

**Priority Habitat Definition Statement
Lowland Calcareous Grassland - Version 1.2**

1. Introduction

1.1 General description

Lowland calcareous grasslands are developed on shallow lime-rich soils generally overlying limestone rocks, including chalk. The definition of calcareous grasslands covers a range of plant communities in which lime-loving plants are characteristic. In the context of the HAP, lowland types are defined as the first nine calcareous grassland National Vegetation Classification communities, CG1 to CG9. With the exception of CG9, *Sesleria albicans* - *Galium sternerii* grassland, which straddles both lowlands and uplands, these communities are largely restricted to the warmer and drier climates of the southern and eastern areas of the United Kingdom. Lowland sub-communities of CG9 occur in the more clement conditions around Morecambe Bay in Cumbria, while upland sub-communities occupy colder and wetter localities in the Pennines. Lowland calcareous grassland sites occur in both enclosed and unenclosed situations but typically below the upper level of agricultural enclosure in any particular district; calcareous grasslands situated in the unenclosed uplands are covered by a separate Action Plan.¹

The cover of lowland calcareous grassland has suffered a sharp decline in extent over the last 50 years. There are no comprehensive figures, but a sample of chalk sites in England surveyed in 1966 and 1980 showed a 20% loss in that period and an assessment of chalk grassland in Dorset found that over 50% had been lost between the mid-1950s and the early 1990s. Current estimates put the amount of lowland calcareous grassland remaining in the United Kingdom around 33,000 to 41,000 ha with less than 1,000 ha of this in Wales. The bulk of the resource is found on chalk (25,000 to 32,000 ha), with major concentrations in Wiltshire, Dorset and the South Downs.¹

1.2 Summary of existing information

1.2.1 Information sources

This definition is based primarily on the UK Biodiversity Action Plan. A list of all documents used to compile this definition statement is included as **Appendix 1**.

1.2.2 Existing inventories

English Nature have produced County Grassland Inventories (Jefferson et al, 1997

1.3 Key issues with mapping and discriminating from other habitats.

- Please refer to Section 9 for instructions on dealing with relationships with other habitats, and Section 11 for size of mappable units.
- Areas of semi-natural or artificial habitat totally within an area of this priority habitat should be included in the polygon for this priority habitat polygon, if <0.25ha.

Scattered scrub is sometimes an integral part of the calcareous grassland environment. It can support invertebrates which otherwise would not occur on down-land and is also an important habitat for birds and scrub-edge plants. Large stands (>0.25ha) of dense scrub (>20% cover) should be excluded and regarded as a separate habitat type. Areas of scrub that are surrounded by calcareous grassland and are <0.25 ha should be mapped as part of the grassland habitat and noted as a feature of the polygon.

2. Physio-graphical description

2.1 Structural/physical components

Lowland Calcareous Grassland is usually found on steeper slopes, dry river valleys and ancient earthworks because other suitable sites have been cultivated. However, there are more extensive areas on flatter topography including Salisbury Plain.

2.2 Applicability of aerial photos and other remote sensing technologies

A combination of contour maps and aerial photography information can be useful in mapping the unimproved grassland and areas of denser scrub, although it is not always possible to distinguish unimproved from improved grassland.. Other datasets such as soil maps and Landcover may also be of use in mapping this habitat.

3. Altitudinal limits

Altitudinal limit is not always a useful tool for distinguishing Upland and Lowland Calcareous Grassland, and wherever possible the boundary should be based on enclosure and NVC plant community data. Typically Lowland Calcareous Grassland occurs below the upper limit of agricultural enclosure. On the ground judgment will often be required on what to include as upland versus lowland when mapping in the upland fringes of England. API should allow assessment of whether habitat parcels are above or below the local enclosure limit.

4. Habitat classification

The categories in these classifications are not totally synonymous and the comparisons below attempt to be the best approximation.

CLASSIFICATION and version date	CODE	DESCRIPTION	RELATIONSHIP *	COMMENTS			
BAP priority habitat (1995)		Lowland calcareous grassland	=				
BAP broad habitat (1998)		Calcareous grassland	>				
Phase 1 (1990)	B3	Calcareous grassland	>				
	B31	Calcareous grassland – unimproved	>				
	B32	Calcareous grassland - semi-improved	>				
	B2.1	Neutral grassland - unimproved	>				
NVC (1998)	CG1	<i>Festuca ovina - Carlina vulgaris</i> grassland	<	Ben - From HR's classification table: MG2 is also included when occurs with CG types. Also includes CG2d-related and MG1-related.			
	CG2	<i>Festuca ovina – Avenula pratensis</i> grassland	<				
	CG3	<i>Bromus erectus</i> grassland	<				
	CG4	<i>Brachypodium pinnatum</i> grassland	<				
	CG5	<i>Bromus erectus – Brachypodium pinnatum</i> grassland	<				
	CG6	<i>Avenula pubescens</i> grassland	<				
	CG7	<i>Festuca ovina – Hieracium pilosella – Thymus</i> spp. grassland	<				
	CG8	<i>Sesleria albicans – Scabiosa columbaria</i> grassland	<				
	CG9	<i>Sesleria albicans – Galium sternerii</i> grassland	<				
MG2	lowland sub-communities only.	<	Where it occurs with CG types				
EUNIS (1999)	E1.2	Perennial calcareous grassland and basic steppes	>				
	E1.2/P-34.2						
	E1.2/P-34.32						
	E1.2/P-34.33						
	E1.2/P-34.34						
	E2.2						
	E5.2/P34.41						
	E5.2/P34.42						
	E5.5/P-37.81						
	Palaeartic				34.32 34.33 34.34 34.41 34.42 38.2 (37.1) (37.8)		HR lists these as the corresponding Palearctic types:

CORINE (1991) Biotopes	34.321 34.331 34.34 34.41 34.42 38.2 (37.1) (37.8) Corine land cover classes: 3.2.1 (natural grassland) and 3.2.4 (transitional woodland/shrub).	Natural grassland	>	:
Habitats Directive Annex 1 type (1999 Interpretation manual)	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates [Festuco-Brometalia] and important orchid sites	>	
IHS (2001)	GC/P/1	Lowland calcareous grassland	=	

relationship of classification type to priority habitat:
= equal, < narrower, > wider, # overlap, ? not determined

5. Species composition

5.1 Flora

Lowland Calcareous Grassland often supports a very rich flora. It is dominated by combinations of *Festuca ovina*, *Brachypodium pinnatum*, *Bromopsis erecta*, *Briza media*, *Helictotrichon* sp, *Koeleria macrantha* and *Trisetum flavescens* with many associated herbs including *Helianthemum nummularium*, *Knautia arvensis*, *Leontodon hispidus* and *Thymus praecox*. However it does not always have all the above. Open communities can be rich in lichens and bryophytes including *Ctenidium molluscum* and *Homalothecium lutescens*.

See Rodwell (1998) for further details of flora.

5.2 Fauna

Calcareous grassland provides essential habitat for a wide range of invertebrates notably skipper and blue butterflies.

Making the Links finds 27 BAP priority species to be primarily associated with the habitat. These and a list of associated species as found in the UK BAP are found in **Appendix 2**.

6. Geographical restrictions

6.1 Geographical coverage and restrictions in the UK

Lowland Calcareous Grassland is found predominantly in southern and eastern England where Wiltshire, Dorset and South Downs hold the bulk of the resource. There is limited distribution in Wales and very little Lowland Calcareous Grassland in Scotland.

The core region for calcareous grasslands is on the Cretaceous and Jurassic strata with NVC communities CG1-7. CG1 and CG2 extend to north and south Wales and the west of England. CG8 & 9 are confined to northern England.

6.2 Climate requirements

The NVC communities included within this definition are largely restricted to the warmer and drier climates of the southern and eastern areas of the United Kingdom. Lowland sub-communities of CG9 occur in the more clement conditions around Morecambe Bay in Cumbria.

7. Geology and soils

The distribution of lowland calcareous grassland is limited by the geology of the under-lying rock. The habitat is primarily found on Chalk and Jurassic limestone, but also found on some of the older limestones, especially the Carboniferous where the distinction between upland and lowland becomes less clear.

Soils are characteristically shallow, lime-rich but nutrient poor rendzinas with pH \geq 6.5.

8. Hydrology

The soil type is free draining.

9. Relationship with other priority habitats

	Lowland calcareous grassland
Ancient and/or species rich hedgerows	Allowable overlap. Hedges will be mapped as linear features and should not artificially sub-divide contiguous areas of grassland.
Chalk rivers	Awaiting guidance.
Coastal sand dunes	Allowable overlap.
Lowland Heath – This may be relevant to areas where “chalk heath” occurs in close association with calcareous grassland.	Separate based on broad habitat distinction. Heath must be 25% or more Ericoids or small Ulex cover. Where the two have been mapped as a mosaic, the area should be assigned to the predominant habitat with proportion estimates entered in text comment attribute. If the two are in unknown or roughly equal proportions, map in both inventories using “definitely present within polygon but not mappable” under the priority determination attribute.
Lowland dry acid grassland	Separate by NVC. Soil data may be useful.
Maritime cliff and slopes	Allowable overlap. In most cases NVC will separate those grasslands that are considered as Maritime Cliff communities.
Upland calcareous grassland	Separate by NVC, sub-communities and enclosure limit.
Upland mixed ashwoods	Separate by broad habitat distinction, i.e. 20% canopy cover.

Chalk and limestone may be overlain with more recent deposits of clay with flint or gravel, or leached deposits. These can give rise to acid grassland and some heath communities. However, there is usually a clear distinction between the heath and grassland. True chalk heath, where heathers grow directly on the Chalk substrate is rare but does occur. This should be mapped as Phase 1 Basic dwarf shrub heathland (D12).

The shift from calcareous grassland to **maritime** habitat, eg on limestone cliffs of southern England, is usually a fairly sharp transition from NVC CG communities to MC communities.

10. Management

Lowland Calcareous Grassland has traditionally been grazed by cattle, sheep or, occasionally horses. However, if grazing is relaxed this leads to rank grassland, a loss of diversity and, ultimately, scrub encroachment.

There has been extensive loss of calcareous grassland on the gentle slopes as a result of agricultural improvement. Relicts of unimproved grassland survive only on ancient monuments and the steeper slopes. Thus there are few remaining large areas of unimproved or semi-improved calcareous grassland outside army ranges such as those on Salisbury Plain). In Dorset >55% sites are under 10 ha and in the Lincolnshire Wolds 66% sites are < 1 ha with none > 10 ha.

Observations suggest that the number of plant species does not immediately decline with fragmentation, as many calcicoles are tenacious. However, fragmentation may affect invertebrate metapopulations, which are more at risk from local extinctions (ref).

11. Size of mappable units

Minimum mappable unit (MMU): 0.25 ha

Remaining fragments can be very small, however they are an important resource.

12. Regional differences

Please refer to Rodwell (1998) for details of regional variations

Appendix 1

Review of Information Sources

¹Anon (1998). Lowland Calcareous grassland. UK Biodiversity group: Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats.

Dargie, T.C. (1993). The distribution of lowland wet grassland in England. Peterborough: English Nature Research Reports No. 49.

England Field Unit (1990). Handbook for Phase 1 habitat survey - a technique for environmental audit. NCC, Peterborough.

English Nature Biodiversity series (1999). *Biodiversity - Making the links*. English Nature, Peterborough.

EUNIS website [www.mrw.wallonie.be/dgrne/sibw/EUNIS/]

Jackson, D. L. (2000). *Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): definitions and the relationship with other habitat classifications*. JNCC Report 307, Peterborough

Jefferson et al (1997). Inventories of lowland grassland in England: Rationale and methodology. Peterborough: *English Nature Research Reports* No. 215.

Rodwell, J. S. (1998). *British Plant Communities Vol. 3 Grasslands and montane communities*. Cambridge University Press.

SERC (2001). *The Integrated Habitat System*.

Appendix 2

BAP priority species associated with lowland calcareous grassland

(From "Biodiversity - Making the Links" - 28 June 2000 version)

Scientific name	Common name	Taxon	Priority list	Importance of habitat to the species *
<i>Asilus crabroniformis</i>	Hornet robberfly	Fly	SAP	P
<i>Aspitates gilvaria gilvaria</i>	Straw belle	Moth	SAP	P
<i>Burhinus oediconemus</i>	Stone curlew	Bird	SAP	P
<i>Coleophora tricolor</i>	Basil thyme case-bearer	Moth	SAP	P
<i>Cryptocephalus coryli</i>	a leaf beetle	Beetle	SAP	P
<i>Cryptocephalus nitidulus</i>	a leaf beetle	Beetle	SAP	P
<i>Cryptocephalus primarius</i>	a leaf beetle	Beetle	SAP	P
<i>Doros profuges/conopseus</i>	a hoverfly	Fly	SAP	P
<i>Eurodryas aurinia</i>	Marsh fritillary	Butterfly	SAP	P
<i>Harpalus cordatus</i>	a ground beetle	Beetle	SS	P
<i>Harpalus dimidiatus</i>	a ground beetle	Beetle	SS	P
<i>Harpalus obscurus</i>	a ground beetle	Beetle	SS	P
<i>Harpalus parallelus</i>	a ground beetle	Beetle	SS	P
<i>Harpalus punctatulus</i>	a ground beetle	Beetle	SS	P
<i>Heliophobus reticulata</i>	Bordered gothic	Moth	SAP	P
<i>Hemaris tityus</i>	Narrow-bordered hawk-moth	Moth	SAP	P
<i>Hesperia comma</i>	Silver spotted skipper	Butterfly	SAP	P
<i>Idaea dilutaria</i>	Silky wave	Moth	SAP	P
<i>Lysandra bellargus</i>	Adonis blue	Butterfly	SAP	P
<i>Maculinea arion</i>	Large blue	Butterfly	SAP	P
<i>Noctua orbona</i>	Lunar yellow underwing	Moth	SAP	P
<i>Plebejus argus</i>	Silver-studded blue	Butterfly	SAP	P
<i>Polia bombycina</i>	Pale shining brown	Moth	SAP	P
<i>Scotopteryx bipunctaria cretata</i>	Chalk carpet	Moth	SAP	P
<i>Siona lineata</i>	Black-veined moth	Moth	SAP	P
<i>Trichopteryx polyommata</i>	Barred toothed stripe	Moth	SAP	P
<i>Tyta luctuosa</i>	Four-spotted moth	Moth	SAP	P
<i>Alauda arvensis</i>	Skylark	Bird	SAP	S
<i>Bembecia chrysidiformis</i>	Fiery clearwing	Moth	SAP	S
<i>Bombylius discolor</i>	Dotted bee-fly	Fly	SAP	S
<i>Cucullia lychnitis</i>	Striped lychnis	Moth	SAP	S
<i>Hygrocybe calyptriformis</i>	Pink meadow cap	Fungi	SAP	S
<i>Hygrocybe spadicea</i>	Date-colored waxcap	Fungi	SAP	S
<i>Miliaria calandra</i>	Corn bunting	Bird	SAP	S
<i>Myotis myotis</i>	Greater mouse-eared bat	Mammal	SAP	S
<i>Perdix perdix</i>	Grey partridge	Bird	SAP	S
<i>Pipistrellus pipistrellus</i>	Pipistrelle bat	Mammal	SAP	S
<i>Rana lessonae</i>	Pool frog	Amphibian	SAP	S
<i>Seligeria calycina</i>	English rock-bristle	Moss	SS	S
<i>Andrena gravida</i>	Banded mining bee	Bee	SAP	X
<i>Andrena lathyri</i>	a mining bee	Bee	SAP	X
<i>Arabis glabra</i>	Tower mustard	Vascular plant	SAP	X

<i>Aricia artaxerxes</i>	Northern brown argus	Butterfly	SS	X
<i>Barbastella barbastellus</i>	Barbastelle bat	Mammal	SAP	X
<i>Bombus distinguendus</i>	Great yellow bumblebee	Bee	SAP	X
<i>Bombus humilis</i>	a carder bumblebee	Bee	SAP	X
<i>Bombus ruderatus</i>	Large garden bumblebee	Bee	SAP	X
<i>Bombus subterraneus</i>	Short-haired bumble-bee	Bee	SAP	X
<i>Bombus sylvarum</i>	Shrill carder bee	Bee	SAP	X
<i>Buellia asterella</i>	Starry Breck-lichen	Lichen	SAP	X
<i>Carex muricata</i> ssp. <i>muricata</i>	Prickly sedge	Vascular plant	SAP	X
<i>Cotoneaster integerrimus/cambricus</i>	Wild cotoneaster	Vascular plant	SAP	X
<i>Decticus verrucivorus</i>	Wart-biter	Cricket	SAP	X
<i>Dianthus armeria</i>	Deptford pink	Vascular plant	SAP	X
<i>Gentianella anglica</i> ssp. <i>anglica</i>	Early gentian	Vascular plant	SAP	X
<i>Gryllus campestris</i>	Field cricket	Cricket	SAP	X
<i>Juniperus communis</i>	Juniper	Vascular plant	SAP	X
<i>Malachius aeneus</i>	a false soldier beetle	Beetle	SAP	X
<i>Nomada armata</i>	a cuckoo bee	Bee	SAP	X
<i>Nomada ferruginata</i>	a cuckoo bee	Bee	SS	X
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat	Mammal	SAP	X
<i>Sorbus leyana</i>	Ley's whitebeam	Vascular plant	SAP	X
<i>Squamarina lentigera</i>	Scaly breck-lichen	Lichen	SAP	X
<i>Thlaspi perfoliatum</i>	Cotswold pennycress	Vascular plant	SAP	X
<i>Triturus cristatus</i>	Great crested newt	Amphibian	SAP	X
<i>Weissia sterilis</i>	Sterile beardless-moss	Moss	SS	X

* (P) primary, (S) secondary or (x) less