



Benefits of Sites of Special Scientific Interest

Defra

Annex 5 – Summary of Stakeholder Workshops

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1 Introduction to the workshops

1.1 Introduction

This Annex presents the results of four workshops to explore the benefits of SSSIs. Each workshop involved experts and stakeholders with an interest in SSSIs in England and Wales. The aim of the workshops was to examine the benefits of SSSIs, drawing on the experience of stakeholders and with reference to case study sites. They also engaged participants in quantifying the services delivered by SSSIs, through a Weighting Matrix. The qualitative discussion of the benefits of SSSIs helped to inform the subsequent research, while the Weighting Matrix exercise fed directly into the later assessment and valuation of the ecosystem services delivered by SSSIs.

This Annex is structured as follows:

- **Section 1 provides an introduction to the workshops;**
- **Section 2 summarises the workshop discussions, setting out verbatim statements from the workshop participants.**
- **Section 3 summarises some of the most commonly and strongly voiced points to emerge from these workshop contributions.**
- **Section 4 summarises the main general points and issues relating to the benefits of the case study sites discussed at the workshops.**
- **Section 5 provides an introduction to each of the case study sites, and the benefits and services it provides.**

The results of the Weighting Matrix, and their use in assessing the value of the benefits of SSSIs, are presented separately in Annex 3.

1.2 Workshop Locations and Participants

During the study, workshops with key SSSI stakeholders were held across England and Wales, in the locations listed below. Those who participated, as summarised with each location below, had accepted an invitation which was widely circulated amongst a wide scope of bodies involved in managing and using SSSIs at a practical and a policy level. The events contained strong representation from amongst Natural England staff (and in Aberystwyth, from staff from Countryside Council for Wales), with these officers drawn from a range of roles and specialisms. Across the four workshops, a range of other bodies with varied perspectives and from different sectors were able to participate and make an input.

Sand Hutton, York, 6 July 2010: 18 Participants including representatives from Natural England, RSPB, Wildlife Trusts, CLA, NFU, Centre for Ecology and Hydrology, British Mountaineering Council.

Aberystwyth, 8 July 2010: 29 Participants including representatives from Countryside Council for Wales, WAG Sustainable Futures – SEED, Brecon Beacons national Park, Pembrokeshire Coast National Park, EA Wales, Welsh Water, Wildlife Trusts, RSPB, Plantlife, Hanson Quarry Products, NFU Cymru.

Peterborough, 15 July 2010: 27 Participants including representatives from Natural England, Defra, Environment Agency, Wildlife Trusts, RSPB, CLA, Queen Mary College, World Conservation Monitoring Centre.

London, 18 October 2010: 19 Participants including representatives from Defra, JNCC, New Forest National Park Authority, MOD, Thames Water, Essex and Suffolk Water, Somerset Drainage Boards, Grasslands Trust, Surrey Wildlife Trust, RSPB, Mineral Products Association, London Borough of Haringey, NFU, CLA.

1.3 Workshop Objectives

The workshops had four main roles:

- Briefing on the study, to ensure the stakeholders understood the aims and were able to offer feedback and advice on the general context for the work.
- Identification of the benefits of SSSIs, by considering specific examples which covered a range of different scales and situations.
- Collective discussion on the range of benefits identified, and the implications and the learning points arising.
- Review and discussion of the feedback from the Weighting Matrix (see Annex 3 and sections 3.3.4 and 5.6 of the main report).

1.4 SSSI examples reviewed at the workshops

The benefits of the specific example SSSIs were summarised and structured according to the main ecosystem service categories. Section 5 presents a summary matrix of each example site and the ecosystem services provided.

The sites examined at the workshops were selected in advance by an invited range of the participants in collaboration with the workshop facilitator. For each event, a range of habitats and situations were sought amongst the sites, to allow the prospect of a range of different benefits and associated issues to be considered amongst the examples. The participants who offered sites as examples were familiar with the respective site through a direct association or some familiarity with it. At each event, workshop participants chose one of the example sites to review in a small group format. The participant who had offered the example site provided a brief overview to the respective small group, before the group's members worked together to identify the range of likely benefits. In most instances, only the participant providing the overview-briefing was familiar with the site in question.

The list of example sites reviewed at each workshop is as follows:

York workshop

- Humber Estuary (The largest coastal plain estuary on the east coast of Britain, including extensive intertidal mudflats, and coastal lagoons)
- Mungrisedale Common (extensive upland moorland common in Cumbria)
- Purfleet (chalk pit geological site in West London)

Aberystwyth workshop

- Brecon Beacons (a range of upland habitats, heavily visited, in the heart of the Brecon Beacons National Park)
- Clemenstone Meadows (small, isolated meadow grassland in South Wales)
- Drostre Bank (isolated farm woodland in South Wales)
- Port Eynon (a mixed range of coastal habitats, heavily visited, on the Gower coast in South Wales)
- Ynyslas (a sand dune spit which is a specific unit within the southern tip of Dyfi SSSI – the site is heavily used by local people, holiday makers and for field visits)

Peterborough workshop

- Barnack Hills and Holes (limestone grassland NNR in East Midlands)

- Blo’Norton and Thelnetham Fen (lowland fen in Suffolk)
- Croham Hurst (urban woodland and heathland site in South London)
- Monks Wood (woodland and other fringing habitats – a NNR in Cambridgeshire)
- Wiveton Downs (a remnant esker geological site in Norfolk)

London workshop

- Chingford Reservoirs (artificial concrete bowls that are operational reservoirs - a major wintering ground for wildfowl)
- Roydon Woods (ancient woodland, heathland and old meadows in the New Forest)
- Norbury Park (chalk grassland in Surrey with linked farm diversification)
- Southlake Moor (wet grassland site within the Somerset Levels)

1.5 Workshop Discussions

Once the benefits of specific SSSIs had been identified and recorded in the respective matrix, the workshop participants considered the range of types of benefits which had emerged, and the implications and the learning points from these. All of this discussion was captured, mostly in the participants’ own words. These observations from participants are reproduced below under headings for the main points which arose.

2 Benefits of SSSIs - main points from the workshop discussions

The text throughout section 2 presents verbatim comments and questions made by participants at the workshops. These comments have been grouped into common themes as labelled by the main and secondary subheads.

2.1 Recognising the primary role of SSSIs

The biggest service provision from SSSIs is the biodiversity and geodiversity itself.

Ecosystem services and benefits to humans is an additional benefit of the SSSI designation. We should not let the designation reasoning get lost.

The imperative should be to ensure that a full range of ecological and geological features are considered through SSSI designation – this will secure benefits in the longer term.

There is no guarantee that SSSI status will prevent damage to a site in all instances, and often retrospective measures are required to halt damaging operations, and in such situations, damage may have already occurred.

SSSIs provide a guarantee of protection where this may not happen from land management at the site.

SSSIs have a flagship role for conservation.

SSSIs should protect the most important habitats across the UK – many benefits flow on from this.

SSSIs protect the best wildlife sites now and for future generations.

SSSIs have a 'destroyed' category in the condition assessment. This is rarely used but does sometimes happen eg. A car park developed on a grassland site, or ploughed up grassland.

SSSIs should act as a species refuge; be representative of characteristic habitat; and focus on ecosystem functioning.

SSSIs are concerned with looking after habitats for today and tomorrow – for national and local benefits and for communities.

SSSI benefits come from the special features of each site.

2.2 Benefits of SSSIs

Multiple benefits

SSSIs offer conservation value, recreational value, and a quality experience.

SSSI benefits should encompass carbon, food, water, landscape, and nice places to enjoy.

Sites don't have a single value – they can offer economic, cultural and other benefits.

The role and value of both charismatic and non charismatic biodiversity needs to be appreciated and captured.

SSSIs can allow provision of food and other products with special qualities eg cheese from Norbury Park, traditional wood products from Roydon Wood. This provides added-value from the green source of the product, and it can help consumer awareness of sustainable land management.

Many sites include both biotic and abiotic values and benefits eg. relating to rivers, coasts, quarries. Thus large-scale features of a site can provide a system- dynamic (such as clean

water and its range of associated benefits) as well as specific wildlife benefits relating to specific species and habitats.

Research as a key benefit

SSSIs offer a valuable role in providing research opportunities and offering evidence and learning points from research. It is important to take due account of this, especially as research does not appear to neatly fit the ecosystem service categories, and is labelled under cultural services.

Quantifying benefits

To help provide evidence and rigour, benefits need substantiating and quantifying where possible. This sometimes needs creative thinking to identify relevant evidence - for example, there are ways of quantifying benefits which may seem intangible at first eg. Number of scientific publications that relate to a site.

Some benefits are difficult to measure but still need to be captured and their general scale of effects understood. A good example is mental health benefits from experiencing an SSSI.

Disbenefits

SSSIs in some instances can restrict opportunities on private land, and sometimes the recommended prescriptions might be doubted by the landowner from their historical knowledge of working a particular piece of land. Thus the fact that SSSIs have a downside for some people should be recognised.

Are SSSIs value for money for taxpayers? Are they necessary? What are the disbenefits?

Conflicting benefits

There are regularly trade offs between different benefits at a site.

Ecology can be complex and this can give rise to different opinions and tensions amongst what to prioritise at a site.

Certain benefits provided within a site can conflict with or create tension with a different benefit from the same site. Management activities and assessment of the benefits must address this. One way of handling conflicting benefits is to ensure that the objectives and the stakeholders are genuinely and proportionately compensated in some way, for a benefit which is diminished.

SSSIs as a catalyst for benefits

It was noted that many benefits at Purfleet SSSI (a geological site) arose indirectly from the SSSI, but the SSSI acted as a catalyst for these.

Indirect provision of benefits

It was noted that at Mungrisedale Common SSSI, many benefits are provided more by other policy measures (such as the incentive schemes applied to the site) but the SSSI influences the quality of the outcome of these benefits.

Intuitive understanding of benefits

Some habitat management, such as moorland management partly results in a range of often ill-defined outcomes, which results in practitioners taking a 'luck and judgement' approach to the nature of the benefits.

Intrinsic values

The intrinsic and existence value of SSSIs' wildlife should not be sacrificed on the alter of modish environmental policy

Need to ensure intrinsic value and benefits to wildlife generally don't get lost in the process of considering wider benefits to society and the different ecosystem services.

Even at an artificial, engineered location such as Chingford reservoir the area can have significant biodiversity and intrinsic value.

In terms of intrinsic value of sites, we should consider the level of importance of intellectual access.

There is a challenge of capturing the intrinsic value of having regionally, nationally, and globally important habitats and species protected. This is difficult to monetise and therefore it risks being undervalued.

The intrinsic value, cultural and diversity considerations are largely driven by the desire that there is a sustainable element to landscape, habitat and species protection.

The Countryside Council for Wales campaign on My Favourite Place helped to indicate the intrinsic value of special sites and showed that these made people feel good about where they live. Ynyslas (part of the Dyfi SSSI) was the top spot in Ceredigion.

Public understanding

To what extent do people relate the benefits they obtain to the fact that the site is an SSSI?

Benefits of National Nature Reserve status

Some NNRs have provided a long-term and stable resource of research. The security offered by the NNR has helped provide this continuity of management and confidence for undertaking ongoing research and monitoring.

National Nature Reserves provide enhanced benefits through providing:

- visitor experience
- social cohesion (through use of volunteers, guided walks and the like)

Planning and development constraints can result in benefits

Planning constraint (the constraint on physical development of a site) presented by SSSI designation can be a benefit to society by restricting opportunities for development opportunities and in some situations by encouraging environmentally friendly developments with a variety of public benefits, such as at wetland sites like London Wetland Centre at Barnes, Moseley Reservoirs (pSPA), & Rutland Water.

The stringency of SSSIs promotes innovation and the need for sympathetic and sensitive development and infrastructure that still allows biodiversity to thrive.

2.3 Ecosystem Services

Management of SSSIs and ecosystem services

Should wildlife sites be managed for the specific services and benefits they provide as the priority consideration?

SSSI status provides the overriding benefit of habitat and species. This secures the best ecosystem services overall.

SSSI designation is for habitat and species predominantly – ecosystem services are additional to that. Connectivity is also additional.

Importance of the SSSI protection itself should be recognised. This underlies the ability of sites to provide ecosystem services.

What drives the type of management that occurs and in turn, what value is derived for the resulting services?

Why have a Common Agricultural Policy? Why not put the money into ecosystem services more explicitly ie. pay for ecosystem services from rural land uses.

To what extent are some or all ecosystem services delivered by SSSIs?

Science

Through SSSIs we have an increased knowledge of species, habitats, ecosystems and of management techniques.

Genetic resources

SSSIs provide a key benefit of conserving genetic resources of lower organisms present in undisturbed soils.

The genetic resource is particularly important – particularly the unseen micro-organisms. Fertilizer use has decimated micro-organisms in the general landscape.

SSSIs can help genetic diversity across landscapes. Crop wild relatives offer some of the genetic diversity for future needs farming and pharmaceuticals.

Insurance value of SSSIs

SSSIs create a holding resource for an important stock of biodiversity. They provide some security for maintaining ecological conditions and functional ecosystems. This natural dynamic is important to retain as an insurance value in the future in the face of environmental change.

We do not know what natural resources and species may be helpful in the future, so the options offered amongst relatively healthy and robust habitats, as represented by SSSIs, are important to retain.

The insurance value of SSSIs includes provision of:

- Habitat security for wildlife
- Green space maintained for its multiple benefits to wildlife and people
- Wildlife support value if damage or impacts occur on nearby or similar sites.

Regulatory services – the need for evidence

More evidence is required to indicate the precise nature and extent of regulating services provided by SSSIs, such as water holding and carbon absorption. Studying and even modelling the evidence at particular sites may be an important way forward in providing evidence and learning points.

Supporting services

SSSIs provide supporting services that are important in the wider landscape, even if less immediately tangible, such as sources of colonists, pollination services, and primary production of biomass.

Geographic scales, and off site issues

SSSIs have a value in protecting biodiversity both locally, regionally, and nationally.

Large SSSIs tend to deliver a range of services where as smaller sites are often more restricted in the services they offer, unless they are or can be linked up in some way.

There are benefits (and possibly some disbenefits) to society in designating on a landscape scale rather than through lots of smaller sites.

Within a whole landscape context SSSIs deliver against all ecosystem services. Landscape is by definition the summation of ecosystem services.

Can SSSIs actually function at an ecosystem level literally, and deliver associated services in that context? Across lowland UK many SSSIs are relatively small, and genetically and physically restricted – this constrains what can be achieved at an actual ecosystem level.

Are off-site impacts on SSSIs impacting on them and is this being considered adequately at present?

Many people who benefit from a service, especially for regulatory services such as water management and carbon absorption, may be located far away from the site itself –hence benefits must be recognised as relevant to a regional, national and sometimes global scale, as well as on site and local.

Recognise that off-site benefits also include important cultural services such as education.

Recreation and visitor experience

SSSIs with public access offer a place to visit with an aesthetic value which can be important for people's well-being.

SSSIs provide an aesthetic experience for people.

Don't overlook the value of public health where access is included.

Recreational benefits and sense of place are key common benefits of SSSIs, according to the examples.

Most greenspaces have a general recreational value but SSSIs enhance this by providing a more specialist product and also providing a more unique experience that will still appeal to many.

Health benefits

Volunteer participation on SSSIs has a variety of benefits especially including physical health.

Many SSSIs offer open space, public access, recreation issues – these offer health benefits. How do we quantify them?

Emerging evidence indicates that human health benefits are delivered from high quality green space.

Geodiversity issues

SSSIs can be biological in focus, geological, or both. SSSIs are not necessarily biocentric, and 1200 SSSIs include a geological component.

You cannot capture all of the benefits to society from geological SSSIs by using the ecosystem services classification and by relating to favourable condition as a key criterion.

Due regard must be paid to geodiversity in all its forms – geology, geomorphology, coastal and fluvial soils etc.

Benefits from geodiversity sites and features readily fit the ecosystem services approach.

Marine and inter-tidal benefits

Marine and inter-tidal benefits must not be overlooked, they include:

- Coastal defence by shingle, dunes, saltmarsh, biogenic reefs.

- Seagrass and saltmarsh as carbon sinks
- Estuaries as nutrient sinks
- Sustaining fisheries through management on SSSIs (cockle and mussel)
- Saltmarsh as fish nursery
- Recreation and landscape

Ynyslas spit at the Dyfi estuary is a low (or zero) cost coastal protection system – it protects hundreds of millions of pounds of human infrastructure and biodiversity immediately inland from the coast.

Cultural services

Cultural services are powerful drivers – often difficult to quantify, but can be politically influential.

Cultural benefits come out more strongly than biodiversity and nature benefits.

Cultural diversity – you don't know what you've lost until it's gone!

The examples show that science can be viewed as a cultural service.

The examples show the role of the SSSI network in providing a sense of place – this is a common and significant theme amongst the examples.

The importance of designated sites to people must be recognised, especially as they connect people with a place for wildlife and provide a range of benefits in so doing.

Cultural services and double counting

Some cultural services may overlap and merge, such as recreation, aesthetic values and sense of place. The distinctions and the linkages amongst these must be understood clearly, especially to ensure no double counting of benefits.

Education, learning and demonstration

SSSIs can provide demonstration of traditional techniques in land management and associated crafts.

SSSIs can showcase good practice in habitat management practices.

SSSIs can tell us about the impact of past climate change on the landscape and indicate what may happen in the future.

SSSIs should include sites which remain available for research and field visits.

Community and social benefits

SSSIs can engage local community members, especially in a volunteering capacity, as illustrated in some of the examples examined in this study, such as Norbury Park and Roydon Woods.

Timescales

Ecosystem services of site may differ in relation to relative timeframes such as:

- When designated
- The present situation
- Aspirations and potential

People's values and society's priorities change over time, which may have implications for different benefits in the past, present and future.

Objectives, aims and management activities can change over time.

Human perception is often very short-term where as landscapes and habitats are created over long time periods. eg tree removal on scrubbed-up heathlands can be controversial, especially where people do not know of the history of a site's habitat and the reasons why 'favourable condition' might point towards more open heathland.

2.4 SSSI Protection and Management

Vulnerability, damage and loss

SSSIs should offer protection to vulnerable habitats and species.

Small isolated SSSIs seem particularly vulnerable. Many are utterly surrounded by intensively farmed land, and only just hanging on at 'favourable status'.

Small-scale SSSIs may be of no economic value and may be vulnerable if the only consideration is an economic and functional one under an ecosystem services approach.

SSSIs are concerned with stopping the continuing degradation of the variety of life forms.

The continuing net loss of biodiversity is detrimental to many types of benefits.

SSSIs show how much we've lost from the rest of the countryside. Most SSSIs are in poor shape, so they are not representative of past habitats. We've forgotten what we have lost.

Protected areas could become under increasing pressure from population increase.

Money is needed to incentivise the management of sites, to halt deterioration, although this may be a challenge in a period of reducing public expenditure.

Other habitat protection measures

Farming is covered by other regulation in addition to SSSIs. Environmental Impact Assessment is now an additional safeguard in protection of habitats as well as cross compliance regulation under the single payment scheme.

Representativeness

SSSIs often encompass a mosaic of habitats, types of management (including traditional methods) diverse assemblages of species, all within a discrete and easily accessed area.

Representativeness is a valuable role for SSSIs where it exists for a site, both for protection and management of representative habitat(s) and for people to be able to experience this. Examples in the workshops which illustrate representativeness include Roydon Woods for New Forest habitats, and Southlake Moor for the Somerset levels.

Favourable Condition

SSSI designation in itself protects natural (regulating) processes from being compromised by development, industry and improvement. Comparing the benefits of a site with or without SSSI status is a very different evaluation to comparing the benefits of features that are or are not in favourable condition.

Note that there are clear distinctions between:

- a change from favourable to unfavourable condition; and
- a change of land use resulting in a complete loss of the habitat.

How can we understand public benefits in relation to the quality of the site? What relationships are there between a better favourable condition and the level of public benefits, or does this vary depending on the type of benefit?

Government expenditure which has impacted on SSSIs

It needs to be recognised that much government expenditure since 1945, for example on grants and subsidies has served to damage and fragment SSSIs, and thus a balance of investment to repair SSSIs is justified.

The wider context of SSSIs

The Convention on Biological Diversity targets the whole biodiversity resource. Designated sites only cover a subset of that resource.

Targets

The PSA target for SSSIs has driven resources from Natural England to focus on sites. Where could these resources be expended elsewhere for an equal or greater effect?

Species

Can priorities for resources amongst SSSIs sometimes be skewed by emphasis on a certain species?

Features and processes

Specific features of a site are distinct from the dynamic process happening there.

Financial and resource issues

Considering the benefits of SSSIs should mean prioritising limited funding with a clear understanding of the objectives.

Society, through government, has agreed to designate these sites – there is a significant investment in SSSIs.

There is an administrative burden for a landowner or site manager to access whatever management funds may be available. Farmers probably don't perceive an SSSI as providing a benefit to them.

Broadening the scope of SSSIs

Designations could be multi-functional, rather than just biological and geomorphological. This would draw in more interest and support and permit easier links to surrounding countryside. It would also change the boundaries and would be more likely to incorporate the ecosystem approach.

Changing contexts

The potential of a site relates to its context, situation, and relative priorities. For example, Chingford reservoir is not primarily managed for wildlife, but if it was, its regional wildlife value might become national or international value. If increased public access were to be prioritised it could offer a green lung of access in an area of North East London with low accessibility to natural greenspace, with tourism and educational value.

Settings for development, industry and utilities

Some SSSIs provide a setting for industrial, extractive, port, infrastructure or military use yet still maintain their wildlife value and are managed for the needs of favourable condition. Sensitive development and heavily conditioned use of the location is specified in such situations, to keep the integrity of the SSSI.

3 General conclusions from the workshop discussions

This short section summarises some of the most commonly and strongly expressed views voiced during the workshop discussion sessions. This section supplements the points above and does not attempt to provide a comprehensive range of the issues raised.

3.1 Biodiversity and ecosystem services

The role of biodiversity in providing ecosystem services comes through as a strong message, even though there is an uncertainty amongst stakeholders as to whether biodiversity itself is an ecosystem service.

It was noted that there is a challenge in capturing the full role of biodiversity in the ecosystem services approach, particularly since biodiversity has intrinsic values which are not captured by the approach.

There was some debate as to whether biodiversity should be classed as a supporting, provisioning or a cultural service, and a general view that biodiversity itself is understated in the Millennium Ecosystem Assessment classification of services.

There is also uncertainty about the extent to which geodiversity fits into the classification of ecosystem services, and even contrasting views on this point amongst geologists.

3.2 Intrinsic values – a distinct priority

Many participants in each workshop stressed that although they found merit in expressing benefits through the ecosystem services approach, they were concerned that intrinsic values of wildlife of SSSIs (ie. wildlife having a value for its own sake – a biocentric rather than anthropocentric view) should also be recognised by the study. These participants were not convinced that the ecosystem services categories could handle intrinsic values and thus were concerned at intrinsic values being overlooked. Several also felt that intrinsic values were a long-held and fundamental principle for protection of biodiversity by the SSSI system and the importance of intrinsic values needed re-stating at a time when policy making puts much emphasis on human benefits from the environment and the natural world.

3.3 Ecosystem services as added value

Many workshop participants were practitioners who were closely associated with SSSI policies and activities. Especially amongst this constituency but also amongst other practitioners present, there was a realisation that 'benefits' and 'ecosystem services' offered further strong justification for the general worth of SSSIs. Most of these practitioners were however very keen to stress the fundamental role of SSSIs as protecting and safeguarding the bottom-line resource of wildlife and geodiversity and establishing steps to maintain its favourable condition. These participants therefore regarded benefits and ecosystem services as an additional plus point for SSSIs and something which introduced additional contemporary issues such as the importance of carbon sequestration and water holding, but did not override the basic statutory function and integrity of the SSSI system.

3.4 The scope of ecosystem services

Most forms of ecosystem services were registered in the site examples covered at the workshops, and participants readily found examples of each type of service, although as with the 20 sampled case studies in the main part of the report, less attention was paid to supporting services, with the implication that the classification is not easily applied to real cases.

3.5 Cultural services

The category of cultural services appears broad, covering many aspects of human endeavour, learning, experience and emotion. Many of the activities and experiences offered by SSSIs are highly relevant to cultural services. Although they were a challenge to quantify they are especially evident and were readily expressed in consistent ways, with aesthetic and emotional values being prominent considerations which people wanted to see registered amongst all the instrumental values which were being highlighted.

Mental health benefits - the tonic value of SSSIs

The human health benefits of experiencing SSSI environments emerged as a consistently strong point. This factor was highlighted in the focus group feedback as well. Both the public and practitioners readily regard SSSIs as a tonic for human wellbeing and an important experience to have available in a stress-filled world. Both the wildlife itself and the aesthetic experience of a rich environment were seen as part of this set of benefits.

Research, demonstration and learning

The ability of SSSIs to offer learning environments for visitors of all ages was a widely recognised and deeply felt point. Some of the case studies were strong examples of sites which had a significant 'recorded history', for their particular wildlife or geology, and which could be used further as a resource for learning, discovery and research. The scientific and the cultural value of SSSIs as places for on-going research, monitoring and education was very strongly expressed throughout many of the examples and in much of the discussion.

3.6 Regulating services

Regulating services were seen as a widespread and readily identifiable role of SSSIs, and one which had come to prominence of late because of current policy drivers relating to climate resilience and water management. There was a realisation that regulating services were easily cited but more of a challenge to understand and quantify with any confidence. It was suggested several times that heavily researched sites where carbon absorption and water regulation functions were being monitored might have pointers to offer for wider application, so estimates could be made for these factors at other sites.

3.7 Provisioning services

Provisioning services considered amongst the workshops included products with added-value from the high environmental status of sites, such as wood crafts and high-value cheeses, and wild harvest products such as woodfuel, shellfish, and wildfowling which have evolved as activities closely linked to some of the case study sites. Such services have an additional benefit in illustrating methods of sensitive use and husbandry of sites in a tangible way.

4 ADDITIONAL POINTS FROM THE WORKSHOP CASE STUDIES

In addition to considering the benefits and ecosystem services for a particular case study based on its SSSI status (as set out in matrices in section 5), each small group was invited to address one of the following questions in relation to their case study site:

- Is there added value to the SSSI from additional status eg. NNR, SAC, SPA, Ramsar?
- Which benefits relate to the site itself, and which more to the SSSI status?
- Which benefits relate to the wider landscape?
- How does the site's condition affect the benefits?

The sections below draw out the collective responses from the small groups to these questions.

4.1 Is there added value to the SSSI from additional status eg. NNR, SAC, SPA, Ramsar?

Main points identified by the groups on this points are set out in bold below:

Stronger protection: The different groups reviewing this question were consistent in suggesting that NNR and SAC status provided more secure protection against physical development and potentially damaging activity on the site, because of the additional weight afforded to sites with this status in the UK planning system.

Additional resources: The higher level designation was commonly used as a justification cited in bids for additional resources for management and improvement measures sought for the site.

Greater access and education provision: Because of the higher profile and exposure given to these sites, and in some instances their ability to command specific supplementary resources, it was also noted that these sites often made specific provision for visitors and for education and outreach, such as through guided walks, interpretation material.

Specific statements quoted by the groups on this topic are listed in the bullets below, in the groups' own words:

- NNR status facilitates management activity.
- NNR has given continuity of management.
- NNR staff facilitate recreational use of the site.
- NNR status has prompted the use of volunteers at the site to help with practical management work. This creates benefits of social cohesion and personal development amongst the volunteers.
- SAC status (with its greater weight of protection) enhances security of the site.
- SAC increases status of the site with the specialist value relating to the SAC criteria.
- The site gains from more stringent protection from development and potentially damaging operations, due to greater weight given to SAC status in the planning system.
- SAC status may improve opportunities to harness funds and resources for site management.

- Cultural benefits from these higher level designations include enhanced facilities and opportunities for education, access, recreation, and tourism.
- Income generation.

The NNR status has helped to provide:

- More stringent protection (prior to the 1981 Wildlife & Countryside Act)
- Improved resources for public access provisions eg. signage and path management.
- Additional conservation management (and possibly more resources allocated for this)
- More security and confidence that the research at the site will be ongoing and provide a 'recorded history'.

Added value from SPA and from Ramsar status:

- Higher level of protection means no net loss such as within managed realignment works
- The SPA and Ramsar labels for the site give potential for additional funding
- A greater scientific understanding of the ecological value results through development control and improved industry processes which are required as a consequence of the higher-level status of the site

4.1 Which benefits relate to the wider landscape?

Main points identified by the groups on this point are set out in bold below:

Natural processes: It was recognised that SSSIs may support and protect some important natural processes and regulatory services which have benefits for the wider landscape, such as helping flood management and maintaining water quality.

Evidence base: SSSIs can act as a demonstration of habitat protection and natural processes which can have lessons for other situations in the area's adjacent landscapes.

Representativeness: An SSSI can act as a microcosm of key habitats and species in the wider area.

Genetic resources: SSSIs can act as a buffer for key genetic resources in a changing landscape.

A focus for education: SSSIs can act as a learning experience, and may be used often as an area for explaining an area's wildlife and geology to people.

Specific statements quoted by the groups on this topic are listed in the bullets below, in the groups' own words:

- Benefits from the site for its hinterland landscape include:
 - Flood management
 - Water quality
 - Sense of place
 - Biodiversity – importance of links to other schemes
- The outcomes of the site's management provide an evidence base for areas in the wider landscape facing similar issues and forces of change

- The recreational visitors to the site use it as part of an experience of a wider area, thus it forms part of people's landscape experience and it is an element which contributes to the area's overall landscape character.
- The site is a source of biodiversity which facilitates dispersal to and colonisation of the wider countryside.
- A genetic resource for wildlife populations.
- The variety of habitats provides a microcosm of the area to experience.
- The site has linkages to traditional land management such as back up grazing, which helps support wider landscape and National Park special qualities.
- The site acts as an educational and research resource.
- The protective nature of the SSSI and National Park designation and the value of the area inhibits development that would have adverse impacts on services such as flood plain functioning, water quality, and landscape value.
- By providing a protective spit, Ynyslas has a major influence on the functioning of the estuary's natural processes and the human activities which in turn influence the natural environment. The neighbouring Borth Bog and sand banks would be prone to inundation and physically very different without the protective barrier provided by the Ynyslas spit.

4.2 Linkage to other designations – SAC and AONB

Main points identified by the groups on this point are set out in bold below:

AONB's complementary role: An AONB can help support land management processes which relate to and reinforce the management requirements for an SSSI

SAC as a potential lever of funds: The higher level status of SAC can be used as a lever for additional funds for a site. In practice this

Bureaucracy for landowners: The bureaucracy linked to owning or hosting and SSSI needs to be recognised.

- In theory SAC enables access to European LIFE funds. In practice this is too hard and time consuming to harness.
- SSSI comes with associated bureaucracy, especially for landowners.
- AONB status helps to reinforce the management and protection of the SSSI by providing:
 - Strategic planning
 - Profile for landscape
 - Sawmill benefit from AONB Sustainable Development Fund and LEADER

4.3 Which benefits relate to the site, and which more to the SSSI status?

Main points identified by the groups on this point are set out in bold below:

Inherent SSSI benefits: For some sites (especially with limited or no public access), the benefits may all be derived from the site's SSSI status and the sensitive management that it demands for the site.

Benefits enhanced by SSSI: A range of benefits may be present on an SSSI regardless of its status, but the environmental quality and the land management associated with the SSSI leads to these benefits being enhanced.

Distinguishing benefits provided by the SSSI: Some sites may have various opportunities for recreation, amenity and public enjoyment regardless of their SSSI status. The sensitive land management may enhance some of these benefits and help provide further benefits across a range of ecological factors and for natural processes.

Specific statements quoted by the groups on this topic are listed in the bullets below, in the groups' own words:

- All relate benefits relate to the site. The site's existence depends on legal protection
- All the above benefits relate to the site but are enhanced by the designated status of the site, which maintains the quality of the habitats and ensures protection and management of these and other benefits.
- Access and outdoor recreation, and carbon storage, are benefits which relate to this tract of land, and are not necessarily a result of it being an SSSI.
- The SSSI could be a key measure to ensure the site's favourable management.
- SSSI status leads to more sensitive management which enhances ecological factors and processes such as:
 - Protection of habitats, species, & geological features
 - Erosion protection - stability from vegetation cover
 - Pollinating species
 - Pest control - insects predated pests species

4.4 How does the site's condition affect the benefits?

Main points identified by the groups on this point are set out in bold below:

Benefits enhanced by improved condition: It was recognised that benefits of all types, from regulatory services to cultural services, and including aesthetic values of a site, can be enhanced through improved condition.

Varying relationships: It was also recognised that there can be a variety of relationships between condition of various features within a site and the benefits which are obtained – these relationships can be considered to best effect within a management plan situation.

Specific statements quoted by the groups on this topic are listed in the bullets below, in the groups' own words:

- Improvement in site condition will improve all other benefits
- Designation leads to conservation objectives
- Conservation objectives lead to management objectives
- Condition of site changes the balance of services delivered
- *Economic:* wider local community involved and helped in achieving favourable condition – good example of management with farmers' help, and some financial return.
- *Biodiversity:* the site's wildlife benefits from the improved condition that has been achieved.
- *Aesthetic & cultural:* people's experience of the site is enhanced due to the improved condition and the water level improvements and appearance.
- *Carbon storage:* a regulating benefit. The peat is hydrated.

- *Flood storage capacity*: Increased with improved condition of site.
- The Ynyslas spit needs to be in favourable condition to properly fulfil coastal defence function and other benefits eg Tourism; Education & research; Biodiversity

5 Summary of Example Sites and Ecosystem Services Provided

The following matrices summarise the characteristics of example SSSIs discussed during the workshops and the ecosystem services provided by each. The description of ecosystem services is not intended to be comprehensive, and is constrained by the evidence available for these sites.

Barnack Hills and Holes SSSI, SAC, NNR

Limestone grassland; high floral diversity; largest UK population of man orchid

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Recreation – (Dog) walking	Cultural	Local (10 miles)	Visitor surveys (Travel & Numbers) & Observation	Quantitative (Numbers) Qualitative
Historic Cultural heritage	Cultural	Regional (Specific)	Literature academic & vernacular	Qualitative & Also Quantitative (references)
Biodiversity Specialist & Aesthetic	Cultural	(inter-) National (specific) & Local	Literature Legislative status Visitor experience surveys	Quantitative (comparative) Qualitative
Pollination & Predators (control)	Provisioning	Local (Agriculture)	Generic ecological research	Benefits transfer
Water purification	Regulating	Regional	Generic ecosystem research	Benefits transfer
Genetic conservation	Provisioning	Global	Generic genetics research	Benefits transfer Crop wild relatives

Is there added value from NNR & SAC status?

NNR status facilitates management activity.

NNR has given continuity of management.

NNR staff facilitate recreational use of the site.

NNR status has prompted the use of volunteers at the site to help with practical management work. This creates benefits of social cohesion and personal development amongst the volunteers.

SAC status (with its greater weight of protection) enhances security of the site.

SAC increases status of the site with the specialist value relating to the SAC criteria.

Blo' Norton and Thel'netham Fen SSSI

Lowland Fen in headwaters

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Carbon storage	Regulating	Global, National & Regional	Natural England Peat Report Defra examples of peat SWT Surveys	Quantitative: £ per ton
Flood regulation	Regulating	Local (headwater site)	EA study on Redgrave and Lopham Fen Nothing specific but info for habitat	Quantitative & Qualitative Difficult to be accurate
Clean water	Provisioning Regulating	Local Regional	& EA water quality data; Generic studies on water quality & land use	Quantitative
Biodiversity (nature conservation)	Cultural	Global, National, Regional & Local	SSSI data	Qualitative Difficult to monetise
Education	Cultural	Regional Local	& Visits to and learning from the site	Quantitative
Sense of place	Cultural	Regional	Inclusion in landscape character description for the area	Qualitative
Inspiration	Cultural	Regional Local	& Creative reactions of visitors; Inclusion of site in arts and poetry	Qualitative
Woodfuel	Provisioning	Local	Evidence and use of harvesting	Quantitative
Health & wellbeing	& Cultural	Regional Local	& Observation and survey of site visitors & users	Qualitative & Quantitative
Genetic resources	Provisioning	Regional	Generic genetics research	Benefits transfer
Wild food (potential) With link to hinterland	Provisioning	Regional Local	& Harvesting of food from the site Markets for wild food	Quantitative (amount) and Qualitative (reaction and satisfaction of consumers for wild food)

SSSI status is a strong influence on the site being retained in its present form

Which benefits relate to the wider landscape?
Flood management

Water quality
Sense of place
Biodiversity – importance of links to other schemes

Brecon Beacons SSSI

Upland bog and upland habitats including heath and cliffs

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Water supply & Water regulation	Provisioning Regulating Supporting	National, Regional & Local	Dwr Cymru	Quantitative & Qualitative
Quality meat production Section A Ponies Cattle (enclosed)	Provisioning Regulating	National, Regional & Local	Commoners	Quantitative & Qualitative
Peat & Carbon management	Regulating	Global & National	Surveys Visual	Quantitative & Qualitative
Biodiversity features	Provisioning Supporting	Global	Wildlife designations	Quantitative & Qualitative
Cultural heritage	Provisioning Cultural	National, Regional & Local	National status	Park Qualitative
Landscape character	Provisioning Cultural	National	National status	Park Qualitative
Outdoor recreation	Provisioning Supporting Cultural	National Regional	& National status	Park Qualitative

Chingford Reservoir SSSI

A managed system of water supply. Standing water, supporting overwintering and moulting wildfowl.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express.....? <i>Quantitative Qualitative</i>
Potable water supply	Provisioning	Regional	Water supply activity of Thames Water	Quantitative
Recreation	Cultural	Regional	Sailing club, bird watchers, LVPRA	Quantitative
Open space corridor	Cultural Intrinsic	Regional	Recreation and site management activity of Lee Valley Regional Park Authority	Quantitative
Wildlife security	Intrinsic	National	Interest in the site from Natural England, BTO, London Natural History Society	Quantitative
Landscape value	Cultural	Regional & Local	Protective landscape policies of local authorities and interest from local people and visitors	Qualitative
Climate regulation - cooling	Regulating	Local	Environment Agency	Quantitative
Enhanced values of neighbouring properties	Cultural	Local	Local authority and neighbouring properties	Quantitative
What 'Insurance Value' role does this SSSI play? Habitat security for wildlife Green space maintained Wildlife support value if something goes wrong on one of the other local water bodies.				

Clemenstone Meadows SSSI

Fen meadow grassland - two meadows of 4.9 ha in Vale of Glamorgan

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Protection	Supporting	Global & Local	Biodiversity reservoir Genetics reservoir	Quantitative & Qualitative
Pollination/insects	Regulating & Provisioning	Local	Site assessment knowledge	Quantitative & Qualitative
Aesthetic	Cultural	Local	Owner's (and visitors') perspective	Qualitative
Education & Research	Cultural	Regional	Training courses held on site	Qualitative

Which benefits relate to the site, and which more to the SSSI status?

All relate benefits relate to the site. The site's existence depends on legal protection

How does the site's condition affect the benefits?

Improvement in site condition will improve all other benefits

Croham Hurst SSSI

Ancient semi-natural woodland, heath, scrub, and cliffs. Blackheath pebble beds over chalk.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express.....? <i>Quantitative Qualitative</i>
Recreation Local residents have access to greenspace without having to drive	Cultural	Local	Used by hundreds of people in the surrounding suburban areas on a regular basis; This intensive public use enhances the cultural vale of the site; 'Friends of Croham Hurst Woods' has been established	Qualitative
Sense of place	Cultural	Local	Site management maintains the views outwards from the site and scrub control helps public access	Qualitative
Aesthetic value	Cultural	Local	Recognised by local people as a prominent hill and landscape feature	Qualitative
Water regulation	Regulating	Local specific	& Impact on neighbouring golf course from both water holding and water run-off	Quantitative – management implications for golf course from water run off and water holding
Climate regulation	Regulating	Local specific	& Would need to identify from similar/proxy sites where evidence has been researched	Quantitative
Nutrient cycling and soil formation	Supporting	Local specific	& Would need to identify from similar/proxy sites where evidence has been researched	Quantitative
Fuel	Provisioning	Local specific	& Firewood collected in 1947 winter and fuel wood is a potential by-product of future management	Quantitative - amount of fuel wood collected and numbers of homes heated
Cultural heritage	Cultural	Local specific	& Bronze age barrow is visited at the site Campaign to save the site from development in 1901	Qualitative

Which benefits relate to the site and which to the SSSI status?

All the above benefits relate to the site but are enhanced by the designated status of the site, which maintains the quality of the habitats and ensures protection and management of these and other benefits.

Drostre Bank SSSI and SAC

Wet woodland; dry broadleaved woodland with molinia meadows

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Conserved genetic resources including fungi and bacteria	Provisioning & Supporting (micro-organisms are supporting)	National Global	& Almost total loss of these ecosystems from the wider landscape, which has become drenched in nutrients	Qualitative (Could be quantified - but a challenge)
Carbon storage	Regulating	Global	Nothing harvested – mature woodland	Quantitative
Water regulation and purification	Regulating	Regional	Last remaining wetland for many miles	Quantitative
Historic land use tradition	Cultural	Global	Traditional management maintained	?
Benchmarking of human impact on surrounding landscape	Supporting	National Global	– Presence of undisturbed soil profiles and associated micro-organisms	Quantitative

Additional benefits of SAC status

More stringent protection from development and potentially damaging operations, due to greater weight given to SAC status in the planning system.

SAC status may improve opportunities to harness funds and resources for site management.

Potential Disbenefits

The SSSI site management statement can inhibit a flexible management approach and the recognition of the site as a dynamic woodland.

Humber Estuary SSSI and SAC

37,000 ha estuary with intertidal mudflats, sandflats, coastal saltmarsh, saline lagoons, sand dunes and standing water. Geological interest from South Ferriby Cliff and Spurn; nationally important numbers of wintering wildfowl.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Maintaining inter-tidal area (in take of seal-level rise)	Regulating	Regional/national	Spend on FRM eg. Environment Agency work	Quantitative
Wildlife-attraction	Cultural	Regional/national	Visitor numbers Visitor spend	Quantitative
Ability to regulate discharges	Regulating	Regional	Improved water quality Healthy fish population – chemical and biological data	Quantitative
Commercial fish nursery	Supporting & Provisioning	Regional/national	Fish data	Quantitative
Wildlife	Provisioning & Supporting	Global	Biological data	Quantitative
Improved resilience	Regulating & Supporting	National	Modelling examples	Quantitative

Added value from NNR status

Cultural – enhanced facilities and opportunities for education, access, recreation, tourism
Income generation

Added value from Natura 2000 and from Ramsar status

Higher level of protection: no net loss such as managed realignment

Leads to in-combination assessments

Potential for additional funding

Greater scientific understanding through development control (for improved industry processes)

Norbury Park SSSI, SAC

Chalk grassland within farmland in Surrey Hills AONB

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Access & Recreation	Cultural	National Local	No of visitors	Quantitative & Qualitative
Biodiversity	All	Everyone	SSSI, SAC	Quantitative & Qualitative
Landscape character	Cultural	Everyone	AONB Landscape Character Assessment	Qualitative & Quantitative
Carbon storage	Regulating	Everyone	Forestry data	Quantitative
Water quality	Regulating	Local & Regional	Water quality data	Quantitative
Water – flood relief	Regulating	Local	Flood relief data (modelling)	Quantitative

The SSSIs linkage to other designations – SAC and AONB

In theory SAC enables access to European LIFE funds. In practice this is too hard and time consuming to harness.

SSSI comes with associated bureaucracy

AONB status helps to reinforce the management and protection of the SSSI by providing:

Strategic planning

Profile for landscape

Sawmill benefit from AONB Sustainable Development Fund and LEADER

Local community action

Monks Wood SSSI and NNR

Ancient woodland

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Recorded history of habitat Long-term trend data; Informs policy decisions on invertebrate habitat management, effects of climate change, and landscape ecology.	Cultural (Educational)	National & Global Information and learning points for conservation management	& Research outputs	Quantitative: Volume of publications; Number of citations; Policy & practice based on Monks Wood research
Biodiversity Diverse quality of ancient woodland habitat and associated rare species	Cultural (inc Existence value) Provisioning (Genetic resource) Supporting (underpinning)	Regional & National	& Indications of how people value rare species found at the site Research outputs as above	Quantitative & Qualitative Public interest in the site's wildlife and rare species – visitors at site open days can number 2,000
Landscape character Including effect of the site in the wider landscape, and view from train & A1	Cultural (aesthetic)	Local, National & Regional	Citations of the site in Landscape Character descriptions and Countryside Quality Counts	Qualitative

Added value from NNR status

The NNR status has helped to provide:

More stringent protection (prior to the 1981 Wildlife & Countryside Act)

Improved access resources eg signage and path management.

Additional conservation management (& possibly more resources allocated for this)

More security and confidence that the research will be ongoing and provide a 'recorded history'.

Mungisedale Common SSSI

Upland heath, wet heath, acid grassland, montane, blanket bog, oak woodland

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Food livestock Genetic stock	– Provisioning	National Local Specific landowner	& Data on stocking Change in lamb prices Still farming at loss eg Single Farm Payment - Better condition of stock	Quantitative Economic
Access and outdoor recreation	Cultural	Regional catchment visitors	of Tourism revenue in nearby businesses Visitor surveys Health and fitness of the recreational users Pedestrian and mountain bike use Knowledge of visitor days at the site	Quantitative & Qualitative
Water quality	Provisioning Regulating	Local Regional	& Monitoring data Sediment chemistry Lower cost of water treatment Gauge on the water catchment	Quantitative & Qualitative
Carbon storage	Regulating	National	No information available for the site, so don't know the benefits of different management regimes. Learn from proxy sites	

Which benefits relate to the site, and which more to the SSSI status?
Access and outdoor recreation, and carbon storage, are benefits which relate to this tract of land, and are not necessarily a result of it being an SSSI.
The SSSI could be a key measure to ensure the site's favourable management.

Which of the site's benefits also relate to the wider landscape?
The outcomes of the site's management provide an evidence base for areas in the wider landscape facing similar issues and forces of change
The recreational visitors to the site use it as part of an experience of a wider area, thus it forms part of people's landscape experience and it is an element which contributes to the area's overall landscape character.

Purfleet Chalk Pits SSSI

Ice Age deposits which overlie chalk bedrock

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Geological knowledge	Cultural	Global, National & Specific	Publications understanding of interglacial period	on Qualitative
Recorded history of geological knowledge	Cultural	National, Regional & Local	Publications understanding Of interglacial period	on Qualitative
Ecological Area of nature in urban setting	Cultural	Local	People experiencing wildlife & geology	Quantitative & Qualitative Numbers of people and visitor surveys
Ecological Pollination	Supporting Provisioning	Local	Generic ecological research: effects on local plants, cereals and horticulture	Benefits transfer
Education	Cultural	Regional & Local	Visitors learning about the site's wildlife & geology	Quantitative & Qualitative Numbers of people and visitor surveys

How does the site's condition affect the benefits?

Designation leads to conservation objectives

Conservation objectives lead to management objectives

Condition of site changes the balance of services delivered

Roydon Woods SSSI

A 950 acre site within the New Forest National Park. It comprises a mosaic of habitats including ungrazed ancient woodland, open heathland and old meadows. The site is owned and managed as a publicly accessible nature reserve by the Hampshire and Isle of Wight Wildlife Trust.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Rare biodiversity – A source for important species & groups	Supporting Cultural Provisioning Regulating	National/Regional/Local/Specific	Site surveys Inventory	Quantitative
Woodland products	Provisioning	Local	From income	Quantitative
Local economy – grazing & service industry	Provisioning Cultural	Local	Sales figures from woodland products	Quantitative & Qualitative
Volunteers from the community	Cultural	National/Regional/Local	Wood fair: cultural and craft activity associated with the woodland. Woodland products: charcoal, woodchip	Qualitative & Quantitative
Recreation and access	Cultural	National/Regional/Local	Use of Rights of Way across the site	Quantitative & Qualitative
Local climate regulation	Regulating	Local	Cooling effect of the woodland cover	Quantitative
Natural floodplain functioning	Regulating	Regional/Local	Good water quality	Quantitative
Resilience to climate impacts	Supporting & Regulating	National	Theoretical	Quantitative & Qualitative
Buffer from surrounding land use	Regulating & Cultural	Local/Regional	Undeveloped land in and around the SSSI	Quantitative & Qualitative

Which of the site's benefits also relate to the wider landscape?

The site is a source of biodiversity which facilitates dispersal to and colonisation of the wider countryside.

A genetic resource for wildlife populations.

The variety of habitats provides a microcosm of the area to experience.

The site has linkages to traditional land management such as back up grazing, which helps support wider landscape and National Park special qualities.

The site acts as an educational and research resource.

The protective nature of the SSSI and National Park designation and the value of the area inhibits development that would have adverse impacts on services such as flood plain functioning, water quality, and landscape value.

South Gower Coast - Port Eynon to Rhossili SSSI, SAC

Limestone Cliffs, heathland, calcareous grassland, foreshore, remains of interglacial biota, Wales coastal path.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Protection of habitats, species & geological features	Provisioning Cultural	Global, National, Regional Local Specific	SSI & SAC Citations & features list	Quantitative (numbers) Qualitative (value of having these)
Food Livestock Wild food (including shellfish harvesting)	Provisioning	National, Regional & Local	Meat – markets Wild food – market value	Quantitative: Lamb weights Market value of produce
Outdoor recreation	Cultural	National, Regional Local Specific	Visitor numbers Economic benefits to local businesses	Quantitative: numbers Qualitative: visitor surveys
Tourism	Cultural	National, Regional Local Specific	Visitor numbers Economic benefits to local businesses	Quantitative: numbers Qualitative: visitor surveys
Erosion protection - Stability from vegetation cover	Regulating	Local	Vegetation removed and eroded at similar coastal habitats	Quantitative & Qualitative
Pollinating insects	Supporting & Regulating	National, Regional Local	Local agriculture & horticulture produce	Quantitative Value in the economy of such produce
Pest control - insects predating pests species	Provisioning and regulating	National, Regional Local	Local agriculture & horticulture produce, including cereals	Quantitative Value in the economy of such produce
Archaeological & Cultural heritage	Cultural	National, Regional Local Specific	Presence of archaeological sites & Demand to study and explore such sites	Quantitative: Visitor numbers Qualitative: Visitor experience
Clean bathing water (including filtration from shellfish)	Regulating Cultural	National, Regional Local Specific	Bathing water quality measurement; & Presence of visitors and tourists enjoying bathing water	Quantitative Measurement Qualitative Numbers and experience of users

Which benefits relate to the SSSI status?

From the above list of benefits, the following relate more directly to the influence of the SSSI:

Protection of habitats, species, & geological features

Erosion protection - stability from vegetation cover

Pollinating species

Pest control - insects predating pests species

Southlake Moor SSSI

Wet grassland site in Somerset important for wintering migratory water birds, neutral grasslands, and ditch invertebrates and plants. Traditionally managed for agriculture and flood storage. Recently restored to favourable condition through changes in water management.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Biodiversity – ecological connectivity with landscape	Supporting & Provisioning	National & Global	Good examples of bird feeding and roosting indicate favourable condition. Floodplain grazing marsh maintained. Important assemblages of rare plants and invertebrates. Deep water habitat benefits other SSSIs in the area, including the Severn Estuary.	Quantitative
Archaeological heritage interest	Cultural	National & Regional	Conservation of historic landscape. Public enjoyment of scheduled monuments and the archaeological resource.	Quantitative & Qualitative
Carbon regulation	Regulating	Global	Peat conservation	Quantitative
Flooding regulation	Regulating	Local & Regional	Flood risk protection as a secondary benefit	Quantitative - Amount of water stored
Water quality and associated economic benefit	Regulating	Local & Regional	Farmers and river users benefit	Qualitative Possibly Quantitative
Fuel	Provisioning	Local	Willow pollarding and & scrub management	Quantitative
Public access	Cultural	Local & Regional	Footpaths, open space, Public enjoyment	Quantitative & Qualitative
Research & education	Cultural	Local & National	Ecological research and education resource. Important demonstration site for multi-functional floodplain management and the benefits of flooding to lowland habitats.	Qualitative
Inspiration & aesthetic	Cultural	Local & National	Visitors to the site. Seasonal changes and dynamic nature of site management.	Qualitative

Shooting & wildfowling	& Cultural	Local	Traditional local activity by landowners	Quantitative & Qualitative
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How does the site's condition affect the benefits?

Economic: wider local community involved and helped in achieving favourable condition – good example of management with farmers' help, and some financial return.

Biodiversity: the site's wildlife benefits from the improved condition that has been achieved.

Aesthetic & cultural: people's experience of the site is enhanced due to the improved condition and the water level improvements and appearance.

Carbon storage: a regulating benefit. The peat is hydrated.

Flood storage capacity: Increased with improved condition of site.

Wiveton Downs SSSI

Sand and gravel quarrying on a heathland ridge, which has exposed the ‘Blakeney Esker’ - England’s best-developed and well known esker (glacial deposit). A 3.5km ridge west of Blakeney, Norfolk.

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Flood control 1 through infiltration	Regulating	Local	Permeability – knowledge on gravel	Quantitative?
Water quality & quantity 2	Regulating	Regional	Permeability – knowledge on gravel	Quantitative
Habitat provision & soil 3	Supporting	Local	Habitat mapping	Qualitative
Landscape, aesthetic, Sense of place 4	Cultural	Local	Visual, landscape character	Qualitative
Outdoor recreation 5 Footpaths, picnics	Cultural	Local	Visual	Qualitative
Research, education 6	Cultural (knowledge)	National	Published research School trips	Qualitative & Quantitative
Use of gravel, flint 7	Provisioning	Regional	Historical records	Qualitative
Understanding past climates 8	Cultural (knowledge)	National	Scientific research	Qualitative

How does the site’s condition affect its benefits?

The site is currently in favourable condition

Main threats to site comprise:

Quarrying away of ridge

Filling of quarried areas

Obscuring by development, vegetation or trees

Impact a. would result in loss of benefits 1,2,3,4,6,8

Impact b. would result in loss of benefits 2, 5 (partly) 6, 8

Impact c. would result in loss of benefits 1 (partly), 3,4,5,6,8

Ynyslas (distinct part of Dyfi SSSI and NNR)

Shingle ridge and spit with dynamic dune systems

Benefit	Type of Ecosystem Service <i>Supporting Provisioning Regulating Cultural</i>	Who Benefits? <i>Global National Regional Local Specific</i>	Evidence?	How to Express? <i>Quantitative Qualitative</i>
Coastal protection	Regulating Provisioning	Local	Presence of infrastructure Agricultural protection	of £20m worth of housing and campsites; Railway line; Agricultural produce.
Tourism	Cultural	National Regional	& Visitor numbers	Quantitative
Research and Education	Cultural Regulating	Global	Phd research & published research & studies Field study visits	Quantitative: Numbers of Phds publications & reports; Numbers of school & educational field visits
Biodiversity	Cultural Provisioning	Global	Monitoring	Quantitative: Monitoring data

How does site condition affect the benefits?

The Ynyslas spit needs to be in favourable condition to properly fulfil coastal defence function and other benefits eg

Tourism

Education & research

Biodiversity

Which of the site's benefits also relate to the wider landscape?

By providing a protective spit, Ynyslas has a major influence on the functioning of the estuary's natural processes and the human activities which in turn influence the natural environment.

The neighbouring Borth Bog and sand banks would be prone to inundation and physically very different without the protective barrier provided by the Ynyslas spit.