

Lowland calcareous grassland

A scarce and special habitat

English Nature is the Government agency that champions the conservation of wildlife and natural features throughout England.

This is one of a range of publications published by External Relations Team English Nature Northminster House Peterborough PE1 1UA

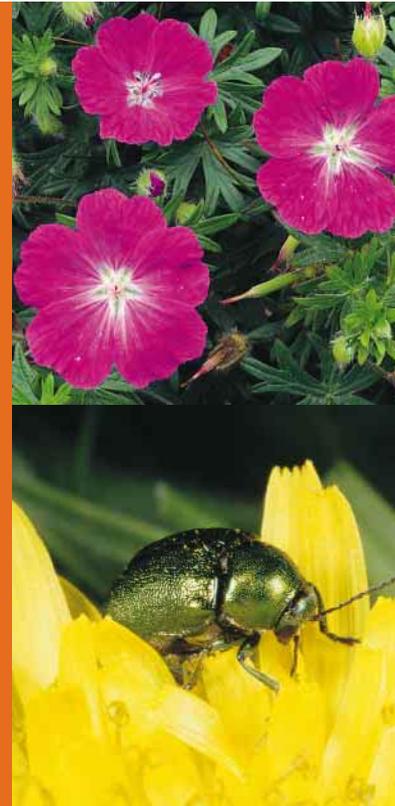
www.english-nature.org.uk

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Printed by W Lake (Birmingham) Ltd, 15M Printed on Evolution Satin, 75% recycled post-consumer waste paper, Elemental Chlorine Free.

ISBN 1 85716 539 X
Catalogue code IN6.1

Designed by Status Design & Advertising.



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Front cover pictures:
Top left: Bloody crane's-bill - Peter Wakely.
Bottom left: Cat's-ear pot beetle - Roger Key.
Main: Crook Peak to Shute Shelve Hill, Somerset - Peter Wakely.

working today
for nature tomorrow

“The air, especially in the evening of a hot spring day, is full of a fresh herby smell, to which many minute aromatic plants contribute...”

“The vegetation has the appearance of a beautiful tapestry worked in various shades of green, roughened with the slender dry bents standing out like pale yellow thread-ends from the green texture; flecked, and in places splashed with brilliant colour - red, purple, blue, and yellow.”

(Extract from W.H. Hudson, 1900 Nature in downland. Longmans, Green & Co., London)

What is lowland calcareous grassland?

Lowland calcareous grassland is made up of many different kinds of lime-loving plants, including grasses, herbs, mosses and lichens, that together provide a habitat for a wide variety of insects and birds. This type of grassland is different from the calcareous grassland that occurs in the



The Devils Kneading Trough, Wye & Crundale Downs, Kent. Photograph - Stephen Davis.

colder, wetter uplands and mountains of northern England, Wales, Northern Ireland and Scotland. Lowland calcareous grassland is one of the United Kingdom's rarest and most threatened habitats.

Where is it found?

Lowland calcareous grassland is found on lime-rich soils, usually over limestone or chalk. The soils are generally well-draining, and are often shallow and infertile. Lowland calcareous grassland occurs mainly in the warmer, drier areas of England and Wales.

Remaining areas of this grassland are now found mostly on steep valley

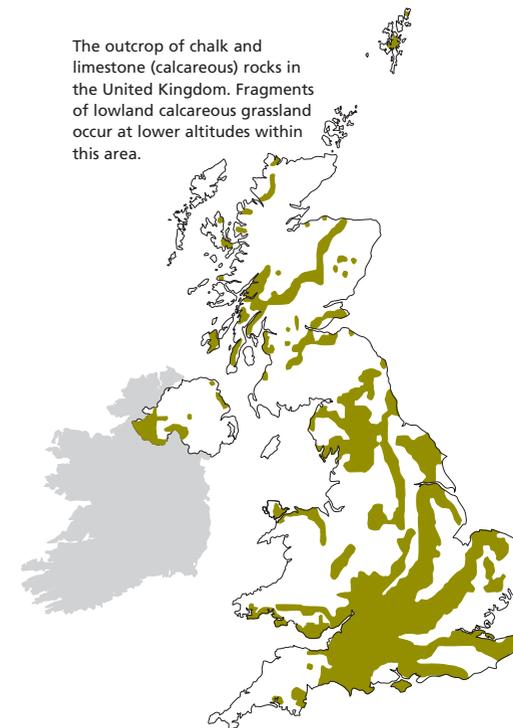


Whitbarrow, Cumbria. Photograph - Richard Jefferson.

slopes, escarpments and coastal cliffs and headlands, although, more rarely, there are some areas on level ground or plains, such as in the East Anglian Breckland and on Salisbury Plain.

Important concentrations occur in the downs of Wiltshire, Dorset, Sussex, Hampshire and Kent, the Cotswolds, the Derbyshire Dales, the Breckland, the limestone outcrops and coastal cliffs and headlands of north and south Wales, and around Morecambe Bay. Only small areas of this grassland have been found in Scotland and Northern Ireland. The calcareous grassland that occurs at low levels around the coast of north west Scotland is closer in character to upland calcareous grassland.

The outcrop of chalk and limestone (calcareous) rocks in the United Kingdom. Fragments of lowland calcareous grassland occur at lower altitudes within this area.





Worms Head, Gower Coast. Photograph - David Woodfall/NHPA.

Why is it important for wildlife?

The rich variety of plants and animals which make up lowland calcareous grassland includes many rare and scarce plants, birds and invertebrates. Lowland calcareous grassland thus has considerable nature conservation value. It is also an important part of some of the UK's most attractive landscapes such as the rolling chalk downland of southern England, the coastal headlands of the north Wales coast and the limestone gorges, hills and crags of the Mendips in Somerset.

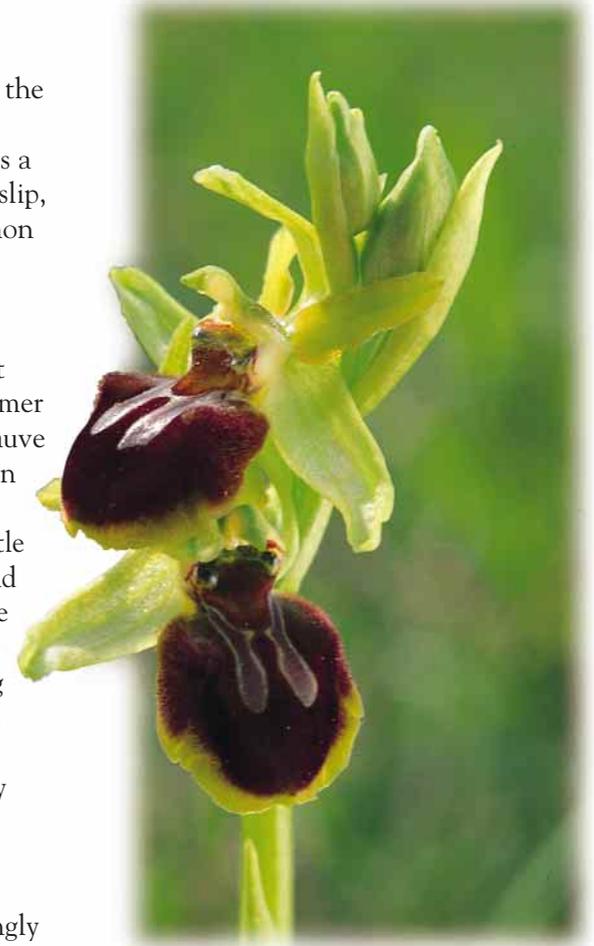
Lowland calcareous grasslands have considerable historical value. Prehistoric burial mounds, stone circles, hill-figures and Iron Age hill forts are a particular feature of chalk downland and illustrate the antiquity of man's association with the landscape and its wildlife.

Lowland calcareous grassland is remarkable for the intricate mixture of plants it contains including grasses, sedges, herbs, mosses, liverworts and lichens. A careful search may reveal as many as 40 plant species in a square metre. Grasses such as sheep's-fescue, upright brome, meadow oat-grass and crested hair-grass are characteristic of many of these grasslands. In eastern Durham and the Morecambe Bay area of Cumbria, the bluish tufts of blue moor-grass are prominent in limestone pastures.



Parsonage Down, Wiltshire. Photograph - Stephen Davis.

The typical herbs of lowland calcareous grassland produce a glorious spectrum of colours from the spring through to early autumn. Spring and early summer produces a carpet of yellow flowers with cowslip, common bird's-foot-trefoil, common rock-rose, kidney vetch and horseshoe vetch. White and cream-coloured flowers of oxeye daisy and dropwort are prominent from late May onwards. Late summer is the best time for purple and mauve flowers with small scabious, autumn gentian, devil's-bit scabious, clustered bellflower and dwarf thistle producing a riot of colour. Lowland calcareous grasslands are also home to a large number of rare and declining flowering plants. Among these are the orchids which often hold a particular fascination for people. Of the rarer species, many are confined to the southern, warmer, drier areas of England. Examples include the early spider-orchid, whose flowers strongly resemble the body of a large fat spider and man orchid, so-named as each greenish-yellow flower resembles a small human figure with head, arms and legs. An exception to the generally southern distribution is dark-red helleborine, whose southernmost locality in the UK is



Early spider orchid. Photograph - Stephen Davis.

the Derbyshire Dales. This orchid occurs in limestone grassland, but can also be found on rocky slopes, screes and in the crevices (grikes) of limestone pavements.



Pasqueflower. Photograph - Stephen Davis.

Other scarce plants include the blue-flowered perennial flax which can be found mainly in eastern England from County Durham south to Cambridgeshire, hoary rock-rose which has strongholds on the coastal limestones of the Gower and north Wales, and the showy purple-flowered pasqueflower occurring in central and eastern England. Legend has it that the pasqueflower sprang from the blood of Danes on account of its association with ancient defensive

dykes or banks on the chalk. Patches, tufts and carpets of different types of mosses can sometimes be conspicuous amongst the grasses and herbs in lowland calcareous grasslands.

Drier, sparsely-vegetated calcareous grasslands on thin soils may support a variety of lichens, notably species of *Cladonia* whose intricately-branched tufts resemble miniature trees. The name *Cladonia* comes from the Greek for a twig. Chalk pebbles and flints

are also important lichen habitats. Lowland calcareous grassland is an important habitat for a variety of birds, insects and snails. Ground-nesting birds such as skylark, meadow pipit and lapwing are declining in number but are still relatively widespread. Rare gems include the stone curlew and quail, two of the UK's most threatened species. The stone curlew's plaintive cries can sometimes be heard during spring and summer in its open country strongholds in the East Anglian Breckland and on Salisbury Plain. They nest on sparsely vegetated and bare stony ground, and search for earthworms, woodlice and beetles on chalk grassland and on nearby farmland.



Perennial flax. Photograph - Peter Wakely.

The quail is a small partridge-like gamebird which migrates to the UK in spring, and nests in dense, tall herbage in open countryside. It is an elusive bird which is rarely seen but its distinctive call can occasionally be heard on calcareous grassland in Wiltshire and Dorset.



Stone curlew settling on nest. Photograph - Roger Wilmshurst/FLPA.

Kestrels may be seen hovering over grassland searching for voles and other small mammals. One may be fortunate to glimpse a hobby (a small falcon) hawking for insects over downland on a summer's evening in southern England. These grasslands appear devoid of life in winter but a hunting hen harrier or short-eared owl hint at the presence of voles, mice and shrews hidden amongst the grass.

Lowland calcareous grassland supports a tremendous variety of insects and other invertebrates. On a sunny summer's day, one may encounter a multitude of butterflies and hear the hum of foraging bees and the singing of grasshoppers and crickets.



Adonis blue. Photograph - Stephen Davis.

Common kestrel. Photograph - J Hawkins/FLPA.



Some of our scarcer butterflies, such as the adonis blue, Duke of Burgundy, and northern brown argus, are found in calcareous grassland. The caterpillars of these species feed on plants which are typical of lime-rich soils, namely horseshoe vetch, cowslip and common rock-rose.

As well as butterflies, a wide range of moths live on calcareous grassland. The day-flying cistus forester, found at scattered localities in England and Wales may sometimes be seen feeding on the flowers of wild thyme and common rock-rose in June and early July. Plant-feeding insects are abundant in calcareous grassland and include a rich array of beetles, particularly weevils and leaf beetles.

Many typical calcareous grassland plants support specific plant-feeding beetles and their leaf rosettes provide essential cover for ground beetles and ground bugs. A variety of grasshoppers and crickets live in lowland calcareous grassland. On the steep chalk and limestone slopes in southern England in July one may be lucky enough to find the uncommon rufous grasshopper. This reddish-brown grasshopper has distinctive white-tipped, club-shaped antennae, and likes to sun itself on low bushes. Short-grazed calcareous grassland



Cistus forester moth. Photograph - Roger Key.

can support a rich snail fauna, particularly species which are able to withstand dry conditions and high temperatures. For example the round-mouthed snail lives only on limestone and chalk habitats where it burrows into the loose soil.



Rufous grasshopper. Photograph - Martin Wendler/NHPA.



Anthills, Porton Down, Wiltshire. Photograph - Stephen Davis.

A small, white oval-shaped, eyeless woodlouse with the delightful scientific name of *Platyarthus hoffmanseggi* can sometimes be found in ants nests in calcareous grassland, particularly in south-east England.

Why is it now scarce?

As with other types of species-rich grassland, lowland calcareous grassland suffered substantial losses in the 20th Century. For example, in Dorset, 50% of calcareous (chalk) grassland was lost between the mid-1950s and the early 1990s. Individual areas of calcareous grassland have also become smaller and more fragmented and increasingly surrounded and isolated by arable land and heavily fertilised grassland. A survey of calcareous (chalk) grassland in the Lincolnshire Wolds found that 66% of sites were less than one hectare in size and none was more than 10 hectares in size.

This decline is mostly due to intensification of farming by conversion to arable or ploughing and re-seeding with vigorous agricultural grasses. The application of fertilisers and herbicides has resulted in the loss or decline of characteristic species. The slower growing plants which comprise calcareous grasslands are unable to compete with more vigorous grasses and herbs which thrive when the soil fertility is raised by fertiliser application.

Abandonment of grazing with farm livestock has also played a part in this decline. A lack of grazing allows coarse grasses to dominate, swamping low-growing grasses and herbs, and eventually everything disappears under scrub and trees.



Scrub invasion, Folkestone to Etchinghill Escarpment, Kent. Photograph - Richard Jefferson.



Sheep grazing, Martin Down, Hampshire. Photograph - Peter Wakely.

Only about 41, 000 hectares of lowland calcareous grassland remain in the UK. This area is only tiny (<1 %) compared to the 5 million hectares of agriculturally improved species-poor grassland.

How can it be conserved?

For centuries, these grasslands have provided pasture for grazing animals particularly sheep and cattle. Grazing is also vital for conserving the unique flora and fauna of calcareous grassland. In some areas such as Breckland, rabbit farming in warrens and occasional shallow cultivation were formerly traditional practices. Rabbits remain important

for maintaining the wildlife value of calcareous grassland in some areas, especially where there is no livestock.

The plants and animals of calcareous grassland have differing requirements as far as turf height and amount of bare ground are concerned. These factors are in turn, dependent on the number and type of grazing animals and the timing of grazing. Short turf and plenty of bare ground is required in drier calcareous grassland to provide places where small, short-lived plants can grow and ripen seed. Many types of lichens, mosses and liverworts also thrive in open, bare areas.



Duke of Burgundy. Photograph - Stephen Davis.

Certain types of insects need loose, bare soil as places for burrowing and nesting, feeding or basking. Many species of insects, however, require a mixture of shorter turf and longer turf for feeding and shelter, such as the rare wart-biter bush-cricket, while others, such as the hazel pot beetle need patches of scrub amongst the grassland. The Duke of Burgundy was primarily a woodland butterfly until the beginning of the 20th Century when it began to occur more widely on calcareous grassland. The caterpillars have a requirement for a mixture of longer grassland and scrub, in contrast to many of the scarcer butterflies occurring in this habitat which prefer short grassland turf. Some birds such as the meadow pipit require longer grass for nesting or hunting for prey.

Lowland calcareous grassland that has become dominated by rank vegetation and scrub due to an absence of grazing can often be restored by scrub removal, mowing

and introduction of grazing animals. However, grassland scrub can also be important for the wildlife it supports, particularly insects and birds. It may therefore be appropriate to retain some scrub on grassland and ensure that it is managed, for example by periodic coppicing or cutting.

There are various ways in which lowland calcareous grassland is conserved in the UK. The most important areas for nature conservation are designated as Sites or Areas of Special Scientific Interest (SSSIs/ASSIs) where funds are available to farmers and landowners to undertake conservation management. Some of these sites are also nature reserves managed by the statutory conservation agencies or voluntary conservation organisations. A selection of sites have been recognised as being of international importance for nature conservation and have been proposed as candidate Special Areas of Conservation (SAC) under European Community legislation.

Many lowland calcareous grassland sites have been entered into Environmental Land Management Schemes such as the Environmentally Sensitive Areas (ESAs), Countryside

Stewardship, and Tir Gofal schemes. These schemes offer financial incentives to landowners to manage land for nature and landscape conservation, and also include incentives to re-create habitats of wildlife interest. Soils that are shallow, lime-rich and infertile offer the best opportunity to create calcareous grassland. If areas of this grassland occur nearby, then allowing plants to spread-in naturally is the preferred option. Alternatively, native plant species can be introduced as seed or young plants.



Children at Barnack Hills & Holes, Peterborough. Photograph - Richard Wright.

The importance of lowland calcareous grassland is recognised by its listing as a priority habitat in the Government's UK Biodiversity Action Plan. An action plan for lowland calcareous grassland was published in 1998 as part of this initiative. The plan sets out a range of actions and targets which should help conserve and expand the habitat for the benefit of future generations.

Further reading

CROFTS, A. & JEFFERSON, R.G. 1999. *The Lowland Grassland Management Handbook*. 2nd edition. Peterborough: English Nature/The Wildlife Trusts.

HILLIER, S.H., WALTON, D.W.H. & WELLS, D.A. eds. 1990. *Calcareous Grasslands - Ecology and Management*. Huntingdon: Bluntisham Books.

LOUSLEY, J.E. 1950. *Wild flowers of Chalk and Limestone*. New Naturalist No. 16. London: Collins.

UK BIODIVERSITY GROUP 1998. *UK Biodiversity Group. Tranche 2 Action Plans. Volume II. Terrestrial and freshwater habitats*. Peterborough: English Nature & UK Biodiversity Group.

MARREN, P. 1999. *Britain's rare flowers*. London: T & A.D. Poyser

Contact names and addresses

Butterfly Conservation

PO Box 444, Wareham,

Dorset, BH20 5YA.

Tel: 01929 400209

Charitable body concerned with the conservation of butterflies and moths and their habitats.

Countryside Agency

John Dower House, Crescent Place,

Cheltenham, GL50 3RA.

Tel: 01242 521381

Contact for National Parks, Areas of Outstanding Natural Beauty and a wide range of countryside matters.

Countryside Council for Wales

Plas Penrhos, Ffordd Penrhos,

Bangor, Gwynedd LL57 2LQ .

Tel: 01248 385500.

Contact for all matters concerning countryside conservation, Sites of Special Scientific Interest in Wales and the Tir Gofal Scheme.

Department of Agriculture and Rural Development Northern Ireland

Countryside Management Division,

Dundonald House, Upper

Newtownards Road, Belfast, BT4 3SB.

Tel: 028 90520100

Contact for information on Environmental Land Management Schemes in Northern Ireland.

Department of the Environment, Transport and the Regions

Tollgate House, Houlton Street,

Bristol, BS2 9DJ.

Tel: 0117 9878883.

Co-ordinates implementation of the UK Biodiversity Action Plan.

English Nature

Northminster House,

Peterborough PE1 1UA.

Tel: 01733 455000

Contact for all matters concerning nature conservation, Sites of Special Scientific Interest and the Wildlife Enhancement Scheme. Lead agency for the conservation of lowland calcareous grassland under the UK Biodiversity Action Plan.

Environment & Heritage Service

Commonwealth House, 35 Castle

Street, Belfast, Northern Ireland,

BT1 1GU.

Tel 028 90251477

Contact for matters relating to the conservation of the natural and built heritage including responsibility for Areas of Special Scientific Interest.

Farming and Wildlife Advisory Group

The National Agricultural Centre,

Stoneleigh, Kenilworth,

Warwicks, CV8 2RX.

Tel: 01203 696699

Charitable organisation providing farm conservation advice throughout the UK.

Ministry of Agriculture, Fisheries & Food/Farming and Rural Conservation Agency

Nobel House, 17 Smith Square,

London, SW1P 3JR.

Tel: 0207 238 3000

Contact for information on Environmental Land Management Schemes in England.

National Assembly for Wales Agriculture Department

Crown Buildings, Cathays Park,

Cardiff, CF1 3NQ.

Tel: 029 20825111

Contact for information on ESAs in Wales.

National Trust

33 Sheep Street, Cirencester,

Gloucestershire, GL7 1QW.

Tel: 01285 651818

Charitable body concerned with the conservation of places of historic interest and natural beauty in England, Wales and Northern Ireland.

Plantlife

21 Elizabeth Street,

London, SW1W 9RP.

Tel: 0207 808 0100

Charitable body concerned with the conservation of wild plants and their

habitats.

Royal Society for the Protection of Birds

The Lodge, Sandy,

Bedfordshire, SG19 2DL.

Tel: 01767 680551

Charitable body concerned with the conservation of wild birds and their habitats.

Scottish Executive Rural Affairs Department

Pentland House, 47 Robb's Loan,

Edinburgh, EH14 1TY.

Tel: 0131 556 8400

Contact for information on Environmental Land Management Schemes in Scotland.

Scottish Natural Heritage

12 Hope Terrace,

Edinburgh, EH9 2AS.

Tel: 0131 446 2277

Contact for all matters concerning countryside conservation and Sites of Special Scientific Interest in Scotland.

The Wildlife Trusts

UK office, The Kiln, Waterside,

Mather Road, Newark, NG24 1WT.

Tel: 01636 677711.

Voluntary conservation organisation concerned with the conservation of wildlife throughout the UK. Contact for information on Local Wildlife Trusts.