



**Arnside & Silverdale
Area of Outstanding Natural Beauty
Management Plan 2019-2024**

Environmental Report

Prepared by the Arnside & Silverdale AONB Partnership, April 2019

NON TECHNICAL SUMMARY

This document is a summary of the Environmental Report which has been produced as part of the Strategic Environmental Assessment (including sustainability appraisal) of the Arnside & Silverdale Area of Outstanding Natural Beauty (AONB) Management Plan 2019 -24.

The AONB Partnership has prepared their Management Plan which sets out how the AONB is to be managed over the period 2019-2024. Strategic Environmental Assessment (SEA) is a statutory process under the Environmental Assessment of Plans and Programmes Regulations 2004 which require formal strategic environmental assessment of new plans and programmes which are likely to have significant effects on the environment. The AONB Management Plan is such a plan.

The SEA process requires that the key environmental aspects of the AONB are identified and how these are likely to evolve without implementation of the Management Plan. The environmental impact of the proposed Management Plan must then be assessed, and indicators for monitoring the environmental effects of the Management Plan must be proposed. This Environmental Report fulfils the assessment requirements of the Directive.

The main outputs and conclusions are that **the SEA process (and sustainability appraisal) has shown that the AONB Management Plan is highly supportive of the agreed environmental and sustainability objectives and delivery will lead to significant cumulative positive benefits to the environment and also communities and local environment-based economy of the AONB.**

The significant contribution made by the Management Plan objectives in supporting the environmental and sustainability objectives also demonstrates the highly positive impact achieving Management Plan objectives will have in delivering multiple benefits across a wide range of ecosystem services.

The primary purpose of the AONB designation is to conserve and enhance natural beauty. In pursuing the primary purpose of designation, account needs to be taken of the needs of agriculture, forestry, other rural industries and of the economic and social needs of the local communities. Particular regard should be paid to promoting sustainable forms of social and economic development that in themselves conserve and enhance the environment. Recreation is not an objective of the AONB designation, but the demand for recreation should be met so far as this is consistent with the conservation of natural beauty and the needs of agriculture, forestry and other users.

The special qualities of the AONB are vulnerable to change and subject to a wide variety of pressures. The key issues identified for the Arnside & Silverdale AONB include climate change; habitat fragmentation and declining resilience of ecological networks, invasive and non-native species; changes in and uncertainty about national policies relating to farming and forestry; diffuse and point source pollution from agriculture and septic tank outflows; declining condition of some heritage assets and features; inappropriate location and design of development; need to deliver housing which meets local needs without harm to the special qualities of the AONB with affordable housing as a particular priority; retention of local rural services and facilities; and the national issue of children and young people losing their connection with nature. Positive management is needed to protect, maintain and enhance the natural resources and distinctive character of the AONB and the objectives within the Management Plan have been developed to help deliver this.

For the assessment, the 14 Management Plan objectives were each individually assessed against the 21 SEA objectives (12 environmental objectives and 9 sustainability objectives), a total of 294 assessments. The SEA/SA objectives, given in the table below, are based on those given in the Natural England guidance and reflect environmental and sustainability matters relevant to the Arnside & Silverdale AONB. A six point assessment scale was used as recommended by Natural England.

| SEA/SA Objectives |
|---|
| Environmental Objectives |
| E1 To protect and enhance biodiversity (habitats and connectivity) and geodiversity |
| E2 To protect and enhance fauna and flora (individual species) |
| E3 To ensure no adverse effect arises on population (i.e. demographic balance) |
| E4 To safeguard human health |
| E5 To protect and enhance soil quality |
| E6 To safeguard the water environment |
| E7 To protect air and climate |
| E8 To conserve and enhance the historic environment, heritage assets and their setting, and maintain cultural heritage (including architectural and archaeological heritage) |
| E9 To protect and enhance the character and appearance of townscapes, maintaining and strengthening local distinctiveness and sense of place |
| E10 To protect and enhance landscape |
| E11 To protect material assets including natural resources |
| E12 To reduce risks associated with climate change and extreme weather whilst increasing resilience and maximising the positive benefits for communities, landscape and the natural environment |
| E13 To avoid significant adverse effects between the above interrelationships. |
| Sustainability Objectives |
| S1 To create more vibrant, cohesive, safe and mixed communities |
| S2 To protect the quality and character of individual settlements and communities |
| S3 To protect the environment, people and properties from flood risk |
| S4 To reduce the need and desire to travel by car |
| S5 To promote healthy lifestyles |
| S6 To raise standards of education and training and promote employment skills |
| S7 To promote the development of an economy that supports social and environmental objectives |
| S8 To promote good governance |
| S9 To minimise the consumption of natural resources including fossil fuels, minerals, land take and water |

The development of the AONB Management Plan objectives has taken place over a number of weeks, informed by public and partner consultation. Strategic Environmental Assessment has been carried out at the end of this process and has been undertaken on the draft final objectives.

Of all 294 assessments, 79% are supportive or strongly supportive (43% and 36% respectively) of the environmental and sustainability objectives. 1% are assessed as 'uncertain' and 20 % as neutral.

The 4 assessments recorded as 'uncertain' relate to 3 objectives (Objectives 2, 4 and 6).

In each of these cases a consideration of options was undertaken to examine if the potentially uncertain effects could be removed or mitigated against. As the AONB Management Plan is aiming to conserve and enhance natural beauty it is already centred round environmental protection and management. Because of the nature of the Plan, it was not considered appropriate or reasonable to look at very different alternatives. Comparison of a number of different alternatives has not, therefore, been included but instead, the option of deleting an objective was assessed together with objective improvements.

The key impacts of the Management Plan objectives were identified during the assessment process as described above. As some environmental problems, however, result from the accumulation of multiple small and often indirect effects, rather than a few large and obvious ones the cumulative effects of the Management Plan objectives on the SEA/SA objectives were also assessed. The cumulative effects of the Management Plan objectives have been assessed as very positive or positive.

Analysis was also undertaken to define a clear link between the SEA and SA objectives and the ecosystem services provided by the AONB landscape as identified in the draft Management Plan. This analysis

confirmed the significant positive link between the SEA/SA objectives and the ecosystem services provided. The role the AONB Partnership can play in preparing for climate change is an important benefit which will be provided by delivery of many of the Management Plan objectives.

The SEA Directive requires the effectiveness of the Management Plan and its impact on the environment to be monitored. Suggested indicators which could be used to measure the impact of the management plan/change over time are given in the Environmental Report, Appendix 3. Wherever possible, existing data sets and indicators have been suggested where monitoring is routinely carried out and data available cut to the AONB boundary. However, the SEA process has also highlighted data gaps where data is not currently collected or where data is not currently available/collected for the AONB in a consistent way.

The Environmental Report (Consultation Draft) was published at the same time as the Draft Management Plan so that comments could be made on the Management Plan with the benefit of the information presented in the Environmental Report. The comments made on the Draft Management Plan led to minor changes being made to two of the Management Plan Objectives (8 and 10). Reassessment of both these objectives against the SEA/SA objectives has been undertaken and resulted in no changes to the scoring.

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1 INTRODUCTION

1.1 Background

The Arnside and Silverdale area was designated as an Area of Outstanding Natural Beauty (AONB) in 1972 under the National Parks and Access to the Countryside Act of 1949, in recognition of the outstanding qualities of its landscape. The Countryside and Rights of Way (CROW) Act 2000 (Section 89) subsequently strengthened the earlier legislation and placed a statutory duty on local authorities to act jointly to produce Management Plans for AONBs within their boundaries and review them every five years.

The Arnside & Silverdale AONB Management Plan 2014-19 was produced by the Arnside & Silverdale AONB Executive Committee on behalf of the four principal local authorities in the area, Cumbria and Lancashire County Councils, Lancaster City Council and South Lakeland District Council. In accordance with the CROW Act 2000, this plan is now subject to review.

The AONB Management Plan is subject to a Strategic Environmental Assessment (SEA) in accordance with European Directive 2001/42/EC and the Environmental Assessment of Plans and Programmes Regulations 2004. This is a European Union requirement which seeks to provide a high level of protection of the environment by integrating environmental considerations into the process of preparing certain plans and programmes. The process of SEA is not separate, but is an integral part of the Management Plan review process. SEAs have been undertaken of the previous (2009-2014) and current (2014 -2019) AONB Management Plans. The Management Plan must also be subject to a separate formal assessment under European Directive (92/43/EEC), referred to as the Habitats Directive, to establish that its proposals will not have a significant impact on any Natura 2000 sites. This process is Habitats Regulations Assessment (HRA).

The revised Plan will set out how the AONB is to be managed over the next 5 years (2019-2024) and, as part of the process of developing the Plan, a Strategic Environmental Assessment of the draft Plan was carried out. More information about Strategic Environmental Assessment is given in Section 1.4 below.

This Environmental Report is the third output from the SEA process. In March 2018, a Draft Scoping Report was prepared providing baseline information and a proposed framework for assessment. The report was issued for consultation and issues raised by consultees were taken into account in undertaking the assessment work and in the preparation of the Environment Report (Consultation Draft). This latter report was published at the same time as the Draft Management Plan so that comments could be made on the Management Plan with the benefit of the information presented in the Environmental Report. Comments received on the Draft Management Plan have been reviewed and taken into account during preparation of the final Management Plan. No comments were received on the Environmental Report (Consultation Draft).

The Environmental Report presents the environmental baseline against which the assessment has been undertaken (Section 3) and provides information on how the assessment was carried out (Section 4). The results of the assessments are presented in Sections 5 and 6 together with an assessment of alternatives. An assessment of the link between SEA and ecosystem services is given in Section 7 and Section 8 discusses monitoring the effectiveness of the Management Plan and its impact on the environment. Outcomes from the consultation on the Draft Management Plan and Environmental Report (Consultation Draft) are described in Section 9 and final conclusions are set out in Section 10.

1.2 The Arnside & Silverdale AONB

The Arnside & Silverdale area was designated as an Area of Outstanding Natural Beauty (AONB) in 1972. The AONB covers an area of approximately 75km² in south Cumbria and north Lancashire and includes around 30km² of intertidal sands and mudflats. It is recognised for its extraordinary diversity of habitats,

and of plants, birds and butterflies. The stunning limestone pavements, ancient woodlands, intimate orchards and meadows and an impressive coastline make this area one of England's finest landscapes.

The Arnside & Silverdale AONB is managed by a partnership of local authorities, statutory agencies, voluntary organisations, wildlife groups and recreation groups who work to protect, conserve and enhance the natural and cultural heritage of the area. Members of the AONB Executive Committee are listed in Appendix 1. A small staff team, hosted by Lancaster City Council, work on behalf of the AONB Partnership.

1.3 The AONB Management Plan

AONB Management Plans are statutory Plans whose purpose is to provide a framework for ensuring delivery of the statutory purpose of AONBs, that of conserving and enhancing the natural beauty of their designated landscapes. The Management Plan guides the work of the AONB Partnership.

The Countryside and Rights of Way (CROW) Act 2000 requires relevant local authorities to produce and adopt a plan which formulates policy for the management of the area and review it every five years. The first statutory AONB Management Plan was produced in 2004 and has been subsequently reviewed and revised every five years as required by the CROW Act 2000. The Plan published in 2014 is now due to be reviewed under the periodic review timetable as set out in the Act.

The Arnside & Silverdale AONB Partnership has committed to undertake the review on behalf of the four principal local authorities in the area. A Review Working Group has been set up comprising the chair of the Executive Committee, one representative from each of the four local authorities, Natural England, the AONB Manager and the AONB Officer and up to three other representatives. The Review Working Group has delegated responsibility to oversee the review process and will report to the Partnership Executive Committee.

The Management Plan is a statutory plan which gives guidance and direction towards achieving the long term 'Vision' for the Arnside and Silverdale AONB.

The aims of the draft Management Plan, which reflect the purposes of AONB designation are to:

- conserve and enhance the natural beauty and special qualities of the AONB
- promote and support sustainable agriculture, forestry and other rural industries
- promote the social and economic wellbeing of people living within the AONB
- increase public understanding and enjoyment of the AONB
- meet the recreational needs of local residents and visitors alike - where these are compatible with the purpose of AONB designation.

To achieve the Vision, the AONB Partnership is aiming for 3 key outcomes which reflect the national objectives of the AONB Family:

- An outstanding landscape rich in natural and cultural heritage
- Vibrant and sustainable communities
- A strong connection between people and the landscape

The Plan sets out management objectives that aim to realise the Vision and provide direction for positive action in the AONB over the 5-year period 2019-2024. The objectives are grouped under three themes reflecting the key outcomes:

An outstanding landscape rich in natural and cultural heritage

- Landscape and seascape

- Natural capital and ecosystem services
- Geodiversity
- Habitats and species
- Water environment
- Historic and cultural heritage
- Development management

Vibrant and sustainable communities

- Land management and rural livelihoods
- Sustainable visitor economy
- Affordable housing, rural services and local economy
- Community engagement and volunteering

A strong connection between people and the landscape

- Enjoyment and understanding
- Access and recreation
- Health and wellbeing

The Management Plan contains 14 objectives across these themes.

1.4 Strategic Environmental Assessment

1.4.1 Overview

Strategic Environmental Assessment (SEA) is a statutory requirement¹ to ensure that land-use plans and programmes, that are likely to have significant effects on the environment, are subjected to a strategic (high and overarching) assessment of options and alternative courses of action during plan preparation in order to avoid or mitigate any adverse effects.

Article 1 of the Directive states that its objective is “*to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development*”.

The Directive requires that information be provided on the likely significant effects on the environment, including on issues such as: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape, and the interrelationship between the above factors.

The Directive defines “*environmental assessment*” (Article 2(b)) as a procedure comprising:

- preparing an Environmental Report on the likely significant effects of the draft plan or programme;
- carrying out consultation on the draft plan or programme and the accompanying Environmental Report;
- taking into account the Environmental Report and the results of consultation in decision making; and
- providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

The Management Plan process fulfils many of the requirements set out in the SEA process. As the Management Plan is aiming to conserve and enhance the landscape, it is already putting the environment

¹ The European Union Directive on Strategic Environmental Assessment (2001/42/EC) came into force in England on 21 July 2004 through the Environmental Assessment of Plans and Programmes Regulations 2004 (the Strategic Environmental Assessment Regulations). (Statutory Instrument 2004 No.1633)

at the heart of the plan-making process, which is a key aim of SEA, and the steps for both processes have strong parallels.

1.4.2 Stages of a Strategic Environmental Assessment

There are five stages to a Strategic Environmental Assessment:

Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope

Stage B: Developing and refining alternatives and assessing effects

Stage C: Preparing the Environmental Report

Stage D: Consultation (on the draft plan or programme and the Environmental Report) and decision-making

Stage E: Monitoring the significant effects of implementing the plan or programme on the environment

Completion of Stages A, B, and C has led to the production of this Environmental Report.

1.4.3 Consultation

Consultation is a key element of the strategic environmental assessment and management plan review process and occurs at various stages in the process. The SEA Directive requires consultation with the Consultation Bodies – Natural England, Historic England and the Environment Agency - on the scope and level of detail of the information to be included in the Environmental Report, and both the Consultation Bodies and the public on the Environmental Report and draft plan or programme (see section 9).

1.5 Applying Strategic Environmental Assessment to the Arnside & Silverdale AONB Management Plan

The main aim of the AONB Management Plan is to conserve and enhance the natural beauty of the AONB. As such, it is already putting the environment at the heart of the plan-making process, which is a key aim of SEA and the steps for both processes have strong parallels. As mentioned in Section 1.3, the AONB Management Plan will put forward management objectives and recommendations for delivery for the next 5 years. The SEA is on the 5 year Plan (not over the 20 years of the Vision statement) and indicators suggested to monitor the Plan's success or otherwise aim to reflect this timescale.

Natural England guidance states that '*Assessment is the key part of the SEA process and involves the systematic analysis of the potential effects of each Management Plan policy in relation to the **environmental assessment (essential)** and **sustainability appraisal (desirable)**.....Having developed or refined the AONB Management Plan to ensure that all of the policies support the (SEA) environmental objectives, it may then be appropriate but not essential, to apply a second tier sustainability objectives ... This may help to indicate the level of sustainability being achieved and will provide further opportunity for enhancement or mitigation.*' The current Management Plan was subject to a sustainability appraisal, as part of the SEA process, to help ensure that the plan preparation process improved the contribution that the plan makes to the achievement of sustainable development. The review of the AONB Management Plan (2019 – 24) has therefore also been subject to a sustainability appraisal (SA) and second tier sustainability objectives have been applied. The SA meets the requirements of the SEA Directive.

The methodology used for this SEA is based on government guidance² published in September 2005 by ODPM (now CLG) and the Guidance on SEA of AONB Management Plans³ provided by Natural England, July 2007 and the Scoping Report has drawn extensively on the SEA undertaken and Environmental Report prepared as part of the preparation of the current Management Plan. It was also informed by the work of the Lancaster City Council and South Lakeland local authorities on sustainability appraisal of the AONB Development Plan Document (DPD). The AONB DPD Sustainability Appraisal was undertaken by Arcadis on behalf of the two local authorities. The Sustainability Appraisals of the local authority local plans have also informed this SEA.

² A Practical Guide to the Strategic Environmental Assessment Directive, Office of the Deputy Prime Minister, September 2005

³ Guidance to English AONB Partnerships and Conservation Boards on Strategic Environmental Assessment (SEA) of AONB Management Plans, Natural England, July 2007.

The Environmental Report has been produced internally by AONB staff, overseen by Cumbria County Council, providing an element of independence. The SEA has been carried out in parallel with the revision of the AONB Management Plan.

1.6 Habitats Regulations Assessment and SEA

The Habitats Directive⁴ requires plans or projects to be assessed before they can be adopted to ensure that they have no significant environmental effect on sites of European interest. The requirements of the Habitats Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna are transposed into English and Welsh law by means of the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations). This ensures that protection of the integrity of European sites is a part of the planning process at a regional and local level.

Habitats Regulations Assessment (HRA) of the AONB Management Plan⁵ has been carried out alongside SEA. The assessment concluded that the Management Plan will not have any significant effects on the European sites, either alone or in combination.

2 SCOPING

The SEA has been undertaken in accordance with regulations and guidance produced by the government and, as detailed in section 1.4.2, the first stage was to produce and consult on the scope of the SEA.

A scoping report was produced in March 2018 which set out the baseline information to set the context for the assessment and also the approach that was to be taken in carrying out the SEA. This included the development of environmental and sustainability objectives (SEA and SA objectives) against which the likely impact of the Management Plan objectives could be assessed. The scoping report was sent to the statutory consultees of Natural England, the Environment Agency and Historic England. The report was supported by the three organisations and the views put forward were incorporated in the thinking and development of both the Management Plan and the Environmental Report. The following key comments were contributed:

NE comments

Refer to the SA/SEA documents included in Lancaster City Council's, South Lakeland District Council's local plan and the SEA written for the Arnside & Silverdale AONB Development Plan Document.

A list of sources of local plan evidence on the natural environment provided to assist in the preparation of the SEA.

Suggested indicators

Biodiversity:

- Number of planning approvals that generated any adverse impacts on sites of acknowledged biodiversity importance
- Percentage of major developments generating overall biodiversity enhancement
- Hectares of biodiversity habitat delivered within the AONB

Landscape:

- Amount of new development in the AONB with comment on likely impact

Table 3 SEA Objectives – as well as being included in the Environmental Baseline (table 2) and Key Issues (table 7), European designated sites and SSSIs should be covered by the SEA Objectives (table 3).

⁴ European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

⁵ Habitats Regulations Assessment Screening of the Arnside & Silverdale AONB Management Plan 2019 -24, April 2019

SEA Objective E1 To protect and where practical enhance biodiversity (habitats) and geodiversity - The 'where practical' part of this sentence does not promote enhancements - rather gives an immediate way out of enhancing biodiversity. This should say 'To protect and enhance' to show that this is the desired outcome and to ensure consistency with objectives E2, E5 and E9.

Historic England

A link provided to Historic England's document, which provides guidance on the effective assessment of the historic environment in Strategic Environmental Assessments.

Context

The report should identify the built environment and its character and distinctiveness and refer to the historic environment. There is the potential for undesignated assets and archaeology on some sites, and these should be referred to within the baseline information.

Relevant Plans, Programmes and Policies

In terms of the plans and policies identified, this needs to cover all those relevant at an international, national and local level that would have a direct bearing for the historic environment.

Baseline Information

The baseline information in the scoping report on the historic environment should include all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged. This not only involves undesignated (or local heritage assets) but the potential for unrecorded archaeology, and historic landscape character areas for example.

The NPPF recognises the importance of undesignated heritage assets and therefore this should be included within the baseline data. The source of this information should be included within the scoping report; references made to them and recognise the opportunities for their enhancement and contribution to other aspects of the Plan area.

The importance of local character and identity including the landscape and townscape of an area is an important consideration. The scoping report should recognise the importance of this and the source of this information should be included within the scoping report, with reference made to them in key issues and opportunities.

SEA Themes and Objectives

It is important that the role the historic environment plays in sustainable development and the contribution it makes to delivering social, cultural, economic and environmental benefits is recognised. The historic environment underpins sustainable development and therefore, it may warrant including in other objectives including the need for specific reference to landscape character.

In terms of the SEA Objectives, E8 needs to be amended to ensure that it meets the requirements of the SEA Directive, this should ensure that reference is not just made to "maintain cultural heritage" and to make clear that it is not just architectural and archaeological heritage. Therefore, it needs to include reference to the following: "Conserve and enhance the historic environment, heritage assets and their setting". The Objectives would also benefit from a reference to the protection and enhancement of the character and appearance of townscapes, maintaining and strengthening local distinctiveness and sense of place.

Historic England strongly advises that you engage conservation, archaeology and urban design colleagues at the local and county level to ensure you are aware of all the relevant features of the historic environment

and that the historic environment is effectively and efficiently considered as part of the Local Plan, the allocation of any site and in the preparation of the SEA. They are also best placed to advise on local historic environment issues and priorities, including access to data held in the HER (formerly SMR). They will be able to provide you with the Historic Environment Records for the area including any relevant studies, and ensure a joined-up and robust approach is undertaken.

Environment Agency

The EA are satisfied that the proposed scope is fully comprehensive. In particular we are satisfied that the document considers all relevant Plans and Policies; provides a thorough Environmental Baseline; sets out comprehensive Objectives; and covers all the potential Environmental Issues that are relevant to the remit of the Environment Agency.

Established good practice is to consult more widely at this stage and the local authorities and other key stakeholders, including the AONB Executive Committee, were consulted. No specific comments were made.

3 BASELINE

In accordance with the SEA Directive, the following sections provide information on the review of relevant plans and programmes and environmental protection objectives (section 3.1) and a summary of the environmental baseline within the AONB (section 3.2).

Key environmental issues highlighted in the Scoping Report have been reviewed as part of the Management Plan review and consultation process and have been considered in the development of the Management Plan objectives and are summarised in section 3.3.

3.1 Review of relevant policies, plans and programmes

The AONB Management Plan is influenced by many other plans and programmes and also contributes to achieving the goals of those other plans and programmes. It needs to be consistent with national guidance, strategic and local planning policies and must conform to international, European and national environmental protection legislation and sustainability objectives. A review of relevant policy documents is an essential part of establishing baseline conditions. It sets the context within which the Management Plan will be operating and can help identify areas of potential conflict but also areas of synergy.

The SEA Directive requires that the Environmental Report must provide information on the plan's *'relationship with other relevant plans and programmes'* and *'The environmental protection objectives, established at international, European Community or national level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation'* (Directive Annex I a, e).

There is no definitive list of plans to be reviewed but using the guidance available, plans and programmes were identified from a wide range that have been produced at an international, national, regional and local level.

The plans and policies which have been identified as relevant to the Management Plan review are listed in Table 1. These are the main directives, plans and strategies that influence the aspects of the AONB that the new Management Plan is seeking to address.

Often the documents are further refined by interpretation at a 'lower level' (e.g. national strategies translated into local strategies). As the AONB Management Plan seeks to be a summary and reflection of local policies and actions, the scoping review has often been directed at the most pertinent local level documents. A table outlining the key thrust of each plan/strategy and its implications for the Management Plan review is included as Appendix 2 to this report.

Table 1 Relevant plans and policies

| Directive, plan, strategy |
|--|
| INTERNATIONAL |
| Agenda 21, (1992) |
| Convention on Biodiversity, (1992) |
| Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat |
| Kyoto Protocol to the United Nations Framework Convention on Climate Change (Adopted December 1997) |
| Copenhagen Accord United Nations Climate Change Conference 2009 |
| EUROPEAN |
| European Landscape Convention |
| The Birds Directive (79/409/EEC), (1979) |
| The Habitats Directive (92/43/EEC), (1992) |
| Our life insurance, our natural capital: an EU biodiversity strategy to 2020, European Commission, 2011 |
| Marine Strategy Framework Directive (2008/56/EC) 2008 |
| The Water Framework Directive (2000/60/EC), (2000) |
| The Flood Directive: Assessment and Management of Flood Risks (2007) (2007/60/EC) |
| EU Sustainable Development Strategy (June 2006) |
| The Waste Framework Directive, (2008/98/EC) (2008) |
| The Strategic Environmental Assessment Directive (2001/42/EC) |
| EU DIRECTIVE 2003/4/EC on public access to environmental information, (2003) |
| NATIONAL |
| Legislation/White papers |
| Wildlife and Countryside Act (as amended), (1981) |
| Countryside and Rights of Way Act (CRoW), (2000) |
| The Conservation of Habitats and Species Regulations 2010 (as amended) |
| The Natural Environment and Rural Communities (NERC) Act (2006) |
| Marine and Coastal Access Act 2009 |
| 'The Natural Choice', the Natural Environment White Paper (Defra, 2012) |
| Water for Life, the Water White Paper (Defra, 2011) |
| Flood and Water Management Act (2010) |
| Climate Change Act 2008 |
| Ancient Monuments and Archaeological Areas Act, (1979) |
| Planning (Listed Buildings and Conservation Area) Act, (1990) |
| Sustainable Energy Act (2003) |
| Secure and Sustainable Buildings Act (2004) |
| National Planning Policy Framework (CLG 2018) |
| Localism Act (2011) |
| Local Transport White Paper 2011 |
| Healthy Lives, Healthy People: Our Strategy for Public Health in England, the Health White Paper (Dept. of Health, 2010) |
| Strategies, Plans and Policies |
| Creating a great place for living: Defra's strategy to 2020, 2016 |
| Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Defra 2011) |
| National Pollinator Strategy: for bees and other pollinators in England, Defra, 2014 |
| The Invasive Non-Native Species Framework Strategy for Great Britain, Defra, 2008 |
| 25 Year Environment Plan: A Green Future: Our 25 Year Plan to Improve the Environment, Defra, 2018 |
| Defra Single Departmental Plan: 2015 to 2020, 2016 |
| Government Forestry and Woodlands Policy Statement 31 January 2013 |
| Natural England Designations Strategy, July 2012 |
| Conservation 21, Natural England's Conservation Strategy for the 21st Century |
| State of the Natural Environment in the North West, 2009, Natural England |
| UK Marine Strategy Parts 1, 2 and 3 |
| Marine Policy Statement |
| UK Geodiversity Action Plan, 2009 |
| Safeguarding our Soils – A Strategy for England (Defra 2011) |
| Future Water: The Government's Water Strategy for England, 2011 |
| Creating a better place, Our ambition to 2020, April 2016, Environment Agency |
| North West River Basin District River Basin Management Plan: 2015 |
| National Flood and Coastal Erosion Risk Management Strategy for England, Environment Agency, 2011 |
| North West River Basin District Flood Risk Management Plan 2015 – 2021, Environment Agency, 2016 |
| North West England and North Wales Shoreline Management Plan 2, 2012 |

| |
|--|
| Directive, plan, strategy |
| The Carbon Plan (DECC, 2011) |
| The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, (2007) |
| Government's Statement on the Historic Environment for England 2010 |
| Research and Archaeology in North West England: An Archaeological Research Framework for North West England Volume 2 Strategy |
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|--|
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3.2 Environmental Baseline

Another key aspect of establishing baseline conditions is to look at the current state of the environment and identify the environmental issues and trends that characterise the AONB. Much information will record the state of the environment at a point in time but, where possible, it is important to examine any future trends under a ‘no plan or programme’ or ‘business as usual’ scenario. The information collated will provide the evidence base upon which the potential effects of the Management Plan can be measured and assessed.

The collation of baseline information for the SEA overlaps significantly with that for the AONB Management Plan itself, and the two programmes have worked together to acquire data of relevant themes. The Arnsdale & Silverdale State of the AONB Report 2019 provides the data for both. The scope of the SEA data requirements includes: air quality, climatic factors, biodiversity, cultural heritage, landscape, population, materials assets, water and soil.

Appendix 3 sets out the key baseline data for the AONB. Baseline data trends are identified where possible. Currently, some of this data is not being collated in a systematic way related to the AONB boundary or is not being collected at all. Further discussion on the limitations of the data is given in section 3.2.1.

Baseline indicators and targets are suggested to form measures of the status of the area and the basis for monitoring the SEA. Some of these indicators will be the same as those required by the Management Plan, although the latter will also require response indicators.

A summary of the information in Appendix 3 is provided for each topic below. Many of the elements described may be inter-related and are cross cutting between SEA topics.

| SEA Topics |
|--|
| Biodiversity, Flora and Fauna |
| <p>The Arnsdale & Silverdale AONB is a nationally and regionally important core biodiversity resource which contains an unusually wide range of habitat types within a small area, creating a mosaic which is home to an outstanding variety of wildlife. Over 1,100 notable species have been recorded in the AONB, and this includes over 170 priority species (S41 NERC Act), most of which are likely to be resident or regular visitors to the AONB⁶.</p> <p>Large areas of the AONB are of international importance: there are 4 Natura 2000 sites: 2 SACs - Morecambe Bay and Morecambe Bay Pavements (including 12 sites of Special Scientific Interest) and 2 SPAs - Morecambe Bay and Duddon Estuary, and Leighton Moss. Morecambe Bay and Leighton Moss are also Ramsar sites. There are also many sites of national and regional importance: there are 19 SSSIs (two of which are designated for geological reasons) which cover 54% of the whole AONB, one National Nature</p> |

⁶ Notable and Characteristic Species in the Arnsdale & Silverdale AONB, G Skelcher, 2016

Reserve (NNR) and 64 Local Wildlife Sites (covering 11% of the AONB).

In 2018, 99.1% of SSSIs were in favourable or recovering condition (64.7% in favourable condition with 34.4% in recovering condition)⁷. 21 of the 64 Local Wildlife Sites have been assessed as being in positive management⁸.

Priority habitats cover around 70% of the AONB⁹ and include:

- Deciduous woodland
- Upland mixed ashwoods
- Wet woodland
- Wood pastures and parkland
- Lowland calcareous grassland
- Lowland meadows
- Purple moor grass and rush pasture
- Lowland fens
- Reedbeds
- Intertidal mudflats
- Coastal and flood plain grazing marsh
- Coastal saltmarsh
- Maritime cliffs and slopes
- Inland rock outcrop and scree habitats
- Limestone pavements
- Oligo-mesotrophic lakes
- Ponds
- Rivers
- Traditional orchards
- Lowland heathland

Woodlands cover around a third of the terrestrial AONB. Active woodland management has increased by 19% over recent years and 73%¹⁰ of the woodland is now in active management.

Of the woodland area within SSSIs, 99%⁷ is in favourable or recovering condition. Of the calcareous grasslands within SSSIs 100% is in favourable or recovering condition and of the freshwater wetlands within the AONB SSSIs (fen, marsh and swamp) 90% are in favourable condition. 100% of littoral sediments are in favourable or recovering condition.

Population and Human Health

The population of the AONB is approximately 7070¹¹. There appears to have been a continued shift towards an older population since the census in 2011, with a greater percentage of over 65s and a smaller percentage of younger adults and also 0-14 year olds. The AONB has fewer children and young working age people and a greater percentage of people over 65 than Cumbria, Lancashire or nationally.

House prices remain high within the AONB and there has been no improvement in the affordability ratio (ratio of mean house price to household income). High house prices and a high affordability ratio lead to an increased demand for affordable housing.

95% of people are in 'very good, good or fair' health within the AONB (Census 2011). This percentage is

⁷ © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018.

⁸ G Skelcher, County Wildlife Sites Survey 2014/15

⁹ G Skelcher, Priority Habitat Survey, 2016

¹⁰ © Forestry Commission copyright [2017]

¹¹ Office for National Statistics, 2016

comparable with and very slightly above that in Cumbria and nationally (94 and 94.4% respectively) and slightly above that in Lancashire (93.6%).

The Indices of Multiple Deprivation for the AONB shows that the overall deprivation of the AONB is low. The low scores do not mean that deprivation does not exist within the AONB but that it is scarce.

Geology and Soils

The Carboniferous limestone bedrock of the Arnside and Silverdale area underpins the natural beauty of the AONB. The limestone unifies its character and creates the conditions that have allowed the wide diversity of habitats to develop.

The superficial geology, for example tidal flats, saltmarsh, lacustrine and peat deposits, also contribute to the natural beauty by creating broad areas of flat ground which contrast with, and provide a natural setting for, the limestone hills. The saltmarsh areas, dynamically changing in their location and extent, provide natural beauty in their contrast with the different colours and textures of the tidal flats beyond. Deposits have contributed to the development of reedbed, fen and mosses.

There are 16 Limestone Pavement Orders within the AONB covering 15% of its area. Many of these sites are also SSSIs and 5 form part of the Morecambe Bay Pavements SAC.

2 SSSIs are of particular geological interest – Trowbarrow Quarry and Hale Moss Caves. The condition of both these sites remains favourable. There are also 8 Local Geological Sites (LGS). All the LGS are in good condition or are under positive management.

Other features of geological interest which also contribute to the landscape character are the low limestone cliffs along the coast, solution hollows (or dolines) in the limestone, sea caves, scree-covered slopes, erratic boulders, karstic features and Carboniferous limestone fossil assemblages.

Soils within the AONB are generally thin and free draining. Permanent pasture, particularly on species rich limestone grassland, provides effective erosion control, often on vulnerable sites where the depth of soil is very shallow and, being present over limestone, are prone to drought. Peaty soils are present under the low lying mosses such as Arnside Moss, Silverdale Moss, Hale Moss and Leighton Moss. Some of these deep peat soils are more or less permanently waterlogged. Others are drained by open ditches, although flooding still occurs periodically.

Agricultural Land Classification within the AONB identifies 31% of the terrestrial AONB as Grade 3 (good/moderate), 39% as Grade 4 (poor), and 22% as Grade 5 (very poor). There is no Grade 1 (excellent) or Grade 2 (very good) agricultural land within the AONB.

Climate change projections of increases in winter rainfall and drier summers may increase the susceptibility of soils. Increases in applications of pesticides and fertilisers have potential impacts on soils, water courses and biodiversity. Agri-environment payments help to minimise these risks.

Water

As a consequence of its geology, the Arnside & Silverdale AONB is a relatively dry landscape. However, water has played an important role in the formation of the area and is a key feature of the landscape. The two principal rivers in the area, River Bela and River Kent form the AONB boundaries, to the north east and south respectively. Leighton Beck, Quicksand Pool and Black Dyke are smaller water courses which are present within the terrestrial AONB. Standing water is rare in a limestone landscape where most water finds its way underground. The main water body within the AONB is Hawes Water, an internationally important marl lake, one of only a small number in England. Open water is also present at Leighton Moss and there is also a small lake at Haverbrack. There are numerous springs and small ponds across the AONB. The springs are historically important having been a key factor in the location of settlements, particularly

Silverdale village and its dispersed pattern.

About 37 % of the AONB is covered by the tidal waters of the Kent Estuary and Morecambe Bay.

Where water quality monitoring takes place in the AONB it shows that water quality is generally good in the rivers and streams and in Hawes Water. At Leighton Moss monitoring indicates levels of phosphorus elevated above the level required to ensure that the SSSI is in favourable condition. Agriculture has been identified as the primary reason for the elevated levels. Whilst there is currently little monitoring information to confirm it there are concerns about groundwater quality in the Silverdale area. Discharges from sewage treatment infrastructure are the cause of concern here.

Abstraction from ground and surface water is not extensive within the AONB. Abstraction licensing strategies for South Cumbria and Lune and Wyre, Feb 2013, indicate that there is water available for licensing within the AONB area generally. However, there is no water available from Hawes Water and restricted water available from the Bela. Licensing strategies remain unchanged since 2004, indicating no particular or increasing pressure on water resources in AONB area. Overall, water resources are not considered to be an issue within the AONB.

Fluvial flood risk has been low within the Arnside & Silverdale AONB but in December 2015 Storm Desmond led this to be the wettest calendar month overall since records began and there was flooding in Warton and Beetham villages and flooding across the mosses. Surface water flooding is an issue in Warton and coastal flooding is a potential risk in certain low lying areas of the AONB. The issue of coastal flooding and salt water inundation of the low lying mosses within the AONB is cross cutting with climatic factors.

Air

The Air Quality (England) Regulations 2000 place a duty on local authorities to review and assess air quality for seven pollutants and ensure that standards and objectives laid down for each will be met. Monitoring is not carried out within the AONB by either South Lakeland District Council or Lancaster City Council and air quality is not considered to be a problem within the AONB.

Climatic Factors

Predicted changes to the climate have the potential to impact on many cross-cutting aspects of the AONB, including biodiversity, water resources and the water environment, agriculture, forestry, human health and the historic environment. It is recognised that the full extent of the impacts will not be apparent in the short term. Predicted changes include a possible mean increase in summer temperatures of 2-4°C, milder winters, changes in rainfall distribution and seasonality, more extremes of weather and sea level rise¹².

Climate change is increasing the risk of flooding and coastal erosion¹³. The situation, however, is likely to intensify as temperatures continue to rise: a warmer atmosphere can hold more moisture, leading to heavier rainfall; oceans are likely to become more acid, polar ice reduce and sea-levels rise.

The main impacts on the biodiversity of the AONB are expected to be changes in species ranges, and species abundance and timings of biological events as a result of increases in temperature, the impact of extreme weather events such as flooding, drought and storms and loss of inter-tidal habitat as a result of sea level rise. Flight times of butterflies are already thought to be altering in the AONB. Temperature changes and more extreme weather conditions could in the long term affect farming and forestry, changing the balance between arable and pastoral farming, influencing crops grown and stock kept. Tree species may alter over time as temperatures and rainfall patterns alter, affecting the forestry and woodland management practices of the area.

Hotter weather would be likely to lead to more evaporation from rivers. Intense rainfall also leads to

¹² Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra, 2012

¹³ A Green Future: Our 25 Year Plan to Improve the Environment, Defra, 2018

surface water flooding and more pollutants running off into rivers and streams and ultimately affecting our coastal waters. Possible less rainfall in summer on average will lead to lower river flows in summer. Drought conditions are likely to be more common. Climate change is also likely to put more stress on the water environment. Lower water levels in rivers and lakes would reduce their capacity to dilute pollutants, and worsen water quality, as well as reducing their ability to sustain wildlife.

Impacts on the historic environment may include the increased likelihood of damage to foundations of both historic buildings and agricultural boundary walls through winter waterlogging and heavier rain events and new pest species which may affect the integrity of individual sites.

Material Assets

Agriculture

Agricultural land in the Arnside & Silverdale AONB comprises 4275 ha (2016 Defra June agricultural survey), around 56% of the AONB. The main land uses is Grassland (permanent, temporary and rough grazing (80%). Woodland accounts for a further 11% of the agricultural land and 5% is crops and bare fallow. There are a total of 48 commercial farm holdings in the AONB, most being under 20 ha according to the 2016 survey. Farms grazing livestock (beef and dairy cattle and sheep) are the predominant farm type. Sheep are the main grazing livestock type (82% of stock) although cattle (both dairy and beef) make up around 18%.

The figures from the annual Defra surveys indicate that since 2010 the total farmed area has increased by 38% and the number of farm holdings in the AONB has increased. There has been an apparent increase in the size of the farms, particularly above 20ha and a shift away from smaller holdings (<5ha and less than 20ha). Grassland remains the main land use. Between 2010 and 2016 there has been an overall decline in cattle numbers and a significant increase in poultry numbers.

Employment in farming within the AONB has increased by 23% since 2010. In 2016, 26% of those employed in farming were full time farmers, 35% part time and the remainder full and part time employees and casual workers.

There is significant uptake of Environmental Stewardship and Countryside Stewardship (agri-environment schemes) within the AONB, with 24 live agreements in 2018 covering 1314ha.¹⁴

Nationally, work is being carried out on the design for a successor agri-environment approach after Britain's exit from the European Union. The key drivers behind this are expected to be priority policy objectives contained in the 25 year Environment Plan¹⁵.

Woodland

Woodland cover within the Arnside & Silverdale AONB is around 1559 ha¹⁶, about a third of terrestrial AONB), mainly comprising broadleaved woodland (87%) followed by mixed woodland (6%) and coniferous woodland (4%). 652 ha (around 14% of the terrestrial AONB) is ancient woodland¹⁷, of which 488 ha is Ancient and Semi-Natural Ancient Woodland and 164 ha is Plantations on Ancient Woodland sites (PAWS).

Woodland management provides local timber and woodfuel products. Management of woodlands for amenity, recreation and wildlife value is also important. Silverdale District Woodbank is a community group that carries out woodland management work, producing wood fuel and aiming to help people in fuel poverty.

¹⁴ © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018.

¹⁵ A Green Future: Our 25 Year Plan to Improve the Environment, Defra, 2018

¹⁶ © Forestry Commission copyright (2017), 2015 data

¹⁷ : © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2017.

Tourism

Tourism is a key component of the local economy. It is based on the area's special qualities and people's value of the area including quiet outdoor recreation, such as walking, cycling, bird watching, fishing and climbing. Around 14%¹⁸ of businesses are involved in tourism business activity (7.2% in accommodation and transport, 6.6% in food and beverage & culture and leisure businesses). This compares with 12.4% for all AONBs and 27.3% in National Parks. Tourism accounts for nearly a fifth of total employment within the AONB.

In the Morecambe Bay Visitor Survey¹⁹ the most popular reasons for visiting the area were for its beautiful scenery and its peace and tranquillity. Almost 90% of respondents were interested in visiting places where they can see and or experience wildlife. 94% agreed that Morecambe Bay was good for nature and scenery; 70% of visitors agreed that the area was good for culture and heritage.

The number of visitors to the AONB is to rise in the future and managing this increase whilst at the same time protecting the special qualities of the AONB is a key challenge.

Minerals

Sandside Quarry is the only remaining active limestone quarry within the AONB. It is due for closure in 2029. No new mineral developments are planned within the AONB.

Some of the former limestone quarry sites, such as Trowbarrow and at Warton Crag, have been extensively recolonised by uncommon plants and are now designated as Local Nature Reserves.

Shellfisheries

The intertidal sand and mudflats of Morecambe Bay support a range of shellfish, including cockles. Warton Sands cockle bed is located in the south west corner of the AONB. There were active cockle fisheries in Morecambe Bay for most of 2017 but stocks of cockles were not of a commercial quantity at Warton Sands²⁰.

The fluctuation in cockle recruitment is natural and there can be huge variations over time. The sustainable management of the cockle fishery is very important as over exploitation could impact on the important oystercatcher population within the Bay, which feeds on the cockles in the inter tidal area.

Access

There is an extensive network of over 116km of public rights of way (PRoW) within the AONB including footpaths, bridleways, byeways and 18km of easy access walks.

Significant areas of the AONB are also openly accessible to the public such as National and Local Nature Reserves, National Trust, RSPB and AONB Landscape Trust owned land. The outstanding level of access within the AONB is one of the special qualities of the area.

Public Rights of Way should be easy to use by all legal users and, wherever reasonable, access should be available to people with a wide range of mobility difficulties.

The coast is also an important part of the AONB for recreation, particularly for walking, running, sailing and angling.

Work is well underway by Natural England on the England Coast Path - a new National Trail around all of

¹⁸ Protected Landscapes Monitoring, Source: IDBR, 2009, Local Units

¹⁹ Morecambe Bay Visitor Survey, 2013

²⁰ North Western Inshore Fisheries and Conservation Authority, Jan 2018

England's coast. The England Coast Path is due to be completed in 2020. The trail runs along the coast of the AONB.

The National Cycle Network route 6, route 9 and route 700 pass through the AONB. Route 700, the Bay Cycle Way, was launched in 2015 as part of Morecambe Bay Partnership's 700 Days Scheme, funded by the Coastal Communities Fund and Heritage Lottery Fund.

Waste

There are no active landfill sites within the AONB and no new waste developments are planned. There is household waste recycling centre at Carnforth and various local recycling sites.

Cultural Heritage including Archaeological and Architectural heritage

The rich historic heritage of the AONB and the distinctive settlement characters are two of the special qualities of the area and are integral to its character. The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged. This includes designated assets but also not only involves undesignated (or local heritage assets) but the potential for unrecorded archaeology, and historic landscape character areas.

The features that make the area distinctive reflect the strong agricultural and industrial heritage of the AONB and many are cross cutting with the special landscape of the AONB such as field boundaries (drystone walls and hedges), designed landscapes, ancient woodlands, walls within woodland, traditionally coppiced woodland, orchards, limekilns and quarries. The settlements (their character and appearance, the layout of villages and hamlets and the building traditions of the area) contribute strongly to the character and quality of the AONB landscape and are important to the local distinctiveness and sense of place.

Listed within the AONB are 695 Historic Environment Records including 10 Scheduled Monuments, 115 Listed Buildings, 1 Registered Park and Garden and many non-statutory archaeological sites. There are 3 Conservation Areas – Warton, Beetham and the Yealands. Up to date Conservation Area Appraisals (CAA) are available for Beetham and Warton.

There are four sites on the Historic England Heritage at Risk Register 2017. Since 2013 Slackwood Farm has been removed from the register. Arnside Tower and Hazelslack Tower remain in very bad condition and Beetham Hall remains in bad condition. The small multivallate hillfort on Warton Crag is in generally unsatisfactory condition with major localised problems. Scrub/tree growth is the principal vulnerability but its trend is now improving; was declining back in 2013.

The two local authorities covering the AONB, South Lakeland District Council and Lancaster City Council, are preparing lists of local heritage assets within their districts. A local heritage asset is a building, structure or man-made landscape of local historic or architectural importance which contributes to the local landscape, the local built character, settlement formation and 'sense of place' but is not covered by statutory legislation.

Pressures for development within the AONB are ongoing and there is continuing risk of damage to the rich archaeological resource and traditional character of settlements and individual buildings.

Historic Landscape Characterisation Reports for both Lancashire²¹ and Cumbria²² provide valuable tools for understanding the cultural heritage of the AONB.

²¹ The Lancashire Historic Landscape Characterisation Report, December 2002.

²² Cumbria Historic Landscape Characterisation – final report, July 2009

Landscape

The Arnside and Silverdale AONB has a very distinctive character which combines improved agricultural pastures and intensively managed farmland with large semi-natural areas including inter-tidal sands and mudflats, salt marsh, coastal mosses, species-rich limestone grasslands, limestone pavements, cliffs and escarpments and extensively wooded limestone hills. Its scenic qualities include the rarity and distinctiveness of its Carboniferous Limestone, the mosaic of contrasting landscape types present, and the estuarine setting of the AONB, which affords dramatic views over Morecambe Bay.

Landscape character types found within the AONB are: Intertidal flats, bay saltmarshes and lagoons, lowland moss, coastal limestone pasture, inland pasture and parkland and wooded limestone hills and pavements²³.

Man has significantly influenced the AONB landscape in many ways, through settlement, quarrying and land management, in particular, farming (cross cutting themes with Material Assets and Cultural Heritage). The landscape comprises numerous individual features (sites, monuments and buildings) as well as broad patterns of field systems, settlements and woodlands. The form and layout of villages and hamlets in the area also contributes to the character and quality of the local landscape and there are strong vernacular traditions in the area including the design, construction and detailing of individual buildings.

Important features characteristic of the AONB landscape include: natural limestone features – limestone pavements, low coastal cliffs, solution hollows, erratic boulders, historic field patterns (particularly in the vicinity of Beetham, Hale, the Yealands and Warton), distinctive field boundaries, in particular dry stone walls and hedgerows, historic settlement patterns and the distinctive character of settlements such as the Yealands, Warton and Beetham, limestone kilns and ponds, walls within woodlands, mature infield, boundary and parkland trees, areas of traditionally coppiced woodland and areas of species-rich grassland such as hay meadows.

Agri-environment agreements support conservation and enhancement of the landscape and may include for conservation of specific landscape features such as in-field trees or hedgerows. Agri-environment agreements within the AONB (Environmental Stewardship and Countryside Stewardship schemes) cover 1314 ha²⁴.

The tranquillity of the AONB is one of its key features. According to the Council for Protection of Rural England (2006), the west of the AONB, along the coast, can be regarded as ‘most tranquil’ becoming slightly less tranquil towards the east and the A6.

There are increasing pressures in the local area for renewable energy developments, particularly wind turbines and wind farms located on land adjoining the AONB which forms the setting of the designated landscape. These developments have the potential to negatively impact on views out from and the setting of the AONB. There is also ongoing pressure for other forms of development such as housing and tourism developments which have the potential to adversely affect landscape quality if not sited and designed appropriately.

Increasing visitor numbers and cars and changing recreational activities have the potential to lead to a decline in the tranquillity of parts of the AONB.

3.2.1 Limitations of the data

There have been a number of difficulties in accessing and collating relevant data sets. Some data sets are not available, some are unavailable at the right scale or are somewhat out of date.

²³ Arnside & Silverdale AONB Landscape and Seascape Character Assessment LUC, 2011

²⁴ © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018

Census data is not available cut to the AONB boundary. However, LCiC and SLDC have provided percentages to be applied to the data, representing the ward population resident within the AONB. Indices of Multiple Deprivation are also not available for the AONB specifically. Comparisons have therefore been used, presenting the indices for the most relevant units which include the area of AONB.

Substantial information is collected within the AONB and Morecambe Bay area on certain species such as butterflies and bird populations. Collating and interpreting this information for the AONB, however, is very resource intensive. Decisions need to be made on selecting key indicator species for the AONB and the need for regular collation of AONB specific information on population trends.

Tranquillity data for the AONB is available from CPRE but has not been updated since 2006.

The 'Framework for Monitoring Environmental Outcomes in Protected Landscapes' has provided a substantial amount of information for the preparation of the Management Plan and this Environmental Report. The Framework is managed by Natural England and presents data collected by Natural England, the Forestry Commission, Historic England and the Environment Agency. However future provision of this data by Natural England is uncertain at present.

3.2.2 Ecosystem services

As part of the Management Plan review, an assessment has been made of the range of services contributed to by ecosystems in the AONB. Consultation has included an identification of the key natural, social and cultural benefits (ecosystem services) provided by the special qualities of the AONB. The AONB Management Plan identifies the key ecosystem services provided by the AONB landscape and gives links to relevant objectives within the Management Plan which will help sustain and improve the range and quality of those services. Further information on the role of ecosystem services in the context of sustainability appraisal is given in Section 7.

3.3 Key environmental issues

The SEA Directive requires that the Environmental Report should include: *“any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC(Birds) and 92/43/EEC(Habitats)”(Annex I (d))*

The key environmental issues identified during the Management Plan review process are set out in the Management Plan and are given in the Table below.

Table 2 – Environmental issues

| |
|--|
| Key Issues and Challenges |
| An outstanding landscape rich in natural and cultural heritage |
| Landscape and seascape |
| International conventions and obligations such as the European Landscape Convention, the Convention on Biodiversity and Climate Change Agreements |
| Changes in and uncertainty about national policies relating to farming, forestry and the environment as a result of the UK’s exit from the European Union, in particular new approaches to environmental land management and rural development schemes and other support mechanisms for farmers and landowners Government ambitions to improve the environment as set out in ‘A Green Future: Our 25 Year Environment Plan |
| The landscape and seascape character in Arnside & Silverdale AONB has a high or very high level of inherent sensitivity with limited or very limited capacity to accommodate change or development, as confirmed in the Landscape and Seascape Character Assessment |
| Incremental changes over time lead to cumulative loss of character and erosion of the special qualities of the AONB |

| Key Issues and Challenges |
|--|
| Effects of climate change including extreme weather, storm surges, sea level rise and temperature change |
| Land use and land management changes, including agricultural change, particularly intensification |
| Soil erosion, compaction (both machinery and flood compaction) and management |
| Over or under grazing of limestone grassland |
| Under management of woodland |
| Potential for loss and deterioration of key landscape features |
| Loss and deterioration of traditional boundaries including dry stone walls (and associated features) and species-rich hedgerows (through intensive mechanised cutting), reducing effectiveness to contain stock and value as wildlife corridors |
| Potential loss of ancient, veteran and notable and parkland trees |
| Dynamic cycles of erosion, deposition and accretion of saltmarsh/mud/sand due to natural geomorphological processes within the Kent Estuary |
| Increased intrusion through noise and light pollution affecting tranquillity, dark skies and sense of place |
| Loss of key views due to vegetation and tree growth |
| Natural capital and ecosystem services |
| Limited knowledge and awareness of natural capital and ecosystems services |
| Geodiversity |
| Potential for loss of, damage to or under management of geological sites or features |
| Lower than expected level of awareness and understanding of the area's geodiversity, its importance and its links to biodiversity, heritage, natural capital and ecosystem services |
| Ensuring monitoring and positive management of Local Geological sites and areas covered by Limestone Pavement Orders, and other geological designations |
| Further research required about certain aspects of the area's geodiversity |
| Habitats and species |
| Changes in and uncertainty about support mechanisms for farmers and landowners to enable biodiversity enhancements |
| Effects of climate change including extreme weather, storm surges, sea level rise and temperature change |
| Loss and deterioration of some characteristic habitats, habitat fragmentation and declining resilience of ecological networks |
| Loss or decline of characteristic species and species diversity including low genetic diversity of some species that are on the brink of extinction e.g. Teesdale violet |
| Unfavourable or declining condition of a small number of SSSI sites/units: while 99.1% of the SSSIs are in favourable or recovering condition (64.7% in favourable condition and 34.4% in recovering condition), Middlebarrow unit 3 remains in decline, Hawes Water unit 3 has declined from favourable to declining, Hawes Water unit 12 remains unfavourable no change, and both Gait Barrows (Little Hawes Water) and Warton Crag (Three Brothers allotments) have declined from favourable to unfavourable no change. |
| Relatively low level of positive management of Local Wildlife Sites: only 21 of the 64 Local Wildlife Sites have been assessed as being in positive management |
| A focus on designated sites can make non-designated areas of priority habitat more vulnerable |
| Scrub encroachment on and nutrient enrichment (through fertiliser, manure or slurry application) of species-rich limestones grassland sites leading to decline in species-richness |
| Achieving appropriate grazing and management regimes on limestone grassland to enhance their species-richness |
| Under management of woodland, particularly on sensitive difficult-to-manage sites such as limestone pavement and damage to woodland caused by Grey Squirrels and deer |
| Dieback of Ash caused by the fungus <i>Hymenoscyphus fraxineus</i> is present in the AONB and is likely to significantly affect ash woodlands, the dominant woodland type within the area |
| Fungus-like pathogens <i>Phytophthora austrocedrae</i> , which causes dieback and mortality of Juniper and <i>Phytophthora ramorum</i> that causes extensive damage and mortality to trees and other plants, are now present in northern England |
| Invasive non-native species now present at a small number of locations within the AONB include Japanese Knotweed, Giant Hogweed, Himalayan Balsam, Piri-piri Burr and New Zealand Pygmy Weed; Cotoneaster and Buddleia have been recorded at various SSSIs within the AONB and Grey Squirrels are well established, with Mink also present |

| Key Issues and Challenges |
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| High tide salt water incursion into Leighton Moss and other low-lying mosses during storm surges and high tide erosion impacts on saline pools on Warton Marsh |
| Recreational disturbance of wildlife particularly breeding and overwintering waders and wildfowl on the coast |
| Potential to cause harm to biodiversity through works to conserve or research historic assets or archaeological sites |
| Decline in species reliant on the built environment such as swifts and bats |
| Terrestrial and marine litter |
| Wildlife crime |
| Need for further coordination of biodiversity research and monitoring, including up-to-date condition surveys of designated sites, and data collation and analysis |
| Water environment |
| Diffuse water pollution from agriculture (e.g. through fertiliser manure or slurry application) and point source water pollution from private sewage treatment infrastructure and assets. [Where water quality monitoring takes place in the AONB it shows that water quality is overall generally good in the rivers and streams and in Hawes Water. At Leighton Moss monitoring indicates levels of phosphorus and nitrate elevated above the level required to ensure that the SSSI is in favourable condition. Agriculture has been identified as the primary reason for the elevated levels. While there is currently little monitoring information to confirm it, there are concerns about groundwater quality in the Silverdale area. Discharges from private sewage treatment infrastructure and assets are the cause of concern here. The vast majority of the area drains to private sewerage treatment infrastructure rather than the public sewerage system] |
| Lack of comprehensive and coordinated water quality monitoring programme |
| Effects of climate change including extreme weather, storm surges, sea level rise with increased risk of fluvial, surface water and coastal flooding and also low flows in times of drought |
| Fluvial and surface water flood management [fluvial flood risk has previously been low within the AONB but in 2015 Storm Desmond resulted in December being the wettest calendar month overall since records began and there was flooding in Warton and Beetham villages and across the mosses. Surface water flooding can be an issue in Warton, Arnside and Yealand and coastal flooding is a potential risk in certain areas such as Storth and Sandside. The issue of coastal flooding and salt water inundation of the low lying mosses is cross cutting with climatic factors.] |
| Eutrophication, particularly in the Leighton Moss SSSI, and sedimentation of water courses and water bodies |
| Modification and loss of natural processes for rivers and wetlands |
| Increasing and conflicting demands on the coastal zone resulting from coastal squeeze due to sea level rise, enhanced coastal access and land use |
| Achieving suitable water quality and conditions for migrating and spawning native fish stock |
| Sustainable management of shellfishery [The intertidal sand and mudflats of Morecambe Bay support a range of shellfish, including cockles. Warton Sands cockle bed is located in the south west corner of the AONB. There were active cockle fisheries in Morecambe Bay for most of 2017 stocks of cockles were not of a commercial quantity at Warton Sands. The fluctuation in cockle recruitment is natural and there can be huge variations over time. The sustainable management of the cockle fishery is very important as over exploitation could impact on the important Oystercatcher population within the Bay, which feeds on the cockles in the intertidal area, along with other foods such as mussels and lugworm.] |
| Historic and cultural heritage |
| Four scheduled monuments remain on the Historic England Heritage At Risk Register: Arnside Tower, Hazelslack Tower, Beetham Hall (curtain wall and uninhabited portion) and Warton Crag Hillfort |
| Declining condition of, loss of and under management or poor management of heritage assets and features |
| Heritage assets and features that contribute to historic landscape character |
| The lack of information and research about, and recording of, the heritage assets and historic landscape character of the AONB |
| The need for greater collaboration between owners, partner organisations and communities to conserve, enhance and improve understanding of the historic and cultural heritage of the AONB |
| A focus on designated assets can make non-designated assets more vulnerable to loss, damage or neglect |
| Non-designated historic assets that are an important part of the historic landscape and are valued by |

| Key Issues and Challenges |
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| people are not always well described or recognised |
| Gradual loss or fragmentation of traditional field patterns resulting from the removal and erosion of field boundaries such as drystone walls and hedges |
| Loss of and deterioration in condition of orchards and loss of traditional fruit varieties |
| Risk of harm to the archaeological resource and traditional character of settlements and individual buildings through inappropriate development |
| Increased likelihood of damage to and deterioration of structure and foundations of historic buildings through storm events, heavier and winter waterlogging due to climate change |
| Damage to or loss of chimney and associated structures at Jenny Brown's Point due to erosion of salt marsh and sea level rise |
| Potential to cause harm to historic assets or archaeology through works to conserve or enhance biodiversity |
| While some projects have been undertaken, information on social and cultural history of the AONB such as land management practices, local history and development of the villages is at risk of being lost as people get older and if it is not formally recorded in some way |
| Development management |
| Development pressure and inappropriate development were identified as one of the most significant issues affecting the AONB in the Management Plan consultation held in early 2018 |
| Inappropriate location, design scale and/or nature of development which causes harm to the area's landscape character, visual amenity or natural and cultural heritage within the AONB or its setting (for example loss of priority habitat, loss of traditional boundaries, impact on heritage features etc.) |
| Small-scale cumulative development resulting in incremental erosion of landscape integrity and quality over time |
| Potential pressure for major development within the AONB or its setting including commercial scale energy development such as wind, tidal schemes, overhead wires and pylons or the winning of shale gas by hydraulic fracturing (fracking) |
| Loss of character and/or features due to insensitive conversion or modification of traditional vernacular buildings e.g. barns, farmsteads |
| Significant pressure for new housing development leading to potential loss of open spaces within settlements which contribute to rural, landscape and settlement character or encroachment into the countryside |
| Risk of detrimental impacts on landscape character, visual amenity and the coast from tourism development in particular detrimental impacts of caravan development including cumulative impacts, urbanisation of sites, erosion of undeveloped coastline, loss of tranquillity and increased traffic (including regular transportation of static caravans requiring escort vehicles) on narrow lanes of the area |
| Urbanisation of villages and rural lanes and roads |
| Achieving 'net gain' and securing enhancements through sensitive development |
| Lack of mains sewerage systems in large parts of the AONB, particularly Silverdale |
| If affordable or other local needs are not met on sites which may be suitable for development in the AONB, those needs will remain unmet potentially putting pressure on more sensitive sites |
| Development just outside the AONB such as large scale holiday complexes and further commercial development along the A6/M6 corridor, has the potential to adversely affect the setting and views out from the AONB, particularly on the eastern margins |
| Vibrant and sustainable communities |
| Land management and rural livelihoods |
| Changes in and uncertainty about new trade agreements, national policies relating to farming, forestry and the environment as a result of the UK's exit from the European Union, in particular new approaches rural development schemes and other support mechanisms for farmers and landowners |
| An older than average population and loss of young people affects the ability of the area to maintain a vibrant local economy [the AONB has an older than average population with fewer children and young working age people than in Cumbria and Lancashire as a whole] |
| Lack of economic and business information applicable to the AONB boundary |
| Sustaining viable rural, farming and forestry businesses and livelihoods |
| Decline in number and coverage of environmental land management schemes in the AONB and uncertainty about future of such schemes |

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| Key Issues and Challenges |
| Loss of expertise in traditional rural skills and land management practices such as hedgelaying, drystone walling, woodland management, coppicing and orchard management |
| Developing short supply chains for and marketing of local products |
| Limited access to training, business support and networking |
| Sustainable visitor economy |
| Relatively low level of collaboration between businesses and opportunities to help conserve, enhance, celebrate and benefit from and link directly with the landscape/special qualities of the AONB |
| A sustainable approach to the management of tourism in the AONB is required which takes account of the needs of the environment and does not harm, rather enhances, the special qualities of the AONB |
| The number of visitors to the AONB is expected to rise in the future, particularly due to Eden Project North being developed in nearby Morecambe and the forthcoming England Coast Path; managing this increase while protecting the special qualities of the AONB is a key challenge |
| Limited access to training, business support and networking opportunities |
| Affordable housing, rural services and local economy |
| The need to deliver housing which meets local needs, with affordable housing as a particular priority, without harm to the special qualities of the AONB |
| To maintain the vibrancy of local communities retention of local rural services and facilities is vital |
| Mobile phone and superfast broadband coverage is improving overall but is still limited in some parts of the AONB |
| Reliance on private cars for travel and under-use of sustainable forms of transport leading to detrimental impact of vehicles and traffic on the character and tranquillity |
| Decline in bus and train services and need for improvements to station infrastructure |
| Lack of car parking and cycling and walking infrastructure provision in some locations |
| Risk of detrimental impacts on landscape character, visual amenity and the coast from economic activity |
| The global need to reduce carbon emissions, reduce consumption of natural resources and adopt sustainable lifestyles |
| Economic development strategies and initiatives affecting the wider area, including the development of the Lancaster and South Cumbria Economic Region |
| Community engagement and volunteering |
| Encouraging effective engagement, participation, representation by local communities in the management of and decision-making about the AONB – putting people at the heart of policy-making |
| Supporting communities to conserve and enhance the special qualities of the AONB |
| Maintaining a shared sense of identity linked to the AONB and its special qualities |
| Maintaining a high level of volunteer involvement |
| A strong connection between people and the landscape |
| Enjoyment and understanding |
| The need to raise awareness and understanding about the area, its special qualities and opportunities for enjoyment |
| Maintaining high quality and up to date communications with limited resources including responding to the changing ways people use and consume data and information |
| Maximising opportunities for lifelong learning |
| Providing and resourcing a wide range of events and activities to engage with different audiences including those with additional needs |
| Lack of resources to cover transport costs for school visits |
| The national issue of children and young people losing their connection with nature |
| A highly competitive environment for attracting funding support |
| Relatively low awareness nationally of AONB designation |
| Access and recreation |
| The need to maintain the Public Rights of Way network to a high standard |
| Improving public access for a wide range of people often requires the cooperation of many different partners, stakeholders and landowners and ability to attract sufficient resources |
| Relative lack of bridleway routes for horses in the AONB and off road cycling routes |
| Maintaining high quality signage for the AONB access network |
| Irresponsible behaviour in the countryside |

| Key Issues and Challenges |
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| Recreation, particularly with dogs, can cause disturbance of wildlife on the coast and other sensitive sites |
| The delivery and management of the new England Coast Path is a key challenge |
| Increasing volume and speed of road traffic |
| Erosion of paths at key locations |
| Recreational activity can cause disturbance, damage and other detrimental impacts e.g. jet skis, motorbikes on the foreshore and mountain bikes on footpaths, use of drones/UAVs |
| While the vast majority of people treat the countryside with respect, public access can lead to issues that cause problems for landowners, managers and farmers. Public access particularly with dogs, can disturb grazing livestock or wildlife on sensitive sites. Dog attacks on sheep or cattle cause a significant impact on farmers' livelihoods and their wellbeing. Noise disturbance, cycling on footpaths, damage to infrastructure, litter and dog fouling are all potential issues which need to be managed. |
| The coastal area of the AONB can be dangerous, with shifting quicksands and fast incoming tides; Arnside coastguard responded to approximately 50 incidents in 2018. Increased coastal access and the loss of salt marsh along the AONB coast due to natural erosion is likely to lead to increased risk of more people using the intertidal sandflats for recreation. |
| Health and wellbeing |
| National public health issues such as dementia, mental health issues, obesity and social exclusion |
| Barriers to accessing nature and the countryside |
| Low level of collaboration between the environmental and health and wellbeing sectors |

4 ASSESSMENT METHOD

The approach set out in the Scoping Report has been used to undertake the assessment set out in this Environmental Report. It is based on assessing each objective within the Management Plan against a range of environmental and sustainability objectives (SEA and SA objectives). By assessing each Management Plan objective against these SEA/SA objectives it has become clearer where the AONB Management Plan can contribute to sustainability and where its impact could be improved. The development of the SEA/SA objectives and the appraisal framework used in the assessment are described below. The results and commentary are given in Sections 5 and 6 together with an assessment of options.

4.1 SEA Objectives

The SEA objectives are based on those given in the NE Guidance, with an additional objective focused on climate change adaptation and resilience, as was included in the previous Environmental Report (2014), with further small amendments made by the Management Plan Review Group and an additional objective specifically focussing on the character and appearance of townscapes was suggested during scoping and, following agreement by the Review Group has also been included. The twelve environmental objectives have been used to assess the impact of Management Plan objectives on the environment. To reflect wider sustainability issues all Management Plan objectives have also been assessed against the nine sustainability objectives given in the NE guidance.

The SEA/SA objectives are given in Table 2. An important check on the objectives was to consider whether they included all the topics set out in the SEA Directive. The links between the SEA/SA Objectives and the SEA criteria/topic are illustrated in the table below.

It is useful to test the internal compatibility of the SEA/SA objectives. There may be tensions between objectives that cannot be resolved: the compatibility assessment will clarify these so that subsequent decisions are well based, and mitigation or alternatives can be considered. Table 4 presents this compatibility assessment and illustrates that there are no potential conflicts.

Table 3 SEA/SA Objectives

| SEA/SA Objectives | SEA Topic |
|---|--|
| Environmental Objectives | |
| E1 To protect and enhance biodiversity (habitats and connectivity) and geodiversity | Biodiversity, flora and fauna, Soil |
| E2 To protect and enhance fauna and flora (individual species) | Biodiversity, flora and fauna |
| E3 To ensure no adverse effect arises on population (i.e. demographic balance) | Population |
| E4 To safeguard human health | Human health |
| E5 To protect and enhance soil quality | Soil, Water |
| E6 To safeguard the water environment | Water |
| E7 To protect air and climate | Air, Climate |
| E8 To conserve and enhance the historic environment, heritage assets and their setting, and maintain cultural heritage (including architectural and archaeological heritage) | Cultural heritage |
| E9 To protect and enhance the character and appearance of townscapes, maintaining and strengthening local distinctiveness and sense of place | Cultural heritage |
| E10 To protect and enhance landscape | Landscape |
| E11 To protect material assets including natural resources | Geology, Soil, Water, Material assets |
| E12 To reduce risks associated with climate change and extreme weather whilst increasing resilience and maximising the positive benefits for communities, landscape and the natural environment | Biodiversity, flora and fauna, Soil, Human health, Water, Air, Climate, Material assets, Cultural heritage |
| E13 To avoid significant adverse effects between the above interrelationships. | |
| Sustainability Objectives | |
| S1 To create more vibrant, cohesive, safe and mixed communities | Population, Human health |
| S2 To protect the quality and character of individual settlements and communities | Population |
| S3 To protect the environment, people and properties from flood risk | Human health, Biodiversity, flora and fauna |
| S4 To reduce the need and desire to travel by car | Climate |
| S5 To promote healthy lifestyles | Human health |
| S6 To raise standards of education and training and promote employment skills | Population |
| S7 To promote the development of an economy that supports social and environmental objectives | Population, Biodiversity, flora and fauna |
| S8 To promote good governance | All |
| S9 To minimise the consumption of natural resources including fossil fuels, minerals, land take and water | Geology, Water, Climate |

5 ASSESSMENT OF MANAGEMENT PLAN OBJECTIVES

5.1 Analysis matrix

The assessment of the 14 Management Plan objectives against the SEA and SA objectives (294 assessments in total, 168 environmental, 126 sustainability) is summarised in Table 5 below.

5.2 Commentary

The development of the AONB Management Plan draft objectives has taken place over a number of weeks, and approved by the Management Plan Review Group. Strategic Environmental Assessment has been carried out at the end of this process and has been undertaken on the draft final policies.

Of all 294 assessments, 79% are supportive or strongly supportive (43 and 36% respectively) of the SEA and SA objectives. 1% are assessed as 'uncertain' and 20% as neutral. Further analysis of the assessments against the environmental and sustainability objectives respectively is given below.

Environmental objectives

The majority of the conclusions, 78%, are supportive or strongly supportive (31 and 47% respectively) of the SEA environmental objectives, demonstrating that significant positive benefits to the environment should occur within the AONB and surrounding areas through implementation of the Management Plan.

All three key outcomes of the Management Plan - 'An outstanding landscape rich in natural and cultural heritage', 'Vibrant and sustainable communities' and 'A strong connection between people and the landscape' performed strongly with 76%, 83% and 75% of assessments supporting or strongly supporting the SEA environmental objectives.

No Management Plan objectives were recorded as 'strongly working against the SEA environmental objectives' or 'potentially working against the SEA environmental objectives). 4 boxes in the matrix show up as uncertain (2%). These relate to 3 objectives (Objectives 2, 4 and 6).

20% of the matrix demonstrates a neutral effect on the SEA environmental objectives.

The reasoning behind the assessments of 'uncertain' is discussed below for each of the relevant objectives.

Objective 2 Conserve, enhance and improve understanding of the natural capital of the AONB and the range and value of the public benefits and services that it provides to society and Objective 4 Conserve, enhance and restore the AONB's characteristic mosaic of habitats and improve their connectivity, take targeted action for key species and improve understanding of the biodiversity of the AONB - 'uncertain' impact on historic environment. Biodiversity, including woodland, freshwater wetland, coastal habitat, grassland and water environment, is a natural capital asset of the AONB. Some habitat management, for example creation of butterfly rides at Warton Crag within the scheduled monument, has potential to damage archaeological features. Also, habitat restoration schemes can have impacts on the historic environment and archaeology, for example tree felling and the removal of roots can cause damage to archaeology, creation of new embankments can alter the landscape character if not in keeping with historic field patterns, scrapes to create wet ground can have a direct impact on buried archaeological remains or an indirect impact on changes in water levels, wetland restoration, such as at Warton Mires, needs to very carefully consider the impact on or loss of heritage assets and archaeological features through increase in water levels.

Table 5 Analysis matrix of AONB Management Plan objectives against SEA/SA objectives

| Objective No | Management Plan Objective | SEA Objectives | | | | | | | | | | | | SA Objectives | | | | | | | | |
|---|---|-----------------|--------------------|---------------|-----------------|-----------------|---------------|------------------|------------------|--------------|---------------|---------------------|--------------------|---------------------|----------------|---------------|-------------------|-----------------------|-------------------|------------|---------------|----------------------|
| | | 1. biodiversity | 2. fauna and flora | 3. population | 4. human health | 5. soil quality | 6. water env. | 7. air & climate | 8. historic env. | 9. townscape | 10. landscape | 11. material assets | 112 climate change | 1. safe communities | 2. settlements | 3. flood risk | 4. reduce car use | 5. healthy lifestyles | 6. education-work | 7. economy | 8. governance | 9. natural resources |
| An outstanding landscape rich in natural and cultural heritage | | | | | | | | | | | | | | | | | | | | | | |
| Landscape and seascape | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Conserve, enhance and improve understanding of the natural beauty, landscape and seascape character and special qualities of Arnside & Silverdale AONB | S++ | S++ | N | S++ | S+ | S+ | S+ | S++ | S++ | S++ | S++ | S++ | S+ | S++ | S+ | S++ | S+ | S++ | S+ | S+ | |
| Natural capital and ecosystem services | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Conserve, enhance and improve understanding of the natural capital of the AONB and the range and value of the public benefits and services that it provides to society | S++ | S++ | N | S++ | S++ | S++ | S++ | X | S++ | S++ | S++ | S++ | S+ | S++ | S+ | S++ | S+ | S++ | S+ | S++ | |
| Geodiversity | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Conserve and improve understanding of the geodiversity of the AONB | S++ | S++ | N | S+ | S++ | S++ | S++ | S++ | S++ | S++ | S++ | S++ | S+ | S++ | S+ | S++ | S+ | S++ | S+ | S++ | |
| Habitats and Species | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Conserve, enhance and restore the AONB's characteristic mosaic of habitats and improve their connectivity, take targeted action to conserve key species and improve understanding of the biodiversity of the AONB | S++ | S++ | N | S+ | S++ | S++ | S++ | X | N | S++ | S++ | S++ | S+ | N | S+ | S++ | S+ | S+ | S+ | S+ | |
| Water environment | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Improve water quality and condition of watercourses and waterbodies in the AONB and support sustainable flood risk mgt | S++ | S++ | N | S+ | S+ | S++ | N | S+ | S+ | S++ | S+ | S+ | S+ | S+ | N | S+ | N | S+ | S+ | S+ | |
| Historic and cultural heritage | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Conserve, restore and improve understanding of the historic environment of the AONB including heritage assets, historic landscape character and cultural heritage | X | X | N | S+ | N | N | N | S++ | S++ | S++ | S++ | N | S+ | S++ | N | N | S+ | S++ | S+ | S+ | S+ |
| Development management | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Implement a landscape capacity-led approach to development planning, which conserves and enhances the natural beauty, landscape and special qualities of the AONB and its setting | S++ | S++ | S+ | S+ | N | N | N | S++ | S++ | S++ | S+ | N | S+ | S++ | N | N | S+ | S++ | S+ | S+ | S+ |

| Objective No | Management Plan Objective | SEA Objectives | | | | | | | | | | | SA Objectives | | | | | | | | | |
|---|--|-----------------|--------------------|---------------|-----------------|-----------------|---------------|------------------|------------------|--------------|---------------|---------------------|--------------------|---------------------|----------------|---------------|-------------------|-----------------------|-------------------|------------|---------------|----------------------|
| | | 1. biodiversity | 2. fauna and flora | 3. population | 4. human health | 5. soil quality | 6. water env. | 7. air & climate | 8. historic env. | 9. townscape | 10. landscape | 11. material assets | 112 climate change | 1. safe communities | 2. settlements | 3. flood risk | 4. reduce car use | 5. healthy lifestyles | 6. education-work | 7. economy | 8. governance | 9. natural resources |
| Vibrant and sustainable communities | | | | | | | | | | | | | | | | | | | | | | |
| Land management and rural livelihoods | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Support landowners and managers to sustainably manage the landscape in a way that conserves and enhances the special qualities of the AONB and delivers a range of environmental, community and local economic benefits, in particular by encouraging farming, land- and woodland management practices that enhance natural beauty and landscape character | S++ | S++ | S+ | S+ | S++ | S++ | S++ | S+ | N | S++ | S++ | S++ | S++ | S+ | S+ | N | S++ | S++ | S+ | S+ | S+ |
| Sustainable visitor economy | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Ensure that the visitor economy is environmentally sustainable and contributes to the conservation and enhancement of the area's special qualities, and enable visitors to have high quality experiences of nature, culture and quiet recreation | S+ | S+ | S+ | S+ | N | S+ | S+ | S+ | S+ | S+ | S++ | N | S+ | S+ | N | S+ | S+ | S+ | S+ | S+ | S+ |
| Affordable housing, rural services and local economy | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Support the delivery of affordable housing and services to help meet local community needs and environmentally sustainable local economic activity that conserves and enhances the special qualities of the AONB | S+ | S+ | S+ | S+ | N | N | S+ | S+ | S+ | S+ | N | N | S++ | N | N | S+ | S+ | N | S+ | N | N |
| Community engagement and volunteering | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Engage local communities in conserving and enhancing the AONB and encourage active involvement through volunteering | S++ | S++ | N | S++ | S+ | S+ | S+ | S++ | S++ | S++ | S++ | S+ | S+ | S+ | N | S+ | S+ | S+ | S+ | S+ | S+ |
| A strong connection between people and the landscape | | | | | | | | | | | | | | | | | | | | | | |
| Enjoyment and understanding | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Provide high quality information, events and activities to enable people to enjoy, learn about and celebrate the AONB's special qualities in a sustainable way | S++ | S++ | N | S++ | N | S+ | S+ | S++ | S++ | S++ | S+ | S+ | S+ | S+ | N | S+ | S++ | S++ | S+ | S+ | S+ |

| Objective No | Management Plan Objective | SEA Objectives | | | | | | | | | | | | SA Objectives | | | | | | | | |
|------------------------------|--|-----------------|--------------------|---------------|-----------------|-----------------|---------------|------------------|------------------|--------------|---------------|---------------------|--------------------|---------------------|----------------|---------------|-------------------|-----------------------|-------------------|------------|---------------|----------------------|
| | | 1. biodiversity | 2. fauna and flora | 3. population | 4. human health | 5. soil quality | 6. water env. | 7. air & climate | 8. historic env. | 9. townscape | 10. landscape | 11. material assets | 112 climate change | 1. safe communities | 2. settlements | 3. flood risk | 4. reduce car use | 5. healthy lifestyles | 6. education-work | 7. economy | 8. governance | 9. natural resources |
| Access and recreation | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Maintain and improve access to the coast and countryside in a sustainable way for a diverse range of people and promote responsible and safe, quiet recreation | S+ | S+ | N | S++ | N | N | S+ | S+ | N | S+ | S++ | N | S+ | N | N | S+ | S++ | S+ | S+ | N | N |
| Health and wellbeing | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Provide opportunities for people to improve their health and wellbeing by connecting with nature, culture and the landscape | S++ | S++ | N | S++ | N | S+ | S+ | S++ | S++ | S++ | S+ | S+ | S+ | S+ | N | S+ | S++ | S++ | S+ | S+ | S+ |

Objective 6 Conserve, restore and improve understanding of the historic environment of the AONB including historic landscape character, heritage assets and cultural heritage – ‘uncertain’ impact on biodiversity and flora and fauna. Conserving heritage assets, such as Warton Crag scheduled monument, can require careful and appropriate management of surrounding habitat. Archaeological excavation, such as at Jenny Browns Point, can affect the surrounding habitat, and habitat restoration will be required.

There is also the possibility that certain restoration works, such as on old buildings, could adversely affect species such as bats, if surveys are not undertaken and work not carried out appropriately. Adverse effects would be very localized.

Sustainability objectives

The majority of the conclusions, 80%, are supportive or strongly supportive (59% and 21% respectively) of the SA objectives, demonstrating that significant positive benefits to the environment, communities and local economy should occur within the AONB and surrounding areas through implementation of the Management Plan.

All three key outcomes of the Management Plan - ‘An outstanding landscape rich in natural and cultural heritage’, ‘Vibrant and sustainable communities’ and ‘A strong connection between people and the landscape’ performed strongly with 83%, 78% and 78% respectively of assessments supporting or strongly supporting the SA objectives.

No Management Plan objectives were recorded as ‘strongly working against the SA objectives’ or ‘potentially working against the SEA objectives) or ‘uncertain’. 17% of the matrix demonstrates a neutral effect on the SA objectives

5.3 Assessment of options

The AONB Management Plan is aiming to conserve and enhance natural beauty. The whole Plan is therefore, centred round environmental protection and improvement. Because of the nature of the Plan, it is not considered appropriate or reasonable to look at very different alternatives. Comparison of a number of different alternatives has not, therefore, been included but instead, the option of deleting an objective is assessed together with objective improvements.

Possible alternative options are:

- to remove the objective
- to leave the wording of the policy as it is and ensure that any supporting text identifies the potential for conflict (adverse effects on habitats or species or heritage assets) and any actions include for their protection where appropriate
- to modify the wording of the objective to ensure that any proposals do not lead to adverse effects on wildlife, landscape or cultural assets

These options are discussed below for the objectives assessed as ‘uncertain’.

Objective 2 Conserve, enhance and improve understanding of the natural capital of the AONB and the range and value of the public benefits and services that it provides to society - ‘uncertain’ impact on historic environment

To remove the objective completely would remove the uncertainty of any adverse impact on the historic environment as described above. However, the natural capital is a key element of the natural beauty of the AONB, and its conservation and enhancement is an area of core activity in pursuing the primary purpose of the AONB designation and is an essential part of management activity. Understanding the range and value of the public benefits and services that the natural capital provides to society is important and will support

the conserving and enhancing of the natural assets of the AONB and its natural beauty. The option of removing the objective is not supported.

Objective 4 Conserve, enhance and restore the AONB's characteristic mosaic of habitats and improve their connectivity, take targeted action for key species and improve understanding of the biodiversity of the AONB - 'uncertain' impact on historic environment

To remove the objective completely would remove the uncertainty of any adverse impact on the historic environment as described above. However, biodiversity is a key element of the natural beauty of the AONB, and its conservation and enhancement is an area of core activity in pursuing the primary purpose of the AONB designation and is an essential part of management activity. The option of removing the objective is not supported.

Habitat management and enhancement, delivered through both of the above objectives, is an important activity within the AONB and is essential to support conservation and enhancement of the natural beauty of the AONB, the primary purpose of the AONB designation. The potential impacts on the historic environment through habitat management and enhancement are already being taken into account when planning and delivering this work. For example, a Warton Crag Conservation Management Plan is being prepared which will facilitate holistic management of the scheduled site, enabling conservation of the scheduled monument together with habitat management of the SSSI and Local Nature Reserve. Also, the proposal for creation of new wetland habitats on fields at Warton Mires is under preparation and the potential impact on archaeology and heritage assets is being taken into account by the land owner, RSPB. Advice has previously been given by the AONB Partnership to RSPB and to the local authority, LCiC, regarding the need to consider the historic environment as part of these proposals and providing information on the historic environment record assets within the area.

The wording of the objective as it stands is considered to be as robust as possible and consideration of the historic environment impacts will be undertaken in all habitat management and enhancement activities. This is included within Draft Management Plan as a key environmental issue and the supporting text in the Management Plan identifies the potential for conflict which must be managed carefully in any future delivery of actions.

Objective 6 Conserve, restore and improve understanding of the historic environment of the AONB including historic landscape character, heritage assets and cultural heritage – 'uncertain' impact on biodiversity and flora and fauna.

To remove the objective completely would remove the uncertainty of any adverse impact on biodiversity as described above. However the historic environment is a key element of the natural beauty of the AONB, and its conservation and restoration is an area of core activity in pursuing the primary purpose of the AONB designation and is an essential part of the AONB management activity. The option of removing the objective is not supported.

Consideration of the potential impacts on both heritage assets and habitats and species when maintaining, restoring, enhancing or researching both assets and working together with the relevant organisations/landowners is essential and is already being taken into account when planning and delivering this work. An example is the Conservation Management Plan for Warton Crag.

If planning permission is required for restoration, appropriate surveys will be required through existing and proposed national and local plan policies (NPPF, SLDC and LCC local plans and the AONB DPD). Any other historic projects need to include species and habitat assessments and appropriate combined actions. The wording of the objective as it stands is considered to be as robust as possible and consideration of the biodiversity impacts will be undertaken in all historic environment activities. This is included within the

Management Plan as a key environmental issue and the supporting text in the Management Plan identifies the potential for conflict which must be managed carefully in any future delivery of actions.

6 ASSESSMENT OF SECONDARY, CUMULATIVE AND SYNERGISTIC EFFECTS

The key impacts of the Management Plan objectives were identified during the assessment process with the 'uncertain' impacts discussed in detail in section 5 above. Some environmental problems, however, result from the accumulation of multiple small and often indirect effects, rather than a few large and obvious ones. Examples include adverse effects on habitats, species and heritage assets. Annex I of the SEA Directive requires that the assessment of effects include secondary, cumulative and synergistic effects.

Secondary or indirect effects are effects that are not a direct result of a plan, but occur away from the original effect or as a result of a complex pathway. Examples of secondary effects are a development that changes a water table and thus affects the ecology of a nearby wetland; and construction of one project that facilitates or attracts other developments.

Cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect; or where several individual effects of a plan (e.g. noise, dust and visual) have a combined effect.

Synergistic effects interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

These terms are not mutually exclusive. Often the term 'cumulative effects' is taken to include secondary and synergistic effects.

The assessments of the Management Plan objectives noted a range of cumulative effects, largely synergistic, where different policies of the Plan work together to strengthen positive impacts. The cumulative effects of the plan, on each of the SEA topics, are given below.

Biodiversity

The cumulative impacts of the MP objective directly relating to biodiversity (Objectives 2 and 3) are strongly positive and should lead to progressively better management and continued restoration and enhancement of habitats and species. The reversal of habitat fragmentation through restoration and improving connectivity will be a particularly important benefit creating wildlife corridors and helping to maintain and increase species diversity and buffer against climate change. Targeted action to conserve key species and development of an appropriate species recovery programme and reintroduction initiatives will strongly support the area's biodiversity.

Invasive species, both aquatic and terrestrial, can cause habitat damage and out-compete native wildlife leading to ecosystem deterioration. Diseases such as *Chalara* dieback has the potential to lead to significant biodiversity impacts as ash woodlands are the dominant woodland type within the AONB. Managing, preventing the spread of and, if possible, eradicating non-native species and plant diseases will bring significant positive long term benefits to biodiversity within the AONB.

Geodiversity underpins many of the unique habitats found in the AONB, for example limestone pavements and associated plant communities occupying niche habitats within grykes, calcareous grasslands, mudflats, and marl water bodies. Conserving geodiversity (Objective 3) will lead to significant positive benefits to biodiversity.

Significant benefits are expected to the AONB's lakes, rivers, wetland and coastal habitats and associated species as a result of delivery of objective 5 regarding the water environment. Reductions in agricultural

diffuse pollution and septic tank outflows will lead to improvements in water quality and reductions in eutrophication and subsequent improvements to estuarine water quality are expected.

In addition, Objectives 1 and 6 regarding conserving and restoring landscape and heritage features such as woodlands, hedgerows, veteran trees, coppiced woodland, drystone walls, and Objective 8 supporting sustainable land management and which can include improved woodland management and coppicing and improved orchard conservation, will be particularly helpful.

Practical conservation work, including habitat management, is carried out by many volunteers within the AONB, through for example the AONB Partnership Volunteer Programme, community led volunteer groups, volunteer programmes run by key AONB partner organizations such as Butterfly Conservation, the National Trust, and this contributes enormously to the good condition of biodiversity within the AONB. Many volunteers also carry out monitoring, particularly of species, which is very valuable for informing management decisions and some will be involved in active conservation work. Objective 11 will help support continued active volunteering within the AONB.

Regular litter picks are also undertaken by volunteers. Litter can cause harm to both terrestrial and marine species by causing external injury or, if accidentally ingested, suffocation or starvation. Also, litter can last for long periods of time before degrading and toxic elements can leach into the soil and aquatic environment, affecting the condition of habitats. Minimizing litter will have positive benefits to both habitats and species.

The Landscape Trust (LT) and Bittern Countryside Community Interest Company (BCCIC) are both organisations which directly support the conservation of the AONB. The LT carry out volunteer activities including active conservation management of their three reserves. Members of the Trust also take part in the AONB Team's volunteer programme of practical habitat management work. The Trust also plays a significant role in raising awareness of the AONB's special qualities, including biodiversity and geodiversity, through its events programmes and publication eg. the Storth geotrail leaflet. The LT also has funds with which it can support biodiversity through purchase of land to become nature reserves and support other projects which will benefit biodiversity. The BCCIC exists to support the AONB Partnership and help deliver the AONB Management Plan through delivering small projects. It has developed publications aimed at raising awareness of the AONB biodiversity, such as its wildlife atlases. Supporting these community-led organisations will be very beneficial for biodiversity over the short and long term (Objective 11).

Objective 13 encourages responsible and quiet recreation. Promoting the countryside code and encouraging responsible dog ownership and providing appropriate signage re sensitive sites will help protect biodiversity.

Improving awareness and understanding of biodiversity through information provision and providing opportunities for people to enjoy the AONB's special qualities (Objective 12) and better understanding of the work of the AONB Partnership in conserving and enhancing these qualities by a wider range of local people and visitors is expected to bring positive benefits to biodiversity, as people become more aware of the impacts of their actions on both habitats and species and the importance of appropriate management. People may also be encouraged to become more involved in active conservation work.

Implementing a landscape capacity-led approach to development planning within the AONB (through the AONB Development Plan Document), as set out in Objective 7, will be positive to biodiversity. Policies AS01: Development Strategy (which requires all development to be consistent with the primary purpose of the AONB designation and to support the special qualities of the AONB), AS02: Landscape, AS04: Natural Environment and AS08: Design are particularly relevant and contribute to conservation and enhancement of biodiversity.

Population and Human Health

Enabling the delivery of affordable housing and services to meet local needs, Objective 10, will provide opportunities for younger people and families to move to and stay within the AONB and contribute to the demographic balance within the AONB.

Supporting landowners and managers to sustainably manage the landscape as set out in Objective 8 will deliver a range of community and local economic benefits. Improved training and employment opportunities have the potential to encourage more young people to live and work within the AONB, creating a more balanced age profile locally. Developing an AONB Land Managers Network, providing information, knowledge sharing, training and events, delivering a rural skills programme - competitions, demonstrations and training events, and supporting apprenticeships, graduate trainees, internships, training contracts etc. are all positive to the local population.

In addition, ensuring the visitor economy is environmentally sustainable, which will support the conservation of the AONB, and enabling visitors to have high quality experiences of nature, culture and quiet recreation (Objective 9) is expected to encourage people to visit the area and will support the local economy and may lead to additional local employment opportunities.

Objective 14 is specifically focused on improving health and wellbeing. There are also a number of objectives in the Management Plan aimed principally at other issues but which will help to improve the health and quality of life for those living and working in and visiting the AONB, to encourage healthy lifestyles and to increase environmental understanding.

The natural beauty of the AONB, its landscapes and seascapes and special qualities are some of the key reasons why people live in and visit the AONB. Conserving and enhancing this landscape and improving understanding (Objective 1) and the conservation of features which contribute to the special landscape (Objectives 2, 3, 4,5,and 6) will ensure that people continue to live in, visit and explore the AONB and experience the physical and mental benefits accessing the natural environment can provide. Improving understanding of the area's cultural heritage may also contribute to people's sense of place and enjoyment of the area, further benefiting mental well-being.

Implementing a landscape capacity-led approach to development planning (Objective 7) should ensure that all development within the AONB is sensitive to the designation, does not harm the special qualities and helps meet local needs. This will continue and enhance the physical and mental benefits that the AONB provides.

Enabling visitors to have high quality experiences of nature, culture and quiet recreation (Objective 9) will contribute to health and wellbeing of visitors, many of whom travel from the larger conurbations of the north of England. Promoting walking and cycling will support this as well.

Enabling people to enjoy and learn about the AONB through events and activities (Objective 12) has potential benefits for health, both mental and physical, and quality of life. Providing high quality information and improving understanding of the area's special qualities may also contribute to people's sense of place and enjoyment of the area, further benefiting mental well-being.

Maintaining and improving access (Objective 13) for a diverse range of people will ensure that a wide range of people can continue to visit and explore the AONB and all can experience the benefits to their physical and mental wellbeing that accessing the natural environment can provide. Health benefits are also likely to flow from promoting greater use of cycling and walking. Promoting coastal safety (tide, quicksand etc) and promoting the Countryside code will help safeguard human health as will promoting responsible and safe recreation.

Participation in nature conservation work has been shown to provide benefits to both mental and physical wellbeing. Objective 11 encourages active participation in conservation work by volunteers.

Delivery of affordable housing and local services to help meet local needs (Objective 10) can also have positive impacts on health – ‘The Positive Impacts of Affordable Housing on Health, Enterprise Community Partners, Inc. and The Centre for housing Policy, 2007’.

Geology and Soils

The cumulative effects of the Plan for geology and soil conservation in the AONB are positive. Geodiversity is a key characteristic of the area and underpins the special landscape of the area. Objective 3 supports increased understanding and conservation of the geodiversity of the area. Geodiversity includes both solid geology and geomorphological processes such as coastal erosion and deposition. Positive cumulative benefits to geology and soils are expected through this objective.

Protection of geodiversity will also be delivered through Objective 1, conservation of the natural beauty and special qualities of the AONB, development management (Objective 7) and sustainable land management (Objective 8).

Conserving, enhancing and restoring habitat (Objectives 2 and 3) will lead to significant positive benefits to soil and water quality such as reducing soil erosion and compaction. Invasive species can out-compete native plant species and during winter dieback, bare soil can be exposed, increasing the risks of soil erosion. Halting the spread of and eradicating invasive species will bring positive long term benefits to soil and water quality. Mechanisms for improving water quality (Objective 5) include reducing agricultural pollution and reducing stocking numbers. Both of these mechanisms will also deliver positive benefits to soil quality. Sustainable land management (Objective 8) incorporates good soil management and will help protect and enhance soil and water quality and reduce soil erosion.

Water

Objective 5 refers specifically to improving water quality in the AONB and significant positive cumulative effects on the water environment are expected. Other objectives, as described in the soil quality section above, will also lead to secondary benefits to the water environment (1, 2, 3, 8).

Objective 7, development management, will also lead to benefits to the water environment. AONB DPD Policy AS12: Water quality, sewerage and sustainable drainage refers specifically to protecting water bodies in the AONB.

Ensuring an environmentally sustainable visitor economy (Objective 9) will include delivering programmes of litter picks and beach cleans, supporting Love My Beach Campaign and this will help improve the water environment. Litter can last for long periods of time before degrading and toxic elements can leach into the soil and aquatic environment.

Restoring and appropriately managing some wildlife sites such as saltmarsh and wetlands (Objective 4) may also lead to positive benefits to flood risk. These habitats provide natural buffers against flooding and maintaining them in good condition will improve these natural flood defences. Managing the landscape sustainably (Objective 8) will assist with all aspects of flood risk management, including measures to store more water on land, slowing the flow of water downstream and thus reducing flood risk.

Air

The cumulative effects of the Plan objectives for air quality are expected to be positive. Sustainable transport to, from and within the AONB (which includes public transport and cycling) is supported by Objectives 9, 10 and 13. Encouragement of sustainable means of transport for getting to and traveling

within the AONB, as part of sustainable visitor economy, should ensure that CO2 emissions, resulting from car use, are minimized with benefits to air and climate. Retention of rural services, such as trains and buses, and the promotion of these sustainable transports will be positive to the air and climate. Maintaining and improving access within the AONB, such as PRoW, permissive paths, easy access routes, the Arnside viaduct path, England Coast Path, can encourage more people to access and travel within the AONB on foot or bike. Reductions in car travel will result in positive benefits to the air and climate.

Objectives aimed at affordable housing and rural services and supporting sustainable management of the landscape to deliver local economy benefits (Objectives 10 and 8) will improve the ability of people to live and work locally and access local services which will reduce the need to travel and help improve air quality. High quality information and increasing awareness of the AONB's special qualities, the work of the AONB Partnership and the issues facing the AONB (Objective 12) will help reinforce other work concerning sustainability and the need to protect air and climate through changing behaviours by individuals such as less car use and maximizing energy efficiency.

Climatic Factors

The cumulative effects of the Management Plan objectives on the climate are positive. Habitat conservation and sustainable land management can prevent environmental releases of carbon (Objectives 3 and 8 in particular and also objectives 1, 2, 3, 5, and 11 which will also deliver habitat conservation), and habitat enhancement and creation can create conditions to promote absorption of carbon. Important examples include the storage of carbon in shell material on the mud flats and woodland and saltmarsh.

Objectives will also be helpful in reducing emissions of greenhouse gases as described in the air quality section above: objectives 8, 9, 10, 12 and 13.

The Bittern Countryside Community Interest Company (BCCIC) is funding a Low Carbon Initiative, delivering a series of photo-voltaic projects for community buildings and Fact Sheets to raise awareness of the issues around energy resources. Supporting the BCCIC (Objective 11) will lead to reductions in carbon emissions and positive benefits to air and climate.

Material Assets

The cumulative impacts of the Plan's objectives on material assets are very positive. Conserving and enhancing and improving understanding of the natural beauty, landscape and seascape character and special qualities of the AONB including habitats and species, geology, heritage assets (Objectives 1, 2, 3, 4, and 6) maximises the potential of the land to deliver economic and social benefits and hence the value of businesses based upon the use of those assets including agriculture, forestry and tourism.

Managing the landscape sustainably in a way that enhances the special qualities of the AONB and delivering environmental and local economic benefits (Objective 8) will benefit agriculture, woodland and tourism, which depends heavily on the natural beauty of the AONB.

An environmentally sustainable visitor economy (Objective 9) should support the protection of material assets including natural assets, woodlands, dark skies and access. Contributing to the conservation and enhancement of the area's special qualities and enabling visitors to have high quality experiences of nature, culture and quiet recreation should encourage people to visit the area and this will support the local visitor economy, one of the identified material assets.

Significant positive benefits to access will be delivered from Objective 13. Maintaining and improving access and promoting responsible and safe quiet recreation is expected to benefit local people and visitors to the area, ensuring a positive visitor experience.

Engaging local communities (Objective 11) will help promote local activities that strengthen material assets as local communities improve their understanding and awareness of the value of the area's material assets and their management. Volunteer activities can include woodland management, which could lead to benefits to the condition of woodlands within the AONB and contribute to the local woodfuel economy. All the work the volunteers carry out contributes to conserving and enhancing the special qualities of the AONB which attract visitors, benefiting the tourism economy within the local area. Maintenance of footpaths contributes to the high quality access available within the AONB.

Significant benefits are expected to tourism as a result of provision of high quality information, events and activities (Objective 12). Access, another material asset, will be promoted through events, guided walks, downloadable routes etc.

Secondary – Objective 7, implementing a landscape capacity-led approach to development within the AONB will lead to positive benefits to many of the material assets. Policies AS01, AS02, AS04, AS05: Public Open Space and Recreation, AS06: Key Settlement Landscapes, AS07, AS08, AS09: Economic Development and Community Facilities, AS11: Camping, Caravan and Visitor Accommodation are particularly relevant.

Cultural Heritage

The cumulative effects of the Plan's objectives on the historic environment of the Arnside & Silverdale area are likely to be very positive. Continuing to conserve, restore and improve understanding of the historic assets of the AONB (Objective 6) will lead to better protection and management of sites ensuring the long term sustainability and improvement of those assets. Conservation of individual sites and features, and in particular the conservation of non listed heritage features, will be cumulatively positive for the historic character of the whole AONB. This objective is complemented by others that have beneficial secondary effects on the area's historic environment such as those aimed at conserving the landscape character, Objective 1 including landscape features such as settlements, traditional buildings, field boundaries and patterns, local heritage assets such as limekilns, milk churn stands etc., which are an important part of the historic environment and cultural heritage of the AONB, and at conserving features of both heritage and biodiversity or geodiversity value such as hedgerows and drystone walls, limekilns and old quarries (Objectives 3 and 4) .

Volunteer activities within the AONB include conserving and enhancing cultural heritage features such as hedgerows and drystone walls, as well as features within walls such as water troughs, and also ponds and limekilns and historic designed landscapes (such as The Hying). Work includes active restoration of some of these features but also scrub clearance to protect them (Objective 11). Supporting and encouraging community initiatives and groups which help to conserve and enhance the area, such as Mourholme Society, Arnside Archive will bring significant benefits to the historic environment. Local societies help improve understanding and awareness in the local community of the historic environment and cultural heritage of the area and the importance of conserving individual features, historic landscape character and preserving cultural traditions of the area. Members of these societies may also carry out monitoring which is very valuable for informing management decisions; some may be involved in active conservation work.

Also, the Landscape Trust plays a significant role in raising awareness of the AONB's special qualities, including the cultural heritage of the AONB, such as through the village weekends held in recent years at Arnside, Silverdale, Beetham, Yealands and Warton.

Greater awareness of the historic environment – of historic landscape character and individual historic assets – through provision of high quality information, events and activities (Objective 12) and better understanding of the work of the Partnership in conserving and enhancing these qualities by a wider range of local people and visitors is expected to bring positive benefits to the historic environment as people become more aware of the impacts of their actions on the historic environment and the need for conservation, restoration and research. People may also be encouraged to become more involved in active

conservation work. Events and activities will be provided in a sustainable way and so the historic environment will be conserved.

Managing the landscape sustainably in a way that enhances the special qualities of the AONB (Objective 8) is expected to be positive for the historic environment. For example, drystone walls and hedgerows are important heritage features and contribute to the historic landscape character of the AONB. Sustainable management and training in rural skills such as hedgelaying and drystone walling will lead to benefits to the historic landscape of the area

Also, sustainable flood management (Objective 5) could help protect certain historic assets within the AONB, such as listed buildings within the villages and possibly other features such as limekilns in the open countryside or coastline.

Implementing the landscape capacity-led approach to development planning through the AONB DPD will strongly support the historic environment. Policies AS01: Development Strategy (which requires all development to be consistent with the primary purpose of the AONB designation and to support the special qualities of the AONB), AS02: Landscape (specifically references the historic character of the AONB, settlement character and local vernacular traditions), AS07: Historic Environment and AS08: Design are particularly relevant and contribute to conservation and enhancement of the historic environment

Landscape

Many of the Management Plan objectives include for conservation, restoration and enhancement of features important to the landscape and local distinctiveness and the cumulative benefits on overall landscape character are strongly positive. Also, development management can have a particularly important role in protecting the landscape against inappropriate development and Objectives 1, 2 and 7 score highly.

As habitat diversity and condition contributes to landscape quality, the biodiversity objective (Objective 4) is also positive for landscape conservation and enhancement. Geodiversity is also a key characteristic of the special landscape and seascape and Objective 3 will also be particularly helpful in protecting landscape character.

Features of the historic environment are a key part of the landscape and seascape of the AONB. Traditional buildings, in particular listed buildings, and assets on the local heritage lists, are a fundamental part of the character and appearance of the local townscapes and contribute to the local distinctiveness and sense of place and landscape character. Objective 6 will contribute to protection and enhancement of the landscape.

Wetland and coastal habitats are key elements of the AONB's landscape and improving water quality will enhance these habitats with positive benefits to the landscape (Objective 5).

Managing the landscape sustainably in a way that enhances the special qualities of the AONB and delivering environmental benefits (Objective 8) is expected to be positive for the landscape of the AONB.

Effective engagement with and participation by local communities with conserving and enhancing the AONB (Objective 11) will contribute to protecting and enhancing the landscape. The AONB Grants Fund, support for the AONB LT the BCCIC and other local organisations will also contribute to this objective. Supporting local history and natural history societies, will lead to positive benefits for landscape. Local societies help improve understanding and awareness in the local community of the landscape character of the AONB and the importance of conserving individual landscape. Also, volunteer activities across the

AONB will bring significant positive benefits to the landscape through habitat management etc. and restoration and conservation of cultural heritage features.

Greater awareness of the special qualities of the AONB (Objective 12) and better understanding of the work of the Partnership in conserving and enhancing these qualities by a wider range of local people and visitors is expected to bring positive benefits to the landscape as people become more aware of the impacts of their actions on landscape character and individual landscape features. People may also be encouraged to become more involved in active conservation work. Events and activities will be provided in a sustainable way and so the landscape will be protected.

7 ECOSYSTEM SERVICES

To help define ecosystem services in the context of sustainability appraisal, identifying a clear link between each SEA/SA Objective and the ecosystem service(s) which assist in meeting that objective can be helpful. Such linkages are set out in Tables 6 and 7 in Appendix 4. The table very clearly illustrates the significant positive link between the SEA/SA Objectives and the range of ecosystem services provided by the AONB landscape.

It is also useful to test the internal compatibility of the ecosystem services to identify any conflicts there may be between the services, and which need to be considered. Table 8 in Appendix 4 presents this compatibility assessment and illustrates that there are very few potential conflicts. The table shows that of a total comparison matrix of 253 relationships there are 32 where the ecosystem services are unrelated and are not considered to be linked. Of the remaining 221 relationships, all but 3 are considered compatible; in that they are either mutually supportive or are benign in effect on each feature. The 3 relationships that are judged not compatible have been classified as “potentially inconsistent features”. This recognises that although there are some potential conflicts between the three features, they are relative to the scale of their significance within the AONB, and are therefore unlikely to constitute a significant threat to the affected ecosystem service. All three are related to impacts on Tranquillity from noisy woodland management operations, arable and timber cropping and blasting within Sandside Quarry. These activities are necessarily intermittent in nature and will therefore have a limited effect on the Tranquillity ecosystem service.

Considering the significant positive links demonstrated in Tables 6 and 7 in Appendix 4, the significant contribution made by the Management Plan objectives in meeting SEA and sustainability objectives, as identified in section 5, also demonstrates the highly positive impact delivering Management Plan objectives will have delivering multiple benefits across the range of ecosystem services.

The role the AONB Partnership can play in preparing for climate change is an important benefit which will be provided by delivery of many of the Management Plan objectives. In addition to building resilience to climate change through conserving, enhancing and restoring elements of the landscape such as habitat and heritage asset condition, restoring habitat connectivity, the work of the Partnership in preparing for the impacts of extreme weather on the landscape, biodiversity and communities should be recognised.

Delivery of the Management Plan should maintain and enhance the resilience of the area’s ecological network by ensuring that habitats are bigger, better and joined in order to help adapt to climate change, should develop robust ecological networks that are resilient to climate change through habitat enhancement, expansion, restoration and creation including improving habitat connectivity by establishing buffer zones, linear corridors and ‘stepping stones’, should protect undeveloped coast and achieve sustainable and integrated coastal zone management and should also take a coordinated approach to catchment management through Catchment Partnerships and support natural flood management schemes.

Delivery should also take targeted action to protect heritage assets at risk of damage due to climate change and carry out research, field survey and recording of heritage features along the coast that are likely to be lost due to erosion of saltmarsh and sea level rise.

Increasing awareness locally about the likely impacts of climate change and potential mitigation measures is a further important role of the AONB Partnership. Delivery of the Management Plan will promote use of sustainable transport options particularly train travel, cycling and walking for both residents and visitors and will support sustainability and low carbon initiatives, helping communities to work towards low carbon living. This can help mitigate climate change and increase understanding of the vulnerabilities of the AONB's special qualities to changes in weather patterns and rising sea levels, and will enable better planning and adaptation across the AONB.

The high level of partnership working involved in delivery of the AONB Management Plan will strongly support managing for climate change across the landscape, biodiversity and communities of the AONB.

8 MONITORING

The SEA Directive requires the effectiveness of the Management Plan and its impact on the environment to be monitored (Stage E). In the Scoping Report, a range of indicators were suggested to monitor change within the AONB based on the key environmental issues identified. Following the scoping consultation and consultation on the Management Plan, these have been refined and suggested indicators and targets are given in the table in Appendix 3, Environmental Baseline. Wherever possible, existing data sets and indicators have been suggested where monitoring is routinely carried out and data available cut to the AONB boundary. However, the SEA and Management Plan review processes have also highlighted data gaps. The table in Appendix 3 illustrates where data is not currently collected or where data is not currently available/collected for the AONB in a consistent way.

Following adoption of a final Management Plan, the AONB Team will need to discuss monitoring further with the relevant agencies and authorities and develop an approach to data collection, including who collects what data, the frequency of collection, how it is to be funded and how often and in what format it should be reported.

9 CONSULTATION

The SEA Directive requires consultation on the content of a Strategic Environmental Assessment with the three Consultation Bodies – Natural England, Environment Agency and Historic England – and the public. The Environmental Report (Consultation Draft) formed the basis of that consultation.

The Environment Report (Consultation Draft) was published at the same time as the Draft Management Plan so that comments could be made on the Management Plan with the benefit of the information presented in the Environmental Report. The public consultation period for the Environmental Report and Draft Management Plan ran from 22nd October 2018 to 3rd December 2018.

No comments were received from the Consultation Bodies on the Environmental Report and no responses were received from other stakeholders. The comments made on the Draft Management Plan led to minor changes being made to two of the Management Plan Objectives (8 and 10). Reassessment of both these objectives against the SEA/SA objectives has been undertaken and resulted in no changes to the scoring.

10 CONCLUSION

The SEA/ SA process has shown that the AONB Management Plan is highly supportive of the SEA and SA objectives and delivery will lead to significant cumulative positive benefits to the environment and also communities and local environment-based economy of the AONB.

The significant contribution made by the Management Plan objectives in supporting the environmental and sustainability objectives also demonstrates the highly positive impact achieving Management Plan objectives will have in delivering multiple benefits across a wide range of ecosystem services.

APPENDIX 1 MEMBERS OF THE AONB EXECUTIVE COMMITTEE

The Landscape Trust
Natural England
Environment Agency
CPRE (Friends of the Lake District)
Lancashire County council
Lancaster City Council
South Lakeland District Council
Cumbria County Council
National Trust
NFU
RSPB
Wildlife Trusts
CLA
Silverdale Parish Council
Beetham Parish Council
Warton Parish Council
Yealand Redmayne Parish Council
Yealand Conyers Parish Council
Arnside Parish Council
Farming/landowning rep (Dallam Tower Estate)
Business/Tourism rep (Bittern Countryside CIC)
Business/Tourism rep (Beetham Holiday Homes)
Local User Group (Ramblers)
Local User Group (N Lancs Bridleways Society)

APPENDIX 2 LIST OF RELEVANT PLANS AND POLICIES

APPENDIX 3 ENVIRONMENTAL BASELINE

Environmental baseline

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-------------------------------|-------------------------------|--|---|---|--|------------|--|
| BIODIVERSITY, FLORA AND FAUNA | Protected areas | Extent of area within AONB protected by classes of designations, international, national and local | SSSI – 19 sites, 4028ha, 54% of total AONB area Local Wildlife Sites – 64 sites, 888ha (20% of terrestrial AONB) | SSSI – 19 sites, 4079ha, 54% of total AONB area Local Wildlife Sites – 64 sites, 857ha, 11% of total AONB area | Favourable | No decline | NE (SACs, SPAs, Ramsars, SSSIs, NNRS, LNRs) LERN/CBDC (Local Wildlife Sites) |
| | SSSI condition | % of sites in favourable condition classes | 64.6% favourable, 35.2% recovering ²⁵ | 64.7% favourable, 34.4% recovering ²⁶ | Unfavourable | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Local Wildlife Site condition | % of sites in positive management | Local wildlife sites – no info on condition of sites in Cumbria; For 55% of the sites in Lancashire there is no info on condition, of the remainder, 14% are currently recorded as being in positive management | 21 LWS in broadly acceptable management | Unfavourable | | G Skelcher, LWS Condition Survey, 2014 |
| | Priority habitat | Area and type of priority habitat | n/a | Priority habitats cover around 70% of the AONB Types are listed in the State of the AONB report 2019 | | | G Skelcher, Priority Habitat Survey, 2016 |
| | Woodlands | Condition of broad habitat within SSSIs % of woodland in active management | Woodland (broadleaved mixed and yew) = 44% in favourable condition, 99% in favourable /recovering condition 54% ²⁷ | Woodland (broadleaved mixed and yew) = 99% ²⁶ in favourable /recovering condition 73% ²⁸ | Favourable However, Hawes Water SSSI unit 8 is unfavourable declining Favourable | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes Forestry Commission - Framework for Monitoring Environmental Outcomes in Protected Landscapes |

²⁵ © Natural England copyright 2013

²⁶ © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018

²⁷ © Forestry Commission copyright [2013].

²⁸ © Forestry Commission copyright [2017].

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--|---|---|--|--|------------|--|
| | | Extent of ancient woodland | <p>Area of ancient woodland = 660 ha²⁵ (9% of total AONB, 15% of terrestrial)</p> <p>ASNW: Ancient & Semi-Natural Ancient Woodland = 451 ha (10% of terrestrial)</p> <p>PAWS: Plantations on Ancient Woodland sites = 209 ha (4.8% of terrestrial)</p> | <p>Area of ancient woodland = 652 ha (14% of terrestrial AONB)</p> <p>ASNW: Ancient & Semi-Natural Ancient Woodland = 488 ha</p> <p>PAWS: Plantations on Ancient Woodland sites = 164 ha</p> | | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Grasslands | Condition of broad habitat within SSSIs | Calcareous grassland = 58% in favourable condition, 99% in favourable or recovering condition | Calcareous grassland = 100% in favourable or recovering condition ²⁶ | Favourable | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Wetlands and coastal | Condition of broad habitat within SSSIs | <p>Fen, marsh and swamp = 5%, 100%</p> <p>Littoral sediment = 65%, 78%</p> | <p>Fen, marsh and swamp = 90%²⁶</p> <p>Littoral sediment = 100%²⁶</p> | <p>Unfavourable</p> <p>Gait Barrows SSSI units 16-18, 20-21 and 27 are in unfavourable no change condition</p> <p>Favourable</p> | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | <p>Key species and assemblages of species</p> <p>Species distribution/population changes</p> | <p>Nationally rare and scarce species present within AONB</p> <p>% change in key species distribution/populations eg butterflies, birds</p> | Indicators to be agreed Over 100 of the S41 priority species are known to occur regularly within the AONB | Indicators to be agreed Over 170 S41 species, have been recorded in the AONB most of which are likely to be resident or regular visitors | Variable depending on species | No targets | <p>G Skelcher, AONB Notable & Characteristic Species, 2016</p> <p>Butterfly Conservation</p> |

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--------------------|---|---|--|--|------------|---|
| | Employment | <p>Number of people employed in farming</p> <p>Profile of workers in various industries eg. % in agriculture, forestry, fishing; wholesale and retail trade; education</p> <p>Unemployment – claimant count</p> | <p>Total no. people employed in farming 2010 = 87 No full time farmers in 2010 = 25</p> <p>Total employment in tourism businesses = 330 Total employment in tourism businesses = 19.6%</p> <p>n/a</p> <p>Job seekers allowance (JSA) claimant rate: Silverdale – 1.1 % Warton – 1.1 % Arnside/Beetham – 0.9 %</p> | <p>Total no. people employed in farming 2016 = 107 No full time farmers in 2016 = 28</p> <p>n/a</p> <p>2.0% of the population in agriculture, forestry, fishing 7.0% in accommodation and food service activities and 15.0% in education 14.6% in human health and social work activities 13.6% in wholesale and retail trade</p> <p>To be completed</p> | | No targets | <p>Defra Agricultural census</p> <p>Census data 2011 Cumbria Observatory http://www.cumbriaobservatory.org.uk/instantatlas/Cumbria_Atlas_Area_Profiler_Electoral_Wards/atlas.html Lancaster City Council</p> |
| | Local services | Numbers of rural services | n/a | <p>Schools: 6 Post Offices: 4 Convenience stores: 8 GPs: 2 Village halls: 5 Libraries: 2 Bus services: 3 bus routes Trains: 1 train line</p> | | | Lancaster City Council/South Lakeland District Council |
| | Housing | Affordability ratio | <p>Affordability ratio: Arnside/Beetham –</p> <p>Mean house price to</p> | The affordability ratio of median earnings to median house prices in 2018: | Unfavourable Affordability ratio remains high within the AONB. Comparative | | <p>Cumbria Observatory http://www.cumbriaobservatory.org.uk/instantatlas/Cumbria_Atlas_Area_Profiler_Electoral_Wards/atlas.html</p> |

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources | | | | | | |
|--------------------------------|-----------------------|--|---|--|--|--------------------------------|--|------------------------|-----|--|--|--|---|
| | | Number of new affordable homes delivered within the AONB | household income: 7.9 Median house price to household income: 9.1 Average house prices for Silverdale ward = £214,747 Warton ward = £196,471 | Arnsdale & Beetham ward – 7.813 The affordability ratio of average wage of the district to average house prices in 2016: Silverdale ward – 12.129 Warton ward – 8.613 Within the AONB over 5 years, 2013 – 2017: 0 | figures within Cumbria and Lancashire and nationally are much lower. | | Lancaster City Council South Lakeland District Council Lancaster City Council South Lakeland District Council | | | | | | |
| HUMAN HEALTH | Health and well being | Health of population (self-reported, Census 2011) | <table border="1"> <thead> <tr> <th>Health</th> <th>% of AONB population</th> </tr> </thead> <tbody> <tr> <td>Very good, good or fair health</td> <td>95.6</td> </tr> <tr> <td>Bad or very bad health</td> <td>4.4</td> </tr> </tbody> </table> | Health | % of AONB population | Very good, good or fair health | 95.6 | Bad or very bad health | 4.4 | 2011 census data Very good, good or fair health – 95.3 Bad or very bad health – 4.7% | Favourable % population of AONB in very good or fair health comparable with and above that in Cumbria (94%) and nationally (94.4%) and above that in Lancashire (93.6%). | | Cumbria Observatory http://www.cumbriaobservatory.org.uk/instantatlas/Cumbria_Atlas_Area_Profiler_Electoral_Wards/atlas.html Lancaster City Council South Lakeland District Council |
| Health | % of AONB population | | | | | | | | | | | | |
| Very good, good or fair health | 95.6 | | | | | | | | | | | | |
| Bad or very bad health | 4.4 | | | | | | | | | | | | |
| GEOLOGY and SOILS | Geological sites | Number of geological SSSIs Number and area of Local Geological Sites Number of Limestone Pavement Orders | 2 Local Geological Sites – 7 sites, 429ha (9.8% of the terrestrial AONB). | 2 Local Geological Sites – 8 sites, 429ha (6% of the AONB) 16 | Favourable | No decline | Natural England GeoLancashire, Cumbria Geoconservation LCC/CCC | | | | | | |

²⁹ The SLDC and LCiC figures cannot be directly compared because of dates and way calculated.

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|----------------------------------|---|--|--|--|---|------------------------|---|
| | Condition of geological SSSI sites and features | Condition of geological SSSIs | 100% in favourable condition | 100% in favourable condition | Favourable | No decline | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | | Number of geological SSSI unit features and % in favourable or recovering condition | No. geological SSSI features = 11 ¹ % in favourable or recovering condition = 100% of 9 assessed | n/a | | | |
| | | Condition of broad habitat within SSSIs | Earth heritage = 100% Inland rock = 12%, 88% | Earth heritage = 100% ²⁶ Inland rock = 91.9% ²⁶ | Favourable Favourable Warton Crag SSSI unit 6 is in unfavourable no change condition and Middlebarrow SSSI unit 3 is in unfavourable declining | | |
| | Condition of Local Geological sites | % of sites in positive management | All sites in good/very good condition or under positive management | Generally, the sites recognised for their geodiversity importance are in favourable condition. | Favourable | | |
| Soil Management Plans | Number of Soil Management Plans within the AONB | n/a | To be completed | | No targets | Natural England | |
| Agricultural Land Classification | % of terrestrial AONB in each ALC grade | Agricultural Land Class Grade 3 = 32% of terrestrial AONB Grade 4 = 40% Grade 5 = 23% Non-agricultural = 5% | Agricultural Land Class Grade 3 = 31% of terrestrial AONB Grade 4 = 39% Grade 5 = 22% Non-agricultural = 5% | | No targets | Lancaster City Council | |
| WATER | Water quality | % Length of river with 'High' or 'Good' Status | 6.1% (0.518 km, total length within AONB = 8.493km) ³⁰ | Where water quality monitoring takes place in the AONB it shows that water quality is generally good in the rivers and streams and in Hawes Water. | In 2016 Cycle 2 was introduced and the datasets changed (covering Leighton Beck, Leighton Moss and the Pool and Bela) and cannot be compared with Cycle 1 data. | | Natural England - Framework for Monitoring Environmental Outcomes in Protected Landscapes, Environment Agency |
| | | % WBs with 'High' or 'Good' | Standing Water WB (lakes | As above | | | Environment Agency - Framework for |

³⁰ By using this data, you are accepting the terms of the Environment Agency Standard Notice. Contains Environment Agency information © Environment Agency and database right. In addition, you are accepting the terms of use of the Natural England Open Government Licence, as published at http://www.naturalengland.org.uk/Images/open-government-licence-NE_tcm6-30744.pdf © Natural England copyright 2013."

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--------------------|-------------------------------------|---|--|---|---------|---|
| | | Status | and SSSI ditches) = 0% (1 moderate) | | | | Monitoring Environmental Outcomes in Protected Landscapes |
| | | Bathing water quality | Transitional WB = 0% (1 bad) n/a | At Morecambe North and Morecambe South: bathing water quality classifications 'good' ³¹ | Both beaches in Morecambe were classified as 'sufficient' in 2014* and 2015 and 'good' in 2016 and 2017 | | Environment Agency |
| | Water resources | Availability of water for licensing | n/a n/a Abstraction licensing strategies for South Cumbria and Lune and Wyre, Feb 2013, indicate that there is water available for licensing within the AONB area generally. However, | 8 abstraction licences within the AONB, permitting 4 surface water abstractions (3 from the River Bela and one from the River Keer) and 4 groundwater abstractions Private water supplies: SLDC: 8 private water supplies in total. 4 of these are boreholes. 4 of these are private distribution systems. LCiC: to be completed Abstraction licensing strategies for South Cumbria and Lune and Wyre, Feb 2013, indicate that there is water available for licensing within the AONB area generally. However, | Favourable | | Environment Agency SLDC, LCC Environment Agency |

³¹ © Environment Agency and database right.

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|---|------------|--|---|--------------------|---|---|
| | | | <p>there is no water available from Hawes Water and restricted water available from the Bela.</p> <p>Licensing strategies unchanged since previous CAMS in 2004, indicating no particular or increasing pressure on water resources in AONB area</p> | <p>there is no water available from Hawes Water and restricted water available from the Bela.</p> <p>Licensing strategies unchanged since previous CAMS in 2004, indicating no particular or increasing pressure on water resources in AONB area</p> | | | |
| | Flooding – fluvial and tidal flood risk | | <p>Fluvial flood risk around Warton</p> <p>Tidal flooding – current and future risk likely to be exacerbated by climate change</p> | <p>Fluvial flood risk around Beetham and Warton</p> <p>Tidal flooding – current and future risk likely to be exacerbated by climate change</p> | | | Environment Agency |
| AIR | Air quality | | | Air quality monitoring is not carried out within the AONB by either South Lakeland District Council or Lancaster City Council. | Favourable | Not currently considered to be an issue within AONB | SLDC LCiC |
| CLIMATE | Climate change | | | <p>Predicted changes include a possible mean increase in summer temperatures of 2-4°C, milder winters, changes in rainfall distribution and seasonality, more extremes of weather and sea level rise³².</p> <p>Climate change is increasing the risk of flooding and coastal erosion³³.</p> | | Predicted local impacts of Climate Change | Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra, 2012 ¹ A Green Future: Our 25 Year Plan to Improve the Environment, Defra, 2018 |

³² Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra, 2012

³³ A Green Future: Our 25 Year Plan to Improve the Environment, Defra, 2018

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------------|-----------------------|------------|---|--|---|---------|---------------------------------|
| MATERIAL ASSETS | Agricultural Holdings | | <p>Total farm holdings = 43</p> <p>Farm type: Grazing livestock (LFA) = 22 Grazing livestock (lowland) = 13</p> <p>Farm size <5 = 6 >=5 and <20 = 14 >=20 and <50 = 6 >=50 and <100 = 7 >=100 = 10</p> <p>Land Use: Total farmed area = 3105 ha Permanent grass = 2547 ha Temporary grass = 100 ha Woodland = 125 ha</p> <p>Livestock numbers: Total cattle = 2935 Beef herd = 177 Dairy herd = 568</p> <p>Total sheep = 12157 Poultry = 296 Horses = 82</p> | <p>Total farm holdings = 48</p> <p>Farm type: Grazing livestock (LFA) = 21 Grazing livestock (lowland) = 9</p> <p>Farm size <5 = 8 >=5 and <20 = 10 >=20 and <50 = 10 >=50 and <100 = 7 >=100 = 13</p> <p>Land Use: Total farmed area = 4275 ha Permanent grass = 2270 ha Temporary grass = n/a Woodland = 474 ha Crops and bare fallow = 222ha</p> <p>Livestock numbers: Total cattle = 2570 Beef herd = 257 Dairy herd = 621</p> <p>Total sheep = 12047 Poultry = 10580 Horses = 62</p> | <p>Increase from 2010 to 2016</p> <p>Decline in number of dairy farms since 2000</p> <p>Apparent increase in % of large farms (>= 100ha) and shift away from small holdings (<20ha)</p> <p>Increase in total farmed area of 37% since 2010. Grass remains majority of land use</p> <p>The number of cattle and sheep within the AONB have varied over the last 8 years Overall decline in cattle numbers of 12% 1% sheep numbers since 2010</p> | | Defra Agricultural Census, 2016 |

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--------------------|---|---|--|--------------------|------------|---|
| | Woodland | Total area of woodland (Sub-divided into categories) | Total area of woodland = 1552 ha ³⁴ (35.5% of terrestrial AONB) Including: Broadleaved = 1,360 ha Conifer = 67 ha Mixed = 97 ha | Total area of woodland = 1543 ha Including: Broadleaved = 1,415 ha Conifer = 53 ha Felled = 24 ha Low density = 0.4ha Mixed mainly broadleaved = 20ha Mixed mainly conifer = 32ha Young trees = 20ha | Stable | | Forestry Commission - Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Dark skies | Increase in light pollution within the AONB | n/a | Baseline to be determined | | | CPRE http://www.cpre.org.uk/resources/countryside/dark-skies |
| | Tourism | % tourism businesses out of all businesses Number of caravan pitches Number of tourism related businesses | 14% tourism businesses out of all businesses (7.2% in accommodation and transport, 6.6% in food and beverage & culture and leisure businesses Total employed in tourism businesses = 330 n/a n/a | n/a n/a 1,684 caravan site pitches (1,388 static, 292 touring and 4 residential) for visitors on 14 registered sites To be completed | | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes, IDBR, 2009, Local Units SLDC, LCC |
| | Minerals | No. of active quarries | Sandside Quarry - 1 active quarry – Sandside, | 1 active quarry – Sandside, due to close | | No targets | Cumbria County Council/Lancashire County Council |

34 © Forestry Commission copyright [2011]. Forestry Commission England National Forest Inventory (NFI) Woodland Map spatial data

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--------------------|---|--|--|--------------------|------------|--|
| | | | due to close 2020. | 2029. No further mineral extraction planned within AONB | | | |
| | Shellfishing | Status of cockle populations | Since 2007/8 there have been no commercially viable stocks of cockles in Morecambe Bay | Active cockle fisheries in Morecambe Bay for most of 2017. Stocks of cockles were not of a commercial quantity at Warton Sands | | No targets | NWIFCA |
| | Access | <p>Length of Public Rights of Way</p> <p>Area of open access land (CRoW Act plus other managed open access)</p> <p>% of the protected landscape as 'accessible natural environment'</p> | <p>Bridleways – 12.2km Footpaths – 90.5km Byways – 7.2km Permissive paths - 17.7km</p> <p>Open Country, Registered Common Land, S16 & S15 (ha) (with inaccessible land removed) = 1,140 ha 15% of total AONB</p> <p>All Accessible Natural Environment (ANE) land including LNR, NNR, Forestry Commission, woodland Trust land = 1,553 ha, 20% of total AONB</p> | <p>Bridleways – 13.3km Footpaths – 93.6km Byways – 10.1km</p> | | | <p>Cumbria County Council/Lancashire County Council</p> <p>Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes</p> |
| | Waste | <p>No. of household recycling centres</p> <p>No. of local recycling sites</p> | <p>No. of household recycling centres = 1</p> <p>No. of local recycling sites = <i>data to be collated</i></p> | <p>No. of household recycling centres = 1</p> <p>No. of local recycling sites = <i>data to be collated</i></p> | | | SLDC/LCIC |

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|-------------------------------------|------------|------------------------------------|---|--------------------|---------|--------------|
| | Historic Landscape characterisation | | n/a | <p>Cumbria Historic Landscape Types within the AONB: Woodland Ancient enclosure Planned enclosure Former common arable Designed Landscape Settlement Extractive industry Built environment Recreation Water</p> <p>Lancashire Historic Landscape Types within the AONB: Sand and mudflats Saltmarsh Lowland moss and grassland/scrub Ancient and post-medieval woodland Modern woodland Water Ancient enclosure (Pre-AD1600) Post-medieval enclosure (AD1600 – 1850) Modern enclosure (after AD1850) Ancient and post-medieval ornamental Modern recreation Ancient and post-medieval industry Ancient and post-medieval settlement Modern settlement</p> | | | CCC/LCC |

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--------------------|--|---|--|--------------------|---|---------------------------------------|
| HERITAGE | Heritage assets | Number of heritage assets, including the number of listed buildings (including grade II listed) and structural scheduled monuments, scheduled monuments, registered parks and gardens, HER, Conservation Areas | Heritage Assets ³⁵ HER within AONB = 655 No. Listed buildings: Grade I = 6 Grade II* = 10 Grade II = 98 Total = 114 No. Scheduled Monuments = 10 No. Registered Parks and Gardens = 1 Conservation areas = 3 Up to date Conservation Area Appraisals (CAA) are available for Beetham and Warton. | HER within AONB = 695 No. Listed buildings: Grade I = 6 Grade II* = 10 Grade II = 99 Total = 115 No. Scheduled Monuments = 10 No. Registered Parks and Gardens = 1 Conservation areas = 3 Up to date Conservation Area Appraisals (CAA) are available for Beetham and Warton. | Favourable | | Historic England SLDC/LCiC/LCC/CCC |
| | | Undesignated heritage assets % of heritage assets that are 'at risk', including buildings at risk (excluding grade II listed), monuments, registered parks and gardens, conservation areas | n/a 5 sites within the AONB on the Heritage at Risk data 2012 ³⁶ | LCiC/SLDC preparing Local Heritage Lists 4 sites within the AONB on the Heritage at Risk Register, 2017 | Favourable | Warton Crag to be removed from the register | |

³⁵ (c) English Heritage [2013].

³⁶ (c) English Heritage [2012].

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|----------------------------|--|---|--|--------------------|------------|---|
| | Landscape quality | Landscape character type condition | n/a | Good: Intertidal Flats Bay Saltmarshes and Lagoons Inland Pasture and Parkland Moderate to Good: Lowland Moss Coastal limestone Pasture Wooded Limestone Hills and Pavements | | | Arnside & Silverdale AONB Landscape and Seascape Character Assessment, 2015 |
| LANDSCAPE | Land management incentives | Area managed under agri-environment agreements (CSS, ESA and the different levels of ES Number of agri-environment agreements | Area managed under agri-environment agreements = 2095 ha (33 agreements, 58 % of the UAA of the AONB ³⁷) 40% of the 2095 ha is Entry Level + Higher Level Stewardship 23% is ELS 28% is HLS 9% is organic ELS and HLS 33 | Area managed under agri-environment agreements = in total 1314ha 1196 ha within the AONB was in Environmental Stewardship, including 25% at Higher Level and 118 ha was in Countryside Stewardship, including 96% at High Tier 19 Environmental Stewardship 5 Countryside Stewardship | | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Tranquillity | Areas disturbed by noise and visual intrusion Changes in extent of tranquil areas | CPRE data | CPRE Intrusion map http://www.cpre.org.uk/resources/countryside/tranquil-places To be completed | | No targets | CPRE data |

³⁷ © Natural England copyright 2013

| SEA Topic | Aspects/objectives | Indicators | Status (Environmental Report 2014) | Current status | Trends/comparators | Targets | Data sources |
|-----------|--|--|------------------------------------|--|--------------------|------------|---|
| | | % of the protected landscape that is relatively tranquil for its area | | | | | |
| | Landscape features | Uptake of ES options that contribute to conserving and enhancing landscape character: archaeological features, hedgerow trees and in-field trees, woodland managed and created, low input grassland managed, restored and created, | <i>Data to be collated</i> | <p>Area of land under ES specifically for the management and protection of archaeological features was 14.4ha</p> <p>Number of hedgerow trees and in-field trees managed under ES was 304</p> <p>Area of woodland managed and created under ES was 30ha</p> <p>Area of low input grassland managed, restored or created under ES was 272ha</p> | | | Natural England – Framework for Monitoring Environmental Outcomes in Protected Landscapes |
| | Grasslands within the agricultural setting | % of AONB in grassland types (permanent, temporary, rough grazing) | | 80% of the farmed land is grassland | | No targets | Defra Agricultural Census, 2016 |
| | Woodland within the agricultural setting | % of AONB in woodland | | 11% is woodland | | No targets | Defra Agricultural Census, 2016 |

APPENDIX 4 ECOSYSTEM SERVICES ASSESSMENTS

Table 6 Links between ecosystem services within the AONB and SEA objectives

| | E1 To protect and where practical enhance biodiversity (habitats) and geodiversity | E2 To protect and enhance fauna and flora (individual species) | E3 To ensure no adverse effect arises on population (i.e. demographic balance) | E4 To safeguard human health | E5 To protect and enhance soil quality | E6 To safeguard the water environment | E7 To protect air and climate | E8 To maintain cultural heritage (including architectural and archaeological heritage) | E9 To protect and enhance the character and appearance of townscapes, maintaining and strengthening local distinctiveness and sense of place | E10 To protect and enhance landscape | E11 To protect material assets including natural resources | E12 To reduce risks associated with climate change and extreme weather whilst increasing resilience and maximising the positive benefits for communities, landscape and the natural environment Etc. |
|---------------------------------------|--|--|--|------------------------------|--|---------------------------------------|-------------------------------|--|--|--------------------------------------|--|--|
| Provisioning Services | | | | | | | | | | | | |
| Food provision | = | = | = | + | + | + | = | + | = | + | ++ | + |
| Fibre | = | = | = | + | + | = | = | + | = | + | ++ | + |
| Genetic diversity | ++ | ++ | = | + | + | + | = | + | = | + | ++ | ++ |
| Water supply | = | = | + | + | + | ++ | = | + | = | + | ++ | ++ |
| Woodfuel | + | + | + | + | = | + | + | + | = | + | ++ | + |
| Rocks and minerals | ++ | = | = | + | + | = | + | + | ++ | + | ++ | + |
| Regulating Services | | | | | | | | | | | | |
| Water quality | ++ | = | + | + | ++ | ++ | + | + | = | + | ++ | + |
| Water flow and flood regulation | + | = | + | + | + | ++ | + | + | + | ++ | ++ | ++ |
| Disease and pest regulation | + | + | + | + | + | ++ | + | + | + | ++ | + | ++ |
| Pollination | | = | | + | + | + | = | = | = | + | + | + |
| Climate regulation and carbon storage | ++ | + | + | + | + | ++ | ++ | + | + | + | + | ++ |
| Soil quality | ++ | + | + | + | ++ | ++ | ++ | = | = | + | + | ++ |
| Cultural Services | | | | | | | | | | | | |
| Beauty | ++ | ++ | = | + | + | ++ | + | ++ | ++ | ++ | ++ | + |
| Sense of history | = | = | = | = | = | + | = | ++ | ++ | ++ | = | = |
| Tranquillity | + | + | + | + | = | + | + | + | ++ | ++ | + | + |
| Sense of place and inspiration | + | + | + | = | = | + | = | ++ | ++ | ++ | + | + |
| Knowledge and education | ++ | ++ | + | + | + | ++ | ++ | ++ | ++ | ++ | ++ | ++ |

| | | | | | | | | | | | | |
|----------------------------|----|----|---|---|----|----|----|----|----|----|----|----|
| Recreation | = | = | + | + | = | + | + | + | ++ | + | = | + |
| Visitor economy | + | + | = | = | = | + | + | ++ | ++ | ++ | + | ++ |
| Health and wellbeing | + | = | + | + | + | + | ++ | + | ++ | + | + | ++ |
| Supporting services | | | | | | | | | | | | |
| Biodiversity | ++ | ++ | + | + | + | ++ | + | + | + | + | ++ | +V |
| Geodiversity | ++ | = | + | = | + | = | + | ++ | ++ | ++ | ++ | + |
| Nutrient/water cycling | + | + | = | + | ++ | ++ | ++ | = | = | = | + | ++ |

Table 7 Links between ecosystem services within the AONB and SA objectives

| | S1 To create more vibrant, cohesive, safe and mixed communities | S2 To protect the quality and character of individual settlements and communities | S3 To protect the environment, people and properties from flood risk | S4 To reduce the need and desire to travel by car | S5 To promote healthy lifestyles | S6 To raise standards of education and training and promote employment skills | S7 To promote the development of an economy that supports social and environmental objectives | S8 To promote good governance | S9 To minimise the consumption of natural resources including fossil fuels, minerals, land take and water |
|------------------------------|---|---|--|---|----------------------------------|---|---|-------------------------------|---|
| Provisioning Services | | | | | | | | | |
| Food provision | = | = | = | = | + | + | + | = | + |
| Fibre | = | = | = | = | = | + | + | = | + |
| Genetic diversity | = | = | = | = | = | + | + | = | + |
| Water supply | = | + | + | = | + | = | + | + | ++ |
| Wood fuel | = | = | = | = | = | = | ++ | + | + |
| Rocks and minerals | + | + | + | = | = | + | + | = | ++ |
| Regulating Services | | | | | | | | | |
| Water quality | = | + | + | = | + | = | + | + | ++ |
| Water flow/flood regulation | = | + | ++ | = | + | = | = | = | + |
| Disease/pest regulation | = | = | + | = | + | = | + | + | + |
| Pollination | = | = | = | = | = | + | + | = | + |
| Climate regulation | + | = | + | + | + | + | + | + | ++ |
| Soil quality | + | = | ++ | + | = | + | + | = | ++ |
| Cultural Services | | | | | | | | | |
| Beauty | ++ | ++ | = | + | ++ | + | ++ | + | ++ |
| Sense of history | + | ++ | + | + | = | = | = | = | + |
| Tranquillity | = | + | = | ++ | + | = | + | = | + |

| | | | | | | | | | |
|-------------------------------|----|----|----|---|---|----|---|----|----|
| Sense of place | + | ++ | + | + | = | + | + | + | + |
| Knowledge/ education | ++ | ++ | ++ | + | + | ++ | + | ++ | ++ |
| Recreation | ++ | + | = | + | + | + | + | + | + |
| Visitor economy | + | ++ | + | = | + | + | + | + | = |
| Health and wellbeing | ++ | + | ++ | + | + | + | + | + | + |
| Supporting Services | | | | | | | | | |
| Biodiversity | + | + | + | + | = | + | + | = | ++ |
| Geodiversity | + | + | + | = | = | = | + | = | ++ |
| Nutrient/water cycling | = | = | + | + | = | = | + | = | ++ |

Table 8 Internal compatibility of the ecosystem services provided by the AONB landscape

| | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|----------------|-------|-------------------|--------------|-----------|--------------------|---------------|----------------------|-------------------------|-------------|--------------------|--------------|--------|------------------|--------------|----------------|---------------------|------------|-----------------|--------------------|--------------|--------------|------------------|
| Food provision | | | | | | | | | | | | | | | | | | | | | | | |
| Fibre | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Genetic diversity | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | |
| Water supply | ✓ | ✓ | nl | | | | | | | | | | | | | | | | | | | | |
| Wood fuel | ✓ | ✓ | ✓ | nl | | | | | | | | | | | | | | | | | | | |
| Rocks and minerals | nl | nl | nl | ✓ | nl | | | | | | | | | | | | | | | | | | |
| Water quality | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | |
| Water flow/flood reg | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Disease/pest reg | ✓ | ✓ | ✓ | ✓ | ✓ | nl | ✓ | ✓ | | | | | | | | | | | | | | | |
| Pollination | ✓ | ✓ | ✓ | ✓ | ✓ | nl | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| Climate regulation | ✓ | ✓ | ✓ | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | |
| Soil quality | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| Beauty | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| Sense of history | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | nl | nl | ✓ | nl | nl | ✓ | | | | | | | | | | |
| Tranquillity | ✓ | ? | nl | nl | ? | ? | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | |
| Sense of place | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | nl | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| Knowledge/educn | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| Recreation | nl | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| Visitor economy | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Health & wellbeing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Biodiversity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ? | ✓ | ✓ | ✓ | | |
| Geodiversity | nl | nl | nl | ✓ | nl | ✓ | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Nutrient cycling | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | nl | nl | nl | ✓ | nl | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Food provision | Fibre | Genetic diversity | Water supply | Wood fuel | Rocks and minerals | Water quality | Water flow/flood reg | Disease/pest regulation | Pollination | Climate regulation | Soil quality | Beauty | Sense of history | Tranquillity | Sense of place | Knowledge/education | Recreation | Visitor economy | Health & wellbeing | Biodiversity | Geodiversity | Nutrient cycling |

Key: ✓ - Compatible features ? - Potentially inconsistent features nl – Unrelated and no I

