Eurosite

A SHORT INTRODUCTION TO ECOSYSTEM SERVICES **FOR SITE MANAGERS**

Photo: Mark van Dun

Nature provides numerous benefits to people. These benefits of nature are also known as ecosystem services. For example, healthy forest ecosystems can reduce air pollution, purify water and help mitigate climate change through storing and capturing CO_2 while delivering, in return, fresh oxygen into the atmosphere. The protection of nature and its ecosystem services are therefore vital for human kind.

Since biodiversity plays an important role in maintaining and enhancing ecosystem stability, thus underpinning the delivery of (more diverse) ecosystem services, protected natural sites deliver valuable benefits to society by protecting unique or threatened species and habitats.

ECOSYSTEM SERVICES CONCEPT:

The concept of ecosystem services was brought into widespread use by the *Millennium Ecosystem Assessment* (MEA) in 2005. The MEA describes ecosystem services as the '**benefits people obtain from these ecosystems**'. According to the Economics of Ecosystems and Biodiversity (TEEB) initiative from 2010, ecosystem services are: '**The direct and indirect contributions of ecosystems to human well-being**'. The EU process of Mapping and Assessment of Ecosystems and their Services (MAES) follows the same definition.

NATURA 2000

Life

ECOSYSTEM SERVICES HAVE BEEN MOST OFTEN CLASSIFIED IN THREE MAIN GROUPS OF SERVICES:

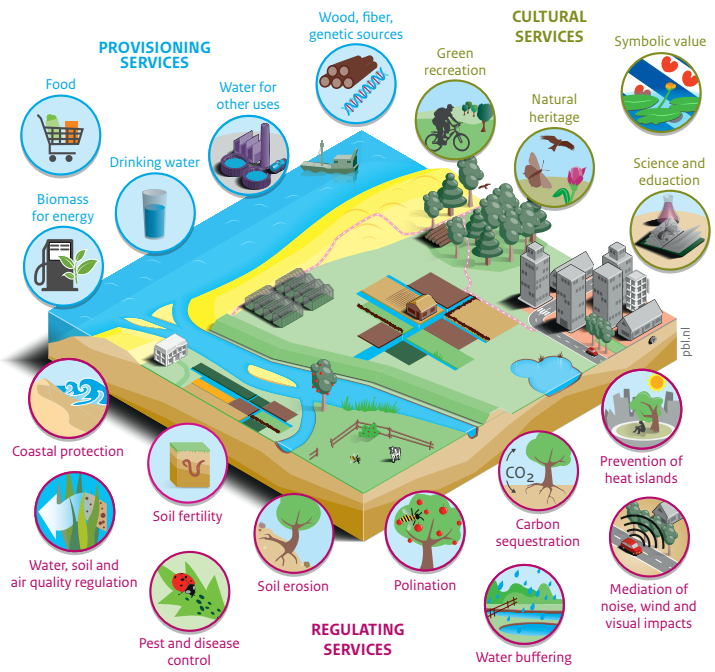
1. PROVISIONING SERVICES
comprise all the material/products obtained from ecosystems, such as food, water and timber.

2. REGULATING SERVICES
are defined as the benefits obtained from the regulation of ecosystem processes (climate regulation, regulation of water and air quality, flood control, control of soil erosion).

3. CULTURAL SERVICES
comprise the non-material benefits that ecosystems offer to people through spiritual enrichment, intellectual development, recreation and aesthetic experiences.

In the *Millenium Ecosystem Assesment* a fourth group was identified - the supporting services. However in more recent classifications these services are not distinguished any more.

Examples of ecosystem services



Source: PBL, WUR, CICES 2014

A detailed and the most commonly used classification of ecosystem services in the EU is: The Common International Classification of Ecosystem Services (CICES) (www.cices.eu). This classification is developed from the work on environmental accounting undertaken by the European Environment Agency (EEA). Nevertheless, there are other classifications globally and/or regionally used, while several countries have also produced their own national ecosystem services assessments.

WHY IS THE CONCEPT OF ECOSYSTEM SERVICES USEFUL FOR SITE MANAGEMENT?

Ecosystem services could be the tool to improve the link between the site managers on the one hand, and businesses, policy makers, governments (at different levels), and citizens on the other. This could increase the appreciation of, and understanding for nature and its conservation, and if wanted even help generate some additional funding.

However, the practice has shown that it is not that easy for the site managers to identify and demonstrate the ecosystem services their site provides. This is equally a challenge for deciding on the most appropriate management actions in a management plan; reporting on the benefits of a LIFE project; or communicating about this to the visitors and the general public. The reasons for this are that there is not enough knowledge and capacity among site managers to translate the existing scientific knowledge on this topic, into practical approaches and into factual arguments.

According to an European study 'The Economic benefits of the Natura 2000 Network' the benefits from the ecosystem services that Natura 2000 sites provide are estimated to €200 to €300 billion each year. It is also estimated that there are between 1.2 to 2.2 billion visitor days to Natura 2000 sites each year, generating recreational benefits worth between €5 and €9 billion per annum. This shows that Natura 2000, and other protected sites, can be a motor for the local and regional, but also national economy. Therefore, it can be important to integrate this aspect into the management planning process.

Additionally, for ecosystem services such as experiencing nature, soil quality, or water and air quality, it remains especially difficult to estimate their added value. This makes integrating them into practice and decision making difficult. Ecosystem services could be used to demonstrate the additional benefit of protecting the nature and biodiversity to the society – rather than just being perceived as an additional cost.

It can happen that a valuable ecosystem service is not taken into account and prioritized in decision making for its positive societal and economic contribution. While conservationists make their management plans based on conserving nature the scope of site managers can be broadened by also considering ecosystem services. The number and the level of ecosystem services a site delivers can be greatly influenced by restoration activities as well as the selection of management measures to be applied.

To summarise, identification and evaluation of the ecosystem services at different levels (site, region, country) can be a useful tool for decision making, communication and fund raising. Table 1 shows the different uses for ecosystem services, relevant for site managers, at different organisational levels.

TABLE 1

ECOSYSTEM SERVICES CONCEPT CAN BE APPLIED AT DIFFERENT LEVELS:

Level of application	Purpose
Country level	Influence on policy and decision makers by underlining the different benefits of the protected sites managed by the site managers.
Regional level	Fine-tuning and internal decision-making on which are the most important ecosystem services in a certain region.
Site level	Management - restoration measures and management plans
	Informing the public about the importance of the site
	Assessment of different plans and trade-offs between different ecosystem services (e.g. grassland vs forests)
	Generating income

Arrow shows how demand for more and high-quality information about ecosystem services rises from country to site level.

SOME EXAMPLES OF ECOSYSTEM SERVICES:

POLLINATION – Pollinators provide many benefits to humans. Many of our food crops such as apples, strawberries and tomatoes, as well as many wild flowers and trees, need visits by wild insects to transfer the pollen between plants leading to fertilization and the production of seeds and fruits. For some crops, it has even been demonstrated that insect pollination leads to higher yields and improved quality of the fruit or seeds. In the Netherlands 75% of the agricultural crops are dependent on in the wild-living insects for pollination. The value of wild bees to the profit of pears and strawberries has been estimated to be 10 and 5 million respectively. The total value of the wild bees population in the Netherlands has been estimated at 1.1 billion euro's each year.

HEALTH BENEFITS – Natural ecosystems are known to play an important role in supporting physical and mental health by providing possibilities for outdoors activities, recreation and relaxation. This especially benefits the development of children, but it also results in healthier and happier people in general. There are numerous studies showing that interaction with nature speeds up the healing process of patients (e.g. after surgery), which could potentially allow for significant savings in the health system. Furthermore, access to natural compounds also plays a significant role in modern pharmaceutical research and development, while protecting the diversity of species and habitats helps to maintain a wider variety of possibilities for tourism and recreation.

EXAMPLES OF AVAILABLE TOOLS FOR IDENTIFYING/ ASSESSING/ MAPPING/ VALUATING THE ECOSYSTEM SERVICES

Several tools and models have been developed to identify, assess, map and valuate ecosystems services (see for instance www.oppla.eu, www.guideToEs.eu and www.es-partnership.org/services/guidelines-toolkits/). Before choosing which tool or model to use, it is good to first consider the requirements your organisation has for mapping and assessment (valuation) of ecosystem services. Important questions to consider in this respect are:

1. Do we want to be able to use the tool in our organisation and if so which expertise do we have (complex tool/ easy to use tool)?
2. Do we have the budget to acquire a tool (can it be downloaded /ordered either for free or for a license)?
3. Which ecosystem services are we interested in (which and which type/ number of ecosystem services does the tool distinguish: Provisioning (P), Regulating (R), Cultural (C), Supporting (S))?
4. Do we want to monetarise services? What are the uncertainties that can arise during this process and how to resolve them?
5. Do we want to show the results in maps or not and do we have the spatial data needed?
6. Do we want to use the tool in a participatory planning process?
7. Do we want to review future scenarios or planning options or not?

As an example, for a small sample of the available tools that are applicable in more than one country, the answers to some of these questions are shown in the table below. Keep in mind that there are many more tools out there - more information about some of them can be found under Further reading.

	Public available?	Number of services included?	Monetarisation possible?	Does it produce maps?
1. The Corporate Ecosystem Services Review (ESR)	Yes - free	**35** (P:14, C:3, R:11 S:7)	No	No
2. CostingNature	Yes - free	Only bundles of ES	Yes	Yes
3. TESSA	Yes - free	7 (P:3, R:3, C:1)	Yes	No
4. QuickScan	No	Dependent on available maps of an area and decision rules included	Not yet	Yes
5. Tool for valuing conservation measures	Yes - free	14 (P:5, R:7, C:2)	Yes	No
6. InVest	Yes - free	17 (P:5, R:7, C:2, S:3)	Yes	Yes
7. The Protected Areas Benefits Assessment Tool	Yes - free	24	No	No

P: provisioning; R: regulating; C: cultural; S: supporting

FURTHER READING

The Millennium Ecosystem Assessment (2005) assessed the consequences of ecosystem change for human well-being. https://www.millenniumassessment.org/en/index.html

The Economics of Ecosystems and Biodiversity (TEEB) (2010): a global initiative focused on "making nature's values visible". Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. http://www.teebweb.org/

Mapping and Assessment of Ecosystems and their Services (MAES): Action 5 of the EU Biodiversity Strategy to 2020 calls Member States to map and assess the state of ecosystems and their services in their national territory with the assistance of the European Commission. https://biodiversity.europa.eu/maes

The Common International Classification of Ecosystem Services (CICES). https://cices.eu/

The Economic benefits of the Environment Natura 2000 Network - Synthesis Report (2013). http://ec.europa.eu/environment/nature/natura2000/financing/docs/ENV-12-018_LR_Final1.pdf

Oppla: knowledge marketplace where the latest thinking on ecosystem services, natural capital and nature-based solutions is brought together. https://oppla.eu/

Ecosystem Services Assessment Support Tool, a website with several models and tools. www.guideToEs.eu

A Guidance Manual for Assessing Ecosystem Services at Natura 2000 Sites (2014): The purpose of this manual is to provide a practical guide to the key steps involved in identifying, assessing, and communicating the value of ecosystem services – the outputs of ecosystems from which people derive benefits – at terrestrial Natura 2000 sites. Royal Society for the Protection of Birds. http://ww2.rspb.org.uk/Images/natura_2000_guidance_manual_tcm9-399208.pdf

Mapping Ecosystem Services (2017) by Benjamin Burkhard and Joachim Maes (Eds), provides a very good conceptual background for the concept of ecosystem services and gives a very broad overview of different approaches and tools for mapping and assessment of ecosystem services at different levels. https://ab.pensoft.net/articles.php?id=12837

Payment for Ecosystem Services (PES) schemes. An Italian LIFE project 'Making Good Natura' has developed innovative approaches to PES and has published a detailed manual about it. The manual helps users take decisions in the field and indicates how and when different activities should be undertaken. It leads the reader from the project outset, via the valuation of ecosystem services, to the final agreement on a payment scheme. http://www.lifemgn-serviziecosistemici.eu/EN/Documents/LIFE+MGN_Manual_EN.pdf

Eurosite

As it was mentioned before, the concept of ecosystem services can be useful for site managers. However, the application of the concept is not yet straightforward or already incorporated in the strategic decisions or day to day activities of site management organisation. Therefore, Eurosite's Economics and Ecosystem Services Working Group helps and supports the Eurosite members to take action and make ecosystem services work for them.

The Eurosite Economics and Ecosystem Services Working Group

The main goals of the Eurosite Economics and Ecosystem Services Working Group are to:

- raise awareness of the ecosystem services and natural capital concepts among the managers of protected sites;
- build capacity among site managers on how to implement ecosystem services in their day-to-day work by finding and sharing examples of practical applications;
- find ways to utilise the ecosystem services approach to generate additional funding for site management.

The Working Group was formed in 2013. It meets regularly throughout the year and holds annual demand-driven workshops on relevant topics.

Visit www.eurosite.org for more information.

This publication is financially supported by the European Union. The sole responsibility lies with the author – the Agency is not responsible for any use that may be made of the information contained herein.