ENGLISH NATURE

Natural Areas

in the South West 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.

Chesil Beach, Dorset. Peter Wakely/English Nature

Avon Gorge NNR, Bristol. Peter Wakely/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).

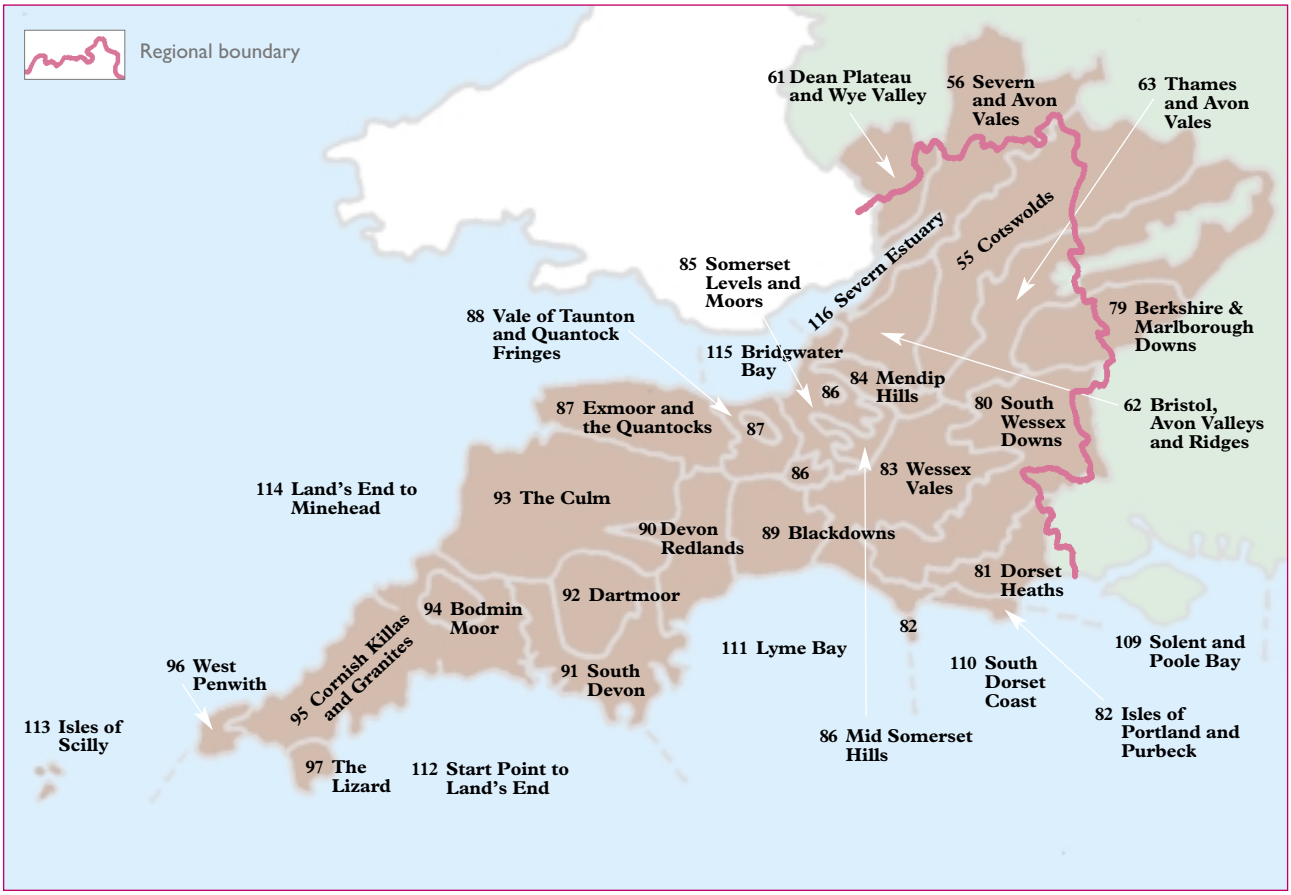
Natural Areas as a Regional framework for nature

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 sevaral 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.



Natural Areas covered in the South West Region report

Objectives for sustainable development and nature conservation in the South West Region

The South West is a region of dramatic, and often sharp contrasts. Whilst agriculture is the dominant land use and underpins the rural economy, large urban populations are concentrated around the business and industry of the major sea ports, primarily Bristol and Plymouth. The countryside and natural beauty, in particular the coast (which is proportionately the longest of any Region) and the National Parks, is the mainstay of a significant tourism industry.

The Region contains a diversity of landscapes which support a characteristic and remarkable combination of wildlife and geological heritage. The Cotswolds and the chalklands of Wiltshire and Dorset are dominated by the large scale, open spaces of pastoral farming. Densely wooded ancient countryside is found in the Forest of Dean and Cranborne Chase, whilst the Mendips is an area of discrete and varied hills and escarpments. Elsewhere there are intimate patterns of small fields, hamlets and winding lanes, rugged coasts and upland moorland. There is an outstanding diversity of habitats and species that are very rare, and of very high quality, of which the Region can be justifiably proud. Prime examples include the heathland of Dorset, the uplands of Dartmoor and Exmoor, the wet grasslands of Somerset, the varied wet heath of the Culm Measures in Devon and the rolling chalk downlands of Wiltshire.

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.

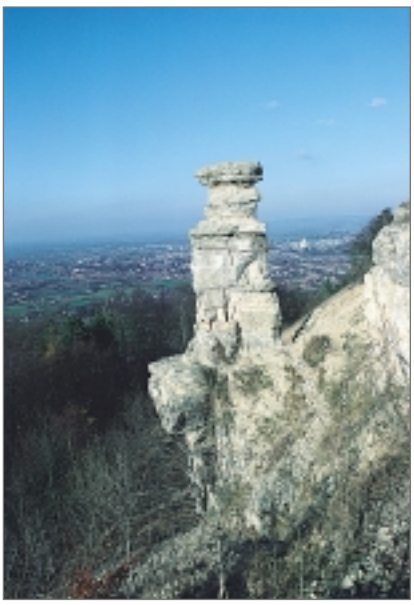
Our ability to exploit the environment for economic gain is beginning to jeopardise our present and future well-being. Since our decisions can have far-reaching effects on present

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



Devil's Chimney, Gloucestershire.
Ruth Briggs/English Nature

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 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 South West 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.

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.

Planning for new developments, projects and programmes should therefore include an awareness of the implications for the wider countryside that extends beyond the boundaries of designated sites and landscapes. In addition to the key issues and objectives listed in the sections which follow, a wide range of species and habitats with targets for protection and enhancement are set out in the document: *Action for biodiversity in the South West: a series of habitat and species plans to guide delivery* [L Cordrey (ed.), RSPB, Exeter 1997].

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

- **Maintain** the integrity of natural landforms.
- **Protect** sites from the threat of landfill and review proposals for aggregate extraction and quarrying with care.
- **Secure** conservation of important sites in working pits and quarries.
- **Assess** and collect data from new and/or temporary sites.

Issue: site management

- **Maintain** and where possible **enhance** the geological resource by:
  - **ensuring** appropriate management of sites, for instance by removing overgrowth;
  - **maintaining** the operation of coastal, fluvial and other natural processes.

Issue: recreation and education

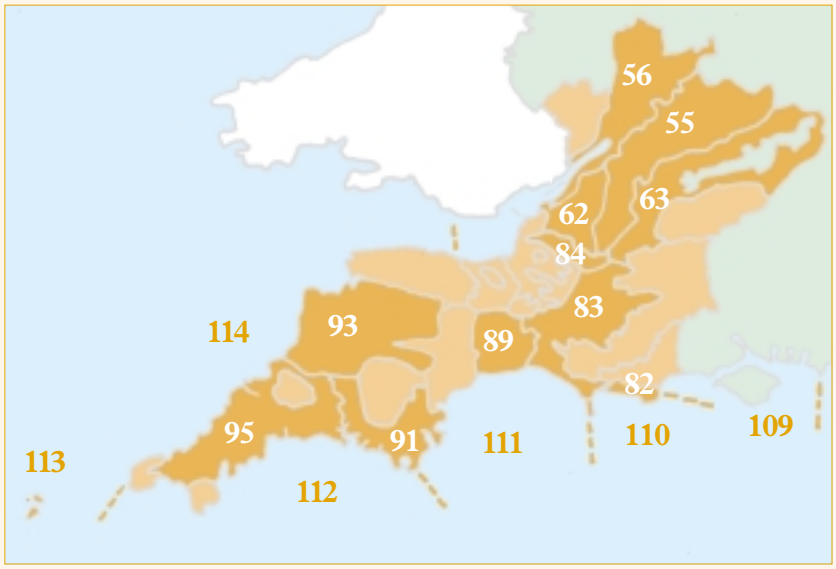
- **Encourage** local caving organisations to be responsible for cave conservation.
- **Avoid** over-use and misuse of sensitive fossil locations.
- **Promote** the geological resource by:
  - **explaining** the influence of geology on local habitats, scenery and economy;
  - site **interpretation** using signboards, leaflets and trail guides;
  - **assessment** and **use** of sites with a high educational value.

The varied geology of the South West Region is outstanding, with superb coastal features, rich mineral deposits and internationally important fossils.

In the Dean Plateau and Wye Valley Carboniferous Coal Measures are surrounded by Carboniferous limestones, siltstone and shales which form prominent scarp features and gorges. Coal Measures also occur under the Bristol, Avon Valley and Ridges and have, until recently, been extensively mined. Ice Age rivers and glacial meltwaters, with river terraces and fossil-rich gravels form the Severn and Avon Vales, cut through the surrounding Devonian sandstones and siltstones and younger limestones and shales to give the area its varied topography.

Kimmeridge Bay, Dorset. Peter Wakely/English Nature

Main Earth heritage features of key Natural Areas



55. Cotswolds

- Cotswolds scarp slope and clay vales
- Limestone exposures in Cotswolds scarp and crest
- Cotswold stone buildings and walls

56. Severn and Avon Vales

- Tremadoc, Llandovery and Wenlock rocks and fossils
- Exposures of Quaternary sediments including river gravels and glacial deposits

62. Bristol, Avon Valleys and Ridges

- Devonian layers and sediments of the Portishead beds, including fossil fish
- Lower Carboniferous layers in the Avon Gorge
- Coal Measure fossil communities including plants, insects and arthropods
- Lower Lias layers and sediments
- Inferior oolite sequences on Dundry Hill
- Fluvioglacial and interglacial Pleistocene/Quaternary gravels

63. Thames and Avon Vales

- Outcrops of Oxford and Kimmeridge Clays in brickpits
- Most northerly deposits of Wealden rocks in Britain
- Upper Jurassic 'Corallian' limestones and fossil remains in classic area
- Most northerly exposures of Portlandian rocks

82. Isles of Portland and Purbeck

- World-famous Jurassic fossils
- Type localities for Kimmeridge Clay, Portland and Purbeck beds
- Key area for Cretaceous and Alpine folding
- Purbeck anticline and 'crumple'
- Holworth House unconformity, Poxwell and Chaldon periclines
- Abbotsbury - Ridgeway Fault zone
- Kimmeridge oilfield
- Candidate basal boundary stratotype sections for Kimmeridgian and Portlandian stages
- Portland stone quarries

83. Wessex Vales

- Jurassic and Cretaceous strata and palaeoenvironments
- Jurassic vertebrate and invertebrate fossils
- Uppermost Jurassic stratigraphy - Portland and Purbeck Beds

84. Mendip Hills

- Triassic-Lower Jurassic fissure fills containing fossilised early reptile and mammal remains
- Cave deposits containing Pleistocene animal and hominid fossils
- Highly fossiliferous Lower Carboniferous marine limestones
- Jurassic hard ground surfaces encrusted with oysters and boring organisms
- Deep gorge and related scenic features, Cheddar and Ebbor Gorges
- Mining grounds of geological, historical and cultural importance

89. Blackdowns

- Penarth and Lias group fossils
- Blackdown Greensand fossils
- Very fossil rich Lower Chalk
- Beer Stone Quarries
- Landslip coast between Lyme Regis and Seaton

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Saddle Tor, Dartmoor, Devon.
Peter Wakely/English Nature

The Cotswolds are dominated by Jurassic yellow limestones which typically form prominent scarps. Middle and Upper Jurassic Oxford and Kimmeridge Clays rich in fossils characterise the Thames and Avon Vales. Ice Age mammal remains occur in sand and river terrace gravels. The Berkshire and Marlborough Downs and South Wessex Downs are dominated by chalk formed during the Upper Cretaceous. Subsequent weathering led to the formation of the distinctive clay-with-flints and hard sandstone silcretes which later broke, forming Sarsen stones.

Gravels, sands, silts and clays underlie the Dorset Heaths giving rise to a mixture of well drained and waterlogged soils over which heathland has developed. Jurassic clays, limestones and sandstones contain the largest onshore oilfield in the UK. Soft cliffs around the Solent and Poole Bay are formed of Tertiary-aged fossil-rich marine clays overlain by unconsolidated gravels. The Isles of Portland and Purbeck are formed of chalk, limestones and clays. A vertical Cretaceous Chalk ridge forms the spine of the Purbeck Hills and a limestone plateau dominates the Isle of Portland. The world-famous cliffs of the South Dorset Coast reveal exceptional exposures of Jurassic and Cretaceous rock layers along with spectacular erosional features such as Lulworth Cove. This area also has one of the most important raised beach sequences on the south coast.

The Mendip Hills are the most southerly Carboniferous limestone upland in Britain. The weathering of the limestone has formed gorges, screes, valleys and caves in which animal and hominid fossils occur. The low-lying fen landscape of the Somerset Levels and Moors is formed by deposits of alluvium, peat and marine clays underlain by Triassic clays. The Mid Somerset Hills consist of late Triassic and early Jurassic mudstone, clays and limestones. The undulating landscape of Exmoor and the Quantocks is formed mainly by Devonian sandstones and slates overlain by blown sand, peats and alluvial deposits. Permo-Triassic pebble-bed conglomerates, breccias and sandstones underlie shales and limestones in the Vale of Taunton giving rise to the low-lying rolling countryside.

Rocks in the Wessex Vales range from Jurassic age. Many of the rock layers dip eastwards and the rolling countryside is produced by clays and limestones with hills capped by Cretaceous Greensand and Chalk.

The Blackdowns is an extensive lowland plateau characterised by a succession of mudstone, greensands and chalk. The Devon Redlands and South Devon Natural Areas were formerly submerged under a sea. Reef development in the Devonian led to the formation of fossil-rich limestones, which are overlain by characteristic red coloured sandstones and mudstones.

The structural geology of the Region is dominated by the Variscan Orogeny - a long period of mountain building which started during the Carboniferous Period and strongly contorted many Devonian strata and led to the emplacement of granites. The hot granite baked the surrounding rocks forming rich mineral ores which became the heart of the Cornish tin and copper mining industry. There are seven main granite outcrops forming a spine running from the west of Dartmoor to the Scilly Isles. These characterise the West Penwith, Cornish Killas and Granites, Bodmin Moor, the Culm and Dartmoor Natural Areas and, where the granite extends out into the sea, the Scilly Isles. Eroded remnants of these granites form the distinctive tors, clitter, boulder fields and acidic soils associated with this Region. The Lizard represents one of Europe's best exposures of rocks derived from the Earth's mantle, including the distinctive spotted rock called Serpentine.

The Start Point to Land's End and Land's End to Minehead maritime Natural Areas are characterised by strongly folded Devonian and Carboniferous slates and sandstones which form many coves and headlands. Coastal processes dominate much of the character of the Dorset coast as seen by the effects of longshore drift at Chesil Beach and the continual landslipping near Lyme Regis and Charmouth.

91. South Devon

- Refolded folds in Start Peninsula
- Coastal sections in Devonian Rocks
- Superb coastal exposures of Variscan thrust structures
- Devonian fossils and pillow lavas
- Coastal platform
- Devonian 'swell' succession at Chudleigh
- Slapton shingle Ridge

93. The Culm

- Coastal exposures of deformed rocks
- Quarry exposures of igneous and sedimentary rocks
- Mineral localities and links with mining heritage
- Coastal geomorphological features

95. Cornish Killas and Granites

- Coastal exposures of deformed 'killas' rocks
- Upland granite masses and associated coastal exposures
- Ancient mineral mines, spoil heaps and links with mining heritage
- Type mineral localities such as Arthurite (Hingston Down Quarry and Consols)

109. Solent and Poole Bay

- Tertiary stratigraphy, palaeoenvironments and palaeontology
- Evolution of the River Solent and Pleistocene environments
- Coastal geomorphological features including Poole Harbour

110. South Dorset Coast

- Internationally important stratigraphic sites
- World-famous fossil locations
- Displays all stages in the formation of caves, arches and stacks
- Portland Bill, a raised beach on the Isle of Portland
- Erosional features of Lulworth Coast

111. Lyme Bay

- Coastal exposures of international importance
- Type localities for vertebrate and invertebrate fossils
- Coastal geomorphological features of international importance
- Coastal landslips of international importance

112. Start Point to Land's End

- Igneous rocks, particularly 'ophiolitic' mantle rocks
- Devonian sediments deformed by the Variscan orogeny
- Mineral sites, particularly related to the granites
- Sea-level change sites; raised beaches and rias

113. Isles of Scilly

- Granite weathering landforms including coastal tors
- Coastal cliff sections showing glacial deposits in the north and head deposits in the south
- Coastal geomorphological features such as beaches, sand bars and tombolos
- Raised beaches or platforms 3-8 m above present sea level

114. Land's End to Minehead

- Devonian sediments and associated fossil fauna, deformed by the Variscan orogeny
- Igneous rocks, particularly around Land's End
- Mineral sites, particularly related to the granites
- Coastal erosion features - arches, stacks, hanging valleys, etc.

Freshwater

Key issues and objectives

Issue: water quality

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

Issue: water quantity

- **Maintain** river levels and flows by:
  - **managing** demand for water;
  - **reducing** abstraction to sustainable levels;
  - **restoring** historic flows.

Issue: lack of or inappropriate management

- **Manage** freshwater and its waterside habitats appropriately by:
  - **re-establishing** natural waterside habitats;
  - **maintenance** and **re-creation** of natural channels by river engineering and flood defence works;
  - **reducing** grazing of waterside margins;
  - **balancing** recreational and wildlife objectives, particularly in canals and lakes.

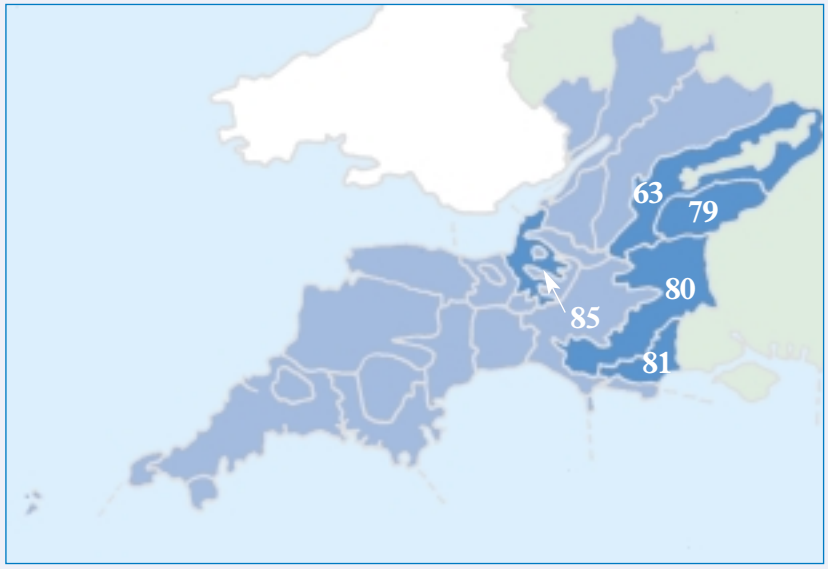
Rivers and streams are an important feature of the South West Region. Seven rivers, namely the Avon, Moors, Frome, Axe, Barle, Wye and De Lank, are the best examples of their type and form part of the national series of river SSSIs.

Chalk rivers feature prominently in some parts of the Region and often have fast-flowing, spring-fed streams in their upper reaches, with sections that dry out in summer known as 'winterbournes'. These winterbournes are characteristic of the Cotswolds, the Berkshire and Marlborough Downs, and the South Wessex Downs. Chalk river SSSIs include the River Avon, which rises in the Berkshire and Marlborough Downs and flows through the South

De Lank River SSSI, Bodmin, Cornwall. Peter Wakely/English Nature

Wessex Downs; the upper reaches of River Kennet and its tributary, the River Lambourn (also in Berkshire and Marlborough Downs); and the River Frome which flows across the Dorset Heaths. Elsewhere in the Region there are a variety of river types including the clay-bottomed rivers of Thames and Avon Vales, the upland rivers and streams of Bodmin Moor, Dartmoor and Exmoor and the Quantocks, and the River Wye, a limestone and sandstone river whose lower reaches flow into the Severn Estuary.

A number of rivers and streams support species that are of international importance. The River Avon and the River Wye are candidate Special Areas of Conservation (SACs) for their water-crowfoot beds and fish species including the bullhead, brook lamprey, sea lamprey and Atlantic salmon. The River Wye is also a candidate SAC for allis shad and twaite shad. There are strong populations of otters in the west of the Region, for example in the Taw, Torridge and Tamar river valleys



Characteristic habitats of key Natural Areas

63. Thames and Avon Vales

- Many clay-bottomed rivers, most forming tributaries of the Thames
- Canals, including the Kennet and Avon
- Extensive marl lake systems
- Extensive ditch systems

79. Berkshire and Marlborough Downs

- Rivers and streams including *chalk rivers*
- Canal habitat: the Kennet and Avon Canal
- Ponds

80. South Wessex Downs

- *Chalk rivers*, including the River Avon and River Frome
- Some temporary pools

81. Dorset Heaths

- Significant rivers, including the *chalk rivers* of the Frome and Piddle
- Many flooded ball clay lakes
- Important floodplain and riverside habitats
- Ponds

85. Somerset Levels and Moors

- River systems, e.g. Parrett, Yeo
- Extensive ditch systems
- Lakes, pools and ponds

NB Priority BAP habitats in italics

Candidate Special Areas of Conservation

- Dorset Heaths (Purbeck and Wareham) and Studland Dunes (Dorset Heaths)
- Dorset Heaths (Dorset Heaths)
- East Devon Pebblebed Heaths (Devon Redlands)
- River Avon (South Wessex Downs; Berkshire and Marlborough Downs)
- River Camel (Cornish Killas and Granites)
- River Wye/Afon Gwy (Dean Plateau and Wye Valley; plus Central Herefordshire in the West Midlands Region and parts in Wales)
- The Lizard (The Lizard)

Special Protection Areas

- Chew Valley Lake (Bristol, Avon Valleys and Ridges)

River Frome SSSI, Dorset. Peter Wakely/English Nature

within The Culm. The River Camel in the Cornish Killas and Granites is a candidate SAC for the otter. Other BAP species present in the Region include the water vole, the white-clawed crayfish, which can still be found in a number of rivers and streams in the easternmost parts of the Region, and the freshwater pearl mussel, which occurs in The Culm.

Many of the large open water bodies in the Region are man-made, such as the reservoirs in the Mendip Hills and the Bristol, Avon Valleys and Ridges. Many such areas are important for waterfowl, such as Chew Valley Lake which is a Special Protection Area (SPA) for its large populations of gadwall, shoveler, teal and tufted duck. The large complex of flooded gravel pits that form the marl lakes of the Cotswolds Water Park in Thames and Avon Vales support a diverse range of aquatic plants, including the BAP species lesser bearded stonewort, and is rich in invertebrates. In the Severn and Avon Vales most pools result from industrial activity, such as brine pumping, or were created as ornamental lakes. One of these lakes is the only known site for the BAP species ribbon-leaved water-plantain; others are eutrophic standing waters used by breeding and wintering wildfowl and waders. In the Devon Redlands, West Penwith and Dartmoor, natural lakes and pools are scarce and reservoirs and flooded pools resulting from china clay extraction are the only large water bodies.

Slapton Ley in South Devon was once a saltwater lagoon, but has gradually become freshwater. This eutrophic lake supports a diverse and abundant aquatic flora including

Slapton Ley NNR, South Devon. Peter Wakely/English Nature

the rare convergent stonewort and the only British population of the strapwort. Slapton Ley is also important for invertebrate fauna and for passage and breeding birds such as reed bunting, a BAP species.

A number of the floodplain grasslands in the Region are drained by ditches which are often important for their aquatic flora and fauna. An extensive network of ditches, or 'rhynes', are a strong feature of the Somerset Levels and Moors. Here the BAP species lesser silver diving beetle and shining ramshorn snail are found. Ditches are also significant features in the floodplains of the Severn and Avon Vales and the Thames and Avon Vales.

The Lizard has some unusual pools and ponds including a unique series that supports both rare stoneworts that grow more often in calcareous lakes, and species associated with acid conditions, such as bog pondweed. There is also a series of temporary ponds, which dry out in the summer and support rare species such as land quillwort and dwarf rush. The Lizard is a candidate SAC for these habitats.

The flushes, pools and ponds across the Region support a number of BAP species. The reed beetle *Donacia bicolora* occurs in ponds on the Dorset Heaths and the medicinal leech is found in the Blackdowns and Dorset Heaths. The Region is a major stronghold for the southern damselfly and three candidate SACs for this species occur within wet heaths here. Good populations of the great-crested newt are present across much of the Region, but the species is uncommon in the more westerly parts.

Inland rock

Key issues and objectives

Issue: site protection

- **Avoid** extensive use of stone and scree for creating new footpaths and walls.
- **Minimise** damage to sites during safety works by liaising with maintenance workers.
- **Protect** bat sites from disturbance through use of grills.

Issue: recreation

- **Control** rock and boulder climbing 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 to benefit the vegetation without damaging the clitter and scree.

Issue: public awareness

- **Develop** interpretation of Sarsen stones and important rock outcrops to raise awareness of their geological and nature conservation importance.

The Avon Gorge in the Bristol, Avon Valleys and Ridges is an outstanding inland rock feature where Carboniferous Limestone is exposed both naturally and by quarry workings. This creates a habitat for many rare plants such as the Bristol rock-cress which is unique to the site, round-headed leek, at its only mainland location, and grasses such as compact brome and nit-grass. The gorge forms part of a National Nature Reserve. In the Dean Plateau and Wye Valley, ledges and steep slopes of Carboniferous Limestone are a refuge for sedges and mosses, the most notable site being the Wye Valley Gorge.

Granite tors and their surrounding clitter are a distinctive feature of Dartmoor, Bodmin Moor and, to a lesser extent, Exmoor and the Quantocks. Formed as the granite erodes, they are found on summits, valley sides and in particular on the edges of the Dartmoor plateau. Eventually the clitter disintegrates to form gravel, known locally as growan, which is the basis for many soil types in the area. The tors are regionally important for their lichen communities and ferns, including some rare species such as the forked spleenwort and lanceolate spleenwort. The wheatear and ring ouzel are associated with this habitat. The peregrine falcon, dependent on secluded edges for nesting, is found on both the limestone and granite outcrops across the Region.

There are good examples of scree slopes in the north west of Exmoor and the Quantocks. Where these are stable an unusual vegetation develops, characterised by English stonecrop, with mosses and *Cladonia* lichens.

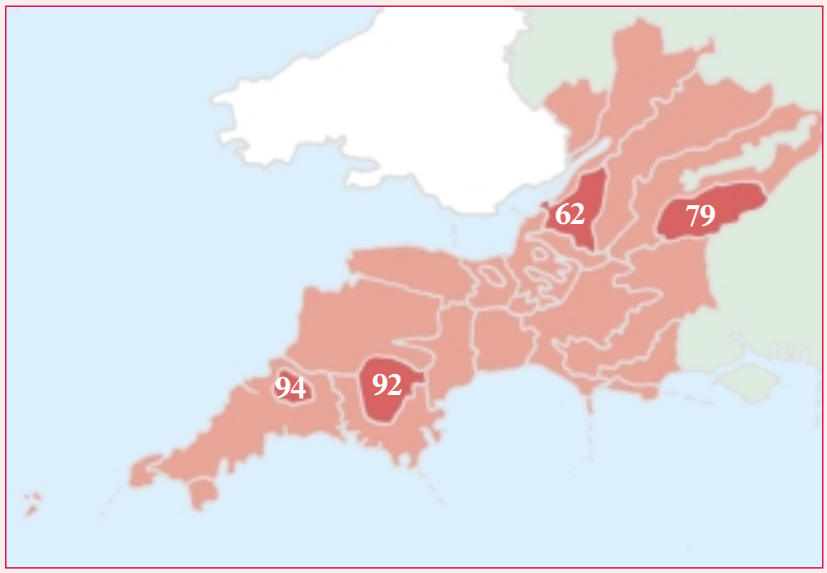
The world famous 'Sarsen' stones in the Berkshire and Marlborough Downs are formed of sandstone and provide one of the few natural exposures of hard, acidic rock in lowland Britain. They support a diverse relict lower plant flora, some of which have developed over several centuries. Many unusual lichens are present including *Buellia saxorum*

Avon Gorge NNR, Bristol. Peter Wakely/English Nature

which is found only on Sarsen stones and notable mosses including the nationally scarce *Grimmia laevigata* and *Grimmia decipiens* which is also restricted to Sarsen stones.

The many caves and disused mines in the Region are valuable hibernating places for bats, notably the BAP species Bechstein's, barbastelle, greater and lesser horseshoe bats. Beer Quarry and Caves in the Devon Redlands, Chilmark Quarries in the South Wessex Downs, Bath and Bradford-on-Avon Bats in The Cotswolds and Wye Valley and Forest of Dean Bat Sites in the Dean Plateau and Wye Valley are candidate SACs because of the bats that hibernate or roost there.

Caves and disused mines are also valuable for mosses and liverworts. The western rustwort is a very rare liverwort that colonises crumbling granite and china clay. In Britain it is found at a very small number of sites, including Lower Bostraze and Leswidden and Tregonning Hill, both of which are candidate SACs in the Cornish Killas and Granites. The priority BAP species Cornish path moss is restricted to two sites on disused mines in Bodmin Moor and is found nowhere else in the world.



Sarsen stones at Fyfield Down NNR, Wiltshire.
Peter Wakely/English Nature

Candidate Special Areas of Conservation

- Bath and Bradford-on-Avon Bats (Cotswolds)
- Beer Quarry and Caves (Devon Redlands)
- Chilmark Quarries (South Wessex Downs)
- Lower Bostraze and Leswidden (Cornish Killas and Granites)
- Tregonning Hill (Cornish Killas and Granites)
- Wye Valley and Forest of Dean Bat Sites (Dean Plateau and Wye Valley; plus part of site in Wales)

Special Protection Areas

None

Characteristic habitats of key Natural Areas

62. Bristol, Avon Valleys and Ridges

- Outstanding Carboniferous outcrops in the Avon Gorge

79. Berkshire and Marlborough Downs

- Highest concentration of Sarsen stones in England at Fyfield Down and Piggledene

92. Dartmoor

- Extensive rocky outcrops, including tors, clitter slopes and quarries

94. Bodmin Moor

- Extensive granite outcrops including tors, clitter slopes
- Disused mining areas

NB Priority BAP habitats in italics

Bog, fen and swamp

Key issues and objectives

Issue: loss of habitat

- **Re-establish** bog, fen and swamp habitat by:
  - **restoring** the water levels, particularly to damaged bogs, to enable peat formation;
  - **creating** large, wet reedbeds;
  - **removing** encroaching trees and scrub;
  - **restoring** grazing to neglected fens.

Issue: inappropriate management

- **Manage** existing bog habitats by **reducing** burning on blanket bogs.

Issue: water

- **Enhance** hydrology and water quality through:
  - **control** of land drainage and prevention of pollution;
  - sustainable **management** of water abstraction.

Bog, fen and swamp are an important range of habitats that are well represented across the South West Region.

Blanket bogs are characterised by *Sphagnum* mosses, cottongrasses, sedges and dwarf shrubs such as heather and cross-leaved heath. Dartmoor is a candidate Special Area of Conservation (SAC) for its extensive areas of blanket bog, which form a mosaic with wet heathland. These moors have breeding populations of golden plover and dunlin. Small areas of blanket bog are also found on Exmoor.

Lowland raised bogs are one of Europe's rarest and most threatened habitats. Tor Royal Bog on Dartmoor is almost intact hydrologically, and is part of the Dartmoor candidate SAC. The only other raised bogs remaining in the Region, whilst valuable, are no longer intact. These are scattered across a large number of sites in the Somerset Levels and Moors.

Valley mires are wet boggy areas, usually found along stream and river lines or springs. They are an immensely valuable habitat for a diverse range of species and provide resting and feeding places within the moorland habitat mosaic. Dartmoor, Bodmin Moor, Exmoor and the Quantocks and Cornish Killas and Granite have an important range of valley mires. There are other areas of mire in Blackdowns, the Lizard, Isles of Portland and Purbeck, the Scilly Isles and Wessex Vales.

Pioneer communities on humid, exposed peat are a feature of the Dorset Heaths valley mires and wet flushes. The habitat is usually open and characterised by algal mats with nationally scarce species such as brown beak-sedge, great sundew and bog orchid. Two sites in the Region are candidate SACs, the Dorset Heaths and the Dorset Heaths (Purbeck and Wareham) and Studland Dunes for this habitat.

Bog bean at Blackslade Mire SSSI, Devon.
Peter Wakely/English Nature

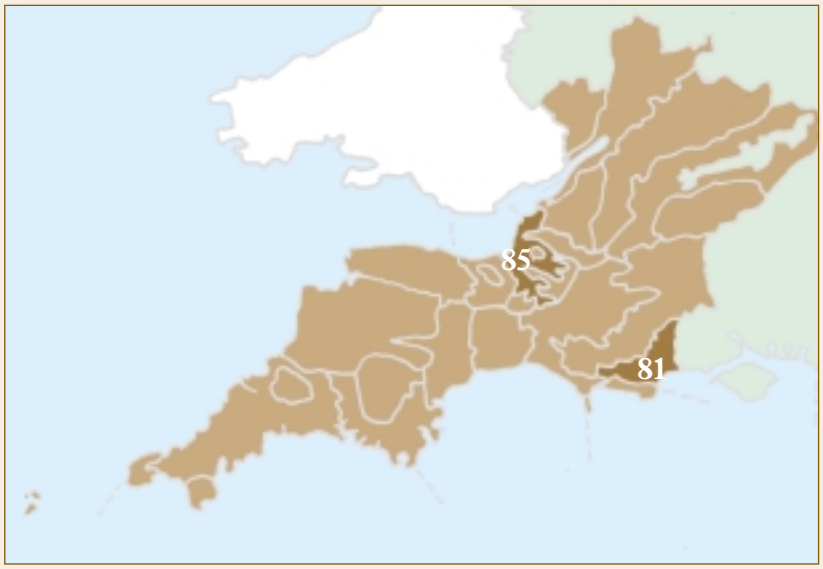
The purple moor-grass and rush pasture habitat, sometimes referred to as Rhôs pasture, occurs in good quantity on the Culm in Devon and Cornwall where it is known as Culm grassland. There are also considerable areas on Dartmoor, and some on the Blackdowns, and Exmoor and the Quantocks. Characteristic plants of Culm grassland include meadow thistle, devil's-bit scabious and various orchids and sedges. Some of the largest sites in the Culm Natural Area form a candidate SAC, both for their purple moor-grass and rush pasture and for marsh fritillary, a priority BAP butterfly with a major stronghold on this habitat in Devon.

Fen meadow is a vulnerable habitat and one of the largest areas remaining in England is found on the Somerset Levels and Moors.

This is very species-rich, with sedges, southern marsh-orchid and marsh arrowgrass. A good example of species-rich fen meadow on chalk and clay is found at Holme Moor and Clean Moor, a candidate SAC in the Vale of Taunton and the Quantock Fringes. This site has calcareous fens with the rare great fen-sedge. Fen meadow is an important part of the Culm grassland mosaic. Extensive populations of the Desmoulin's whorl snail, a BAP priority species, are found on reed sweet-grass swamp and tall sedges in the Kennet and Lambourn Floodplain, in the Berkshire and Marlborough Downs and the wetlands of the River Avon in the South Wessex Downs and Berkshire and Marlborough Downs. Both of these sites are candidate SACs. Smaller areas of fen meadow occur across the Bristol Avon Valleys and Ridges, Dorset Heaths, Wessex Vales, Vale of Taunton, Blackdowns and Exmoor and the Quantocks.

Reedbeds are found along the River Exe in the Devon Redlands, at Slapton Ley in South Devon, in Poole Harbour, at the edges of lakes and ponds in the Severn and Avon Vales, along the coast of the Wessex Vales and on the Lizard. The Scilly Isles have small reedbeds fringing the pools on Tresco, adding to the wildlife value of the islands. Elsewhere in the Region, reedbeds are scarce but new areas are being created in the Somerset Levels and Moors on old peat workings.

The many invertebrates and plants associated with bog, fen and swamp communities in the Region include the BAP priority species prickly sedge, large marsh grasshopper, argent and sable moth and narrow-bordered bee hawk moth.



Eblake Bog SSSI, Dorset.
Peter Wakely/English Nature

Characteristic habitats of key Natural Areas

81. Dorset Heaths

- *Fen* communities including rare examples of valley mire
- Significant areas of *reedbed*

85. Somerset Levels and Moors

- Large areas of species-rich *fen meadow* of outstanding importance
- Small remnants of *fen*
- Important areas of degraded *lowland raised bog*
- Increasing amounts of *reedbed*

NB Priority BAP habitats in italics

Candidate Special Areas of Conservation

- Culm Grasslands (The Culm)
- Dartmoor (Dartmoor)
- Dorset Heaths (Dorset Heaths)
- Dorset Heaths [Purbeck & Wareham] and Studland Dunes (Dorset Heaths)
- East Devon Pebblebed Heaths (Devon Redlands)
- Holme Moor and Clean Moor (Vale of Taunton and the Quantock Fringes)
- Kennet and Lambourn Floodplain (Berkshire and Marlborough Downs; plus London Basin in London and the South East Region)
- River Avon (South Wessex Downs; Berkshire and Marlborough Downs)

Special Protection Areas

- Somerset Levels and Moors (Somerset Levels and Moors)

Woodland

Key issues and objectives

Issue: loss of habitat

- **Create** new broadleaved woodland around existing blocks and **link** small fragments, for example along river corridors.
- **Promote** the Forestry Commission Woodland Grants Scheme.
- **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** and **promote** sustainable management of broadleaved woodland through:
  - **changes** to forestry and farming regimes;
  - **control** of grazing animals, particularly deer;
  - **promotion** of local markets for local wood products (e.g. charcoal).
- **Promote** recreational activities which are sensitive to nature conservation objectives.

Issue: loss and neglect of hedges

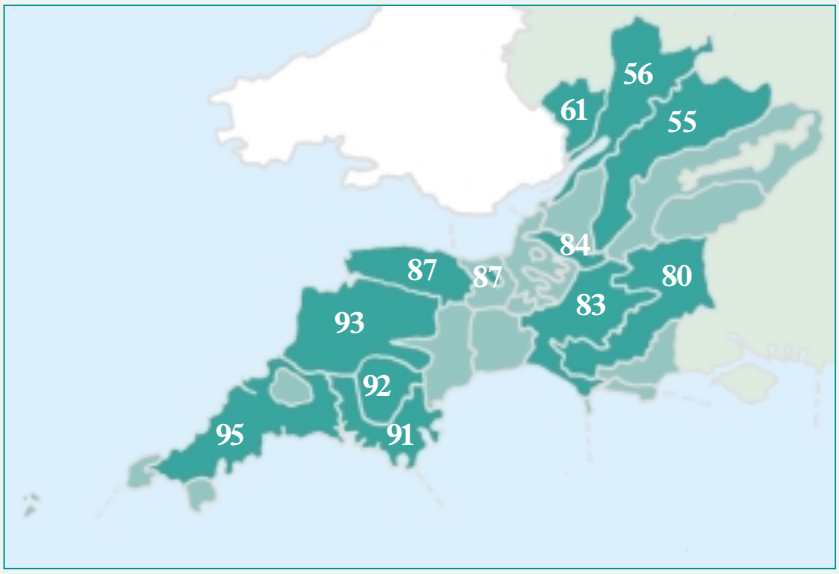
- **Protect** existing hedgerows using legislation.
- **Restore** and **re-establish** hedgerow boundaries to **link** existing fragments using locally native species.

The woodland of the South West Region is very diverse, both in age and type. Ancient woodland survives on land which was difficult to clear and cultivate, such as valley sides, or where woodland was part of the local economy (for example making furniture and hurdles). There is significant ancient semi-natural woodland in the Region, particularly in the Cotswolds, Dean Plateau and Wye Valley and the Bristol, Avon Valleys and Ridges. The dormouse, a BAP species associated with large ancient woodlands, is found throughout the more wooded areas of the Region.

The Mendip Woodlands in the Mendip Hills, the Avon Gorge Woodlands in the Bristol, Avon

Cotswold Commons and Beechwoods NNR, Gloucestershire. Peter Wakely/English Nature

Characteristic habitats of key Natural Areas



55. Cotswolds

- Internationally important *lowland beech and yew woodland* on scarp slopes and in valleys
- Well distributed, significant lowland oak and mixed deciduous wood
- Characteristic *lowland wood pasture and parkland*
- Some large blocks of conifer plantation

56. Severn and Avon Vales

- Some areas of lowland oak and mixed deciduous wood
- Some *wet woodland* in the river valleys
- Several areas of *lowland wood pasture and parkland*

61. Dean Plateau and Wye Valley

- Extensive areas of lowland oak and mixed deciduous woodland
- Significant stands of *lowland beech and yew woodland*
- Widespread *lowland wood pasture and parkland*
- Some *wet woodland* in the river valleys
- *Upland mixed ash* and *upland oak wood*

80. South Wessex Downs

- Important lowland oak and mixed deciduous woodland with yew
- Some *lowland wood pasture and parkland*
- Small areas of *lowland beech and yew woodland*

83. Wessex Vales

- Frequent small areas of lowland oak and mixed deciduous wood, particularly coppice
- Extensive *wet woodland* along stream valleys
- Scarce but important *lowland wood pasture and parkland*

84. Mendip Hills

- *Upland mixed ash woodland*

87. Exmoor and the Quantocks

- Internationally important *lowland wood pasture and parkland*
- Extensive *upland oak woodland*
- Extensive areas of conifer plantations
- Restricted areas of *upland ash* and *wet woodland*

91. South Devon

- Some extensive areas of lowland oak and mixed deciduous wood
- *Wet woodland* with grey willow

92. Dartmoor

- Internationally important *upland oak woodland* and some *upland ash woodland*
- Frequent *wet woodland* on waterlogged ground
- Important *lowland wood pasture and parkland*, e.g. Whiddon Deer Park

93. The Culm

- Important *upland oak woodland*, particularly along the coast
- Frequent, usually small, *wet woodland*
- Extensive conifer plantations

95. Cornish Killas and Granite

- A key area for *wet woodland*
- Good examples of *lowland wood pasture and parkland*
- Scattered areas of lowland oak and mixed deciduous wood
- Oak woodland along the Fal and Helford Estuaries

NB Priority BAP habitats in italics

Valleys and Ridges and the Wye Valley Woodlands in the Dean Plateau and Wye Valley are candidate Special Areas of Conservation (SAC) for lime-ash ravine forest. This habitat is found on steep, rocky slopes and screes of gorges and is dominated by ash with wych elm, lime and sycamore. The Mendip Woodlands site is a cluster of relatively extensive ash-dominated woodland on limestone, mixed with either elm or small-leaved lime. A rich variety of other trees and shrubs are present and the site holds a large population of dormouse. The Avon Gorge Woodlands are important for their high concentration of small-leaved lime and rare whitebeams, including two which are unique to the Avon Gorge. Small groves of yew occur on stonier locations. The Wye Valley Woodlands are important for their diversity of woodland types including beechwood and yew groves, for which they are also a candidate SAC, and stands of rare whitebeams. Great Yews in the South Wessex Downs is a candidate SAC for yew woodland.

Beech woodland is relatively widespread along chalk and limestone hillsides in southern England and a particularly extensive and species-rich example is found at the Cotswold Beechwoods candidate SAC in the Cotswolds.

Both upland ash and upland oak woodland are found in the Region, most notably on Exmoor and the Quantocks and Dartmoor. The South Dartmoor Woods are a candidate SAC for their old upland oak woods, which show the transition to lowland mixed woodland with small-leaved lime. The BAP species blue ground beetle is found in upland oak woodland on Dartmoor and the Cornish Killas and Granites. Redstarts and pied flycatchers are characteristic birds of upland oak woods in the Region.

Wet woodland characterised by alder, grey willow and, sometimes, unusual species such as bird cherry, is a feature of many rivers, streams and lake margins throughout the Region, particularly the Cornish Killas and Granites.

Lowland wood pasture and parkland is often a relict of mediaeval deer parks or more recent enclosure. The lichen-rich veteran trees of England are internationally important and these, along with younger trees and dead wood, provide a habitat for rare and specialised invertebrates, birds, fungi and mosses. BAP species include the stag beetle and Devil's bolete fungus. Significant areas of parkland occur in the Wessex Vales, Exmoor and the Quantocks, Cotswolds, Dean Plateau and Wye Valley and the Severn and Avon Vales and, to a lesser extent, in the South Wessex Downs, Dorset Heaths, Isles of Portland and Purbeck, Dartmoor and the Devon Redlands.

Extensive areas of conifer plantation are present in some parts of the Region, particularly the Dean Plateau and Wye Valley, Wessex Vales, Dorset Heaths and at Savernake Forest in the Berkshire and Marlborough Downs. Where conifers are established on ancient sites and associated with areas of broadleaved woodland, the restoration to broadleaves should be a priority, but where planted on heathland sites, re-establishment of heathland is the priority.

Scrub is an important part of the woodland mosaic, in particular juniper scrub which is a rare habitat on the southern edge of its range. The best remaining example of lowland juniper scrub on chalk is found among chalk grassland and heath on the Salisbury Plain

Great Yews SSSI, Wiltshire. Peter Wakely/English Nature

Gidleigh Glen, Devon. Derek Ratcliffe/English Nature

candidate SAC in the South Wessex Downs. Mixed scrub around woods and copses supports many farmland and woodland species.

Hedgerows have been identified as a significant feature across the whole Region with the exception of the larger upland commons, the Mendip Hills and Somerset Levels and Moors. Ancient and species-rich hedges which adjoin or link other semi-natural habitats have the highest nature conservation value. Hedges in the Region often have the character of woodland with hazel and bluebells in the understorey. Many species depend upon hedgerows for shelter and food, in particular bats, dormice and the linnet, bullfinch, tree sparrow and song thrush, all of which are BAP species. The Blackdowns and Wessex Vales is one of the most important Natural Areas for species-rich ancient hedgerows in the country. The hedgerows of the Isles of Scilly are one of the few places in Britain that have healthy stands of elm. The dense network of hedges has enabled an unusually high population of song thrushes to thrive.

Candidate Special Areas of Conservation

- Avon Gorge Woodlands (Bristol, Avon Valleys and Ridges)
- Bath and Bradford-on-Avon Bats (Bristol, Avon Valleys and Ridges)
- Cotswold Beechwoods (Cotswolds)
- Great Yews (South Wessex Downs)
- Mells Valley (Mendip Hills)
- Mendip Woodlands (Mendip Hills)
- North Somerset and Mendip Bats (Mendip Hills)
- Salisbury Plain (South Wessex Downs)
- South Hams (South Devon)
- South Dartmoor Woods (Dartmoor)
- Wye Valley Woodlands (Dean Plateau and Wye Valley)

Special Protection Areas

None

The South West Region is a stronghold for the greater and lesser horseshoe bats. Both are BAP species which rely on woodland and parkland for feeding, and need buildings close by for maternity roosts and underground locations for hibernation. There are large populations at South Hams in South Devon which has the largest maternity roost in England and possibly Europe. The Bath and Bradford-on-Avon Bats candidate SAC in the Bristol Avon Valley and Ridges, the North Somerset and Mendip Bats and Mells Valley candidate SACs in the Mendip Hills have exceptional breeding populations of both species. There are regular records from South Devon of the much rarer barbastelle bat and less frequent records from the Cornish Killas and Granites and Vale of Taunton and Quantock Fringes. Bechstein's bat is also rare and occurs in the east of the Region. These are both BAP species associated with mature deciduous woodland.

Other BAP species found throughout the Region include the high brown fritillary and pearl-bordered fritillary butterflies, and numerous moths of which the double line moth and waved carpet moth are particularly widespread. All benefit from open glades and rides within the woodland. The rare true fox-sedge is found in the Severn and Avon Vales.

Lowland grassland and heath

Key issues and objectives

Issue: lack of appropriate management

- **Promote** appropriate management through:
  - extensive, low-intensity **grazing** on grasslands and heaths;
  - controlled **scrub clearance** on heaths and chalk downland.

Issue: pressure for agricultural intensification

- **Avoid** further agricultural intensification by:
  - **encouraging** traditional, low-intensity agriculture;
  - **promoting** the uptake of agri-environment incentive schemes and organic systems where changes in farming practice would benefit wildlife;
  - **creating** cereal field margins to halt decline in arable plant species;
  - **reducing** use of fertilisers and pesticides.

Issue: opportunities for habitat creation

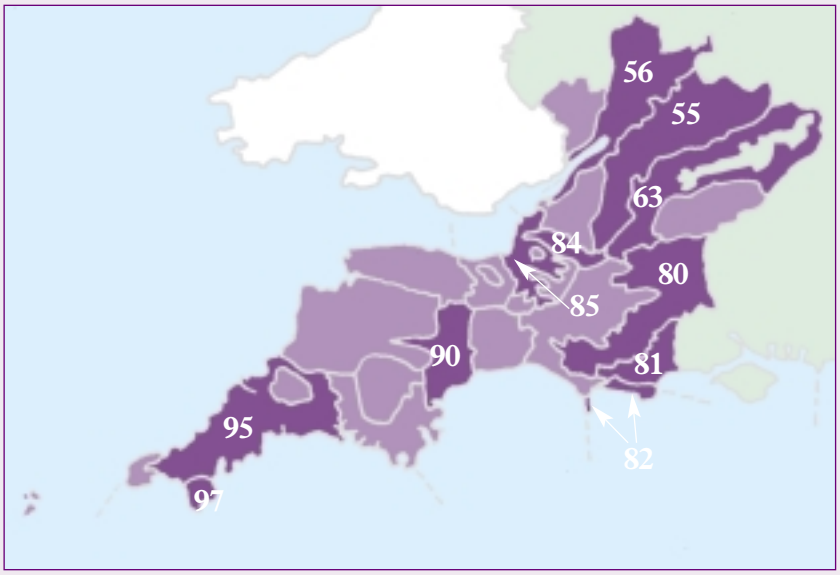
- **Create** or **restore** grassland and heaths from farmland, plantations and secondary woodland, particularly to **link** existing fragments and **increase** patch sizes.

The South West Region contains large areas of lowland calcareous grassland, whose quality is reflected in the high number of candidate Special Areas of Conservation (SACs). Salisbury Plain in the South Wessex Downs is the largest surviving continuous area of chalk grassland in the country; other remaining chalk grasslands are mostly small and isolated. Elsewhere there are notable chalk grasslands in the Berkshire and Marlborough Downs and in the Isles of Portland and Purbeck. The most significant areas of limestone grassland in the Region are in the Cotswolds, the Mendip Hills and in South Devon, which each support nationally scarce or rare grassland types. Limestone grasslands are also found in a number of other Natural Areas, including the Dean Plateau and Wye Valley, the Bristol, Avon Valley and Ridges, the Isles of Portland and Purbeck, and the Mid Somerset Hills.

Calcareous grassland is one of the richest plant habitats in Britain. The early gentian, a BAP species that is endemic to England, is among the many rare and scarce species present in the Region. It has large populations within the Berkshire and Marlborough Downs, South Wessex Downs, the Isles of Portland and Purbeck and Cornish Killas and Granites. Several sites are candidate SACs for this species. The Region also contains a large proportion of the British population of the scarce chalk milkwort. The Isles of Portland and Purbeck is notable in supporting the largest British population of early spider orchid. Chalk and limestone grasslands are also rich in invertebrates. BAP species in the Region include the chalk carpet moth, silky wave moth, Adonis blue butterfly, shrill carder bee, the brown-banded carder bee and the large blue butterfly, which has been successfully reintroduced in some areas. The chalk grasslands of Salisbury Plain and Porton Down in South Wessex Downs support a relatively large proportion of the breeding population of stone curlew, a priority BAP species.

Holt Heath NNR, Dorset. Peter Wakely/English Nature

Characteristic habitats of key Natural Areas



55. Cotswolds

- Nationally significant *lowland calcareous grassland* (on limestone)
- Neutral grassland including species-rich meadows and pasture on lower slopes
- Remnant wet grasslands along river valleys

56. Severn and Avon Vales

- Unimproved neutral grasslands, especially old meadows and pasture
- Areas of *lowland hay meadows*
- Small areas of *lowland heathland*

63. Thames and Avon Vales

- Wet neutral grasslands in river valleys
- Significant dry neutral grasslands including mostly small *lowland hay meadows*

80. South Wessex Downs

- Extensive *lowland calcareous grasslands* (on chalk)
- Significant areas of *floodplain grazing marsh*, particularly the water meadows of the River Avon and tributaries
- Small areas of lowland heathland

81. Dorset Heaths

- Outstanding areas of *lowland heath*
- Nationally important *acid grassland*
- Significant areas of *floodplain grazing marsh*
- Small, isolated areas of dry neutral grassland

82. Isles of Portland and Purbeck

- Considerable *lowland calcareous grassland* on chalk and limestone
- Small areas of acid grassland on sandstones
- Small area of chalk heath

84. Mendip Hills

- *Lowland calcareous grassland* including nationally rare limestone types and chalk types
- Few large areas of dry neutral grassland

85. Somerset Levels and Moors

- Largest area of lowland wet grassland in England including extensive *floodplain grazing marsh*
- Small areas of dry neutral grassland

90. Devon Redlands

- Outstanding *lowland heath*
- Small areas of dry neutral grassland
- *Floodplain grazing marsh* along Exe Estuary and river valleys

95. Cornish Killas and Granite

- Some *lowland heathland*, particularly coastal heath
- Small areas of dry neutral grassland on steep valley sides
- Areas of coastal *parched (dry) acid grassland*

97. The Lizard

- Outstanding *lowland heath*
- Unimproved neutral grassland on the cliff tops
- Small areas of *lowland dry acid grassland* and *lowland calcareous grassland*
- Good examples of dry coastal heath

NB Priority BAP habitats in italics

Nationally important acid grasslands occur in the Dorset Heaths, where they are associated with heathland vegetation. Other areas of acid grassland occur across the Region, including the Devon Redlands, the Bristol Avon Valleys and Ridges, Wessex Vales, in the Dean Plateau and Wye Valley and in the Thames and Avon Vales. In the Mendip Hills and in the Isles of Portland and Purbeck acid grassland is unusually associated with limestone overlain by superficial deposits of sands and gravels. The coast and cliffs of Exmoor and the Quantocks also have notable areas of acid grassland.

Neutral grasslands are a characteristic feature in some parts and small areas of dry neutral grasslands occur in many parts of the Region, for example in Bristol, Avon Valley and Ridges, the Vale of Taunton and the Quantock Fringes, and the Devon Redlands. There are notable old meadows in the Thames and Avon Vales, Wessex Vales and the Cotswolds, and those in the Severn and Avon Vales and Dean Plateau and Wye Valley feature wild daffodils. Lowland hay meadows are a species-rich and scarce habitat. They are scattered throughout the Region, particularly the Somerset Levels and Moors and in the Thames and Avon Vales which includes North Meadow and Clattinger Farm, a candidate SAC. A very high proportion of the British population of fritillary is found here.

There are large areas of wet neutral grassland in the Region, including numerous grazing marshes, wet meadows and pastures along floodplains and river valleys. Those associated with river systems in the Severn and Avon Vales, the Thames and Avon Vales and along the floodplains of the Exe Estuary and

Early purple orchid. Peter Wakely/English Nature

other river valleys in the Devon Redlands are particularly significant. Smaller amounts of wet grassland are found in the river valleys of the Dorset Heaths, and along the Kennet and Lambourn floodplains in the Berkshire and Marlborough Downs. Dartmoor and Exmoor and the Quantocks have wet grasslands that merge into 'Culm' grasslands, a habitat dealt with under bog, fen and swamp.

Wet grasslands have a distinctive vegetation that can withstand being waterlogged and those of the Thames and Avon Vales are notable for the only colony of creeping marshwort in Britain. The invertebrate fauna is also significant and the wet grasslands of the Region are a major stronghold for the marsh fritillary butterfly, a BAP species. Three sites here are candidate SACs for this species. Many of the wet grasslands also support breeding and wintering birds, such as Bewick's swans and teal. Sites such as Walmore Common in the Severn and Avon Vales and the Somerset Levels and Moors are designated as a Special Protection Area (SPA) for the internationally important numbers of birds they support.

Cereal field margins are an important feature of arable land in the Region. In some parts, particularly the Cornish Killas and Granites and the South Wessex Downs, they are reasonably species-rich and support BAP plant species such as pennyroyal, perfoliate penny-cress, cornflower, shepherd's-needle and broad-fruited cornsalad. Owing to the regular cycle of cultivation the bulb fields of the Isles of Scilly support many rare arable plants including the western ramping-fumitory, which occurs in Cornwall and the Isles of Scilly, and purple ramping-fumitory. A number of BAP birds are associated with farmland and grasslands in the Region including the grey partridge, skylark, turtle dove and tree sparrow. The cirl bunting, a rare BAP species, occurs only in the South West Region where it is associated with the lowland farmland of South Devon and along the coastal fringe of the Devon Redlands. The brown hare occurs on farmland in many areas in the Region.

There are large areas of lowland heath in the Region that form a number of candidate SACs. Extensive areas of dry heath, dominated by heather, bell heather and gorses, and wet heath with cross-leaved heath, occur in the Dorset Heaths, Devon Redlands and Cornish Killas and Granite, with smaller but notable areas in Exmoor and the Quantocks, the Vale of Taunton and the Quantock Fringes, Blackdowns, and The Culm. Fragments of lowland heathland also occur in many other Natural Areas in the Region. A rare form of wet heath, characterised by Dorset heath *Erica*

ciliaris, is confined to the Region where it occurs mostly in the Dorset Heaths Natural Area, with fragments in the Cornish Killas and Granites.

The Lizard has a unique type of heathland that found nowhere else in Britain. Dominated by Cornish heath *Erica vagans*, the heathland here contains an unusual mixture of species typical of both acid and basic soils. The vegetation ranges from cliff-top heath, rich in maritime species such as spring squill, to more inland heaths with bristle bent and the nationally rare liverwort, Lizard crystalwort. The Lizard is a candidate SAC for this heathland type. Other heathland with a maritime influence occurs in the Scilly Isles, where the heaths are rich in lichens, and in The Culm, where small areas of maritime heath and wet heath merge into 'Culm' grassland.

The heathlands support a number of rare and uncommon species including the marsh gentian, which mainly occurs in the wet heathland of the Dorset Heaths. Heathlands are valuable habitats for invertebrates such as the dune tiger beetle and the rare narrow-headed ant, both BAP species. The Dorset Heaths are an important area for the smooth snake, and are also the main stronghold in Britain for the sand lizard, a priority BAP species. Natural populations of sand lizards are present on the Dorset Heaths, and populations have been re-introduced to the Cornish Killas and Granites and Devon Redlands. The extensive heathlands of the Dorset Heaths and Devon Redlands hold important populations of characteristic heathland birds, such as nightjar, woodlark and the rare Dartford warbler. The Dorset Heathlands are a SPA for these species and for wintering hen harrier and merlin.

Carrine Common, Cornwall. Peter Wakely/English Nature

Candidate Special Areas of Conservation

- Carrine Common (Cornish Killas and Granites)
- Culm Grasslands (The Culm)
- Dorset Heaths (Dorset Heaths)
- Dorset Heaths [Purbeck and Wareham] and Studland Dunes (Dorset Heaths)
- East Devon Pebblebed Heaths (Devon Redlands)
- Fontmell and Melbury Downs (South Wessex Downs)
- Godrevy Head to St Agnes (Cornish Killas and Granites)
- Isle of Portland and Studland Cliffs (Isles of Portland and Purbeck)
- Newlyn Downs (Cornish Killas and Granites)
- North Meadow and Clattinger Farm (Thames and Avon Vales)
- Pewsey Downs (Berkshire and Marlborough Downs)
- Prescombe Down (South Wessex Downs)
- Rodborough Common (Cotswolds)
- Rooksmoor (Wessex Vales)
- Salisbury Plain (South Wessex Downs)
- St Albans Head to Durlston Head (Isles of Portland and Purbeck)
- The Lizard (The Lizard)

Special Protection Areas

- Dorset Heathlands (Dorset Heath)
- Porton Down (South Wessex Downs)
- Salisbury Plain (South Wessex Downs)
- Somerset Levels and Moors (Somerset Levels and Moors)
- Walmore Common (Severn and Avon Vales)

Upland grassland and heath

Key issues and objectives

Issue: habitat fragmentation

- **Restore** and **re-create** upland heathland especially where this would **link** existing fragments.
- **Prevent** further loss of upland heath to grass moor or bracken.

Issue: inappropriate management

- Where **overgrazing** is occurring, **reduce** stocking levels.
- **Ensure** burning regimes are appropriate.

Issue: pressure for agricultural intensification

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

Issue: management of common land

- **Encourage** the formation of commoners' associations, agreement on appropriate management, and the uptake of agri-environment agreements.

Helman's Tor, Cornwall. Peter Wakely/English Nature

There are three upland Natural Areas in the South West Region: Bodmin Moor, Dartmoor and Exmoor and the Quantocks. These are the warmest upland areas in England, a fact reflected in their unusual range of species.

Exmoor and the Quantocks supports the largest areas of internationally important dry upland heath in the Region. Dominated by dwarf shrubs, this is a characteristic habitat of the area and becomes wet upland heath on the wetter plateau tops. The Exmoor Heaths are a candidate Special Area of Conservation (SAC) for extensive areas of upland heath, parts of which are characterised by lowland species. Unusual plants include the lesser twayblade and fir clubmoss. Crowberry and cranberry occur here at the southern edge of their range. The Exmoor Heaths are the largest stronghold in Britain for the heath fritillary butterfly, a BAP species.

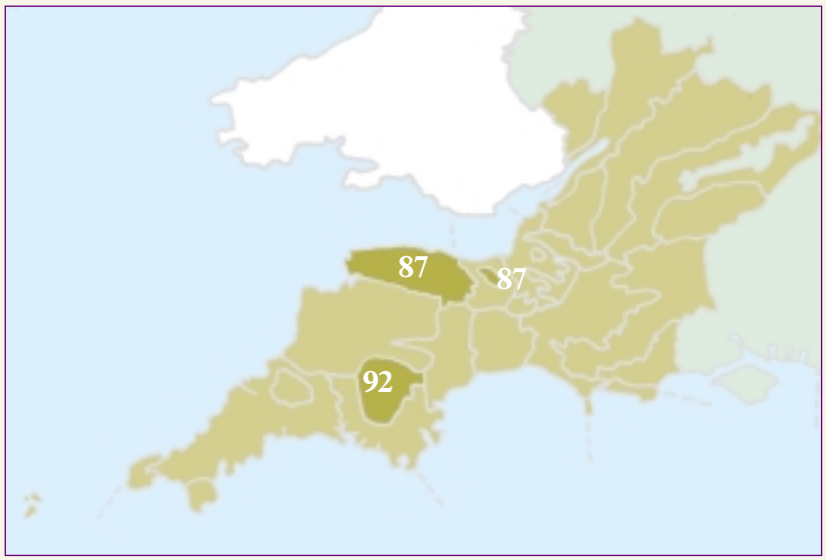
Dartmoor also has extensive areas of internationally important upland heathland characterised by heather, bilberry, cross-leaved heath and western gorse. The Dartmoor candidate SAC is predominantly wet heath and blanket bog which, together with small areas of dry heath and some mire communities, form a distinctive mosaic of vegetation types. Most of the vegetation communities on Dartmoor are extremely rare outside the UK. Bodmin Moor has only small fragments of heathland remaining and these are mainly confined to the south of the Moor.

Upland heathland in the Region supports a number of species on the southern edge of their range such as red grouse, golden plover and stag's-horn clubmoss, and others that are rare in the Region such as ring ouzel.

Upland acid grassland occurs within a mosaic of habitats and extensive areas are found on both Bodmin Moor and

Dartmoor, largely as a result of the heavy grazing of heathland. These grass moors occur on mineral soils or shallow peat and are characterised by bristle bent. Distinguishing between upland and lowland acid grassland is often difficult on both of these moors, the lower fringes sometimes having a rich lowland flora, including chamomile and heath violet.

The heathlands and grasslands are important for a range of invertebrates, such as the hornet robberfly, heath, high brown and pearl-bordered fritillary butterflies (all BAP species) and birds such as merlin, skylark, raven, wheatear and stonechat.



Exmoor National Park, Dartmoor. Peter Wakely/English Nature

Characteristic habitats of key Natural Areas

87. Exmoor and the Quantocks

- Internationally important areas of dry *upland heath*
- Small areas of wet *upland heath*

92. Dartmoor

- Internationally important areas of wet *upland heath* and *blanket bog*

NB Priority BAP habitats in italics

Candidate Special Areas of Conservation

- Dartmoor (Dartmoor)
- Exmoor Heaths (Exmoor and the Quantocks)

Special Protection Areas

None

Maritime

Key issues and objectives

Issue: maintenance of coastal processes

- **Maintain** natural, dynamic coastal processes by:
  - **promoting** the use of 'soft' engineering for sea defences, for example by managed retreat;
  - **avoiding** dredging and sand extraction that would remove sediment from the system, for example by recycling dredge spoil for beach nourishment;
  - **ensuring** an integrated, holistic approach to coastal planning activities through Shoreline Management Plans.

Issue: water quality

- **Improve** 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 **ensuring** that recreation and tourism is consistent with maintaining wildlife features.

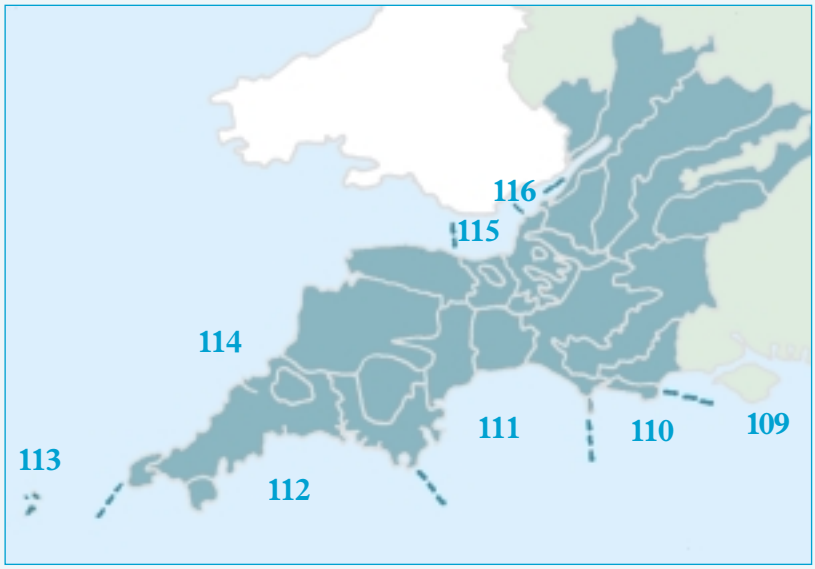
Issue: fisheries

- **Encourage** and **promote** fishing practices that:
  - **sustain** populations of the target species;
  - **avoid** detrimental impacts on wildlife such as sea bed communities and birds.

The coastline of the South West Region is dominated by long, scenic stretches of cliffs cut into sedimentary, igneous and metamorphic rocks. The South Dorset Coast has hard limestone cliffs interspersed with soft chalk cliffs, sands and clays, while Lyme Bay has a continuous stretch of unstable soft cliffs between Sidmouth and West Bay, where mudslides and landslips have produced stepped undercliffs. Hard cliffs dominate the coastline from Lyme Bay westwards to Land's End, and these tall, near-vertical cliffs of sedimentary and igneous rock are broken only by the mouths of estuaries and rivers. The famous headland of the Lizard has unusual base-rich igneous and acid metamorphic cliffs and these support diverse plant communities, including many rare species. Land's End to

Lizard NNR, Cornwall. Peter Wakely/English Nature

Characteristic habitats of key Natural Areas



109. Solent and Poole Bay

- *Sand dunes* at Studland Bay
- *Vegetated shingle*, e.g. at mouths of Christchurch Harbour and Poole Harbour
- *Lagoons*, e.g. in Poole Harbour
- Large areas of *saltmarsh*, e.g in Poole Harbour and Christchurch Harbour
- Large areas of intertidal *mudflats* in estuaries and embayments

110. South Dorset Coast

- Outstanding, large brackish *lagoon* at the Fleet
- Extensive hard limestone cliffs and soft chalk *cliffs*
- *Shingle* beach
- *Saltmarsh* at Lodmoor
- Extensive intertidal rocky shores
- Intertidal *mudflats* and sandflats in Weymouth Bay
- Subtidal sediments, mostly sands and gravels
- Subtidal rocky *reefs*

111. Lyme Bay

- Soft, unstable *cliffs* between Lyme Regis and Axmouth; high, hard rock *cliffs* to the west
- *Sand dunes* at Dawlish Warren
- Outstanding *vegetated shingle beaches* at Chesil and Slapton Ley, also some bare shingle beaches
- Intertidal sandy beaches within Tor Bay
- Intertidal and subtidal rocky *reefs*
- Well-developed *reefs* of *Sabellaria alveolata* in coves

112. Start Point to Land's End

- Tall, vertical hard *cliffs* developed in igneous and metamorphic rocks
- *Sand dunes* in St Austell's Bay
- *Vegetated shingle* beaches within the Fal Estuary, at Loe Bar and Penzance
- Small number of *saline* lagoons in Cornwall
- *Saltmarshes* in the shelter of estuaries
- Intertidal sandflats and *mudflats* in estuaries and embayments
- Extensive areas of exposed, rocky intertidal shores
- Large subtidal sandbanks in embayments and off the open coast
- Rocky *reefs* in the subtidal, including outstanding development of maerl, e.g. St Mawes Bank

113. Isles of Scilly

- Small *sand dune* system on St Mary's
- *Lagoon* at Bryher
- Extensive areas of intertidal sandflats
- Well developed sheltered *beds of seagrasses*
- Rocky intertidal shores
- Extensive subtidal sandbanks with *seagrass beds*
- Many marine species not recorded on the mainland

114. Land's End to Minehead

- Mostly hard *cliffs* dominated by sedimentary rocks, with some slumped sections
- *Sand dune* systems, including several extensive sites
- *Vegetated shingle* at Porlock, also shingle beaches within Barnstaple Bay
- *Saltmarsh* in estuaries, most (except Taw-Torridge) covering small areas
- Exposed, rocky intertidal shores
- Subtidal *reefs*, including rock platforms and rock outcrops
- Colonies of the *reef-building* worm *Sabellaria alveolata*

115. Bridgwater Bay

- *Sand dunes* at Berrow
- *Vegetated shingle* beach at Steart
- *Lagoon* at Catsford Common
- Large area of *saltmarsh*
- Extensive intertidal sandflats and *mudflats* in estuary mouth
- Extensive areas of subtidal sandbanks

116. Severn Estuary

- Substantial areas of *saltmarsh*
- Substantial areas of intertidal sandflats and *mudflats*
- Extensive areas of highly mobile sandbanks
- Extensive subtidal *reef* of *Sabellaria alveolata*

NB Priority BAP habitats in italics

Cape Cornwall-Botallack Head, Cornwall. Peter Wakely/English Nature

Minehead is dominated by very exposed, vertical cliffs of hard sedimentary rocks, with some intervening slumped sections; the Exmoor coastline has some of the finest examples of 'hogsback' cliffs in Britain. Several stretches of cliffs in the Region are candidate Special Areas of Conservation (SACs).

A large number of rare and scarce plants occur on these cliffs with a number of species that are mostly restricted to this Region. These include several BAP species such as white rock-rose, goldilocks, shore dock, and Lundy cabbage which is found only on Lundy Island and is host to an endemic beetle. Several sites in the South West Region are candidate SACs for their populations of shore dock.

The largest sand dune systems in the Region occur along the exposed coast of Land's End to Minehead, for example at Braunton Burrows, Gwithian to Mexico Towans, and at Penhale Sands. A notable feature of some of these sites is that the dunes are blown against cliffs, and in some cases, over the top of cliffs. Like many other dunes on the north coast of Devon and Cornwall, the dunes of Braunton Burrows and Penhale Sands support relatively large areas of mobile dunes with marram, dune grassland and dune slacks. On the southern coast of the Region the only large dune system is at Studland Bay in the Solent and Poole Bay; this site has a range of vegetation including embryonic dunes, mobile dunes with marram, dune slack and the only large dune heath in the south of Britain.

Owing to their greater diversity of vegetation, the larger dune systems are often richer in species and some support BAP plants such as water germander, petalwort and sand crocus, which occurs only in the South West Region. The damp dune slacks at Braunton Burrows are one of only three known sites in Britain for the sandbowl snail, and the dune heath at Studland supports all six native species of reptile, including the sand lizard, which is a priority BAP species.

Vegetated shingle habitats in the Region are dominated by the extensive shingle beaches of Chesil Beach and Slapton Ley, both within Lyme Bay. Chesil Beach encloses the Fleet, a large brackish lagoon, and the shingle supports a varied

vegetation including an unusual scrub of shrubby sea-blite and sea purslane. The shingle at Slapton Ley is also rich in plants and encloses a freshwater lagoon. Other major areas of vegetated shingle occur at Porlock within Land's End to Minehead, and at Steart in Bridgwater Bay. A number of uncommon plants occur on shingle in the Region, including large populations of sea pea and sea kale. Shingle often supports a specialised invertebrate fauna. One site of particular note is Loe Bar in Start Point to Land's End, which is the only known site for the Cornish sandhill rustic moth. Elsewhere in the Region there are a number of largely bare shingle beaches, a number of which also enclose lagoons, such as Swanpool by the Fal Estuary.

The Fleet is by far England's largest brackish lagoon and is very rich in plants and animals, with more than 200 species recorded. These include a number of rare and scarce species, such as the lagoon sand worm and DeFolin's lagoon snail, and substantial populations of the foxtail stonewort. Elsewhere in the Region there are few lagoons, most of which cover only very small areas. Of particular note is the lagoon at Swanpool. This is the only site in Britain for the trembling sea mat and it is one of few British localities for the copepod *Ergasilus lizae*, which is parasitic on grey mullet.

As the coastline of the Region is largely exposed or cliffed, saltmarshes have developed only in the sheltered estuaries. Many of these estuaries are predominantly narrow or sinuous so saltmarsh is limited. However, there are extensive areas in large estuaries such as the

Woolacombe Sands, Devon. Peter Wakely/English Nature

Candidate Special Areas of Conservation

- Braunton Burrows (Land's End to Minehead)
- Chesil and the Fleet (Lyme Bay, South Dorset Coast)
- Dorset Heaths (Purbeck and Wareham) and Studland Dunes (Solent and Poole Bay)
- Fal and Helford (Start Point to Land's End)
- Isle of Portland to Studland Cliffs (South Dorset Coast)
- Isles of Scilly Complex (Isles of Scilly)
- Lundy (Land's End to Minehead)
- Penhale Dunes (Land's End to Minehead)
- Plymouth Sound and Estuaries (Start Point to Land's End)
- The Lizard (Start Point to Land's End)
- Tintagel-Marsland-Clovelly Coast (Land's End to Minehead)
- Sidmouth to West Bay (Lyme Bay)
- South Devon Shore Dock (Start Point to Land's End)
- St Albans Head to Durlston Bay (South Dorset Coast)
- Studland Dunes (Solent and Poole Bay)

Potential Special Areas of Conservation

- Severn Estuary/Môr Hafren (Severn Estuary; plus part of site in Wales)

Special Protection Areas

- Chesil Beach and the Fleet (Lyme Bay)
- Exe Estuary (Start Point to Land's End)
- Poole Harbour (Solent and Poole Bay)
- Severn Estuary (Severn Estuary; Bridgwater Bay; plus part of site in Wales)
- Tamar Estuaries Complex (Start Point to Land's End)
- Upper Severn Estuary (Severn Estuary; plus part of site in Wales)

Gerrans Bay to Camels Cove SSSI, Cornwall. Peter Wakely/English Nature

Severn, where most of the saltmarsh is grazed, in Bridgwater Bay, in the Exe Estuary, in the estuaries of Plymouth Sound, and in Poole Bay, where the vegetation is dominated by common cord-grass. The saltmarsh of the upper Tamar-Tavy Estuary (part of Plymouth Sound) is the only site in Britain for triangular club-rush, a BAP species.

There are extensive rocky shores along the coast of Devon and Cornwall. These range from very exposed rocky shores from Land's End to Minehead, which support barnacles, limpets and seaweeds, to more sheltered shores eastwards of the Lizard that have rich communities of sponges, hydroids and sea squirts. Rocky shores also extend into several of the estuaries where the conditions are very sheltered, for example in the Helford Estuary, which supports marine communities of national importance. Elsewhere in the Region there are smaller stretches of rocky shore, such as the cobble, pebble and sand beaches backed by high cliffs in Lyme Bay.

Owing to the exposed nature of much of the coastline the largest areas of intertidal sediments occur within the shelter of estuaries and embayments. The most extensive intertidal flats are in Bridgwater Bay and the Severn Estuary, where the large tidal range means that much of the sediment is mobile sandflats, with sheltered mudflats only in the uppermost reaches. Other large areas of intertidal flats are found in the Exe Estuary, Plymouth Sound and the estuary of the Taw-Torridge. On the open coast there are intertidal sandflats in the shelter of the Isles of Scilly, with smaller areas in the shelter of headlands and embayments, such as at Weymouth.

The most extensive intertidal flats support large populations of wintering birds. Bridgwater Bay, the Severn Estuary, the Exe Estuary, Poole Harbour and the Fleet are of international importance for wintering waterfowl, with large populations of Bewick's swan, shelduck, gadwall, dunlin, redshank, avocet, black-tailed godwit, oystercatcher and dark-bellied brent goose. These sites are classified as Special Protection Areas (SPAs).

Subtidal sediments vary greatly around the coastline. North of Land's End the subtidal sediments are largely sands and gravels, with extensive sandbanks in the Severn Estuary that

Godrevy Head to St Agnes SSSI, Cornwall. Peter Wakely/English Nature

are highly mobile. In Bridgwater Bay there is a large area of more stable, subtidal mudflats. East of Land's End, the sea bed is covered by a mostly thin layer of gravels, formed of pebbles of flint, chalk, sandstone, limestone and ironstone. In Lyme Bay, the thicker deposits of sand and sandy muds support an extremely diverse fauna.

There are substantial subtidal rocky reefs off the coast of the Region. In the outer reaches of the Severn Estuary a large, subtidal rock outcrop supports an extensive area of the reef-building worms *Sabellaria alveolata* and *S. spinulosa*. The island of Lundy is an outstanding granite and slate reef system with an unusually diverse complex of marine habitats and communities, including the sunset coral (a BAP species), here at its most northerly location. There are extensive areas of subtidal bedrock off Land's End, around the Isles of Scilly and off the Lizard, with well-developed kelp beds including the south-western species *Laminaria ochroleuca*, and communities of sponges, hydroids and sea squirts. In the shelter of the Fal and Helford Estuaries there are beds of maerl, an unusual calcareous alga. The Fal has one of the largest maerl beds in England. Further east there are discrete reefs such as Eddystone Rocks south of Plymouth Sound, and East Rutt Pinnacle, off Bolt Tail. Lyme Bay also has large areas of subtidal reefs, for example at Lane's Ground, West Tennants and East Tennants, and Eastern Heads, which support sea fans and rich communities of sponges. Off the South Dorset coast there is a shallow chalk reef close to the cliffs at White Nothe, and a Portland Limestone reef runs parallel to the shore from Durdle Dor to White Nothe. This limestone reef is rich in sponges. Further east, the rocky shore at Kimmeridge Bay descends into the subtidal to a submerged, former cliff-line.

The coast and seas of the Region are also important for a number of animal species. Small numbers of grey seals breed in caves, on islands and on beaches from Land's End to Minehead and at an isolated location in Start Point to Land's End. The waters off the north coast of Devon and Cornwall are the richest area in southern Britain for whales, dolphins, porpoises and basking sharks, and there are frequent sightings of marine turtles off Land's End.

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

Newtown First School, Exeter. Neville Kettell/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?

Exe Estuary, Devon.
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.

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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.

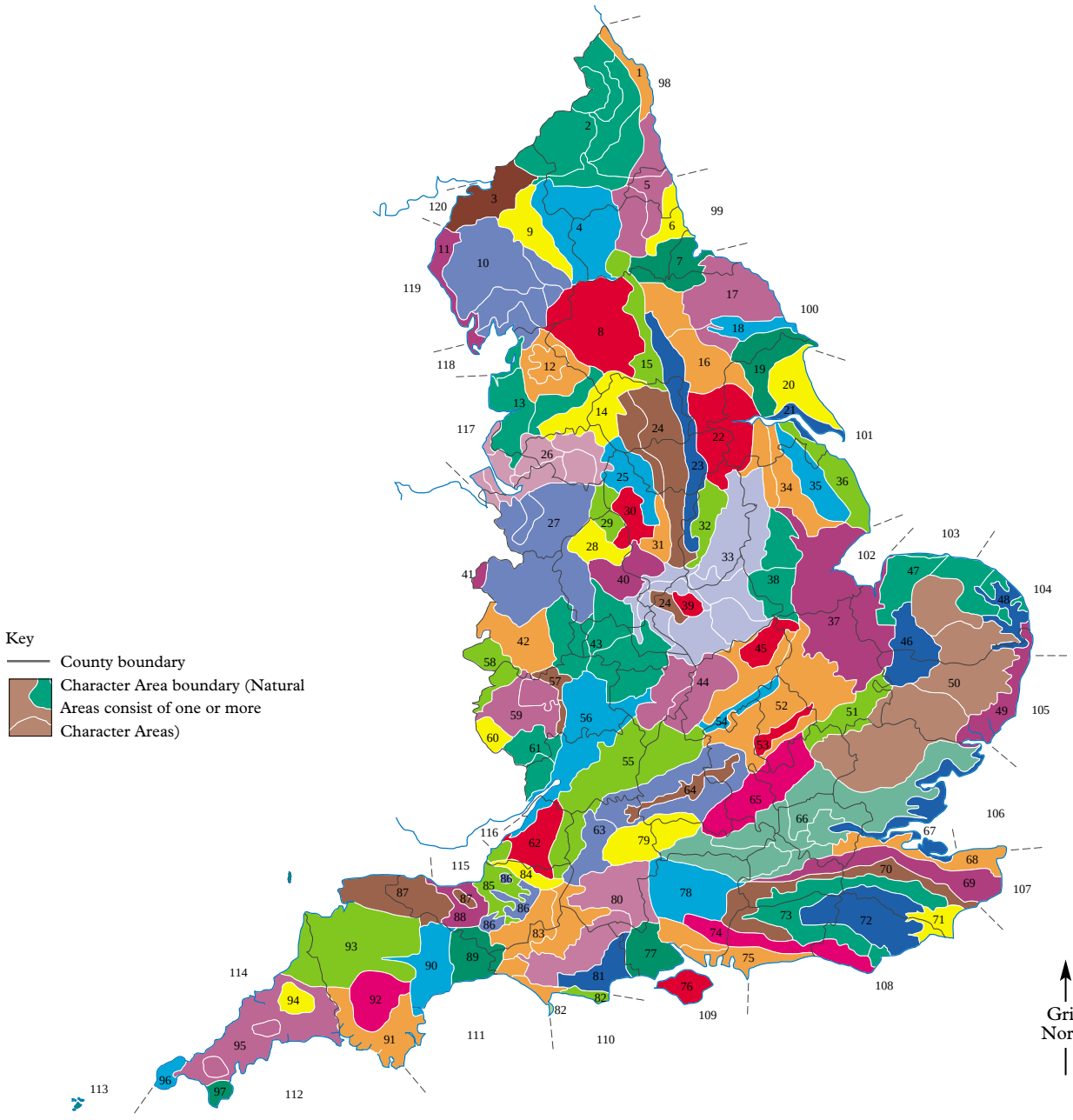
All available free from the Enquiry Service, English Nature, Northminster House, Peterborough PE1 1UA Tel. 01733 455101 Fax. 01733 568834.

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

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62. Bristol, Avon Valley and Ridges
84. Mendip Hills
85. Somerset Levels and Moors
86. Mid Somerset Hills
87. Exmoor and the Quantocks
88. Vale of Taunton and Quantock Fringes
115. Bridgwater Bay
116. Severn Estuary

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81. Dorset Heaths
82. Isles of Portland and Purbeck
83. Wessex Vales
110. South Dorset Coast

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Natural Areas for which they lead:

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90. Devon Redlands
91. South Devon
92. Dartmoor
93. The Culm

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95. Cornish Killas and Granites
96. West Penwith
97. The Lizard
111. Lyme Bay
112. Start Point to Land's End
113. Isles of Scilly
114. Land's End to Minehead

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56. Severn and Avon Vales
61. Dean Plateau and Wye Valley

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Natural Areas for which they lead:

109. Solent and Poole Bay

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