

Summary of Evidence: Landscape

1. General introduction

This summary sets out Natural England's assessment of the key evidence relating to Landscape. It provides a statement of the current evidence base, presenting:

- What we know (with supporting data and key references).
- Areas that are subject to active research and debate.
- What we do not yet know from the evidence base.

It also lists current Natural England research projects and key external research programmes to show how we are seeking to fill gaps. This summary forms part of a suite of summaries covering all of Natural England's remit. The summaries are not systematic reviews, but enable us to identify areas where the evidence is absent, or complex, conflicting and/or contested. These summaries are for both internal and external use and will be regularly updated as new evidence emerges and more detailed reviews are completed.

2. Introduction to landscape

Landscape evidence underpins our role as the Government's adviser on landscape, a remit which extends to the limit of our territorial waters. Landscape is a cross-cutting theme, drawing on evidence from other interests such as geodiversity, biodiversity and historic environment. Working with partners, including academics and practitioners, we gather and use evidence to inform a holistic approach to landscape conservation, enhancement and monitoring, recognising that landscapes change in response to a range of influences and at different timescales. This is integral to our work on, for example, implementation of the European Landscape Convention (ELC 2000) in England, protected landscapes, land management, land use and marine planning. Landscape is considered in the summary of evidence below under the following headings:

- The landscape resource
- The conservation of landscape
- The use of landscape
- The application of landscape expertise

3 The landscape resource

We know that:

3.1 Our understanding of Landscape as a resource evolved over the last century to embrace an holistic and egalitarian meaning. Whilst there is a residual tendency to associate landscape only with 'the view', the current concept of Landscape encompasses the physical, cultural, perceptual and ecological aspects of the environment, and the interactions between them. This helps us to understand landscape as a dynamic resource influenced by the needs of society and different drivers of change (Natural England 2006; Jellicoe & Jellicoe 1995).

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3.2 Landscape is a resource that is valued by society in its own right, it is continually influenced by forces for change and where appropriate needs to be protected, conserved and enhanced. In England we have a history of landscape being valued by society including a growing public and political awareness of the need to conserve and enhance landscapes in the context of change. For example the National Trust was founded in 1895 and the Campaign to Protect Rural England was first established in 1926. The National Parks and Access to the Countryside Act, 1949, a further milestone in British landscape conservation history, was informed by the Dower Report of 1945 and the Hobhouse Report of 1947, both of which identified ‘special landscapes’ with potential for designation as protected landscapes. Subsequent legislation, including more recent designations such as the New Forest National Park in 2005 and South Downs National Park in 2011 (involving a detailed consultation process), show that in the context of the European Landscape Convention (see below) and our concern for all landscapes, designated landscapes also continue to be recognised as being of benefit to society.

3.3 Twenty-three per cent of England is covered by the statutory landscape designations of National Parks and Areas of Outstanding Natural Beauty (AONBs). There are nine statutorily designated National Parks plus the Norfolk & Suffolk Broads which has equivalent status, and 34 statutorily designated AONBs. In addition there are 32 stretches of defined Heritage Coast in England, covering 33% of the English coastline; most are within the boundaries of National Parks or AONB. (Natural England 2008a).

3.4 The last 70 years have also seen a ‘democratisation’ of landscape. Recent qualitative research looking at how people perceive and experience different landscapes shows there is a growing sense that all landscapes are important to people and that they are capable of contributing to human well-being in many different ways, not only as a source of natural beauty (Natural England 2010b 2010c).

3.5 The European Landscape Convention (ELC) is the first international treaty devoted exclusively to the management, protection and planning of all landscapes in Europe. It seeks to maintain and improve landscape quality and bring the public, institutions, national and local organisations together, to recognise the value and importance of landscape and to take part in public decisions relating to landscape. The ELC, which was signed by the UK government in 2006 and came into effect in England in 2007, calls for the conservation and enhancement of all landscapes (ie upland, lowland, rural, urban, coastal and seascapes). It provides a broad, inclusive definition of landscape which underpins our work:

“Landscape means an area, as perceived by people, whose character is the result of the action and interaction of their natural and/or human factors” (ELC 2000).

3.6 This widely accepted definition, and the principles contained in the articles of the ELC, build on earlier landscape initiatives in the UK (Countryside Commission 1993a; Countryside Agency 1996) and elsewhere across Europe. It underpins our understanding of landscape as a diverse resource which includes individual landscapes of distinct character, experienced at different scales, and defining distinctive places. It reinforces the point that all our landscapes matter for their individual and collective value to society and, as such, landscape is recognised as a resource that is not only to be protected but also managed and sometimes created. The concept of Landscape concerns the quality of the

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surroundings where people live and it is recognised by the ELC as a precondition for social and individual well-being, sustainable development and a resource conducive to economic activity.

3.7 The ELC also relates to the marine environment, including our diverse seascapes and their interface with coastal and inland landscapes. Natural England defines seascape as “an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors”. This definition is closely aligned to the ELC definition of landscape, thereby the close link between evidence gathered through landscape and seascape character assessment and which will be a focus for future work. Two reports make a major contribution to our understanding of England’s seascapes and coastal landscapes around the English coast. Firstly an approach to seascape character assessment (Natural England 2012a) and also the pilot work testing the methodology (Natural England 2012b). This research aims to provide practical tools and evidence to assist in responding to the increasing demands being placed upon the related marine and terrestrial environments. This also builds upon the increased awareness of the high profile of the connections between land and sea reflected in the Marine and Coastal Access Act, 2009 and informs the marine spatial planning system (including offshore renewable energy projects).

3.8 The diversity of landscape character across England is described in the 159 National Character Areas (NCAs). Early work on the initiative that evolved into the current NCA framework was led by the Countryside Commission and included the New Map of England Pilot Project in the south-west (Countryside Commission 1993b) followed by the Character of England, regional volumes (Countryside Agency 1996). This work then combined with a parallel initiative by English Nature, describing Natural Areas (Countryside Commission and English Nature 1996), to create a map of Joint Character Areas which now comprises the framework for 159 NCAs. By covering all-England, the NCAs address concerns that protection of selected landscapes through statutory designations has left many other, large areas of landscape vulnerable to inappropriate land use or management. The NCA descriptions were initially prepared in the 1990s to provide broad-scale context and reinforce the role of landscape character assessment as a tool to help influence decision-making that affects landscape change. They have now been updated as more detailed profiles that bring together a wide range of information about the natural and cultural environment – drawing on new evidence about the provision of ecosystem services and more sustainable approaches to land use. The profiles include forward-looking statements about the opportunities available to enhance the natural environment, all of which reflects the recommendations in the Foresight Land Use Futures Project (Government Office for Science 2010), which places sustainable, multi-functional landscapes at the heart of future land use policy. The NCA profiles can be found online at: <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making>.

3.9 At a more detailed level than the NCA framework, England’s diverse landscapes are described by a range of Landscape Character Assessments (LCAs) and historic landscape characterisation (HLC), prepared or commissioned by local authorities and protected landscapes to inform local landscape planning and management decisions. Whilst methods have developed over time, a reasonable level of consistency between different LCAs has been supported by the relevant guidance (Countryside Commission 1987, 1993a; Countryside Agency & Scottish Natural Heritage 2002; Natural England 2014a) LCAs are also important sources of evidence supporting the role of landscape as a strategic priority within the Local Development Plan process as set out in the National Planning Policy Framework.

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3.10 There is a wide coverage of more detailed landscape character assessments that fit beneath the NCA framework. For example, recent local partnership work in the East of England (also East Midlands and the North West) has produced a landscape character framework and typology relevant to regional, county, and district scales, supporting the fundamental ELC concept that all landscapes matter. The interactive map can be found at <http://landscape-east.org.uk/>. Many other individual LCAs undertaken by local authorities and other public bodies are also published on their websites. An archived database of LCAs undertaken between 1985 and 2010 is available online at: <http://webarchive.nationalarchives.gov.uk/20100707141229/http://www.landscapecharacter.org.uk/db/index.html>. LCAs are also used to provide a baseline for monitoring landscape change, and those that date back to earlier years also inform evidence about local change trends. In addition the current programme of county scale Historic Landscape Characterisation (HLC) led by Historic England, working with local authorities and other partners, includes evidence of the associated cultural values, time depth and historical evolution of our landscapes; it also informs LCA and future conservation of landscapes. Further information about HLC is available online at: <http://historicengland.org.uk/advice/caring-for-heritage/rural-heritage/landscape-and-areas/>

3.11 The Living Landscapes Project (English Nature 2004) explored the relationship between LCA, HLC, and the biodiversity of Natural Areas through identification of a landscape typology expressed as Land Description Units (LDU). The national typology (level LDU1) is available on Web Map, whilst regional coverage in the South West became most advanced with a nested hierarchy of LDU scales 1, 2 and 3 (field parcel). Plans for national coverage of the LDU hierarchy did not come to fruition largely due to a focus on developing the NCA framework. The Living Landscape Project helped to provide evidence advocating the 'landscape-scale' approaches to wildlife conservation taking into account synergies with both landscape character and the cultural heritage.

3.12 Landscape change has generally tended to occur not in a strategically planned and intentional manner, but as society responds to the prevailing economic and social circumstances. Planning policy has ensured that urban areas, though now larger, are more tightly defined than they were seventy years ago. These changes have tended to increase the capacity of landscapes to produce more, and to absorb the greater demands that society makes of them (Natural England 2013).

3.13 Evidence about landscape change over the past four decades is provided by Countryside Survey and the New Agricultural Landscapes (NAL) project. The New Agricultural Landscapes (NAL) project, initiated by the Countryside Commission in 1972, provides a unique insight into the impacts of farming methods and agricultural policies on England's lowland landscapes over a third of a century, and includes data on farmer attitudes relating to decisions that influence change. Seven study areas have been revisited at 10 or 11-year intervals between 1974 and 2005 showing the variations in the type and pace of change between different farming systems across England (Westmacott & Worthington, 1974, 1984, 1996, 2005). Since 1978 the Countryside Survey repeat surveys in a sample of km squares distributed across England have provided a broad picture of landscape change affecting landscape features such as the overall continued loss of field boundaries and ponds (<http://www.countrysidesurvey.org.uk/home>). In addition, over the past 20 years, the Centre for Ecology and Hydrology has produced the Land Cover Map for 1990, 2000 and 2007, providing evidence of changes in the area of land cover classes, broad habitat and settlement (<http://www.ceh.ac.uk/accessinglcmdata.html>).

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3.14 Countryside Quality Counts (CQC) provides a tested mechanism for measuring landscape change/countryside quality. The CQC project was initiated in 2002 by the Countryside Agency in response to the need for a better understanding of change in the countryside and to meet the commitment set out in the Rural White Paper for England (2000) to develop an indicator of change in countryside quality. The indicator is based on change in countryside character within the National Character Areas (NCA) of England. We have trend data for changes in landscape character for the periods 1990-1998 (1st assessment) and 1999-2003 (2nd assessment), between which there was a decrease in the number of character areas where there is evidence of neglect or erosion of landscape character. Reports for the 1st and 2nd assessment periods can be found online here: <http://publications.naturalengland.org.uk/category/31019> Some of the changes occurring within the period 1999-2003 show the emergence of new landscape characteristics to 19% of character areas; ie characteristics that were not identified in the baseline NCA descriptions. The project found that not all such change could be regarded as having an adverse impact. In some NCAs, change also improved the quality of the natural environment, but overall, changes during that period tended to result in loss of diversity, distinctiveness, tranquillity and ecological richness (Haines-Young 2007).

3.15 Evidence is now available about landscape change attributed to Environmental Stewardship agreements at NCA scale. Defra sponsored research and monitoring of the effectiveness of Environmental Stewardship (Land Use Consultants, June 2013) in maintaining and enhancing of landscape character has delivered firstly an objective and repeatable field survey methodology, across a representative sample of sites in England, to assess how the scheme is delivering its landscape conservation objective. Secondly, the project has developed a detailed database to assist analysis of GIS data on the stock of landscape features and uptake of ES options that can be used to develop landscape thresholds identifying the landscape performance of ES across every NCA and to predict the landscape impact of ES and future schemes in each of England's 159 NCAs. The data is available in a web tool provided to Natural England to facilitate ongoing access to the detail and overall findings of the research. The outputs comprise a set of detailed and summaries for each NCA, recording and presenting all of the information collected throughout the assessment. A series of maps and charts present the data visually so that spatial patterns can be identified.

3.16 The monitoring of delivery of environmental outcomes through protected landscape bodies and others, in supporting National Park and AONB statutory management plan objectives and policies, is now yielding relevant evidence about Natural Beauty, Ecosystem Services and Social-Economic criterion. Through close collaboration between partners, the *Framework for Monitoring Environmental Outcomes in Protected Landscapes* (Natural England 2014a) uses the best available set of existing national statistics, combined with local measures, to shed light on a range of environmental outcomes. National statistics sourced from a variety of organisations include: environmental stewardship uptake; heritage at risk; tranquillity; the condition of Sites of Special Scientific Interest; the ecological status of water; woodland management and publicly accessible land. The statistics have been collated and distributed to protected landscape bodies in 2012, 2013 and 2014, and are now beginning to yield evidence about landscape change trends associated with designated landscapes, and inform local management plans and monitoring initiatives. There is scope to combine this work with approaches to monitoring change across NCAs to gain a more holistic picture of influences of change within and outside of protected landscapes.

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Areas that are subject to active research and debate:

3.17 Whilst there now exists an agreed approach to seascape character assessment, there is still a need to better understand and appreciate coastal and underwater landscapes, their habitats, geomorphology and functions. It is important to ensure that the inter-relationships between land and sea are emphasised and valued by all. The work will start to provide baseline evidence to inform marine spatial planning (including off-shore renewable energy projects), and will also contribute to implementation of the European Landscape Convention.

3.18 The 159 National Character Area profiles have been updated during 2013-14; they are increasingly being referenced and used to inform decision-making, and there is a need for debate about further uses and future development. The detailed profiles bring together a wide range of interests; they take new evidence into account including ecosystem services and climate change. Landscape values are at their core although they go well beyond landscape description to encompass an integrated body of evidence about the natural environment.

What we don't know:

3.19 How landscapes are changing across all England (not only within designated landscapes). The requirement is for both wider surveillance of change and monitoring of our interventions in land management and spatial planning. It is necessary in order for us to make a full contribution in reporting to Government on the state of the environment. The evidence of trends in landscape change across England associated with CQC (1990–2003) is becoming increasingly outdated and subsequent monitoring has comprised separate, unrelated projects. As part of a renewed landscape monitoring strategy we need to know what the wider trends in landscape change are since 2003 as context for our more specific monitoring work and to inform our advice and activities in response to change.

3.20 How changes in the condition, distribution and extent of wildlife habitat across England contribute to the quality and character of our landscapes. Wildlife habitat is an integral part of landscape and contributes to landscape character at a variety of scales depending on the context (eg enclosed farmland, unenclosed moorland or urban landscapes). There is scope to use other sources of biodiversity evidence (eg integrated site assessment, biodiversity opportunity mapping and remote sensing) to contribute to a new landscape monitoring strategy (see 3.19). In addition, we should integrate survey and evaluation resources across our landscape, wildlife ecosystem service and climate change monitoring work. The potential benefits are described in the lessons learnt from the CQuEL project (Natural England 2012c) which piloted an approach to integrated monitoring.

3.21 The extent to which Landscape Character Assessments reflect the most up-to-date methods and evidence. The Landscape Character Network database of landscape character assessments across England held by Natural England, needs updating. The particular concern is whether landscape character assessments have effectively captured landscape dynamics and the way in which landscapes are changing. Also, understanding the use, effectiveness and influence of landscape character assessments in spatial planning, landscape and biodiversity conservation strategies and decision-making. There is also a need to fill the identified gaps in coverage across England.

3.22 The evidence base on a) the stock, condition and extent of landscape features such as ancient field boundaries and parkland features and b) the impact and significance of change to landscape character and features. Currently the Countryside Survey project, through a limited number of sample km squares, provides evidence on the broad direction in condition of boundary features.

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However, the findings are not a representative sample of landscape types or areas, for example at the broad scale of NCAs. Countryside Quality Counts provides some indicative evidence of changes in condition of landscape features within individual NCAs, between 1999 and 2003 (Haines-Young 2007).

3.23 How climate change will affect England's landscapes and seascapes, the implications of change and of our potential responses. The research undertaken in four pilot NCAs (Natural England 2008) has identified some generic principles for adaptation to climate change, but more evidence is required about the implications of change for our diverse landscapes, including the different landscape character types and responses tailored to local places. Evidence is required relating to the landscape effects of climate change that is also spatially alert to areas that are of most significant risk of landscape change.

4 The conservation of landscape

We know that:

4.1 Engaging with partners, pooling resources and sharing experience and best practice, can lead to better protection, management and planning of all landscapes. The publication '*Valuing our Landscapes*' (Natural England 2010) draws together the results of partnership work at a local level, undertaken as a part of Natural England funding of European Landscape Convention action plans during 2009/10. Ten case studies demonstrate various ways in which Landscape partnerships help connect people to the places where they live and show that all landscapes matter.

4.2 The maintenance and enhancement of landscape quality and character has been one of five primary objectives of Agri-Environment Schemes since 1987. Agri-Environment Schemes (AES) have included the maintenance and enhancement of landscape character and landscape features as a key objective. There are currently over 58,000 voluntary AES agreements, covering over 6 million hectares – about 66% of agricultural land in England. They make a major contribution to maintaining and enhancing the landscape character of different areas. Key uptake figures are: 43% of registered parks and gardens are under AES agreement; 24% of the stone walls in England are actively maintained under AES and 3% have been restored; 41% of hedgerows in England are actively managed under AES, with 6% having been restored (Natural England 2009b).

Areas that are subject to active research and debate:

4.3 How to monitor the effectiveness of agri-environment schemes in maintaining and enhancing the character and quality of landscapes at a local scale. Current evidence relies on gathering data about the condition and management of the individual landscape features, land cover or wildlife habitats. There is a need to explore cost effective ways to monitor the impacts of these factors in the context of local landscape character, for example by combining broad monitoring of change within NCAs with a sample of more detailed local surveys and case studies. This monitoring methodology is currently being explored in the project described below in paragraph 7.5.

4.4 Exploring the links between what are currently two separate, but related, approaches to landscape:- a) landscape character-based planning and management also informed by people's cultural values and b) landscape-scale wildlife conservation, focusing on biodiversity outcomes. Enhanced join-up between these two approaches, blending natural and social science, will help achieve integrated, multi-functional landscapes. Current discussions are focussing on linking the evidence associated with the NCA profile updating <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making> and the review of large-scale conservation

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projects, using the findings to inform, for example, the design of ecological networks (such as within the Nature Improvement Areas) that take into account both natural and cultural factors.

What we don't know:

4.5 How effective is the land use planning system in conserving and enhancing landscape character, particularly in the context of the Localism Act, 2011 and the National Planning Policy Framework (NPPF 2012). The Countryside Quality Counts project (Haines-Young 2007) provides some context on land use change, together with a report on landscape change since 1940 (Natural England 2013). This should also highlight the opportunities provided by the NPPF for landscape evidence such as landscape character assessment and National Character Area profiles to inform Local Plans.

4.6 There is a need for a better understanding of progress and achievements in embedding the European Landscape Convention (ELC) across different sectors and organisations. A 'light touch' review of the ELC Implementation Framework, including processes and outcomes and discussion with key partners, was carried out in autumn 2012. This identified the need for more evidence about progress in embedding the aims of the ELC across sectors. There is a real need to update and build on the initial base-line research in 2008, into the degree to which the current legislation and strategies and policies at the national and local level reflected the aims of the ELC (Natural England & Newcastle University 2008). An update would also take into account the subsequent ELC guidance published in 2009, annual Action Plans from partners, including the projects initiated under the ELC Regional Fund (Natural England 2010b) and also the more recent national policy and planning reforms.

4.7 We need to understand the synergies between landscape quality and biodiversity quality and values in order to facilitate more integrated approaches to landscape and wildlife conservation.

5 The use of landscapes

We know that:

5.1 Understanding of people's use and appreciation of different landscapes has evolved further to include the cultural perceptions that shape the way people value places, and the functions and benefits that landscapes provide to society. Our landscape evidence depends not only on quantitative approaches to measurement data but also the complementary qualitative research that helps us to interpret the results. For example, the Experiencing Landscapes research found that people value their local landscapes for being accessible, comforting and familiar as much as they value less frequent visits to special landscapes further afield. Also, the research confirmed that people value certain types of landscape over others based largely on their cultural associations and experiences (Natural England 2011).

5.2 Landscapes, whilst visually defined by variations in landscape character, include more than 'the view'; they are also places that provide a wide range of essential services and benefits, including biodiversity, food, drinking water, minerals and construction materials, flood management, climate regulation and disease management. They are also vital for our national culture, providing enjoyment, relaxation, inspiration, spiritual refreshment, and a link with past societies, and make an important contribution to our tourism economy (Haines-Young & Potschin 2008)

5.3 Landscape provides a place-based context for delivering ecosystem goods and services. A place-based approach can help us understand issues of multi-functionality, natural capital, and the role

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of landscape in framing discussion about ecosystem services and sustainability in the context of real landscapes (Haines-Young & Potschin 2012; Selman & Knight 2005). Landscapes also provide a spatial framework within defined geographic spaces at different scales (from international to local) and in different contexts (from urban areas to rural and coastal) (Defra 2009; Natural England 2010c).

5.4 Landscapes provide a wide range of interlinked cultural services, valued for their contribution to human well-being and quality of life. People often have a sense of ownership about the landscapes they value, and which provide places to find peace and solitude, as well as for exercise and activity. People vary in their attitudes towards landscape; some are more transactional (simply seeing it as somewhere to obtain exercise or entertainment), whereas others consider the landscape to be part of the fabric of their lives (Natural England 2009a, 2011).

What we don't know:

5.5 How to reconcile the exploitation of renewable energy sources with the conservation and enhancement of landscape character. There is a need for better evidence about how renewable energy development might impact on protected landscapes and their settings, and on the wider landscape and seascapes; and also how to assess potential cumulative impacts.

5.6 The economic benefits of landscape and the services provided. Past thinking on this has been associated with cost/benefit approaches to landscape planning. However, the ecosystem approach may provide a more practical framework for further work on the economic value of landscape.

6 The application of landscape expertise

We know that:

6.1 Professional expertise in landscape technical skills, and the application of landscape character assessment is now becoming more embedded in the spatial planning process certainly with regard to development affecting protected landscapes, and also through the Strategic Environmental Assessment, Environmental Impact Assessment and Landscape and Visual Impact Assessment processes (particularly since publication of the 2002 Guidance, associated Topic Papers and promotion through the Landscape Character Network).

6.2 Protected landscapes provide exemplars of landscape conservation approaches that engage with local communities, developing best practice in sustainable landscape management and planning that can also be extended to the wider landscape outside protected areas.

What we don't know:

6.3 The impact of the existing Landscape Character Guidance on the delivery of spatial planning and land management in counties, districts and protected landscapes. We need to establish whether the method (Countryside Agency & Scottish Natural Heritage 2002) has been amended in practice to suit individual situations or locations, and the extent to which landscape character assessment has developed to help manage and monitor landscape change.

6.4 The numbers of staff in public sector organisations in England who either hold professional qualifications in landscape design, management or planning or have other qualifications and have acquired extensive experience in these landscape disciplines. Given the evidence we have about the decline in landscape staff resources over the past several years we need better evidence about the size, distribution, and trends in the national resource of expertise – as context

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for our aspirations to build capacity in landscape expertise, to collaborate on building the evidence base and also providing innovative solutions to delivering landscape benefits locally by alternative means where appropriate.

7 Current Natural England evidence projects

7.1 Developing a strategy for surveillance and monitoring of landscape change. This internal project is at an early stage and explores how to effectively combine long-term surveillance of landscape change trends (at a national scale) with monitoring the impact of our interventions in the landscape (eg through land management and spatial planning mechanisms). The strategy aims to build on the legacy of Countryside Quality Counts (CQC)

(<http://webarchive.nationalarchives.gov.uk/20101219012433/countryside-quality-counts.org.uk/>) and the Character and Condition of England's Landscapes (CQuEL). In 2011-2012 CQuEL tested a methodology for a sample of NCAs and ecosystem services, and the project report (Natural England 2012c) demonstrates that the methods are feasible although heavily dependent on the availability of specific information and adequate resources. The strategy also draws on a wide range of initiatives including the updated National Character Area framework of 159 NCA profiles, the Framework for Monitoring Environmental Outcomes in Protected Landscapes (Natural England 2014a) and agri-environment monitoring and evaluation data (Defra 2013). In addition, the strategy seeks to make links with terrestrial biodiversity monitoring approaches, for example use of remote sensing and appropriate citizen science techniques through collaboration with partners.

7.2 Developing the approach to Seascape Character Assessment (SCA) through Seascape Character Assessment of the English Coast. This project is building on the newly published approach to seascape character assessment (Natural England 2012a), which also relates to the updating of the existing landscape character assessment guidance (Countryside Agency & Scottish Natural Heritage 2002). The pilot seascape characterisation project has now been completed (Natural England 2012b) and will inform further work, currently at the planning stage, to achieve full coverage around the whole English Coast, in order to inform marine spatial planning (including off-shore renewable energy projects), and also contribute to the European Landscape Convention.

7.3 Framework for Monitoring Environmental Outcomes in Protected Landscapes (FMEOPL). This is a joint project with Defra, Historic England and protected landscape partners including the National Parks and Areas of Outstanding Natural Beauty. The project is now in the operational stages using the methods developed and agreed in partnership (Natural England 2014a) The project aims to use the monitoring framework to demonstrate the effectiveness of the conservation and enhancement of England's protected landscapes (including local character, cultural heritage, tranquillity, biodiversity in favourable condition, exemplary access management, resilience to climate change). The main output is an evidence base that can be used for a variety of purposes, including:

- to help government and protected landscapes management bodies determine how their policies are working to deliver protected landscape objectives and purposes;
- to help in the review and updating of protected landscapes' management plans; and to show where National Parks and AONBs are delivering exemplary outcomes.
- to contribute to the gathering of evidence more widely about landscape change occurring across England's landscapes both within and outside of protected landscapes.

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7.4 A method for reporting and monitoring the direct and cumulative impacts of Environmental Stewardship on the maintenance & enhancement of Landscape Character & Quality. The initial project, funded by Defra, was completed in 2013, and an overview report of findings is available (Defra 2013). The project will be an important component of the landscape monitoring strategy (para 4.1) and is now informing on-going work establishing a robust sample of rapid field surveys to enable future landscape monitoring, including the new Countryside Stewardship Scheme. The project aimed to develop and test a robust, repeatable and comprehensive evaluation framework for reporting and monitoring the direct and cumulative impacts of Environmental Stewardship (and future agri-environment schemes) on the maintenance and enhancement of landscape character and quality at a variety of scales, and using a combination of quantitative and qualitative techniques. Some key outputs include:

- A robust and comprehensive evaluation framework for reporting and monitoring the direct and cumulative impacts of Environmental Stewardship on the maintenance and enhancement of landscape character and quality at a variety of scales (including National Park, AONB, NCA, SSSI and county).
- A new database of key landscape characteristics at a variety of scales to provide consistent detailed and strategic evaluation of landscape character and quality.
- A rapid survey method which can be used to gather new (and reinforce existing) primary evidence about how land management interventions are influencing landscape character and other interests such as wildlife conservation.
- A robust set of 'Indicators of success' and thresholds on uptake of agri-environment scheme options, at an appropriate scale for all landscapes.
- A tested method of survey, analysis and evaluation which can be used as part of a wider programme of monitoring of change across England's landscapes.

7.5 Ecological networks, Landscape and People (EcoLaP): linking cultural values and public perceptions with natural sciences. The foundation of this research is complete (Natural England 2015) and on-going work is now informing the follow-up work summarised below (paragraph 7.7). This research identified effective ways of integrating the public's perception of landscape change, and the aesthetic and socio-cultural values of landscape into the planning, design and implementation on ecological networks. Underlying this is the need to find ways to better integrate social-science evidence with natural science evidence, bringing a cultural and people dimension further into more traditionally nature conservation driven projects – helping to build in and deliver landscape and cultural service outcomes alongside biodiversity objectives. A cultural services framework has been used as the central basis with which to engage and capture what people value (through quantitative and qualitative methods) and seeking ways in which this can be mapped. The project has tested methodological approaches through a pilot with the Greensand Trust relating to proposals for habitat restoration and connection in part of the Greensand Ridge in Bedfordshire as part of a wider nature improvement area. This is a collaborative piece of work between The Research Box, Cambridge (University) Centre for Landscape & People & Professor Paul Selman. Work is now starting on a communications and action plan to take forward and disseminate the outputs of the research.

7.6 Integrating cultural values and services in landscape and ecological planning - a case study in the Morecambe Bay area (RP2036). This project will bring together existing ecological, landscape and geodiversity evidence/data with an understanding of the perceptions and cultural values of people to inform landscape-scale conservation options. The project will include public engagement, citizen science and participatory mapping approaches in the Morecombe Bay NIA. This 'action research'

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project will provide evidence on the benefits of integrated landscape planning with social research methods by using an existing landscape scale project as a case study. The project will bring together two existing strands of research:

- The research findings, methodologies and recommendations of Natural England's Ecological Networks, Landscape and People study (Natural England 2015). And
- The evidence and mapping project for ecological networks and restoration options in the Morecambe Bay NIA/LNP area.

7.7 Collaborative project to develop the functionality of a Smart Phone App for monitoring and public engagement on landscape change (RP2301). The project aims to develop and improve the functionality of an existing App (Rate My View) with partners (including South Devon AONB and Plymouth University), to improve its ability to capture information and provide data about landscape change and people's perceptions of change. The app's ability to capture information from the public about valued cultural services and benefits, relating to specific landscapes and landscape features will also be developed.

8 Key external research programmes

8.1 Sustainable Futures for Europe's Heritage in Cultural Landscapes (HERCULES): Tools for understanding, managing and protecting landscape functions and values. This project is funded by the European Union and is collaboration between 13 partner organisations from 11 countries representing European universities, small and medium-sized enterprises, non-governmental organisations and research institutes. The project runs from December 2013 to December 2016, and has five objectives:

- To synthesise existing knowledge on drivers, patterns and outcomes of persistence and change in Europe's cultural landscapes.
- To perform targeted case studies to develop in-depth insights on dynamics and values of cultural landscapes.
- To develop a typology of cultural landscapes and scale-up case study insights using observations and landscape modelling.
- To develop visions for re-coupling social and ecological components in cultural landscapes and translate them into policy and management options.
- To design and implement a community-based Knowledge Hub for Good Landscape Practice and test it with land users, agencies, small and medium-sized enterprises, and citizen associations.

8.2 The Landscape Research Group, an international network based in the UK, is also a partner, and will contribute to the design of recommendations for landscape policy and practice, communication and dissemination. The project aims are very relevant to Natural England's remit, working with partners, particularly with regard to its focus on understanding landscape change and exploring people's values relating to cultural landscapes. Proposed case study areas include the River Erme landscape in South Devon. <http://www.hercules-landscapes.eu/project.php> .

8.3 A landscape monitoring framework for Scotland is currently being developed by Scottish National Heritage. The framework has been developed through research, data review and pilot project work. It brings together both existing and new data to monitor landscape change in a meaningful and economical way. 18 indicators grouped into 4 themes have been developed (built development, land cover, landscape qualities, public attitudes to landscape), bringing together both quantitative and

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qualitative data which will collectively provide a robust baseline and method to monitor landscape change at the national level. There is also scope for many of these indicators to be developed and applied locally throughout Scotland. Phase 1 involves establishing baseline data for each indicator. Phase 2 will include re-survey at least every 5 years with reporting on landscape change. The public attitudes data draws on 7 questions specifically about landscape included in the *Scottish People and Nature Survey* (SPANS) which was first run in 2013 (SNH, 2014). SPANS is incorporated into the Scottish Opinion Survey (SOS); the SOS interviews a representative sample of around 1,000 adults aged 16 plus living in Scotland each month, providing an annual sample of more than 12,000 respondents.

8.3 A landscape monitoring methodology and framework for Wales, since 2003. Natural Resource Wales has a programme of targeted updating of the LANDMAP database to reflect outcomes from a repeatable and standardised monitoring method with resurvey at intervals between 5 -10 years. The method approach includes indicators on landscape and tranquillity. The underpinning evidence includes a range of mapped data, remotely sensed imagery and techniques (Ordnance Survey, aerial photography, satellite imagery, Normalised Difference Vegetation Index, land cover complexity/segment density), OS MasterMap, Phase 1 Habitat Classification and professional and local knowledge to identify areas of potentially significant landscape change. The project includes the LANDMAP Change Detection Pack (CDP) with:

- Visual & Sensory Classification showing boundaries and thematically mapped according to Level 3 classification (ie Low, Moderate, High, Outstanding). The visual and sensory aspect identifies those landscape qualities that are perceived through the senses and relate to the landscape character of an area. The CDP allows for consistent resurvey and evaluation of changes or impacts on baseline condition, and can include consultation with local partners about changes identified.

8.4 New Forest National Park tranquil areas mapping. The New Forest National Park is working with Land Use Consultants to prepare a bespoke New Forest approach to tranquil areas that recognises some of the unique factors that apply to the area. Using a 1996 study carried out for the New Forest Committee (a precursor of the National Park) as the baseline, including the same criteria (or as similar as possible) to measure the same factors (traffic, aircraft, trains, villages and towns, popular car parks and recreation destinations etc) this allows comparison of levels of tranquillity with 1996 and a method that can also be repeated in the future to monitor changes. Also, volunteers have been asked to answer a questionnaire at 100 locations in order to help validate the desk based assessment. Once adjustments have been made following the 'ground-truthing', a map with report will be made available in 2015. The mapping will be used as an evidence base for development control and recreation management and also to know where the most and least tranquil places are in the New Forest National Park so that we conserve and improve tranquillity levels. This is also an example of local monitoring in designated landscapes that complements the national approaches to monitoring undertaken by Natural England with partners.

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