Chapter 16:
Cultural Services

Coordinating Lead Authors: Andrew Church, Jacquelin Burgess and Neil Ravenscroft
Contributing Authors: William Bird, Kirsty Blackstock, Emily Brady, Michael Crang, Robert Fish, Pyrs Gruffudd, Susana Mourato, Jules Pretty, Divya Tolia-Kelly, Kerry Turner and Michael Winter

Key Findings*

Ecosystem cultural services are the environmental settings that give rise to the cultural goods and benefits that people obtain from ecosystems. Over millennia these environmental settings have been co-produced by the constant interactions between humans and nature. They are inscribed with not only natural features but also the legacies of past and current societies, technologies, and cultures. The continual change in these settings involves a range of complex cultural practices, such as the development of institutions, the application of capital, and human processes involving memories, emotions, the senses, and aesthetic appreciation.

There are many environmental settings where people interact with nature including the domestic garden, informal green and blue spaces, formal green/blue spaces, the nearby and wider countryside and national landscapes. People's engagement with environmental settings is contingent, context specific, fluid and mutable[1,a]. Frameworks of interpretation and social practices associated with the production and uses of environmental settings are dynamic: meanings, values and behaviours change over time in response to economic, technological, social, political and cultural drivers. Change can be rapid and far-reaching in its implications. One particularly noticeable characteristic of UK cultural practice, however, is the depth and breadth of engagement with nature and wildlife[1,c].

[1] *well established*
[a] *virtually certain*
[c] *likely*

Ecosystem cultural services make a significant contribution to achieving people's key needs. In the 21st Century the cultural life of the UK is diverse and dynamic. Yet **encounters with the natural world maintain their fascination for very substantial numbers of people,** as reflected for example, in the membership of a very wide range of civil society organizations embracing landscape and nature interests, the numbers of people who use urban parks and green-spaces on a daily basis, and the massive popularity of gardening across the UK. **Daily contact with nature is part, still, of being human.** This is illustrated by the Human-Scale Development Matrix (H-SDM) developed by Manfred Max Neef, which indicates how both existence needs (being, having, doing, interacting) and value needs (subsistence, protection, affection, understanding, participation, creation, leisure, identity and freedom) can be met through nature[1,a]. Evidence suggests that contemporary consumption practices are not satisfying our human needs adequately. Happiness research in economics, and policy initiatives to measure levels of happiness among populations reflects statistical evidence that, although people are far better off in material terms than they have ever been, rates of depression, mental illness, obesity and family breakdown are also increasing[1,b].

[1] *well established*
[a] *virtually certain*
[b] *very likely*

The discipline of ecolinguistics appeared in the 1990s[2,c]. It brought together research from a number of academic disciplines interested in the ways in which scientific, professional, amateur and popular knowledge about the natural world was constructed; how different media shaped the environmental messages being communicated, and the politicisation of environmental issues associated with the rise of non-governmental organisations and pressure groups from the late 1960s. Whether humankind is regarded as a part of nature or as separate from it continues to be a fault line between different philosophical, moral, ethical

[2] *established but incomplete evidence*
[c] *likely*

* Each Key Finding has been assigned a level of scientific certainty, based on a 4-box model and complemented, where possible, with a likelihood scale. Superscript numbers indicate the uncertainty term assigned to each finding. Full details of each term and how they were assigned are presented in Appendix 16.1.

and communicative traditions. **One distinctive feature of language relating to the environment appears to be that reference to agency is avoided and there is a strong tendency not to identify who did what when discussing environmental change.** This is achieved in a number of ways, such as using the passive rather than active voice or omitting the grammatical subject and using the object instead, for example, the habitat was destroyed rather than the developer destroyed the habitat. Thus **there is frequently a choice of syntax that obscures agency and, thereby, responsibility for negative changes in environmental conditions.**

Since 1945 there have been some significant changes in people's interactions with environmental settings. The growth of urban settlements means that more people have a set of local environmental settings with urban characteristics. At the same time, however, increased mobility has allowed more people to travel longer distances nationally and internationally to environmental settings for tourism and recreation purposes[1,b]. In more local environmental settings data limits the interpretations of changes in domestic gardens. Marked changes did occur, however, in certain countryside settings of the UK during the second half of the last century especially those in and around large urban areas, although the characteristics of other environmental settings have remained more static. Declines in numbers and/or the quality of certain local/green blue spaces, such as playing fields, allotments and parks in deprived areas, have occurred over past decades but have been arrested in the last few years[2,c].

[1] *well established*
[2] *established but incomplete evidence*
[b] *very likely*
[c] *likely*

Since 1945 a large number of protection schemes instigated by UK and European Union government have been implemented to conserve certain socially and culturally significant environmental settings[1,a]. National Parks, National and Local Nature Reserves, Sites of Special Scientific Interest, Special Protection Areas (SPAs), Ramsar sites, Local Nature Reserves (LNRs) and land owned by bodies such as The National Trust all play a role in managing cultural services in specific landscapes and local places.

[1] *well established*
[a] *virtually certain*

A driver of people's changing relationships with environmental settings has been associated with a desire for self-determination, responsibility and security (of self and environment)[1,c]. This has led to **a small but increasing number of people making new productive connections to environmental settings.** This includes an increasing demand for allotment gardening, increasing membership of community farms, and whilst many people relocate to rural environments for amenity reasons, more people are doing so to run smallholdings or to engage in other forms of 'pro-environmental' lifestyle.

[1] *well established*
[c] *likely*

Environmental settings have been one of the most enduringly popular locations for recreation, leisure and tourism[2,c]. They offer generic opportunities to walk, run or cycle; specific opportunities only available in a few habitats, to ski, swim or sail, for example; and unique settings that offer opportunities to achieve specific benefits, related for example to seeing particular fauna and flora, or being able to climb particular crags. **Three quarters of the population in England consider local greenspace to be a very important part of the local environment, and 50% visit it at least once a week.** Access to environmental settings for recreation, leisure and tourism is highly differentiated, throughout the UK. A number of measures have been implemented to address this, including Natural England's

[2] *established but incomplete evidence*
[c] *likely*

Accessible Natural Greenspace Standard (ANGSt), which provides a set of benchmarks for ensuring access to places near to where people live. Recent legislative changes have contributed to improving access to some settings, with the Countryside and Rights of Way Act 2000 providing access to uplands, downs and commons and the Marine and Coastal Access Act 2009 promising to do the same for access to the coast. Economic studies have highlighted the benefits and monetary value that arise from being able to access environmental settings for recreation, leisure and tourism. Secondary analysis conducted for UK NEA of the English Leisure Visits Survey 2005 estimated that the total recreational value of the 4 billion visits to different habitats generated a value of between £2.2 and £3 billion per annum. A national park designation can raise house prices in proximate locations.

Environmental settings can contribute to a wide range of health goods often by providing places where people can undertake physical activity and interact with nature[2,b]. Levels of interaction/engagement of 'green space' have been linked with longevity and decreased risk of mental ill-health, and that vitamin D obtained from sunshine whilst being in environmental settings plays a role in long-term health. **The presence of urban nature has been associated with improved cognitive functioning, aesthetic inspiration and reduced levels of crime and aggression as well providing an outdoor classroom.** 'Green exercise', defined as any physical activity taking place in the presence of nature, is predicted to lead to positive health outcomes, as well as promoting ecological knowledge, fostering social bonds and influencing behavioural choices.

[2] *established but incomplete evidence*
[b] *very likely*

Open green space and access to nature is important for children[2,c]. The quality of their environmental exposure is inextricably linked to their wellbeing. Children's relationship with nature is a fundamental part of their development, allowing opportunities for self-discovery and natural environmental experience. The outdoor environment is perceived as a social space which influences their choice of informal play activities and promotes healthy personal development. Nature allows unstructured play, generating a sense of freedom, independence and inner strength which children can draw upon when experiencing future incidents of stress.

[2] *established but incomplete evidence*
[c] *likely*

Through their differing heritages, every environmental setting is capable of being interpreted as possessing a distinctive sense of place which can contribute to a range of human value needs[2,a]. The intricacies and contingent nature of the relationship between needs, environmental settings and the past creates analytical challenges but is fundamental to understanding heritage goods. **There is a very diverse range of heritage goods that are linked to ecosystem services, ranging in scale and ease of identification from perceived national landscapes through territorially demarcated National Trust land to the subtle and personal historical meanings people may attach to some urban commons.** Environmental settings also function as a generator of a vast range of local identities based around a more local and everyday sense of heritage. Heritage goods, therefore, can be a source of community empowerment as well as potential conflict between different interests and can contribute to a sense of identity, place, freedom and understanding.

[2] *established but incomplete evidence*
[a] *virtually certain*

The complex emotional and personalised characteristics of heritage goods mean that identifying their value to society is problematic[1,b]. Indeed, a recent survey identified that almost every feature in an environmental setting will connote personal memories and attachments

[1] *well established*
[b] *very likely*

for someone. Despite the highly personal and context-specific nature of heritage, it is widely felt that it should be preserved to be passed on to future generations, as a means of providing both children and adults with an understanding of their history and identity. In addition, **several million people across the UK actively support a wide range of civil society organizations dedicated to conserving and enhancing particular landscapes and places, wildlife and habitats through membership fees and, to a lesser extent, volunteering their time.**

Environmental settings are valuable surroundings for outdoor learning where engaging with nature can lead to enhanced connectedness to nature and increased ecological knowledge[2,c]. Ecological knowledge has been defined as 'accumulated knowledge about nature' and can be acquired through contact with different natural environments, directly or indirectly. **The economic value of ecological knowledge, generated formally in schools and less formally elsewhere, is considered to be substantial.** However, there are significant complexities associated with estimating this economic value, with a recent study undertaken as part of UK NEA using an investment in human capital approach to investigate the value of ecological learning experiences of children in the formal educational system. Benefits of this investment in ecological knowledge include a possible boost in lifetime earnings as well as possibly enhanced quality of life through more productive use of leisure opportunities. Whilst this approach may be appropriate for ecological knowledge acquired in school it is difficult to ascribe a gain in knowledge to a specific trip or location. The approach to the latter therefore involved examining travel costs and resource costs in order to estimate investment costs over and above those involved in gaining knowledge in a classroom situation.

[2] *established but incomplete evidence*
[c] *likely*

Environmental settings play a positive role in religious practice and faith but more general evidence on their spiritual and religious role is limited[4]. Religious and spiritual goods are clearly linked to our existence need for being, but the extent to which religious encounters with specific environmental settings are synergistic satisfiers for value needs such as participation and identity resides in the character and qualities of belief. The importance of ecosystems in religious terms had almost certainly increased in the post-war period in Britain, notwithstanding secularisation and the decline of conventional religious observance. There has, apparently, been an increase in the incidence of both pilgrimage and of religious retreats although it is extremely difficult to identify any quantitative measures of this trend. It is extremely hard to pin-point evidence of particular landscapes or ecosystems being conducive to religious experiences. The configuration of Marine and Coastal Habitats which appear to contribute to spiritual/religious experiences at the holy islands of Iona, Lindisfarne and Bardsley have to be seen in the context of other highly popular sites of pilgrimage that are inland and not characterised by dramatic landscape/ ecological characteristics, such as Walsingham in North Norfolk.

[4] *speculative*

New evidence gathered as part of the UK NEA indicates that **people clearly benefit from a range of environmental settings proximate to their homes and that the presence of certain settings can increase residential house prices[2,c].** A new hedonic price analysis shows that the house market in England reveals substantial amenity value attached to a number of habitats, designations, private gardens and local environmental amenities. In particular, protected areas (National Parks, National Trust land and metropolitan green

[2] *established but incomplete evidence*

belt), local environmental settings (domestic gardens, local green spaces, rivers) and several habitats (such as woodland, farmland and freshwater) are a statistically significant factor in explaining higher house prices. A new well-being survey analysis also reveals that **people who visit non-countryside green spaces such as urban parks at least once a month, and those who spend time in their own gardens at least once a week, have higher life satisfaction than those who do not.** Survey respondents who used domestic gardens and local green spaces at least once a month also showed better self-reported health, measured by physical functioning and emotional well-being, compared to those who do not.

[c] *likely*

There are knowledge gaps related to ecosystem cultural services, specifically in data collection and the uneven monitoring of change in different environmental settings[2,c]. An ecosystem services approach to understanding culture-nature interactions is a relatively new perspective and consequently many key sources of social, economic and environmental data are not designed to examine key aspects of cultural services and goods. Recent initiatives, such as the Countryside Quality Counts analysis and the new Master Map digital inventories, are leading to improvements, but a lot remains to be done, particularly to provide consistent data suitable for economic analyses. Further research is required, particularly longitudinal studies, to understand the social and physiological processes involved in people acquiring mental and physical health benefits from engagement with environmental settings and nature so that management of environmental settings for long term behaviour change can be more effective. Further studies are needed to examine people's exercise habits and understand what proportion of exercise is a direct consequence of the provision of green spaces. A key knowledge gap regarding education and ecological knowledge goods concerns the processes by which adults acquire ecological knowledge, their participation in nature-based educational activities and how knowledge acquisition is influenced by engagement with environmental settings as a form of cultural service. For religious and spiritual goods the knowledge gaps are particularly notable. There is a marked lack of evidence on the numbers of people for whom religious/spiritual experience and wellbeing is related to experiences of nature. We do not know how many people in Britain go on pilgrimage or make retreats or for whom contact with nature is an intrinsic part of their religious/spiritual lives. There is also limited evidence on detailed wildlife viewing figures for species other than birds, benefits of TV and radio programmes about nature, nature-based art markets (paintings, arts and crafts, photography), social cohesion and neighbourhood benefits associated with nature and non-use values of environmental settings at a national scale not already reflected in legacies.

[2] *established but incomplete evidence*
[c] *likely*

Addressing these knowledge gaps will require the regular and consistent collection of quantitative data at the national scale[1,b]. Many of the gaps, however, require an understanding of the complex ways individuals and groups of people engage with environmental settings, the cultural goods/ benefits that may arise and the inequalities associated with cultural goods/benefits. Recent guidance published by Defra emphasises that the **cultural goods linked to ecosystem services cannot just be understood in monetary terms but in future their shared and non-monetary value will need to be understood** using a range of participatory and deliberative techniques such as multi-criteria analysis that require the use of both quantitative and qualitative methods[3,c].

[1] *well established*
[3] *competing explanations*
[b] *very likely*
[c] *likely*

16.1 The Characteristics of Cultural Services

16.1.1 Ecosystem Assessment and Cultural Services

Humans are an inseparable component of the world's ecosystems and all ecosystem services are influenced by human actions. Understanding and respecting the world's natural environments, while harnessing nature's benefits, requires a rigorous approach to analysing how human cultures interact with nature (Pilgrim & Pretty 2010). The concepts of 'cultural services' and 'cultural goods' are designed to provide a framework for understanding human benefits from nature and the consequent social, economic and environmental changes that arise. This chapter seeks to advance the understanding of ecosystem services by developing an analytical framework for assessing cultural services and goods.

The Millennium Ecosystem Assessment (MA) described cultural services as "the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences" (MA 2005a p.29); it acknowledged the challenge of producing a coherent assessment of such services at a global scale because cultural benefits are clearly country and/or context specific. In order to address this difficulty, the cultural services assessment was largely based on differences between universalised, formal knowledge produced through the theory and practice of science, and informal knowledge (often called 'traditional knowledge') associated with people's everyday experiences, customs, practices and beliefs in particular places. The MA's assessment emphasised the influences of globalisation—especially economic development and consumption pressures—on traditional communities and its impact on specific cultural services. At the same time, the MA's approach to cultural services struggled to find a consistent theoretical and methodological framework to match that underpinning other areas of the assessment. There was little quantitative data beyond measures of volumes of global tourism, leading the MA to conclude that whilst difficult to measure the loss of cultural services are significant for many people (MA 2005a).

Every national assessment of the cultural component of ecosystem services faces similar problems with data, partly because the 'subjective' elements of human-nature relationships—supposedly captured in the concept of 'non-material benefits'—have not, to date, been of central concern either to the natural sciences or to economics. Fisher *et al.* (2008) argue that "couching ecosystem service research within economic theory gives us one way to move to a more structured engagement between biophysical science, social science research, and policy". One important challenge is how to develop a conceptual and/or methodological approach which allows the humanities and more interpretive social science disciplines to make their distinctive contributions to the assessment in such a way as to strengthen the integration of scientific, economic, cultural and socio-political evidence for policy.

A key aim of this chapter is to introduce an approach to cultural services that draws on novel thinking in the humanities, and social and natural sciences regarding human-nature relationships. The chapter seeks to assess the status, trends, drivers and knowledge gaps relating to cultural services and goods. The remainder of Section 16.1 outlines the rationale and characteristics of the conceptual approach to ecosystem services. A discussion of human values, the nature of culture, and an analysis of the distinctive forms of language used for 'environmental talk' across the UK is followed by a discussion of the cultural services conceptual approach adopted in the UK NEA. Recognising the importance of finding a value-based framework which supports some level of integration with economic and ecological valuation, we have worked with the Human-Scale Development Matrix (H-SDM) devised by Max-Neef (1989; 1992). Using the framework as a structuring device (which will need substantial field-testing in future work), the chapter examines how components of the UK's habitats and ecosystems acquire cultural meaning and significance because they are able to satisfy human needs for a 'good life'. We argue for a final cultural ecosystem service as being a 'series of environmental settings' which provide locations and places where people interact with each other and with nature.

Section 16.2 assesses the status and trends of these different environmental settings. Section 16.3 discusses a number of cultural goods that emerge from human-nature interactions in environmental settings. Further discussion of the selected cultural goods can be found in Chapters 5–12 and 17–20. Cultural goods arising from people's engagement with all four ecosystem services help to shape the social and economic value of changes in ecosystem services and habitats. In this chapter, we include an assessment of the social and economic value of cultural goods in order to highlight their contribution to human well-being.

16.1.1.1 Cultural services and values

Over the last 30 years, environmental and ecological economists have worked alongside natural and social scientists to develop more robust, defensible estimates of the monetary value of certain aspects of the natural environment that are now termed 'ecosystem services' and the contributions they make to improving human welfare. However, in making a distinction between anthropocentric, instrumental and intrinsic values (Chapter 2), environmental philosophers argue that societies maintain a range of beliefs about the 'ethical' basis of people's relationships with nature—what constitutes right and proper conduct towards the non-human world—and also make 'aesthetic judgements' about what is beautiful or significant in terms of landscapes, species and natural processes (O'Neill 1993; Sagoff 2004).

Ethical concerns and aesthetic judgements are always context-specific: they are outcomes of local circumstances, of specific times and particular places. Values for nature change over time; they are expressed in different ways by different groups of people in different societies; and they give rise to different kinds of formal and informal institutions. Academic research in the fields of ethical

concerns and aesthetic judgements for nature, place and landscape tends to rely on a wide range of methods. Often the goal is 'hermeneutic', i.e. the production of sophisticated descriptive interpretations based on reasoned argument and the weighing of many different sources of quantitative and qualitative evidence (Chapter 2).

Some argue that these three dimensions of human-environment relations—utility, ethics, and aesthetics—are basic principles guiding human behaviour and, as such, are incommensurable: ethical and aesthetic principles cannot be meaningfully expressed in financial terms (Vatn & Bromley 1994; O'Neill 1997; Holland 2002; Vatn 2009; Chapter 2). At the same time, environmental decision-makers do have to make choices which require trade-offs to be made between them (Fisher & Turner 2008). What is important in such cases is that the decision-making process is seen to be reliable, credible and legitimate. Current reviews of academic and policy literatures suggest decision-makers would benefit from deliberative tools, such as participatory multi-criteria analysis, to help them integrate the different kinds of quantitative and qualitative information needed to strengthen the ecosystem approach in policy appraisal processes (Fish *et al.* 2011; Dryzek 2002; Wilson & Howarth 2002; Gregory *et al.* 2005; Renn 2006). These issues are discussed in more detail in Chapter 24. In the rest of this section, we introduce some of the key terms that are important in discussions about cultural ecosystem services in the UK.

16.1.2 Culture, Nature, Ecosystems

In his seminal book, *Keywords: a vocabulary of culture and society*, Raymond Williams traced the ways in which the meanings of 'keywords' in the English language had altered as historical contexts changed (Williams 1976). He asserted that "culture' is one of the two or three most complicated words in the English language". He identified three stages in the transformation of the meaning of this word into its modern usage. Coming from the Latin *cultura*, 'culture' was the noun first associated with the tending of plants and animals (*agri-culture, horti-culture, silvi-culture,* etc. (Pretty 2002)). From the 16th Century, the notion of propagation came to be linked with the idea of education producing 'cultured' individuals with sensibilities able to appreciate the products of human knowledge and creativity which, very often, embraced the natural world. The third set of meanings, emerging in the 19th century, uses 'culture' to classify the distinctive practices and ways of life of different human groups. This latter sense structures the discussion of cultural services in the MA with its distinction between, for example, cultural landscapes in different parts of the world. In the MA scenarios assessment, therefore, culture is primarily portrayed as conditioning individuals, influencing what they consider important and stimulating courses of action by individuals that are appropriate and inappropriate in terms of their impacts on ecosystems (MA 2005b).

In the UK, the study of culture has a rich, multidisciplinary intellectual tradition, embracing the biological sciences, social sciences (such as anthropology, geography, sociology, cultural and media studies), and humanities (including history, literature, philosophy and the fine arts). For the majority of these disciplines, culture is not understood as a causal determinant of individual perception and behaviour amenable to experimental research such as that associated with the analysis of landscape preferences. Rather, research is based on an understanding of culture as an interpretive, qualitative endeavour focused on the communicative production of 'shared meanings' within and between different social groups, and the 'particularities of their everyday practices' including individual behaviours and social institutions in different places. Within this framing, cultures are emergent processes, products and practices, while individuals are 'social individuals' living their lives embedded in many different kinds of social groups (Lorimer & Lund 2003; Milbourne 2003; Shove & Pantzar 2005).

Exploring the cultural dimensions of human-environment relations requires attention to be paid to the two key issues of communications and social practices. How people, as members of different social groups, communicate their feelings, experiences and shared knowledge about the natural world is a vital source of evidence for understanding the cultural significance of nature. Understanding how the natural world is significant in what people do (social practices) provides evidence of cultural shifts in environmental meanings and values, and produces tangible changes in the environment. In summary:

> "It is participants in a culture who give meaning to people, objects and events. Things 'in themselves' rarely if ever have any one, single, fixed and unchanging meaning. Even something as obvious as a stone can be a stone, a boundary marker or a piece of sculpture depending on *what it means*—that is, within a certain context of use, within what the philosophers call different 'language games' (i.e. the language of boundaries, the language of sculpture, and so on). It is by our use of things, and what we say, think and feel about them—how we represent them—that we *give them a meaning*. In part, we give objects, people and events a meaning by the frameworks of interpretation which we bring to them. In part, we give things meaning by how we use them, or integrate them into our everyday practices." (Hall 1997 p.9).

16.1.2.1 Ecosystem services and human-nature relationships in the UK

The evidence presented in this section indicates that, in the UK, that the term 'ecosystem services' is not a meaningful framework for the interpretation of human-environment relationships for the vast majority of people; yet it has gained recent traction in policy (Hall 1997). Culturally, the concepts which have most meaning are those of 'nature', 'place' and 'landscape'. These are the products of cultural communications and practices which, despite the homogenising forces associated with multinational forms of consumer capitalism and communications media, still vary across different regions of the UK. The landscapes of the UK are characterised by a diversity of scenery and habitat, created and maintained through the activities of countless generations of people and institutions (The Countryside Agency 2005). Equally, literary and artistic endeavours, ranging from the glowing miniatures depicting medieval

practices in the margins of the Holkham Bible (Brown 2007) to Ian McEwan's (2010) novel *Solar* exploring human frailties in the face of climate change, create a reservoir of ideas and images which represent human relations with the living world (Williams 1980; Cosgrove & Daniels 1988). Representations communicate the meanings, values and practices of their historical period, offering potential both for stability and comfort in maintaining some interpretive frameworks, and for re-interpretation as times, places and the natural world change over generations. One particularly noticeable characteristic of UK cultural practice is the depth and breadth of engagement with nature and wildlife dating back to a tradition of amateur naturalists in late 18th and 19th Centuries—many of whom were clergymen, such as Gilbert White (1977)—and which continues to flourish (Rackham 1986; Mabey 1996; Macfarlane 2007; Pretty 2007; Marren & Mabey 2010; Pretty 2011).

Research evidence to support these assertions comes from two recent studies. The first study involved qualitative research carried out for the Department for Environment, Food and Rural Affairs and the Central Office for Information (Defra 2007a) and used a stratified socio-demographic sampling strategy to recruit people for eight focus groups which were led through discussions about the ecosystems approach. The second study, commissioned especially for the UK NEA, is entitled *Corpus linguistics analysis of ecosystems vocabulary in the public sphere* (CLAEVIPS, Wild & McCarthy 2010). It is discussed in more detail in the next section below and provides a quantitative linguistic analysis of the use in public discourse of words and phrases related to 'ecosystems'.

The first study used qualitative methods and found that 'ecosystem services' "was a completely unfamiliar term, and proved to be baffling for most due to the lack of awareness of the term *ecosystem*" (Defra 2007a, p.40). 'Nature', on the other hand, meant a lot. The focus group participants in this study had diverse social backgrounds but shared a common language and understanding of the word 'nature' as summarised in **Figure 16.1**. The report concludes that everyone in the study talked about nature as 'other' to themselves and not 'man-made'. For example, the focus group participants described a range of habitats (including the sea) as characterised by the presence of many different species of plants, animals, birds, insects and fish.

Such cultural ideas of nature as 'other' are also associated with an aesthetic notion of the 'sublime' (awe and wonder) and an ethical belief in 'purity' (fresh air, clean air and water), derived from the considerations of nature by the Romantic movement of the early 19th Century. This sensibility grew as the need to believe that 'pure nature', untainted by industrialisation and the appalling conditions of life for the poor in Victorian cities, could still be found in the wild parts of the UK; it soon became an established ideological position (Williams 1980).

Nature is a word with a history as old as human thought itself (Williams 1976). 'Environment', on the other hand, is one of a family of new 'eco-words' which began to appear in the late 19th and 20th Centuries to express a scientific agenda. As Worster (1994), in his study of the interweaving of ecological and economic thought over the last two centuries, argues:

> "Every generation … writes its own description of the natural order, which generally reveals as much about human society and its changing concerns as it does about nature. And these descriptions linger on in bits and pieces, often creating incongruous or incompatible juxtapositions. … The 'New Ecology' that had emerged by the middle of the twentieth century saw nature through a different set of spectacles: the forms, processes and values of the modern economic order as shaped by technology." (Worster 1994).

The phrase 'natural environment', together with 'natural resources', has also been used for many decades to explain relationships between human activities and the natural world. In the (Defra 2007a) study, the focus group

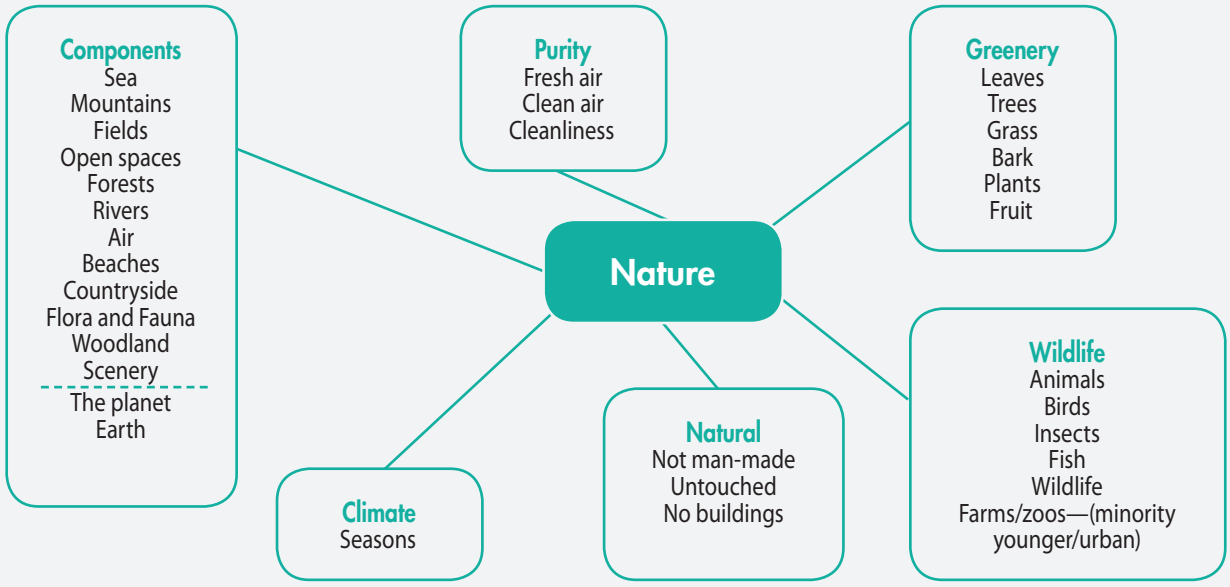

Figure 16.1 Specific semantic associations with the term 'nature'. Source: Defra (2007a).

participants iterated ideas of 'naturalness' but also showed understanding of human impacts on the natural environment (**Figure 16.2a, b**). **Figure 16.2b** shows a more use-orientated understanding through associations of the words 'natural environment' with farming and gardening, leisure experiences in parks and the countryside, awareness of some of the negative impacts of economic activity on the natural environment (such as climate change), and the need for nature conservation. These semantic diagrams provide interesting visual representations of the 'bits and pieces' which constitute common sense knowledge of 'nature' and 'natural environment' in contemporary UK culture as people draw on material learned at school. The teenagers in the focus groups, for example, remembered the 'ecosystem' concept from science lessons, mass media, and the many other forms of lay (as opposed to specialist) knowledge (Defra 2007a).

16.1.2.2 Ecosystems and ecolinguistics

Ecolinguistics emerged as a new discipline in the 1990s, bringing together research from a number of different academic disciplines which focused on the ways in which scientific, professional, amateur and popular knowledge about the natural world was constructed. It considers how different media shapes the environmental messages being communicated and how environmental issues have become politicised with the rise of non-governmental organisations (NGOs) and pressure groups from the late 1960s onwards (Fill 2001). One strand of research uses content analysis: a quantitative technique used in social psychology and mass communication research which measures the frequency of words and phrases in written and spoken texts. The massive expansion of computing power and accessibility to digitised resources is enabling a new generation of content-analytic research and such a study commissioned for the UK NEA is described in **Box 16.1** below.

The CLAEVIPS project is a rich resource for further analysis. Relevant to this discussion, the study provides quantitative support for many of the observations based on qualitative analysis in the Defra 2007a report discussed above. The key findings in the CLAEVIPS study include:

- Ambiguity in terms of whether human beings are a part of nature or separate from it is apparent in the quantitative data.
- 'Nature' is often used to modify another noun when the sense meant is that of 'the physical world and living things'. The study shows that 'nature' appears twice as frequently in the government corpus than in the other two specialised collections of written material. In all

Box 16.1 CLAEVIPS—Corpus linguistics analysis of ecosystems vocabulary in the public sphere.

The UK NEA commissioned a quantitative study of how more than 100 words and phrases related to 'ecosystems' are currently being used in public discourse (Wild & McCarthy 2010). The study was carried out using UK Web as Corpus (UKWaC, Ferraresi *et al.* 2008), which is a body of over 1.5 billion words of UK English in the public domain. In addition, the researchers used 100 seed words as the basis of a computerised process that drew material from the world-wide-web to create three new collections of written material (known in linguistics as a 'language corpus') relating to ecosystems. Material was collected from: a) academic websites; b) government websites; and c) newspapers, non-governmental organisation (NGO) websites and blogs. Software known as Sketch Engine (Kilgarriff *et al.* 2004) provides an interface that gives measures of how frequently words are used and the way they co-occur with other words in particular grammatical relationships. Comparisons can be made between the three specialised collections of written material; but caution should be taken, since it is possible that a seed word was used in the automatic creation of one collection, but not in another.

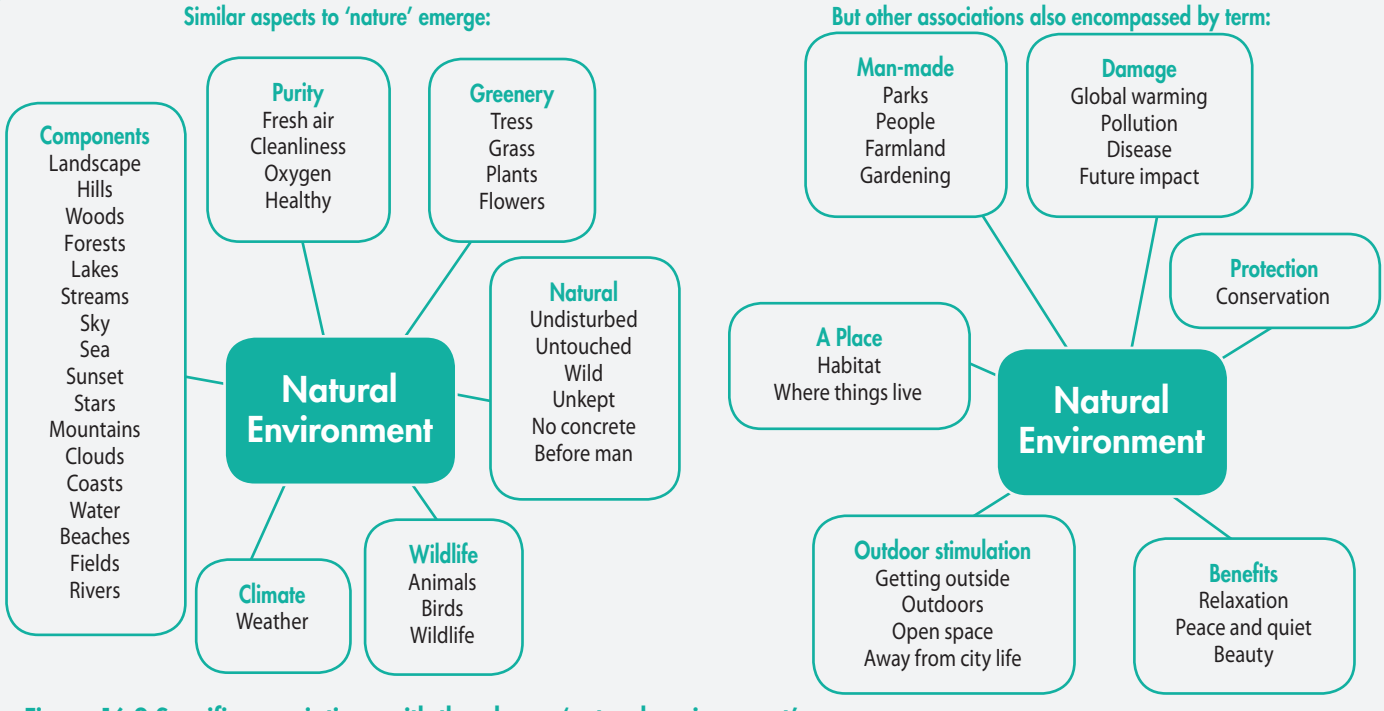

Figure 16.2 Specific associations with the phrase 'natural environment'. Source: Defra (2007a).

three corpus', key phrases are 'nature conservation', and 'nature reserve' while in the government corpus, 'nature interest' and 'nature value' are also salient.

- A number of positive verbs and adjectives co-occur with nature and landscape including 'experience', 'enjoy', 'solitude', 'peaceful' and 'beautiful'. Therefore, it is not surprising that there is a great deal of evidence in the UKWaC—as in the specialist public corpus—that the natural world continues to be used as a promotional device in advertising a very wide range of goods and services (Williamson 2000), which is an indication of its cultural value.
- 'Ecosystem' appears more than twice as frequently in the academic corpus as it does in the government and public ones, with government much more likely to use the phrase 'ecosystem goods and services'. The study finds key adjectives and nouns associated with 'ecosystem' are those indicating habitat type (such as 'marine', 'aquatic' and 'forest'). Adjectives which indicate vulnerability (such as 'fragile', 'threatened', 'endangered' and 'delicate') are most commonly used in conjunction with 'ecosystem'. Most frequently used verbs are those indicating harm done to ecosystems (such as 'degrade', 'disrupt', 'damage', 'harm', 'threaten', 'upset' and 'suffer'), as well as verbs referring to the protection and restoration of ecosystems ('conserve', 'preserve' and 'protect').
- The word which is used most similarly to ecosystem in the UKWaC is 'habitat'. While habitats and ecosystems are equally likely to be described as degraded, ecosystems are more likely to be described as delicate and habitats are more regularly described as 'valuable' and 'rare'; this reflects the characteristic framing of nature by conservationists since the Second World War (WWII) (Wild & McCarthy 2010; Evans 1997).

One distinctive grammatical feature of environmental discourse in these three collections of words is a process known as 'nominalisation', combined with the passive rather than active form of the verb. This results in a strong tendency not to identify *who* did *what* when discussing environmental change. This is achieved in a number of ways, such as using the passive rather than active voice, or omitting the grammatical subject and using the object instead; for example, 'the habitat was destroyed' rather than 'the developer destroyed the habitat'. This choice of syntax obscures agency, thereby concealing responsibility for negative changes in environmental conditions (Burgess *et al.* 2000; Goatly 2001; Kuha 2007; Wild & McCarthy 2010). Relevant to this discussion, in the CLAEVIPs analysis, the most salient verb collocate of ecosystem is 'degrade', but over 90% of occurrences use the passive form such as 'ecosystems are degraded' or 'degraded ecosystems'. One implication of this pattern of language use is that audiences are not being given full information about who (or what) is causing these disturbing environmental changes. In such circumstances, individuals may ignore the message altogether because it is uninteresting, or they may use pre-existing interpretive frameworks to create a meaning for themselves which may or may not be an accurate representation of the specific circumstances being discussed (Burgess *et al.* 1988; Burgess *et al.* 2000; Myerson & Rydin 1996; Holliman 2004; Philo 2008).

16.1.3. An Approach for Understanding Cultural Ecosystem Services in the UK

The global scale of the MA (2005a, 2005c) required considerable experimentation with conceptual approaches, especially given the paucity of quantitative and/or experimental data. Subsequent commentaries suggest that, particularly in sub-global assessments, cultural services are seen by stakeholders as highly important, but that there is uncertainty over how they should be addressed (Raudsepp-Hearne & Capistroana 2010). In the following sections, we attempt to develop an interpretive framework for examining cultural services that reflects our understanding of culture as a dynamic and transformative process involving the enormous range of social communications and social practices that enfold nature, places and landscapes into everyday life.

How might this interpretive approach contribute to a science- and economics-based assessment of ecosystem services? From science comes the definition of an ecosystem as "a complex where interactions among the biotic (living) and abiotic (non-living) components of that unit determine its properties and set limits to the types of processes that take place there." (Chapter 2). As humans are simply one biological species among a multitude (albeit with particularly interesting technological and linguistic capabilities), places are fundamental to human life, too. From environmental and ecological economics comes an understanding of the many contributions or 'goods' ('good things') that ecosystems make to human welfare (Chapter 2). Agreed definitions of what constitutes 'good things' or, more generally, the 'good life' are a reflection of how ideas about individual and collective well-being are expressed, and these change over time. In other words, different cultural groups at different times and in different places share an interpretive framework of 'the good life'.

Philosophical discussion on the meaning of the good life may be traced back to Aristotle in Western thought (Coleman 2000). There is a body of work, ranging from psychology to philosophy, which suggests that underpinning cultural diversity is a relatively small number of fundamental human needs that require satisfaction if well-being is to be achieved (McGillivary 2006). What change through time are the specific means through which these needs are satisfied. In many areas of social science, there is also debate as to the nature of human needs and well-being, how these might be measured, and how they are affected by the natural environment and sustainable development (Alkire 2002; McGillivary 2006; Newton 2007). Chapter 2 outlines the general approach and definitions used in the UK NEA to address well-being and emphasises the importance of understanding how ecosystem services, and the goods that arise from them, contribute to economic, health and shared values. We extend these ideas by suggesting an approach for cultural services that explores in more depth the interactions between ecosystem services, goods and the satisfaction of human needs that contributes to well-being.

16.1.3.1 The Human-Scale Development Matrix (H-SDM) and its relevance for the UK NEA

The Human-Scale Development Matrix (H-SDM), conceived by the Chilean development economist Manfred Max-Neef (1989; 1992), is attracting attention from academics and policy makers working on global development issues (Alkire 2002; Gasper 2004), producing new indices to measure sustainable economic welfare (Bleys 2007) and quality-of-life (Costanza *et al.* 2007; Dodds 1997), and promoting more sustainable consumption and production practices (Jackson & Marks 1999; Jackson 2009). We believe the H-SDM also has potential to provide a conceptual approach for examining systematically the extent to which cultural ecosystem services and different kinds of cultural 'goods' (e.g. material objects, abstract ideas, emotional experiences, social practices, living things, etc.) are valued because they are able to satisfy a substantial number of fundamental human needs. No empirical research to test this proposition has yet been undertaken, but it would be possible, following Cruz *et al.* (2009) for example, to adapt the H-SDM for a deliberative process that could engage citizens, stakeholders and specialists in a participatory ecosystem assessment.

The basic argument for the H-SDM rests on the proposition that, beyond the need for subsistence to stay alive, there is no rigid hierarchy of human needs as was suggested by Maslow (1954). Rather, Max-Neef argues for a relatively small number of fundamental human needs which are equally important in contributing to a 'good life', but not all of which may be satisfied at any given time. Furthermore, individuals and groups make trade-offs between the satisfaction of different needs, often using different satisfiers to do so. Economic, social and cultural values arise from the extent to which different satisfiers are able to meet individual and societal needs.

The H-SDM is shown in **Table 16.1**; the matrix consists of four columns ('being', 'doing', 'having' and 'interacting') and nine rows, each expressing a different human need. The four columns represent four human qualities or contexts within which specific needs should, or could be, satisfied. Max-Neef calls these qualities 'existential' in the sense that each is absolutely necessary to the ways in which we human beings, as social animals, structure our existence (**Table 16.1** refers to these four as existence needs).

- **Being** addresses personal and/or collective attributes such as physical and mental health, adaptability, self-esteem, receptiveness, curiosity and rationality.
- **Having** refers to the institutions, norms and resources necessary for society to function effectively, with attributes such as health systems, education, work, family relations, language, religion and historical memory.
- **Doing** captures personal and/or collective action such as cooperating, cultivating, investigating, relaxing and developing awareness.
- **Interacting** recognises what is all too easily forgotten because it is self-evident. Human life is 'environed', lived within natural and technologically mediated settings which change over the lifespan and at different spatial and timescales. What characterises modern, Western societies, such as the UK, is the extent to which science and technology have mediated society-nature interactions at the level of living spaces and/or habitats. One outcome is a growing experiential disconnect between people and the natural environment, recognised as a challenge, for example, in discussions about future social resilience and adaptation to climate change.

Table 16.1 the Human-Scale Development Matrix.
Source: Max-Neef (1992).

	Existence needs			
Value needs	***Being***	***Having***	***Doing***	***Interacting***
SUBSISTENCE				
PROTECTION				
AFFECTION				
UNDERSTANDING				
PARTICIPATION				
LEISURE *				
CREATIVITY				
IDENTITY				
FREEDOM				

*Max-Neef's term translates as 'idleness'

The rows across the matrix represent human needs which require satisfaction in order to achieve 'a good life'. Max-Neef describes these as 'axiological values' in the sense that there is general acceptance of the proposition that each need is fundamental to our sense of our humanity. These are referred to in Table 16.1 as the value needs for: *'subsistence', 'protection', 'affection', 'understanding', 'participation', 'creativity', 'leisure', 'identity' and 'freedom'*. Subsistence is the category of need which must be satisfied for human survival, but all other value-based needs can, in some sense, be traded-off one against another, or in one existence mode against another. Cultural differences between countries in different parts of the world arise, in part, through the different kinds of trade-offs that might be possible or thought desirable. There is some discussion in the literature about the labels Max-Neef uses to describe these needs, for example: some replace 'idleness' with leisure because of the specific negative connotations 'idleness' has in many Protestant countries; protection may be termed 'security' in some studies; and other studies have added a separate category to cover 'reproduction' (Costanza *et al.* 2007). The nine axiological categories are comparable with other studies of well-being and assessments of happiness, although the terminology may vary slightly (Diener & Seligman 2004; Blanchflower & Oswald 2008; Thompson *et al.* 2008; Bacon *et al.* 2010). **Table 16.2** shows how, in the abstract, the 36-cell matrix can be populated, suggesting, for example, how it might be possible to integrate scientific, economic and interpretive information in a systematic framework.

Table 16.2 The Human-Scale Development Matrix. Source: adapted from Max-Neef (1992).

	Needs according to axiological (value) characteristics			
Needs according to existential (existence) characteristics	***Being*** (personal or collective **attributes**)	***Having*** (registers **institutions**, norms, rules and resources)	***Doing*** (registers personal & collective **actions**)	***Interacting*** (registers **times and spaces**)
SUBSISTENCE	1/ Physical health, mental health, sense of humour, adaptability	2/ Food, shelter, work	3/ Feed, procreate, rest, work, take exercise	4/ Living environments, social settings
PROTECTION	5/ Care, adaptability, autonomy, solidarity	6/ Insurance systems, savings, social security, health systems, work rights, family	7/ Co-operate, prevent, plan, take care of, cure, help	8/ Living space, dwelling, social environment
AFFECTION	9/ Self-esteem, respect, tolerance, passion, determination.	10/ Friendships, family, partnerships, relations with nature	11/ Caress, express emotions, take care of, cultivate, appreciate	12/ Private spaces, intimacy, home, spaces of togetherness
UNDERSTANDING	13/ Critical conscience, receptiveness, curiosity, discipline, intuition, rationality	14/ Literature, teachers, method, education policies, communication policies	15/ Investigate, study, experiment, educate, analyse, meditate	16/ Settings of formative interaction, schools, universities, groups, gardens, natural habitats
PARTICIPATION	17/ Adaptation, receptiveness, solidarity, willingness, determination, respect, etc	18/ Rights, responsibilities, duties, privileges, work	19/ Affiliate, co-operate, propose, share, dissent, obey, interact, express opinions	20/ Parties, churches, communities, neighbourhoods, parks, greenspaces, natural habitats
LEISURE	21/ Curiosity, receptiveness, imagination, recklessness, tranquillity	22/ Games, spectacles, clubs, holidays	23/ Daydream, remember, relax, connect, have fun, play	24/ Privacy, time, intimate spaces, surroundings, landscapes
CREATIVITY	25/ Passion, determination, imagination, boldness, rationality, inventiveness, curiosity	26/ Abilities, skills, method, work	27/ Work, invent, build, design, compose, interpret	28/ Productive and feedback settings, cultural groups, spaces for expression, temporal freedom.
IDENTITY	29/ Self-esteem, sense of belonging, consistency, differentiation, assertiveness	30/ Symbols, language, religion, habits, customs, reference groups, values, norms, historical memory, work	31/ Commit oneself, integrate, confront, decide, recognise oneself, grow	32/ Social rhythms, natural rhythms, everyday settings, maturation stages
FREEDOM	33/ Autonomy, self-esteem, determination, passion, assertiveness, boldness, rebelliousness, tolerance	34/ Equal rights	35/ Dissent, chose, run risks, develop awareness, commit oneself, disobey	36/ Temporal and spatial plasticity—offering multiple opportunities and meanings

16.1.4 Environmental Settings as an Ecosystem Service

16.1.4.1 The H-SDM and environmental settings

As stated above, it has not been possible within the constraints of the UK NEA to undertake empirical research to evaluate the H-SDM in an assessment of ecosystem cultural services. Furthermore, the needs discussed in the matrix are not neatly separated, so it will often be hard to identify which need a particular satisfier is addressing. We have used the H-SDM as a conceptual device—a 'thought experiment' in scientific parlance—to challenge us to articulate more clearly what final cultural ecosystem services might be, and how cultural ecosystem 'goods' can be understood as 'benefits' because they satisfy one or more human need. We shall take this in two stages. The first is to use the H-SDM to help give clarity to the definition of final cultural ecosystem services in order to be able to incorporate new insights since the MA was published (Fisher *et al.* 2008). The second is to discuss a number of cultural goods which could be said to have value because they are capable of satisfying a number of human needs.

The MA (2005a) recognised the challenges involved in identifying cultural services at a global scale and drew on a variety of mainly environmental and ecosystem studies to produce the following list of cultural services:

- **Cultural identity:** the current cultural linkage between humans and their environment.
- **Heritage values**: 'memories' in the landscape from past cultural ties.
- **Spiritual services**: sacred, religious, or other forms of spiritual inspiration derived from ecosystems.
- **Inspiration:** the use of natural motives or artefacts in arts, folklore, and so on.
- **Aesthetic appreciation:** of natural and cultivated landscapes.
- **Recreation and tourism:** the use of natural and cultivated landscapes for pleasure.

The MA chapter on cultural and amenity services (MA 2005a p.457) categorise cultural services as "ecosystem and amenity services provided by ecosystems and landscapes". The term amenity is used to acknowledge the challenge of separating out individual cultural services and that they will often need to be valued collectively as providing amenity (see section 16.3.1 below for a consideration of amenity value in the UK NEA). There is considerable overlap between the list of services above, which increases the difficulty of undertaking a defensible economic valuation. The NEA conceptual framework (Chapter 2) would define some elements of the list above as services and others as goods. The MA chapter recognises the importance of cultural landscapes but the list above refers to 'natural and cultivated landscapes'. Landscapes are a further complex component of cultural services as they are socio-cultural constructions. Landscapes are produced through the combination of human labour and the application of technology, *and* the interpretive frameworks which particular social groups use to create shared meanings for their assemblages of physical, biological and technological processes and products. Unlike a landform created by a specific set of geophysical processes, 'landscape' is not an objective category.

Fisher *et al.* (2008) draw a distinction between intermediate and final ecosystem services and benefits: "ecosystem services are the ecological phenomena, and the benefit is the thing that has direct impact on human welfare. Benefits are typically generated by ecosystem services in combination with other forms of capital like people, knowledge or equipment". More conceptual clarity into the definition of cultural services may assist in the development of more defensible measures of their value in future assessments.

The H-SDM offers a way forward. One of the four human 'existence needs' is for 'settings' in which people can be located together and with nature in place and in time, allowing interaction with others and with the living world (Pilgrim & Pretty 2010). According to the H-SDM the settings of everyday life are essential for human well-being and include 'environmental (natural/naturalistic) settings' where ecosystems are clearly present, such as gardens and parks. Our proposition is that environmental settings represent a final cultural ecosystem service. The intermediate services that underpin this cultural ecosystem service are geophysical, hydro-meteorological and biological products and processes. These intermediate services will be crucial in shaping environmental settings even though many people will be unaware of the influence of some of these processes. In the expert discourse of the UK NEA, these are regulating, supporting and provisioning services. In public discourse, as we have seen above, they are simply 'the natural environment' and 'nature'. Through the interactions between these other ecosystem services and human intellectual, material and social capital over very long periods of time, environmental settings emerge as a final cultural ecosystem service from which a number of time- and space-specific cultural goods arise—these were termed 'benefits' by Fisher *et al.* (2008). These environmental settings are discussed in more detail in Section 16.2; they are very diverse and include domestic gardens, local greenspaces, landscapes and the countryside.

Some of the cultural services identified by the MA, such as recreation and tourism, are better described as goods as, in keeping with the Conceptual Framework for the UK NEA (Chapter 2), they are 'good things' that arise at particular places and points in time through the interaction between environmental settings and human capital inputs. Section 16.3 provides an assessment of specific cultural goods, such as heritage and recreation, which are linked to environmental settings. These goods will, of course, be influenced by all other ecosystem services, but the aim of this chapter is to explore how they interact with the final cultural service of environmental settings.

A valuable characteristic of environmental settings is that they have spatial limits. These may vary depending on how individuals and groups interact with these settings to satisfy needs. For example, people will differ in their views as to where countryside starts and ends, but, in contemporary culture, virtually everyone will accept the idea of a space that can be termed 'the countryside'. Spatially defined environmental settings are better suited for the assessment of status and trends compared to certain MA cultural services (e.g. inspiration) as spatially disaggregated data can be compiled for many environmental settings and their associated goods and values. Data for environmental settings can then be integrated with spatially disaggregated data concerning other ecosystem services and will allow a consideration of cultural services to be included in various policy activities that guide and shape ecosystem management. In this way, cultural services and goods are not simply a discrete 'box' in ecosystem assessments, but they can be incorporated into the decision-making and trade-offs involved with managing and conserving ecosystems.

16.1.4.2 Environmental settings, habitats and landscapes

Conceptually, environmental settings overlap with spatially defined habitats or ecosystems (Chapter 2). Environmental settings are, however, distinct from these other conceptual entities as they are the places at certain points in time that are valued because they satisfy the fundamental human need for social interaction with others and with nature. Consequently, in any of the eight Broad Habitat types identified by the UK NEA a range of different environmental settings will be present. Equally, in any environmental setting several habitat types might be present which, in their assemblage, could satisfy needs for understanding, aesthetic pleasure and active recreation. A large country park may allow visitors to walk through Woodland, Enclosed Farmland and Semi-natural Grassland, for instance, providing a range of habitats that may satisfy various needs such as for identity and leisure. The habitat type may influence the nature of the interactions people can have with others and with nature, but there are also a range of other factors that collectively shape our interactions in environmental settings.

Environmental settings also combine with built environments, human activities and our imaginations to produce what we often term 'landscapes'. The European Landscape Convention (COE 2004) defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".

Habitats turn into landscape through the intervention of culture and cognition: classifying visual experience by taking a perspective that encompasses and organises a view (Appleton 1975; Cosgrove & Daniels 1988; Pretty 2002). Ingold (2000) describes the engagement people have with the environment and landscape through practice as a process of 'dwelling'. The experience and appreciation of landscapes is acquired and reflects aesthetic sensibilities at particular points in time, and between different cultures (Tuan 1979; Harrison 1992; Barrell 1980; Palmer & Brady 2007; Tolia-Kelly 2007a). For the historian, Simon Schama, "landscape is the work of the mind. Its scenery is built up as much from strata of memory as from layers of rock" (1995, p.7). Some of the empirical data used in this chapter to examine environmental settings assesses landscape change which emphasises how the environmental settings that constitute final ecosystem services are the result of interactions between natural and social systems over long periods of time.

16.2 Cultural Services and Environmental Settings: Status, Trends and Drivers

16.2.1 The Nature of Environmental Settings

The final cultural ecosystem service is the series of environmental settings shown on one axis in **Figure 16.3**, ranging from domestic gardens to country territories. Over millennia, these have been co-produced by the constant interactions between people and nature. Environmental settings are inscribed with the legacies of past and current societies, technologies and cultures. In contemporary society, people tend to perceive these environmental settings as distinct from technologically produced ('man-made') settings such as the interior of the home, workplaces and shopping malls (although the air in such indoor spaces means nature is always present and it can also be manifested in plants, shrubs and visual representations). Therefore, the environmental settings in **Figure 16.3** are all outdoor places where there are opportunities for people to engage with nature and with each other.

Figure 16.3 represents an adaptation of the Max-Neef (1992) framework to address the specific spatial challenges of an ecosystem assessment. These environmental settings provide spaces for social interaction that our current culture sees as important as highlighted in a recent 2009/10 survey of the adult population of England. The survey found that:

- 88% agreed that spending time outdoors was an important part of their life;
- 93% agreed that having greenspaces near to where they lived was important to them (Natural England 2010).

The environmental settings in **Figure 16.3** are distinct from each other by virtue of their geography and proximity to our daily lives. More than 80% of households in the UK have access to a private/shared garden or yard—an environmental setting adjoined to their homes (Mintel 2010). The places where we spend much of our everyday lives provide informal, local, green and blue settings (such as footpaths, bridleways, canal and riversides, and hedgerows), and also contain formal local settings designed for certain activities, such as recreation in parks, angling at lakes, food-growing in allotments or retreat and contemplation in cemeteries. One advantage of basing the analysis of cultural services on environmental settings is that they have a number of readily measured features and characteristics that can be incorporated into empirical assessments of value.

For some people their locality will contain the countryside or seaside, but many people will have to travel to these environmental settings. In 2009–10, just under half the visits made to natural environment by adults in England were to the countryside (Natural England 2010). Wherever people live, however, there will be an environmental setting that is the more distant wider countryside or seaside that they will have to make a journey to visit.

Human interactions with nature are, in part, conditioned by an environmental setting defined by country boundaries.

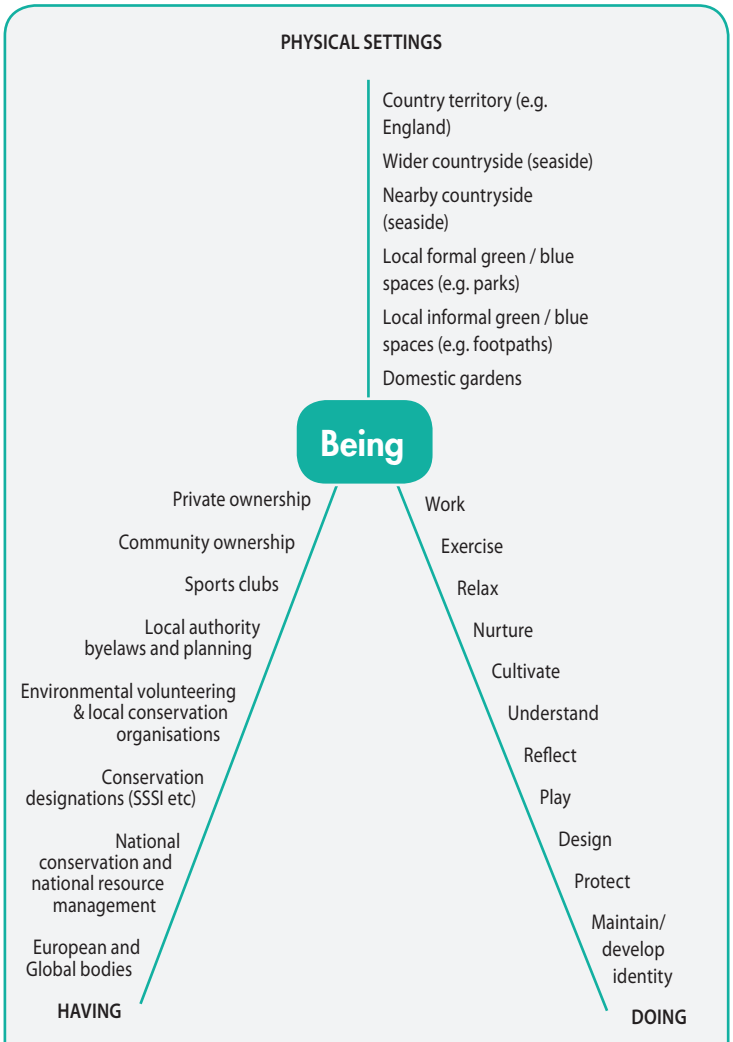

Figure 16.3 Environmental settings for interacting and human existence needs for being, having and doing.

As Chapters 17–20 show, the countryside of Scotland, Wales, England and Northern Ireland is perceived as having natural and cultural features that are distinct to that particular country, and so, shape human-nature relationships.

The environmental settings shown in **Figure 16.3** can satisfy a number or even all of our value needs at any point in time. A garden or allotment can provide food and subsistence, be a space for leisure, and promote our sense of affection and creativity. People walking in open access countryside in the Highlands of Scotland may feel a sense of freedom and connect to a Scottish sense of identity. Different settings can satisfy different value needs. As this chapter shows, however, due to cultural, economic and technological change how we satisfy our value needs has changed. The process of needs satisfaction has shaped, and been shaped by, the changes in environmental settings. A key aim of this chapter is to outline how our changing value needs interact with changing environmental settings and the ecosystem services that underpin these environmental settings.

16.2.2 Environmental Settings and Human Existence Needs

The adapted Max-Neef (1992) framework summarises how our need for 'environmental settings for interacting' must be considered alongside our need for 'being', 'doing' and 'having', which are also fundamental to our existence. In **Figure 16.3**, our being need is placed at the centre of the diagram to reflect that an individual's need to 'be'—by developing personal and collective attributes—is a process of endless change that involves constant tensions and relations with the other axes; these other axes outline what people are doing in the environmental settings and how our having need results in the ways society organises natural environments.

The doing axis in **Figure 16.3** summarises the key personal and collective actions that take place in the environmental settings to satisfy our existence and value needs; thus, these actions also shape the characteristics and status of the settings. The doing actions include work, exercise, and developing understanding and awareness. There are many other actions that people do in environmental settings that are not listed in **Figure 16.3**, but are included in the H-SDM in **Table 16.2**. Those shown, however, are examples of doing actions that relate to each of the nine value needs listed in the H-SDM and, in contemporary UK culture, often make use of outdoor settings. Other cultures will interact with environmental settings differently.

The having axis outlines the key norms, rules and institutions we need to have to organise the environmental settings, many of which are designed to manage natural environments. They include regulations for private property ownership, local planning authorities and national conservation bodies. In contemporary culture, these norms and institutions are how we organise environmental settings to satisfy existence and value needs.

16.2.3 Environmental Settings: Status and Trends

Since 1945, there have been fundamental changes in people's interactions with environmental settings. These can be understood both through analysis of changing patterns of mobility, work, social behaviour and consumption trends, and through analysis of the processes underpinning these patterns. Together, they chart changing relations between people and environmental settings.

In relation to changes in patterns, the growth of settlements defined as 'urban' means that more people have a set of local environmental settings with urban characteristics. However, at the same time, increased mobility has allowed people to travel longer distances to environmental settings for tourism and recreation purposes. From the late 1980s, with the introduction of cheap air travel, these destinations have expanded across the globe. Data limits the interpretations of changes in domestic gardens and local green/blue spaces. Marked changes did occur, however, in certain countryside settings of the UK during the second half of the 20th Century, especially those in and around large urban areas. The characteristics of other settings have remained more static.

Since 1945, these changes have been accompanied by a large number of protection schemes instigated by UK and European governments aiming to conserve what are seen culturally as highly valued environmental settings.

This section outlines key aspects of the status, trends and drivers of the different environmental settings shown in **Figure 16.3** and draws on the detailed evidence presented in some of the UK NEA habitat and country synthesis chapters. Evidence is uneven, so it is possible to provide a more detailed assessment of some environmental settings than it is for others. This section also discusses the key drivers reflecting our existence needs for being, doing and organising that have collectively interacted with and shaped these environmental settings.

Overall, there is a mixed picture of change in environmental settings, with maintenance and enhancement of character in some settings, and loss or neglect in others. In some, such as playing fields, a decline in quality or extent has recently been arrested.

16.2.3.1 Domestic gardens

In 2005, domestic gardens in England accounted for just over 4% (564,500 hectares (ha)) of total land cover (GLUD 2005). Yet, in 2010, 83% of adults had access to a private/shared garden or yard (Mintel 2010). In the urban areas of England, gardens may account for up to 13% of land (Bibby 2009), and in the 35 major cities of Scotland, the percentage of the land footprint occupied by gardens and allotments varies between 6–50% (Birnie *et al.* 2002; Greenspace Scotland 2009).

A detailed discussion of domestic gardens that considers biodiversity issues can be found in Chapter 10; it notes that a negative trend has been the increase in paving over front gardens which results in less percolation and increased runoff. This trend may not continue due to new legislation, but incomplete evidence suggests that, by 2006, 47% of front gardens were more than three quarters paved in North East England and 31% in Scotland (RHS 2006).

Domestic gardens also provide an important heterogeneous Urban subhabitat in which species variety is likely to be beneficial for pollination (Chapter 10), but they

Figure 16.4 The great tit (*Parus major*) is one of a wide range of bird species attracted to domestic gardens.
Photo by iJammin available under a Creative Commons Attribution license.

can also contain some invasive non-native species which may threaten ecosystem services (Reichard & White 2001). A number of studies in urban and rural areas have suggested domestic gardens can contain more species diversity than comparably sized areas of open country, partly due to changes in planting habits and the way gardeners construct habitat mosaics (Walters 1970; Phillips *et al.* 2008; Smith *et.al.* 2006; **Figure 16.4**).

16.2.3.2 Local, formal green and blue spaces

Evidence suggests that the decline in either the amount or the quality of formal green and blue spaces has been arrested in recent years. Parks and greenspaces have experienced a significant decline in their quality in the last few decades, especially in deprived areas, but as the social and health benefits of parks have been recognised, this has been reversed by a range of policy initiatives (Chapter 10). The decline in numbers of playing fields due to an estimated 10,000 being sold between in the 1980s and 90s (DCMS 2008) has also been arrested in recent years. Certain parks and greenspaces, however, are of exceptionally high quality and, in 2010, there were 1,606 parks on the Register of Parks and Gardens of Special Historic Interest for England—an increase of 115 since 2002. Most of the new parks on the register were added between 2002 and 2004, and, in 2010, 99 parks (6.2%) were identified as being at risk (English Heritage 2010).

Legislation over the last 50 years has also seen the growth of other formal greenspaces where public use and access is encouraged. The 1949 National Parks and Access to the Countryside Act initiated the designation of Local Nature Reserves (LNRs) and, in England, there are now over 1,100 reserves in very varying habitats, covering nearly 35,000 ha. Country Parks were established under the 1968 Countryside Act and there are now just over 400 identified Country Parks that have more than 70 million visitors per year (Natural England 2011a).

The number and extent of allotments have also declined over recent decades. The Second World War stimulated a marked increase in allotment plots, but decline since means there are now only approximately 160,000 plots in England, equating to 10% of the post-war acreage (Campbell & Campbell 2009), and 211 plots in Scotland (SAGS 2007). Nonetheless, many areas in the UK have witnessed an increase in allotment waiting lists, and new allotments have opened in many parts of the UK (Chapter 18).

The first city farm in the UK is generally acknowledged to be the one that opened in Kentish Town in 1972. There are now over 100 city farms that seek to promote improved understanding about agriculture and the environment. CABE (2010) identifies 197 city farms and community gardens, and the Federation of City Farms and Community Gardens (2010) identifies 48 city farms that are open for visits by the public.

There are approximately 18,000–20,000 Church of England burial grounds in England and Wales, which can act as sites encouraging biodiversity. However, Chapter 10 concludes that the lack of a centralised record of such spaces makes it difficult to assess trends in burial ground extent and quality.

16.2.3.3 Local, informal green and blue spaces

The diversity of species and habitats found in some informal spaces in urban areas was referred to by the naturalist Richard Mabey in the 1970s as 'The Unofficial Countryside'; this is in contrast to the 'official' countryside conserved in national parks and other designations (Mabey 2010). Chapter 10 concludes that greenspaces in cities are not systematically monitored and, for some informal spaces, such as green corridors and hedges, very little evidence of status or trends exists. Evidence does exist regarding changes in the quality of street trees and some bluespaces.

Surveys of Urban trees in 1992 and 2004–05 (DoE 1993; DCLG 2008) indicate a regional increase in street tree density in South East and South West England. On a national level, 70% of Urban street trees surveyed in 2004 were in good condition. Despite this, trends are not clear as there was an overall decline in the percentage of good condition trees, but a decrease in the percentage of trees considered poor, dead or dying.

There are many informal blue spaces such as rivers, lakes, canals and the coast (**Figure 16.5**). Chapter 9 indicates that there are 160,000 km of rivers in the UK, and almost 6,000 permanent lakes. In the urban areas of the UK, 0.8% of the land is classified as Urban Freshwater, but there are marked variations between some major cities (GLUD 2005). The chemical and biological quality trends for lakes are not clear, but for rivers the trends are generally positive since 1990, with local variations; for example, rivers in urban areas or locations with intensive agriculture have significantly lower sanitary quality and more elevated nutrients (e.g. nitrate >5 mg/L) than elsewhere (Chapter 9).

Figure 16.5 Canals, such as this one in Warwickshire, England, along with hedges can be classified as informal blue and greenspace. *©David Hughes, 2011 used under license of Shutterstock.com.*

Table 16.3 The importance of greenspace in England in 2007. Source: Defra (2009) © Crown copyright 2009.

Importance of greenspace	Percentage of people (%)
Very important	74
Fairly important	21
Not very important	4
Not at all important	1

Table 16.4 The frequency of greenspace use in England in 2007. Source: Defra (2009) © Crown copyright 2009.

Frequency of greenspace use	Percentage of people (%)
6–7 days a week	10
3–5 days per week	12
1–2 days per week	27
Once a fortnight month	26
Several times a year	16
Less often	10

Table 16.3 and **Table 16.4** indicate that, in England, people regularly use local, formal and informal greenspace and place considerable importance on it as a local environmental setting: three quarters of the population consider it to be a very important part of the local environment, and 50% use it at least once a week.

16.2.3.4 The nearby and wider countryside and seaside

The UK is a predominantly urban society; in 2009, approximately 90% of people lived in areas defined as 'urban', an increase from 79% in 1951 (DCMS & ONS 2009; House of Commons 1999). Yet not much land is categorised as being urban. In England, 10.5% of land (1,378,800 ha) is classified as urban, compared to 4.2% of Wales (86,000 ha), 2.9% (50,600 ha) in Northern Ireland and only 1.9% (148,300 ha) in Scotland. In England, agriculture covers approximately 70% of the land area outside built up areas, with woodland cover and forestry making up 8% (CRC 2008). The Land Cover of Scotland Report f(1988) found that over 50% of the land area of Scotland was covered by semi-natural vegetation, mainly heather moorland and peatland, a further 15% was woodland, and less than 3% was urban or rural development (MLURI 1993). In Wales, 52% of land area was Enclosed Farmland in 2004 and 5% was urban, gardens and amenity (Chapter 20).

There are, therefore, large areas of what, in contemporary culture, is referred to as 'countryside'. For some people this will be located nearby, but for others, it is a more distant, wider countryside. Recent surveys suggest that, in 2009–10, 41.4 million adults resident in England made 2.86 billion visits to the natural environment, 48% (1.38 billion) of which were to places the adults defined as the countryside, 7%(0.21 billion) were to a greenspace in a seaside town or resort, and 4% (0.11 billion) were to other seaside coastlines.

The Countryside Quality Counts (CQC) project provides an indicator of change in the countryside quality of England and is the most comprehensive data on changes in countryside environmental settings, including coastal features. It involves integrating data mainly from 10 different national datasets and producing measurements of landscape change in 159 'landscape character areas' (geographical areas that have distinct landscapes).

The CQC analysis for 1990 to 1998 indicated that about 40% of English landscapes were stable, the changes occurring on a further 37% were not significant to overall landscape character, but 26% were experiencing change that was marked and inconsistent with landscape type. Yorkshire and Humberside, the East, the North West and the North East landscapes stood out as being the most stable. By contrast, marked and inconsistent changes in landscapes were concentrated in 'middle England', especially across central England and around the conurbations of Manchester, Bristol and Birmingham (Defra *et al.* 2008).

The CQC assessment for 1999 to 2003 showed a good level of consistency with the analysis for 1990 to 1998. Landscape character was maintained in 51% of landscapes and enhanced in a further 10%, but there was loss or neglect of character in 20% of landscapes, and new characteristics emerging in 19% (Defra *et al.* 2008).

In coastal locations, the sea will make a significant contribution to the environmental settings in both urban and rural areas. The contribution of the Marine environment to culturally valued environmental settings is only partially understood and is the subject of ongoing research. English Heritage has commissioned pilot and demonstration studies to develop a Historic Seascape Characterisation for England.

Chapter 12 concludes that the UK's seas are increasingly important to personal quality of life, but are currently less well protected than terrestrial environments. For example, under the Habitat's Directive in the UK, out of a total of 621 designated Special Areas of Conservation (SACs), only 81 are for marine locations. The Marine and Coastal Access Act 2009, however, will establish Marine Conservation Zones that are designed to enhance the protection of the Marine ecosystem and its biodiversity.

16.2.3.5 National country environmental settings

The country boundaries of England, Northern Ireland, Scotland and Wales mark out an area in which environmental settings can have distinct meanings to people, often linked to the history and identity of that country (**Figure 16.6**).

In Northern Ireland, a recent survey of tourist attitudes found that the vast majority of visitors agreed that the country had 'unique and distinctive landscapes and coastlines' and that the activities rated most important were sightseeing opportunities of the countryside and coast, along with cities, towns and villages that give Northern Ireland a distinctive sense of place (NITB 2009).

The interactions between history, scenery and landscape have, for a long time, been central to Scotland's distinct brand as a tourism destination, affecting how Scottish people perceive and experience the national landscape (McCrone *et al.* 1995). Species, as well as landscape, can be perceived as having national qualities as has been found in studies of heritage trees in Scotland (Rodger *et al.* 2006).

Chapter 20 highlights that perceptions of landscape for many Welsh people are intimately linked with culture and the Welsh language partly due to the existence of Welsh terms and words that define aspects of biodiversity and marine produce. The chapter also notes that distinctive features of landscapes in parts of Wales have been, and are, under threat from intrusive developments linked to energy, transport, tourism and the planting of conifer trees.

Figure 16.6 National country environmental settings: a) Dorset coast, England. *Photo ©David Hughes 2011 used under license of Shutterstock.com.* **b) The Giant's Causeway, Northern Ireland.** *Photo ©Josemaria Toscan 2011 used under license of Shutterstock.com.* **c) View from Snowdon, Wales.** *Photo by Andrew Michaels available under a Creative Commons Attribution-NonCommercial-NoDerivs license.* **d) Cairngorm National Park, Scotland.** *Photo by Peter Mulligan available under a Creative Commons Attribution license.*

The connections between the national land base as an environmental setting and the satisfaction of human needs are complex and no quantitative data currently exists that allows an accurate assessment of status or trends; however, in Section 16.3, the significance of national landscapes for identity and other value needs is discussed.

16.2.4 The Drivers of Change in Environmental Settings

The varied characteristics and geography of environmental settings means there is a wide range of cultural, social, technological and political drivers. The cultural significance of these settings arises from the role they play in meeting people's value and existence needs. This section, therefore, focuses on the key drivers that have shaped the way people meet their needs through interactions in environmental settings. As indicated in **Figure 16.3**, our being needs, as individuals and social groups, are inseparable from our interacting, having and doing needs. The discussion of key drivers is divided between drivers concerned with institutions, norms and legislation relating to our having needs, and those drivers based on personal and collective actions linked to our doing needs.

16.2.4.1 Drivers and having needs: institutions, rules and norms

A key strand of evidence concerning the drivers of environmental settings is the changing institutions and laws for protecting and conserving the countryside. This has altered the relations between humans and certain settings, often making places available where people can undertake recreation activities or appreciate flora and fauna. There are now 15 National Parks in the UK and they protect environmental settings and landscapes of particular cultural significance. The 10 National Parks in England (listed in **Table 16.5**) cover 9.3% of the country land area, the 3 in Wales (Snowdonia, Pembrokeshire Coast and Brecon Beacons) cover 19.9%, and the 2 in (Cairngorms, Loch Lomond and the Trossachs) cover 7.2% (Natural England 2011b).

National Nature Reserves (NNRs) are designated by Natural England and include a number of important sites for wildlife and geology. There are currently 222 NNRs in England, covering more than 92,000 ha, which amounts to approximately 0.6% of England's land surface. Initially developed to protect sensitive features and to provide 'outdoor laboratories' for research, the focus of NNRs has now widened. Today, one of their main purposes is to provide an environment for the public, schools and specialist audiences to experience.

On the edge of larger cities in England, the environmental settings and landscapes are protected by designated green belt land which, as at 31 March 2009, is estimated to be 1,638,800 ha, 1.2% of the land area of England (DCLG 2009). The green belt covers 156,720 ha in Scotland and 2,540 ha in Wales. Northern Ireland has an extensive green belt which covers 29.9% of the land area (DCLG 2009).

The environmental settings of the countryside are also protected by conservation designations, most notably the national designation of Sites of Special Scientific Interest (SSSIs) and the European designation of SACs. Sites of Special Scientific Interest are those areas designated as containing some of the country's very best wildlife and geographical sites. There are over 4,000 SSSIs in England, covering around 7% of the country's land area. More than 70% of these sites (by area covered) are also designated as SACs, Special Protection Areas (SPAs) or Ramsar sites due to their international importance for wildlife. Many of SSSIs are also designated as either NNRs or LNRs.

Special Areas of Conservation are given protection through the EU's Habitats Directive. There are 231 SACs in England, with a total area of 846,200 ha (all terrestrial SACs in England are also SSSIs). In Scotland, there are 236 SACs totalling 921,230 ha; in Wales, there are 85 SACs with a total area of 590,800 ha; and, in Northern Ireland, there are 54 making up 66,600 ha. Further SACs are designated across the borders between England, Scotland and Wales, and there are 7 SACs in overseas territories and in UK offshore waters. This amounts to a total of 623 SACs covering an area of 2,906,600 ha across the UK.

Environmental settings have also been affected by the growth of the planning system and changes in urban settlement patterns since 1945. New transport technologies, planning regulations and the growth of job opportunities in rural areas and smaller towns mean that larger urban areas and conurbations have become less crowded, while smaller settlements and rural areas, especially in Southern England, have become more crowded. Rural Wales and Scotland, however, still contain relatively few people (Southall 2009). Since the New Towns Act of 1946, 30 New Towns have been built in the UK: 21 in England, 2 in Wales, 2 in Northern Ireland and 5 in Scotland. The local environmental settings in New Towns will be distinct as they were built with relatively high levels of greenspace compared to other urban areas (Ward 1993). In 2001, the New Towns had a combined population of nearly 3 million (just under 5% of the UK total) (Alexander 2009; Census of Population 2001).

The processes affecting the connections between humans and environmental settings are not just shaped by formal institutions and legislation. The groundswell of protests by local communities and specialist interest groups against planning decisions opened the way for massive changes in

Table 16.5 Cumulative National Park area in England.
Source: based on Natural England (2011b).

Year	Total area ('000 hectares)	National Park confirmed
1951 (April)	143.8	Peak District
1951 (May)	373	Lake District
1951 (October)	468.4	Dartmoor
1952 (November)	612	North York Moors
1954 (October)	788.9	Yorkshire Dales
1954 (October)	858.2	Exmoor
1956 (April)	963.1	Northumberland
1989 (April)	993.4	The Broads
2005 (March)	1,050	New Forest
2010 (March)	1,214	South Downs

urban and rural areas which began in the mid-1950s. Over the next 30 years or so, a substantial body of academic research and policy-practice concentrated on trying to better understand why particular environmental settings and landscapes seemed to be so highly valued that people would willingly engage in political protest to protect them. Debates raged about what constituted 'natural' and 'cultural' heritage; about whether it was possible to determine, in any scientifically robust way, a cause-effect relationship between assemblages of physical terrain, vegetation cover, human artefacts and expressions of landscape preferences (Moore-Colyer & Scott 2005); and about whose tastes and views were being favoured when certain landscapes were protected and others were allowed to be damaged or destroyed. Institutional recognition of the right of the public and stakeholders to participate in planning decisions was achieved in the 1968 Town and Country Planning Act; subsequently, this has developed in a variety of ways, but always with the intention of providing opportunities for participants to offer alternative perspectives on whether, and how, developments should take place.

16.2.4.2 Drivers and doing needs: work, mobility, leisure and consumption

The doing needs of people are summarised in **Figure 16.1** and have been shaped by a range of drivers resulting in changes in the way people interact with environmental settings. Workers in agriculture have a particular engagement with ecosystems and environmental settings that has changed markedly due new agricultural technology and the decline of the workforce. In 1951, the 1 million agricultural workers represented 5% of the British workforce, but the 470,000 agricultural workers in 2001 constituted fewer than 2% of the total workforce. In England and Wales, no local authority district has more than 2% of the workforce employed at the production end of the agricultural chain (University of Portsmouth 2009).

The changes in work have been accompanied by changes in personal mobility. **Table 16.6** shows that the number of journeys that people make by private car, bicycle or on foot have grown only slightly, although there has been a modal shift to cars from bicycles and walking. **Table 16.7** illustrates, however, that distance travelled has increased by about 25% for commuting/business travel and by over 30% for other journey types. People are increasingly living in, or close to, urban settlements, but they are also able to travel further to access environmental settings, services and work in their local area. Some of the leisure miles travelled in **Table 16.7** will involve trips to access the natural environment and specific environmental settings.

Leisure and consumption habits have changed markedly in the last 60 years, but the depth and breadth of cultural engagement with nature and wildlife across the UK continues to flourish (Rackham 1986; Mabey 1996; Cocker & Mabey 2005; Macfarlane 2007; Pretty 2007; Marren & Mabey 2010). In the 21st Century, the cultural life of the UK is diverse and dynamic (Wood *et al.* 2006). Yet encounters with the natural world maintain their fascination for very substantial numbers of people, as reflected, for example, in the huge audiences for television wildlife documentaries, the membership of a very wide range of civil society organisations embracing landscape and nature interests, the numbers of people who use urban parks and greenspaces on a daily basis, and the massive popularity of gardening across the UK. Daily contact with nature is still part of being human. Even in the most extreme built environments, such as Canary Wharf in London Docklands, professional workers seek out patches of greenery in which to eat their lunch (Hitchings 2010). Several million people across the UK actively support a wide range of conservation organisations through paying membership fees and donations, and, to a lesser extent, volunteering their time (Lowe & Godyer 1983; Eden *et al.* 2006).

The interactions between people and environmental settings have been affected by the changing relationship between the public and the land—in a paradigmatic sense—since the 1970s. Until then, the relationship was an essentially consumptive one, informed by a rights agenda that invoked the 18th and 19th Century government-mandated enclosures as evidence of landowners assuming powers that were not theirs to assume (Shoard 1987; Harrison 1991; Ravenscroft 1995; 1998). For many people, their connection to the land is still enacted largely through consumption under conventional liberal market regimes (albeit shifting from, say, the supermarket to the farmers' market—what Hegarty (2007) terms 'green-shifting') and is, therefore, intimately tied to established social structures such as class (Ilbery & Maye 2006; London Food Link 2007; Sustain 2008).

The last two to three decades, however, have witnessed some people combining consumption-based connections to the land with increasingly ecologically productive forms of engagement with the land. Production, in this sense, is understood through two related concepts:

Table 16.6 Average number of trips per person per year in Great Britain*. Source: data from Department for Transport; Defra (2009) © Crown copyright 2009.

Period	Walk and Bicycle	Private motor vehicles	Public transport and taxis
1989–1991	349	629	113
2006	265	669	103

* Note: Figures for 1995 onwards are based on weighted data and are not directly comparable with earlier years. The effect of weighting is broadly to uplift the number of trips by approximately 4%. The sample size of the survey tripled in 2002.

Table 16.7 Distance travelled (miles) per person per year (miles) in Great Britain by broad trip purpose*. Source: data from Department for Transport; Defra (2009) © Crown copyright 2009.

Period	Leisure/ other	Commuting and business	Shopping and personal business	Education and children being escorted to education
1985–1986	2,224	1,631	1,256	206
2006	2,853	2,073	1,902	305

* Note: Figures for 1995 onwards are based on weighted data and are not directly comparable with earlier years. The effect of weighting is broadly to uplift the number of trips by approximately 4%. The sample size of the survey tripled in 2002.

- **Environmental and personal security:** managing ecosystems to provide a mix of services that increase environmental and personal security while reducing carbon and water dependence, increasing carbon sequestration, and mitigating and adapting to climate change.
- **Individual responsibility and self-determination:** the development of a deeper and more sustained relationship between people and ecosystems in which people increasingly produce their own lifestyles (through volunteering to undertake conservation work, or engaging in community farming and gardening, for example) as part of a shift towards more secure, ethical and environmentally aware practices. This latter construct is akin to Stebbins' (1992; 1997) concept of 'serious leisure' in which people pursue non-work interests—and take on non-work identities—in ways more conventionally associated with work. Although not referred to explicitly by Stebbins, these 'serious leisure' practices could include voluntary participation in community recycling schemes, local food cooperatives and community transport initiatives. Such lifestyle production could also include what Stebbins (2001) has referred to as 'busy leisure': voluntary activities undertaken primarily by the retired and unemployed to 'keep themselves busy'.

An example of these changes is the process of identity formation through attachment to specific landscapes and ways of living (Marsden *et al.* 2003; CCRCD 2007; Curry 2009). This has led to significant numbers of people relocating to rural areas (Halfacree 1995) and taking up lifestyle and consumption practices which they see as more sustainable. It has also led to a reappraisal of how to improve personal safety and feelings of belonging in different urban and rural environments (BEN 2006; Defra 2008). For increasing numbers of people, however, the commitment extends beyond the market to encompass new approaches to lifestyle based on a creative (re)connection with the land and environment in a positive, productive, way (Halfacree 2001). The ultimate form of engagement in this reconnection with the land is through farming and food security. Halfacree (2001) has found examples of people relocating to rural areas to run smallholdings, while Ravenscroft and Taylor (2009) have identified that increasing numbers of people are getting involved in farming through the membership of cooperatives and various forms of community supported agriculture (Hollins & Hollins 2007; The Countryside Agency 2005; Soil Association 2005; McFadden 2003a; 2003b).

The underlying impulse for this shift in connections to the land has been about establishing new forms of citizenship, often linked to earlier historical social movements (Parker 2002), that support individual responsibility and self-determination within a newly emerging understanding of environmental security. This reflects what Rojek (2001) has termed a new 'life politics' in which people seek 'civil labour' as a primary means of expressing their identity. Faced with the growing threat of environmental insecurity, increasing numbers of people are seeking new avenues to assert their identity and environmental awareness, and, in the process, are supporting new approaches to ecosystem management and governance. Ideas relating to ecosystem services are part of this new consciousness.

16.3 Cultural Goods

16.3.1. Cultural Goods, Needs Satisfaction, Economic Value and Well-being

16.3.1.1 Environmental settings and cultural goods

Cultural goods emerge through the interaction of human needs satisfaction with a range of environmental settings. Frameworks of interpretation and social practices associated with the production and uses of environmental settings are dynamic: meanings, values and behaviours change over time in response to economic, technological, social, political and cultural drivers. "Cultural change is, among other things, the consequence of dropping traditional satisfiers for the purpose of adopting new or different ones" (Max-Neef 1992). What this means for ecosystem cultural goods and benefits is that the capacity of environmental settings to satisfy human needs is contingent, fluid and mutable. Change can be rapid and far-reaching in its implications; for instance, the rise in cheap airline flights since the 1960s has encouraged millions of people to take holidays in distant locations rather than following earlier generations to UK coastal resorts, mountains and moorlands, and historic towns. In this example, existence needs are still being met by 'having' the necessary financial resources, technologies and institutions to support medium and long-haul travel; 'doing' all the things which help to create the 'exotic holiday experience'; and 'being' a particular kind of tourist (types and roles recognisable from social marketing surveys which range from sun-sea-sand hedonists to discerning travellers seeking 'authentic' encounters with their host communities). The environmental settings are no longer mundane, of course, and that is part of the attraction.

One purpose of the UK NEA's economic valuation has been to measure the utility of certain cultural goods and to infer, from analysis of patterns of expenditure, how individual welfare/well-being has been improved. Expressing a preference for a good could also be described as an individual wanting one or more value needs to be satisfied. But what kind of satisfaction does the individual achieve? The rapid development of happiness research in economics and policy-political initiatives to measure levels of happiness among populations reflects statistical evidence that, although people are far better off in material terms than they have ever been, rates of depression, mental illness, obesity and family breakdown are also increasing (Layard 2005). Evidence suggests that contemporary consumption practices are not satisfying our human needs adequately.

16.3.1.2 The nature of need satisfiers

Writing in the context of a highly charged political discussion about the nature of Latin American development, Max-Neef

(1992, p.205) suggested it might be possible to distinguish analytically between five categories of human needs 'satisfiers'. These were:

1. **violators or destroyers** which paradoxically appear to satisfy one need but systematically destroy opportunities for the satisfaction of others;
2. **pseudo-satisfiers** which appear to satisfy, but ultimately disappoint;
3. **inhibiting satisfiers** which satisfy one need (in an often over-determined way) and thereby inhibit the satisfaction of other needs;
4. **singular satisfiers** which satisfy one need only; and
5. **synergistic satisfiers** which, in satisfying one need, are also able to satisfy others.

It is clear that there is a strong ideological position underpinning these categories. When addressing ecosystem cultural goods and benefits, it is important not to slip into the trap of judging in advance what kinds of satisfiers might be life-enhancing or not. There is little empirical evidence upon which to base a judgement. Furthermore, identifying what kind of satisfier particular goods and services might be is difficult given the range of producer and consumer interests involved, although successive government policies to reduce smoking, promote healthy eating, and encourage more pro-environmental behaviours indicate some prioritisation. The goods that people derive from environmental settings act as satisfiers for existence and value needs leading to changes in well- being.

This process of needs satisfaction through cultural goods is immensely complex as ecosystem services and environmental settings provide multiple assemblages of living and non-living features, species, spaces and opportunities for people to satisfy needs by creating a range of activities, experiences, attachments, feelings, emotions and memories which are meaningful (Castree 2005; Natural England 2005).

In addition, taste and sensibilities towards environmental settings, as well as attitudes and values towards environmental issues, vary across demographic, socioeconomic and cultural groups, as demonstrated in recent large-scale quantitative research (Defra 2007b; Natural England 2010). Environment attitudes range from those who are defined as 'green' in outlook to those who are disinterested in the environment, or who face long-term restrictions on changing their environmental behaviors (Defra 2007b).

Max-Neef (1992) described the process of cultural change as the substitution of new for traditional satisfiers. In addressing the question of how, specifically, cultural ecosystem goods have changed, one way is to consider whether traditional satisfiers (objects, activities, ideas) have been replaced and, if so, by what and for what reasons. Take, for example, outdoor play in parks and informal greenspaces which is widely acknowledged to provide multiple benefits for children and youth (Burgess *et al.* 1988; Louv 2005; CABE 2006; Gleave 2009). Outdoor play could reasonably be classified as a 'synergistic satisfier'. However, over the last forty years, increased volumes of traffic, exaggerated fears about 'stranger-danger', loss of opportunities as local authorities have disinvested from parks, and development pressures on brown- and greenfield sites have meant that many children no longer have the freedom to play outdoors which their parents and grandparents enjoyed (Veitch *et al.* 2007; Gleave 2009). Computer games, journeys to school by car and organised activities could be considered as 'inhibiting satisfiers', replacing what has been lost, but could be equally beneficial in other ways.

A slightly different substitution process could be evident in cultural encounters with wildlife. The UK has a long tradition of amateur naturalists watching and recording wildlife, while many millions of people simply enjoy sharing their everyday lives with birds and animals (Macfarlane 2007; Pretty 2007). As the numbers of many species of birds, butterflies and mammals have declined, so have opportunities to satisfy a number of value needs. A cultural substitution is offered by wildlife documentaries on television, which attract audiences in the millions and do satisfy the value need for understanding. But there is a struggle between conservationists and documentary filmmakers about the impact of this substitution on the fate of actual wildlife; the virtual-zoo is an example, some would argue, of a pseudo-satisfier (Davies 1999; Scott 2003).

Individuals vary in terms of how they interact with different environmental settings to satisfy their value needs. Many people consider their garden to be an important environmental setting in which to engage with nature (Bhatti & Church 2001), as well as an important site for consumption (Hitchings 2003; see Robbins & Sharp 2003); others, meanwhile, feel the need to escape to remote 'wilderness' settings to achieve a fulfilling connection to nature (Pretty 2007; Natural England 2009a). Consumer surveys of adults with access to a domestic garden show that 25% consider themselves committed gardeners and knowledgeable about nature, whereas 15% are not interested in their garden and do little gardening (Mintel 2004). Max-Neef (1992) observes, however, that satisfiers can change quite quickly and unpredictably. The role of some environmental settings in meeting needs has changed rapidly in recent years. For example, few would have predicted the changing use of the domestic garden for food growing over the last 25 years. Only 20% of those with access to a garden grew vegetables in 1996, compared with 35% ten years earlier (Mintel 1999); nevertheless, there has been a recent resurgence in people using their gardens to grow food (Mintel 2010).

Given this range of meanings, values, attitudes and behaviours, along with the diverse environmental settings found in the UK, it is not possible to argue that some environmental settings will be somehow 'better satisfiers' than others in terms of the cultural goods they generate (Edensor 2000). Wild mountains in the wider countryside may provide the spaces mountaineers or wilderness-lovers need to pursue their cultural activities, but urban trees, gardens and local parks also play important roles in providing contact with nature and the living world for those who cannot, or do not wish to, travel to more remote locations (Harrison *et al.* 1987; Burgess *et al.* 1988; Dwyer *et al.* 1991; Crouch & Lubbren 2003).

16.3.1.3 Cultural goods, monetary and non-monetary values, and well-being

Given the complex ways cultural goods satisfy needs and how this can change over time, the rest of this chapter discusses cultural goods from a number of perspectives using a range of evidence. Some of the evidence is derived from existing studies on the characteristics of cultural goods. Other new evidence, especially on the economic value of cultural goods, has been generated especially for the UK NEA, the characteristics of which are discussed in Chapter 22.

A wide range of cultural goods emerge from the interactions between environmental settings and the processes of satisfying existence and value needs. Not all cultural goods are considered in this chapter, but the goods discussed are those for which there are quantitative and/or qualitative evidence to allow an assessment of their characteristics and to examine how the goods interact with environmental settings as the cultural ecosystem service. These goods have also been highlighted in previous studies and ecosystem assessments as being significant for human well-being and valued by different groups of people (MA 2005a; MA 2005c; Natural England 2009a). The following five main groups of goods are considered:

- Leisure, recreation and tourism goods
- Health goods
- Heritage goods
- Education and ecological knowledge goods
- Religious and spiritual goods

Each of these goods is the subject of a separate section which consider issues such as the nature of the good, how it satisfies need, changes in the good over time, how the good is shaped by the interactions between humans and environmental settings, and the monetary and non-monetary value of the good. Given the different characteristics of these goods, these issues are explored using economic/monetary, non-monetary and subjective well-being analysis involving both quantitative and qualitative evidence.

The economic valuation reported here, based on a standard welfare economics conceptual approach, aims to value, in monetary terms, the welfare benefits accruing from a selected number of cultural goods for which data are available. According to the total economic value framework, values can occur from use of a resource (either directly through personal contact or via books, film or other media), potential future use (i.e. option values), or be unrelated to any kind of use (i.e. non-use values, relating to altruistic, bequest or existence motivations). Most of the economic assessment reported here focuses on use values (or potential use), with non-use being considered by a study of environmental bequests.

Several monetary values are presented using new economic evidence generated specifically for the UK NEA; a far more detailed discussion of the approach used in the UK NEA for the economic valuation of ecosystem services can be found Chapter 22. The rest of this chapter summarises some of the key findings of that work. The existence of significant data gaps, however, means that monetary values have not been estimated for all the goods considered. For example, there is currently insufficient quantitative information to make a reliable estimate of the monetary value of some of the spiritual and religious goods associated with environmental settings.

The non-monetary evidence presented is both qualitative and quantitative and is mostly drawn from previous studies. Some new quantitative measures relating to self-reported health benefits are presented, which were generated as part of the economic valuation conducted for the UK NEA (Chapter 22; Mourato *et al.* 2010). Further quantitative non-monetary evidence is also drawn from the subjective well-being (or life satisfaction) analysis undertaken by Mourato and other researchers specifically for the UK NEA, based on original data which measures the impact of environmental settings and related goods on well-being (Chapter 22; Mourato & MacKerron *et al.* 2010).

The distinction made in this chapter between monetary and non-monetary evidence is designed to avoid some of the conceptual difficulties raised by the discussion of cultural services in the MA (2005a) and other sub-global ecosystem assessments which identify so-called 'non-material benefits' arising from cultural services such as inspiration, aesthetic experiences, recreation and tourism. Difficulties arise, in part, because recreation and tourism linked to environmental settings can also be conceptualised as a material benefit with a market value. For example, recreational anglers who pay to catch fish clearly obtain a material benefit through a market mechanism, with an instrumental value to them as consumers. Furthermore, 'non-material' cultural goods must not be viewed as not having monetary value as they can be reflected in actual uses that can be measured in quantitative and monetary terms. For example, people may pay a premium to buy a house in a remote coastal location because of the sense of calm and escape, but those feelings can, in part, be captured in house price differentials. By discussing monetary and non-monetary values in a manner consistent with economic terminology, this chapter aims to avoid some of the difficulties that can arise with the general use of the term 'non-material benefit'.

This does not mean, however, that some of the more 'subjective' cultural goods that are usually described as 'non-material', such as inspiration and aesthetic experiences, are not considered in the discussion of cultural goods in this chapter. Previous research highlights their significance. Openness and remoteness in landscapes have been linked to feeling calm, relaxed and a sense of escape (Pretty 2007; Natural England 2009a). Research into an evolutionary, cross-cultural basis for our aesthetic preferences has shown the significance of particular kinds of natural landscapes for feelings of safety, and how natural beauty functions to produce emotions linked to inspiration, harmony, peace and security (Appleton 1975; Kellert 1993; Grinde &Patil 2009). These types of benefit involve very complex and not fully understood human cognitive and pre-cognitive processes linked to all the different cultural goods discussed in this chapter. Therefore, rather than discussing benefits such as inspiration or sense of security separately, they are considered in the discussions of the different cultural goods.

A related important point to note is that the benefits which arise from the various types of goods considered in

this chapter are often bundled together, so it may not be possible to identify them separately (Chapter 22; Mourato *et al.* 2010). For example, a leisure visit may result in health, heritage and spiritual benefits. To address this issue, the economic valuation for the UK NEA calculated the overall 'amenity value' of environmental settings. Amenity value refers to the increase in welfare associated with living in, or within close proximity to, certain settings. This amenity value will be affected by a range of cultural goods that individuals experience from their interaction with particular settings and provides an aggregate measure of a number of benefits that are bundled together. Section 16.3.7 reports on measures of the aggregate contribution of cultural services and goods to human well-being by drawing on some of the key findings of new research undertaken for the UK NEA involving amenity value analysis, as well as the subjective well-being analysis relating to cultural goods and environmental settings in the UK NEA (Chapter 22).

A group of cultural goods that is not discussed fully in this chapter arise from the role played in ecosystems by wild species. The Conceptual Framework for the UK NEA (Chapter 2) notes that wild species as part of biodiversity occupy a complex position within ecosystem thinking. Wild species are both a service and a good (Bharucha & Pretty 2010). Wild species diversity is also identified in Chapter 2 as contributing to both provisioning and cultural services. The genetic diversity of wild species is involved in provisioning services and affects the characteristics of certain goods linked to provisioning services. For example, the diversity of wild crop relatives can contribute to food as a provisioning good by influencing strains of farm crops. Similarly, the characteristics of environmental settings that constitute cultural services can be affected by the absence or presence of wild species (Hinchcliffe *et al.* 2005). Consequently, human interactions with wild animals and plants can generate cultural goods partly because people value environmental settings where certain types of animals or plants are present. The complex nature of wild species and biodiversity in general means that they are considered in detail in other chapters of the UK NEA (Chapter 3 on biodiversity, Chapter 15 on provisioning services and the country synthesis chapters 17–20). As a result, the cultural goods directly linked to wild species are not examined in detail in this chapter, apart from a short discussion on the Royal Society for the Protection of Birds (RSPB)'s Big School Birdwatch in section 16.3.5 on education and ecological knowledge goods.

16.3.2 Leisure, Recreation and Tourism Goods

16.3.2.1 Definitions of leisure, recreation and tourism

There have been many attempts to identify what constitutes recreation and leisure. It is generally accepted that 'leisure' is a combination of time, activity and state of mind (Ravenscroft 1985), with recreation, tourism and sport comprising parts of its activity component. Broadhurst (2001, p.4) suggests that 'recreation' describes what we do with, or at, our 'leisure', while tourism encompasses the travel and accommodation required to gain access to some recreation and leisure activities. Following Mieczkowski (1981), we can conceptualise the relationship between leisure, recreation, tourism and outdoor activities as shown in **Figure 16.7**.

This is consistent with Max-Neef (1992) in addressing the four existence human needs:

- **being** at leisure;
- **having** physical and legal access to a range of habitats (acknowledging that choices are often constrained (Green 1985; Curry & Ravenscroft 2001));
- **doing** recreation;
- and **interacting** with others through recreation and leisure in natural environments.

16.3.2.2 The role of environmental settings

Natural environments have been one of the most enduringly popular locations for recreation and leisure (Curry 1994), and all UK NEA Broad Habitats offer scope for addressing the existence needs of having and doing. Opportunities include:

- relatively generic opportunities to walk, run or cycle;
- specific opportunities only available in a few habitats (e.g. surfing on the sea);
- and unique settings that offer opportunities to achieve specific benefits related, for example, to seeing particular fauna and flora, or being able to climb particular crags (**Figure 16.8**).

Table 16.8 identifies the habitats and/or habitat features, the opportunities, and the potential benefits that can be derived from these services.

As **Table 16.8** indicates, those habitats that provide unique cultural services tend to be physically remote from urban populations and in places that are not suited to extensive development. This means that there are significant constraints in gaining access to them (Curry 1994). These constraints help limit human impacts, although it is recognised that additional management is often required to prevent degradation of the sites (Keirle 2002). Specific cultural services can be provided by a range of habitats,

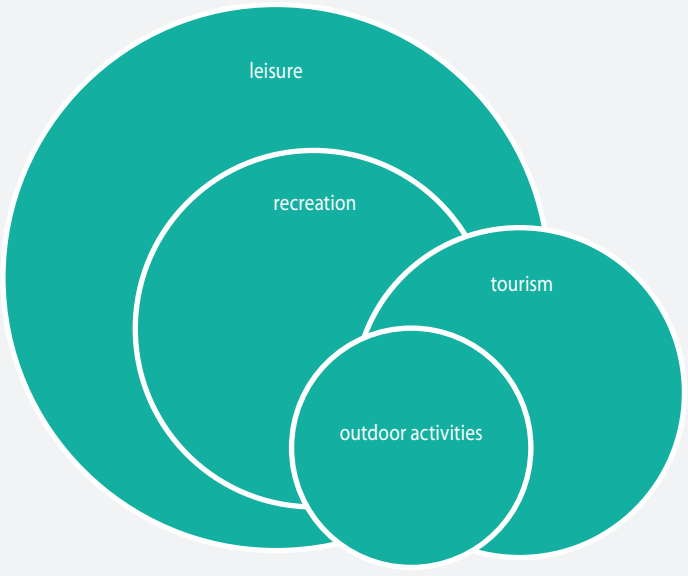

Figure 16.7 The relationship between leisure, recreation, tourism and outdoor activities.

Figure 16.8 Climbers on the Cow & Calf rocks near Ilkley, West Yorkshire, England. *Photo by Jim Moran available under a Creative Commons Attribution-NonCommercial-NoDerivs license.*

usually under particular atmospheric conditions such as snow, rain or wind. While some of these sites will be remote, others will be local and will provide a broad range of services that are meaningful to local people. Typical of this would be an urban park that might be used for snow sports at certain times of the year. Finally, many habitats, whether managed for recreation or not, offer opportunities for a broad range of cultural services. These environments include parks, tracks, paths, roads, verges and other elements of a 'green network' (Natural England 2009b).

16.3.2.3 Changing access to environmental settings

Access to ecosystem cultural services for recreation is highly differentiated throughout the UK (Curry 1994). A number of measures have been implemented to address this. These include Natural England's Accessible Natural Greenspace Standard (ANGSt), which provides a set of benchmarks for ensuring access to places near to where people live (Harrison *et al.* 1995; Handley *et al.* 2003). These standards recommend that people living in towns and cities should have:

- an accessible natural greenspace of at least 2 ha in size, no more than 300 m (5 minutes' walk) from home;
- at least one accessible 20 ha site within 2 kilometres of home;
- one accessible 100 ha site within 5 kilometres of home;
- one accessible 500 ha site within 10 kilometres of home;
- and statutory LNRs at a minimum level of 1 ha per thousand population.

It is recognised that, in some areas, this will be hard to achieve in the short-term (LUC2008), but Natural England argues that it should be a long-term aim for all local authorities within their Greenspace Strategies (Barker 1997; CABE 2006). Currently, in England, only 13% of homes in urban areas are within 300 m of a natural greenspace of at least 2 ha in size (CABE 2010), but this figure varies from 7% in Yorkshire and Humberside to 18% in the West Midlands.

Table 16.8 The opportunities and potential benefits of different habitats for recreation and tourism.

Habitat/habitat characteristic	Opportunities	Potential benefits
Unique opportunities—landscapes		
Mountains, crags and hills	Vertical and near vertical inclines	Climbing, mountaineering, rock scrambling, long range views and picnicking
Sea	Wind and waves	Surfing, kite surfing
Upland streams	Fast flowing shallow waters	Game angling, white water canoeing and rafting
Limestone rocks	Caves and fissures	Caving and potholing
Unique opportunities—landscapes/local places		
Alpine landscapes	Snow cover	Snow sports
Woodlands	Tree cover with tracks, rides and clearings	Walking, cycling, horse riding, many types of informal recreation
Estuarine environments	Sheltered waters	Moorings, marinas
Lakes	Wind	Sail sports
Beaches	Sand and sea	Outdoor swimming and beach activities
Generic opportunities—local places		
Parks and open spaces	Publicly accessible greenspaces	Walking, dog walking, cycling, running, picnicking and informal recreational activities

Recent legislative changes have contributed to improving access to some landscapes, with the Countryside and Rights of Way Act 2000 providing access to the uplands, downs and commons, and the Marine and Coastal Access Act 2009 promising to do the same for access to the coast. The 2008–09 audit of coastal access in England revealed that, of the 4,422 km (2,748 miles) of coast audited, 66% (2,940 km, 1,827 miles) had a legally secure and satisfactory path (Natural England 2009c). However, certain parts of England—in particular, some which are dominated by intensive lowland farming such as Lincolnshire—continue to offer limited accessibility to outdoor environments compared to other parts of the UK.

16.3.2.4 Environmental settings and trends in leisure, recreation and tourism

Research for Natural England (2009a) has identified that ecosystem services for recreation and leisure are often linked to settings where there is a lot to do, such as the local park or stretches of coastline. They are also associated with settings that have easy access, places that have rocks, crags, or things to climb, as well as lanes, roads and pathways. Woodlands are valued for the multiple benefits they provide including opportunities for walking and cycling.

In 2005, the last time that a national leisure visits survey was conducted for England, approximately two thirds of the English adult population visited natural habitats. Two thirds of their visits were to inland towns and/or cities, with the remaining one third, being to countryside, coast and woodlands (Natural England 2005). The duration of the visits was split equally between more than and less than three hours, with nearly 60% using a car and 25% walking to the site. This suggests a fairly even spread of visits between local 'doorstep' sites and those located further from home. The main activities undertaken during leisure visits were eating and drinking, walking, visiting friends and relatives, and shopping. Natural England (2010), the Department for Environment, Food and Rural Affairs and the Forestry Commission recently introduced a new survey, *Monitoring Engagement with the Natural Environment (MENE)*, to provide baseline and trend data on how people use the natural environment in England. In the period March 2009 to February 2010, just over half the adult population normally visited the natural environment once a week, with a further 8% visiting on occasion. This equates to approximately 2.86 billion leisure visits for the 12-month period, which is in the order of 7% more than in 2005 (care has to be taken with this comparison since there are differences in scope and methodology between the 2005 and 2010 surveys). In common with previous surveys, the Monitoring Engagement with the Natural Environment survey found that visits to the natural environment are highest among people aged 45 to 64, people in employment, and people in the ABC1 socioeconomic categories. Interestingly, the proportion of visits to natural environments that take place in urban areas has fallen since 2005, with more visits to the countryside instead. This is consistent with Sport England's (2009) findings which revealed that there is substantial and growing participation in a number of outdoor sports that largely take place away from urban areas (**Table 16.9**).

Scottish Natural Heritage's Scottish Recreation Survey 2007 (TNS 2009) found that just under half of the adult population in Scotland had made at least one visit per week to the outdoors for leisure and recreation purposes in 2007—the same level as was recorded during 2006. Four fifths (80%) of the adult population claimed to have made at least one trip to the outdoors in the previous 12 months, which equates to around 340 million visits to the outdoors in Scotland during 2007 and a 3% increase on the estimate for 2006. One key trend observed in Scotland has been the year-on-year increase in the number of shorter duration visits made closer to home since 2004, with an average distance travelled of 18 km in 2007 (down from 26 km in 2004). Also, the proportion of visits taken on foot has increased from 50% in 2004 to 61% in 2007, while the proportion of visits taken by car has fallen from 43% to 31% over the same period of time.

In contrast, the 2008 Welsh Outdoor Recreation survey found that more than 90% of the Welsh population participate in some form of outdoor recreation, although less than 30% of these are classed as regular participants

Table 16.9 Sports participation: at least once a week for 30 minutes at moderate intensity. Note: The data is for moderate intensity activity resulting in participation levels for some activities (e.g. angling) appearing well below the overall participation level. Data is not included for walking due to the low intensity level of physical activity. Source: Sport England (2009).

Sport	Participation 2007–2008	Participation 2008–2009	Percentage (%) of adults
Angling	No data	56,700	0.14
Canoeing/Kayaking	43,500	62,900	0.15
Cycling	1,767,100	1,880,000	4.5
Equestrian	341,700	341,500	0.82
Golf	948,300	897,600	2.15
Mountaineering	86,100	83,900	0.2
Rowing	54,900	49,000	0.12
Sailing	89,900	83,000	0.2
Snow sports	120,600	106,800	0.26
Swimming (indoor and outdoor)	3,244,300	3,162,400	7.57

(at least five times per week) (Forestry Commission and Countryside Council for Wales 2008). Parks, woodlands and hilly areas are the most popular sites, with walking (often with dogs) being the most popular activity. The Welsh survey is due to be repeated in 2011. There are no comparable data for Northern Ireland, although the Forest Service reported that, in 2002–03, approximately 2 million visits were made to Forest Service woodlands, and over 400,000 visits were made to recreation areas in which a charge was made. Tourism data for Northern Ireland suggest that there has been a long-term increase in visits to natural environments, although there has been a recent (2008–09) downturn in visits. In contrast, visits to natural environments by local people are thought to be increasing.

16.3.2.5 The monetary value of environmental settings for leisure, recreation and tourism

Economic studies have highlighted the benefits and monetary value that arise from being able to access environmental settings. For example, Cheshire and Sheppard (2002) found that the economic benefits associated with accessible open space, such as parks, considerably exceeded those from more inaccessible open space such as green belt and farmland.

Hedonic pricing studies have shown that many people recognise the value of environmental settings by choosing to live near them, including those locations designated for leisure and recreational use such as National Parks. This means that the value of marginal changes in proximity to these environmental amenities is reflected in house and land prices. Of course, house prices will reflect a range of benefits linked to National Parks, such as health and aesthetic beauty, as well as leisure and tourism benefits. The economic valuation undertaken for the UK NEA (Chapter 22; Mourato *et al.* 2010) looked at more than 1 million housing transactions taking place between 1996 and 2008 and found that, proximity to National Parks sites was related to an increase in house prices: for each 1 km increase in distance from the nearest National Park house prices decreased by 0.24% or £460 at 2008 prices. In addition, location within a National Park can add 5% to house prices compared to the national average house prices. While being broadly transferable to the UK as a whole, the results exhibit significant regional variations, with people in the Midlands, for example, willing to pay more to live in a National Park than people living elsewhere (Chapter 22; Mourato *et al.* 2010).

In work commissioned for the UK NEA on the recreation value of UK habitats (Sen *et al.* 2010) using Site Prediction Models, Trip Generation Functions and Meta-Analysis, broadly similar relationships were revealed. They indicated that, for most habitats, visit numbers are highly influenced by travel time and associated costs, with the availability of substitute sites reducing people's value estimates of individual sites. This is less the case with highly prized landscapes (such as south-west England, the north Norfolk coast and the English Lake District), where visitors are prepared to pay high travel and associated costs to visit them. Using this methodology, Sen *et al.* (2010) estimated that, in 2000, 3.2 billion people per annum visited UK habitats, generating a value of just over £10 billion (the estimates for England were 2.9 billion visits generating a value of £8.8 billion). This is somewhat lower than the recent estimate of £17 billion estimated for UK seaside tourism (Beaumont *et al.* 2010), although it is more consistent with other estimates (ONS 2005, 2006; Tinch *et al.* 2010). As Chapter 22 observes, given the size of expenditures involved and the likelihood of ecosystem services making a significant contribution to such values, there is a need for further investigation to determine more robust value estimates.

16.3.2.6 Changing satisfiers

The benefits of regular engagement with the natural environment are synergistic satisfiers. As the trend data suggests, more people have been enjoying these satisfiers in recent years, particularly as they visit the countryside and participate in informal recreation activities such as walking. These synergistic satisfiers are able to address all four existence human needs (being, having, doing and interacting). In addition, outdoor recreation and leisure are able to address a number of the axiological needs identified by Max-Neef (1992), including leisure, identity, participation, creation and freedom. Some aspects of outdoor recreation and leisure may also facilitate or promote understanding of the natural environment.

Alongside the growth in synergistic satisfiers has been a similar growth in pseudo-satisfiers such as wildlife and nature programmes on television and the rise of 'artificial' recreation experiences like indoor climbing walls and virtual reality simulators. Wildlife programmes have become popular across a broad spectrum of the viewing population and watching these programmes can appear to satisfy both existence and value needs, especially those related to leisure (being) and understanding. For some people they are synergistic to actual visits to the countryside (for example, the 'Springwatch effect' which has generated new tourism in Scotland; Scottish Government Social Research (2010)), but for others they may fail to deliver sustained satisfaction because the world they offer cannot be accessed by all. In the case of computer games and 'theme' parks, the experiences threaten to deny authentic engagement with the natural environment, rendering them inhibiting satisfiers. Equally, intense engagement in specific recreation activities, such as angling or canoeing, can become singular satisfiers, where just one need is satisfied (often the doing need) at the expense of all the others. Indeed, in the case of angling and canoeing, recent evidence from the National Assembly for Wales (NAW 2010) indicates that entrenched singular satisfiers can undermine being, having and interacting needs in the pursuit of a singular participatory goal.

In conclusion, the recent growth in engagement with natural environments is not necessarily an indication of the increasing value of ecosystem cultural services in economic or broader social or environmental terms. Indeed, increasing participation in individual sports activities could be associated with the increasing dominance of singular satisfiers, while growing reliance on television programmes, as well as actual experience, may promote pseudo- rather than synergistic satisfaction, or may become inhibiting satisfiers.

16.3.3 Health Goods

16.3.3.1 Environmental settings, physical activity and health

Environmental settings can contribute to a wide range of health goods, often by providing places where people can undertake physical activity and interact with nature. This physical activity can synergistically meet a range of our existence and value needs discussed in the conceptual approach in **Table 16.1**. It is particularly important for meeting our being and subsistence needs for good physical and mental health. By undertaking physical activity we can also meet our value needs to participate in activities, as well as meeting our having and doing existence needs by accessing open spaces designed for a range of formal and informal physical activity.

Within the last generation, physical activity levels have dropped to less than 40% of men and 28% of women in England (Craig & Mindell 2008) meeting UK Government guidelines to perform 30 minutes of exercise on most days. In the UK, energy expenditure per person declined by 800 kcal per day between 1945 and 1995 (Brownson *et al.* 2005; Davis *et al.* 2007).

Obesity has risen from 3–6% of adult populations to more than 25% in many industrialised countries (Foresight 2007); 23% of men and 26% of women lead sedentary lives (NICE 2009). Physical inactivity is known to track from childhood. It is associated with increased risk of obesity, is a key risk factor in many chronic diseases of later life, and leads to a reduced life expectancy (Dobbins *et al.* 2009). Physical inactivity results in 1.9 million deaths worldwide annually (WHO 2004)—roughly one in 25 of all deaths. The costs of inactivity in the UK are £8.3 billion per year, equating to £5 million for each Primary Care Trust (NICE 2009). It is estimated that a 1% reduction in inactivity would save 1,063 lives per year, reduce morbidity by 15,000 cases and save £1.4 billion. The monetary benefits (not including the mental health benefits) amount to £2,423 per additionally active person per year (NICE 2008).

Physical activity improves both physical and mental health (Laumann *et al.* 2003; DH 2004; Foresight 2007; Sandercock *et al.* 2010). Regular physical activity improves the survival of the elderly and their quality of life (Lim & Taylor 2004). It is now well-established that exposure to natural places, whether a view of nature from a window, being within natural places or exercising in these environments, can lead to positive mental health outcomes (Moore 1982; Ulrich 1984; Hartig *et al.* 2003; Pretty *et al.* 2005, 2007; Barton *et al.* 2009). Green space is important for mental well-being and levels of interaction/engagement with it have been linked with longevity and decreased risk of mental ill-health in Japan, Scandinavia and The Netherlands (Takano *et al.* 2002; de Vries *et al.* 2003; Grahn & Stigsdotter 2003). In addition, the importance of vitamin D—obtained from being outdoors in sunshine—has recently been identified as playing a role in long-term health (**Box 16.2**).

Urban noise, especially from transport, can affect well-being (Stansfield *et al.* 2000). Some environmental settings, particularly the countryside, offer less noisy, more tranquil locations. Traffic generated noise is one of the main sources of noise pollution, with excessive noise from traffic and railways in urban areas commonly resulting in stress (den Boer & Schroten 2007; Ozer *et al.* 2008). Ecosystems containing trees and shrub vegetation have been demonstrated to be particularly effective at providing barriers to noise in urban settings (Frumkin *et al.* 2004; Ozer *et al.* 2008; Fitter *et al.* 2010; Ernstson *et al.* 2010). Recent research suggests that certain countryside landscapes offer experiences that provide people with a sense of calm and tranquillity (Natural England 2009a). The Campaign to Protect Rural England have undertaken a series of studies to map changes in tranquillity and argue that the proportion of England defined as tranquil is declining (tranquillity mapping is explored further in Chapter 17).

'Green exercise', defined as physical activity taking place in the presence of nature, has been shown to lead to positive health outcomes (Ulrich *et al.* 1991; Hartig *et al.* 1991; van den Berg 2003; Morita *et al.* 2006; Hine *et al.* 2007; Mind 2007; Pretty *et al.* 2007; Barton & Pretty 2010), as well as promoting ecological knowledge (Burgess 1995; Pilgrim *et al.* 2007, 2008; Pretty 2007), fostering social bonds (Burgess *et al.* 1988; Kawachi *et al.* 1997; Takano *et al.* 2002; Pretty 2007) and influencing behavioural choices (Kuo *et al.* 1998; Maas *et al.* 2006; Mitchell & Popham 2008; Peacock *et al.* 2008).

There is still a need for further research into the benefits of green exercise (Barton & Pretty 2010). Increases in physical activity produce physical and mental health benefits and the outcomes vary among subgroups of the population. A systematic review of previous studies has shown that the extent to which outdoor environments produce a greater effect on physical and mental well-being than indoor environments is still uncertain (Thompson Coon 2011); however, recent research shows the additional benefits of outdoor over indoor activity for clinical populations suffering mental ill-health (Barton *et al.* 2011).

16.3.3.2 Health, nature and urban greening

A substantial body of research on the associations between nature and health has been produced from the UK, US,

Box 16.2 Sunlight and vitamin D. Source: Holick (2004); Kampman *et al.* (2007).

Humans depend on exposure to the sun for the synthesis of adequate amounts of vitamin D. Ultraviolet B light is absorbed by dehydrocholesterol in the skin; this is transformed and further converted to vitamin D3 which is metabolised by the liver to its biologically active form. Lack of vitamin D has long been recognised as causing rickets in children, as well as exacerbating osteoporosis and even osteomalacia in adults. More recently, it has been recognised that vitamin D deficiency is associated with increased risks of some cancers, cardiovascular disease, multiple sclerosis, rheumatoid arthritis and type I diabetes, with possible links to type II diabetes and schizophrenia (Holick 2004). Furthermore, the incidence of multiple sclerosis has been shown to be affected by latitude, with people at lower latitudes having an increased risk of developing it due to reduced sunlight exposure, although Norway appears to be an exception possibly as a result of increased summer outdoor activities in childhood and diet both of which have been shown to protect against MS. It is conceivable that concerns over skin cancers combined with less time spent in outdoor environmental settings is reducing exposure to sunlight and, therefore, contributing to the incidence of some of these chronic diseases. However, sensible exposure to the sun for five to ten minutes three times per week is likely to be highly beneficial.

Scandinavia and Japan. This research addresses a wide range of themes including:

1. **Levels of engagement with nature:** the view from the window (Moore 1982; Ulrich 1984; Kaplan 1995; Kaplan 2001; Parsons *et al.* 1998; Diette *et al.* 2003; Pretty *et al.* 2005); the role of nearby nature and urban greenspace (Harrison *et al.* 1987; Burgess *et al.* 1988; Takano *et al.* 2002; de Vries *et al.* 2003; Grahn & Stigsdotter 2003; Tabbush & O'Brien 2003); the outcomes from countryside activities (Butryn & Furst 2003; Hartig *et al.* 2003; Morita *et al.* 2006; Yamaguchi *et al.* 2006; Pretty *et al.* 2007); and the outcomes from wilderness programmes (Davis-Berman & Berman 1989; Cason & Gillis 1993; Russell 2003).
2. **Types of engagement with a wide range of activities** including walking, gardening, fishing, hunting (Samson & Pretty 2005; Pretty 2007), and different types of settings from the urban built environment to countryside and wilderness.
3. **Mental health outcomes** using a range of measures of self-esteem, mood and stress (Ulrich *et al.* 1991; Hartig *et al.* 1991, 2003; van den Berg 2003; Pretty *et al.* 2005, 2007; Peacock *et al.* 2007).
4. **Physical health outcomes** using heart rate, blood pressure, Body Mass Index, waist measures (waist circumference and waist to hip ratios) and physical activity level (Laumann *et al.* 2003; Hartig *et al.* 2003; Pretty *et al.* 2005; Wells *et al.* 2007; Sandercock *et al.* 2010).
5. **Epidemiological studies** showing associations between home proximity to greenspace and health (Maas *et al.* 2006; Mitchell & Popham 2008), and associations between the presence of nature on urban estates and reduced recorded crime (Kuo *et al.* 1998; Kuo & Sullivan 2001a, 2001b).

Large-scale quantitative studies have shown that the prevalence of psychiatric morbidity is greater in urban areas and less common in rural domains, after adjusting for confounding variables (Galea *et al.* 2005; Lewis & Booth 1994; White & Heerwagen 1998). Lewis & Booth (1994) found that the prevalence of psychiatric morbidity among urban residents (33.7%) was higher than their rural counterparts (24.8%), after controlling for socioeconomic and other extraneous variables. Income-related inequalities in health also depend on exposure to greenspace. People who live in greener areas reported lower levels of health inequality relating to income deprivation for both all-cause mortality and mortality from circulatory diseases (Mitchell & Popham 2008). The presence of urban nature is a well-documented example of a synergic satisfier, meeting a substantial number of human needs at the same time. Empirical evidence demonstrates that green urban environmental settings:

- improve human health and well-being (Kaplan & Kaplan 1989; Frumkin 2001; Irvine & Warber 2002; HCN 2004);
- facilitate the taking of exercise (Giles-Corti & Donovan 2002; Giles-Corti *et al.* 2005);
- improve behaviour and cognitive functioning (Wells 2000; Taylor *et al.* 2001);
- provide an outdoor classroom (Kaplan & Kaplan 1989; Kahn & Kellert 2002);
- facilitate social networking (Kuo *et al.* 1998; Ward-Thompson *et al.* 2006; Hitchings 2010);
- reduce levels of crime, aggression and violence (Kuo & Sullivan 2001a; 2001b);
- and improve the aesthetic value of urban environments (Sheets & Manzer 1991; Frumkin *et al.* 2004; Frumkin 2005).

[The terms 'health' and 'human well being' are often used interchangeably, but the term 'health' usually incorporates physical health, mental or emotional health, social health, spiritual health, lifestyle and functionality.]

A direct link between the amount of accessible local greenspace and health has also been evidenced, using large-scale epidemiological studies in other countries (de Vries *et al.* 2003; Grahn & Stigsdotter 2003; Takano *et al.* 2002). Tree-lined streets, parks and other environmental settings play a key role in longevity and decreased risk of mental ill-health (Takano *et al.* 2002). Self-reported health data from over 10,000 Dutch respondents reported that people living in greener neighbourhoods enjoyed better general health (de Vries *et al.* 2003). The type of environmental setting did not seem to alter effectiveness, however. The total amount of greenspace in the living environment seemed to be the most relevant predictor. This crude measure does not acknowledge that the exposure to greenspace may vary considerably between residents of the same neighbourhood and that durations of exposure may also differ (Harrison *et al.* 1995). Empirical research by Sugiyama *et al.* (2008) demonstrates that perceived neighbourhood greenness is also strongly associated with better mental and physical health. Respondents who perceive their neighbourhood as highly green are 1.37 and 1.60 times more likely to have better physical and mental health respectively, in comparison with those who perceived it as low in greenery. The degree of species richness in urban greenspaces has also been positively associated with the psychological well-being of visitors (Fuller *et al.* 2007), emphasising the importance of locally managed biodiversity for sense of place and reflection.

In terms of overall health, studies of local park users in the USA reported fewer visits to a physician for purposes other than routine check-ups in comparison with non-park users. This difference was apparent even when controlling for the effects of age, income, education level, health status and other potential confounding variables (Godbey *et al.* 1998). Frequently active park users also scored better on self-reported health indices and perceived their health states to be better than passive users and non-park users (Godbey *et al.* 1998). Thus, people engaging in recreation in local parks seem to be in disproportionately better health than non-users and are also less likely to be obese than the general population (Ho *et al.* 2003). Godbey and Blazey (1983) also investigated the leisure behaviour of adults participating in light to moderate aerobic activity in urban parks and found that over half reported better moods after visiting the park. In addition, More and Payne (1978) also in the USA found that participants' negative moods improved and that park users reported lower levels of anxiety and depression. Often visitors started their recreation experiences in a better mood and their

positive moods remained on leaving, implying that outdoor recreation and park use might enhance positive moods, reduce negative ones and alleviate stress. Similar findings are reported from Sweden (Grahn & Stigsdotter 2003).

Research on associations between physical access to greenspace, frequency of use, physical activity and health (including obesity) which draws together Geographical Information System (GIS) data, including the Index of Multiple Deprivation, with quantitative social surveys is developing in the UK (Hillsdon *et al.* 2006; Jones *et al.* 2009; Coombes *et al.* 2010). The research, conducted in Bristol, provides robust statistical evidence that the frequency of reported greenspace use declines with increasing distance from the home, and that a statistically significant relationship exists between physical activity and accessible greenspace, even when adjustments for respondent characteristics, area deprivation and neighbourhood characteristics are made to the data.

A number of the studies discussed above in this section identify associations rather than causal relationships between greenspace and health. Casual relationships can be hard to identify, partly because—as is the case in many epidemiological studies—directionality is unclear. Existing health can affect an individual's use of greenspace or choice of residence near a particular environmental setting, and *vice versa*. Nevertheless, these findings suggest more attention should be given to developing the use of green exercise as a therapeutic intervention ('green care'), and planners and architects should be encouraged to improve access to greenspace ('green design'). Some of the substantial mental health challenges facing society (Foresight 2008) and physical challenges arising from modern diets and sedentary lifestyles (Wanless 2002; DH 2004; Sport England 2006; Wells *et al.* 2007; DCSF 2009; NICE 2009) could be addressed by increasing physical activity in natural places. If we encourage and enable children to undertake more green exercise, they are more likely to have active exposure to nature embedded in their lifestyle as adults and will reap the associated improvements in health.

16.3.3.3 Access to nature and the health and well-being of children

Open greenspace and access to nature is important for children (Ward 1978, 1988; Harrison *et al.* 1987; Kaplan & Kaplan 1989; Kahn & Kellert 2002; Bingley & Milligan 2004; Thomas & Thompson 2004; Louv 2005; Ward-Thompson *et al.*, 2008; Gleave 2009; Pretty *et al.* 2009). The quality of their environmental exposure is inextricably linked to their well-being (Thomas & Thompson 2004). Children's relationship with nature is a fundamental part of their development, allowing opportunities for self-discovery and natural environmental experience (Nabhan & Trimble 1994; Bird 2007). The outdoor environment is perceived as a social space which influences their choice of informal play activities and promotes healthy personal development (Burgess *et al.* 1988; Thomas & Thompson 2004). Nature allows unstructured play, generating a sense of freedom, independence and inner strength which children can draw upon when experiencing future incidents of stress (Orr 2002; Wells & Lekies 2006).

Wells (2000) conducted a longitudinal study with children of low income urban families and assessed the effects of nature on their cognitive functioning. When the families were relocated to houses with more nearby nature they had higher levels of cognitive functioning and their enhanced ability to direct attention continued for several months after moving. Another quasi-experimental study explored the idea that nature could act as a buffer to stressful events among rural children. Wells and Evans (2003) reported that 8–10-year old children exposed to high levels of nearby nature, both indoors and outdoors, were less stressed and recovered from stressful events more successfully than those in homes or with backyards that lacked contact with nature. However, cause and effect can be difficult to disentangle and decipher. Does contact with nature aid the development of stress-coping mechanisms which are used in later life? Or does nearby nature provide the opportunity for stress recovery? Additionally, does nearby nature provide the opportunity to play with other children (social contact), or is the improved tolerance to stress due to a combination of many factors? Further research is needed to establish the health effects of nature on children.

Taylor *et al.* (1998) found that nearly twice as many children chose to play in open spaces with trees compared with barren spaces lacking nature. They engaged in much more creative play and were more likely to spend time with adults, which facilitated social development. This was particularly apparent in a study involving children with Attention Deficit Hyperactivity Disorder (ADHD) (Taylor *et al.* 2001). Children worked better and their concentration improved after participating in activities in green surroundings. Bingley and Milligan (2004) assessed how recalled childhood play experiences (from ages 7–11 years) in the form of memories and imaginings have an influence on the mental well-being of adults. For instance, childhood experiences of unstructured play with minimal adult supervision in woodland areas significantly influenced the perception of woodlands in adult life and the seeking out of outdoor spaces when stressed.

Infrequent woodland or greenspace experiences as a child correlates with a lower frequency of visits during adulthood (Ward-Thompson *et al.* 2008). Therefore, lack of outdoor experiences during childhood may hinder any desires to visit such places as adults, to engage in physical activity, or to benefit from its emotional restorative qualities. It is also known that children's social play, concentration and motor ability are all positively influenced by playing in nature. Yet the opportunities for children resident in both urban and rural neighbourhoods to join in safe play are rapidly diminishing, partly because of parental fear of crime and volume of road traffic (Holloway & Valentine 2000; 2003). Children spend less time outdoors today than they used to (Orr 2002; Louv 2005), and as children have become more disconnected from the natural environment, they understand it less (Bird 2007).

16.3.3.4 Environmental settings: the benefits for health and well-being

Measuring the value of the health and well-being benefits that arise from contact with environmental settings and undertaking outdoor exercise raises particular challenges.

For example, assessments of the environmental and mental health benefits of outdoor exercise need to estimate additional exercise that is directly attributable to particular settings and would not have occurred anyway either in an environmental setting or an indoor environment (CJC Consulting and Willis 2005).

The economic valuation for the UK NEA (Chapter 22) uses secondary data to examine the link between greenspace and created physical exercise within the sedentary portion of the UK population. The study suggests that there are potentially large-scale economic benefits from increasing physical activity among sedentary people.

However, the study surmises that there is "no conclusive evidence on the strength of the relationship between the amount of greenspace in the living environment and the level of physical activity. Hence, it is not possible to accurately value, at the present time, the health benefits of created exercise due to additional greenspace provision" (Chapter 22; Mourato *et al.* 2010).

As part of the economic valuation in Chapter 22, the UK NEA collected new primary data on the interactions between environmental settings and health (for full details see the supporting report by Mourato *et al.* 2010). A geographically referenced quota survey of 1,851 respondents was undertaken to examine the physical and mental health effects associated with various forms of contact and exposure to environmental settings, habitats and other natural amenities. Using this data, ordinary least squares (OLS) regression models were developed in which the explanatory variables included attributes relating to certain environmental settings and other environmental characteristics. Two dependent variables were based on validated measures of respondents' self-reported physical and mental health. The nature of the dependent variables is central to understanding the analysis undertaken, so they are summarised in **Table 16.10** and the regression results are presented in **Table 16.11**.

One of the key limitations of the OLS regression is that any association identified cannot be interpreted as a causal effect, but could be because of omitted variables that could affect dependent or independent variables (Chapter 22; Mourato *et al.* 2010). Also, when considering the results in **Table 16.11**, it is particularly important to bear in mind that causality between dependent and independent variables is likely to be bidirectional. For example, physical functioning could influence the use of an environmental setting, but not *vice versa*. This is a limitation of many epidemiological and survey-based studies examining health and environmental settings. More detailed controlled experiments are needed to establish causality.

Nevertheless, the OLS regression does show statistically significant relationships between both health measures and the use of the environmental settings of domestic gardens and local greenspaces. Respondents who visit non-countryside greenspaces, such as urban parks, at least once a month report significantly better health on both measures compared to those who do not. The same results are also shown for respondents who spend time in their garden at least once a week. Visits to the countryside at least once a month only have a positive relationship with physical functioning, but the association is likely to

Table 16.10 Health dependent variables. Source: Mourato *et al.* (2010).

Dependent variable	Description	Survey items
Physical functioning	SF-36 subscale: mean of 10 coded survey items	The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much? • **Vigorous activities** such as running, lifting heavy objects, participating in strenuous sports • **Moderate activities** such as moving a table, pushing a vacuum cleaner, bowling, or playing golf • **Lifting** or carrying groceries • Climbing **several** flights of stairs • Climbing **one** flight of stairs • Bending, kneeling, or stooping • Walking **more than a mile** • Walking **several blocks** • Walking **one block** • Bathing or dressing yourself Yes, limited a lot = 0 Yes, limited a little = 50 No, not limited at all = 100
Emotional well-being	SF-36 subscale: mean of 5 coded survey items	How much of the time during the **past 4 weeks...** • Have you been a very nervous person? (–) • Have you felt so down in the dumps that nothing could cheer you up? (–) • Have you felt calm and peaceful? (+) • Have you felt downhearted and blue? (–) • Have you been a happy person? (+) All of the time = 100 (+) / 0 (–) Most of the time = 80 (+) / 20 (–) A good bit of the time = 60 (+) / 40 (–) Some of the time = 40 (+) / 60 (–) A little of the time = 20 (+) / 80 (–) None of the time = 0 (+) / 100 (–)

Table 16.11 Physical functioning and emotional well-being scores from UK NEA ordinary least squares **(OLS) regressions.**
Notes: The 'a' models include all respondents from England, Wales, Scotland and Northern Ireland, and have only a subset of spatial variables available. The 'b' models include all spatial variables, but are limited to England and Wales. The statistical significance relates to the precision of the estimate, and the degree of confidence that the association is not a feature of this particular sample rather than an underlying relationship in the population. Three stars indicates that the chance of observing this estimate if there is no underlying relationship is less than 0.1%, two stars indicates 1%, one star 5%, and the cross indicates a weak level of statistical significance at 10%. No stars indicates that there is a high chance of observing this coefficient even if there is no underlying relationship, i.e. the coefficient is statistically insignificantly different from zero at the 10% level. †Income is logged to account for diminishing marginal returns. The income measure used is household income divided by weighted household size. ‡Summed self-reported housing problems, out of: infestations, damp, mould, serious draughts, inadequate heating, low daylight. §Number of rooms divided by number of residents. Source: Mourato *et al.* (2010).

	SF-36 physical functioning (0–100)		SF-36 emotional well-being (0–100)	
Demographics	**(1a)**	**(1b)**	**(2a)**	**(2b)**
Male (0/1)	1.48	0.98	1.89*	2.17*
Age	-0.61**	-0.48*	-0.56**	-0.42*
Age‡	0.00012	-0.0012	0.0083***	0.0068***
Log (income) †	3.74***	3.88***	3.33***	3.39***
Living alone (0/1)	1.54	1.68	-2.23+	-1.76
Unemployed (0/1)	8.66***	7.65**	1.59	0.19
Religious (0/1)	-3.59**	-3.15*	-1.03	-0.68
Exercise (IPAQ total MET-hours/week)	0.012**	0.015**	0.011**	0.011**
Housing				
Homeowner without mortgage (0/1)	3.40*	2.84+	1.98	2.40+
Social tenant (0/1)	-9.06***	-9.07***	0.64	0.58
Housing problems (count) ‡	-4.67***	-5.24***	-4.79***	-5.09***
House crowding §	-3.16+	-2.86	0.48	0.65
Green space use and views				
Home views of grass (0/1)	2.08	1.98	5.03***	5.20***
Home views of water (0/1)	0.94	0.34	2.28	3.21
Weekly+ use of garden (0/1)	3.30*	3.54*	3.25**	3.70**
Monthly+ countryside visits (0/1)	3.08*	2.83+	1.31	0.91
Monthly+ other greenspace visits (0/1)	4.15**	3.44*	2.62*	2.58*
National Park visits per year (count)	-0.26	-0.26	0.18	0.26
Marine and Coastal Margins	-0.0063	-0.012	0.027	0.037
Freshwaters—Openwaters, Wetlands and Floodplains	0.039	0.056	0.0095	0.0093
Mountains, Moorlands and Heaths	-0.094	0.079	-0.034	0.0025
Semi-natural Grasslands	0.0018	0.021	-0.019	-0.018
Enclosed Farmland	-0.0043	0.016	-0.0019	0.018
Coniferous Woodland	0.035	-0.031	0.033	-0.020
Broadleaved/Mixed Woodland	0.023	0.058	0.00028	0.046
Inland bare ground	0.075	0.13	-0.10	-0.032
Distance to nearest…and other variables				
National Park boundary (km, 0 if inside)		-0.0079		0.022
National Trust site (km)		-0.086		0.026
Coastline (km)		0.0072		0.022
Motorway (km)		0.020		-0.014
A-road (km)		0.19		-0.067
Railway station (km)		-0.19		-0.18
Population density (1,000/km2)		0.66+		0.67*
Standardised house price index		0.011		-0.019
Countries (base category is England)				
Wales (0/1)	-4.37	-4.18	-2.50	-2.31
Scotland (0/1)	-3.47		-2.30	
Northern Ireland (0/1)	3.44		-2.69	
Constant	65.6***	57.9***	29.2***	19.4*
Observations	1851	1647	1851	1647
Adjusted R-squared	0.181	0.181	0.135	0.141

be bidirectional (Chapter 22; Mourato *et al.* 2010). A view of grass from the home was seen to have a significantly positive impact on emotional well-being.

16.3.4 Heritage Goods

16.3.4.1 Heritage and environmental settings

'Heritage' is the term often used to refer to what the past bequeaths the present; like many other cultural goods, it is a contested concept since the elements of the past valued by one social group may not be valued by another. There is often disagreement between experts and lay publics about, for example, the appropriateness of restoring historic buildings, parks and landscapes (Rackham 1986; Laurier 1998; Harvey 2001). The role of ecosystem services in the emergence of heritage goods in the UK is complex, and the experience of heritage will vary markedly between different groups of people in different parts of the country (English Heritage 2000). In the UK, ecosystems, habitats and environmental settings are all heavily infused with the cultural values and histories of human use, with each adaptation imprinting the values and assumptions of the cultures of that time and place on the different environmental settings.

At a larger geographical scale, certain types of cultural landscapes based on a range of environmental settings and built environments act as synergistic satisfiers for human needs. In particular, these wider landscapes, such as the Highlands of Scotland or the Welsh borders, can contribute to the human value need for 'identity' (both individual and collective) and for a range of democratic 'freedoms' including the rights and responsibilities associated with ideas of citizenship (Lowenthal 1985; Cosgrove & Daniels 1988; Tilley 2006; Graham & Howard 2008). The artistic and creative endeavour that is often involved in the emergence of cultural landscapes indicates that heritage goods can play a role in the meeting of value needs for creativity (Cosgrove & Daniels 1988).

Through their differing heritages, however, every environmental setting is capable of being interpreted as possessing a distinctive sense of place (English Heritage 2000). Thus, they can contribute to a range of human needs, such as the need for 'protection' by creating a sense of local solidarity, or the need for 'affection' by nurturing passion for places, as well as contributing to the need for identity, leisure and understanding. Equally, some notions of heritage attached to particular environmental settings can be exclusive and ignore the heritage others feel is present. The intricacies and personal nature of the relationship between needs, environmental settings and the past creates analytical challenges, but is fundamental to understanding heritage goods. As Lowenthal (1985) observes, every society "inherit(s) a legacy no less precious for being often indecipherable or inconvenient. To be is to have been, and to project our messy, malleable past into our unknown future"; furthermore, "what people treasure about it (the past) arises out of needs and desires seldom analysed" (p.63).

The complex emotional and personalised characteristics of heritage goods mean that there are noticeable social differences in how heritage is perceived. In 2000, one of the most detailed quantitative studies of public attitudes towards heritage and the historic environment in England was carried out by Ipsos MORI for English Heritage (2000). With a sample of 3,000 people and, for the first time, a specific quota sample of individuals drawn from Black and Asian communities, the research provides statistically significant evidence of the continuing importance of heritage and access to historic environmental settings across the country. The Ipsos MORI survey embraced a range of environmental settings including parks, gardens, countryside, inner city streets, market towns and rural villages, as well as sites of historical interest such as castles, ecclesiastical buildings, stately homes and archaeological sites.

The Ipsos MORI study showed that almost every feature in an environmental setting will have a form of value for someone through personal memories and attachments. The survey confirmed that people's ideas and values relating to heritage are both idiosyncratic in terms of their everyday lives and environmental settings, as well as consensual when considering what constitutes national heritage. Accordingly, 98% of adults thought that heritage is important to educate children about the past and that all school children should be given the opportunity to find out about England's heritage. In addition, 88% of adults agreed that it is right that there should be public funding to preserve the country's heritage (English Heritage 2000). Such surveys often produce high levels of agreement, especially if respondents are not presented with trade-offs over which to make judgements of relative importance. Nevertheless, these findings suggest a consensus around the importance of heritage in general. However, nearly half of the respondents from Black and Asian communities did not consider English country houses and ancient monuments to be relevant to their experiences and interests. These feelings, often expressed as a sense of exclusion, have also been conveyed by members of ethnic minorities in the context of outdoor recreation and use of the countryside (The Countryside Agency 2003).

Consequently, there is a very diverse range of heritage goods that are linked to ecosystem services ranging in scale and ease of identification from perceived national landscapes, through territorially demarcated National Trust land, to the subtle and personal historical meanings people may attach to some urban commons. This section cannot provide a detailed overview of all these heritage goods; instead, it aims to provide a framework for interpretation by drawing on existing evidence, case studies and new evidence of monetary value estimated for the UK NEA to highlight certain key heritage goods at the national and local level.

16.3.4.2 Landscape, heritage goods and national identity

The interactions between cultures, environmental settings and habitats have led, over long periods of time, to the emergence of a series of landscapes that constitute heritage goods based on material objects, imaginations and memoires. The cultural appreciation of high hills, mountains and moorlands in England, Wales and Scotland as landscapes of wilderness in an urbanised world has lasted for over two centuries, but has also been used culturally to promote ideas of national identity

and difference. The landscape heritage of the UK has been used as visual evidence for a variety of (often contradictory) national narratives, some working with a myth of a deep Albion, others with Celtic identity, Anglo-Saxon heritages and more (Smiles 2003; Bender 2004). It is no coincidence that the movement for founding the National Trust arose from efforts to preserve ancient monuments, nor that the first generation of National Parks followed the Romantic landscape vision in focusing on upland Britain (Squire 1988; Shoard 1982; Stephenson 1989). Additionally, the cultural heritage of the land is not easy to distinguish from the geophysical heritage when, for instance, archaeologists and geomorphologists clash over the 'naturalness' of clearings in block fields (Tilley *et al.* 2000).

The connection of natural areas with cultural heritage has a long and distinctive history in the UK, linked to the notable tradition of art and literature in transforming the landscape from an environmental setting to a "scenery with amenity value" (Andrews 1999, p.56). Of particular interest, the interpretive frameworks brought to bear on the scenery of mountains and moorlands address abstract values of national 'identity' and democratic 'freedom'. For example, early 18th Century appreciation of the sublimity of mountainous landscapes undoubtedly played a major role in transforming relationships to environmental settings, but the connection to ideas of national identity is complex (Darby 2000). Wordsworth's *Guide to the Lakes* (1810) refers to the Lake District as being "a sort of national property" while, at the same time, using North American archetypes to describe a primordial wildwood and Alpine archetypes for the mountains (Whyte 2000). Alpine ecosystems could be said to have played a significant role in British cultural heritage (Zaring 1977) and British culture, especially through the activities of its 19th Century mountaineers (Hansen 1995) who changed how alpine lands were seen.

The era of European nation-building coincided with the Romantic era, and romantic nationalism has accordingly been characterised by an intense relationship to nature. Nation-states needed to build collective memories at a scale larger than the locality—a sense of 'imagined community' (Anderson 1991)—in order to generate loyalty to the new space of the nation. Zimmer (1998) argues that, not only was there a process of 'nationalising of nature', drawing territorial boundaries around habitats and landscapes considered 'native' or 'authentic' to a country, but also of 'naturalszing the nation', with social identities being authenticated or regenerated through contact with nature (Tolia-Kelly 2007b). An identification with certain sites and environments provided a means through which national citizenship could be built; a great variety of cultural products, including painting, literature, music, sculpture, television and film, have been deployed in such representational work (Higson 1987; Daniels 1993; Cant & Morris 2006).

While certain versions of national identity have gathered around urban areas and spectacular architectural sites and monuments across the UK, the defining senses of place appear to be built around typically rural landscapes (Weiner 2004); although Turner's many seascape paintings also have strong resonances with national identity, in part, due to their connections to a specific 19th Century period in naval history. English identities, in particular, have coalesced around the notion of 'deep England' (Matless 1998), with agricultural lowland landscapes as symbols of continuity, social stability and a productive nature (Lowenthal 1991). Shoard (1982) and Matless (1993; 1998) show how, in the 20th Century, debates about landscape, place-based conservation and citizens' engagement with nature collectively constructed a 'moral geography' of English identity in landscape. Askins (2009) argues that this invocation creates an urban-rural dichotomy which works to exclude ethnic groups from claims to 'English' landscapes and places. The rural in the sense of not-urban has provided a resource for a variety of English nationalisms. Inevitably, this has involved repressing a variety of entangled histories that show the countryside of the pastoral idyll has never been separate from histories of social class, colonialism (Perry 1994; Fraiman 1995; Winter 1996; Howkins 2003; Woods 2003; Tolia-Kelly 2010) and black presences in places and landscapes (Bressey 2009).

In Scotland, the national sense of place is divided between the lowlands and the highlands, with the latter providing the nation with its globally powerful, externally projected identity of 'Tartanry' and 'Balmorality' (McCrone *et al.* 1995). Lorimer (1997; 2000) shows how, for example, educational opportunities offered to children from urban Scotland to engage with wild landscape in the Highlands promoted a particular form of national citizenship. Rennie (2006) notes how the easy passage of the National Parks (Scotland) Act 2000 signified a desire that the Highland landscapes be enshrined in legislation as a symbol of devolved Scottish identity; but she also argues that debates around the Bill revealed a far more fluid sense of place-based identity. Thus, the landscape and habitats of the Scottish Highlands, largely artefacts of sporting interests and the eradication of marginal agriculture (Lorimer 2000), have become to be seen as crucibles of a popular national identity. The appeal to 'Scottishness' works despite a history that has excluded substantial sectors of the population, especially visible minorities (Askins 2006).

In Wales, a strong sense of place-based identity developed during the 20th Century with the emergence of an urban, industrial and largely English-speaking identity in the south, and a rural, agricultural and Welsh-speaking one in the north-west in particular. For many politicians and other commentators, the rural has been viewed as a more 'authentic' identity, based on the Romantic era notion of the *gwerin* ('folk') living sustainable lives free from the corruption of capitalism (Gruffudd 1994). The defence of these rural landscapes and their populations from perceived threats have provided instances of mass political and civic engagement (Gruffudd 1995). The emergent sense of a deeply layered cultural relationship to place has recently been embodied in the Countryside Council for Wales' (CCW 2008) LANDMAP methodology for assessing the cultural landscape. Not only is the visual and material record of importance, "but the relationship also manifests itself in immaterial ways, in the way we think of landscape and respond to it, how we describe it, and how we acquire our 'sense of place'" (CCW 2008, p.1). The connections between history, culture and environment were further emphasised in

The Welsh Assembly Government's (WAG 2006) first position statement on the Historic Environment which identified listed buildings and ancient monuments, as well as 58 'historic landscapes'—a designation that has no equivalent in the UK or Europe. The interrelationship between cultural identity and sense of place has also been acknowledged in the recent call by the Institute of Welsh Affairs (IWA) for National Park Authorities in Wales to be given legislative responsibility for social and cultural affairs in addition to environmental concerns (IWA 2009).

16.3.4.3 Environmental settings, heritage goods and local identity: some examples

Environmental settings also function as a generator of a vast range of local identities based around a more local and everyday sense of heritage. Heritage goods, therefore, can be a source of community empowerment, as well as potential conflict between different interests (Cloke *et al.* 1996; Clifford & King 2006; Common Ground 2009a; Schofield & Szymanski 2011), and this section provides some examples of the interconnections between heritage goods and local identities.

The environmental education charity Common Ground provides a case study of an organisation that has campaigned to protect what it calls 'local distinctiveness', not only because of the value of ecological diversity, but also because of the enriching social and spiritual value of sense of place:

> "...many of us have strong allegiances to places, complex and compound appreciation of them, and we recognise that nature, identity and place have strong bonds. We sometimes forget that ours is a cultural landscape. It is our great creation: underpinned by nature, it is a physical thing and an invisible web... Places are process and story as well as artefact, layer upon layer of our continuing history and nature's history intertwined. Places offer an exposition of their evolution, given sensitive development and barefoot education, everyplace is its own living museum, dynamic and filled with sensibilities to its own small richnesses. These are places we know when we are in them. Meaning is entrapped in the experience of change, symbolisms and significance cling to seemingly ordinary buildings, trees, artefacts" (Common Ground 2009a).

One of Common Ground's most creative methods for generating community spirit around a place has been the Parish Maps project. The significance of the parish is explained thus:

> "We are trying to focus on locality, the smallest arena in which life is played out. The territory to which you feel loyalty, which has meaning to you, about which you share some knowledge, for which protectiveness is easily roused, the neighbourhood of which you have the measure, which in some way helps to shape you. This is the local, the actual place, where the reference is reality, indifference is unusual, detachment is difficult. Here we are somehow entangled, although we may behave thoughtlessly, responsibility tries to surface. It is here that values and facts act upon each other and are passed on by us to create wisdom about nature, about living, dying and remembering. And more prosaically, it is where 'strategy' and 'policy' are tested to breaking point" (Common Ground 2009b).

The acts of survey, data gathering (including defining what constitutes data), and representation all potentially generate a sense of individual and collective connection to place and are empowering. 'Knowing your place' leads to a willingness to take an active part in its upkeep and defence (Crouch & Matless 1996; Thompson 2007).

Since 2002, English Heritage, on behalf of the Historic Environment Forum, has produced an annual report called *Heritage Counts* that considers the economic and social role of heritage and historic environments. The 2009 *Heritage Counts* report examined the role of historic environments in influencing how people felt about where they lived, their sense of place and their social capital, as indicated through community involvement. A regression analysis was undertaken using the results of a national survey of 500 adults and 700 children. This highlighted the importance of historic buildings because a high proportion of such buildings had a statistically significant influence on sense of place and people who had recently visited a historic building had higher levels of social capital.

Land and seascapes provide a rich source of inspiration for many artists seeking to represent local distinctiveness and identities. Qualitative research investigating how people connect to nature invites participants to compose poems or keep nature diaries in order to express how local places are meaningful to them (Natural England 2009a). Artists are inspired to design site-specific artworks which draw upon the distinctive aesthetic qualities of particular places; **Box 16.3** provides an example from Cumbria.

While it is clear that iconic landscapes and places, and those that conform to notions of environmental and aesthetic 'value', have benefits for individual and local community identity, it is important to note that marginal landscapes can also function in this way and bring significant meaning to people's lives. One of the best examples is the urban allotment garden discussed in **Box 16.4**.

16.3.4.4 The monetary value of heritage goods

The large numbers of people that are members of certain environmental charities suggests many people will make a monetary contribution to conserve the mix of landscapes,

Box 16.3 Art, landscape, place and inspiration: Andy Goldworthy, Sheepfolds (1996 to 2003).
Source: Cumbria County Council (2007).

Sheepfolds is a sculpture project combines artistic creativity with the cultural heritage of a rural area:

> "Rather than making new *Sheepfolds*, Goldsworthy committed himself to working with existing folds in various states of disrepair or, in some cases, folds which had disappeared altogether but were clearly indicated on old maps. This enabled him to connect directly with the farming tradition and history of Cumbria, but, at the same time, as each sheepfold was rebuilt, so he invigorated them with a new energy by incorporating his sculptural response".

Box 16.4 Allotments.

Originally created in response to rural depopulation and migration to urban areas, the 'classic' allotment was carved out of remnant railway-owned land, so was found in semi-industrial parts of cities (**Figure 1**). Allotments—mainly managed by elderly, working-class men—sustained many families for decades during the 20th Century (Crouch & Ward 1988), but fell into decline after WWII. In recent years, however, they have enjoyed resurgence and, although there are uncertainties with the evidence, waiting lists have increased in the last decade especially (Campbell & Campbell 2009). There is also evidence that they have attracted a greater diversity of users, with growing numbers of women, minority ethnic groups and young people managing plots. Buckingham's (2005) survey of allotment users in West London showed that in some boroughs up to a third of plot-holders were women. She also noted that "other advantages claimed by, particularly Asian, low income women, who are more likely to be gardening collectively, are the social benefits which appear to be reducing the isolation they feel living in blocks of flats" (Buckingham 2005). Milligan *et al.* (2004) studied the therapeutic benefits of gardening for older people in the north of England using a mixed methodology incorporating focus groups, interviews, participants' diaries and longitudinal data about health and well-being. They argue that communal gardening on allotment sites combats social isolation and creates support networks (for a comparative study from the USA see Teig *et al.* 2009). Fieldhouse (2003) examined the effects of being part of an allotment group on people who had experienced mental ill health and found that gardening on an allotment was de-stigmatising, developed skills, and promoted social cohesion and mutual support. Given this kind of evidence, it is not surprising that the UK Government recognised the role that allotment gardening might play in generating social capital and in its sustainable development agenda (Milligan *et al.* 2004).

Figure 1 An allotment garden filled with flowers and vegetables.
Photo by © joingate, 2011. Used under license of Shutterstock.com.

places and habitats that represent heritage goods. The first amenity society, the Open Spaces Society, was set up in 1865 to defend common land and rights of way. It was followed by The National Trust which was founded in 1895 to protect threatened countryside, coast and buildings. The National Trust started out with just 100 members, rising to 12,000 by 1946. Recent growth in membership has been rapid and there are now 3.6 million members—more than 5% of the total UK population (National Trust 2010). In 2006–07, just over 49,000 people volunteered for the National Trust, an increase from 38,000 in 2001/02, although many of these volunteers would have been associated with activities in buildings (English Heritage 2009).

During the mid-19th Century, there was also a shift in sensibilities and an increase in repulsion at the mass slaughter of birds, ensuring the establishment of early nature conservation legislation and movements such as the Sea Birds Preservation Act (1869) and the Wild Birds Protection Act (1880). In 1889, The Royal Society for the Protection of Birds (RSPB) was founded by a group of influential women protesting against the destruction of birds solely for the trade in plumage. The RSPB now has over one million members and, like the National Trust, is becoming a substantial landowner, committed to the management and restoration of habitats across the UK. The RSPB oversees nature reserves covering 142,044 ha in the UK; the National Trust owns 254,000 ha of countryside, moorland, beaches and coastline in England, Wales and Northern Ireland, and a further 76,000 ha of countryside is owned by the National Trust for Scotland which has 310,000 members.

An analysis of the income and legacies donated to these environmental charities was conducted as part of the economic valuation undertaken for the UK NEA (Chapter 22; Mourato *et al.* 2010). Legacies could potentially be interpreted as a (market) proxy for non-use values reflecting altruistic, bequest or existence motivations. This analysis found that in terms of the total income raised by the top 500 UK charities in 2008/09, charities in the environmental area were ranked 7th (cancer, social welfare and animal charities ranked highest). Environmental charities, however, were ranked 4th in terms of income from legacies. In 2008/09, the National Trust raised a total of £97.8 million (44% from legacies), making it the 12th largest charity in the UK. The RSPB was ranked 16th having raised £64.9 million (41% from legacies).

The analysis of income and legacies conducted for the UK NEA in Chapter 22 also found that the total value of annual legacies to the National Trust, the RSPB and the National Trust for Scotland has doubled over the last two decades despite falling death rates in the UK. For the National Trust and the RSPB, this is partly a result of an increase in mean legacy values and the number of legacies. However, while mean legacy value may have risen, GDP per capita has risen faster, so the mean legacy value as a proportion of GDP per capita has, in fact, fallen (Chapter 22; Mourato *et al.* 2010).

The monetary value of National Trust sites were also considered in the hedonic pricing study undertaken for the UK NEA (Chapter 22; Mourato *et al.* 2010) based on an analysis of over 1 million housing transactions between 1996 and 2008 (see Section 16.3.7.1, **Table 16.13**). This considered the effect on house prices of marginal changes in proximity to National Trust sites and showed that proximity to these heritage sites had a statistically significant influence on house prices. Each 1 km increase in distance from the nearest National Trust owned site was associated with a

0.7%, or £1,350, fall in 2008 house prices. Certain types of heritage, therefore, clearly have an economic value which is reflected in house prices.

The 2010 Heritage Counts report produced by English Heritage focused on economic impact issues and mainly considered historic built environments through an analysis of existing research and new studies of 17 areas that had received investment in the regeneration of an historic environment. The survey concluded that, over a 10-year period, £1 of investment in an historic environment generates £1.60 of additional economic activity and approximately half of the jobs generated by historic environment attractions are based in local businesses (English Heritage 2010).

The economic and social significance of heritage goods in people's lives is now subject to ongoing monitoring. The Taking Part survey commissioned by the Department for Culture, Media and Sport (DCMS & ONS 2010) collects data at the national level for England about participation in the historic environment. Between 2005 and 2009, nearly 97,000 people responded to the survey. In 2005/06, 57.2% of adults had visited at least two historic environment sites in the previous 12 months; this figure rose to 61.9% in 2007/08, but fell back to 58.0% in 2008/09. These historic environment sites will often contain historic buildings, but the environmental settings of many sites will also contribute to their heritage and the reasons for visiting.

This ongoing monitoring, and other future studies, should provide further insights to the complex and often highly personalised ways environmental settings influence peoples' sense of heritage and how this affects the satisfaction of various needs such as for identity and understanding. What is less well understood is how heritage goods that represent the environment, but are not physically based in environmental settings, such as books and TV programmes concerned with the countryside, satisfy our value and existence needs or are a form of pseudo-satisfiers. However, Section 16.3.5 indicates that environmental representations produced by the media can have an influence on the nature of ecological knowledge and environmental education.

16.3.5 Education and Ecological Knowledge Goods

16.3.5.1 Environmental settings and green education

Environmental settings provide surroundings for outdoor learning where engaging with nature can lead to enhanced connectedness to nature and increased ecological knowledge (**Figure 16.9**). Ecological knowledge has been defined as 'accumulated knowledge about nature' and can be acquired through contact with local environments (Pilgrim *et al.* 2008). A study comparing the UK with India and Indonesia suggested that ecological knowledge declines in association with economic growth (Pilgrim *et al.* 2008), partly due to a lack of transfer to younger people. Other studies have noted the value of ecological knowledge among lay people can contribute to conservation and environmental management (Davis & Wagner 2003).

One way to increase children's contact with nature, and potentially their future ecological knowledge, is within the formal education system, both in terms of: i) the amount of exposure to nature in the learning environments outside the classroom; and ii) actually learning about nature, sometimes known as 'green education'. The Office for Standards in Education (Ofsted 2008) has recently published guidance on learning outside the classroom. Outdoor learning is more than just fieldwork for natural history or geography; it is the notion that learning for all disciplines can take place in outdoor settings (Rickinson *et al.* 2004). There is evidence that this leads to improved cognitive outcomes, better behaviour in the classroom and at home, and improved working conditions for teachers (Sibley & Etinier 2003). Furthermore, outdoor learning provided by third sector organisations, such as care farms, is often funded by a range of public sector education, social care and offender management organisations as it has provided beneficial educational opportunities for young people not in formal education, training or employment (Hine *et al.* 2008). **Box 16.5** presents two case studies on the range of benefits of green education outside the classroom.

Some evidence suggests, however, that the provision of education outside the classroom and the acquisition of ecological knowledge through green education could be improved. A government assessment of education outside the classroom in 2006 (DfES 2006) found that teachers involved with these activities, especially in primary schools, saw the objectives as being linked to personal development rather than the acquisition of knowledge. They also discovered that there was inequality of provision in terms of education outside the classroom: pupils from schools with low levels of achievement and in areas of high deprivation had fewer opportunities for visits to local sites away from school. In addition, there were regional inequalities, with teachers in schools in the North and the Midlands less likely to have undertaken such visits with pupils than teachers in the South of England. Similar regional differences were found in surveys by English Heritage and the National Trust of school visits to historic environments (English Heritage 2009).

More positively, the National Trust (Peacock 2006) undertook an in-depth survey of young people who had formerly been involved in primary school visits to eight of their sites where many of the learning opportunities were concerned with the natural environment. This survey found evidence that the trips had influenced school behaviour and skills and had also impacted on local environmental knowledge, although this was often not linked to more general environmental issues.

Ecological knowledge can also be acquired outside the classroom, but still within school grounds. Learning through Landscapes**,** founded in 1990, is a UK national charity running programmes in England, Scotland and Wales. Working in partnership with private, public and other third sector organisations, it helps schools to make physical improvements to their school grounds including creating nature or 'wilderness' areas, digging ponds, growing food, and enhancing many other outdoor activities through imaginative design and introduction of new equipment.

Learning through Landscapes funds independent research to evaluate the success of its interventions and demonstrate the value of outdoor learning. In 2003, Ipsos MORI carried out a national survey of 351 schools who had

Figure 16.9 Environmental education session at Conkers Discovery Centre, Derbyshire, England. *Photo courtesy of Christopher Beech/National Forest Company.*

Box 16.5 Case studies on green education.

Eastfeast

Eastfeast is a team of professional gardeners, artists and teachers that helps schools deliver more effective learning based on working a school allotment through the seasons, culminating in a community feast. Eastfeast started in 2005 with a year-long pilot programme at Aldeburgh Primary School in Suffolk; the project continues to evolve in partnership with a growing number of schools in East Anglia and through a series of linked, but independent, creative learning programmes. Pupils involved in Eastfeast schools spend more time outdoors as children and become involved in activities focused around working an allotment. This creates connections between nature and learning that can result in memories which impact on choices young people make later in life—helping them to choose to spend more time outdoors. The Eastfeast initiative has been shown to be successful in developing links between creative learning activities and local resources such as allotments, growers, food producers and cultural centres. By helping to get the local community involved, a 'shared learning ethos' is developed both inside and outside the formal school boundaries which helps pupils to gain the confidence to make their own decisions about learning and is likely to have an effect on life courses (Eastfeast 2009).

Forest schools

Based on an educational initiative established in Scandinavia in the 1950s, Forest Schools have been educating children regularly in UK woodlands since the mid-1990s. Normally working with a particular group over a period of several months, they provide learning activities linked to the national curriculum. An evaluation by O'Brien and Murray (2007) of Forest Schools and their pupils in England and Wales found that such children had improved: physical and motor skills; language and communications skills; social skills, including team working; knowledge and understanding of the environment; self-confidence and self-belief; and motivation and concentration.

improved their outdoor spaces within the previous four years (Learning through Landscapes 2003). The survey assessed their motivations for the improvements, which are shown in **Figure 16.10**. The results suggest that behaviour and citizenship are slightly more important motivations than knowledge linked to the curriculum, but that an ecological motivation was important for about 75% of the sample. The survey did not include a question on any ecological improvements or knowledge enhancement that may have taken place over the period, but **Table 16.12** shows that the results reinforce the case for environmental improvements having synergistic outcomes in meeting a number of school and pupil needs, especially for play and social interaction.

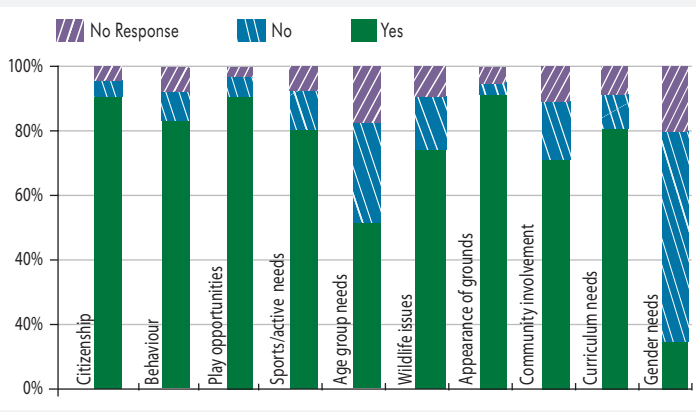

Figure 16.10 Reasons for participation in Learning through Landscapes school grounds improvement programmes. *Source: Learning through Landscapes (2003).*

Far less evidence exists regarding the acquisition of ecological knowledge among young people and adults outside the formal education system. A recent study by the Sustainable Development Commission (SDC 2010), however, indicates that the skills and knowledge gained from volunteering in outdoor environments can improve the resilience, responsibility and employment chances of marginalised young people. The study also found that environmental volunteering opportunities are often not part of social inclusion policies targeted at young people.

16.3.5.2 The monetary value of green education and ecological knowledge

The economic valuation of cultural goods conducted for the UK NEA examined two components of ecological knowledge using differing methods (Chapter 22). Firstly, an accounting framework was used to examine a portion of the ecological component of school education. Secondly, two case studies were used to estimate the monetary value of ecological knowledge acquired through outdoor learning by examining the 'cost of investment' associated with these activities.

The accounting framework is designed to measure the 'investment value' of enhanced earnings and leisure benefits linked to educational attainment in GCSE and A2 geography, science and biology, which all contain significant proportions of ecological knowledge as part of their curricula. The authors conclude that the accounting framework is very approximate as it has to estimate the proportion of ecological knowledge in each curriculum and does not estimate the net benefit of ecological knowledge relative to other education. But the "findings are instructive, not least in indicating, in explicit terms, the value of ecological knowledge is possibly substantial" (Chapter 22; Mourato *et al.* 2010). The tentative findings produce an estimate of £2.1 billion for the value of the ecological knowledge contained in the education attainment of pupils in 2010 completing GCSE and A2 geography, science and biology.

The monetary value of outdoor learning was explored through a case study of the 'cost of investment' in 1,968 organised school trips to 51 RSPB nature reserves during 2009/10. The analysis notes that, while ecological knowledge is acquired in school, it is difficult to ascribe a gain in knowledge to a specific trip or location. The approach, therefore, involves examining travel costs and resource costs in order to estimate investment costs over and above those involved in gaining knowledge in a classroom situation. The analysis estimates that trips to the RSPB reserves by schools were based on total investment costs of between £850,000 and just over £1.3 million (Chapter 22).

A second case study was made of the RSPB Big School Birdwatch initiative which involves pupils and teachers counting species of birds visiting school grounds for an hour on any day in a two-week period. In 2010, 69,100 pupils and nearly 6,300 adults took part, compared to a total of 14,675 people in 2004. As with the first case study, the 'cost of investment ' approach does not reveal the level or benefit of ecological knowledge acquired, but gives an indication of the financial outlay for an activity which can contribute to the acquisition of ecological knowledge. By using government estimates of the cost to government of students aged 3–19 in education, the analysis suggests the value of pupil and teacher time contributing to the RSPB Big School Birdwatch is £374,000 or an average of £188 per school (Chapter 22).

Table 16.12 Learning through Landscapes' National School Grounds Survey 2003. Source: Learning through Landscapes (2003).

Has your school grounds improvement…	Yes (%)	No (%)	No response (%)
… increased the number of children who 'enjoy' and 'have fun' being in their grounds?	90	2	8
… stimulated increased active play and games?	85	6	9
…. increased the perceived quality of the environment by pupils, teachers, parents, etc.?	87	1	12
…. improved pupil behaviour?	73	9	18
…. Improved quality of other play?	83	6	11
….increased the number of lessons taught outside?	65	17	18
…. improved pupil attitudes towards learning?	65	8	27
… increased the number of activities and opportunities provided for pupils at break and lunchtimes?	85	4	11
…changed levels of self-esteem?	64	8	28
…..improved social interaction between pupils, and pupils and staff?	84	2	14
….increased community/parental involvement?	66	18	11

16.3.6 Religious and Spiritual Goods

16.3.6.1 Ecosystems and the nature of religious and spiritual goods

The MA (2005a) identified spirituality as a type of cultural service, and spirituality is mentioned frequently in discussions of cultural services with, according to Cooper (2009), the word having distinct meanings. On the one hand, spirituality connotes the religious values held by indigenous people, and on the other, the values of those in developed countries who find spiritual inspiration from nature. Such inspiration may be variously characterised as 'enrichment', 'experience', 'solace', 'enlightenment', 'fulfilment', 'renewal' or 'reflection'. These different types of inspiration will be forged by such a wide range of social, cultural and psychological factors. In this section, we focus on the role environmental settings play in the emergence of religious and spiritual goods arising from human engagement with the environment of the UK.

It must also be acknowledged that people without religious faith may have spiritual experiences and, for such people, spiritual inspiration may contribute to the emergence of other goods already discussed, such as leisure or health. Religious and spiritual goods are clearly linked to our existence need for being, but the extent to which religious encounters with specific environmental settings are synergistic satisfiers for value needs, such as participation and identity, resides in the character and qualities of belief.

16.3.6.2 Ecosystems, nature and changing religious and spiritual goods

The importance of ecosystems in religious terms has almost certainly increased in the post-war period in the UK, notwithstanding secularisation and the decline of conventional religious observance. There has, apparently, been an increase in the incidence of both pilgrimage and of religious retreats, although it is extremely difficult to identify any quantitative measures of this trend. Writing from anecdotal evidence, Inge (2003) sees this increase as representing grassroots protest against the loss of place imposed on Christians by Modernism and reformed Christianity. Similarly, Wynn (2007) talks of the 'localisation of divine presence' that is implied in pilgrimage.

Alongside changes in conventional protestant Christianity, religious pluralism has characterised the last 60 years—what Heelas and Woodhead (2005) call a 'spiritual revolution'—and marks a shift from church religiosity to holistic spirituality. Based on a detailed empirical case study of Kendal in the Lake District, Heelas and Woodhead (2005) identify two cultural practices. On the one hand, 'religions of difference' exist—conventional Christian denominations which distinguish sharply between God, the human, and the natural world ; on the other hand, 'spiritualities of life' adopt a holistic perspective and stress the fundamental identity between the divine, the human and the natural world . Many of the latter have fused with more orthodox Christian theology; some Christians are linked to 'New Age' thinking with origins in the 1960s. The best-known example is the Findhorn community in the north-east of Scotland (Sutcliffe 2000). New Age spirituality places particular emphasis on holism and 'connectedness' to nature, believing humans should not attempt to control and dominate nature, but should live in an ecologically friendly way in 'green communities' (Heelas 2006; Hatton 2008). Specific geographical places are associated with the holistic milieu, either because of historic links with spirituality, such as Glastonbury (Wylie 2002), or because of more recent socio-demographic trends, such as Totnes, whose reputation is derived from the practices of innovative local landowners—the Elmhirsts at Dartington and Maurice Ash at Sharpham—which have a particular connection with Buddhism (Snelling 1992).

While not undermining conventional religious space, the new spirituality has undermined any monopoly religious places might have held in terms of providing spiritual solace and/or meaning, as well as promoting new leisure and recreational uses. Sacralisation of new places may come about through new rituals of grief, such as temporary wayside shrines marking fatal traffic accidents, green burial places, and places where ashes may be scattered. The place-based rituals of death are no longer confined to the traditional graveyard as people strive to find new ways to "encounter the significance of the historical person" (Hunt 1995). Clearly, there is a temporary nature to some of these new sacred sites.

Notwithstanding the depth and breadth of this tradition of valuing nature spiritually, we face serious problems in seeking to assess the precise contribution of UK ecosystems to spiritual and religious experiences and the related activities and products. Much of the academic endeavour related to this topic is normative: theological and ethical writings abound (Bauckham 2009; Carruthers 2009). Empirical social scientific evidence of the extent and nature of religious and spiritual beliefs, or experiences related to nature, are much harder to find, especially in the UK context, the reasons for which are rooted in the historical and contemporary sociology of religion.

Historically, Protestant Christianity has not been sympathetic to a theology of sacred places as efficacious, in and of themselves, to religious well-being. Thus, it stands in contrast to the importance attached to religious sites and places in pre-Reformation Britain (Duffy 1992), to the sites and landscape features sacred to Hinduism (Smith 2002), or to the specific territories with national and religious identities most associated with Judaism (Smith 2003). However, the 20th Century has witnessed a modest reassessment within mainstream protestant denominations (including the Anglican Church) and pilgrimage, retreats and ideas of sacred space have become much more acceptable.

In the 1990s, this movement gathered pace and became more explicitly a multi-faith phenomenon with examples emerging from other faith traditions. For example, in Manchester at the Cheetham Al Hilal Community Project, the Muslim community has participated in an innovative project to improve the built and natural environment including the creation of a garden with an Islamic theme. The Sacred Land Project, supported by WWF and launched by the Archbishop of Canterbury in April 1997, set out to revive and create sacred sites in the UK and overseas. In the UK the project has involved Buddhist, Christian, Hindu, Jewish, Muslim and secular communities in: creating and reviving inner city and community gardens; conserving and celebrating holy wells; rediscovering and renewing pilgrimage trails; protecting trees and woodlands; regenerating community meeting places and their ecosystems; and celebrating sacred places with works of art and poems (The Sacred Land Project 2001 see also www.arcworld.org/projects.asp?projectID=9). Two case studies from the Sacred Land Project are provided in **Box 16.6**.

Hay and Hunt (2002) report on people's religious or spiritual experiences in Britain. Based on national survey data, the proportion of the population claiming to have had such experiences increased from 48% to 76% between 1987 and 2000, with the awareness of a sacred presence in nature increasing from 16% to 29%. Relatively few studies have focused empirically on the motivations and experiences of those for whom religious experiences are linked in some way to particular places and ecosystems. Research often focuses on elements of the built environment, such as churches and cathedrals, as pilgrimage destinations (Winter & Gasson 1996).

A few academics are focusing on the practice of pilgrimage rather than the destination (Frey 1998; Coleman & Eade 2004; Bremborg 2008). For example, Frey (1998) studied those walking on the pilgrimage route to Santiago de Compostela and found the sacred goal to be less important to many than the journey through wild and beautiful terrain. Linked to this, 'get out in nature' headed a list of 12 motivations for the journey.

Box 16.6 Case studies from the Sacred Land Project.

Our Lady of the Crag

In Knaresborough in North Yorkshire, the ancient shrine of Our Lady of the Crag can be found in a cave cut into the rocky crags overlooking the river Nidd, which cuts a gorge through the centre of the town (**Figure 1**). According to local legend, the shrine was dedicated to Our Lady in the 12th Century by John the Builder in thanks for a miracle that saved the life of his son from a rock-fall; but some say it is very much older. Nearly 500 years ago, the shrine was suppressed during the Reformation, and became neglected and forgotten. In the early 1990s, a local group formed to renovate the shrine and to create a sacred garden around it, supported by the Sacred Land Project. Now a stunning new Madonna and Child—commissioned by Arts and Sacred Places to be carved from Yorkshire granite by local sculptor, Ian Judd—has been installed in the cave.

Vrindavan Garden

In Leicester, in a predominantly Hindu neighbourhood, a sacred garden was inaugurated in October 2000 beside Rushey Brook, in the grounds of Rushey Mead School, as a quiet space and an environment in which pupils could produce works of art. The idea for the garden was inspired by Friends of Vrindavan, a Hindu community group, whose inspiration comes from the sacred forests of Krishna in Vrindavan, India. The garden, designed by landscape architect Rebecca Cotton, is based upon the theme of Krishna's struggle with the serpent Kaliya, who poisoned the sacred River Yamuna in Vrindavan. This theme was chosen to symbolise the struggle to clean our rivers and environment. Pupils of Rushey Mead School have created their own works of art to be placed in the garden.

Figure 1 Chapel of Our Lady of the Crag. *Photo by R/DV/RS available under a Creative Commons Attribution license.*

The importance of 'natures' and the countryside to national identity can be seen in many political, social and literary writings of the 20th Century in the UK, some of which are explicitly linked to religious discourses. Matless (1998) shows how advocates of organic farming and ruralism both drew from and further developed Christian thinking: "the model is of a universal parochial church, attentive to often semi-pagan seasonal ritual, with place itself becoming a church to belong to and revere". Moore-Colyer (2001) has examined one of these thinkers, Rolf Gardiner, in more detail, investigating his attempts to enlist Church leaders and people in a greater understanding of the spirituality of nature and of rural living.

Alongside the growth of pilgrimage as 'moving though nature', there has also been a recent marked growth in religious retreats to particular places in nature. There are currently 132 places of Christian retreat in the UK listed by the Retreat Association, located in both urban and rural locations. Conradson is researching four retreat centres in southern England, using participant observation and interviews with monks and guests on retreat. Two Benedectine places of retreat in southern England, Alton Abbey and Elmore Abbey, are explored in particular. His work demonstrates clearly the spatiality of these religious places, not just the abbey buildings themselves, but also the surrounding gardens and countryside. So for those on retreat, the 'stillness' they seek may be found in both the Benedictine monastic liturgy and in the abbey grounds and gardens.

16.3.6.3 Environmental settings and religious and spiritual goods

It is extremely hard to pinpoint evidence of particular landscapes or ecosystems being conducive to religious experiences. The configuration of Marine and Coastal habitats which appear to contribute to spiritual/religious experiences on the holy islands of Iona, Lindisfarne and Bardsley have to be seen in the context of other highly popular sites of pilgrimage that are inland and not characterised by dramatic landscape or ecological characteristics, such as Walsingham in North Norfolk. There is relatively little evidence on the specific role of nature and religious pilgrimage in human well-being. Conradson (2008) couches his research in terms of the therapeutic role of stillness, and so, by implication, religious places are important to human well-being in their provision of 'therapeutic stillness'. Clearly, diminution of the qualities (peace, beauty) that characterise pilgrimage journeys and places of retreat would have a potentially marked impact on the well-being of participants.

Wynn (2009) seeks to explain how "our encounter with particular places, each characterised by its own phenomenology and distinctive possibilities for bodily appropriation, may prove to be religiously significant" (p44). He outlines three ways in which this might be the case: firstly, particular places may come to hold a religious significance because they carry some microcosmic significance, epitomising in some way the nature of things more generally; secondly, God is taken to be presupposed in some particular material context which may be a place or landscape or habitat; and thirdly, specific places represent the meaning of past religious events that occurred there. In all three contexts, the religious experiences can have positive implications for faith, relationships and action. In the first and second of these possibilities, outdoor and open places may be more important than the traditional built or enclosed sites of religious devotion, but further research is needed to explore these complex issues.

16.3.7 Cultural Services and Goods: the Contribution to Human Well-being

16.3.7.1 Environmental settings and amenity value

The preceding discussion of the various cultural goods has already highlighted some of the specific contributions that environmental settings make to satisfying human needs and, consequently, human well-being. As noted in Section

16.3.1, however, the benefits that individuals experience from environmental settings can be multiple and bundled together. A trip to a local park can generate health, leisure and spiritual benefits. The economic valuation for the UK NEA addresses this by calculating the amenity value of environmental settings as an aggregate measure of the benefits gained from cultural services and goods (Chapter 22). The amenity value is based on a measure of well-being associated with living in, or within close proximity to, certain settings.

A hedonic pricing study of over 1 million housing transactions between 1996 and 2008 was used to assess the effect of environmental settings on amenity value and concluded "that the house market in England reveals substantial amenity value attached to a number of habitats, protected and managed areas, private gardens and local environmental amenities" (Mourato *et al.* 2010; Chapter 22). **Table 16.13** is taken directly from Mourato *et al.* (2010) and summarises the key findings of the hedonic regression analysis according to their statistical significance.

The hedonic regression found that, for census wards in England, a 1 percentage point increase in the land use share made up of the environmental setting of greenspace added 1.04% to house prices (£2,020 at 2008 prices) compared to national average house prices. The comparable figure for domestic gardens was 1.01% (£1,970 at 2008 prices), and 0.97% for water (£1,886 at 2008 prices). Environmental settings with designations also affected amenity value: a location within a green belt surrounding a major metropolitan area can add 3% to house prices (£5,880 at 2008 prices) compared to national average house prices.

Table 16.13 also shows that certain broad and component habitat types have a high amenity value. A 1 percentage point increase in the share of Broadleaved Woodland, Coniferous Woodland, Enclosed Farmland, or Freshwater—Open Waters, Wetlands and Floodplains within the one km^2 containing a house has a statistically significant effect on house prices compared to national average house prices.

There are certain limitations in the hedonic regression that generated the findings in **Table 16.13** (Mourato *et al.* 2010; Chapter 22). For example, due to data that is currently available, it is a cross sectional study only for England. The analysis only examines land cover in the vicinity of a property and the distance to the nearest environmental setting or amenity. The diversity of land cover, or the benefits of accessibility to multiple instances of a particular

Table 16.13 Implicit prices for environmental settings and related environmental amenities in England (£ capitalised values). Note: The stars indicate statistical significance levels: *** p<0.01, ** p<0.05, * p<0.10.
Source: Mourato *et al.* (2010).

Environmental setting/ Environmental amenity	% change in house value with:	Implicit price in relation to average 2008 house price	
	1 percentage point increase in share of land cover of habitat type:		
Marine and Coastal Margins	0.04% increase in house prices	£70	
Freshwater—Open Waters, Wetlands and Floodplains	0.40% increase in house prices	£768	***
Mountains, Moorlands and Heath	0.09% increase in house prices	£166	
Semi-natural Grassland	0.01% decrease in house prices	-£27	
Enclosed Farmland	0.06% increase in house prices	£113	***
Broadleaved Woodland	0.19% increase in house prices	£377	***
Coniferous woodland	0.12% increase in house prices	£227	*
Inland bare ground	0.38% decrease in house prices	-£738	***
	1 percentage point increase in land use share of environmental setting:		
Domestic gardens	1.01% increase in house prices	£1,970	***
Greenspace	1.04% increase in house prices	£2,020	***
Water	0.97% increase in house prices	£1,886	***
	1 percentage point increase in land use share of designation:		
Being in the green belt (in major metropolitan areas)	3.00% increase in house prices	£5,800	**
Being in a National Park	5.00% increase in house prices	£9,400	
	1 km increase in distance:		
Distance to coastline	0.14% fall in house prices	-£275	
Distance to rivers	0.91% fall in house prices	-£1,751	*
Distance to National Parks	0.24% fall in house prices	-£461	***
Distance to nature reserves	0.07% fall in house prices	-£143	
Distance to National Trust land	0.70 % fall in house prices	-£1,347	***

environmental setting, are not considered, nor are the visibility of settings and environmental amenities. Nevertheless, a variety of different regressions confirm that the findings are robust and that environmental settings and habitats do influence house prices. Individual well-being is influenced by a wide range of social, economic, cultural and genetic factors (Defra 2007c), but the increased monetary value of an individual's home may contribute to enhanced well-being.

16.3.7.2 Environmental settings and subjective well-being

Further aggregate measures of the benefits gained from environmental settings are provided in the analysis of subjective well-being and the environment undertaken for the UK NEA economic valuation (Mourato & MacKerron 2010; Chapter 22). The measures of subjective well-being are based on data obtained from a geo-located web survey completed by 1,851 panel respondents in August 2010. The respondents were asked to self-assess life satisfaction using the European Social Survey 0–10 life satisfaction scale. The measures of life satisfaction acted as the dependent variable in an OLS regression model. The survey also obtained data on time spent by respondents in different environmental settings. The UK Land Cover 2000 map was used to generate measures of the proximity of respondents' homes to particular habitats.

The results from the OLS regression model are shown in **Table 16.14** (Mourato & MacKerron 2010; Chapter 22); the caveats associated with the model are discussed in Mourato & MacKerron (2010) and Chapter 22. Two models were estimated: model (a) for the UK as a whole, which had fewer variables; and model (b) for just England and Wales. The statistically significant associations between life satisfaction and the demographic and housing variables are to be expected given the findings of previous research.

Table 16.14 reveals that people who visit non-countryside greenspaces, such as urban parks, at least once a month, and those who spend time in their own gardens at least once a week, have statistically significant higher life satisfaction measures than those who do not. This appears to confirm the significance of local greenspace and private gardens to increases in well-being, as indicated by the hedonic regression reported in the previous section above.

Certain broad and component habitats were also found to have statistically significant associations with life satisfaction. Proximity of respondents' home to Broadleaved or Mixed Woodland was associated with higher life satisfaction. By contrast, proximity of Mountain, Moorlands and Heath were associated with slightly lower life satisfaction.

16.4 Knowledge Gaps

An ecosystem services approach to understanding culture-nature interactions is a relatively new perspective; consequently, many key sources of social, economic and environmental data are not designed to examine key aspects of cultural services and goods. There are knowledge gaps related to data collection and the uneven monitoring of change of different environmental settings. The Countryside Quality Counts analysis (Defra *et al.* 2008) is providing a consistent approach to examining the changing nature of landscapes in countryside environmental settings. Chapter 10, however, notes that for urban landscape morphology and character there is no single data inventory and a lack of harmonisation between sources. Data on the nature and quality of local formal and informal greenspace has been improving, but is still limited. Since 2006, Natural England has been seeking to collate the different digital data sets of urban and rural accessible greenspace to provide a single inventory, but, to date, only 70% of 32 possible datasets have been collated (Chapter 10). National planning guidance also instructs local authorities to audit the use and access to open spaces, but the approaches adopted are not consistent (CABE 2010).

The Ordnance Survey, through its product Master Map, has developed increasingly reliable digital inventories of the coastline and 'inland water', including enclosed water bodies, rivers, canals and smaller streams, which are refreshed every six weeks at scales of 1:1250, 1:2500 and 1:10,000 in urban, rural and mountain areas, respectively. The requirements of the Water Framework Directive now mean that the quality of data on the biological and chemical characteristics of many inland water bodies, especially rivers, has improved. A number of organisations, such as the Environment Agency and British Waterways, hold information on the uses of certain inland waterways, but there is no consistent dataset on public use or access to inland blue spaces (University of Brighton 2008); the situation on the coast, however, has improved, partly due to the audit of coastal access undertaken by Natural England in preparation for the Marine and Coastal Access Bill.

The development of consistent terminology and data collection approaches for digital data on environmental settings and their use by the public will be central to developing an ecosystem approach that takes account of cultural services and goods. For future economic valuation exercises, the availability of consistent digital data on changes over time to environmental settings will also be required.

Knowledge, data and evidence is also uneven for the different cultural goods discussed in this chapter. For health goods, there is well-established evidence of the potential of environmental settings to play a role in facilitating exercise and other activities that enhance mental and physical health (Pretty *et al.* 2005; Mitchell & Popham 2008; Barton & Pretty 2010). Nevertheless, further research is required—particularly longitudinal studies—to understand the social and physiological processes involved in adults and children acquiring mental and physical health benefits from engagement with environmental settings and nature, in order to ensure that the management of environmental settings for long-term behaviour change can be more effective (Thompson Coon 2011).

The economic valuation for the UK NEA (Chapter 22) also recommends undertaking further studies to examine

Table 16.14 Life satisfaction ordinary least squares regressions (web survey). Notes: † Income is logged to account for diminishing marginal returns. The income measure used is household income divided by weighted household size; ‡ Summed self-reported housing problems, out of: infestations, damp, mould, serious draughts, inadequate heating, low daylight; § Number of rooms divided by number of residents; models (a) and (b) are based on UK and England and Wales samples, respectively; significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Source: Mourato & MacKerron (2010).

Variables	Life satisfaction (0–10)	
	(a)	(b)
Demographics		
Male (0/1)	-0.19*	-0.16+
Age	-0.054***	-0.054**
Age squared	0.00069***	0.00070***
Log(income) †	0.24***	0.25***
Living alone (0/1)	-0.35**	-0.37**
Unemployed (0/1)	-1.09***	-1.13***
Religious (0/1)	0.30**	0.32**
Exercise (IPAQ total MET-hours/week)	0.00048	0.00044
Self-rated health (1–5)	0.82***	0.82***
Housing		
Homeowner without mortgage (0/1)	0.58***	0.62***
Social tenant (0/1)	0.49***	0.43**
Housing problems (count) ‡	-0.14+	-0.18*
House crowding §	0.028	0.16
Greenspace use and views		
Home views of grass (0/1)	0.037	0.036
Home views of water (0/1)	0.069	0.14
Weekly+ use of garden (0/1)	0.28*	0.20+
Monthly+ countryside visits (0/1)	0.11	0.098
Monthly+ other green space visits (0/1)	0.19+	0.18+
National Park visits per year (count)	0.014	0.010
Land cover (ha within 1 km radius of postcode centroid—base category is urban)		
Marine and Coastal Margins	0.0018	-0.00074
Freshwater—Open Waters, Wetlands and Floodplains	0.0079	0.0068
Mountains, Moorlands and Heath	-0.0078	-0.020+
Semi-natural Grasslands	0.0023	0.0019
Enclosed Farmland	-0.0010	-0.00063
Coniferous Woodland	-0.0041	-0.0035
Broadleaved/Mixed Woodland	0.0042+	0.0067*
Inland bare ground	-0.0047	-0.0036
Distance to nearest…		
National Park boundary (km, 0 if inside)		0.0020
National Trust site (km)		-0.0071
Coastline (km)		-0.0019
Motorway (km)		0.00059
A-road (km)		0.060
Railway station (km)		-0.0043
Countries (base category is England)		
Wales (0/1)	0.15	0.16
Scotland (0/1)	0.22	
Northern Ireland (0/1)	-0.14	
Population density (1,000/km2)		0.048+
Standardised house price index		-0.0028*
Constant	1.72*	1.42+
Observations	1851	1647
Adjusted R-squared	0.290	0.292

people's exercise habits and understand what proportion of exercise is a direct consequence of the provision of greenspaces. This could involve revealed and stated preference techniques, or possibly experimental methods where behavioral change can be monitored before and after the provision of new green- and/or bluespaces.

One of the ongoing challenges facing the evaluation of leisure, recreation and tourism goods has been a lack of consistent data over time regarding the use of environmental settings. The potential of certain previous datasets, such as the English Leisure Visits Survey, was limited by changes in measurement and also one-off events such as the outbreak of Foot and Mouth Disease. Recently, the situation has improved as new surveys have sought to establish reliable time-series data to monitor the impacts of a range of policy measures. These include Sport England's (2009) Active People survey of physical activity and the DCMS & ONS (2010) survey, Taking Part, which examines participation in culture, leisure and sport. The Monitoring Engagement with the Natural Environment (MENE) survey was introduced in 2009 by Natural England (2010), the Department for Environment Food and Rural Affairs and the Forestry Commission to provide baseline and trend data on how people use the natural environment in England, but the introduction of more precise measures of destination and origin in this survey would enhance future economic valuation using travel cost methods.

A number of organisations, such as English Heritage and the National Trust, provide regular monitoring reports on the quality and use of heritage and historic environment sites. These usually focus on built features and less on the natural environment, but the annual report *Heritage Counts*, produced by English Heritage, does consider changes to certain open spaces such as registered parks and gardens, ancient woodland and battlefields. English Heritage (2009) is also undertaking a historic characterisation mapping exercise for England that, by 2009, had been finished for 81% of the country and, if completed, will provide valuable insights into the connections between heritage goods and landscape. The UK NEA was not able to obtain accurate data on the nature or value of heritage goods produced by different forms of the media that rely on representations of nature and environmental settings, such as wildlife documentaries and TV programmes about the countryside. A future analysis of the economic value of this type of heritage good would need to be accompanied by quantitative and qualitative research to understand how such goods link to other forms of environmental behaviour and whether they satisfy our needs as synergistic satisfiers or are pseudo/inhibitor satisfiers.

Many people experience heritage goods through their role as volunteers. English Heritage and the National Trust monitor volunteering in historic environments, but far less reliable data is available on environmental volunteering despite the valuable social role of such activity recently identified by the Sustainable Development Commission (SDC 2010). Similarly, the economic valuation of cultural goods for the UK NEA (Chapter 22) concluded that little is known about charitable bequests and giving in the UK, and that there is only limited available data on donation patterns, the demographic characteristics of donors and how these change over time. The current UK government's desire to encourage volunteering, charitable giving and localism may make collecting data on environmental volunteering and charitable giving a priority if the costs and benefits of such activities are to be fully understood and incorporated within an ecosystem approach to the environment.

A key knowledge gap regarding education and ecological knowledge goods concerns the processes by which adults acquire ecological knowledge, their participation in nature-based educational activities, and how knowledge acquisition is influenced by engagement with environmental settings as a form of cultural service. A number of studies have highlighted the importance of lay, as well as expert, knowledge in shaping the public understanding of key environmental issues (Dickens 2004). Furthermore, research has revealed how engagement with environmental settings, especially in childhood, can shape ecological attitudes and future environmental behaviour (Ward-Thompson *et al.* 2008). The UK NEA economic valuation considered the value of nature-based school visits and noted that a comprehensive database of school visits would be required to allow a national assessment of their worth (Chapter 22). Such a database would also be useful for assessing the extent of inequalities in school visit opportunities identified in 2006 (DfES 2006).

For religious and spiritual goods the knowledge gaps are particularly notable. There is a marked lack of evidence on the numbers of people for whom religious/spiritual experience and well-being is related to experiences of nature. We do not know how many people in the UK go on pilgrimages or spiritual retreats, or for whom contact with nature is an intrinsic part of their religious/spiritual lives. There is a need to take the sophisticated approach to spirituality and space (Wynn 2009) and relate it to different types of ecosystems. It is necessary to do more research to see if pilgrimages and retreats are growing in the UK, and the degree to which moving through nature is important.

This chapter has highlighted some of the important contributions environmental settings make to a range of goods that influence well–being, but there is already evidence to show that there are marked inequalities in access to environmental settings linked to residential location, social background and income (CABE 2010). Initiatives to tackle any of the knowledge gaps linked to cultural services and goods must, therefore, seek to take account of related inequalities that could be addressed in future ecosystem management.

Addressing these knowledge gaps will require the regular and consistent collection of quantitative data at the national scale. Many of the gaps, however, require an understanding of the complex ways in which individuals and groups of people engage with environmental settings, and the social and cultural benefits that may arise (Burgess 2000; Burgess *et al.* 2007) Recent guidance published by the Department for Environment, Food and Rural Affairs (Fish *et al.* 2011) emphasises that the cultural goods linked to ecosystem services cannot just be understood in monetary terms; in future, their collective and non-monetary value will need to be understood using a range of participatory and deliberative techniques, such as multi-criteria analysis, that require both quantitative and qualitative methods.

16.5 Conclusions

Over the last decade, the concept of 'cultural services and goods' linked to ecosystems has been adopted by many academics and environmental policy makers to describe what are experienced as meaningful interactions between people and nature. As such, cultural goods and services represent the newest way of interpreting human-environment relations: a 21st Century framing in a sequence covering millennia through which societies have expressed the centrality of the natural environment in supporting human life and well-being. However, evidence presented in the early section of this chapter shows that 'ecosystem' and 'ecosystem services' were not words to be found in popular discourse. The implication is that the expert knowledge captured in such terms is unlikely to be shared among the wider public. It follows that using these terms is unlikely to be the most effective means of communicating knowledge about how human life and well-being is dependent upon the earth's geophysical, hydro-meteorological and biological systems. The linguistic analysis shows that the cloud of words people associate with the idea of 'nature' and the 'natural environment' are much more meaningful.

Moreover, there are clearly articulated individual and social values which arise from human interaction with nature. Cultural analysis explores the production, circulation and reception of shared meanings and practices, including those with the natural world. Communicating the cultural significance of nature in everyday life—especially in ways which emphasise its positive benefits rather than resorting to the clichés of destruction and despair which have marked environmental discourse over the last four decades—is very important for the mobilisation of wider public support for sustainable environmental management.

In this chapter, the argument is made for a more theoretically informed approach to the definition of cultural services and goods. The MA (2005)'s approach to cultural services and the 'non-material' benefits of ecosystems, had to be flexible enough to embrace countries at very different stages of economic development and with divergent systems of knowledge. For the UK NEA, and acknowledging the insight from Fisher *et al.* (2008) that final ecosystem services include the application of human as well as natural capital, leads us to argue for a final cultural ecosystem service, defined as 'environmental settings which provide the sites for human interactions with nature and others'. Environmental settings range in geographical scale from domestic gardens to regional landscapes, but are distinct from habitats or ecosystems as they are, culturally, the locations within which people interact with one another and with nature. Environmental settings are also spatially delimited, which is useful since they are units for which spatially disaggregated data exists or can be collected. This can then be integrated with other data on ecosystem services to ensure cultural services are readily incorporated into assessments and studies seeking to enhance the management of ecosystems.

In the UK NEA conceptual framework (Chapter 2) wild species diversity is identified as contributing to both provisioning and cultural services. As discussed earlier in this chapter in Section 16.3.1, human interactions with wild animals and plants, usually as components of environmental settings, can generate a range of cultural goods which would benefit from further research. Wild species and ecosystem services are considered in detail in Chapters 3 and 15 concerned with biodiversity and provisioning services.

The argument has been made for environmental settings to be identified as a final ecosystem cultural service. A mixed picture of changes in the character and quality of environmental settings since 1945 has emerged from the evidence presented in the chapter. The growth of cities and towns means that for many people their local environmental settings are urban, dominated by buildings and transport infrastructure. However, increased mobility afforded by the massive expansion of car ownership among the UK's population and the introduction of cheaper air travel has dramatically increased accessibility to a huge variety of environmental settings both in the UK and elsewhere. Quite marked changes have occurred in environmental settings in some peri-urban locations, but elsewhere, the nature of these settings has changed far less. Urbanisation since 1945 has also been accompanied by the emergence of a series of protected environmental settings ranging from Local Nature Reserves to National Parks.

The cultural goods linked to environmental settings are many, so this chapter has concentrated on a limited number that could be readily identifiable and for which some quantitative or qualitative data could be used to assess their characteristics. The chapter has focused on health, tourism/leisure/recreation, heritage, education/ecological knowledge and religious goods.

New evidence gathered as part of the economic valuation for the UK NEA (Chapter 22) measured the economic value of environmental settings and cultural goods, and their contribution to well-being. Specifically, a new hedonic price analysis showed that the house market in England reveals substantial amenity value attached to a number of habitats, designations, private gardens and local environmental settings. In particular, protected areas (National Parks, National Trust land and metropolitan green belt), local environmental settings (domestic gardens, local greenspaces, rivers) and several habitats (such as woodland, farmland and freshwater) are a statistically significant factor in explaining higher house prices (Chapter 22). In parallel, a new well-being survey also revealed that respondents who visit non-countryside greenspaces, such as urban parks, at least once a month, and those who spend time in their own gardens at least once a week, have higher life satisfaction than those who do not. Survey respondents who used domestic gardens at least once a week and local greenspaces at least once a month also showed better self-reported health, measured by physical functioning and emotional well-being, compared to those who do not; in addition, having a view over greenspace from one's house was seen to have a significantly positive impact on emotional well-being (Chapter 22).

The contribution of environmental settings to human well-being stems from their ability to satisfy human needs in context-specific ways. Given the scale of attempting a

global assessment, the MA was not able to drill down into specificities of how cultural meanings and values might be satisfied through interactions with nature. In this chapter, we have argued that working with the H-SDM, conceived by Max-Neef (1989; 1992), could provide a useful framework for more detailed exploration of cultural ecosystem goods and benefits. The H-SDM identifies four human existence needs (to be, to have, to do and to interact) and nine human value needs, (e.g. subsistence, understanding, freedom and leisure). Some cultural goods arising from interactions with environmental settings may well be what the H-SDM terms 'synergistic satisfiers', i.e. satisfying a number of different needs at the same time. Other goods may act more as 'singular satisfiers', meeting just one need is satisfied at a time. Other possibilities were also discussed, such as the ways in which modern consumption practices have been able to substitute technology for nature as in, for example, artificial settings for natural settings. We have drawn on the H-SDM to help create a rational framework for the discussion. The next step would be to undertake empirical research to test its robustness.

More generally, there are major problems with the lack of evidence to underpin any assessment of cultural ecosystem services and goods. Drawing on what data are available, we have begun to open up discussion about how environmental settings and related cultural goods meet human needs, often in a contingent manner, with needs satisfaction varying markedly between individuals and in different settings. This is only a part of the process of developing an ecosystem service approach to the natural environment that is based on evidence concerning the cultural aspects of human-nature relations.

A key research agenda is to deepen knowledge and understanding of the interactions between human needs and ecosystem services. This will require more theoretical development combined with substantial methodological innovation in the collection and analysis of data, both quantitative and qualitative. These innovations will also need to be designed to understand the inequalities that currently exist in terms of how people experience the goods and benefits of cultural services.

Improvements in the collection of quantitative data at the national level are required to facilitate further economic valuation studies, especially of health goods, heritage goods and ecological knowledge. Existing guidance from the Department for Environment, Food and Rural Affairs (Fish *et al.* 2011) indicates, however, that understanding the complex economic, social, cultural and psychological dimensions of the individual and collective interactions between humans and ecosystems also requires qualitative studies using multi-criteria analysis and participatory deliberative techniques. Such techniques must be underpinned by high quality information and clear conceptual frameworks to guide the deliberations of organisations and people taking part (Fish *et al.* 2011). The UK NEA's economic valuation (Chapter 22) has provided new quantitative knowledge that can reliably inform these qualitative techniques, and the H-SDM provides one conceptual approach to ensure future studies are rigorous in covering all aspects of human needs that will be affected by ecosystem services.

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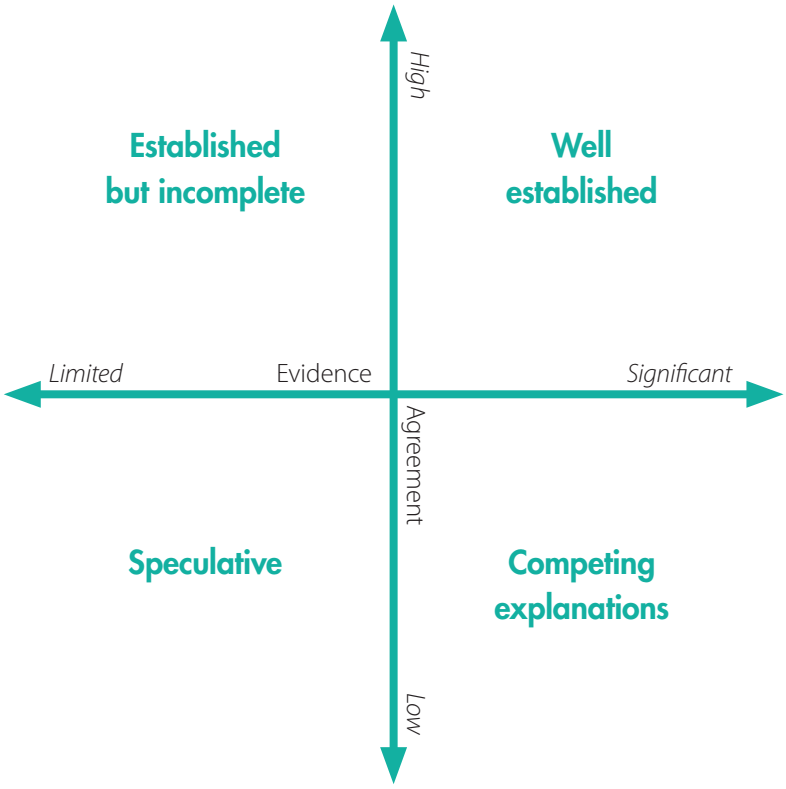
Appendix 16.1 Approach Used to Assign Certainty Terms to Chapter Key Findings

This chapter began with a set of Key Findings. Adopting the approach and terminology used by the Intergovernmental Panel on Climate Change (IPCC) and the Millennium Assessment (MA), these Key Findings also include an indication of the level of scientific certainty. The 'uncertainty approach' of the UK NEA consists of a set of qualitative uncertainty terms derived from a 4-box model and complemented, where possible, with a likelihood scale (see below). Estimates of certainty are derived from the collective judgement of authors, observational evidence, modelling results and/or theory examined for this assessment.

Throughout the Key Findings presented at the start of this chapter, superscript numbers and letters indicate the estimated level of certainty for a particular key finding:

1. *Well established:* high agreement based on significant evidence
2. *Established but incomplete evidence:* high agreement based on limited evidence
3. *Competing explanations:* low agreement, albeit with significant evidence
4. *Speculative:* low agreement based on limited evidence



a. *Virtually certain:* >99% probability of occurrence
b. *Very likely:* >90% probability
c. *Likely:* >66% probability
d. *About as likely as not:* >33–66% probability
e. *Unlikely:* <33% probability
f. *Very unlikely:* <10% probability
g. *Exceptionally unlikely:* <1% probability

Certainty terms 1 to 4 constitute the 4-box model, while *a* to *g* constitute the likelihood scale.