ENGLISH NATURE

Natural Areas
in the East Midlands Region

helping to set the regional agenda for nature

Introduction

Regional strategies and policy documents are being drawn up by the newly-created Regional organisations. These are required to encompass the protection and management of the environment by applying the principles of sustainable development.

This document has been produced by English Nature, the Government body that promotes the conservation of wildlife and natural features throughout England. It is for use by the Regional Development Agency, the Government Regional Office and the Regional Chambers, when making Regional policy. We hope that it will provide a starting point for discussion with our network of Regional Lead Teams, who can provide valuable support, and links into wider partnerships.

The conservation of nature is a key test of policy in all three facets of sustainable development, the social, the economic and the environmental. While its role in the environment is self evident, it also has social implications through the spiritual, cultural and recreational value of people's experience of the natural world; and economic implications through the provision of exploitable resources and the attractiveness to investors of high quality environments.

If we are serious about achieving sustainable development, then understanding the priorities for the conservation of the biodiversity and Earth heritage resource of the Region is therefore essential. This report is a first step towards that understanding, and provides the basis for integrating local and national priorities for nature into the Regional decision-making framework. It contains information of direct relevance to the development of Regional Planning Guidance and Single Programming Documents to support the delivery of European Union Structural Funding, regeneration funding and other economic and social programmes.

The Ministry of Agriculture, Fisheries and Food, the Environment Agency, the country forestry organisations, local authorities and statutory and other agencies involved in land use and land management issues will also find it relevant and, we hope, of value.

We envisage that this document can therefore be used at a number of key points within the Regional strategy-making and planning process.

Peveril Castle, Castleton, Derbyshire. Peter Wakely/English Nature

Claxby Chalk Pit, Lincolnshire. Jane Ostler/English Nature

Relevant Government Planning Policy Guidance (PPG)

PPG 7: The Countryside: environmental quality and economic and social development
PPG 9: Nature Conservation
PPG 11: Regional Planning Guidance
PPG 12: Development Plans and Regional Planning Guidance (presently under review)
PPG 13: Transport

Department of the Environment, Transport and the Regions Policy Guidance: Policy appraisal and the environment (DETR, 1998).

Natural Areas as a Regional framework for nature

English Nature has divided England into a series of **Natural Areas**. Their boundaries are based on the distribution of wildlife and natural features and the land use patterns and human history of each area. They do not follow administrative boundaries but relate instead to variations in the character of the landscape. They reflect our cultural heritage and are central to English Nature's organisational strategy *Beyond 2000*.

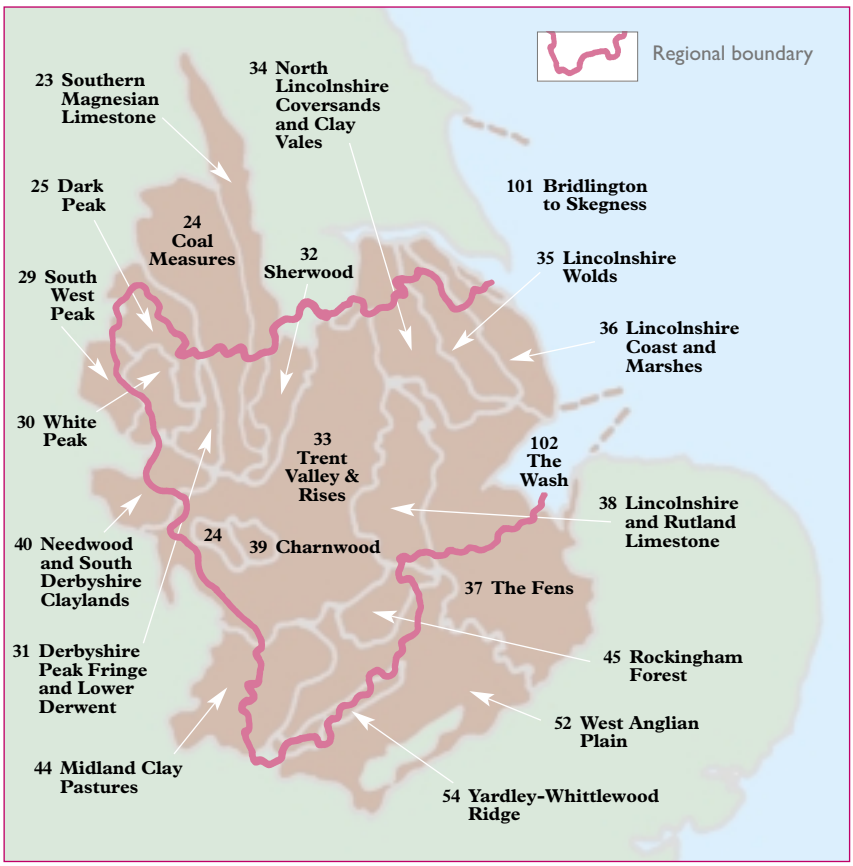
We worked with the Countryside Commission (soon to become the Countryside Agency) to identify a joint approach to the characterisation of the countryside into locally distinctive units called character areas. Where the wildlife and natural features are similar between adjacent character areas we have merged them into one Natural Area - so, a Natural Area may contain several character areas that are considered to be different landscape types.

Natural Areas offer a more effective framework for the planning and achievement of nature conservation objectives than do administrative boundaries. Although they are not formal designations they are now recognised in Government Planning Policy Guidance (PPG) and other statutory advice.

Within this framework, we have, with our key partners in the Region, identified the chief threats to, and opportunities for, nature conservation. Together, we have defined a range of issues, and set associated objectives that we believe provide a starting point for Regional action to protect and manage our biodiversity and geological assets. These objectives are set out in the sections which follow.

Objectives for sustainable development and nature conservation in the East Midlands Region

The East Midlands is a region of dramatic, and often sharp, contrasts. Dense urban populations can be found in and around the major metropolitan centres of Derby, Leicester, Northampton and Nottingham, traditionally linked to coal, textiles and the heavy industries. The East and West of the Region are rural, and Lincolnshire is one of the most sparsely populated counties in England. Agriculture is the dominant land use and underpins the rural base. For instance, the East Midlands Region produces 30% of the national vegetable crop and 40% of the bulbs and flowers.



Natural Areas covered in the East Midlands Region report

The diverse landscape supports a characteristic combination of wildlife and geological heritage. The Region varies from the rugged upland moors and limestone dales of the Peak District, through the Nottinghamshire coalfield, the great clay vale of the Trent, the ridges of the Lincoln Cliff limestone and the chalk of the Wolds, to the flat fertile silts of the Lincolnshire Coastal Plains and the sand dunes of the Lincolnshire coast and the Wash.

The Peak National Park in the west and the Lincolnshire coast and the Wash in the east, have an outstanding diversity of special wildlife habitats and species that are very rare, and of very high quality, of which the Region can be justifiably proud. Rutland Water and Sherwood Forest are also of international importance for their wildlife, and sit within the farmland which dominates the East Midlands landscape - where a number of important species such as brown hare and lapwing can be found.

The distribution of wildlife and the texture of the landscape are the product of complex interactions. The basic physical qualities of the rock, soil and climate have set the scene, but the detail has been, and will continue to be, shaped through human activity which is driven by economic, social, and environmental forces.

Our ability to exploit the environment for economic gain is beginning to jeopardise our present and future well-being. Since our decisions can have far-reaching effects on present and future generations, we need to look at how we can act to maintain and improve both our local and global environments. There is no doubt that work at the Regional level can be a powerful force in steering local agendas for environmental action, whilst providing strong links to national and international programmes.

Sustainable development requires integration, rather than balance or trade off. Decision makers need to build environmental and social criteria into the heart of their policies and programmes - and ensure that they are given the same weight as economic considerations at the beginning of the process. This is what is meant by integration, and contrasts with the more familiar situation, where proposals are drawn

up against economic criteria alone and are only weighed against their environmental impact when they are about to be implemented.

The basic means for many of the Regional level structures and organisations to act will be through the planning process for built development and infrastructure. Planners have a key role in incorporating economic, environmental and social factors into decisions about where to put homes, jobs, shops and leisure facilities. In this way, demands on land, the environment and nature can be managed more sustainably. Regional Planning Guidance will be written to help with this process.

Current government policy encourages investment in urban areas and existing centres rather than out of town sites. This means re-using previously developed urban land as much as possible, while ensuring that the quality of towns or cities is maintained or improved. The challenge will be to determine which patterns and locations of development prove most sustainable.

Conserving and enhancing nature can be compatible with development and, whilst the built environment has fewer designated sites, Local Nature Reserves, pocket parks, green space and even private gardens, are the only contact the majority of people have with nature. They are also important reservoirs of biodiversity.

Another essential role will be played by those charged with the design and implementation of policy and programmes for forestry, agriculture, water and recreation. Farming is the East Midlands Region's major land use. The habitats described in the following chapters are predominantly part of agricultural management systems. **Farmland therefore provides a major source of opportunity for habitat creation and maintenance, and species protection and enhancement. Its importance is reflected in the issues and objectives that are listed at the start of each section.**

The intensification of agriculture, and associated decline in traditional land management, combined with the huge growth of the major towns and cities, has resulted in the reclamation and loss of much of the lowland semi-natural habitat of value to wildlife in the East Midlands Region. The semi-natural habitats that remain are often small and isolated and are adversely affected by agricultural practices and pressure from development, including the use of pesticides and fertilisers, run-off of pollutants from industrial and housing estates, and the lowering of water tables through drainage and abstraction. Similar pressures of agricultural intensification, notably overgrazing, inappropriate burning regimes and a move from traditional grassland management, are applied to the wildlife of the uplands.

The populations of birds, mammals and plants which rely on the agricultural systems themselves have also plummeted. Major priorities therefore include: the sensitive management of existing habitats; increasing the area of existing habitats and re-establishing the links between them; and restoring the conditions in which the wildlife of cereal fields and pasture can also thrive.

Rutland Water.
Peter Wakely/English Nature

How the contents of the report may be applied

Specific application	Relevant contents
Sustainable development	We have sought to set biodiversity and Earth heritage in the context of sustainable development - and to define the latter as a process of integration.
Providing context	Descriptive text which outlines the natural character of the Region.
Identifying issues and objectives	Specific issues and objectives written for direct inclusion in policy documents and/or distillation into policy to protect and enhance nature.
Links to international site designations and biodiversity	Key Natural Areas are named in each section in order to ensure that national priorities for habitat conservation are taken into account. They are identified as supporting nationally important concentrations of a habitat or Earth heritage feature and/or international sites (Special Protection Areas and Special Areas of Conservation) and biodiversity habitats and species.
Benchmarks for nature	A checklist is provided (Annex 1) to make an assessment of the contribution of policies, projects and programmes to the delivery of sustainability in relation to nature.
Key contact points	The English Nature contact addresses are provided for the Region, including the Regional Lead Team, together with a list of sources of information (Annex 2).

Glossary

BAP: Biodiversity Action Plans for habitats and species.

Biodiversity: Simply means the variety of life on earth. It covers everything from human beings to oak trees, bacteria to blue whales. Many Regions have already produced or are working on Biodiversity Audits and Action Plans which begin to catalogue and summarise their wealth of wildlife. This document complements these and other initiatives, including work on Local Agenda 21 and Local Biodiversity Action Plans, and existing Nature Conservation Strategies.

Earth heritage: We have a rich and diverse heritage of rocks, fossils, minerals and land forms. The protection and management of these features is an integral part of nature conservation.

European Union Habitats and Birds Directives requires the Government to designate and protect some of the most important areas for wildlife. They are or will be classified as Special Protection Areas (SPAs) and/or Special Areas of Conservation (SACs). These sites are also Sites of Special Scientific Interest (SSSIs) but meet specific criteria for international importance. In the case of marine SACs the SSSI designation only applies down to the low water mark.

Habitat: is the natural home of any plant, and where animals feed, breed and rest.

Statutory guidance from the Secretary of State to the Regional Development Agencies (RDA) includes: Sustainable Development; Rural Policy; Regional Economic Strategies. **White Papers** include: Building Partnerships for Prosperity; The United Kingdom Sustainable Development Strategy; Rural White Paper; Urban White Paper.

Sustainable development: was defined by the 1987 World Commission Report on Environment and Development as "development which meets the needs of the present without compromising the ability of future generations to meet their needs". It is often described as a 'three legged stool' whose legs comprise environmental, economic and social. If any one of them is missing as a consideration in decisions, the stool will topple.

Earth heritage

Key issues and objectives

Issue: site protection

- **Protect** sites from the threat of landfill.
- **Review** proposals for aggregate extraction and vein mineral working against nature conservation objectives.
- **Discourage** cliff-top development which may require future damaging coast protection works.

Issue: maintenance of existing resources

- **Maintain** existing geological sites by:
  - **agreeing** the conservation of exposures in working and disused quarries with extraction companies;
  - **ensuring** appropriate management of sites (e.g. by removing overgrowth).

Issue: recreation and education

- **Encourage** local caving organisations to be responsible for cave systems by undertaking cave conservation plans.
- **Promote** responsible fossil collection and protect vulnerable sites.
- **Promote** the geological resource by:
  - **explaining** the influence of geology on local habitats and scenery through on site **interpretation** using signboards, leaflets and trail guides, etc;
  - **assessing** and **promoting** the educational and research value of sites.

The Southern Magnesian Limestone area is characterised by a Magnesian Limestone escarpment which runs from south of Sheffield to the Durham coast. Characteristic gorge and cave deposits contain evidence of human occupation making this a key area for examining the early habitation of the British Isles. Creswell Crags is one of the richest sites in Britain for fossilised mammals, fish, birds and evidence of prehistoric man. Upper Carboniferous rocks dominate the landscape of the Coal Measures which was further shaped by the extensive mining industry based on numerous coal seams which were formed from ancient peat deposits. Clays, sands and gravels deposited during recent glaciations cap the landscape.

Beacon Hill, Leicestershire. Steve Clifton/English Nature

Main Earth heritage features of key Natural Areas

23. Southern Magnesian Limestone

- Permian Magnesian Limestone of the Yorkshire Province
- Pleistocene stratigraphy and vertebrates
- Early settlement by palaeolithic man

24. Coal Measures

- Namurian and Westphalian stratigraphy and sedimentology
- Economic resource - Westphalian Coal Measures
- International importance - proposed stratotype and established type localities
- Plant fossils

25. Dark Peak

- Upper Carboniferous stratigraphy and sediments
- Landslips and their geological context
- Quaternary development of the Pennines

30. White Peak

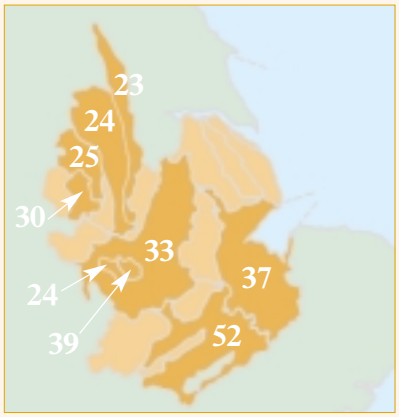
- Exposures showing Carboniferous stratigraphy
- Karst features such as cave systems and dry valleys
- Mineralisation of the Carboniferous limestone
- Influence on the landscape and scenery

33. Trent Valley and Rises

- Precambrian rocks, Caledonian igneous rocks and associated mineral veins
- Exposures of Triassic rocks
- River Trent terraces and associated river gravels and fossils

37. The Fens

- Upper Jurassic clays and associated deposits with important fossil faunas
- Upper Jurassic fossil-rich limestones including coral reefs and associated deposits at Upware
- Complex sequence of Holocene deposits representing varied environments and recording a detailed story of recent sea level and climatic changes



39. Charnwood

- Precambrian fossils and rocks
- Caledonian igneous rocks and associated mineral veins
- Precambrian hills and associated summit tors
- Deep river gorges

52. West Anglian Plain

- Fossil rich limestones and clay
- Oxford Clay exposures in brickpits of importance for palaeontology and stratigraphy
- Quaternary river terrace gravels with important fossil faunas

The Bridlington to Skegness coast is almost entirely underlain by fine grained limestones, however the nature of the area has been determined by the thick layer of clays and gravels deposited on top of the limestone during the last Ice Age. The Lincolnshire Wolds, Lincolnshire Marsh and Coast and Lincolnshire and Rutland Limestone are all characterised by a thick deposit of Chalk overlying sandstones, ironstones and clays. The Chalk is only well exposed on the south bank of the Humber. Lower and middle Jurassic limestone overlain by clays and a semi-continuous sheet of wind-blown sand characterise the northern part of the North Lincolnshire Coversands and Clay Vales, to the south the sands are absent and only thin bands of limestone are found in the clays.

The distinctive White Peak scenery, of which the dales and caves are notable features, results from the weathering and erosion of the underlying Carboniferous Limestone. Volcanic activity during the Carboniferous Period resulted in the production of a number of lava flows. Later volcanic activity during the Permian resulted in the emplacement of several sills, while heated metal-rich brines produced

Charnwood Lodge, Leicestershire. Peter Wakely/English Nature

the mineral veins in the rock. To the north of, and forming a horseshoe around the White Peak limestones are the high moors of the Dark Peak and South West Peak. These sandstones formed in great river deltas. Subsequent glaciation in the South West Peak and Dark Peak has resulted in the distinctive gritstone scenery. The Derbyshire Peak Fringe and Lower Derwent has numerous ridges and dales as a result of its mix of limestones, shales and sandstones of Carboniferous Age.

The Sherwood area is characterised by a low sandstone escarpment running from north to south, underlain by the East Pennine Coalfield. This sandstone extends under the Needwood and South Derbyshire Claylands where it is covered by thick deposits of clays resulting in a generally low-lying landscape.

The peaks of Charnwood are formed from ancient Precambrian rocks which are internationally famous for their soft-body fossils. Volcanic activity in the area resulted in the injection of diorites which form the basis for the Leicestershire quarrying industry. Later erosion under semi-arid conditions led to the formation of red sandstone rocks and the whole area has been lowered by river erosion. Precambrian rocks extend under the Trent Valley and Rises where they have been intruded by granites. The Precambrian rocks and intrusions are overlain by the Sherwood Sandstone, and subsequent glacial deposits now form the low-lying flat landscape of the area.

The Midland Clay Pastures are underlain by clays, silts, sands,

Dovedale, Derbyshire. Peter Wakely/English Nature

limestones and ironstones which have been extensively quarried. The limestone is blanketed by thick glacial deposits which form the heavy clay soils characteristic of Rockingham Forest and the Yardley-Whittlewood Ridge.

The West Anglian Plain is characterised by ancient river-terrace gravels and underlain by Jurassic clays, the uppermost of which is the Oxford Clay, internationally famous for its fossil fauna. The Fens are also dominated by clays, and underlain by Oxford Clay. Of particular note is an isolated mass of richly fossiliferous limestone containing coral reefs. Glacial activity scoured out the Fen basin and the Wash, leaving a deposit of sands, gravels and clays. Recent Holocene deposits created the uniform peat or silt soils that characterise the area today.

Freshwater

Key issues and objectives

Issue: water quality

- **Maintain** high water quality by:
  - **improving** sewage treatment where necessary;
  - **preventing** contamination from minewater;
  - **safeguarding** all watercourses, particularly mesotrophic water bodies, from agricultural and urban run-off.

Issue: water quantity

- **Maintain** river levels and flows by:
  - **reducing** abstractions;
  - **restoring** historic flows.

Issue: lack of or inappropriate management

- **Manage** water and waterside habitats appropriately by:
  - **re-establishing** natural waterside habitats;
  - **reducing** grazing of waterside margins.
- **Balance** recreational and wildlife objectives, particularly in canals and lakes.
- **Protect** plant and animal communities from the influence of introduced species.

River Lathkill, Derbyshire. Peter Wakely/English Nature

Rivers and streams are a significant feature of the East Midlands Region, particularly the Rivers Trent and Soar which characterise the Trent Valley and Rises. Their many tributaries flow across adjacent Natural Areas, and one, the River Eye, is an SSSI for its plant communities.

Chalk-rich rivers and streams are a priority BAP habitat. Those that rise in the Lincolnshire Wolds support a rich fauna. Some cross the North Lincolnshire Coversands and Clay Vales before feeding the Humber, most notably the Rivers Bain and Ancholme.

The characteristic upland streams of the Dark Peak and South West Peak are important water resources, often controlled by reservoirs. The few rivers of the White Peak are of high water quality but subject to low summer flows. These are the only sites in the world for the Derbyshire feather moss, a BAP species. The River Lathkill in the White Peak is an SSSI.

The rivers in the south of the Region, for example the Ise in Rockingham Forest and the Nene in The West Anglian Plain, have a characteristic clay river flora. Charnwood is notable for its fast-flowing, acidic streams with shingle banks and stream margins, which support nationally scarce invertebrates.

Natural Areas where the rivers have been over-managed and are a less valuable wildlife resource, include the Yardley - Whittlewood Ridge, Lincolnshire and Rutland Limestone and Sherwood.

The Region has outstanding open waters which are predominantly reservoirs and gravel pits. These are on an important route for migrating birds and are key locations for wintering wildfowl. The largest, Rutland Water, is a Special Protection Area for wintering gadwall and shoveler and regularly supports over 20,000 waterfowl.

Many lakes and flooded quarries throughout the Region are important

eutrophic standing waters and provide a refuge for waterfowl (unless under high recreational pressure).

Mesotrophic standing waters in the North Lincolnshire Coversands and Clay Vales, Southern Magnesian Limestone, Trent Valley and Rises and Charnwood are valuable for their wetland plant communities and pillwort, the nationally scarce aquatic fern.

Ditches feature strongly in the Lincolnshire Coast and Marshes and The Fens where they are important for their flora. Once common field pools and dew ponds have now declined.

Naturally fluctuating water bodies are a priority BAP habitat and occur in the Lincolnshire Coast and Marshes. The Tetney Blow Wells are a nationally important example.

Canals are a valuable standing water habitat in the East Midlands Region. In the Trent Valley and Rises the Grand Union, Ashby, Chesterfield and Grantham Canals are all SSSIs. Canals also occur in the Derbyshire Peak Fringe and Lower Derwent. Some canals in the South West Peak and the Coal Measures support the floating water-plantain, a priority BAP species.

The White Peak, which formerly had one of the highest water vole populations in Britain, and the south of the Region are of high priority for water vole conservation. Water voles also occur in The Fens and Trent Valley and Rises but are scarce and declining elsewhere.

The River Dove in the White Peak forms part of the Peak District Dales candidate Special Area of Conservation (SAC) for its population of white-clawed crayfish. The head waters and tributaries of the Soar and rivers in The Fens and Midland Clay Pastures also support populations of the white-clawed crayfish. Elsewhere in the Region it has declined rapidly following the introduction of the American signal crayfish.

The brook lamprey and bullhead are both found throughout the Region. The spined loach has an important stronghold in the Trent Valley and Rises in habitats ranging from rivers to gravel pits.

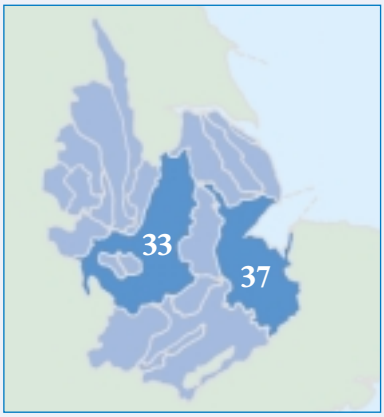
Other BAP species found throughout the Region include great-crested newts, with important populations in the Fens, West Anglian Plain and the White Peak, and pipistrelle bats, which are particularly associated with ponds and rivers. The ribbon-leaved water-plantain is found in The Fens and the grass-wrack pondweed in the Derbyshire Peak Fringe and Lower Derwent and Trent Valley and Rises.

Candidate Special Areas of Conservation

- Peak District Dales (White Peak)

Special Protection Areas

- Rutland Water (Trent Valley and Rises)



Characteristic habitats of key Natural Areas

33. Trent Valley and Rises

- Significant rivers and streams
- Man-made reservoirs (*mesotrophic* and *eutrophic standing waters*)
- Flooded gravel pits, predominantly along the Trent (*mesotrophic* and *eutrophic standing waters*)
- Numerous canals

37. The Fens

- Large, slow-flowing rivers and drains
- Ditches and drains within wet grasslands, some of botanical significance
- Occasional ponds and borrow pits (some *mesotrophic standing waters*)
- Flooded gravel pits (some *mesotrophic standing waters*)

NB Priority BAP habitats in italic

Inland rock

Key issues and objectives

Issue: rock removal

- **Avoid** extensive use of stone and scree for creating new footpaths and walls.

Issue: recreation

- **Control** rock and boulder climbing and scree running to protect rock surfaces, their vegetation and nesting birds.
- **Consider** the impact of footpaths and new tracks on inland rock habitats.

Issue: agriculture

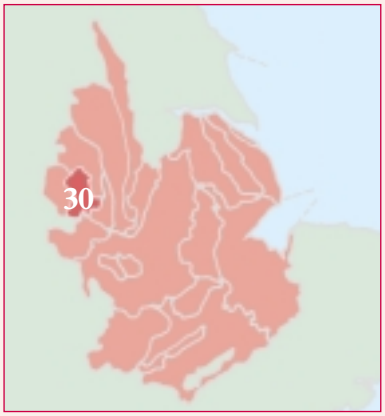
- **Establish** grazing regimes which:
  - **benefit** the vegetation;
  - **minimise** damage to rock surfaces, particularly scree.

The most important inland rock habitats of the East Midlands Region are confined to the White Peak, Dark Peak and the South West Peak, with the White Peak being the most significant Natural Area. There are many disused quarries throughout the Region that provide open rock habitats ideal for lichens, mosses, liverworts and ferns.

Limestone screes are a feature of many dale sides in the White Peak and support a diverse range of plants and animals that are adapted to survive extreme water stress: species include the limestone fern and pill

Gang Mine, Derbyshire. Peter Wakely/English Nature

Alport Castle, Peak District National Park. Tony Warne/English Nature



Characteristic habitats of key Natural Areas

30. White Peak

- Extensive limestone screes and rock faces
- Scattered metal-rich spoil heaps supporting 'calaminarian' grasslands

NB Priority BAP habitats in italic

woodlouse, *Armadillidium pulchellum*. The development of vegetation on the screes is influenced by the size of the rock fragments and their stability. Succession to ash scrub is a problem on larger sizes of scree and on screes where grazing occurs the animals can physically damage the habitat.

Limestone cliffs are also characteristic of the White Peak. With their sheer, fissured faces and inaccessible ledges they support nationally scarce plants such as the rustyback fern, wall whitlowgrass, Jacob's-ladder and the BAP moss species *Brachythecium appleyardiae*, an English endemic.

Metal-rich or 'calaminarian' grasslands occur on soils with levels of heavy metals that are toxic to most plant species. In this Region such sites are associated with past mining activities. In the White Peak, many former lead mines and their associated spoil heaps support these grasslands but reworking for different minerals is reducing their number every year. The most significant site is Gang Mine, a candidate Special Area of Conservation (SAC), notable for its wide variation in aspect and soil toxicity. Floristically this is the richest such site in the UK, characterised by spring sandwort, alpine pennycress, moonwort and a range of specialised lower plants and invertebrates.

The gritstone edges and boulder slopes of the Dark Peak and South West Peak are home to the Killarney fern (a priority BAP species) and an assemblage of lichens some of which are nationally scarce. The peregrine falcon and the raven, dependent on secluded edges for nesting, are found both in the Dark Peak and the White Peak.

Outcrops of igneous rock in Charnwood support regionally important lichen communities.

Candidate Special Areas of Conservation

- Gang Mine (White Peak)

Special Protection Areas

None

Bog, fen and swamp

Key issues and objectives

Issue: loss of habitat

- **Re-establish** bog, fen and swamp habitat by:
  - **restoring** the water levels;
  - **creating** large, wet reedbeds;
  - **removal** of encroaching trees and scrub.

Issue: inappropriate management

- **Manage** existing bog, fen and swamp by:
  - **reducing** burning and grazing of blanket bogs;
  - **cutting** reedbeds to benefit rare species associated with them (e.g. bittern).

Issue: water

- **Enhance** water quality and soil water levels through:
  - **control** of agricultural drainage and reduction in fertiliser run-off;
  - **sustainable management** of water abstraction.

Fragments of fen are found throughout the Region, most notably in the Lincolnshire Wolds, where there is fen meadow, and The Fens where the only remaining areas of peat fen occur. This is dominated by purple moor-grass and is often species rich. Reedbeds are associated with fens and reservoirs, particularly at Rutland Water in the Trent Valley and Rises and at disused quarries, clay and gravel pits in, for instance, the Lincolnshire Coast and Marshes and the West Anglian Plain. Small areas of swamp occur throughout most but not all of the Region. The many invertebrates, breeding waders and plants associated with bog, fen and swamp communities in the Region, and particularly The Fens, include the BAP species greater water-parsnip, reed bunting, bittern, the longhorn beetle *Oberea oculata*, the ground beetles *Pterostichus aterrimus* and *Panageus crux major*, Desmoulin's whorl-snail and a leaf beetle, *Cryptocephalus exiguus*.

Baston Fen, Lincolnshire.
Allan Drewitt/English Nature

Aylestone Meadows, Leicester. George Barker/English Nature

Flushes and springs are small areas of emerging ground water found throughout the Region among bogs, wet grassland, upland heath and fen. They are highly vulnerable to changes in water quality and quantity. The most species-rich flushes are those fed by the basic springs associated with limestone, supporting plant species such as giant horsetail, meadowsweet, opposite-leaved golden-saxifrage, marsh marigold and important invertebrate communities. These base-rich flushes occur in the Lincolnshire and Rutland Limestone, Lincolnshire Wolds, Southern Magnesian Limestone and the Lincolnshire Coversands and Clay Vales.

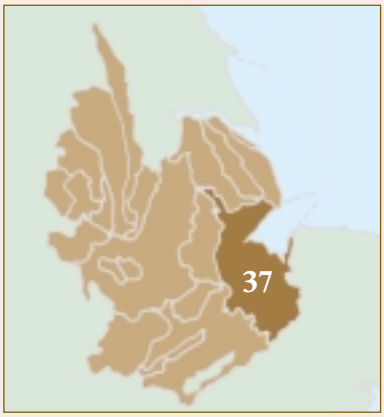
The flushes associated with the cloughs and river valleys of the South West Peak, Dark Peak and Derbyshire Peak Fringe and Lower Derwent are predominantly acidic with mosses, soft-rushes and small sedges. The BAP species reed bunting is associated with these flushes. Flushes and their associated fen habitats are an important resource in the White Peak but are scarce due to the pervious quality of the limestone. Elsewhere in the Region they are very restricted.

Extensive areas of blanket bog, a priority BAP habitat characterised by hare's-tail cottongrass with heather and wavy hair-grass, occur across the Dark Peak and South West Peak. Long-term overgrazing, burning, drainage, acid rain and pollution have led to reduced diversity of plant and animal communities, increased areas of peat erosion and the loss of some species that are characteristic of more natural ecosystems. Nevertheless these upland areas are of international importance for a range of birds. Red grouse, curlew and golden plover still breed there and part of the South Pennine Moors Special Protection Area is found in the Dark Peak and South West Peak. Raised bog, also a priority BAP habitat, only occurs in a small area in the Dark Peak.

Candidate Special Areas of Conservation
None

Special Protection Areas

- South Pennine Moors (Dark Peak; South West Peak)



Characteristic habitats of key Natural Areas

37. The Fens

- Small, scattered areas of relict *fen*
- *Purple moor-grass and rush pastures*
- Small areas of marsh, saw-sedge, swamp and *reedbed* habitats

NB Priority BAP habitats in italic

Woodland

Key issues and objectives

Issue: loss of habitat

- **Create** new broadleaved woodland around existing blocks and link small, isolated fragments (e.g. along river corridors).
- **Protect** ancient and semi-natural woodland.

Issue: commercial woodland

- **Restructure** large conifer plantations through:
  - design plans to **improve** conservation value;
  - **restoration** of native broadleaved trees on ancient woodland sites.
- Identify **appropriate** areas for new commercial woodland which:
  - **enhance** landscape character and ecological interest;
  - **avoid** conflict with other conservation aims.

Issue: management

- **Encourage** appropriate woodland development through:
  - **promotion** of the Forestry Commission Woodland Grants Scheme;
  - **transfer** of arable and improved grassland to forestry;
  - **encouraging** local use of products from semi-natural stands (e.g. charcoal).
- **Encourage** establishment of deer management groups.
- **Promote** recreational activities which are sensitive to nature conservation objectives.

Issue: loss and neglect of hedges

- **Protect** existing hedgerows using legislation.
- **Restore** and **re-establish** hedgerow boundaries to **link** existing fragments using locally native species.

The East Midlands Region as a whole is not well wooded, and woodland is virtually absent from the Fens, Lincolnshire Coast and Marshes and Lincolnshire Wolds in the east, and the Dark Peak in the west. The Region is characterised by lowland oak and mixed deciduous woods. Sessile oak is generally found on thinner, lighter soils and is associated with species such as small-leaved lime and birch. Pedunculate oak with ash and hazel tends to occur on deeper, wetter soils.

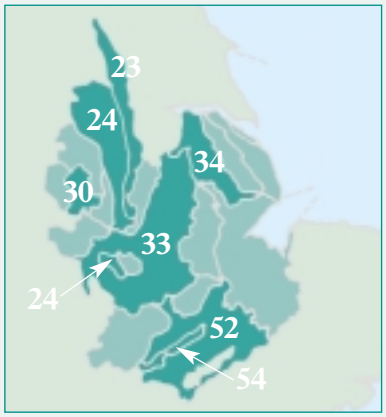
Veteran oak, Calke Abbey, Derbyshire. Peter Wakely/English Nature

Ancient woodland occurs in relatively high density throughout Charnwood, the east of the Trent Valley and Rises, Coal Measures, Yardley - Whittlewood Ridge, Rockingham Forest and Southern Magnesian Limestone. The woods on the Southern Magnesian Limestone include species at the southern edge of their range such as baneberry. Those at the northern edge of their range include green-flowered helleborine, wood barley and the nationally scarce large-leaved lime.

The North Lincolnshire Coversands and Clay Vales are sparsely wooded in the north, but have a relatively high density of ancient woodland in the south, of which the small-leaved lime woods around Bardney are a National Nature Reserve (NNR). The Birklands and Bilhaugh woodland in Sherwood includes a remnant of the historic Sherwood Forest. The site is a candidate Special Area of Conservation (SAC), being one of the most important examples of old oak woodland on sandy soil in the UK. Both the pedunculate oak and sessile oak are present in mixed-age stands. The site also has a notably rich invertebrate fauna and a diversity of fungi. The remains of other ancient forests occur in Rockingham Forest and at Leighfield Forest in the Trent Valley and Rises.

There are areas of lowland wood pasture and parkland throughout the centre and south west of the Region especially in the Trent Valley and Rises, Charnwood and Sherwood. Many of these, such as Clumber Park in Sherwood and Calke Abbey in the Trent Valley and Rises, contain very old 'veteran' trees of significance for bats, invertebrates

Characteristic habitats of key Natural Areas



23. Southern Magnesian Limestone

- Fragments of lowland oak and mixed deciduous woods
- *Lowland wood pasture and parkland*
- Small areas of *wet woodland* with alder

24. Coal Measures

- High density of lowland oak and mixed deciduous woods with ash and lime
- Extensive conifer plantations
- Locally important *lowland wood pasture and parkland*
- Some areas of *wet woodland* associated with alder
- Significant *hedgerows*

30. White Peak

- Upland lime-ash daleside woodland

33. Trent Valley and Rises

- Scattered fragments of ancient semi-natural woodland including lowland oak and mixed deciduous wood
- Nationally important *lowland wood pasture and parkland*
- Widely distributed *wet woodland* with alder, willow and ash
- Significant *hedgerows*

34. North Lincolnshire Coversands and Clay Vales

- Important concentrations of lowland oak and mixed deciduous wood, particularly limewoods
- Extensive conifer plantations in the north of the area
- *Wet woodland* including oak/alder woods on riversides and fen-edge gravels
- Ancient semi-natural woodland on Coversands
- Significant *hedgerows*

52. West Anglian Plain

- Lowland oak and mixed deciduous wood
- Numerous ancient coppice woods

54. Yardley-Whittlewood Ridge

- Extensive lowland oak and mixed deciduous woodland
- Ancient *lowland wood pasture and parkland*

NB Priority BAP habitats in italic

Candidate Special Areas of Conservation

- Peak District Dales Woodland (White Peak)
- Birklands and Bilhaugh (Sherwood)

Special Protection Areas

None

and lichens. Charnwood has good examples of sessile oakwoods and parkland on the more acidic soils.

There are areas of upland mixed oak and upland mixed ash woodland in the valley sides and cloughs of the White Peak, Dark Peak and South West Peak. The most notable is the Peak District Dales Woodland in the White Peak which is a candidate SAC for the lime-ash ravine forest. This is a habitat dominated by ash with wych elm, lime and sycamore and is typically found on coarse scree, steep rocky slopes and in ravines. This site has rich invertebrate and plant communities, including species such as rock whitebeam. Upland mixed oak is a priority BAP habitat and small areas are also found in the Derbyshire Peak Fringe and Lower Derwent.

Wet woodland characterised by alder and willow is a feature of many rivers, streams and lake margins in all Natural Areas throughout the Region except the West Anglian Plain and Yardley-Whittlewood Ridge.

Some extensive areas of conifer plantation are present in the Region, particularly in the Coal Measures, Sherwood and North Lincolnshire Coversands and Clay Vales. Although largely consisting of introduced conifers these can provide habitats for some native species, particularly birds of prey such as goshawk. Some plantations contain the remains of former heathland and support nightjar. They are ideal potential areas for heathland re-creation.

BAP species associated with woodland in the Region include spotted flycatcher, pipistrelle bat, barbastelle bat, lesser horseshoe bat, argent and sable moth and the dormouse, which has a particular association with large ancient woodlands.

Hedgerows occur throughout the East Midlands Region. Those of the Lincolnshire Coast and Marshes, Trent Valley and Rises and Charnwood are considered the most significant. Hawthorn is generally the main constituent of hedgerows, with associated species varying across the Region. For example, in Sherwood gorse, broom, bracken and large oaks are characteristic. Hedgerows and their margins are a key habitat for wildlife such as birds, bats, butterflies and moths. BAP bird species which depend on hedgerows and occur in the Region are the linnet, bullfinch, tree sparrow and song thrush.

Birklands and Bilhaugh, Nottinghamshire.
Peter Wakely/English Nature

▲ Sherwood Forest Country Park. Rob McGibbon/English Nature

▼ Ancient oaks, Bradgate Park, Leicestershire. English Nature

Lowland grassland and heath

Key issues and objectives

Issue: opportunities for habitat creation

- **Create** or **restore** grassland and heaths on farmland and secondary woodland, particularly where this links existing fragments.
- **Implement** existing heathland re-creation strategies.

Issue: lack of appropriate management

- **Promote** appropriate management through:
  - extensive, low-intensity **grazing** on grasslands and heaths;
  - **controlled** burning or scrub clearance on heaths;
  - **sensitive** water management on wet sites.

Issue: pressure for agricultural intensification

- **Avoid** further loss of habitat due to agricultural intensification by:
  - **encouraging** traditional, low-intensity agriculture;
  - **promoting** the uptake of agri-environment and other environmental support schemes;
  - **creating** cereal field margins to halt decline in arable plant species.

Lowland heath has become a nationally and internationally rare habitat after changes in agriculture have seen large areas of heathland converted to grassland, arable land or conifer plantations. There are nationally important heath communities in Charnwood, Sherwood and the North Lincolnshire Coversands and Clay Vales, that are different both from each other and from the heathlands of southern England. The heath communities of Sherwood are characterised by a mosaic of heathers (including local variants such as hoary ling), acid grassland, bracken and acid shrubs such as petty-whin and dwarf gorse. Most of the heath in the North Lincolnshire Coversands and Clay Vales is associated with parched acid grassland, sand dunes and calcicolous grassland. These sites provide an important habitat for lichens, mosses and invertebrates, particularly beetles, flies and moths

Bagthorpe Meadows, Nottinghamshire. Steve Clifton/English Nature

such as the Portland Moth. The Charnwood heaths, which lie on hard acidic rocks, include upland species such as bilberry and crowberry. The Coal Measures, Trent Valley and Rises and Lincolnshire and Rutland Limestone have small but distinct, scattered areas of heath. Dry lowland heath is absent from the rest of the Region.

Small areas of wet heath characterised by cross-leaved heath, purple moor-grass and cottongrass occur on the North Lincolnshire Coversands and Clay Vales, Sherwood and Charnwood. Wet heath is very rare throughout the rest of the Region.

Red hemp-nettle.
Chris Gibson/English Nature

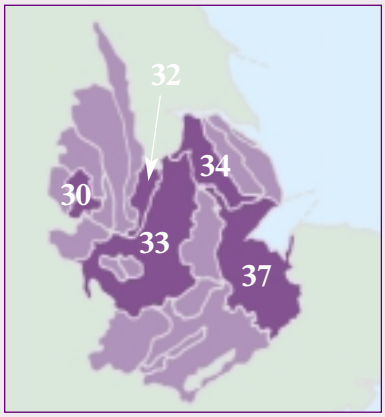
Characteristic habitats of key Natural Areas

30. White Peak

- Extensive *lowland calcareous (limestone) grassland*
- Some areas of tall herb grassland on limestone
- Scarce unimproved neutral grassland
- Some areas of *lowland dry acid grassland*

The priority BAP species associated with heathland in the Region include the Deptford pink and nationally important numbers of breeding nightjar and woodlark.

Across the Region most of the grassland has been agriculturally improved by fertilisers and drainage and is no longer species-rich. The remaining grassland can be broadly classified into four categories; limestone grassland, wet grassland, neutral grassland and acidic grassland. Of these the limestone grassland is the most species-rich, both for plants and insects such as beetles, flies and moths. The White Peak is of outstanding importance for its grassland communities, particularly on limestone and BAP species found there include the chalk carpet moth and light-feathered rustic moth.



32. Sherwood

- Scattered mosaics of *lowland heath* and *lowland dry acid grassland*
- Small amounts of wet *heath*

33. Trent Valley and Rises

- Significant areas of *floodplain grazing marsh* including a group of important *lowland hay meadow* sites
- Dry and wet unimproved neutral grassland

34. North Lincolnshire Coversands and Clay Vales

- Significant areas of parched *(dry) acid grassland*
- Extensive, nationally important *lowland heath*
- Small areas of *lowland calcareous grassland* associated with disused quarries
- Significant, fragmented areas of species-rich dry neutral grassland

37. The Fens

- Wet neutral grassland, including washlands and *floodplain grazing marsh*
- Some unimproved neutral grassland

NB Priority BAP habitats in italic

Candidate Special Areas of Conservation

- Peak District Dales (White Peak)
- Barnack Hills and Holes (Rockingham Forest)
- Grimsthorpe Park (Lincolnshire and Rutland Limestone)

Special Protection Areas

None

Green-winged orchids, Muston Meadows, Leicestershire. Peter Wakely/English Nature

The Peak District Dales in the White Peak are a candidate Special Area of Conservation (SAC) for their extensive surviving areas of species-rich chalk and limestone grassland. The Southern Magnesian Limestone area is notable for having a substantial proportion of the nationally scarce Magnesian Limestone grassland which differs from other limestone grassland in the Region, for example in the White Peak, being characterised by blue moor-grass. The losses of lowland limestone grassland have been considerable, and only small areas now remain. Nevertheless, the Lincolnshire and Rutland Limestone has nationally important areas, including Grimsthorpe which is a candidate SAC for the early gentian, here at its most northerly location. Disused quarries across the Region can be important sites for limestone grassland.

Wet grasslands and floodplain grazing meadows often have a dense network of ditches and a distinctive vegetation which can withstand being waterlogged. They support a wide variety of invertebrates and are important for breeding and wintering birds. The Trent Valley and Rises supports relatively large areas of species-rich floodplain grazing meadow, particularly at Loughborough Big Meadow which is the third largest site of this type in England and is a mediaeval Lammas meadow. Significant areas of wet grassland remain along the Lincolnshire Coast and Marshes between Cleethorpes and Skegness which are of value for their conservation, historical and landscape features. The important 'washlands' of The Fens are deliberately flooded to prevent rivers, such as the Nene, Ouse and Cam, from overtopping. The Needwood and South Derbyshire Claylands have notable wet grassland associated with the Rivers Trent and Dove. Elsewhere there are still important wet grasslands associated with river valleys such as that of the lower Soar. Such grasslands continue to be drained and converted to arable land.

Dry neutral grassland includes old permanent pasture and traditional hay meadows which are species-rich and now very scarce nationally. Lowland hay meadows are found

scattered throughout the Region, particularly in the White Peak, West Anglian Plain and the Trent Valley and Rises where Muston Meadows is an NNR. Some enclosed hay meadows and pastures remain in the Midlands Clay Pastures and the Needwood and South Derbyshire Claylands.

There are considerable areas of acidic grassland in Charnwood, Sherwood and the North Lincolnshire Coversands and Clay Vales, often in association with lowland heath. It also occurs on the poor soils of dale sides in the White Peak. In the Lincolnshire Coversands the acid grassland occurs on wind-blown glacial sands.

The cereal field margins in the Region are generally poor for wildflowers. The Natural Area having the highest number of wildflower species associated with arable land is the West Anglian Plains, where the moss *Weissia rostellata*, a BAP species, is found. The red hemp-nettle, cornflower, small-flowered catchfly and shepherd's-needle are other BAP arable plants found in the Region. BAP animals associated with cereal field margins and grasslands in the Region are the grey partridge, skylark, turtle dove, corn bunting, tree sparrow and the brown hare for which the south and east of the Region is of high importance.

Some arable land on the Lincolnshire Coast and Marshes is of national importance for birds, particularly pink-footed geese and wigeon, which feed in cultivated fields, and golden plover and lapwing, which feed and roost here in winter.

Heathland, Lincolnshire. Steve Clifton/English Nature

Upland grassland and heath

Key issues and objectives

Issue: habitat fragmentation

- **Protect** against inappropriate development.
- **Re-create** upland grasslands and heaths especially where this would **link** existing fragments.
- **Restore** and **extend** wet pasture land for breeding birds.

Issue: inappropriate management

- **Control** overgrazing by **reducing** stocking levels.
- **Encourage** sensitive burning regimes (follow the '*Heather and Grass Burning Code*').
- **Restore** a variety of traditional management regimes, particularly for hay meadows and pastures.

Issue: pressure for agricultural intensification

- **Avoid** further agricultural intensification by **promoting** the uptake of agri-environment and other environmental support schemes.

There are three upland Natural Areas within the East Midlands Region, the Dark Peak, the White Peak and the South West Peak. The moorland landscape comprises a mosaic of habitats of which the upland grasslands and heathlands are an important component. The moors of the South West Peak and the Dark Peak form part of the South Pennine Moors Special Protection Area (SPA), as they are internationally important for their breeding population of golden plover, short-eared owl and merlin. Additionally they support nationally important populations of curlew and ring ouzel and significant populations of red grouse, peregrine and twite.

Upland dry heath, developed as a result of woodland and scrub clearance followed by rotational burning and grazing. The dominant vegetation is heather associated with dwarf shrubs such as bilberry and western gorse in the more species-rich areas, and with grasses in the poorer areas. The Dark Peak and South West Peak are notable for their extensive dry heath. Agricultural improvement has reduced upland heath to scattered, isolated fragments in the White Peak and in the higher areas of the Derbyshire Peak Fringe and Lower Derwent. However, there is still the potential to support BAP species, such as nightjar, which is already present in the Dark Peak, by

Lathkill Dale, Derbyshire Dales. Peter Wakely/English Nature

Fieldscape near High Peak, Derbyshire. Peter Wakely/English Nature

increasing the areas of heath and linking the fragments.

Upland wet heath, characterised by cross-leaved heath, cranberry and bog asphodel is very restricted and only found in parts of the South West Peak and Dark Peak. This is also a priority BAP habitat.

Upland acid grasslands are especially well developed in the United Kingdom. The South West Peak and Dark Peak have extensive areas of upland acid grassland including areas that are species-rich. These are of high conservation value and are characterised by grasses, such as sheep's fescue and common bent, sedges, fungi and wildflowers, like harebell. In the Dark Peak the priority BAP species skylark and the nationally-scarce lichen *Cladonia fragilissima* also occur. The White Peak has a very limited upland acid grassland resource.

Bracken is associated with some areas of species-poor acidic grassland which, in association with heather moorland and pasture, support breeding birds such as twite, ring ouzel and whinchat.

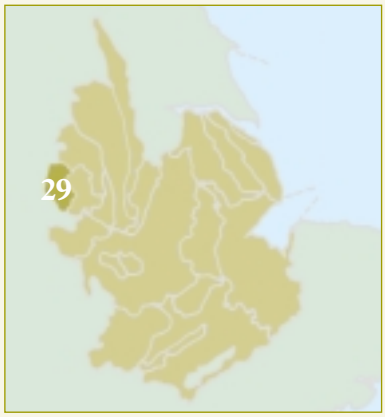
The northern brown argus butterfly, a priority BAP species, is associated with upland grassland and heath in the White Peak.

Other species-poor areas of upland grassland are generally of low conservation status but there is potential for restoration to a more valuable heath or upland woodland habitat.

Candidate Special Areas of Conservation
None

Special Protection Areas

- South Pennine Moors (South West Peak; Dark Peak)



Characteristic habitats of key Natural Areas

29. South West Peak

- Extensive dry *upland heath*
- Species-rich upland acid grassland
- Limited ares of wet *upland heath*

NB Priority BAP habitats in italic

Maritime

Key issues and objectives

Issue: maintenance of coastal processes

- **Allow** natural, dynamic coastal processes to operate by:
  - **avoiding** hard sea defences where these would interrupt the natural flow of sediments and destroy habitats, except where important settlements and economic concerns are identified;
  - **developing** soft engineering options such as managed realignment and creation of saltmarsh/mudflat;
  - **safeguarding** offshore sediment sources through limiting or reducing marine aggregate winning and minimising navigational dredging and ensuring that uncontaminated dredged sediment is not removed from the system;
  - **protecting** areas of high biodiversity and fragile reef structures from offshore development and exploitation.

Issue: water quality

- **Maintain** high water quality by:
  - **reducing** inputs of untreated sewage effluents;
  - **reducing** contamination from industrial discharges and agricultural run-off.

Issue: recreation and tourism

- **Avoid** detrimental impacts on key wildlife features by **promoting** recreation and tourism that are environmentally sensitive.

Issue: fisheries

- Work towards **sustainable** fisheries management, especially in sensitive areas.

The East Midlands Region's coastline, which includes parts of the Wash and the Humber Estuary, is characterised by sandy and muddy beaches with saltmarsh and sand dunes. Much of this coastline is of international importance for waterfowl, for which it is classified as a Special Protection Area (SPA), and for coastal habitats such as Gibraltar Point, a candidate Special Area of Conservation (SAC) for its sand dune habitats. Substantial parts of the coast, such as the Wash, Gibraltar Point and the Saltfleetby and Theddlethorpe Dunes, are designated as National Nature Reserves. The Wash is one of the most extensive estuarine systems in the UK and is a candidate

The Wash. Peter Wakely/English Nature

Saltfleetby, Lincolnshire. Mike Henchman/English Nature

SAC and an SPA. Despite historic land claims the Wash, together with the North Norfolk Coast, forms one of the most important estuarine habitats in the UK.

Cliffs are not a strong feature of the coastline. Low chalk cliffs at Hunstanton provide a breeding ground for seabirds, such as fulmar, and support a narrow fringe of diverse cliff-top grassland. The soft cliffs of the Bridlington to Skegness coast are continually eroding and provide 40% of the sediment in the Humber Estuary and also supply sediment for the coastline as far south as Skegness. This process is fundamental to the maintenance of features such as saltmarsh which are a first line of flood defence and important wildlife habitats.

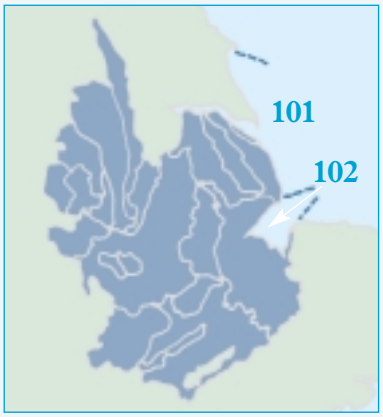
Saltmarshes form on sheltered coasts and the Wash has more saltmarsh than any other estuarine system in the country. The entire range of saltmarsh is represented, from pioneer glasswort beds, through middle marsh to upper saltmarsh, where sea-lavenders and sea-purslane form a saltmarsh scrub at the high water mark. This scrub zone also supports sea wormwood, a food plant for the larvae of the scarce pug-moth. Transitions are often truncated by man-made sea defences, particularly in the Wash where the amount of upper saltmarsh is restricted. Extensive areas of

Candidate Special Areas of Conservation

- North Norfolk Coast and Gibraltar Point Dunes (The Wash; plus Old Hunstanton to Sheringham in the East of England Region)
- The Wash and North Norfolk Coast (The Wash; plus Old Hunstanton to Sheringham in the East of England Region)

Special Protection Areas

- The Wash (The Wash)
- Humber Flats, Marshes and Coast (Bridlington to Skegness; plus Humber Estuary in the Yorkshire and the Humber Region)



Characteristic habitats of key Natural Areas

101. Bridlington to Skegness

- Sandy beaches fringe most of the coast
- Continuous *coastal sand dunes*
- Extensive soft *cliffs* at Holderness
- Substantial intertidal sand and *mudflats* along the north Lincolnshire coast
- Some, but not extensive, *saltmarsh* and small *coastal vegetated shingle structures*
- Small area of *saline lagoons*

102. The Wash

- Very large areas of intertidal sand and *mudflats*
- Extensive areas of *saltmarsh*
- *Sand dune* systems at the mouth of the Wash including calcareous dunes at Gibraltar Point
- Small area of *saline lagoons*
- Sand and *coastal vegetated shingle* on the shorelines
- Widely distributed *Sabellaria spinulosa reefs*
- Scarce *seagrass beds*

NB Priority BAP habitats in italic

Gibraltar Point, Lincolnshire. Peter Wakely/English Nature

middle and pioneer saltmarsh are present. Although these are not very rich botanically they provide grazing for large flocks of wintering birds and shelter for breeding birds, and are part of the SPA. Saltmarshes are not very extensive along the open Bridlington to Skegness coast.

The sand dunes which form an extensive system along the North Lincolnshire Coast from Cleethorpes to Saltfleetby and Theddlethorpe are part of the Humber Flats, Marshes and Coast SPA. The sand dunes at the mouth of the Wash and at Gibraltar Point are part of the Wash and North Norfolk Coast and Gibraltar Point Dunes candidate SAC. The priority BAP species natterjack toad occurs at Gibraltar Point and at Saltfleetby - Theddlethorpe Dunes NNR. The dunes are characterised by sea sandwort, sea rocket, prickly saltwort and the rare rock sea-lavender. The dunes change from mobile wind-blown sand on the foreshore to stabilised systems with dune slacks, often rich in orchids. The dune thread-moss, a BAP species, is found on damp dune slacks. Coastal dunes are also important for their invertebrate populations which include numerous rarities such as the dune tiger beetle and starwort moth. At Gibraltar Point and Snettisham Spit, shingle ridges support specialised vegetation of national importance.

The Wash has the second largest area of intertidal sandflats and mudflats in the UK. Sandy intertidal flats predominate and include extensive fine sands and drying banks of coarse sand. Softer mudflats occur in the upper flats and sheltered areas inshore. Marine invertebrate communities here are characterised by polychaete worms, bivalves and crustaceans, whilst unusual plant communities include seagrass beds.

Saline lagoons provide a specialised habitat where species such as the rare lagoon sand worm, lagoon sand shrimp and spiral tasselweed are found. Natural saline lagoons are very rare, but many other pools behind sea defences have characteristics of such lagoons where saltwater influences are exerted. Small areas of saline lagoon are found along the Wash and on the Bridlington to Skegness coast.

The coastline is characterised by shallow seas, mainly less than 20m deep, with the sea bed from Bridlington to Skegness gradually dipping to the East. The subtidal communities are diverse and are mainly on sands and gravels. Extensive reefs formed by the sand worm *Sabellaria spinulosa* are found offshore. In the Wash, where the seabed communities in the deeper, central part are more diverse, there are also important nursery grounds for plaice, cod and sole.

The sandflats and mudflats, saltmarsh, grazing marsh, shingle and reedbeds of the East Midlands coastline are of outstanding ornithological significance. The Wash supports the largest numbers of migrating and wintering waterfowl of any site in the UK and is one of the most important staging and wintering sites on the east Atlantic flyway network. The Humber Estuary is one of the top ten wildfowl sites in Europe. Birds which occur in internationally important numbers are breeding little tern and overwintering dark-bellied brent geese, pink-footed geese, golden and grey plovers, shelduck, knot, dunlin, bar-tailed godwit, pintail, redshank, oystercatcher and curlew.

Donna Nook, on the Lincolnshire coast, is an important site for grey seals with common seals also recorded. About 80% of the British population of common seal breed in the Wash. Both grey and common seals are BAP species. Harbour porpoises are occasionally seen off Gibraltar Point.

Annex 1: Benchmarks for nature

The conservation of nature is a key test of sustainable development. The list below provides a set of questions to be applied as positive indicators for biodiversity and Earth heritage, where relevant strategies, policies, projects and programmes are under consideration. These may include developments such as agricultural improvement or intensification, coastal and flood defence works and water abstraction, as well as built development or infrastructure such as roads, rail and energy.

Policy links

- Is there compatibility with relevant policies within: any local/regional Biodiversity Action Plan, sustainable development plan, nature conservation strategy or priority setting document for nature; any Government Planning Policy Guidance or Regional Planning Guidance; Local Development Plans/Unitary Development Plans/Structure Plans/etc?
- Is there active contribution to the resolution of Natural Area issues and the delivery of UK, Regional and Local Biodiversity Action Plan targets and Natural Area objectives?
- Has there been an appraisal of the environmental impact of policies, plans and programmes within regional strategic documents? (See: the eight step approach in Department of the Environment, Transport and the Regions Policy Guidance: 'Policy Appraisal and the Environment', DETR 1998)

Biodiversity and Earth heritage

- Will any areas with local/national/international designation for nature conservation be affected or directly damaged?
- Is there scope for the enhancement of biodiversity through the provision of: opportunities for achieving the targets for priority habitats and species in the context of UK, Regional and Local Biodiversity Action Plans; improved habitat and/or the creation of additional habitat for plants and animals, appropriate to the local character?
- Will any non-designated habitat such as woodland, grassland and other vegetation, linking habitats

Children at Gibraltar Point, Lincolnshire. English Nature

such as trees, hedges, grass strips, ditches, that may be destroyed, or fragmented be fully compensated/mitigated for?

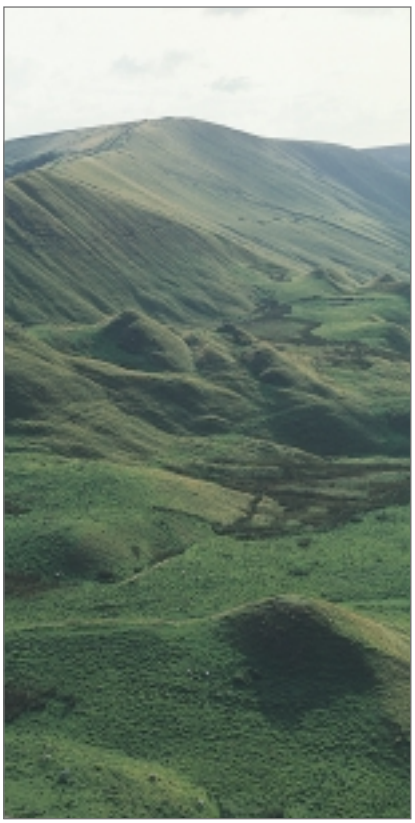
- Do any plant and tree planting programmes use an appropriate mix of species native to the Natural Area in question?
- Will any habitat be in danger of abandonment, under management, change or intensification of management? (e.g. Overgrazing, loss of crop rotations and arable-pasture mosaics; shift from spring sown to autumn sown cereals, loss of winter stubbles, application of artificial fertiliser, etc. - leading to impacts on associated farmland species)
- Will any habitat be in danger of a secondary or indirect damage? (e.g. Wetland or aquatic habitats and ecosystems in danger of drying out, loss or degradation as a result of over-abstraction of surface and groundwaters, pollution and eutrophication of surface and groundwaters; development in a flood plain which may require canalisation of watercourses impacting on river valley wetlands and aquatic ecosystems; coastal development that impacts on natural processes; etc.)
- Is there scope for the enhancement of geological interest? (e.g. Through the improvement of geological exposures or features; the creation of additional geological exposures or features, etc.)

Environmental good practice for nature

- Has an environmental impact assessment been carried out?
- Will post implementation impacts be assessed and managed by regular review and monitoring programmes?

Community involvement for nature

- Will all sections of the community be consulted as part of the decision making process?
- Have the needs of local communities for access to, and experience of, nature been taken into account?
- Does the project help vulnerable, disadvantaged or excluded groups to gain access to nature and wildspace?
- Will there be a contribution to improving the quality of life by local inhabitants, for example: through improved general access to nature, but in particular on foot or by public transport?
- Will local distinctiveness for nature be valued, and community and cultural identity be strengthened?
- Will community enterprises for nature be encouraged?



Rushup Edge, High Peak, Derbyshire.
Peter Wakely/English Nature

Designated areas

National/International Nature Conservation Designations:

- Sites of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- Special Protection Areas (SPA)
- Special Areas of Conservation (SAC)
- Ramsar Sites

Local Nature Conservation Designations (often non-statutory but recognised in local plans, PPG and other similar documents):

- Sites of Importance for Nature Conservation (SINC - locally other terms may be used)
- Local Nature Reserves (LNR)
- Regionally Important Geological/Geomorphological Sites (RIGS)
- Non-statutory nature reserves

(Modified and adapted from a document produced by the Environment & Energy Management Team, Government Office for the South West).

Annex 2: Sources of information

Each Natural Area has an associated profile which contains the issues and objectives specific to that ecological unit. These have already been passed on to our key partners, including local authorities. The complete set of profiles for England is available from English Nature's local teams on a CD-ROM.

National overviews of habitats, species and earth heritage

Brown, A.E., Burn, A.J., Hopkins, J.J. and Way, S.F. (Editors). 1997. The Habitats Directive: selection of Special Areas of Conservation in the UK. *Joint Nature Conservation Committee Report No. 270.* Joint Nature Conservation Committee, Peterborough.

Drake, M., Clements, D., Eyre, M., Gibbs, D. and Kirby, P. 1998. Invertebrates and their habitats in Natural Areas. Volume 1: Midland and Northern Areas. *English Nature Research Report No. 298.* English Nature, Peterborough.

Drake, M., Clements, D., Eyre, M., Gibbs, D. and Kirby, P. 1998. Invertebrates and their habitats in Natural Areas. Volume 2: Southern Areas. *English Nature Research Report No. 298.* English Nature, Peterborough.

Drewitt, A.L., and Manley, V.J. 1997. The vegetation of the mountains and moorlands of England. *English Nature Research Report No. 218.* English Nature, Peterborough.

English Nature 1997. *Wildlife and fresh water, an agenda for sustainable management.* English Nature, Peterborough.

English Nature. In prep. *Overview of coastal habitats by Natural Area.* English Nature, Peterborough.

Gardiner, A.J. 1996. Freshwater wetlands in England. A Natural Areas approach. *English Nature Research Report No. 204.* English Nature, Peterborough.

Grice, P.V., Brown, A.F., Carter, I.C. and Rankine, C.A. 1994. Birds in England: a Natural Areas approach. *English Nature Research Report No. 114.* English Nature, Peterborough.

Jefferson, R.G. 1997. Lowland grassland in Natural Areas. National assessment of significance. *English Nature Research Report No. 171.* English Nature, Peterborough.

King, A., Glasser, N., Larwood, J., Littlewood, A., Moat, T. and Page, K. 1996. Earth heritage conservation in England: a Natural Areas perspective. *English Nature Research Report No. 158.* English Nature, Peterborough.

Kirby, K. and Reid, C. 1997. Preliminary nature conservation objectives for Natural Areas. Woodland and forestry. *English Nature Research Report No. 239.* English Nature, Peterborough.

Michael, N. 1996. Lowland heathland in England. A Natural Areas approach. *English Nature Research Report No. 170.* English Nature, Peterborough.

Mitchell-Jones, A.J. and Gent, A.H. 1997. Priority Natural Areas for mammals, reptiles and amphibians. *English Nature Research Report No. 242.* English Nature, Peterborough.

Porley, R. and McDonnell, A. 1997. Rare and scarce vascular plants and bryophytes in Natural Areas. *English Nature Research Report No. 267.* English Nature, Peterborough.

Reid, C.M., Kirby, K.J. and Cooke, R.J. 1996. A preliminary assessment of woodland conservation in England by Natural Areas. *English Nature Research Report No. 186.* English Nature, Peterborough.

Sanderson, N.A. 1998. A review of the extent, conservation interest and management of lowland acid grassland in England. Volume I: Overview. *English Nature Research Report No. 259.* English Nature, Peterborough.

Sanderson, N.A. 1998. A review of the extent, conservation interest and management of lowland acid grassland in England. Volume II: County Descriptions. *English Nature Research Report No. 259.* English Nature, Peterborough.

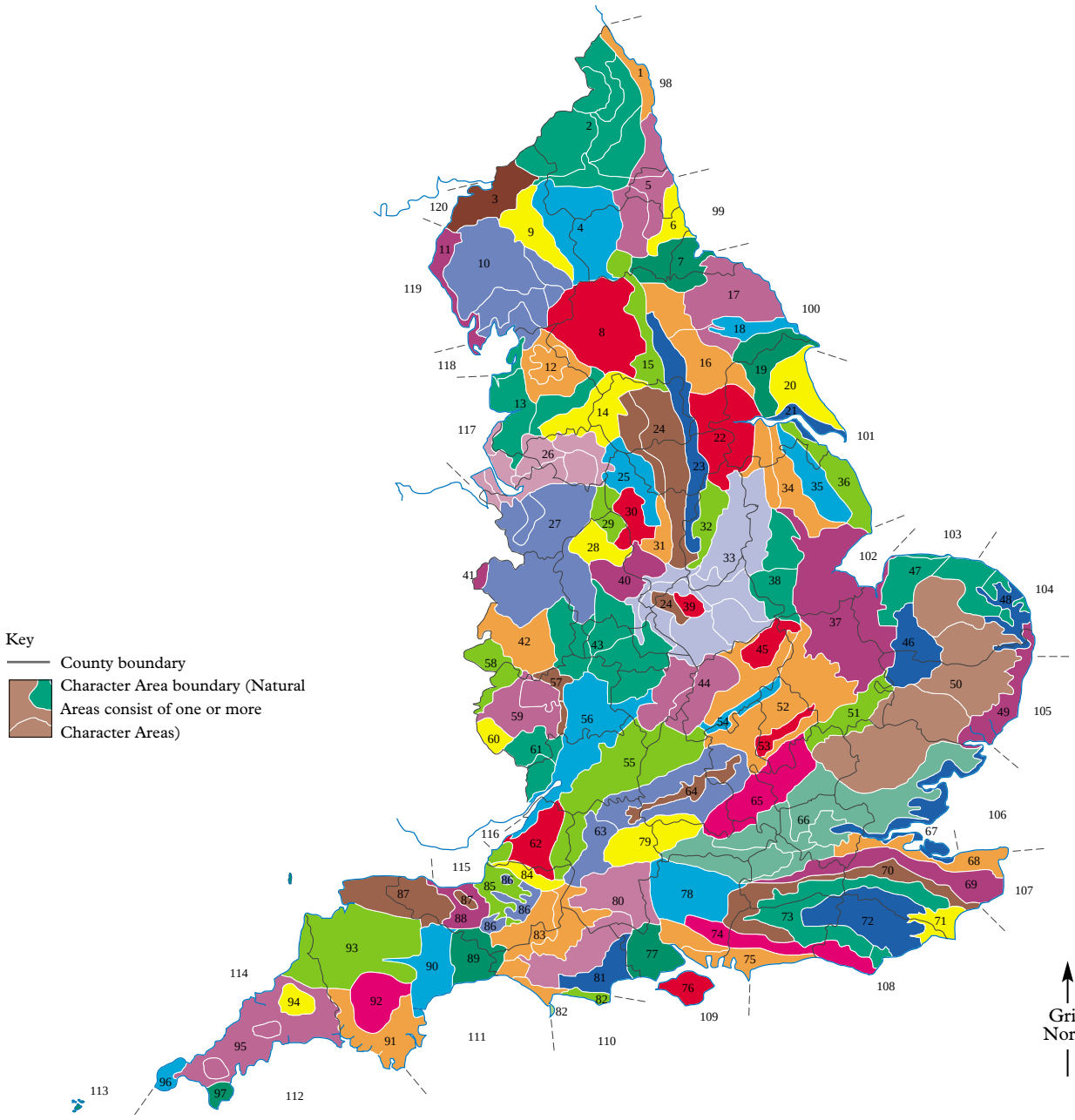
All available free from the Enquiry Service, English Nature, Northminster House, Peterborough PE1 1UA Tel. 01733 455101 Fax. 01733 568834.

Natural Areas CD-ROM.

Available, priced £15, from Telelink Ltd., PO Box 100, Fareham, Hampshire PO14 2SX Tel. 01329 331300 Fax. 01329 330034.

Natural Area Profiles

The individual profiles used in this report are available from the Local Team, address and telephone number shown on the back cover, or can be found on English Nature's web page at www.english-nature.org.uk.



1	North Northumberland Coastal Plain	25	Dark Peak	49	Suffolk Coast and Heaths	73	Low Weald and Pevensey	97	The Lizard
2	Border Uplands	26	Urban Mersey Basin	50	East Anglian Plain	74	South Downs	98	Northumberland Coast
3	Solway Basin	27	Meres and Mosses	51	East Anglian Chalk	75	South Coast Plain and Hampshire Lowlands	99	Tyne to Tees Coast
4	North Pennines	28	Potteries and Churnet Valley	52	West Anglian Plain	76	Isle of Wight	100	Saltburn to Bridlington
5	Northumbria Coal Measures	29	South West Peak	53	Bedfordshire Greensand Ridge	77	New Forest	101	Bridlington to Skegness
6	Durham Magnesian Limestone Plateau	30	White Peak	54	Yardley/Whittlewood Ridge	78	Hampshire Downs	102	The Wash
7	Tees Lowlands	31	Derbyshire Peak Fringe and Lower Derwent	55	Cotswolds	79	Berkshire and Marlborough Downs	103	Old Hunstanton to Sheringham
8	Yorkshire Dales	32	Sherwood	56	Severn and Avon Vales	80	South Wessex Downs	104	Sheringham to Lowestoft
9	Eden Valley	33	Trent Valley and Rises	57	Malvern Hills and Teme Valley	81	Dorset Heaths	105	Suffolk Coast
10	Cumbria Fells and Dales	34	North Lincolnshire Coversands and Clay Vales	58	Clun and North West Herefordshire Hills	82	Isles of Portland and Purbeck	106	North Kent Coast
11	West Cumbria Coastal Plain	35	Lincolnshire Wolds	59	Central Herefordshire	83	Wessex Vales	107	East Kent Coast
12	Forest of Bowland	36	Lincolnshire Coast and Marshes	60	Black Mountains and Golden Valley	84	Mendip Hills	108	Folkestone to Selsey Bill
13	Lancashire Plain and Valleys	37	The Fens	61	Dean Plateau and Wye Valley	85	Somerset Levels and Moors	109	Solent and Poole Bay
14	Southern Pennines	38	Lincolnshire and Rutland Limestone	62	Bristol, Avon Valleys and Ridges	86	Mid Somerset Hills	110	South Dorset Coast
15	Pennine Dales Fringe	39	Charnwood	63	Thames and Avon Vales	87	Exmoor and the Quantocks	111	Lyme Bay
16	Vale of York and Mowbray	40	Needwood and South Derbyshire Claylands	64	Midvale Ridge	88	Vale of Taunton and Quantock Fringes	112	Start Point to Land's End
17	North York Moors and Hills	41	Oswestry Uplands	65	Chilterns	89	Blackdowns	113	Isles of Scilly
18	Vale of Pickering	42	Shropshire Hills	66	London Basin	90	Devon Redlands	114	Land's End to Minehead
19	Yorkshire Wolds	43	Midlands Plateau	67	Greater Thames Estuary	91	South Devon	115	Bridgwater Bay
20	Holderness	44	Midland Clay Pastures	68	North Kent Plain	92	Dartmoor	116	Severn Estuary
21	Humber Estuary	45	Rockingham Forest	69	North Downs	93	The Culm	117	Liverpool Bay
22	Humberhead Levels	46	Breckland	70	Wealden Greensand	94	Bodmin Moor	118	Morecambe Bay
23	Southern Magnesian Limestone	47	North Norfolk	71	Romney Marshes	95	Cornish Killas and Granites	119	Cumbrian Coast
24	Coal Measures	48	The Broads	72	High Weald	96	West Penwith	120	Solway Firth

Revised to December 1996

English Nature Local Teams in the East Midlands Region and Natural Areas for which they lead

East Midlands Team
(Regional Lead Team)
The Maltings
Wharf Road
Grantham
Lincolnshire
NG31 6BH

Tel. 01476 568431
Fax. 01476 570927

Natural Areas for which they lead:

32 Sherwood
33 Trent Valley and Rises
34 North Lincolnshire Coversands and Clay Vales
35 Lincolnshire Wolds
36 Lincolnshire Coast and Marshes
38 Lincolnshire and Rutland Limestone
39 Charnwood
102 The Wash

West Midlands Team
Attingham Park
Shrewsbury
Shropshire
SY4 4TW

Tel. 01743 709611
Fax. 01743 709303

Natural Areas for which they lead:

40 Needwood and South Derbyshire Claylands

Bedfordshire, Cambridgeshire and Northamptonshire Team
Ham Lane House
Ham Lane
Nene Park
Orton Waterville
Peterborough
PE2 5UR

Tel. 01733 405850
Fax. 01733 394093

Natural Areas for which they lead:

37 The Fens
44 Midland Clay Pastures
45 Rockingham Forest
52 West Anglian Plain
54 Yardley-Whittlewood Ridge

Peak District and Derbyshire Team
Manor Barn
Over Haddon
Bakewell
Derbyshire
DE45 1JE

Tel. 01629 815059
Fax. 01629 815091

Natural Areas for which they lead:

25 Dark Peak
29 South West Peak
30 White Peak
31 Derbyshire Peak Fringe and Lower Derwent

North and East Yorkshire Team
Genesis Building 1
Science Park
University Road
Heslington
York
YO10 5ZQ

Tel. 01904 435500
Fax. 01904 435520

Natural Areas for which they lead:

101 Bridlington to Skegness

Humber To Pennines Team
Bullring House
Northgate
Wakefield
WF1 3BJ

Tel. 01924 387010
Fax. 01924 201507

Natural Areas for which they lead:

23 Southern Magnesian Limestone
24 Coal Measures

ENGLISH NATURE

English Nature is the government agency that champions wildlife and natural features throughout England.
This is one of a range of publications published by Publicity & Marketing, English Nature, Northminster House, Peterborough PE1 1UA
Web site: http://www.english-nature.org.uk
ISBN 1 85716 452 0

Designed by Coral Design Management. Printed by Ruddocks, Lincoln on Evolve Silk, 75% recycled post-consumer waste, 25% virgin fibre, ECF. 2M