



Ecosystem Science for Policy & Practice



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List of acronyms

CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CF	Cohesion Fund
CFP	Common Fisheries Policy
CICES	The Common International Classification of Ecosystem Services
COM	Commission Communications
CORINE	Coordination of Information on the Environment programme
CP	Cohesion Policy
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EEA	European Environment Agency
EFA	Ecological Focus Area
EHS	Environmentally Harmful Subsidies
EIA	Environmental Impact Assessment
EMFF	European Maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
GDP	Gross Domestic Product
GI	Green Infrastructure
GPP	Green Public Procurement

IA	Impact assessment
LIFE	Financial Instrument for the Environment
LULUCF	Land Use, Land Use Change and Forestry
MMR	Monitoring Mechanism Regulation
MSFD	Marine Strategy Framework Directive
NNL	No Net Loss
OPERAs	Operational Potential of Ecosystem Research Applications
PES	Payment for Ecosystem Services
RBMP	River Basin Management Plan
RDP	Rural Development Programme
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SEA	Strategic Environmental Assessment
SEEA	System for Environmental and Economic Accounts
TEN-T	Trans-European Transport Network
UNEP	United Nations Environment Programme
WAVES	Wealth Accounting and the Valuation of Ecosystem Services
WFD	Water Framework Directive

1. Introduction, aims and objectives

Ecosystem services and natural capital are addressed and/or influenced by a wide set of EU sectoral policies - and related policy instruments - dealing with the use of natural resources. Different policy sectors can be relevant to ecosystem services in two different ways. A range of EU sectors aim at sustainably managing natural resources with direct interdependency on specific ecosystem services (e.g. agriculture, fisheries and water management). Alternatively, a number of policy sectors are known to have negative impacts on biodiversity, ecosystem and related services (e.g. climate, bioenergy and transport).

Several existing EU policy instruments support the conservation and sustainable use of ecosystem services and natural capital. First and foremost, the Birds and Habitats Directives protect the “biodiversity baseline” underlining all ecosystem services. Furthermore, a range of sector specific instruments - such as the common EU policies for agriculture and fisheries (CAP and CFP), policies for the management of inland, coastal and marine areas (Water Framework Directive - WFD, Marine Strategy Framework Directive - MSFD), and policies supporting EU-wide cohesion and regional development – provide measures relevant for maintaining and sustainably utilising ecosystem services.

However, the existing EU policy framework for ecosystem services and natural capital remain far from optimal. The majority of the instruments, such as CAP, CFP and forest policies, are still primarily focused on regulating ecosystems from the point of view of specific natural resource - in other words single ecosystem services such as provisioning of food, fish and timber - rather than addressing the full range of services ecosystems provide. Ecosystem services and natural capital are also poorly integrated into the information and decision-support framework underpinning the development, implementation and assessment of EU policies (data, indicators, assessment procedures, monitoring and accounting etc.).

Consequently, work is needed to develop a comprehensive policy framework for the sustainable management of ecosystem services and natural capital in the EU. Effective integration is needed to minimise the damage to ecosystems caused by sectoral activities and maximise the positive contribution of these activities to conservation. The integration of ecosystem services into sectoral policies can also contribute to achieving wider policy goals and objectives in a sustainable manner. Finally, there is a need to explore the development of policy instruments, including innovative policy instruments such as market-based instruments, which can help to address ecosystem services in an effective manner.

This report presents the results of an EU policy audit that assesses the current level of integration of ecosystem services and natural capital into the current EU policy framework. It also identifies

key gaps, needs and opportunities for further integration, including policy instruments that can either support and/or that are required for integration. The analysis covers the following aspects: current level of and gaps and needs for further integration and uptake within key EU sectoral policies, high level and/or horizontal EU initiatives supporting integration, and identified opportunities for future integration in emerging policy areas. The purpose of this assessment is to provide a comprehensive overview of the current situation and outline the requirements for developing a comprehensive policy framework for the sustainable management of ecosystem services and natural capital in the EU.

D4.1 in the context of OPERAs

The assessment of policy needs and opportunities for operationalising the concepts of ecosystem services and natural capital (D4.1) has been developed under OPERAs work package 4 (WP4). The deliverable contributes to the following elements of the project:

- WP4 Tasks 4.2 – 4.4: D4.1 provides information on the broader policy and instrument landscape that underpins the development of a range of dedicated tools under WP4. It helps to identify how the instruments and tools developed in the context of OPERAs can contribute to the development and implementation of different (sectoral) policies in the EU. The integration assessment process applied here may also be developing into an OPERAs tool for use in the developing community of practice.
- WP 3 Task 3.3: The insights related to the role of ecosystem service accounting in supporting policy integration will be integrated into the WP3 work on accounting frameworks (D3.2)
- WP3 Task 3.4: D4.1 is an integral part of the research on institutional structure and governance systems for ecosystem services. In particular, it creates the basis for further work on the current level of integration into policies and governance, with further focus on synergies and trade-offs between different policies and their governance (D3.3).
- WP2 Exemplars: D4.1 provides the exemplars a general policy framework within which they can further develop their planned outputs and reflect their final results, with due links to the EU level needs and opportunities. The current assessment is focused at the EU level and the application of a similar approach within national exemplars is being considered, to offer complementary in-depth information at national / regional level.

2. Approach, materials and methods

2.1 Concepts and definitions

Ecosystem services: Ecosystem services are defined as the contributions that ecosystems make to human well-being (EEA 2013 / CICES).

Natural capital: Natural capital is defined as an economic metaphor for the limited stocks of physical and biological resources found on earth (MA 2005). Natural capital stocks provide flows of ecosystem services. It should be noted that purely abiotic natural resources fall outside the scope of the definition used in this assessment.

Green infrastructure: Green infrastructure is defined as a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue in the case of aquatic ecosystems) and other physical features in terrestrial (including coastal) and marine areas. On land, Green Infrastructure is present in rural and urban settings. (COM/2013/249)

Nature-based solutions: concrete approaches for the management of natural resources that build on the understanding of ecosystem services and natural capital, such as conservation and restoration of wetlands for water purification, conservation of ecosystems' carbon storage to mitigate climate change etc.

Conceptual integration: Conceptual integration refers to the integration of ecosystem services and natural capital into the overall premises and objectives of different policy areas. Conceptual integration is assessed based on the key strategic policy documents setting out the scope and objectives for sectoral policies (e.g. EU level strategies).

Operational integration: Operational integration refers to the uptake of ecosystem services and natural capital in practical policy implementation. Operational integration is assessed based on the availability of concrete policy tools and instruments that take up and implement the concepts.

Policy instruments: Three different categories of instruments for policy implementation have been used in the context of this study: information instruments, decision-support instruments and implementation instruments. This categorisation of instruments is based on the overall conceptual framework developed under OPERAs.

2.2 Information sources

The assessment is based on a review of EU policy documents and information available on official EU web pages. In the case of forestry (i.e. an area with limited direct EU competence) a number of relevant international policy and guidance documents have also been considered.

The key types of policy documents reviewed include:

- EU policy strategies, published as Commission Communications (COM)
- EU regulations and directives
- Official and/or Commission endorsed guidance documents for implementing EU policies and legislation
- Official and/or Commission endorsed assessments of EU policy implementation
- Official EU policy discussion documents and proposal for policy action, published as Commission Green and White Papers¹

2.3 Analytical approach

Identification of policy sectors

In the context of this assessment, the integration of ecosystem services and natural capital into the following EU policy areas was assessed: environmental policies (air, soil and water), policies related to the management of natural resources (agriculture and rural development, fisheries and marine areas and forest), policies with known impacts on nature and natural resources (regional development, climate, bioenergy and transport). These policy sectors were identified based on the official EU policy areas (European Commission 2013a) and selected to be included in the analysis based their high direct relevance to the conservation and sustainable use of biodiversity, ecosystems, ecosystem services and natural capital (e.g. use, interdependency and/or impact).

In addition, a number of high level initiatives have been identified that provide an impetus for mainstreaming the concepts of ecosystem services and natural capital in the EU. These horizontal non-sector specific policy initiatives have been identified based on a review of current EU policy

¹ Green Papers are documents published by the European Commission to stimulate discussion on given topics at European level. Commission White Papers are documents containing proposals for Community action in a specific area.

developments and trends that create opportunities for the integration and uptake of ecosystem services.

In addition to the policy sectors above, it is recognised that a range of other EU policy sectors (e.g. trade policy, external assistance and foreign and security policy) indirectly impact and/or depend on the status of ecosystems, ecosystem services and natural capital. However, policy areas with such indirect influence or interlinkages fall outside the scope of this assessment.

No separate analysis of the EU biodiversity policy has been included in this assessment. This is because the concepts of ecosystem services and natural capital are considered to be an integral part of the current EU biodiversity policy, mainstreamed in the EU Biodiversity Strategy to 2020 (COM/2011/244). The key aspects of the EU biodiversity policy, including the Natura 2000 network, the EU Green Infrastructure Strategy and the EU initiative for no net loss of biodiversity, have been integrated into the assessment as horizontal elements of the sectoral analysis, when identifying the needs, opportunities and instruments of different policy sectors. Finally, it is to be noted that while there are different – and indeed differing - views among researchers and decision-makers with regard to making ecosystem services an integral part of biodiversity policy (e.g. risks related to side-lining conservation for its own right) these considerations fall outside the scope of this assessment.

Categorisation and identification of policy instruments

Three different categories of instruments for policy implementation have been used in the context of this study: information instruments, decision-support instruments and implementation instruments. This categorisation of instruments is based on the conceptual framework being developed in the context of OPERAs. Concrete EU policy instruments considered in the context of this study have been identified based on the assessment of key EU policy documents (See Annex 1). The identified EU instruments have been mapped according to the above categorisation, which has been further defined based on the findings (see Table 3).

The identified instruments are considered as the most relevant (directly or indirectly) with regard to the current or future integration of ecosystem services and natural capital. A number of instruments that aim to prevent the degradation of the environment on a more general level - with possible relevance to ecosystem services and natural capital - fall outside the scope of this assessment (e.g. environmental taxes).

Assessing the level of integration - identifying needs, opportunities and instruments for further integration

Two different levels of integration have been identified in the context of this assessment: conceptual integration and integration into policy implementation (See 2.1). The assessment of conceptual integration is based on the review of most recent EU policy documents, including sectoral strategies and other high level policy documents. The level of conceptual integration has been determined based on how explicitly and to what extent the concepts of ecosystem services and natural capital have been recognised in the premises (objectives, criteria etc.) of a given sectoral policy. Operational integration has been assessed based on the identification and analysis of concrete policy instruments and measures for operationalising the concepts during implementation. The level of operational integration has been determined taking into consideration 1) instruments aimed at preventing harm to biodiversity and ecosystem services and 2) instruments aimed at proactively maintaining and enhancing ecosystem services and natural capital.

A general categorisation regarding the level of conceptual and operational policy integration of different sectors has been using a similar qualitative scale (see Table 1). According to this categorisation the integration of ecosystem services and natural capital within policy sectors can range from explicit to implicit and from direct to indirect.

Based on the assessment of the current level of integration, key needs and opportunities for future integration of ecosystem services and natural capital into different EU policy areas have been identified. Furthermore, a range of policy instruments - existing and new – considered as having a key role in addressing the identified needs and opportunities have been listed. This identification has been carried out by sectoral policy experts, reflecting the following aspects: the policy area's known impacts and/or interdependency on biodiversity, ecosystems and ecosystem services; understanding of the role of ecosystem services in supporting the sustainability and effective implementation of a policy area (e.g. providing cost-effective and nature-based solutions to achieving policy objectives); and synergies between implementing sectoral policy objectives and achieving EU biodiversity goals (e.g. policy area's foreseen contribution to the 2020 EU Biodiversity Strategy).

Finally, it should be noted that this assessment focuses on reviewing frameworks for sectoral policies only at the EU level. When interpreting the results it is important to keep in mind that - in order to materialise in practice – the identified opportunities for integration of ecosystem services and natural capital need to be taken up by EU Member States at national and regional level. This applies, for example, to the identified opportunities for public investment in ecosystem service related measures by different EU funding instruments. Aspects related to the implementation of different EU policies at national, regional and local level – and consequently the very final “stage”

of operationalising ecosystem services through concrete actions such as permit decisions, planning and investment choices - falls outside the scope of this particular assessment.

Level of integration	Conceptual integration	Operational integration
Comprehensive and explicit	Explicit recognition of all ecosystem services, including the recognition of ecosystem services and natural capital as underpinning elements of human wellbeing	Dedicated instruments exist for addressing ecosystem services and natural capital in a comprehensive manner within a policy area.
Explicit but not comprehensive	Some explicit integration (e.g. some specific ecosystem services), including some recognition of ecosystem services and natural capital as underpinning elements of human wellbeing.	Some instruments exist that proactively address / build on the understanding of ecosystem services and natural capital within the policy area.
Implicit and incomprehensive	Implicit and indirect integration, generally focus on preventing negative impacts of a policy sector on ecosystem services and natural capital	No dedicated instruments exist for directly addressing ecosystem services and natural capital. Some aspects – mainly focusing on avoiding negative impacts on (some) ecosystem services - integrated into sectoral instruments.
No specific integration	No recognition (direct / indirect) of ecosystem services and natural capital	No instruments exist that would in any way address ecosystem services and natural capital.

Table 1 Categorisation of the level of policy integration in the context of this assessment

3.Results

3.1 Current level of integration

This Chapter summarises the current level of integration of ecosystem services and natural capital into different EU policy sectors reviewed in the context of this assessment. The assessment is based on the review of the existing policy documents and instruments outlined in detail in Table 2 and Annex 1.

Conceptual integration

On a conceptual level, ecosystem services and natural capital have been integrated into most of the sectoral policies reviewed in the context of this assessment. The integration of these concepts into EU policies for soil, water, forests, marine and fisheries, and regional development is both explicit and comprehensive. This means that the importance of all ecosystem services and/or natural capital is clearly recognised in the premises of the key documents for these sectoral policies.

While the integration of ecosystem service and natural capital concepts into the EU policies for agriculture and rural development, climate and bioenergy is explicit, it is not considered to be comprehensive. For example, the EU policy framework for agriculture and rural development focusses mainly on the aspects of ecosystem services related to water management and maintenance of soil quality. In the case of bioenergy, opportunities for the integration of ecosystem services are mainly also focused on water management and soil quality and they refer to the sustainable production of biofuels and not extending to the use of solid biomass.

The level of conceptual integration of ecosystem service and natural capital concepts into the EU policies for air quality and transport is considered to be limited. While the EU policy framework for air quality recognises the value of air as natural capital it does not explicitly identify clean air as an ecosystem service produced by well-functioning ecosystems. Consequently, the EU policy framework simply focuses on preventing air contaminants, rather than aiming to protect ecosystems' ability to purify air and maintain air quality. With regard to transport, key EU policy documents do not make specific, direct links to possible negative impacts of transport and related grey infrastructure on ecosystem services and natural capital. Implicit links can be established through the explicit provisions to avoid negative impacts of transport infrastructure on nature and environment (i.e. the impact assessment procedure).

Operational integration

According to the review results, the level of operational integration is more limited than conceptual integration: none of the EU policy sectors currently provide a comprehensive framework for the implementation and uptake of ecosystem services and natural capital.

The level of operational integration is the most comprehensive and concrete in EU policies for water, agriculture and rural development, marine and fisheries, regional development and climate. All these frameworks include policy instruments that - directly or indirectly - integrate some aspects of ecosystem services and can support their maintenance, conservation and/or restoration in practice. For example, none of the existing instruments under the EU framework for water management explicitly recognises the role ecosystem services in maintaining water quality or maintaining ground water sources nor do they explicitly avoid negative impacts on water ecosystem services. However, guidance and work programmes produced under the WFD support ecosystem-based approaches to the implementation of water management measures, this way implicitly building on the understanding of ecosystem services. Similarly, good environmental status of marine areas, as pursued under MSFD, does not explicitly use the term ecosystem services. However, the EU criteria for good environmental status of marine areas under the Directive include several aspects related to the functioning of ecosystems, this way implicitly underpinning ecosystem services.

The operational integration of ecosystems services and natural capital into the EU policy frameworks for air, soil, forest ecosystems, bioenergy and transport is indirect at best, focusing on preventing negative impacts of sectoral activities on ecosystems and in this way circuitously protecting the maintenance of ecosystem services. For example, instruments exist to mitigate negative effects of air pollution on ecosystems but there are no dedicated instruments to protect ecosystems' ability to regulate air quality. Similarly, the EU policies for bioenergy and transport only focus on mitigating possible negative impacts on ecosystems, with very limited direct links to ecosystem services. No dedicated EU policy instruments exist for soil ecosystem services, however some aspects are integrated into different EU instruments, including for example CAP cross-compliance standards for soil cover and the Environmental Liability Directive regarding damage on soil.

Finally, the Treaty on the Functioning of the EU includes no specific provisions for an EU forest policy and therefore the EU has limited competence in adopting dedicated common forest policy instruments at the Union level. Consequently, the most concrete policy instruments related to forest ecosystems can be found under other EU sectoral policies, including for example the EAFRD rural development funding (the primary source of EU funding for the forest sector) and reporting on Land Use, Land Use Change and Forestry (LULUCF) under the EU climate policy.