

# OPERAs

## Milestone 2.1: Review of existing ES/NC assessment protocols

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### Background

The concepts of ecosystem services (ES) and natural capital (NC) receive increasing attention from both science and society. Both groups have different perceptions about ES/NC, which causes difficulties for communication and cooperation. Proper environmental management requires a further operationalization of the concept. Implementing policy decisions requires tools such as regulations, directives, plans, fees and other economic instruments; their choice and specification would benefit from a coherent base of transdisciplinary ES assessments. To achieve this, a common understanding of the concept of ES/NC as well as a solid information base are needed. This is hindered by the fact that no common guideline for ES case study design and performance is used. Instead, ES case studies differ a lot in properties, which makes it complicated to synthesize their findings and to draw common conclusions. While some case studies follow existing guidelines none of the guidelines published so far has become popular enough to lead to a comparable design and reporting of case studies. OPERAs tries to solve that issue by developing a blueprint for the design, implementation and reporting of case studies. The blueprint is intended to be used for both the meta-analysis of existing case studies and the exemplars that will be part of OPERAs. This blueprint will be based on the existing guidelines and protocols and should aim both at scientists and policymakers/stakeholders. The current report reviews the existing guidelines and protocols.

### State of the art

ES/NC assessment guidelines and protocols have been published with a focus on different user groups, such as business managers in the financial sector and policy makers. They further differ in their level of detail. Some guidelines and protocols focus on a specific region, method or approach. An overview of the assessment protocols reviewed in this milestone is given in Table 1. Further details on selected protocols can be found in the following sections. While a specific guideline might not have met all requirements by OPERAs, we still might have included parts of it in an implicit or explicit way.

Table 1. Brief summary of investigated ES/NC assessment guidelines. Further details for selected publication can be found in the text.

Category	Reference	Main target readers	Focus of assessment	Critiques (from OPERAs' point of view)
<b>General assessment guidelines</b>	Ash et al. 2010	Practitioners designing and conducting an Ecosystem service assessment	The Manual is intended to be a “how to” guide for undertaking ecosystem assessments.	Long and detailed guidelines. OPERAs requires a more condensed, easy to handle blueprint. Furthermore, the focus has been on the design and implementation and less on the reporting of case studies.
	Ranganathan et al. 2008	Decision makers (policy makers and planners)	Outline on how to incorporate an ES approach into existing decision making processes to strengthen economic development strategies	
	TEEB 2011, 2012a, 2012b	Business managers, managers involved in national and local policy	Support of decision-makers to recognise, demonstrate and capture the values of ecosystems and biodiversity. This includes information on how to incorporate these values into decision-making. Several reports have been published which focus on different stakeholder/decision maker groups. The overall structure of the guideline is similar, but the scope differs depending on the type of stakeholders.	
	McKenney et al. 2010	Decision makers, business managers, NGOs	Provides a quick screening list to help successful and effective management of ES. This screening is intended to help the evaluation of key weaknesses and information gaps. It considers the conservation aspect and legal, institutional, social aspects.	The focus is on the final evaluation of the study. Therefore, it doesn't provide enough information for the other parts such as “designing and scoping”.
	Seppelt et al. 2011	Scientific community/ Practitioners reporting an ES/NC assessment	Structured reporting of ecosystem service assessments	It will be used as the base for the development of an improved blueprint. However, it is focused on the reporting of ES case studies and not on the planning and implementation of a case study.

	Crossman et al. 2013	Scientific community/ Practitioners reporting an ES/NC assessment	Reporting of assessments: Checklist for modelling and mapping ecosystem services	Extension/Add-on to the blueprint from Seppelt et al. 2011, focus on modelling and mapping, no general assessment guideline.
	Kosmus et al. 2012	Development planners	Aims at the provision of a practical and policy-relevant framework to integrate ES into development planning. It is based on the TEEB approach. It introduces six steps: Defining the scope, Screening and prioritising, Identifying conditions, trends and trade-offs, Appraising the institutional and cultural framework, Preparing better decision making and Implementing change.	General guideline which can be applied in development planning. Institutional and cultural aspects are also considered in the framework. However, a condensed blueprint would be preferred for the purpose of OPERAs.
	Springate-Baginski et al. 2009	Wetland site managers, environmental impact assessors, conservation managers, development planners and researchers	Design, preparation and carrying out of an integrated assessment. It also emphasizes the evidence-based engagement for the analysis.	Although the guideline focused on wetland ES, the whole structure and ideas are highly applicable to the general assessment guideline. However, it contains too detailed information to be suitable for a blueprint in OPERAs.
	Emerton 1998	Economic development planners, policy makers. Regional focus on East Africa	Links between biodiversity and economics. It provides a framework for the economic assessment of biodiversity, containing three major steps: biodiversity assessment, national action plan, and implementation of policies, programmes and projects. In order to generate information and suggestions, ten iterative steps were suggested.	These frameworks showed detailed assessment processes, however they are too detailed for OPERAs and too narrow in focus.

	Emerton 1999	Management planners, policy makers, people who are directly and indirectly involved marine protected areas	Assessment of economic benefits from marine protected areas. Application of economic measures such as incentives to distribute cost and benefit of marine protected areas. It suggests five steps from identifying economic benefit to identifying economic incentive measures.	
<b>Guidelines for the financial sector</b>	KPMG 2011	Business sector for food, beverage, oil, gas, mining	Provides companies with simple checklists for risk assessment with respect to ES/NC	As the guidelines focuses on the financial sector, it is hard to say that they are in line with the overall goal of the blueprint for OPERAs. The guidelines considered only those ES -aspects in which the business sector would be mainly interested in.
	UENP FI 2010	Financial sectors, such as banks, investors, insurers	Exposure of financial institutions to biodiversity loss and recommendations on how to cope with the associated risks and opportunities	
	VfU 2011	Business managers, customers of banks and insurance companies	Guidelines for assessing biodiversity related risks and opportunities	
	ECNC	Business managers	Guidelines for how to integrate biodiversity measures into operational management, product chains or business plans	
	Cranford et al. 2011	Investors in tropical forests business - who are willing to take a slightly lower return on investment as long as the environmental and social benefits are assureds	Guide to raising-up front finance for tropical forests – what the forest fund is, how it can function, who can invest etc.  It suggests a framework to assess the various structures a forest bond can have and four basic modules: Generation, Institutional Arrangement, Delivery, and Risk.	

	Hanson et al. 2012 (based on WBCSD 2011)	Managers responsible for corporate strategy, business operations, and environmental performance	Framework for conducting an ecosystem valuation study. It contains five steps: selecting the scope, identifying priority ecosystem services, analysing trends in priority services, identifying business risks and opportunities, and developing strategies. It focuses on a business structure with suppliers, companies and customers and its performance.	
<b>Guidelines for the conservation sector</b>	Kettunen et al. 2009	Practitioners involved in the management of Natura 2000 sites (e.g. site managers, landowners and other land users).	Understanding, assessment and communication of the total socio-economic benefit and value of a site. Comparison of different Natura 2000 sites.	It is a detailed guideline for the assessment of each ES and on the communication of results. However, because the scope of the assessment is already defined as Natura 2000 site, the aspects of “purpose of the study” and “designing process” which are necessary for reporting are missing.
	Stolton and Dudley 2008	protected area managers, local communities, NGOs	Aiming to help collate information on the full range of current and potential benefits of individual protected areas. It is an assessment tool, which leads future monitoring. This guideline is based on the questionnaires which can be answered by involved stakeholders	It provides a very detailed protocol and questionnaires for benefits from protected areas. However, it is too detailed for OPERAs and too narrow in focus.
<b>Guidelines for the application of economic instruments</b>	Waage et al. 2008	Managers and staffs in organisations that work directly with communities or landowners who may be interested in PES	Focus on Payment for ES (PES). Step-by-step protocol for the development of a PES. It consists of four steps: identifying ecosystems services prospects and potential buyers, assessing institutional and technical capacity, structuring agreement and implementing PES agreements.	A good guide for developing PES. However, this is too specific on an economic instrument to be used in OPERAs.
<b>Guideline with a focus on a specific method</b>	Defra 2010	economists, scientists and policy makers	Providing more practical support in valuing environmental impacts in policy appraisal in order to make better use of existing valuation evidence. The protocol for the future economic valuation is based on the information needs for value transfer, including eight steps	It narrows down to a specific approach which is called “value transfer”. Therefore, it is not applicable for OPERAs.

<p><b>Guideline with a focus on a specific region or ecosystem</b></p>	<p>Adamus 2011</p>	<p>Environmental manager, local government, wetland users in the US</p>	<p>Standardized method intended for use in rapidly assessing ecosystem services (functions and values) of all wetland types throughout temperate North America</p>	<p>Focused on a specific region and a biome. Therefore, not generally applicable.</p>
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## Details on selected guidelines

### General assessment guidelines

#### **Millennium Ecosystem Assessment: Ecosystem and Human well-being: A manual for assessment practitioners (Ash et al. 2010)**

Ash et al. (2010) provided a detailed conceptual framework for the Millennium Ecosystem Assessment. It describes the assessment process in several chapters: assessments, process design, conceptual framework, state and trends, scenarios, and response. Each chapter considers issues regarding frameworks, management, analysis and communication with different degrees of emphasis. For example, the process design process focuses more on management and communication issues, which address how to establish the need for an ES assessment and how to govern it. The state and trends process chapter considers specifically analysis issues with respect on how to gather and assess the information on ES. The aim of the guideline is to provide lessons for decision makers regarding how their decision influences ES and their interactions.

The Millennium Ecosystem Assessment (MA, 2005) has been carried out to bring up to date knowledge of ES and identify the consequence of changes. It set up the base for the on-going discussion about the sustainable use of ES. As the protocol by Ash et al. (2010) was based on ES identified in the MA, they could develop an even more detailed assessment at local and regional scales. One interesting aspect of the protocol by Ash et al. (2010) compared to others is that they emphasized the importance of communication and management among practitioners, stakeholders and users. Based on it, they suggested different forms of communication; such as reports, workshops, media etc. in order to help better communication.

#### **World Resource Institute (WRI): Ecosystem Services, A guide for decision makers (Ranganathan et al. 2008)**

In comparison to the protocol of Ash et al. (2010), the protocol of Ranganathan et al. (2008) focuses on the link between ES and economic development goals such as human well-being and economic success and its assessment process.

The protocol (Fig.1) aims at helping decision makers concentrate on the services that are more likely to incur risks or opportunities in their society or business. In the first step, all ES which are affected by decision and have an influence on decision in a particular location are identified. Then in the second step, the ones which are most relevant for the decision are screened in order to set priorities for the detailed analysis of the condition in the third step. Economic valuation is aiming at providing quantitative economic values of ES to help identify risks and opportunities in following step five. However, as this is up to a goal of the decision, step four is optional. Given information in the earlier steps, ES related risks and opportunities associated with a decision are identified in step five. Although both publications, Ash et al. (2010) and Ranganathan et al. (2008), stated the development of scenarios as an important step to support decisions, no guideline was provided for scenario development.

The protocol of Ranganathan et al. (2008) is a detailed comprehensive protocol with many examples, however, it is not appropriate for a quick and condensed assessment, at which OPERAs aims.

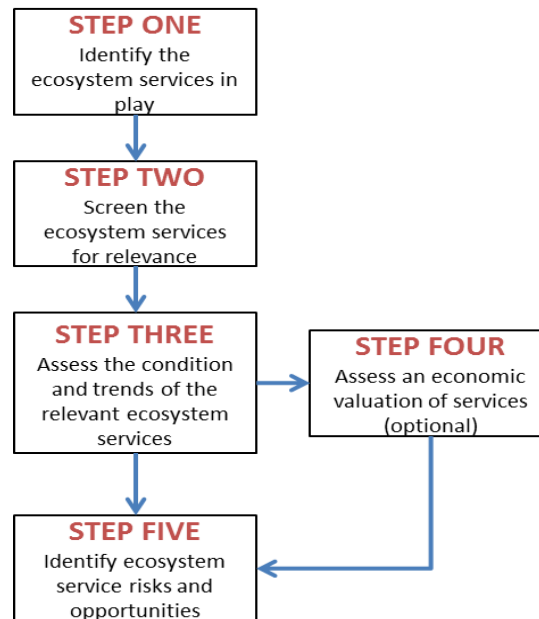


Figure 1. Overview of Steps in Assessing Risks and Opportunities Related to Ecosystem Services (Ranganathan et al. (2008), p.30 modified)

### Blueprint: Seppelt et al. 2011, Crossman et al. 2013

Seppelt et al. (2011) and Crossman et al. (2013) intend to provide a blueprint for ES assessments. These checklists guide through the design and realisation of an assessment. Seppelt et al. (2011) includes not only assessment itself, but also recommendations and monitoring. Aspects of the reporting on stakeholder involvement and stakeholder selection, however, could be improved. The blueprint from Crossman et al. (2013) is an extension of the blueprint from Seppelt et al. (2011) with a strong focus on mapping ES. In combination, the guidelines/blueprints from both studies can be used as base for a further development of an improved blueprint in OPERAs.

### Guidelines for the financial sector

In the financial sector, risks driven by biodiversity loss and related ES became important issues. Under this condition, there have been increasing attentions to investigate how to cope with them. Several guidelines, therefore, have been introduced. Each guideline provides information on the type of risks which business sector might face in the future due to biodiversity loss and changes in ES (VfU, 2011). Furthermore, recommendations for banks, investors and insurers were given (UNEP FI, 2010). However, they often focus on provisioning services as they are easier to handle for an assessment in the financial sector because related market exists and effects on the financial condition can be more directly assessed. For instance, KPMG (2011) provides a checklists for the conductance of a ES related risk assessment and effective monitoring specifically for several business types, such as food, beverage, oil, gas and mineral extraction (See table 1 for more examples). Regulating services, cultural services, supporting services are disregarded in these guidelines since they are hard to quantify in terms of economic values of direct uses.

### Guidelines focusing on the conservation sector

The guidelines from Kettunen et al. (2009) and Stolton and Dudley (2008) focus on ES/NC provided by conservation areas. ES/NC is used as an additional argument for conserving the sites. While they provide detailed guidelines for the assessment of ES/NC provided by the sites, they are hard to apply



to other contexts such as the assessment of importance of ES/NC for the financial sector or for the assessment of ES/NC for urban areas or intensively managed agricultural systems.

**Guidelines with a narrow focus on specific tools, regions or methods**

WEPUS (The Wetland Ecosystem Services Protocol for the United States) is a standardized method for assessing ES, their values and functions in wetlands throughout temperate North America. In contrast to the guideline provided by Springate-Baginski et al. (2009), the WEPUS approach is focused on an individual wetland and cannot be easily used for a more general purpose. Environmental managers, local governments and wetland users can easily use this to assess the wetland ecosystem services. Figure 2 shows an example of the application of WEPUS. Compared to all protocols mentioned earlier, it focuses on a very specific ES and on a specific region. While the assessment tool is connected to a protocol, it is not appropriate to use the protocol in OPERAs, which discusses various types of ES and compares exemplars and case studies.

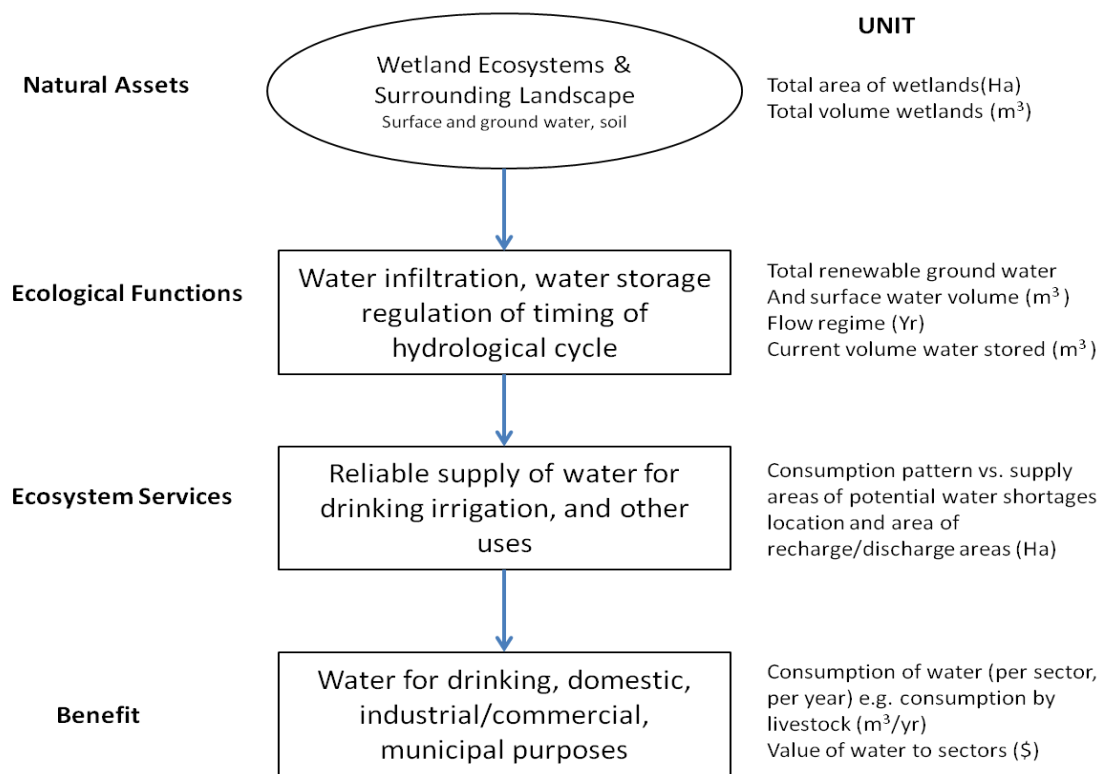


Figure 2. An example of the application of WEPUS related to Water Storage and Supply (Raudsepp-Hearne et al., 2011, p.27, modified).

**Summary and Conclusion**

Various guidelines have been developed with respect to ES starting with the early work by Emerton (1998; 1999) till recent work by Seppelt et al. (2011) and Crossman et al. (2013). Most guidelines have been focused on how to perform assessments. Some of those guidelines had a generic focus such as Ash et al. (2010), the various TEEB reports and Ranganathan et al. (2008). Some guidelines had a narrower focus on a specific economic sector (such as KPMG 2011; UENP FI 2010; VfU 2011; Cranford et al. 2011; Hanson et al. 2012; WBCSD 2011 for the financial sector), a specific policy (such as developing programs e.g. Kosmus et al. 2012; Emerton 1998 or nature conservation e.g. Kettunen

et al. 2009; Stolton and Dudley 2008), a specific method (such as Defra 2010 for the value transfer approach) or a specific policy instrument (such as Waage et al. 2008 for PES).

Some of the guidelines have been found to contain too much detail for the application in OPERAs - a more condensed protocol would be beneficial. Other guidelines have been too short and too narrow to be useful. Guidelines and protocols focused on a specific sector, purpose, method or ecosystem were generally not applicable for the generic purpose that OPERAs aims at. Nevertheless, each of the protocols and guidelines contributed bits and pieces and generated ideas to be included in the OPERAs blueprint. Most of the general guidelines did never intend a description of a short protocol to be followed. Instead, they provide detailed information to be consumed over a significant amount of time. The blueprint in OPERAs instead aims more at a protocol in a nutshell which can be used as a desktop reference. Of course such information could be - and has been - extracted from the longer guidelines. McKenney et al. 2010 provide a short and comprehensive in a nutshell guideline but it is proper for the final evaluation of the study, rather than for the other parts such as “designing and scoping”. However, we consider this framework incorporating into the OPERAs’ blueprint.

Seppelt et al. (2011) and Crossman et al. (2013) provide a blueprint on designing and reporting ES. The blueprint of Seppelt et al. (2011) considered most aspects for an ES assessment, such as valuation, governance and valuation, while aspects on stakeholders could be improved. The work of Crossman et al. (2013) is an extension of the blueprint from Seppelt et al. (2011) with focus on mapping ES. Both studies combine to provide a base for the further development of a blueprint in OPERAs. Still, there is a need to move from the reporting focus of the blueprint towards a more implementation directed focus.

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