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Lowland heathland: wildlife value and conservation status

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Lowland heathland: wildlife value and conservation status

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Foreword

Lowland heathland is a resource of considerable nature conservation value in England. The international significance of England's lowland heathland and its associated species is recognised in legislation such as the European Union's Habitats and Species Directive, the Berne Convention and Birds Directive. It is also highlighted in the United Kingdom's Biodiversity Action Plan.

This Research Report has been produced as part of English Nature's National Lowland Heathland Programme in order to provide a compendium of information on the distribution, extent and conservation status of lowland heathland in England. This information will assist in the process of conserving existing areas of lowland heathland and in targeting the re-creation of areas of heathland.

Contents

Tables

1. Introduction

Lowland heathland is characterised by native ericaceous dwarf shrubs such as heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans* and cross-leaved heath *Erica tetralix*, as well as gorse and a number of grasses. It typically comprises a whole range of habitats including heather and heath species, gorse, grassland, scrub, woodland, bare ground, wet heath, valley mires (bogs) and open water.

Lowland heath tends to be associated with nutrient poor acid to neutral mineral soils such as sands and gravels. In England lowland heath is generally found below altitudes of about 250 metres.

Heathland supports a range of characteristic plants and animals, some of which are rare and many of which are in decline. Rare species associated with heathland include the marsh gentian, marsh clubmoss, Cornish heath, the sand lizard, smooth snake, silver-studded blue butterfly, bog raft spider, small red damselfly, Dartford warbler, woodlark, stone curlew and nightjar. Lowland heaths support 32 Red Data Book species of vascular plants and 11 nationally scarce vascular plant species, all twelve Schedule 5 species of amphibians and reptiles, four Red Data Book breeding bird species (the Dartford warbler, woodlark, stone curlew and nightjar) and two wintering Red Data Book species (the hen harrier and merlin) as well as about 50 nationally endangered or vulnerable Red Data Book invertebrate species.

Using a relatively restrictive definition of heathland as consisting of at least 10% cover of heather, about 32,000 ha of lowland heath remains in England (Farrell 1993). This definition excludes areas of former heathland that have been replaced by the invasion of bracken or scrub.

There is now only about one sixth of the area of lowland heathland that there was in 1800 when there was about 190,000 ha of heathland (Tubbs 1985) and this represents less than 0.3% of England's land surface. Since 1940 about 41,000 ha of lowland heath have been lost, representing a decline of some 56%.

Lowland heathland is therefore a rare and threatened habitat. It remains threatened by development, road construction, mineral extraction and conversion to agriculture and forestry. The greatest overall threat is the lack of positive conservation management. For example, between 1978 and 1987 whilst 5% of the total area of Dorset heathland was lost, principally to conversion to farmland and development, there was a 15% increase in the area of scrub and woody vegetation on these heaths (Webb 1990). In the absence of management by grazing, cutting and controlled burning, lowland heath tends to be invaded by bracken, scrub and trees and is lost and eventually replaced by secondary woodland. The areas of heathland that remain are now highly fragmented and tend to be much smaller than in the

past. For example in 1759 the heathlands of the Poole Basin in Dorset consisted of about ten large blocks which were separated only by the major rivers whilst by 1978 there were 768 separate fragments (Webb and Haskins 1980).

Since lowland heath has suffered such a marked decline and (with the exception of the New Forest) is no longer part of the lowland agricultural system because it is no longer used for grazing, fuel gathering and other uses, lowland heathland is one of England's most endangered habitats. As it is characteristic of England's lowland landscape its conservation is a high priority. Whilst some heathland can be found in nearly every county in England, the main concentrations are shown in Table 1.

Table 1 Counties with greater than 200 hectares of lowland heathland with at least 10% heather cover in England (approximate figures only) (source: Farrell 1993)

		Area (hectares - rounded)
1.	Hampshire	9,000
2.	Cornwall	6,400
3.	Dorset	5,400
4.	Surrey	3,000
5.	Devon	2,400
6.	Staffordshire	900
7.	Suffolk	900
8.	Cumbria	800
9.	Norfolk	500
10.	East Sussex	400
11.	Somerset	400
12.	West Midlands	300
13.	Berkshire	300
14.	North Yorkshire	300
15.	Shropshire	200
16.	West Sussex	200
		31,400

This is about 97% of the total resource of about 32,500 ha (see Table 6)

There are 19 National Nature Reserves (NNRs) which have a major lowland heathland component as opposed to those that include small amounts of heathland within them. These 19 heathland NNRs cover a total site area of about 6,500 ha (Table 2). Taking all England's NNRs, including those with only small amounts of heathland within them, these contain a total of about 5,100 ha of heathland with at least 10% heather cover (see Table 6).

England's 32,000 ha of lowland heathland with at least 10% heather cover is the majority of the total of about 58,500 ha for England, Scotland and Wales combined (Farrell 1993). England's lowland heathland resource is

undoubtedly of considerable international importance as has been recognised in the Berne Convention and European Community's Habitats and Species Directive (see Table 3). Accurate figures for the extent of lowland heathland in Europe are not available but it is likely that England holds between 8 and 18% of the total European resource (Table 4). It should be noted however, that the vegetation communities found in Europe may be different from those found in England, although in some countries such as France there are similarities.

The characteristic vegetation communities of lowland heathland that are found in England and their range of variation are described in detail in the National Vegetation Classification (Rodwell 1991) to which the reader is referred for detailed information. These communities, and their principal locations are, however, summarised in Table 5.

Table 2 National Nature Reserves with a major lowland heathland component

County	Site name	Area (ha)
Cornwall	Goss Moor	481.5
Cornwall	The Lizard	1,546.8
Dorset	Hartland Moor	243.2
Dorset	Holt Heath	488.2
Dorset	Holton Heath	117.0
Dorset	Morden Bog	148.5
Dorset	Stoborough Heath	108.9
Dorset	Studland Heath	630.8
East Sussex	Lullington Heath	62.5
Hampshire	Kingston Great Common	54.0
Norfolk	Dersingham	161.8
Norfolk	Roydon Common	194.1
Norfolk	Winterton Dunes	108.6
Shropshire	Stiperstones	447.2
Suffolk	Cavenham Heath	203.6
Suffolk	Thetford Heath	93.7
Suffolk	Walberswick	582.2
Surrey	Chobham Common	551.0
Surrey	Thursley	325.2

Table 3 Lowland heathland habitat types of community interest whose conservation requires the designation of special areas of conservation under the European Community's Habitats and Species Directive

31.11	Northern Atlantic wet heaths with *Erica tetralix*.
31.12	*Southern Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*.
31.2	Dry heaths (all subtypes).
31.234	*Dry coastal heaths with *Erica vagans* and *Ulex maritimus*.

* = priority habitat types.

Table 4 The extent of lowland heathland in Europe (updated from Farrell 1989)

Country	Area of heathland (ha)
Denmark	70,364
Belgium (in reserves)	1,500-?
France (now much reduced)	?-214,000*
Britain	58,500
England	32,000
Scotland	19,000
Wales	7,500
The Netherlands	42,000
West Germany	6,800
Eire	?
Northern Ireland	?
Sweden	?
Norway	?
Total	**179,164-393,164**

* As at 1955?
England's percentage of total resource = 8 - 18%

Table 5 Types of English lowland heath (from Farrell 1989; Rodwell 1991)

National Vegetation Classification Community		Distribution
Dry or humid heath:		
H1	*Calluna vulgaris/Festuca ovina*	SE and E England (Breckland)
H2	*Calluna vulgaris/Ulex minor*	Kent, Sussex, Surrey to Dorset
H3	*Ulex minor/Agrostis curtisii*	New Forest, W to Dorset
H4	*Ulex gallii/Agrostis curtisii*	SW England
H6	*Erica vagans/Ulex europaeus*	The Lizard, Cornwall
H7	*Calluna vulgaris/Scilla verna*	Coastal cliffs and islands
H8	*Calluna vulgaris/Ulex gallii*	SW England and N Midlands
H9	*Calluna vulgaris/Deschampsia flexuosa*	S Pennines and Midlands
H10	*Calluna vulgaris/Erica cinerea*	SW England
H11	*Calluna vulgaris/Carex arenaria*	Coastal dunes and sandy shingle
H12	*Calluna vulgaris/Vaccinium myrtillus*	Lower moorland of SW and N England
Wet heath		
H5	*Erica vagans/Schoenus nigricans*	The Lizard, Cornwall
M15	*Scirpus cespitosus/Erica tetralix*	Upland transitional
M16	*Erica tetralix/Sphagnum compactum*	Widespread

2. The representation of lowland heathland on statutory sites

This is shown in Table 6. These figures are provisional. They are based on figures taken from the English Nature lowland heath database, produced in 1991 (Farrell 1993), rather than the joint English Nature/ RSPB lowland heathland county inventories. This is because whilst the inventories are more detailed and more recent, having been produced in 1995 and 1996, they do not provide complete coverage of the resource in many counties because of gaps in the availability of information on the areas of open heath on sites. The exception to this is Devon, where because of known inaccuracy in the

lowland heath database figures, data have been taken from the lowland heathland county inventory. It should be noted that the figures in Table 6 refer to heathland with at least 10% cover of heather.

3. The composition of the heathland resource

This is shown in Table 7. These figures are taken from the joint English Nature/ RSPB lowland heathland county inventories produced in 1995 and 1996. For the purposes of these inventories heathland is defined as vegetation which is dominated by ericoid plants (such as heather, bell heather and cross-leaved heath), dwarf gorse species (dwarf and western gorse) or acidophilous lichens (those requiring acid soils). It should be noted that with the possible exception of upland counties such as Cumbria, where some heathland occurring above 250 metres is included, that these figures are generally underestimates of the overall lowland heathland resource because for many counties there are gaps in the availability of information on the areas of open heath on sites. Table 7 shows that about three quarters of the heathland resource comprises dry heath and about a quarter wet heath. The table also illustrates that chalk/limestone heath and lichen heath are both very rare habitats.

Table 6 The representation of lowland heathland which has at least 10% cover of heather in England by county (figures are based on the lowland heath database (Farrell 1993) and are provisional)

County	Total area (ha)	Area of SSSI (ha)	Percentage of total that is biological SSSI	Area of heathland on NNRs
Avon	5	5	100%	0
Bedfordshire	35	27	77%	0
Berkshire	293	229	78%	0
Buckinghamshire	86	86	100%	0
Cambridgeshire	0	0	0%	0
Cheshire	64	36	56%	0
Cornwall	6,416	2,473	39%	< 2,078*
Cumbria	787	740	94%	20
Derbyshire	115	6	5%	0
Devon+	2,362	1,560	66%	0
Dorset	5,365	5,034	94%	1,434
Durham	48	48	100%	0
East Sussex	388	388	100%	9
Essex	5	5	100%	0
Gloucestershire	15	15	100%	0
Greater London	0	0	0%	0
Hampshire	9,021	7,996	89%	?*
Hereford & Worcester	138	120	87%	0
Hertfordshire	16	1	6%	0
Humberside	94	61	65%	0
Isle of Wight	34	34	100%	0
Kent	58	58	100%	0
Lancashire	0	0	0%	0
Leicestershire	31	31	100%	0
Lincolnshire	37	37	0%	0
Merseyside	133	66	50%	0
Norfolk	537	260	48%	<462
North Yorkshire	293	293	100%	0
Northamptonshire	0	0	0%	0
Northumberland	35	35	100%	0
Nottinghamshire	43	39	91%	0
Oxfordshire	78	78	100%	0
Scilly Isles	7	3	43%	0
Shropshire	228	208	91%	50
Somerset	382	13	3%	0
South Yorkshire	0	0	0%	0
Staffordshire	880	559	64%	0
Suffolk	942	876	93%	218
Surrey	2,988	2,884	97%	844
Warwickshire	12	0	0%	0
West Midlands	298	287	96%	0
West Sussex	205	182	89%	0
West Yorkshire	16	16	100%	0
Wiltshire	12	3	25%	0
Total	32,502	24,792	76%	< 5,106

* Exact figures not known.

+ Figures for Devon have been taken from the county lowland heathland inventory to counter known inaccuracy in the lowland heath database figures.

Table 7 The composition of the lowland heathland resource. Figures are taken from the lowland heathland inventory and are likely to be underestimates for most counties.

County	Recorded dry heath (ha)	Recorded wet heath (ha)	Recorded chalk/limestone heath (ha)	Recorded lichen heath (ha)	Total (ha)
Avon	13.3	0	0	0	13.3
Bedfordshire	12.9	0	0	0	12.9
Berkshire	53.2	3.5	0	0	56.7
Bucks	89.8	10	0	0	99.8
Cambs	0.3	1.3	0	0	1.6
Cheshire	54.9	10.9	0	0	65.8
Cleveland	NA	0	0	0	0
Cornwall	1900	622.6	0	NA	2522.6
Cumbria	100.1	72.5	0	0	172.6
Derbyshire	11.8	0.1	0	0	11.9
Devon	1960.3	350.6	0	51.1	2362
Dorset	2125.8	2395.9	1	0	4522.7
Durham	99.1	0.1	0	0	99.2
East Sussex	454.5	165.1	13.8	0	633.4
Essex	33.9	25.1	0	0.2	59.2
Gloucestershire	4.4	0.8	0	0	5.2
Gtr London	123.9	0.1	0	0	124
Gtr Manchester	50.1	15.3	0	0	65.4
Hampshire	7231.2	2048.4	0.2	0.5	9280.3
Herefd & Worcs	55	0	0	0	55
Hertfordshire	16.6	0.3	0	0	16.9
Isles of Scilly	75.2	0	0	0.2	75.4
Isle of Wight	35.5	0	0	0	35.5
Kent	64.6	2.5	0	0.1	67.2
Lancashire	5.4	0	0	0	5.4
Leicestershire	34.3	0.2	0	0	34.5
Lincolnshire	84.7	12.4	0	0.1	97.2
Merseyside	179.5	1.3	0	0	180.8
Norfolk	505.4	39.3	0	33.3	578
N. Yorks/Humbs	462.9	161.9	NA	NA	624.8
Northants	1	0	0	0	1
Northumbs	31	0.7	0	0	31.7
Nottinghamshire	183.3	0.1	0	0	183.4
Oxfordshire	23.6	0	0	0.2	23.8

County	Recorded dry heath (ha)	Recorded wet heath (ha)	Recorded chalk/limestone heath (ha)	Recorded lichen heath (ha)	Total (ha)
Shropshire	208.9	18.9	2.8	0	230.6
Somerset	251.4	9.7	49.1	0	310.2
South Yorkshire	8	0	0	0	8
Staffordshire	975.1	74.1	0	0	1049.2
Suffolk	836.6	0	NA	NA	836.6
Surrey	2841.4	509	0.7	NA	3351.1
Tyne & Wear	2.4	0	0	0	2.4
Warwickshire	17.1	0	0	0	17.1
West Midlands	288.4	52.7	0	0	341.1
West Sussex	310.3	27.5	5.7	0	343.5
West Yorkshire	8.1	0	0	0	8.1
Wiltshire	11.2	23.2	4.4	0	38.8
Total	21836.4	6656.1	77.7	85.7	28655.9
Percentage of total	76.2%	23.2%	0.3%	0.3%	

Note: Figures may not sum up exactly to the totals because of rounding errors. NA denotes not available.

4. Guidelines for monitoring lowland heathland sites

These guidelines follow English Nature's monitoring strategy. For further details of proposed monitoring methods for lowland heathland see Michael (1995).

4.1 Management objectives

The starting point in any monitoring strategy is to set management objectives. Guideline management objectives for lowland heathland are given in Table 8.

4.2 Major management techniques

The main lowland heathland management techniques are given in Table 9.

4.3 Guidance on the appropriateness of major management techniques

Basic guidance on the appropriateness of major lowland heathland management techniques is given in Table 9. For more detailed guidance on which techniques to use, the reader is referred to English

Nature's lowland heathland management handbook (Gimingham 1992) and the lowland heathland management booklet (Michael 1993).

4.4 Decisions to be made in planning heathland management operations

Decisions to be made in the planning of heathland management operations are given in Table 10. Site surveys may indicate the need for additional species-specific management.

4.5 Site monitoring

Methods of site monitoring are briefly described in Michael (1993) and discussed in detail in Michael (1995) and Gimingham (1992) to which the reader is referred.

Table 8 Guideline management objectives for lowland heathland

1.	Provide all growth stages of heather (pioneer, building, mature and degenerate) by rotational management (burning, cutting, turf cutting or rotovation). Aim for about 25% of heather in each growth stage. Some areas (eg 5% of the total area) of heathland should escape the heather rotation to provide areas of deep litter for certain invertebrate species. The length of the heather rotation will vary in different geographical regions.
2.	Rejuvenate areas of older (mature, degenerate and dead) heather by burning, cutting, turf cutting or rotovation.
3.	Ensure the provision of firm (not churned up) horizontal, sloping and vertical bare ground (bare ground is essential for certain invertebrates and reptiles such as the sand lizard). Aim for a minimum of 2% on a site and if necessary provide it by burning, turf cutting, rotovation or scraping.
4.	Undertake any species-specific management that is necessary (for example cut or burn gorse bushes on a 10-12 year rotation where Dartford warblers are present, encourage rabbits on grass and lichen heath etc).
5.	Control species that are <u>invading</u> heathland, eg: Birch, oak etc (by light grazing/cutting/herbicides) Pine (by pulling/cutting) Bracken (by cutting/rolling/herbicide) Rhododendron (by cutting/herbicides) Common gorse (by cutting/burning/herbicides although note that on some sites it may be desirable to <u>encourage</u> gorse) Grasses (by turf cutting/light grazing)
6.	Draw up a fire control plan and install firebreaks as necessary.
7.	Consider light grazing management (sheep, cattle, ponies) of dry heath.
8.	Consider light grazing management (cattle, ponies, sheep) of wet heath. Also undertake small scale turf cutting on wet heath in scattered plots for plants and invertebrates.
9.	Once management of existing heathland is in hand, consider the restoration of areas of secondary birch woodland, pine woodland, bracken or invasive grasses to heathland.
10.	Undertake monitoring to ensure that the management objectives are being met.

Table 9 Major lowland heathland management techniques

Rotational heather management (use to ensure the provision of all four growth stages of heather and rejuvenate older/dead stands of heather)				Control of undesirable plant species that are invading heathland		
Controlled burning	**Heather cutting**	**Turf cutting**	**Rotovation**	**Scrub cutting**	**Herbicide application**	**Light grazing**
Carry out on small plots on a long rotation. 1 Nov-31 March only. Can be used to create firebreaks. Useful for dealing with dead heather. Always follow the heather and grass burning code. Exercise great caution next to forestry plantations. Ensure safety of all personnel.	Carry out on small plots on a long rotation. Avoid nesting season for birds (March-late August) and avoid the period when reptiles are active (March-October). Can be used to create firebreaks. Cannot be used on steep slopes. Cut heather in autumn, ideally between mid October and late November to collect seeds for restoration.	Carry out on small scattered plots on a long rotation. Avoid nesting season for birds. Can also be used to tackle grass invasion and provide bare ground. Large scale turf cutting should not be carried out on sites that support important populations of reptiles or soil inhabiting invertebrates.	Carry out on small plots on a long rotation. Avoid nesting season for birds. Can be used to create firebreaks. Can be used on bracken monocultures. Provides bare ground.	Eg. birch, oak etc, pine, rhododendron, possibly gorse. Avoid nesting season for birds If all the lower branches are removed pine will not regenerate after cutting. Other scrub species will require herbicide application. Cutting can also be used for bracken control.	Necessary to control birch, oak etc, rhododendron and gorse, if the latter is unwanted. Can also be used to control bracken. Health and safety regulations must be followed.	Spring-summer grazing is best for scrub suppression. Use low stocking rates and avoid the overgrazing of heather. Sheep, cattle and ponies can be used.

Table 10 Decisions to be made in planning lowland heathland management operations

Major 1	●	Undertake survey of site (vegetation communities, heather growth stages, rare and notable plant and animal species).	
Major 2	●	Draw up management plan.	
Major 3	●	If there is a successional (eg birch, pine, rhododendron, bracken, grasses) problem implement control.	
Major 4	●	Implement heather rotation (eg by cutting, burning, turf-cutting, rotovation).	
Major 5	●	Devise integrated management to maintain heathland including:	
Minor 1	□	Grazing wherever appropriate	
Minor 2	□	Control of invasive species as necessary (eg birch, pine, rhododendron, bracken, grasses)	
Minor 3	□	Continued rotational heather management	
Minor 4	□	Draw up a fire control plan and install firebreaks as needed	
Minor 5	□	Undertake small scale management for heathland fauna and flora (eg creation of bare ground).	
Major 6	●	Carry out heathland restoration where appropriate.	
Major 7	●	Monitor the effectiveness of all management and any changes to the site.	
Major 8	●	Revise management plan accordingly.	

5. References and key reading

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