

Benefits of SSSIs in England and Wales

Sites of Special Scientific Interest

Sites of Special Scientific Interest (SSSIs) are the best places for wildlife and geology nationally. There are 5,000 SSSIs in England and Wales. They are legally protected and effort and resources are devoted to maintain and enhance their conservation interest. Public expenditure on SSSIs totals £101 million in England and £10 million in Wales annually.

This document summarises the findings of research commissioned by Defra to examine the benefits that SSSIs provide to wildlife and people. The research examined:

- The **conservation benefits** of SSSIs – the role they play in conserving species, habitats and geological features;
- The **ecosystem services** delivered by SSSIs – the goods and services that sites provide to people; and
- The **economic value** of these benefits.

Conservation Benefits of SSSIs

SSSIs play an important role in the conservation of the most important species, habitats and geological sites in England and Wales – the key features for which sites are designated. SSSIs:

- Protect a large proportion of **species** in England and Wales, including most rare species. Although there are some gaps, they are seen to be representative of our wildlife as a whole. They have helped to protect some species which would otherwise be at risk of extinction nationally.
- Protect the majority of semi-natural **habitats** in England and Wales and have been effective in preventing further habitat loss. Coverage varies by habitat, and some agricultural and brownfield habitats are under-represented by the series. However, for other semi-natural habitats, a very small proportion of remaining area survives outside SSSIs, demonstrating the effectiveness of SSSIs in conserving them.
- Provide effective protection for the most important **geological features** in England and Wales.

SSSIs help to protect sites from development and adverse pressures, and to promote sympathetic management to maintain and enhance their conservation interest. However, many sites have fallen into unfavourable condition and do not meet their full potential. Considerable efforts and resources are being devoted to and restoring their conservation interest, which is often a long term process.

SSSIs are not in themselves seen to provide an effective ecological network, as many are small, fragmented and insufficiently connected, and many habitats lie outside them. SSSIs have a role to play at the core of an ecological network, but the need for nature conservation policy to look beyond them is recognised.

Ecosystem Services Delivered by SSSIs

SSSIs deliver a range of services to people and the economy. These include:

- **Cultural services** – SSSIs are widely appreciated by people, support recreation and tourism, provide a resource for scientific research and education about wildlife and geology, and contribute to cultural landscapes and sense of place. People benefit from the knowledge that SSSIs conserve our rarest and most threatened wildlife, habitats and geology for the benefit of society and for future generations. SSSIs provide a special experience to visitors, but nationally they do not attract larger numbers of visitors per hectare than sites in the wider countryside.
- **Regulating services** – SSSIs contribute to water purification and regulation of climate, water and natural hazards by protecting and enhancing natural processes. These services are not measured at most sites. The delivery of these services is affected by site condition. For example, the ability of some SSSIs to store carbon and regulate water flows may be enhanced as these sites are restored to favourable condition over time.
- **Provisioning services** - Most SSSIs produce goods such as food, timber or fresh water. SSSI management may reduce commercial food and timber production but contribute to the

conservation of genetic resources by using rare livestock breeds and protecting plant species that could be used as crops in future.

Examples of ecosystem services include:

- Genetic resources - crop wild relatives (CWR) are potentially important for future agricultural production. A paper has shown that all 17 CWR hotspots that would need to be protected to conserve two thirds of CWR species are designated SSSI.
- Climate regulation –one study found that SSSIs store 1.8 times as much carbon per hectare as the wider landscape, especially as they protect carbon-rich soils in habitats such as heather moorland and wetlands.
- Cultural services - Around 50% of SSSIs are open to the public and more than 39,000 hectares of SSSI land are in or close to urban areas. SSSIs attract around 380 million visits each year and support more than 40 different types of recreational and educational activities.

It is difficult to quantify the overall contribution of SSSIs in delivering ecosystem services, because most are difficult to measure and vary from one site to another. However, according to the judgement of ecological experts, SSSI management helps to increase the delivery of a range of services, especially the cultural services.

Economic Value of the Benefits of SSSIs

The benefits provided by SSSIs can be measured in money terms and compared with the costs, though this is challenging because they are difficult to quantify and value. However, estimates from this and other studies suggest that the economic value of the benefits delivered by SSSIs is substantial and appears to significantly exceed the costs of the policy.

Existing evidence of the value of these benefits is available for a small but increasing number of sites. Much of the available evidence is for cultural services and demonstrates that the public is willing to pay to protect SSSIs and their wildlife and geology. People place value on the existence of SSSIs and their conservation interests, as well as the ability to visit them. A variety of studies also show that management of SSSIs and spending by visitors has significant positive impacts on local economies.

Examples of the value of benefits of SSSIs include:

- The Sustainable Catchment Management Programme (SCaMP) in the Peak District has restored degraded moorland in a 20,000ha catchment area, more than 40% of which is SSSI. Around 13,500ha of SSSI land has been restored into favourable or recovering condition, recreating habitats and enhancing biodiversity. It is estimated that the area is sequestering an additional 2000t of CO₂ per year, valued at £0.86m per year over 50 years. There have also been improvements in water quality in the catchment.
- Based on an average value of £1 to £3 per visit, one study estimated the overall value of recreational visits to SSSIs at between £372m and £1,110m per year.
- Early valuation studies estimated the aggregate willingness to pay of users of three SSSIs in Upper Teasdale, Skipworth Common, and Derwent Ings at £150,000, £1m, and £520,000 per year respectively at 1990 prices.
- A study of the Pevensey Levels Wildlife Enhancement Scheme (WES), which paid landowners and occupants to develop schemes which enhance SSSI wildlife habitats, found an estimated mean willingness to pay of £0.41 for non-users and £0.97 to £1.07 for users. Taking account of use values alone, the benefit cost ratio for the Pevensey Levels WES was 0.5; incorporating non-use values increased the benefit/cost ratio to 2.0.
- A study of the economic benefits of geodiversity estimated willingness to pay to access Wren's Nest National Nature Reserve (also SSSI) and the Jurassic Coast World Heritage Site (which comprises 14 SSSIs). At Wren's Nest, access to the whole site with educational material was valued at £21.26 per household per year compared to £7.83 per household per year without the provision of educational material. At the Jurassic Coast WHS, access with extensive interpretative material was valued at £62.35 per household per year compared to a value of £23.69 per household per year for access without educational material.
- Studies show that expenditures by visitors to SSSIs can bring substantial revenues to local economies, helping to support incomes and employment.

This study used the choice experiment technique to explore the values that members of the public place on SSSIs, by asking them to choose between different options for SSSI funding with different levels of costs and benefits. From this it was estimated that the public is willing to pay £956 million annually to secure the levels of services and benefits currently delivered by SSSI conservation activities in England and Wales, and a further £769 million to secure the benefits that would be delivered if funding for SSSIs was increased to enable them to all reach favourable condition.

Based on the areas of different habitats in England and Wales, it is estimated that the public is willing to pay £827m for the benefits currently provided by SSSIs in England and £128m for those provided by sites in Wales. The benefits of increasing funding to enable all sites to reach favourable condition are estimated at £666 million in England and £103 million in Wales.

These benefit estimates compare with the current annual public cost of the policy of £101 million in England and £10 million in Wales, and suggest an overall benefit: cost ratio of almost 9:1. SSSIs may restrict opportunities for economic development and food and timber production at the site and local level, though there is no evidence that these effects are significant nationally, and such restrictions must be balanced against the net positive benefits that SSSIs provide to society and nature overall.

Table 1 gives estimates of the value of the net benefits of SSSI management in England and Wales. Cultural services account for two thirds of the estimated value of the services currently delivered by SSSI conservation activities. The research found that the public has a high willingness to pay for the conservation of charismatic species.

Table 1: Estimates of the value of the net benefits of SSSI management, by ecosystem service, for England and Wales, based on willingness to pay estimates

Ecosystem service type	Ecosystem Service	Maintain funding scenario (£m per annum)¹	Increase funding scenario, compared to maintain funding scenario (£m per annum)²
Provisioning	<i>Nature's gifts</i>	3	2
Regulating	<i>Climate regulation</i>	135	182
	<i>Water regulation</i>	106	154
Cultural	<i>Sense of place</i>	81	67
	<i>Charismatic species</i>	425	188
	<i>Non-charismatic species</i>	88	52
	<i>Research and Education</i>	117	124
	Total	956	769
<i>Of which:</i>	<i>England</i>	827	666
	<i>Wales</i>	128	103

Table 2 presents estimates the value of the added services delivered by SSSI management, per hectare of different habitats. The highest per hectare values were estimated for sand dunes and shingle, heathland, intertidal mudflats and saltmarsh, bogs and broadleaved, mixed and yew

¹ Estimated benefits of SSSIs if funding is maintained at current levels

² Estimated benefits of SSSIs if funding is increased to a level that allows all sites to reach favourable condition

woodland. The variations in estimated values reflect a combination of factors including the different rates of service delivery, the varying effects of SSSI management on service delivery, and differences in the estimated value of different services.

Caution is needed in interpreting estimates of the economic value of the benefits of SSSIs, given limitations in available data on ecosystem services and their value, the complexity of the scenarios being assessed and the methodological challenges inherent in the valuation methods used. This study estimated the value of the benefits of ecosystem services based on people's willingness to pay, and adjusted for the added ecosystem services provided under SSSI status, and different policy scenarios, which involved some reasoned assumptions. The choice experiment focused on certain major ecosystem services only, not the full range of services potentially delivered by SSSIs, while the weighting matrix used to assess ecosystem service delivery employed conservative assumptions in assessing the added value of SSSI management. The results are therefore not absolute or comprehensive values, but estimates.

Table 2: Per hectare values of ecosystem services delivered by SSSI conservation activities by SSSI habitats under SSSI funding scenarios in England and Wales (£ / Ha/ yr), based on willingness to pay estimates

SSSI habitat	Maintain funding scenario (£ / Ha/ yr)	Increased funding scenario (£ / Ha/ yr)
Sand dunes and shingle	1,377	860
Heathland	1141	556
Intertidal mudflats and saltmarsh	1,035	709
Bogs	1007	1021
Broadleaved, mixed and yew woodland	1002	546
Lowland calcareous grassland	914	469
Rivers and streams	903	568
Fen, marsh and swamp	861	706
Acid Grassland	682	399
Canals	649	339
Neutral Grassland	642	436
Standing waters	622	487
Coastal and flood plain grazing marsh	450	463
Maritime cliffs	344	334
Purple moor-grass and rush pastures	312	522
Coniferous woodland	237	233
Inland rock	200	212

Overall Conclusions

The report concludes that SSSI status provides added protection, resources and profile to sites and therefore increases the benefits that they provide for people, wildlife and geology. The wildlife and geological features of SSSIs are in better condition than in the wider countryside, and the services that sites provide to society are enhanced.

Many sites are also protected by higher level designations (as Natura 2000 sites, Ramsar sites and National Nature Reserves). These higher designations apply especially to larger sites and cover a minority of SSSIs by number but the majority of the SSSI land area. They do not greatly affect the management of sites but have some additional benefits to sites and their users through higher levels of protection, some additional funding and added profile.

The level of funding for SSSIs is an important determinant of the benefits they deliver. The study explored the effects of alternative hypothetical funding scenarios for SSSIs, and concluded that:

- At current funding levels, and condition of SSSI, they provide substantial benefits to society though many do not achieve their full potential in terms of their conservation benefits or the services they provide. The annual value of the benefits if funding is maintained at current levels is estimated at £956 million;
- Increasing funding for SSSIs to enable all of them to achieve favourable condition would substantially increase the costs of the policy but would enhance the conservation benefits of SSSIs and the ecosystem services they deliver. The value of the additional benefits is estimated at £769 million annually;
- Removing funding for SSSIs would lead to a decline in their condition with a substantial reduction in the conservation benefits and ecosystem services they provide. The value of the benefits currently delivered by SSSIs would decline gradually over time.

The study found that there are gaps in current knowledge about the benefits of SSSIs, particularly relating to the measurement and valuation of ecosystem services, and the effects of management strategies on the levels of services delivered. More detailed assessment of the benefits and services delivered by individual sites would be beneficial, and would provide a stronger evidence base on which to develop economic valuation work in future.