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An introductory guide to valuing ecosystem services



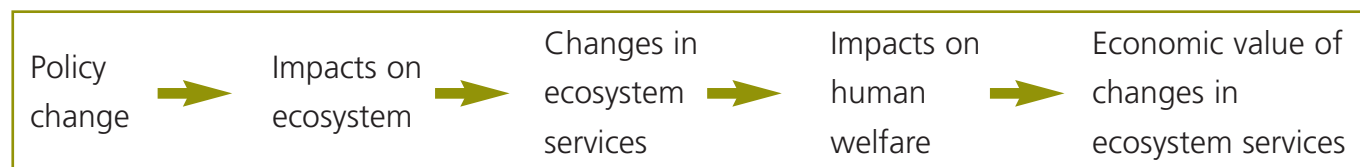
Executive Summary

- i The aim of this Guide is to provide an introduction to the valuation of ecosystem services. It builds on previous approaches to valuing the environment but takes a more systematic approach to the assessment of impacts on the natural environment. The central theme of this work is to ensure that the true value of ecosystems and the services provided are taken into account in policy decision-making.
- ii Ecosystem services are defined as services provided by the natural environment that benefit people. While there is no single, agreed method of categorising all ecosystem services, the Millennium Ecosystem Assessment framework is widely accepted and is seen as a useful starting point.
- iii Ecosystem services provide outputs or outcomes that directly and indirectly affect human wellbeing, and these considerations can link well to taking an economic approach. The underlying case for the valuation of ecosystem services is that it will contribute towards better decision-making, by ensuring that policy appraisals fully take into account the costs and benefits to the natural environment and by highlighting much more clearly the implications for human wellbeing, while providing policy development with new insights.
- iv Some of these ecosystem services are well known including food, fibre and fuel provision and the cultural services that provide benefits to people through recreation and appreciation of nature. Other services provided by ecosystems are not so well known. These include the regulation of the climate, the purification of air and water, flood protection, soil formation and nutrient cycling. These services are not generally considered within policy appraisal at present and represent an area where a greater and more systematic focus would be very useful.
- v The appraisal of new policies, programmes and projects all require environmental impacts to be taken into account. The approach to the valuation of ecosystem services presented in this Guide is not intended to be an additional step within the appraisal process but, instead, a common methodology that can be used in order to consider the impact of our actions on the environment. The environmental impacts currently taken into account in policy appraisal can generally fit well within this broad framework.
- vi This broader framework allows a shift in emphasis from a focus mainly on valuing environmental damage to highlighting the value of changes in the services provided by the natural environment. Ecosystem services contribute to economic welfare in two ways – through contributions to the generation of income and wellbeing and through the prevention of damages that inflict costs on society. Both types of benefits should be accounted for in policy appraisal. With a broader focus on valuing the benefits provided by ecosystems, policy options that enhance the natural environment are also more likely to be considered that demonstrate that investing in natural capital can make economic sense.

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- vii This Introductory Guide provides a practical introduction to the key steps to be undertaken in valuing ecosystem services in a policy appraisal context. The Guide takes an impact pathway approach to valuing ecosystem services. An overview of the impact pathway approach is presented below:

Overview of impact pathway of policy change



- viii In summary, the key steps are:
- 1 Establish the environmental baseline.
 - 2 Identify and provide qualitative assessment of the potential impacts of policy options on ecosystem services.
 - 3 Quantify the impacts of policy options on specific ecosystem services.
 - 4 Assess the effects on human welfare.
 - 5 Value the changes in ecosystem services.
- ix Following these steps can help to ensure a more systematic approach to accounting for impacts on ecosystems. Even an initial screening within a policy appraisal of what ecosystem services are affected, how potentially significant these impacts could be and developing an understanding of the key uncertainties and gaps in evidence can be useful first steps towards integrating these considerations into policy appraisal.
- x It is recognised that there is considerable complexity in understanding and assessing the causal links between a policy, its effects on ecosystems and related services and then valuing the effects in economic terms. Integrated working with policy, science and economics disciplines will be essential in implementing this approach in practice. The critical importance of the links to scientific analysis, which form the basis for valuing ecosystem services, needs to be recognised.
- xi A range of methodologies are available to value changes in ecosystem services. These values are considered in a Total Economic Value framework that takes into account both the use and non-use values individuals and society gain or lose from marginal changes in ecosystem services. As many ecosystem services are not traded in markets, and therefore remain unpriced, it is necessary to assess the relative economic worth of these goods or services using non-market valuation techniques.
- xii The type of valuation technique chosen will depend on the type of ecosystem service to be valued, as well as the quantity and quality of data available. Some valuation methods may be more suited to capturing the values of particular ecosystem services than others. Benefits transfer, which applies economic values that have been generated in one context to another context for which values are required, is also discussed. The use of such transfers is seen as being essential to the more practical use of environmental values in policy-making.

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- xiii The valuation methodologies discussed are not new in themselves. The challenge is in their appropriate application to ecosystem services. The ecosystem services framework emphasises the need to consider the ecosystem as a whole and stresses that changes or impacts on one part of an ecosystem have consequences for the whole system. Therefore, considering the scale and scope of the services to be valued is vital if we are to arrive at any meaningful values.
- xiv Key challenges in the valuation of ecosystem services relate to how ecosystems interrelate to provide services and to dealing with issues of irreversibility and high levels of uncertainty in how ecosystems function. All of this suggests that, while valuation is an important and valuable tool for good policy-making, it should be seen as only one of the inputs in decision-making.
- xv At the same time, the use of ecosystem services as a framework for valuation presents important opportunities to incorporate a wider range of environmental impacts in policy appraisal work in the future. Methodologies to deal with these challenges that account systematically for all the impacts on ecosystems and their services are very much in development. This does not mean that the valuation of ecosystem services cannot be taken forward now – and indeed the priority is that it should be. However, it is recognised that it will be a long-term challenge for those involved in policy appraisal to fully take into account all the impacts on ecosystems and ecosystem services.
- xvi The case study – a flood and coastal erosion risk management scheme – provides a good illustration of the many issues and lessons learned in applying the valuation of ecosystem services to a policy and project appraisal context. The case study is considered with reference to the impact pathway approach and illustrates how such an approach can work in practice. It demonstrates how the ecosystem services valuation framework can be material and useful, despite imperfect information, both in terms of selecting or ruling out certain options, and in directing attention towards the most important data gaps and uncertainties that may have a bearing on the results of appraisals.
- xvii This case study shows the uncertainty surrounding the absolute value of the ecosystem services resulting from uncertainty concerning both the physical changes in ecosystem services and the appropriate monetary values to apply to these changes. However, the work also demonstrates that the ‘perfect’ ecosystem service valuation may not be necessary for many appraisal purposes. Practical appraisals need to compare the relative magnitude of changes in the provision of ecosystem services across different options, and this can be possible even with limited availability and precision of scientific and economic information. In most cases, it should be possible to present a robust assessment, with suitable sensitivity analysis, highlighting the key uncertainties and exploring their implications.
- xviii This Guide is a first step in Defra’s aim to better integrate impacts on the natural environment in decision-making. It is purposely ‘introductory’ recognising that further testing and development is needed to operationalise this approach in policy and project appraisal in Defra, the Defra network and beyond.

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- xix The Introductory Guide has been published alongside ***Securing a Healthy Natural Environment: An Action Plan for embedding an ecosystems approach***¹ which includes specific priorities for Defra and others in moving towards an ecosystems approach in policy-making and delivery. The Action Plan provides a clear overview of the principles and benefits of an ecosystems approach and sets out key steps to take the work forward. Ensuring that the value of ecosystem services is fully reflected in decision-making is one of the core principles outlined in the Action Plan.
- xx Specific priorities for Defra and others in progressing the development of ecosystem services valuation include piloting the practical application of ecosystem services valuation in specific policy areas. If we can demonstrate that valuing ecosystem services is both practical and useful, in the longer term our aim would be to mainstream this approach in existing policy and project appraisal tools and guidance.

¹ <http://www.defra.gov.uk/wildlife-countryside/natres/eco-actionp.htm>