (**Map 3**). The acid grassland species recorded are listed on **Table 6**, an extract from this table is given below. Dony (1976) in his Bedfordshire Plant Atlas shows that numerous species are confined, or nearly confined to the Greensand, including *Teesdalia nudicaulis*, *Cerastium semidecandrum*, *Trifolium striatum*, *Trifolium subterraneum*, *Ornithopus perpusillus*, *Potentilla argentea*, *Potentilla erecta*, *Aphanes inexspectata*, *Myosotis ramosissima*, *Plantago coronopus*, *Galium saxatile*, *Filago minima*, *Deschampsia flexuosa*, *Aira praecox* and *Aira caryophyllea*. *Rumex acetosella* is widespread off the Greensand on the Clay with Flints and gravels but other species are rare with a few records of species such as *Deschampsia flexuosa*, *Aira praecox*, *Galium saxatile* and *Potentilla erecta* on the Clay with Flints to the south.

Habitat surveys

The Grassland and Heathland Inventories indicate the occurrence of small areas of acid grassland and heath in the Greensand area. No other survey reports were obtained, but the distribution maps in the NVC Volume 3 show that sample quadrats of Festuca-Agrostis-Rumex typical sub-community (U1b) and Festuca-Agrostis-Rumex Galium-Potentilla sub-community (U1e) were recorded from the Greensand Ridge (Rodwell, 1992).

Summary of consultations with Local Team Conservation Officers

About 21.5ha of acid grassland have been recorded in SSSIs and 27ha in County Wildlife Sites (CWS). The area of acid grassland in the CWS is obtained from *Manual of wildlife sites and species protection* (Bedfordshire Wildlife Working Group 1995) and includes some areas noted as semi-improved. These areas probably include some neutral grassland. The total acid grassland resource for the county, which occurs in SSSIs and CWSs, is roughly estimated at 50ha.

Both parched acid grassland (Festuca-Agrostis-Rumex grassland, U1) and Wavy Hairgrass grass heath (Deschampsia flexuosa grassland, U2) are present in Bedfordshire, the latter as a matrix with heath. There is insufficient information available to estimate the proportion of these grassland types present.

The grassland is restricted to well-drained Greensand soils as either expanses of grassland (eg Maulden Heath) or mixed with heath. Much has been lost to both agriculture and plantations established on former acid grassland and heathland sites. Nau *et al* (1987) in *Bedfordshire Wildlife* (not seen by EPR) notes the best remaining acid grasslands are located in Maulden Heath and in the north-east area of Woburn Park.

Other than relics of enclosed heaths, some surviving acid grassland sites are parts of landscape parks, eg The Lodge, Sandy and Woburn Abbey. Substantial areas are also developing as a result of restoration proposals, eg Sandy Heath Quarry (Redlands). Acid grasslands are also found at the periphery of sand pits and railway verges.

As well as the species indicated in Dony (1976), lawns of mosses and lichens occur in some areas with the mosses *Polytrichum* species, *Brachythecium albicans* and *Ceratodon purpureus* and the lichens *Cladonia coccifera* agg. and *Cladonia chlorophaea*. The nationally rare Proliferous Pink *Petrorhagia prolifera* occurs in acid grassland and disturbed ground on a disused railway track near Potton, and this is a special species of the Greensand Ridge.

Common Blue (*Polyommatus icarus*) and Small Copper Butterflies (*Lycaena phlaeas*) can be abundant and there are records for local bugs such as *Chorosoma schillingi* and the Bishops Mitre Shield Bug (*Aelia acuminata.*)

The sites are generally managed by cutting, while grazing appears to be rare. There are some uncontrolled fires on heathland sites and some sites suffer from unauthorised motor biking.

3.4 Summary of resource

Extent and composition

The Bedfordshire Greensand clearly once supported extensive heathlands and acid grasslands with a fairly rich acid grassland flora. However, unimproved acid grassland has now been reduced to an estimated total of less than 50ha. The limited existing data suggests that the sub-communities U1b, U1e and U2a are present.

Conservation value

Despite the reduction in extent and richness of the Greensand heathlands and grasslands they are clearly still important in a county context. However, habitat loss has reduced their national significance.

3.5 Future requirements for survey and conservation

Survey

The English Nature Local Team considers that Phase 2 survey of the acid grasslands of the Greensand Ridge, particularly of non-statutory sites, would be valuable, to assess the full importance and extent of this resource.

Conservation

The Greensand Ridge is a clear priority for habitat restoration to counteract past fragmentation and habitat destruction.

3.6 References

DONY, J.G. 1976. *Bedfordshire plant atlas.* Luton: Borough of Luton Museum & Art Gallery.

BEDFORDSHIRE WILDLIFE WORKING GROUP. 1995. *Manual of wildlife sites and species protection - Bedfordshire.*

NAU, B.S., BOON, C.R. & KNOWLES, J.P. (eds.) 1987. *Bedfordshire wildlife.* Ware: Castlemead Publications.

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

County: Bedfordsire	
Natural Areas:	**53**
Filago minima	1
Hypochaeris glabra	0
Moenchia erecta	0
Ornithopus perpusillus	1
Potentilla argentea	1
Stellaria pallida	1
Teesdalia nudicaulis	1
Trifolium striatum	1
Trifolium subterraneum	1
Vicia lathyroides	1
Total no. of species extant	**8**
Total no. of species extinct	**2**
Total no. of species recorded	**10**

Natural Area 53 = Bedfordshire Greensand Ridge
1 = Recent record
0 = Apparently extinct

Bedfordshire acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1984-90	Enclosure relic, Park, Field	All in the Greensand Ridge NA	5	246.9	16.2	7.0		
Heathland Inventory		1995	Enclosure relic, Park	All in the Greensand Ridge NA	13	626.0			112.9	
Estimates, ha		1996		Tim Barfield, EN. All in the Greensand Ridge NA				48.5		
Estimates, classes		1996						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, ha																						
Estimates, class	A		A			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

4. Berkshire

4.1 Physical

Geology

Berkshire is dominated by the Tertiary deposits of the Thames Basin to the south and east, with Chalk outcrops of the Lambourn Downs to the north west. In the Thames Basin the heathland areas tend to be associated with the younger sands and clays above the London Clay, and the gravel terraces that cap the hill tops.

Soils

The heathland areas of the south east and the ridge tops in the rest of the Thames Basin stand out on the soil map with soil associations dominated by Podzols (**Map 1b**)

4.2 Landscape history

19th Century

The Thames Basin outside of the south east was countryside where small to medium size commons with heathland vegetation were frequent on the less fertile soils. In the south east the landscape was dominated by the immense heathlands of Windsor Forest.

Current landscapes and Natural Areas

Berkshire is dominated by two Natural Areas; the chalk Downs of the north west are included within the Berkshire and Marlborough Downs (NA79) and the Tertiary deposits are in the London Basin (NA66). The latter encompasses the two distinct areas, referred to above in the description of the 19th century landscape. In both Natural Areas, enclosure of heathland and general neglect of the surviving areas has resulted in massive losses of heath and associated acid grassland. Some areas of heathland have survived because of their use for military purposes.

4.3 Existing information

Flora

The coincidence map (**Map 2**) of all records of the acid grassland species listed in **Table 1** shows the Thames Valley to have been be rich in these species, especially to the south. However, losses have been severe as shown in **Map 3** and **Map 4**. One notable feature is the survival of *Viola lactea* on Inkpen Common (SU3864) a heathland relic that is now cattle-grazed. Numbers of acid grassland species in Berkshire are given in the extract of **Table 6** below.

Fauna

The short, mown, acid grassland of Greenham Common air base is part of a large area of open habitat which has supported breeding Lapwing and possibly Stone Curlew and Little Ringed Plover (Ecological Planning & Research, 1995).

Habitat surveys

The Grassland Inventory records only 3 sites including two large sites at Greenham Common (SU4964) and Windsor Forest (SU97). The Heathland Inventory records about 50 ha of dry heath in the south and south east of the county. Five habitat surveys have recorded acid grassland. English Nature's chalk grassland data set indicates that 4.6 hectares of neutral/acid grassland (MG/U) was record on the downland in the south west of the county at Inkpen Hill (SU3761). More specific data on acid grassland was found in the following surveys.

Biological survey of common land No 14: Berkshire (Francis et al, 1990)

This survey recorded over 100ha of acid grassland and mosaics of acid grassland with dry heath. Most of it was recorded within the Greenham Common complex, with small areas elsewhere in central southern Berkshire. The descriptions indicate that parched acid grassland (Festuca-Agrostis-Rumex grassland, U1) dominates but with some Deschampsia flexuosa grassland (U2).

Greenham Common reports (Porley, 1993 & Ecological Planning & Research, 1995)

This important site includes both mown acid grassland and heath within the former air base and more overgrown heathland beyond. A detailed NVC survey has been carried out over part of the site and a management plan has been written for the whole site. The acid grassland is especially varied and species rich, dominated by U1 dominating with several sub-communities recorded (U1b, U1d, U1e & U1f). The flora is the richest for acid grassland species in Berkshire with species such as *Moenchia erecta*, *Filago minima* and a large number of calcicole species such as *Carlina vulgaris* and *Hippocrepis comosa* occurring in the U1d communities. The latter species appear to have been favoured by the presence of lime-rich concrete runways. It is intended to reinstate grazing on these commons once they have been restored after military use.

Windsor Great Park (Steven, 1995)

This grassland survey recorded about 30 ha of unimproved acid grassland within the parkland of Windsor Great Park with its internationally important concentration of veteran trees. Moist acid grassland (Festuca-Agrostis-Galium grassland, U4) preominates, but from the data provided it appears that parched acid grassland (U1e) is also present. Selected data from the survey are presented in Volume I (Appendix I) as an example of U4 grassland in a parkland landscape.

The grassland is fragmented and is mown, not grazed, but represents a large proportion of the total acid grassland resource in Berkshire. A small area of turf stripping has produced more diverse acid grassland from species poor grassland. The resumption of grazing by cattle is recommended.

Summary of consultations with Local Team Conservation Officers

It was confirmed that Greenham Common and Windsor Forest, described above, are the most important sites for acid grassland in the county; the former for its parched acid grassland communities with a rich associated flora and the latter, although less diverse, for its unusual stands of U4 grassland on the London Clay.

Ted Green, the former EN warden at Windsor has found the unimproved grasslands at Windsor to be rich in both grassland and mycorrhizal fungi, the latter associated with the veteran trees occurring in the grassland. The best conditions for the fruiting of these fungi is a very short sward, with rabbit grazing producing ideal conditions. The neighbouring improved grasslands are poor in fungi species.

Beyond these major sites the area of acid grassland is limited. Small fragments of U1 and U2 are found in relic heathlands and on the gravelly parts of flood plains. The best example of the latter type of habitat is found in Sulham and Tidmarsh Hoods and Meadows SSSI (SU635741) where 2ha of U1 grassland with *Ulex minor* occurs. It is estimated that there is about 150ha of acid grassland in Berkshire of which about 30ha is U2 grassland, 30ha is U4 grassland, and the rest is U1 grassland.

4.4 Summary of resource

Extent and composition

There has clearly been a massive reduction in the area of acid grassland in Berkshire and most acid grassland sites consist of small fragments. There are however, two large sites surviving; Greenham Common and Windsor Forest. The former contains very diverse U1 grassland and the latter is dominated by U4.

Conservation value

Greenham Common is a site of major nature conservation interest where disturbance and mowing has maintained acid grassland similar to that seen in parts of the New Forest, and it is one of the best individual sites in southern England. The grassland in Windsor Park forms part of the habitat of an internationally important assemblage of veteran trees.

4.5 Future requirements for survey and conservation

Survey

As both Greenham Common and Windsor Park have been surveyed, additional survey and floristic assessment of other acid grasslands in the London Basin are of moderate priority.

Conservation

The main requirement in Berkshire would appear to be a vigorous programme of heathland restoration, including introduction of extensive grazing. Much restoration is already under way or planned.

4.6 References

ECOLOGICAL PLANNING & RESEARCH. 1995. *Greenham Common management plan.* Newbury: Newbury District Council.

FRANCIS I.S., PENFORD, N., AITCHISON, J.W. & MASTERS, S. 1990. *Biological survey of common land No 14: Berkshire.* Peterborough: English Nature.

PORLEY, R.D. 1993. *A botanical survey and assessment of Greenham Common airbase, Berkshire.* Newbury: English Nature, South Region.

STEVEN, G. 1995. *Windsor Great Park. An assessment of the conservation value of the grassland.* Newbury: English Nature, Thames and Chilterns Team.

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

County:	**Berkshire**
Natural Areas:	**66**
Chamaemelum nobile	1
Dianthus deltoides	0
Filago minima	1
Hypochaeris glabra	0
Moenchia erecta	1
Ornithopus perpusillus	1
Potentilla argentea	1
Sagina subulata	1
Stellaria pallida	1
Teesdalia nudicaulis	1
Trifolium ornithopodioides	0
Trifolium scabrum	0
Trifolium subterraneum	1
Viola lactea	1
Total no. of species extant	**10**
Total no. of species extinct	**4**
Total no. of species recorded	**14**

66 = London Basin

1 = Recent record
0 = Apparently extinct

Berkshire acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1983-94	Heath, Flood plain, Parkland	Excludes many heathland sites	3	208.6	100.0	100.0		
Heathland Inventory		1991-93	Heath, Enclosure relic	Mainly in south and south west of the county	30	3290.0			53.2	
Common Land		1990	Heath	Greenham plus other commons in SW, 1 to NE				116.0		
Chalk Grassland	SU374614	1985	Calcicolous/drift	MG/U recorded from downland site, Inkpen		10.8	6.5	6.5		
Greenham (Porley, 1993)	SU495646	1993	Heath	Mosaic of H2 & U1, only part of common surveyed				27.0		
Greenham (EPR, 1995)	SU495646	1995	Heath	Not full survey as still under military ownership						
Widsor (Steven, 1995)	SU97	1994-5	Parkland	Descriptions indicate U4 dominant plus U1e	1			31.7		
Estimate, hectares		1996	Above	Graham Steven, EN				150		
Estimate, class		1996		Graham Steven, EN				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
Grassland Inv.																						
Heathland Inv.																						
Common Land	+							+														
Greenham 93	27.0		+		+		+															
Greenham 95	50.0		+		+	+	+	0.5	0.5													
Windsor 95	+					+			+			+	+									
Estimate, ha	90.0							30.0	30.0			30.0	30.0									
Estimate, class	B		A		A	A	B	A	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

5. Buckinghamshire

5.1 Physical

Geology

Buckinghamshire spans a range of rock types from a small area of Tertiary clays and sands in the south east corner, through the Chalk of the Chilterns and Jurassic clays and limestones beyond. A small area of Lower Greensand outcrops on the western boundary. This is contiguous with the Greensand of Bedfordshire. Deep clay with flint deposits exist on the Chalk of the Chilterns.

Soils

Soil associations dominated by dry acidic soils are rare on the soil map. A soil association dominated by brown sands is recorded in the Greensand Ridge Natural Area (NA 53) (**Map 1c**).

5.2 Landscape history

19th Century

In the early 19th century large commons of rough grazing or pasture woodland were a feature of the hill tops in the south of the county.

Current landscapes and Natural Areas

The north of the county includes part of the West Anglian Plain Natural Area (NA52) and the Thames and Avon Vales Natural Area (NA63) where Jurassic clays are predominant and acidic soils are rare. The Midvale Ridge Naural Area (NA64) probably once had acid grasslands on leached soils derived from sandy Corallian Limestone. In the east a small area of the Greensand Ridge, which is dominated by acid soils (NA53), just extends into the county while in the south the clay cap on the chalk downs of the Chilterns (NA65) support some acid soils. Both of these Natural Areas in Buckinghamshire, however, now have few areas of surviving unimproved acid grassland. The county also includes a corner of the London Basin Natural Area (NA66) where acidic soils are frequent and where some significant heathland relics and pasture woodlands survive.

5.3 Existing information

Flora

Other than in the extreme south east of the county in the London Basin and possibly the Greensand Ridge, the lowland acid grassland species listed in **Table 1** are almost completely absent from Buckinghamshire (**Map 2**). The post-1970 records of selected species (**Map 4**) compared to all records of these species on **Map 3** indicate considerable losses from the limited areas from which acid grassland species have been recorded.

Habitat surveys

The Grassland Inventory records only two sites with acid grassland, both of which occur on drift over the Chalk in the Chilterns. The Heathland Inventory indicates small areas of heathland surviving at Stoke Common (SU9885) and Burnham Beeches (SU9585) and a tiny fragment on the Greensand Ridge.

Summary of consultations with Local Team Conservation Officers

Very little acid grassland is known in Buckinghamshire. Some acidic grassland occurs on thick drift on Coombe Hill (SP849066) above the chalk scarp of the Chilterns but the NVC type is not known. On the dip slope of the Chalk, 1.2ha of moist acid grassland (Festuca-Agrostis-Galium grassland, U4) has been recorded at Moorend Common (SU802905). The heathland and pasture woodlands in the south east, including Burnham Beeches and Stoke Common, probably contain less than 10ha of *Deschampsia flexuosa* grass heath (U2a). In 1996 some remnant acid grassland was discovered on the Greensand close to Kings and Bakers Woods and Heaths SSSI. This is apparently semi-improved but is a large area (14ha). It has not been included in the statistics for the county.

5.4 Summary of resource

Extent and composition

Only extremely small areas of acid grassland remain. NVC communities U4 and U2 certainly survive. Parched acid grassland (U1) must have occurred in the London Basin and the Greensand Ridge and tiny fragments still probably survive in disturbed areas.

Conservation value

The remaining areas of acid grassland are of limited significance other than at a county level. The small area of the London Basin in the county, however, should be regarded as part of the more significant assemblage of acid grasslands of this Natural Area.

5.5 Future requirements for survey and conservation

Survey

There is no obvious requirement for Phase 2 surveys other than in the Greensand Ridge which should be covered by any survey undertaken for the Bedfordshire part of this Natural Area.

Conservation

Restoration of grazing to heathland and pasture woodland in the London Basin and the Greensand Ridge would undoubtedly allow the recovery of significant areas of acid grassland. Such restoration is already under way at Burnham Beeches.

Buckinghamshire acid grassland surveys

Survey Name	GR	Date	Landscape Types	Comments	No Sites	Site Area	Gr Area	AG Area	H Area	LHA
Grassland Inventory		1987-93	Calicicolous/drift, Common	Small areas on superficials on chalk, Chilterns	2	8.2	6.5	1.2		
Heathland Inventory		1984-95	Above + Heath & Pasture wood	Above + most in NA66 & tiny area in NA53	8	572.0			89.8	
Estimates, hectares		1996		Graham Steven, EN				<10		
Estimates, classes		1996		Graham Steven, EN				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, Ha								<10				1.2										0.0
Estimates, class								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