OpenNESS
Operationalisation of Natural Capital and Ecosystem Services

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ENHANCING WATER FRAMEWORK DIRECTIVE IMPLEMENTATION THROUGH THE ECOSYSTEM SERVICE APPROACH

SUMMARY AND KEY MESSAGES

Both the Water Framework Directive (WFD) and an ecosystem service (ES) approach focus on sustainable management of the environment. An ES approach can support and supplement WFD implementation by emphasising the social and economic benefits of achieving good ecological status, providing a stronger case for justifying the costs of restoring aquatic ecosystems and enhancing opportunities for participation. Water management authorities are in need of clearer consistent guidance on how to apply the ecosystem service approach in the implementation of River Basin Management Plans. The exploration of local case-studies in practical implementation, as described here, can provide a basis for the development of these guidelines to operationalise the ecosystem service approach into the WFD.

INTRODUCTION

The WFD is the centerpiece of the management of Europe's water resources. Its objective is to deliver sustainable management of European surface waters and groundwater and to protect and enhance aquatic ecosystems. It follows an integrated catchment management approach (river basin management) to solving water quality and quantity problems and emphasises public participation in shaping and achieving its goals.

The major technical focus of the WFD is to achieve "good ecological and chemical status" of all water bodies by 2027. While good progress has been made since adoption of the WFD in 2000, this goal is a long way off being reached. The WFD is scheduled for review, and possibly revision, by the year 2019 to strengthen implementation and progress.

In this brief, we report results from the FP7-project OpenNESS (www.OpenNESS-project.eu) on how an ecosystem service (ES) approach can support and supplement WFD implementation. Results were obtained on the basis of theoretical work, workshops with European decision makers, and by specific case studies.

CONCEPTS IN WFD & THE ES APPROACH

While the WFD was developed specifically for the management of water resources, the ES approach was originally proposed as an argument for the conservation of biodiversity in integrated landscape planning. Ecosystem Services have been defined as contributions of ecosystem structure and function, in

combination with other inputs, to human well-being (Burckhard et al., 2012). In this context, both WFD and ES approaches focus on fostering sustainability and human well-being, although specific targets and reference points do differ:

- The WFD aims at achieving a particular **state** of water bodies ("good status"), expressed by physical, chemical and biological conditions that together comprise good ecological structure and functioning, to support the protection of aquatic ecosystems and the long-term availability of water resources for different uses (sustainable use).
- The ES approach focuses on the (sustained) **flow** of services and their benefits to people.

How can the ES approach support WFD implementation?

- The ES approach supports WFD implementation:
  - *by emphasising gathering evidence on the benefits of achieving good ecological status,*
  - *by encouraging integration of water policy with other policy arenas (e.g. land-use, agriculture, fisheries),*
  - *by providing additional valuation criteria: monetary and non-monetary,*
  - *by identifying poorly recognised services and/or benefits, such as water purification or flood regulation,*
  - *by providing a stronger case for justifying costs of conservation and restoration of aquatic ecosystems.*
- Adopting an ES approach can enhance opportunities for participation, as it is strongly linked to stakeholders' needs and stresses the importance of stakeholders' knowledge.
- ES can emphasise dynamic and functional aspects of ecosystems, by linking status (stocks) to flows and to mechanisms which maintain both of them.
- Understanding the link between multiple pressures, ecological status, and provision of ES in aquatic ecosystems is fundamental for the successful implementation of the WFD (Grizzetti et al. 2016a).

Case studies: Applying the ES approach to enhance WFD implementation

Loch Leven, Scotland

This OpenNESS case-study examined the impact of lake restoration on achieving WFD targets and the ES benefits this potentially provides. It highlighted how harmful algal blooms, associated with Poor or Bad ecological status, had severe impacts on cultural services, such as tourism and recreation. Improving status, following targeted catchment management to reduce nutrient pollution, has led to recovery in conservation value (aquatic plants and wetland birds) and seen large increases in nature-based tourism and recreation and enhancements in associated businesses (fishery and cafés). The case-study demonstrated how the ES approach better communicates the cross-sector benefits of the WFD. As a note of caution, however, the service benefits of achieving good ecological status are difficult to quantify as relationships are complex and non-linear. WFD data can be used to measure the natural capital required to underpin ES, but the case study highlighted the value of long-term data on cultural services, available at Loch Leven, to explicitly

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demonstrate the benefits of the WFD (Carvalho et al., 2015).

Enhanced brown trout fishery at Loch Leven. Image courtesy of Jamie Montgomery

GORLA MAGGIORE, ITALY

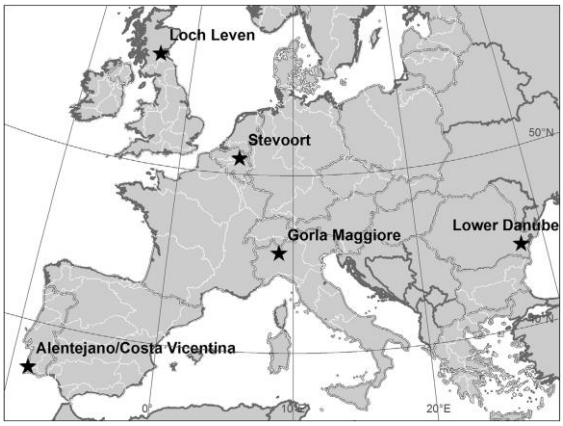
This OpenNESS case-study assessed the multiple benefits provided by a green infrastructure, composed of a park and a constructed wetland to treat waste water from a combined sewer overflow of an urban area (Liquete et al. 2016).

Gorla Maggiore Urban wetland, Northern Italy. Image courtesy of OpenNESS

The green infrastructure was compared with the alternative grey infrastructure and with the previous situation (a poplar plantation), considering different social, environmental, and economic benefits, i.e. controlling flood risk, offering area for recreation, reducing public costs, improving water quality and wildlife habitat. The results indicated that the green infrastructure performs equal or even better than the alternative grey infrastructure for water purification and flood protection, it has a similar cost, and it provides additional benefits (like wildlife support and recreation). Overall, the study showed the potential of green infrastructures for delivering a broad range of ES as well as the effectiveness of investments in nature-based solutions to support the implementation of water policies (Liquete et al. 2016).

OPINIONS AND EXPERIENCES ACROSS A RANGE OF EU CASE STUDIES

The OpenNESS project analyzed the application of ES approaches in the implementation of River Basin Management Plans (RBMP) required by the WFD in several case-studies, located in Belgium, Romania, Portugal, Italy and the United Kingdom (see map below).



These five studies represent different regional contexts of WFD implementation (Grizzetti et al. 2016b). The studies showed that the ES concept has been adopted in the planning instruments implementing the RBMP. It is incorporated, implicitly or explicitly, with regard to the integration of sectoral policies, the identification of multi-functionality of restoration measures, the support to biodiversity conservation, and in economic

valuation to improve cost-benefit analysis in decisions in River Basin Management Plans (RBMPs). The stakeholders consulted in the studies considered the ES approach useful for WFD RBMPs, especially to integrate policies, to identify synergies and trade-offs, to foster a holistic and sustainable view of the water issues and to highlight all the hidden benefits of a water system in good health. However, they also pointed out the challenge for practitioners of understanding new concepts and adopting new methodologies. Overall, most of the knowledge needs required to put the ES approach into practice related to concepts, guidelines, and valuation methods (Grizzetti et al. 2016b).

More information on all the OpenNESS case-studies is available through the OPPLA knowledge portal: http://www.oppla.eu/case-studies

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