



## **“The True Value of Nature” Natural England’s Draft Policy on Ecosystems Approach**

### **Overview**

*Ecosystem services* are (by recent convention) the *goods* (e.g. food, fibre and clean water) and the *services* (e.g. water purification, pollination and climate regulation) which are provided by ecosystems. They sustain human well being. The ecosystem services concept has its origins in the 1970s but has risen to prominence following the publication in 2005 of the UN sponsored *Millennium Ecosystem Assessment (MA)*. An ecosystem is an area of land or water with interacting living and non-living components. Ecosystem services therefore flow not only from our work on biodiversity, but also that on geodiversity and landscape.

An important aspect of an ecosystems approach is that it aims to treat the natural environment holistically; on the one hand weighing the impact of society on the natural environment, and on the other seeking to ensure a supply of ecosystem services from which society benefits.

In the mid 20<sup>th</sup> century we conserved sites, at the end of the 20<sup>th</sup> century we extended our reach to the rest of the natural environment. In the 21<sup>st</sup> century we have come to recognise that these two paradigms for environmental conservation are, on their own, inadequate. We continue to record widespread and substantial decline in quantity and quality of our environment because society does not adequately appreciate the importance and value of a healthy natural environment, nor the cost of an unhealthy natural environment. A third paradigm, the ecosystems approach, will allow us to build on previous paradigms, but not abandon our existing approaches, to reveal to the public the true value of a healthy natural environment and embed the natural environment into societal decisions about our future.

The concept has relevance across all four of Natural England’s Strategic Outcomes and provides us with a systematic framework for our statutory duty to “conserve, enhance and manage the natural environment for the benefit of present and future generations”.

There are a growing number of examples where on-the-ground delivery of an explicit ecosystems approach is occurring. A major opportunity exists for Natural England to pioneer such an approach.

Invariably ecosystems deliver a complex suite of services. The most widely applied classification of ecosystem services is that of the Millennium Ecosystem Assessment (Annex 2) which divides services into:

- a) Provisioning services (e.g. food, fuel and fibre)

- b) Regulating services (e.g. flood control, carbon sequestration)
- c) Cultural services (e.g. inspiration, recreation, ecotourism)
- d) Supporting services (e.g. soil formation, photosynthesis)

Our ecological knowledge of the individual ecosystem services in England is variable. For example we have a good understanding of how and where inter-tidal habitats deliver *natural hazard regulation* (i.e. limit the incidence of coastal flooding events). We know rather less about the role of ecosystems in *water regulation* (i.e. controlling inland run off, flooding and aquifer recharge) and how the general public value *biodiversity* and many cultural services.

There are certainly significant costs involved in having an unhealthy natural environment, in terms of water quality, flood risk and loss of other services.

However in most environmental decisions the resultant change to ecosystem services is seldom considered. We recognise the intrinsic value of the natural environment and that many benefits society derives from the natural environment, such as inspiration and sense of personal identity, are difficult to capture in monetary terms. We must sensitively understand societal preferences.

However the appropriate application of economic valuation methods to ecosystem services may be of great assistance to our decisions. This requires significant development of methods, relies upon correct ecological understanding and is an important challenge for Natural England to meet.

### **Summary of Natural England's draft policy on Ecosystems Approach**

Natural England believes that:

Our decisions about the natural environment should seek to maintain the provision of ecosystem services wherever this is compatible with our responsibilities for the natural environment, and our respect for its intrinsic value.

The value of the natural environment is not adequately recognised by society and it is crucial that people understand the links between their own well-being and the value of services provided by the natural environment.

Action is necessary from all sectors of society, including government, business, NGOs and local communities, to support the provision of ecosystem services.

We require new mechanisms for the delivery of an ecosystem services approach including innovative financial and other instruments.

Investment in the natural environment informed by economic analysis, is necessary to deliver ecosystem services which are critical to the well-being of present and future generations.

## Annex 1: Natural England's Ecosystems Approach Draft Policy

### Context

Ecosystem services are the goods (e.g. food, fibre and clean water) and services (e.g. water purification, pollination and climate regulation) ecosystems provide, and which sustain human well-being. The publication of the Millennium Ecosystem Assessment in 2005 focused attention on the deteriorating condition of the world's ecosystems and so a decline in the services they provide. The concept of ecosystem services and a concern about the condition of our ecosystem services has since then emerged rapidly as a focus for natural environment policy in the UK, the European Union and globally. This includes the publication in 2007 by Defra of *Securing a healthy natural environment :An action plan for embedding an ecosystems approach*.

Although Natural England considers ecosystems are of importance for their intrinsic value, the concept of ecosystem services has relevance across all four of Natural England's Strategic Outcomes. It potentially provides us with a systematic framework for carrying out our statutory duty to "conserve, enhance and manage the natural environment for the benefit of present and future generations".

In the absence of a lead from Natural England there is a risk that the concept could be applied inappropriately to policy and decision making. This could undermine our work (e.g. by placing emphasis upon the delivery of a single service such as water at the expense of biodiversity or landscape).

Natural England has an important role to play in the development and application of the ecosystem services concept. Our breadth of purpose, our remit and our expertise uniquely allow us to understand and lead in this challenge. In addition our delivery powers allow us to innovate and demonstrate the approach on the ground.

### Issues

A preliminary assessment of ecosystem services in England has concluded that 9 out of 19 broad habitats were experiencing change which impacted adversely upon service provision. Five out of 8 services showed evidence of being impaired, or in decline. Climate change may further impact upon provision of services, yet at the same time require enhanced service provision with regard to *climate regulation* and other services.

Our ecological knowledge of the individual ecosystem services in England is variable. For example we have a good understanding of how and where inter-tidal habitats deliver *natural hazard regulation* (i.e. limit the incidence of coastal flooding events). We know less about the role of ecosystems in *water regulation* (i.e. controlling inland run off, flooding and aquifer recharge) and how the general public value *biodiversity* and cultural services. Although we must learn more, we must not put off important decisions.

In most environmental decisions the resultant change to ecosystem services is seldom considered. Whilst we recognise the intrinsic value of the natural environment, the application of economic valuation methods to ecosystem services may be of great assistance to our decisions. This requires significant development of methods, relies upon correct ecological understanding and is an important challenge for Natural England to meet.

## Policies

### Policy 1. Ecosystem services integral to decisions

**Our decisions about the natural environment should seek to maintain the provision of ecosystem services wherever this is compatible with our responsibilities for the natural environment, and our respect for its intrinsic value.**

We have stated “*Natural England is here to conserve and enhance the natural environment, for its intrinsic value, the wellbeing and enjoyment of people and the economic prosperity that it brings*”. This statement emphasises that there are both ethical and practical benefits to be derived from the conservation and enhancement of the natural environment.

Ecosystems comprise the interacting living and abiotic parts of the environment. Some services derive from living organisms, such as pollination; others such as groundwater and aquifer storage are largely due to abiotic components. Our ability to represent the utilitarian benefits of the natural environment has been extremely limited in the past and few decisions have explicitly taken these additional reasons for protecting the natural environment into account.

Although we are increasingly able to state the **costs** of natural environment protection we have had no systematic way of representing the associated **benefits**. Ecosystem services provide us with a nationally and internationally recognised framework for the identification and valuing of the contribution the natural environment plays in the delivery of human well-being. This means that we need to apply a scientifically and economically literate approach to ecosystem services. However the biological, chemical and physical processes which deliver many ecosystem services are incompletely understood. Some, such as the cultural value attached to biodiversity and landscape, are technically difficult to value economically and at times other approaches to valuation may be preferable. We will over time develop our knowledge base to improve our decision making and advice.

#### Evidence

A clear illustration of how ecosystem services valuation can promote natural heritage protection is provided by saltmarsh. It has been estimated that an 80m deep zone of saltmarsh fronting sea walls can save £4,600 per metre in sea defence costs.

An analysis of community woodlands in Wantage, Oxfordshire estimated that the economic benefit of an incomplete suite of ecosystem services was more than double the cost. To illustrate ecological uncertainty, it is unclear where, and if, farmland soils in England are currently sequestering or losing carbon and which factors drive any change. In addition to the general difficulty of pricing non-market goods economic valuation of the cultural value attached to biodiversity is particularly difficult.

The cost of an unhealthy natural environment is high. The annual cost in England and Wales of removing agricultural contaminants in drinking water is £128 million.

### Policy 2. Better public understanding

**The value of the natural environment is not adequately recognised by society and it is crucial that people understand the links between their own well-being and the valuable services provided by the natural environment.**

Ecosystem services are not just of importance to those with an enthusiasm for protection of the natural environment. All members of our society rely heavily upon ecosystems to provide services such as wholesome food, clean water and flood protection. Many individuals may not however understand how they depend upon the natural environment. This is of grave concern in our society, as it inhibits meaningful societal choices about the environment being expressed. More importantly it may result in ill advised decisions on behalf of the public, which damage the provision of ecosystem services. Natural England has a clear responsibility to communicate to wider society about the interdependence of human well-being and the natural environment, so that appropriate decisions will gain support.

### Evidence

The term ecosystem services has rapidly developed a wide currency amongst a range of audiences, and clearly communicates a concept which many find meaningful in the context of policy and decision making.

Defra funded research has explored public understanding of the terms “ecosystems” and “biodiversity” and found a very low level of public understanding. Use of the term “service” was also widely misinterpreted. This same research found that the general public have little concern that the environment is under serious threat but attached real value to aspects of the environment such as green space which more directly enhance people’s lives. On going Defra funded research at Aberystwyth University is seeking to establish the value of ecosystem services delivered by the UK Biodiversity Action Plan. Communicating meaningfully with the public about ecosystem services, in order to capture the value they attach to them has proved to be a major methodological problem due to limited public understanding of the relevant issues. However the concept of ecosystem services has been found generally understandable by focus groups, even if the vocabulary itself is initially off-putting.

### **Policy 3. Society engaged**

**Action is necessary from all sectors of society, including government, business, NGOs and local communities, to support the provision of ecosystem services.**

Although ecosystem services benefit both private citizens and commercial businesses, this dependence is not always apparent to those who receive benefit. This is in large part due to the fact that although some services such as clean water and fibre are bought and sold, most ecosystem services such as climate regulation and flood control are *public goods*. They are provided at no charge to a diverse range of beneficiaries but those who own the land or waters which provide the service receive no payment or other reward. Typically ecosystem services are open to over exploitation or degradation.

Government and other public bodies have an important role to play in the regulation of services to prevent their over exploitation or loss. Payments and other incentives to providers in order to maintain a supply of services is a second option open to governments, not least to meet any additional costs of service provision.

There are significant areas of publicly owned land in England and so public bodies play a major role as direct providers of ecosystem services. However the majority of England is managed for commercial purposes, so business is both a major provider of ecosystem services (particularly the land and water based industries) as well as a beneficiary from services, as for example the insurance industry and its customers’ benefit from flood regulation. To varying degrees all industries require usable water,

clean air and climate regulation. Business can also damage ecosystem services as an unintended consequences of its actions, for example through pollution to air and water and built development. Business therefore has a complex role to play in the protection and enhancement of ecosystem services.

Collectively private individuals impact upon ecosystem services profoundly through their choices, as for example in the consumption of water and use of phosphate based detergents and motor vehicles. Private citizens also act as members and supporters of Non-Governmental Organisations (NGOs), which, in addition to their advocacy and education role are major landowners, and responsible for the provision of a diverse range of ecosystem services.

### Evidence

There is extensive environmental regulation in England and this has played a major role in controlling for example certain types of air and water pollution, tree felling and planting. However the effectiveness of regulation in maintaining ecosystem services is less clear, as for example where compliance monitoring and so enforcement is not practicable.

Natural England, owns and manages 95,859 ha. of land and water as National Nature Reserve, providing ecosystem services which range from biodiversity conservation to flood defence and carbon storage. The Forestry Commission owns and manages c.260,000ha. for public benefits. The National Trust has c.3.56 million members and owns c.250,00 ha. in England, Wales and Northern Ireland, the RSPB has c.1 million members and owns and manages 140,441ha. in Britain. Other NGOs with large memberships and significant land holdings include The Wildlife Trusts and Woodland Trust. The Ministry of Defence, Local Authorities and other public bodies are also major land owners and managers.

Natural England has £2.9 billion to fund agri-environment schemes between 2007 and 2013. This represents the single largest investment in ecosystem services in England. Similarly the Forestry Commission spent £68.9 million on the England Woodland Grant Scheme in 2007/8. Adverse land management practices impose significant additional costs upon the water industry due to nutrient increase and siltation. In recent decades extreme weather events have imposed significant major costs upon the insurance industry, strengthening the case for an ecosystem approach.

### **Policy 4. Innovative support mechanisms**

#### **We require new mechanisms to deliver an ecosystems approach, including innovative financial and other instruments.**

Whilst regulation is in place to maintain certain ecosystem service provision (e.g. recreational access under the Countryside and Rights of Way Act 2000), this does not of itself resource positive management. Time limited, land management contracts through agri-environment schemes are currently the main system for rewarding ecosystem service provisioning in England and the rest of the EU. However such schemes cannot be expected to deliver all ecosystem services because of limited funds and the fact they do not operate in the marine environment and urban environment nor relate to most forestry land. Further sources of funding or other incentives are therefore required.

In other parts of the world a range of initiatives to create markets in ecosystem services have been employed; these reward and resource ecosystem service provision. Tax incentives and easements employed elsewhere offer the possibility of

rewards for service provision with reduced administrative costs, provided adequate compliance monitoring is in place. Although it is unlikely that such approaches will capture the full value of ecosystem services, they have the potential to reveal more tangibly society's reliance upon a healthy natural environment.

### Evidence

The Millennium Ecosystem assessment included a programme relating to the role of business in ecosystem service protection. This has more recently been followed by a Corporate Ecosystem Services Review by the World Resources Institute, Meridian Institute and World Business Council for Sustainable Development, published in 2008.

The Katoomba Group, an international business association founded in 1999, has been promoting markets for ecosystem services since 1999, through regular meetings and other networking activities. In the USA and in other parts of the world The Nature Conservancy has been developing the use of a wide range of economic mechanisms to support ecosystem services, with businesses, local communities and governments, including market, easement and taxation based approaches.

### **Policy 5. Investment in ecosystems**

**Investment in the natural environment informed by economic analysis, is necessary to deliver ecosystem services which are critical to the well-being of present and future generations.**

The wealth of current and future generations is dependant upon its store of natural capital capable of delivering essential goods and services. England's store of natural capital is largely in the form of ecosystems. Maintaining and restoring healthy, natural ecosystems (as measured by their ability to sustainably deliver ecosystem services and maintain their intrinsic value) is therefore critical to the economic, social and personal well-being of the people of England.

We recognise that many benefits of the natural environment, such as the way it inspires us, are not easily given monetary value. However the on-going G8 project *The Economics of Ecosystems and Biodiversity* (TEEB) will be an analysis of how global ecosystem degradation is impacting economically on human well being. A National Ecosystem Assessment is now proposed by Defra. These initiatives are likely to reveal where much of the investment in ecosystems is now required and demonstrate the value of economic analysis in guiding such decisions.

Human pressures have significantly reduced the ability of many ecosystems to function, and so deliver ecosystem services. In addition, increased frequency of extreme events and stress on ecosystems due to climate change may further decrease provision of ecosystem services without investment. Natural England has invested significantly in the natural capital of healthy ecosystems on behalf of the public. If we are to sustain a healthy, wealthy and culturally vibrant society further investment in our ecosystems is needed, particularly if they are to remain resilient in the face of new pressures caused by climate change, increased population and other factors.

### Evidence

A preliminary review of ecosystem services in England concluded that 9 of 19 broad habitats were experiencing change which impacted upon service provision. Five out

of 8 services showed evidence of being impaired or in decline. Significant and sustained diversity loss is recorded in all three of the best recorded groups of organisms i.e. higher plants, butterflies and birds. This is likely to be indicative of change in less well recorded wildlife.

Although its cause is not understood Colony Collapse Disorder has resulted in major losses of pollination services provided by domesticated bees in North America and cases are reported in Europe. Future pollination services may increasingly rely upon wild species of bee and other insects living in natural ecosystems. It is projected that in the next 50 years 12,500 ha of inter-tidal habitat will be lost, along with its flood protection, carbon sequestration, nutrient sequestration, sediment trapping, fish nursery and other services.

## Annex 2: Millennium Ecosystem Assessment Classification of Ecosystem Services

**Ecosystem services** are the benefits people obtain from ecosystems. These include provisioning, regulating and cultural services that directly affect people and the supporting services needed to maintain other services. Many of the services listed here are highly interlinked (primary production, photosynthesis, nutrient cycling and water cycling, for example, all involve different aspects of the same biological processes). This list is not comprehensive and omits health benefit of the natural environment, and the cultural value of biodiversity and landscape.

<p><b>Provisioning services.</b> These are the products obtained from ecosystems, including:</p> <ul style="list-style-type: none"> <li>• <b>food.</b></li> <li>• <b>fibre.</b></li> <li>• <b>fuel.</b></li> <li>• <b>genetic resources.</b></li> <li>• <b>biochemicals, natural medicines, and pharmaceuticals.</b></li> <li>• <b>ornamental resources.</b></li> <li>• <b>fresh water.</b></li> </ul>	<p><b>Regulating services.</b> These are the benefits obtained from the regulation of ecosystem processes, including:</p> <ul style="list-style-type: none"> <li>• <b>air quality regulation.</b></li> <li>• <b>climate regulation.</b></li> <li>• <b>water regulation.</b></li> <li>• <b>erosion regulation.</b></li> <li>• <b>water purification and waste treatment.</b></li> <li>• <b>disease regulation.</b></li> <li>• <b>pest regulation.</b></li> <li>• <b>pollination.</b></li> <li>• <b>natural hazard regulation.</b></li> </ul>
<p><b>Cultural services.</b> These are the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences, including:</p> <ul style="list-style-type: none"> <li>• <b>cultural diversity.</b></li> <li>• <b>spiritual and religious values.</b></li> <li>• <b>knowledge systems (traditional and formal).</b></li> <li>• <b>educational values.</b></li> <li>• <b>inspiration.</b></li> <li>• <b>aesthetic values.</b></li> <li>• <b>social relations.</b></li> <li>• <b>sense of place.</b></li> <li>• <b>cultural heritage values.</b></li> <li>• <b>recreation and ecotourism.</b></li> </ul>	<p><b>Supporting services.</b> These underpin the production of all other ecosystem services.</p> <ul style="list-style-type: none"> <li>• <b>soil formation.</b></li> <li>• <b>photosynthesis.</b></li> <li>• <b>primary production.</b></li> <li>• <b>nutrient cycling.</b></li> <li>• <b>water cycling.</b></li> </ul>