Protecting England's natural treasures

Sites of Special Scientific Interest

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NATURAL ENGLAND

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Cover photo: SSSIs in the Dorset heathlands provide a vital refuge for the sand lizard.

More than a million starlings gather over the reed beds of Shapwick Heath in Somerset before roosting for the night.

Introduction

England's Sites of Special Scientific Interest protect the best of our natural heritage. Each one is special because it preserves a unique array of plants, wildlife, and geology. Some, such as the waterways of the Norfolk Broads, the woodlands of the New Forest, or the fells of Helvellyn, encompass entire landscapes and are familiar to many. A great many more cover much smaller patches of land and are known to only local people and interested experts.

The first SSSIs were designated more than 60 years ago and today there are 4,119 sites covering more than eight per cent of the country. In the past ten years, significant improvements have been achieved in the monitoring and management of this huge area of land. A full inventory for each site is now publically available, showing the reasons why it was designated, the management requirements needed to maintain its special features, and an up-to-date assessment of the condition of the site. At the end of 2010, this showed that all but four per cent of SSSIs were either in a favourable condition or under management regimes that will bring them into favourable condition once natural features have had sufficient time to re-establish.

This report describes in more detail the work undertaken over the past ten years to protect SSSIs and reflects on their future role in preserving the best of England's biodiversity and geodiversity. It is hoped that it will inspire more people to take an interest in England's natural treasures, be it an iconic national landscape or a local patch of nature. To find out much more about what is special about SSSIs, and to locate sites anywhere in the country, readers are encouraged to explore our website at: www.natureonthemap.org.uk.

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A message from the Secretary of State

In 2003, less than two thirds of our Sites of Special Scientific Interest were in a 'favourable' or 'recovering' condition. By the end of last year, this had risen to over 95 percent – the result of seven years of hard work by Natural England, the Environment Agency, the Forestry Commission, Defra, and our partners across the public, private and voluntary sectors. I would like to extend my congratulations to everyone who has been involved with this enormous achievement.

As Environment Secretary, a key part of my role is to protect and enhance the natural world, for the benefit of both ourselves and future generations. Maintaining land banks of precious wildlife is absolutely crucial to this, with Sites of Special Scientific Interest providing over one million hectares of England's most diverse and ecologically fascinating sites, supporting those plants and animals that find it more difficult to survive in the wider countryside.

Although this report marks the completion of a seven year work programme, the good work will not of course stop here. We are moving in the right direction but there is much more to do. These valuable yet vulnerable sites will always be under pressure from development and other land uses, pollution and climate change. Protecting these areas and keeping them in good shape for future generations is a profound responsibility for me and my Department.

The achievement of the overwhelming majority of these sites now being in good or improving condition is a fitting conclusion to the 2010 International Year of Biodiversity. The result would not have been possible without the support and hard work of a diverse range of individuals – including farmers and rural business owners - and people from environmental organisations. It is testament to the dedication of all involved that they were able to achieve so much within the allotted timeframe.

Caroline Spelman
Secretary of State for Environment, Food and Rural Affairs

An expanse of mudflats and salt marsh provide a rich habitat for shellfish, wildfowl and seals at the Wash, England's largest SSSI.

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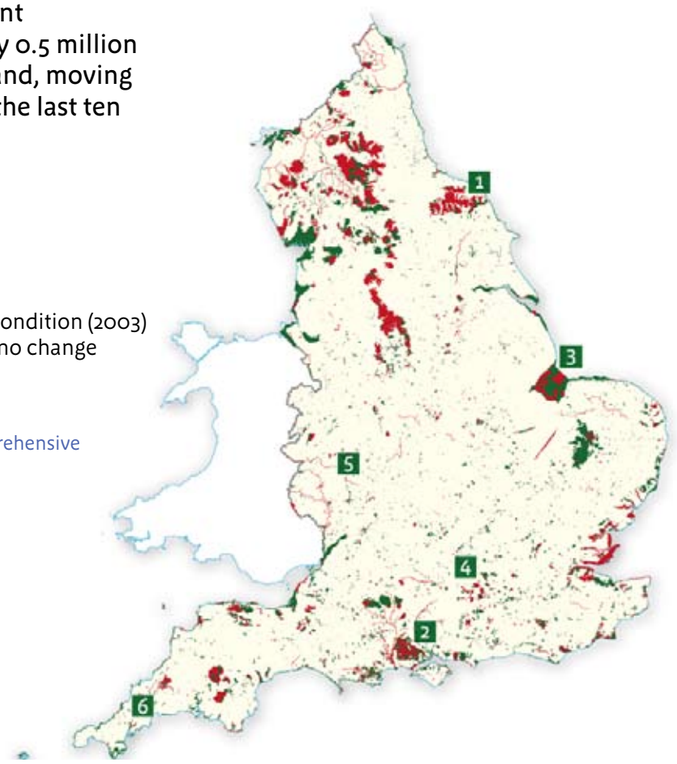
SSSI condition improvements 2003-2010

The maps reveal the huge area of land affected by the SSSI improvement programme, with approximately 0.5 million hectares or 3.8 per cent of England, moving into recovering condition over the last ten years.

2003 *

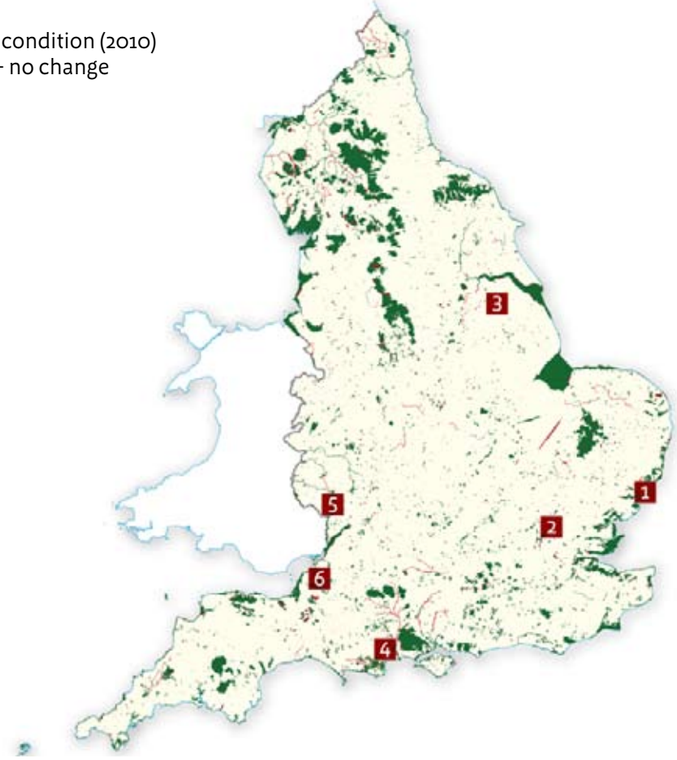
- SSSIs in favourable or recovering condition (2003)
- SSSIs in unfavourable condition – no change or declining (2003)

*2003 was the first year for which a comprehensive assessment of SSSIs is available.



2010

- SSSIs in favourable or recovering condition (2010)
- SSSIs in unfavourable condition – no change or declining (2010)



Examples of SSSIs predominantly in favourable or recovering condition (2010)

North York Moors: England's largest heather moorland.

Cannoncourt Farm Pit: one of the most important excavation sites for Stone Age tools in Europe.

The New Forest: Europe's largest lowland heath, providing a home to Dartford warblers, nightjars, numerous bat species and smooth snakes.

Wyre Forest: ancient oak woodlands that are a key habitat for rare pearl bordered-fritillary butterflies.

The Wash: England's last great wilderness supporting more than 350,000 wild fowl, waders and gulls and our largest colony of common seals.

Goss Moor and Tregoss Moor: a rich heathland opened up to the public by diverting a major road and opening of new trails.

Examples of SSSIs with significant parts in unfavourable condition – no change or declining (2010)

Deben Estuary: coastal erosion has caused the loss of 11 hectares of saltmarsh.

Parley Common: multiple pressures including, water pollution, under grazing, heavy recreational use, and the effects of flood defences threatens species rich heathland.

Epping Forest: nitrogen and sulphur dioxide emissions from industry and traffic affect much of this ancient forest.

River Wye: agricultural run-off is polluting the river system.

Laughton Common: a lack of appropriate grazing is resulting in the loss of semi-natural grassland.

Axbridge Hill and Fry's Hill: scrub is invading this important area of limestone grassland.

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Around 1,300 grey seal pups are born within the Humber SSSI each year.

The SSSI improvement programme

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What are SSSIs?

England's first Sites of Special Scientific Interest were established by Act of Parliament in 1949, with a purpose to protect the best of England's natural habitats, wildlife and geological heritage for the benefit of present and future generations. In the 60 years since its creation, the network of SSSIs has been periodically extended and legislation governing its protection has been strengthened, most significantly by the Wildlife and Countryside Act of 1981 and the Countryside and Rights of Way Act of 2000. As a result, SSSIs are subject to stricter controls to protect wildlife, habitats and geological formations than most other types of designated area. Almost 30 per cent of the area of SSSIs is in the care of private landowners, most typically being part of a working farm. The remaining area is owned by conservation organisations, local authorities, government agencies and public utilities.

Today, a total of 4,119 individual SSSIs cover more than a million hectares (8.1%) of the land surface of England. They represent the entire range of habitat and geology types found in the country and vary as much in size as they do in character. The smallest, Sylvan House Barn in Gloucestershire, is a space of just 4.5 square metres and home to 200 lesser horseshoe bats. Amongst the largest, and possibly the busiest, is the Humber Estuary at 37,000 hectares. It drains a fifth of the country's freshwater, has one of the largest grey seal breeding colonies in the UK and is home to almost 50,000 golden plovers. It is also the site of the UK's largest port complex at Grimsby and Immingham.

Background to the SSSI improvement programme

Until just ten years ago, no overall assessment existed for the vast area of land covered by SSSIs and a great many sites were thought to be failing to protect the biodiversity or geodiversity for which they were designated. In 2000, an improvement programme for SSSIs was agreed by the then Department of Environment, Transport and the Regions which aimed to make the monitoring and maintenance of SSSIs much more effective.

The programme set out a clear target to bring 95 per cent of SSSIs, by area, into a favourable or recovering condition by the end of 2010, the International Year for Biodiversity. Essentially, it gave ten years to prove that the extensive network could really achieve its aim of protecting the best of England's biodiversity and geodiversity. Responsibility for delivery of this programme was given to the then statutory conservation agency, English Nature – a role that passed to Natural England at its formation in 2006.

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Condition assessments for SSSIs

All SSSI land is assessed against the six 'conditions' described below. All sites are divided into units (although some only have one). Each unit is assessed separately and this can often result in a mix of Favourable, Unfavourable and Destroyed units across one SSSI. Each unit should be assessed at least every six years.

SSSI condition states

Favourable
The SSSI is being adequately conserved and is meeting its 'objectives'.

Unfavourable recovering
Often known simply as 'recovering', SSSI units are not yet fully conserved but all the necessary management measures are in place. Provided that the recovery work is sustained, the SSSI will reach favourable condition in time.

Unfavourable no change
The special interest of the SSSI unit is not being conserved and will not reach favourable condition unless there are changes to the site management or external pressures. The longer the SSSI unit remains in this poor condition, the more difficult it will be, in general, to achieve recovery.

Unfavourable declining
The special interest of the SSSI unit is not being conserved and will not reach favourable condition unless there are changes to site management or external pressures. The site condition is becoming progressively worse.

Part destroyed
Lasting damage has occurred to part of the special conservation interest of an SSSI unit, such that it has been irretrievably lost and will never recover. Conservation work may be needed on the residual interest of the land.

Destroyed
Lasting damage has occurred to all the special conservation interest of the SSSI unit, such that it has been irretrievably lost. This land will never recover.

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The results of the improvement programme

The first objective of the programme was to establish a comprehensive database of all SSSIs, and to implement a common system of monitoring that would enable all sites to be evaluated in a consistent manner. This was completed by 2003, although continued refinements to monitoring procedures have taken place.

When Natural England took over management of the programme in 2006, improvements to the condition of SSSIs became a top priority for the newly established organisation. Since that time, a team of around 250 people have been working across the country on the huge task of surveying and assessing sites, and formulating management plans that enable owners and managers to achieve desired changes. At times the timetable for assessing each site has been difficult to maintain and the last few years have seen a great effort made to ensure that all sites have an up-to-date assessment. A key part of Natural England's monitoring programme has been establishing individual Favourable Conservation Tables for every SSSI. These contain a list of the notified features for the site, and the criteria against which the condition of the features can be judged.

At the end of December 2010, 96.5 per cent of SSSIs, measured by land area, were assessed as being in favourable or recovering condition (see chart below). This compares to 56.9 per cent that were in favourable or recovering condition in March 2003, the first point at which a comprehensive assessment was available.

Condition status of SSSIs in 2003 and 2010

	September 2003	December 2010
1 Area in favourable condition	44.6%	37.2%
2 Area in unfavourable recovering condition	13.7%	59.3%
3 Area unfavourable no change	25.2%	2.3%
4 Area unfavourable declining	16.3%	1.2%
5 Area destroyed / part destroyed	0.2%	0.03%
Area meeting the target for SSSI condition (1 + 2)	**58.3%**	**96.5%**

Source: see note on page 39

In the time since the target was set, the greatest effort has been put into improving unfavourable sites to a recovering state. More than half of the area of England's SSSIs is presently in this recovering state, compared to 13.7 per cent seven years ago. While at some sites this will mean that considerable improvement is still required, the key achievement is that they are moving in the right direction and that under current management arrangements the land will reach favourable condition with the passage of time. It may take a generation, for example, for ancient woodland to re-establish its original characteristics. And it could take several decades for sphagnum moss to re-cover an area of drained peat once the water system has been restored.

Overall, there has been a net decrease in the area of SSSIs in favourable condition – down from 44.6 per cent in September 2003 to 37.2 per cent in December 2010. This has occurred, in part, because of the application of consistent monitoring standards which has meant that some adverse features have only been identified in more recent surveys. In other instances, the cause can be attributed to a decline in the population of a particular species, even though the actual condition of the habitat has remained favourable. This is the case at a number of estuary sites where migratory wildfowl are appearing in fewer numbers.

The fluctuation in the status of SSSIs reflects the fact that monitoring is based on an assessment of natural features which, even under the strictest of management regimes, exist in a dynamic state. The future improvement of sites therefore requires an ongoing assessment of changes in the environment and the continued refinement of management plans and monitoring techniques.

The significance of SSSI recovery

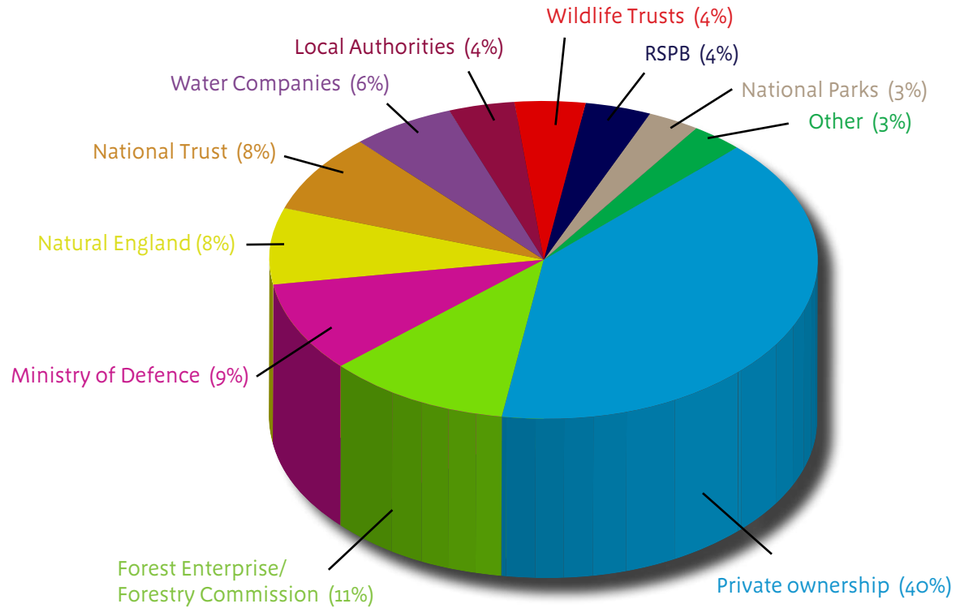
While further work – as well as the passage of time – is required to enable biodiversity and geodiversity to continue to flourish on all SSSIs, the end of 2010 marks a significant achievement. The most comprehensive ever assessment of England's key natural sites has been made, and the means by which those sites can be maintained and improved has been determined. Across 8.1 per cent of the area of the country our natural treasures are in a better condition than they have been for generations, and a clear trend of ongoing improvement has been established.

In the context of the gradual decline in biodiversity over the past century, both nationally and internationally, the revival in the fortunes of England's SSSIs represents a real success story. It will take more years for some improvements to be fully realised, and longer still to enable an evaluation of increases in species, but today this network of special places provides a strong foundation on which biodiversity may continue to flourish.

How the target was achieved

The improvement in condition of the SSSI network would not have been possible without the support and hard work of a diverse range of individuals and organisations who care about our natural environment. Almost 26,000 land owners and land managers are registered as having an interest in individual SSSIs. They include utility companies, which own land at 239 sites; public bodies, such as the Ministry of Defence, which owns land at 124 sites; and conservation organisations like the National Trust, which owns land at 400 sites . Private individuals and companies, particularly farmers, account for the largest single interest group, owning or managing around half of all SSSIs by area.

Who owns SSSIs



Note: Data relates to terrestrial SSSIs only

Grants for environmentally sensitive farming and land management, such as the EU funded Higher Level Stewardship Scheme and the England Woodlands Grants Scheme have contributed more widely than any other mechanism to improving SSSIs. Higher Level Stewardship (HLS), in particular, covers a greater area of SSSI land than any other grant scheme. The grant is targeted to areas where environmental improvements result in the greatest gains for biodiversity, geodiversity and landscape protection and it is estimated that 45 per cent of SSSIs benefit from HLS and other agri-environment grants (Case studies: Misterton Marshes; Breckland Farmland). The chart on page 14 summarises just a few of the improvements currently covered by HLS.

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Environmental improvements on SSSIs funded through Higher Level Stewardship (selected examples)

	hectares
Moorland restoration	157,000
Heather gorse and grass management	65,500
Shepherding supplement	42,600
Restoration and maintenance of semi-natural grassland	31,000
Woodland maintenance and restoration	9,800
Restoration and maintenance of fen	2,200
Maintenance of sand dunes	1,200

European Union funding has also been important for SSSIs through the provision of grants from its LIFE funding programme, which supports innovative environmental and nature conservation projects. Salisbury Plain, Malham-Arncliffe and the New Forest are all sites that have benefited from this resource (Case studies: Salisbury Plain; Malham-Arncliff).

While grants and incentives for environmentally beneficial farming have affected the largest area of land, the work of volunteer groups has also transformed a great number of sites (Case study: Lye Valley). Voluntary organisations such as the Wildlife Trusts, the Woodland Trust and the RSPB own or manage more than 1,200 SSSIs, often including sites that attract significant numbers of visitors. BTCV, which runs one of the country's largest programmes of environmental work, report that 18,000 of their volunteers have contributed 37,154 work days at SSSIs in the past five years (Case study: Sinah Common).

Another influential force in promoting SSSIs has been the Major Landowners Group, an amalgam of landowning organisations, including: voluntary organisations such as the National Trust; public bodies such as the Forestry Commission, the Ministry of Defence, and the Crown Estate; and representatives of the water industry. The group has worked to champion the aims of the SSSI improvement programme, and has had a great impact at regional and local levels in getting agreements signed and work funded and implemented (Case studies: Whitbarrow; Salisbury Plain). The Forestry Commission in England has been particularly successful in improving SSSIs, with 99 per cent of the sites it manages being in favourable or recovering condition.

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Protecting biodiversity

England's wildlife depends heavily on the rich and varied array of habitats that are protected as SSSIs. This mosaic of grassland, forests, heaths, marshes, open water and coastal zones supports populations of several species that are globally significant, including breeding sea birds, wintering and passage waterbirds and heathland invertebrates (Case study: the Wash). SSSIs cover approximately 50 per cent of habitat considered to be of conservation priority in England under the UK Biodiversity Action Plan. This includes 95 per cent of key coastal habitat, 86 per cent of woodland and 72 per cent of heathland.

Improvements in the condition of these land types have occurred across the board, with the most significant changes taking place on heathland and wetland, more than 90 per cent of which is now in favourable or recovering condition, compared to only 40 per cent in 2003.

One of the biggest achievements in the improvement programme has been the turnaround in the condition of grouse moors, which cover 17 per cent of the area of all SSSIs. These iconic landscapes were damaged during the 20th century by the combined effects of inappropriate grazing, heather burning, wildfire and the drainage of blanket bogs. For example, more than 9,000 km of drains were dug in the moorlands of the North Pennines. The development of new management techniques by the Moorland Association and its members, including the adoption of a new code of conduct on burning, is helping to restore the diversity of grouse moors. Funding from Higher Level Stewardship and restoration projects such as the North Pennines Area of Outstanding Natural Beauty's 'Peatscapes' project is also enabling the blocking of thousands of kilometres of drainage channels. Today, 96 per cent of grouse moors are in favourable or recovering condition, compared to only 25 per cent in 2004 (Case study: Bowes Moor).

Area of semi-natural habitats protected by SSSIs and condition status

Priority habitat under UK Biodiversity Action Plan	Area of habitat on SSSIs (hectares)	% of total England habitat on SSSIs	% in target condition 2003	% In target condition 31 December 2010
Coastal	254,000	96%	76%	98%
Woodland	117,000	86%	72%	96%
Grassland	75,000	68%	64%	96%
Heathland	316,000	72%	40%	98%
Wetland	247,000	47%	39%	95%
Open water	29,000	Not available*	56%	80%

* The extent of rivers is measured by length rather than area

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A view of the Dark Peak SSSI before and after moorland restoration (Case study: Dark Peak)

Few studies are available that compare the condition of semi-natural habitat on SSSIs with similar types of habitat on non-designated land. However, those studies that have been made suggest a positive relationship between SSSI status and a richer natural environment. Research undertaken in 2005 [1] showed that for grassland habitat, 43 per cent of land on SSSIs was in favourable condition compared with 21 per cent that was favourable on non-designated grassland (Case study: Salisbury Plain). Looking at wetlands, a 2006 study[2] showed that 51 per cent of SSSI land in the Norfolk fens was in favourable or recovering condition, compared with only 31 per cent of fenland outside of SSSIs. And for heathland SSSIs, a 2006 study[3], showed that 19 per cent were in favourable condition, while no area was assessed as being in favourable condition outside of the SSSIs.

While the monitoring of SSSIs is focused on the quality of habitat and the presence or otherwise of certain indicator species, longer term population studies of key species at certain sites have revealed more specific impacts on wildlife (Case studies: Bryanston Barn, Breckland Farmland).

Of all the habitat types, open water – which comprises lakes, reservoirs, ponds, rivers and canals – has proved to be the most difficult to improve. Although significant progress has been made in the past few years, currently only 80 per cent of SSSIs in this category are in recovering or favourable condition. The main reasons for this are the colonisation of non-native species, pollution from agricultural land and the recycling of nutrients stored in lake sediments. In most cases pollution comes from outside of the area covered by the SSSI and requires solutions that cover the entire catchment area of a river system. The National Catchment Sensitive Farming Delivery Initiative is helping to address this issue by encouraging the sustainable use of fertilisers and pesticides, the maintenance of good soil structure and the establishment of grassland buffer strips to reduce the amount of nutrient run-off into water courses.

Natural England is also working with the Environment Agency and other partners to develop River Basin Management Plans which seek to identify the measures needed to improve water quality for each drainage area. Guidance has also been provided to water companies to ensure that their current five-year plans can deliver their statutory obligations in relation to SSSIs and other protected areas, for example by upgrading water treatment works to include phosphate stripping technology.

1,2,3: See page 39 for references

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Protecting geodiversity

More than a quarter of all SSSIs are designated for their geological importance. These include unique limestone landscapes, extensive cave systems, disused quarries, and sites that preserve internationally significant fossils. The inclusion of geological sites in the target for SSSI condition has led to integrated management that has benefited both geological and biological interests.

Funding generated by a range of management agreements, including Environmental Stewardship and Conservation Enhancement Schemes, has been important in restoring many sites. At Tunstall Hills and Ryhope Cutting SSSI for example, Sunderland City Council has received Higher Level Stewardship funding to manage natural outcrops, disused quarries and an area of limestone grassland. The clearance of scrub and the removal of scree from rock faces is now helping to conserve a site rich in geological and botanical interest and provides a valuable area of green space in the midst of an urban landscape.

Many of the geological features on SSSIs have required significant engineering projects to improve their condition. Southerham Grey Pit SSSI for example, a former chalk quarry in Sussex, exposes a unique record of Cretaceous rocks. Restoration of the site required the excavation of a 200m section of rock debris.

Over the past ten years, work on many geological SSSIs has not only improved their condition and accessibility, but has lead to new research opportunities and the development of new conservation techniques. On a number of Precambrian fossil sites in the Charnwood area, for example, a ground breaking mould and cast technique has been developed to provide perfect replicas of sections which are difficult to access and sensitive to both weathering and, occasionally, vandalism.

A great many geological sites offer huge interest to the wider public, such as the Dorset coastline, which as well as being an SSSI is also recognised as a World Heritage Site (Case study: West Dorset Coast). Other sites, notably England's extensive network of cave SSSIs are much harder to reach, but have benefited from the help of a dedicated group of enthusiasts who are combining sporting interests with that of conservation (Case study: Leck Beck Head).

The management of geological SSSIs over the past ten years has put 86 per cent in a favourable or recovering condition. However, a number of challenges exist to improving the remaining sites, including the need for further large scale engineering works. Much of the management work that has been undertaken on geological SSSIs is the result of one-off restoration projects and for the future it will be important to secure longer term management agreements, otherwise sites may revert to their original condition as scrub vegetation and loose rock encroaches on exposed geology.

The wider benefits of SSSIs

SSSIs do more than just preserve the best of our natural heritage. They present opportunities for the development of rural businesses, provide places for recreation and scientific research, and safeguard essential services such as clean water, flood management, carbon storage. pollination and food production.

A major scheme operated by United Utilities to improve water quality in the North West and the Peak District illustrates how the interests of conservation and business can go hand-in-hand (Case study: Dark Peak). In the Yorkshire Dales, farmers have been able to develop new markets through a new scheme that has helped protect the renowned limestone landscape through the introduction of traditional cattle breeds (Case study: Malham-Arncliffe).

The protection offered to SSSIs provides a degree of security to change and outside influence that makes them ideal places to conduct scientific research. For example, SSSIs account for a significant proportion of sites adopted by the Environmental Change Network, the UK's multi-agency, long-term environmental monitoring programme.

A rock climber on Curbar Edge, Derbshire, part of the Eastern Peak Moors SSSI

Many of the SSSIs that provide the best opportunities for publc recreation are also designated as National Nature Reserves, of which there are 224. Natural England manages two thirds of these sites, which collectively attract more than 15 million visitors each year. Shapwick Heath, for example, which forms part of around 3,000 hectares of the Somerset Levels that are now being managed for nature conservation, attracts more than 80,000 visitors each year. Many come to see the breathtaking gatherings of starlings, known as murmurations. These occur during the autumn months as several million starlings come together in huge 'clouds', twisting and turning in the evening sky, before roosting for the night in the reed beds.

Other National Nature Reserves are run by conservation organisations and local authorities and attract similar numbers of visitors. The most visited of all, Richmond Park, is enjoyed by more than three million visitors each year and conserves an extensive area of ancient woodland and grassland within the confines of suburban London (Case study: Richmond Park).

SSSIs are not only important for tourism and scientific research; they can also form an important part of the history and cultural identity of a local area as at Wren's nest in Dudley (Case study: Wren's Nest).

The legal protection of SSSIs

Notification as an SSSI gives a significant degree of regulatory control and legal protection. The notification package for each site includes a list of activities that may damage its natural features and which cannot be undertaken without consent. These are wide ranging and include activities such as: the felling of trees; the introduction of grazing; the application of fertilizer; and the filling of ditches or ponds. However, it is usually possible to carry out many of these operations in certain ways or at specific times of year, or on certain parts of the SSSI, without damaging the features of interest. Therefore, in the vast majority of cases advisors are able to give consent.

If no agreement can be made to accommodate a certain activity, consent will be refused and the activity cannot legally go ahead. During the period 2009-2010, less than 1 per cent of requests for consent were refused, while a greater proportion were granted with conditions.

Prosecutions may be brought in instances where actions are conducted on SSSIs without the required consent – although such cases are rare as Natural England always seeks to resolve issues without resort to the courts. Prosecutions may also be brought against any person who damages an SSSI or disturbs plants or wildlife found there. In the four years since Natural England was established, six prosecutions have been brought. These cases have included the construction of tracks and car parks on areas of moorland and fenland; setting moorland alight; a dog walker disturbing birds, and overgrazing of lowland bog. In some of these cases the defendants were ordered to repair any damage that had been caused to the SSSI.

As well as deliberate damage, SSSIs can be adversely affected by neglect or poor management. In these instances Natural England attempts to work with owners and occupiers to improve management techniques and identify possible sources of funding. In cases where a voluntary agreement cannot be reached a formal Management Scheme may be drawn up setting out the measures required on the site. If this fails to result in improvements a legally enforceable Management Notice can be issued. Effective negotiations with landowners to establish voluntary agreements has meant that, in recent years, only one Management Scheme has been issued, while no Management Notices have been required.

The future of SSSIs

Looking ahead ten years, it is anticipated that SSSIs will remain a lynchpin of England's conservation strategy. By that time a higher proportion of sites can be expected to be in favourable condition, maintaining in full the features for which they were notified. The wide-ranging management agreements established by SSSI owners and managers throughout England will go a long way towards achieving this. In many cases it should only be a matter of time before new regimes result in the re-establishment of features such as rich woodlands, fens and grassland. However, a significant number of sites will require a period of more than ten years before natural habitats are fully re-established. This recovery period is influenced by the nature of the habitat and the degree of past disturbance. In the case of blanket bog, many areas will take a further 40 to 50 years to reach a favourable state.

While a steady improvement in the condition of SSSI can be expected, significant challenges also exist in maintaining the status of many sites in a favourable or recovering condition. An analysis of the key pressures on these sites reveals that 205,000 hectares, or 19 per cent of SSSIs may be at risk of moving into declining condition. The most significant risk is to sites that are currently under no management agreement and are, therefore, susceptible to falling into neglect. Other pressures which could cause sites to fall out of favourable or recovering condition include the impact of recreational use, non-compliance by site managers and lapses in funding.

Risks to SSSI in favourable or recovering condition*

Reason for unit being identified at risk	Area identified as at risk (hectares)
Alien species, deer and disease	7,000
Hydrological Impacts (eg. decline in water quality or change in water levels)	37,000
Indirect impact from development and recreation	8,900
Land manager not complying with management agreement	25,200
Land manager not complying with permission or inappropriate historic permission	16,700
Land used for development	374
Lapse in partnership funding	20,200
No management agreement in place	58,300
Pollution, other than air pollution	2,400
Species undergoing significant fluctuations	41,600

* Data is not inclusive of all sites

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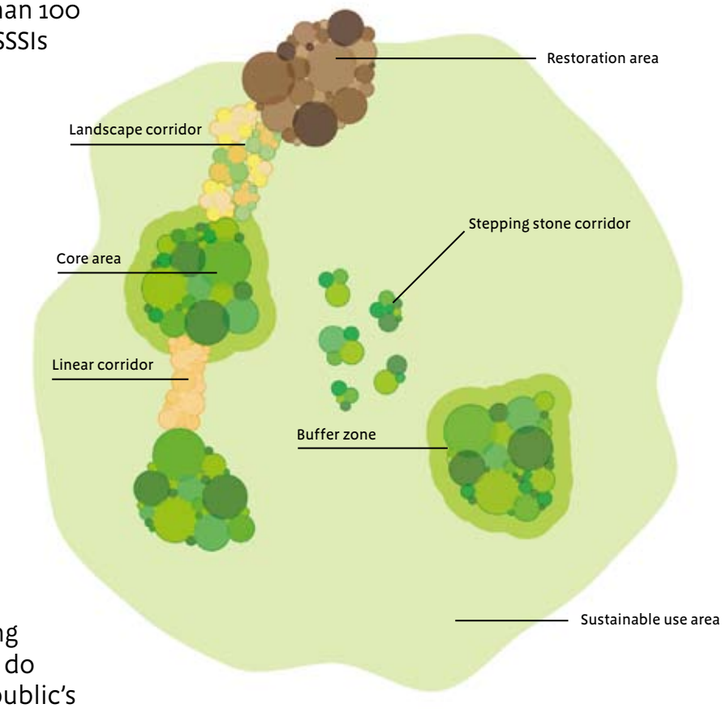
Added to these risks are the impacts of more widespread influences on the natural environment, notably climate change, coastal erosion and air pollution. Meeting these challenges in the coming years will require the continued refinement of monitoring and evaluation procedures and may result in the need for new sites to be notified as well as for some existing sites to be de-notified.

It is also important to consider how the SSSI network might respond to the priorities set out in the Government's recent review of wildlife sites and ecological networks, undertaken by Professor John Lawton. Whilst a few SSSIs, such as Salisbury Plain, the New Forest and the North York Moors, stretch over entire landscapes, most cover less extensive areas. Throughout England, 77 per cent of sites cover an area of less than 100 hectares each. One vision for SSSIs would be to enable them to become resilient sources of biodiversity that, in combination with other designated areas, such as National Parks, Areas of Outstanding Natural Beauty and Local Wildlife Sites, can help to build a coherent ecological network.



Components of an ecological network (from Lawton, J. Making Space for Nature)

The ongoing monitoring and maintenance of SSSIs will probably continue to require substantial public funding, supplemented by resources from voluntary organisations and grant making bodies. It will be important to do more to increase the general public's interest and involvement in SSSIs and harness the skills and enthusiasm of voluntary organisations and local communities in safeguarding their future.

Sixty years ago, SSSIs were established with the aim of conserving the full range of habitat and species that exist in England. It is testimony to the vision that, as the Lawton review concluded, they achieve this goal today. They represent a repository of all that is great about our natural heritage, and should be seen as the foundation of our ecological network. A foundation on which, over the next ten years, our natural heritage can be encouraged to become more resilient to change.

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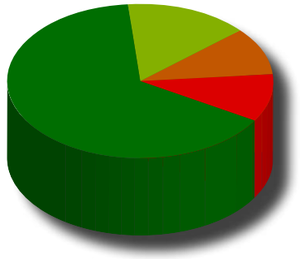
Case studies

The pie chart in each case study gives a breakdown of its condition, according to the categories below. For each SSSI a link is provided to the Natural England website, which provides a detailed map of the site, a description of its notable features and the most recent condition assessment.



- % Area favourable
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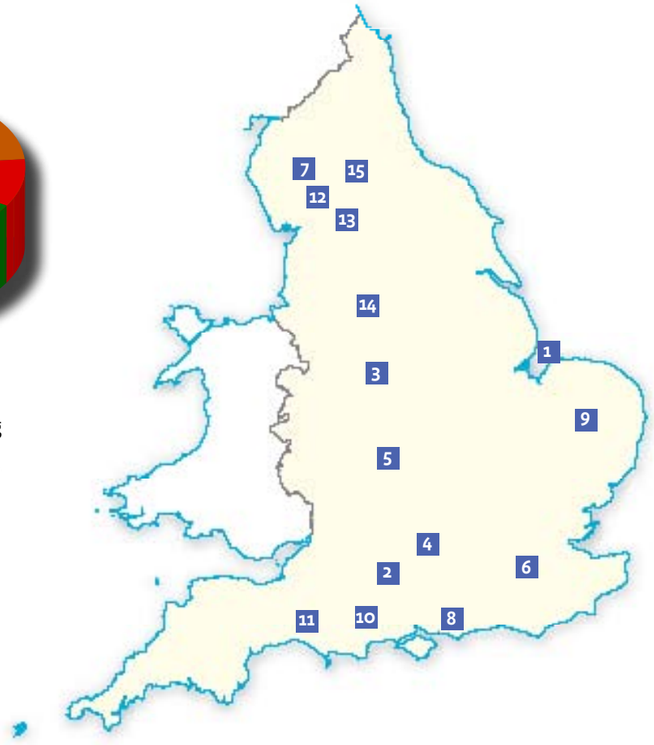


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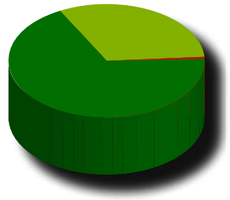
The Wash:
a wetland wilderness



England is a magnet for wildfowl, waders and gulls, with an estimated five million present during winter and at times of the Spring and Autumn passage. The English populations of species such as knot, grey plover, bar-tailed godwit, pintail, Brent goose, and Bewick's swans constitute 25 per cent or more of the species' international totals. The Wash, which regularly supports 320,000 wildfowl and waders, and a further 47,000 gulls in winter, is by far the most significant site for waterbirds in Britain and is one of the most important wetlands in Europe. It is also England's largest SSSI, covering 62,000 hectares – an area larger than Greater London.

Despite its international importance for wildlife, the Wash was in a perilous state by the end of the 20th century. Years of over-fishing had contributed to a collapse of shellfish numbers, which had a severe impact on the number of wading birds, as well as the local fishing industry. Thousands of oystercatchers were found dead on the mudflats and the numbers of knots fell by tens of thousands. In 1997 the cockle fishery was closed due to a lack of stocks and the harvesting of mussels from natural beds fell to the lowest ever levels.

Since that time, dialogue between the fishing industry and conservationists has helped to establish new management policies, for example, the closure of fisheries on cockle beds that contain a significant proportion of juvenile stocks. As a result shellfish numbers returned to record levels by 2007 and today the populations of knots and oyster catchers are steadily recovering. The most recent assessment for the Wash put 68 per cent of the area in a favourable condition, and 31 per cent unfavourable but recovering.

Mat Mander, Chief Fishery Officer for the Eastern Sea Fisheries Joint Committee, said: "The development of these policies is an important milestone for the industry, natural environment and local people. Our work is already making a positive impact, enabling Natural England to change the conservation status of many parts of the SSSI, which is fantastic news and a huge step towards where we want to be in the future."

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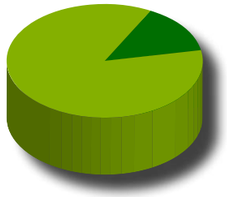
Salisbury Plain:
defending grasslands



Salisbury Plain is the biggest area of chalk grassland in North West Europe, and represents 41 per cent of Britain's total area of this rich wildlife habitat. Most of the area is owned and managed by the Ministry of Defence, which uses the rolling landscape for military exercises. A member of the SSSI Major Landowners Group, the MOD has worked to improve the condition of significant parts of the Plain from declining to recovering. Much of this has been achieved though a major £4.2 million restoration project supported by the EU LIFE fund and involving a wide range of partners, including: the Defence Estates; the RSPB; Butterfly Conservation; and the Centre for Ecology and Hydrology.

The Plain's wide expanses of grassland provide a home to 67 threatened insect species including cuckoo bees, mining bees, and the tawny bumble bee. It is also a nationally important site for a species of fairy shrimp, Chirocephalus diaphanous, which is protected under the Wildlife and Countryside Act and listed on the UK Biodiversity Action Plan.

An Iron Age hill fort at Battlesbury stands within one of Europe's most important grassland habitats.

This species lives only in temporary pools, such as those created by vehicles and cattle (a rare and declining habitat in the UK). On the Plain this habitat is established by the passage of tanks and other military vehicles that use the area.

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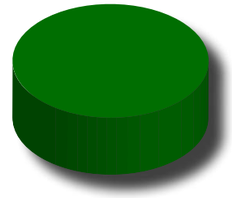
Wren's Nest:
history set in stone



The outcrop of limestone near the centre of Dudley, known as Wren's Nest, is world famous for its well preserved Silurian coral reef fossils and has also shaped the industrial and cultural history of the Black Country.

The significance of Wren's Nest was first revealed during the Industrial Revolution when the excavation of huge amounts of limestone left the area honeycombed with caverns. The most impressive of these, known as the Seven Sisters, is considered to be the world's last remaining surface opening limestone mine. In the past 200 years, more than 700 types of fossil have been uncovered here, including 86 found nowhere else on Earth. One particular species of trilobite was so common in the area that it became known as the Dudley Bug and for a time featured on the town's Coat of Arms.

When mining ended in the early 20th century nature took over much of the site and Wren's Nest has now become an important refuge for flora associated with limestone, including county rarities such as; Autumn gentian, small scabious, common gromwell and bee orchid. Wooded areas support birds such as; sparrow hawk, stock dove, tawny owl, green and great spotted woodpeckers, and nuthatch, while the caverns are a nationally important hibernation site for seven species of bat.

Residents of Dudley take part in a fossil hunt at Wren's Nest.

In 2001, a major rock fall occurred in the Seven Sisters and part of the cavern was subsequently filled in to ensure public safety. Today, while the site is subject to the usual pressures that affect areas of open space amongst dense urban environments, Wren's Nest continues to occupy an important part in the life of the Black Country. A geological trail and interpretation boards help visitors explore much of the site, and wardens arrange guided walks, fossil hunts and visits to the caverns.

In the future, the reputation of Wren's Nest as a unique natural treasure is set to grow. A grant of almost £800,000 from the Heritage Lottery Fund is enabling Dudley Metropolitan Borough Council to improve public access to the Seven Sisters, expand its programme of environmental education and develop volunteering and training opportunities at the site. Councillor David Stanley, cabinet member for environment and culture in Dudley, said: "Wren's Nest is steeped in history and thousands of people visit every year. This money will help us celebrate and build on that history and bring even more people to the borough."

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Lye Valley:
volunteering in action

A short distance from the centre of Oxford, Hogley Bog presents a scene every bit as inspiring as the city's dreaming spires.

Over a period of two years, volunteers from the Oxford Urban Wildlife Group, together with ground staff from nearby Southfield Golf course, moved mountains to restore this tiny piece of urban fenland – part of the Lye Valley SSSI. This included cutting back reed and clearing Himalayan balsam, a non-native plant that grows to a height of two meters, shading out other native species. This has helped rare species to thrive in Hogley Bog, including the beautiful grass-of-Parnassus (bog-star) and the tiny creeping bog pimpernel, as well as water penny beetles and the banded general soldierfly.

Local naturalist, Judy Webb, who helped organise the work, said: "This is one of the most exciting habitats within the bounds of Oxford City and its survival in an urban context is quite remarkable. When the serious problems at this site caused by stream erosion nearby are solved, it is hoped that volunteers will continue to assist in fine tuning the management to the further benefit of the rare species".

Volunteers clear invasive Himalayan balsam at Lye Valley.

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Misterton Marshes:
a natural partnership

At Misterton Marshes in Leicestershire, a Higher Level Stewardship Agreement is helping to transform an important wetland habitat.

The site supports a diverse breeding bird community including cuckoo, reed bunting and sedge warbler and also contains many threatened habitats such as flood plain grassland, neutral grassland, fen meadow and tall fen. Under a ten year HLS scheme, Natural England is working with Leicestershire County Council, the Environment Agency, and Leicestershire and Rutland Ornithological Society. Planned work includes scrub clearance and the introduction of native sheep to graze.

The Environment Agency has also helped to fund construction of a series of wooden dams to raise water levels and encourage the development of fenland and marsh. The impact of these changes will be monitored through annual surveys undertaken with the help of volunteers.

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Sedge warblers are benefiting from improved wetland habitat at Misterton Marshes.

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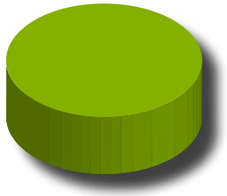
Richmond Park:
getting the grazing right



Richmond Park is the largest open space in London, covering almost 1,000 hectares. It has been managed as a royal deer park since the 17th century and was designated as a Site of Special Scientific Interest in 1992 and a National Nature Reserve in 2000.

The Park's many ancient trees make it one of the most important sites in England for deadwood beetles, with more than 340 species being identified. The Park also includes an extensive area of dry acid grassland, which is characterised by species that thrive on nutrient poor soils such as brown bent, sheep's fescue, wavy hair-grass, and heath bedstraw.

Cattle are helping to improve the diversity of grassland habitat in Richmond Park.

The management of this grassland has been problematic due to the dominance of deer in the Park and the absence of traditional cattle grazing – which breaks up the turf structure and enables a greater range of species to flourish. The Park's dual role as one of London's most important nature reserves and a site that attracts several million recreational visitors a year has made this difficult to address, resulting in large areas being assessed as in a declining condition.

Since 2008, however, cattle grazing has been introduced on a trial area of the Park, in order to gauge the benefits to habitats as well as the response from park visitors. Initial results have been positive, and have led to the adoption of a new management plan by The Royal Parks that could see the appearance of tradition cattle breeds on a range of sites across the Park.

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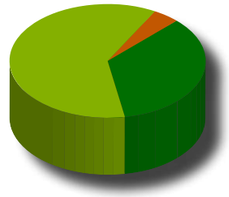
Whitbarrow:
woodland management



Whitbarrow in Cumbria, a Forestry Commission owned SSSI, includes an area of limestone pavements that ranks among the best in the country for its diversity of species.

Here foresters have removed plantation trees from large areas of the holding in a bid to safeguard the rare limestone features and to promote the re-establishment of semi-natural woodland such as ash, hazel, yew, small-leafed lime and juniper. The work has created more open woodland, which is of benefit to a range of butterflies including the increasingly rare high brown fritillary.

The removal of plantation trees at Whitbarrow has aided the establishment of semi-natural woodland.

Jonathan Spencer, the Forestry Commission's Senior Ecologist said: "Our foresters and ecologists have proved that you can balance wildlife interests with producing sustainable, commercial timber, alongside all the other public benefits that the Forestry Commission's unique brand of multi-purpose forestry can deliver."

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Sinah Common:
coastal restoration

At Sinah Common SSSI in Hampshire, volunteers from BTCV have helped turn an area of saltmarsh, heathland and sand dunes into recovering condition through scrub clearance, path improvements, biodiversity monitoring, and beach cleaning.

Volunteers from BTCV help clear the beach as Sinah Common, a home for the rare childing pink (inset).

The site is one of only two places in Britain where the childing pink grows, a small herb with star shaped lilac flowers. Ron Fern, Group Operations Director at BTCV said: "The SSSI label encourages landowners to take extra steps to maintain and improve their sites and often that means coming to BTCV for our expertise and skills. As well as making sure valuable sites are properly managed, it means our volunteers get the opportunity to work on some of the most interesting and beautiful sites across the country."

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Breckland Farmland:
an arable nature reserve

Outside of areas of semi-natural habitat, SSSI designation has helped protect biodiversity on intensively used agricultural land as here in the Breckland area of East Anglia.

One of England's rarest birds, the stone curlew, is now thriving at Breckland Farmland.

Farmland birds are one of the species groups that have experienced the most significant declines over the past 50 years. But in East Anglia the extensive SSSI of Breckland Farmland, which stretches over 70 farms, has bucked the trend. Here the population of stone-curlew, one of Britain's rarest birds, has risen steadily due to measures such as encouraging the use of spring sown crops which help support their favoured nesting habitat. Across the SSSI, numbers have increased from 109 breeding pairs in 1999 to the current total of 230 – which accounts for 60 per cent of the British population. The UK population of stone-curlew is currently the only one in Europe that is increasing.

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Bryanston:
a five star bat roost

Twenty seven SSSIs are notified to protect the greater horseshoe bat – one of Britain's rarest animals, with a population of approximately 5,000. Conservation work at these sites focuses not only on the structures in which the bats roost and hibernate, but also on the habitat in which they forage.

Funds from Higher Level Stewardship and other agri-environment schemes have enabled a range of measures, including: the protection of pasture that provides habitat for beetles and moths (the bat's main food); the maintenance of hedgerows and woodland that give protection from predators; and improvements to buildings to maintain good spaces for roosting and hibernation. Many landowners have also raised money independently to undertake this work.

Because bats are nocturnal, estimating population numbers is extremely difficult. On a number of sites, however, where habitat improvement has occurred, recorded bat numbers have increased by as much as 50%. At Bryanston SSSI in Dorset, greater horseshoe bats have been studied for more than 50 years. The site covers just over a quarter of a hectare, with the bats roosting in the remaining section of a disused country house. The greater part of the SSSI is owned and managed by The Vincent Wildlife Trust, which has done a great deal of work to improve the roosting and hibernation opportunities for the bats.

Conservation measures at 27 SSSIs are helping to increase the population of greater horseshoe bats.

Colin Morris, The Vincent Wildlife Trust's Reserve Manager said, "Conservation work at Bryanston has been very successful, with a 100 per cent increase in the number of adults in residence (103 to 206) and an increase of 87 per cent to the number of juveniles born (55 to 103) in the past ten years. Having SSSI status is important to protect this vital roosting and hibernation site, and may help our case in the future to protect nearby grazing pasture from the impacts of development."

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West Dorset Coast:
world class geology

The cliffs of West Dorset Coast SSSI form part of the Jurassic Coast World Heritage Site and are the centrepiece of an iconic landscape that attracts hundreds of thousands of visitors. Here the force of nature is continually exposing evidence of our prehistory and providing never ending opportunities for professional and amateur fossil hunters alike.

At Lyme Regis the Jurassic rocks have yielded thousands of extremely well-preserved fossils, including ammonites, ichthyosaurs and occasionally dinosaurs. A Scelidosaurus, which was uncovered between 2002 and 2005 remains the most complete dinosaur skeleton ever found in Britain.

To help manage some of the pressure from large visitor numbers to this delicate landscape, local landowners, conservation organisations, museum curators and local fossil collectors have developed the West Dorset Fossil Collecting Code. A leaflet aimed at the general public has also been distributed.

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The iconic landscape of West Dorset Coast is also recognised as a World Heritage Site.

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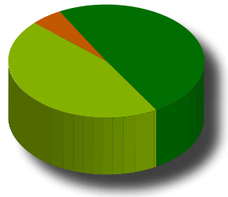
Leck Beck Head:
charting the underground environment



The Easegill cave system, which lies under Leck Fell on the Lancashire-Cumbria border, is the longest cave in the UK, with 70 km of known passages. The system is also considered amongst the 20 longest caves in the world. It contains dated sediments which preserve a near perfect record of climate history, as well as stunning stalactites and calcite formations.

Following years of dedicated work by volunteers from local caving clubs and the establishment of the Northern Caves Monitoring Project, the latest survey of the system is nearing completion. More than 70 features of scientific interest have been assessed following common standards agreed with Natural England. Evocative names such as the Colonnade Chamber, the Hall of the Mountain King, and Easter Grotto, describe various features in the system, some of which take up to nine hours to reach.

Ray Duffy of the Red Rose Cave and Pothole Club, who took part in the survey said. "It has taken us 13 years to complete an accurate underground map on which we can plot the key features of the cave. Despite this epic task there is still a vast amount to discover and record in Easegill."

While the underground survey has helped to verify the condition of much of the cave, the limestone features on the over-ground parts of Leck Beck are affected by overgrazing, resulting in a significant portion of this SSSI remaining in a declining condition.

Caving enthusiasts have helped chart the natural features of England's longest cave under Leck Beck Head.

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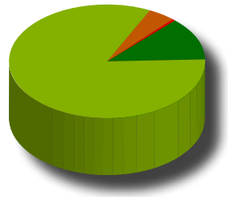
Malham-Arncliffe:
promoting the rural economy



New opportunities for rural business have been opened up through projects aimed at restoring a better balance between farming and the natural environment on and around SSSIs.

In the Yorkshire Dales, for example, a move from mixed farming to specialised sheep farming during the last 50 years has adversely affected the diversity of flora across the area and impacted on its extensive limestone pavement.

Grazing by Highland cattle is helping to protect limestone pavement at Malham.

Now the Limestone Country Project has supported the re-introduction of farming methods that once shaped this landscape. The project, which covers eight SSSIs, has been supported by the European Commission's LIFE Fund. Under the scheme grants have been provided to establish hardy upland cattle breeds, such as highland, belted Galloway and blue gray, whose grazing patterns help to re-create the mosaics of habitats which once thrived in this part of the Dales.

Robert Phillips owns a herd of 250 highland cattle, part of which grazes land at Malham Cove. "The Limestone Country Project helped to kick start the growth of our beef herd, and has transformed the nature of our farm," he said. "The bulk of our beef is now sold direct from the farm shop, where customers appreciate the relationship between traditional breeds and the sustainable management of the landscape".

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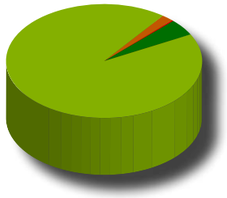
The Dark Peak:
restoring nature's services



By helping to protect the integrity of natural ecosystems, SSSIs can provide huge economic benefits through securing vital public services such as the provision of fresh water, flood alleviation and carbon storage.

A major scheme devised by United Utilities illustrates many of these benefits. The company owns around 57,000 hectares of land in the North West and the Peak District, on which it collects and stores water for around seven million people. More than a quarter of this area is designated as SSSI, including areas such as the Dark Peak, the Goyt Valley and the Bowland Fells.

The impact of air pollution, combined with past management regimes, has resulted in the degradation of large areas of upland moorland and blanket bog across this area. As well as diminishing the value of the land for wildlife, the erosion and desiccation of peat has also caused a decline in water quality, in particular increasing levels of colouration and cloudiness. This has added to the costs of treatment needed before water can be supplied to United Utilities customers.

The Sustainable Catchment Management Programme (SCaMP) was started in 2005 and covers 45 land holdings and 21 farms over an area of 20,000 hectares. Under the plan a range of environmental improvements have been made including: re-vegetating bare peat; blocking drainage channels (known as grips); introducing dwarf shrub species; establishing new woodland; and adopting more sustainable grazing regimes. These measures have been funded directly by United Utilities, as well as through Environmental Stewardship grants.

As a result of these measures, SSSI land in the project area has gone from 17 per cent in favourable or recovering condition to 98 per cent. While the impact on natural habitats and biodiversity is already apparent, the effect of SCaMP on water quality and other services will take more years to evaluate. However, an interim study shows that, over parts of the programme area, the water table is now higher and more stable and there has been a positive impact on water quality. Initial calculations of changes in carbon losses resulting from the grip blocking also suggest significant reductions, which is of considerable significance in terms of maintaining the level of carbon storage in peat.

While the evaluation work continues, SCaMP is now beginning its second phase of operations covering a further 30,000 hectares. Philip Austin, Programme Manager at United Utilities said: "Future evaluations of SCaMP will provide extremely valuable data on the impact of landscape scale conservation initiatives on the provision of essential services from the natural environment."

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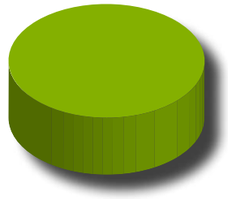
Bowes Moor:
a common approach to grouse moor management



Bowes Moor is a large upland common in the Pennines of west Durham. Here, extensive areas of blanket bog over-lay deep peat to form a rich habitat for species such as golden plover and merlin, while grouse shooting and common grazing rights form an important part of the local economy. In common with all areas of deep peat, the value of the moor as a carbon store, is also being increasingly recognised.

As with most moors of this type in northern England, burning, grazing and the drainage of blanket bog during the 20th century had damaged its natural diversity. Consequently, in 2002 most of the land was assessed as being in an unfavourable condition, declining or no change. Black grouse, once common across all the uplands of northern England, are a good indicator of declining habitat quality. At Bowes and elsewhere there has been a steep decline in their numbers. Male black grouse are known for their distinctive courtship behaviour, known as lekking, in which groups of up 40 birds strut around at dawn, displaying their black and white plumage and calling loudly.

The spectacular black grouse is benefiting from moorland restoration work at Bowes Moor.

The beginnings of a transformation for the SSSI came in 2006, when representatives of the commoners, grazers, the sporting estate and Natural England formed the Bowes Moor Forum in order to develop a common understanding of the challenges it faced and to agree a process to improve the land.

Support to resolve the issue of moorland drainage came from 'Peatscapes', a programme managed by the North Pennines Area of Outstanding Natural Beauty, while the North Pennines Black Grouse Recovery Project and the RSPB provided technical advice on the recovery of black grouse numbers and of other local birds.

These initiatives led to the establishment of an Environmental Stewardship Agreement in 2007, which is helping to fund a programme of drain blocking, heather burning, stock reductions, rush management, tree planting and improved access. By 2010 all the drains on Bowes Moor had been blocked and the last remaining management changes led to an assessment of 100 per cent of the land in recovering condition.

▶ Click here to find out more

A view over Rockford Common in the New Forest.

In undertaking the SSSI improvement plan, 21,571 units of land, across 4,119 sites have been individually surveyed. Here is one example from the New Forest:

Unit number:	404
Habitat category:	Broadleaved, mixed and yew woodland - lowland
Status:	Unfavourable recovering
Date of assessment:	25 Jun 2010

This is a large unit of mixed broadleaved woodland with some areas of wet alder carr. The area is being well managed through a Forest Design Plan. The canopy is mainly oak with some beech, a well developed understory of hazel, holly and hawthorn and a diverse ground flora along the ride/ track edges and within the open spaces. Ancient woodland indicator species included bluebell, violets, wood spurge. There is plenty of open space within the wood, large amounts of fallen and standing deadwood creating good habitat for stag beetle and there is evidence of regenerating canopy species. Some non native tree/ shrubs present, these will be dealt with under the long term plan.

All Natural England site assessments can be found on our website at:
www.sssi.naturalengland.org.uk/Special/sssi/search.cfm

Data sources

Statistics on SSSI condition are taken from Natural England's data base. Up-to-date records covering every SSSI as well as national and local summaries are available at:

www.sssi.naturalengland.org.uk/Special/sssi/search.cfm

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