



PIANC

The World Association for
Waterborne Transport Infrastructure

An Introduction to applying Ecosystem Services for Waterborne Transport Infrastructure Projects

1. Background

Previous EnviCom Working Groups have discussed and developed philosophies on Working with Nature (WwN), mitigation/adaptation for uncertainties of climate change, and procedures to identify and assess impacts attributed to dredging and dredged material placement related to navigation and port infrastructure. These provide a scientific basis to inform decisions and facilitate tradeoffs amongst multiple and oftentimes competing interests and priorities in an objective, resilient and sustainable manner. Ecosystem-related management provides a mechanism for making decisions about navigation infrastructure and dredging activities in light of the goal of including and maintaining the contiguous ecosystems in a healthy, productive, and resilient state.

From this perspective, the system as a whole becomes the focus rather than a specific project goal or activity. Because the drivers and stressors affecting the system are diverse and numerous, the solutions must be holistic and adaptive to avoid negative impact and to benefit from an integrating multi-sectoral approach.

The focus on ecosystems should not be construed as the elevation of ecosystems over people, nature over jobs or of fish and wildlife over progress. Rather the focus on ecosystem reveals the inherent dependence of people on the services provided by the ecosystem and its functions. These so called Ecosystem Services (ES) are given for free by nature, at the same time providing a clear benefit to people, society and economic activities. Nevertheless ES are rarely considered in project related cost-benefit analyses, in both quantitative and qualitative terms, due to a lack of applicable methodologies.

To provide an understanding of the ES approach for the navigation sector PIANC on May 7, 2015 held a seminar in Koblenz, Germany 'Ecosystem Services: Identification, Assessment and Benefits for Navigation Infrastructure Projects'. Introducing the conceptual background and highlighting projects having successfully applied ES in practice the seminar led to the conclusion that a full understanding of the returns of ES on investment will result in more sustainable, and adaptive solutions for the waterborne transport infrastructure (WTI) projects.

2. Objective

Based on the outcomes of the PIANC ES Seminar in Koblenz, May 7, 2015 PIANC compiled an 'Orientation Paper' which provides a first common understanding of the ES concept for the navigation sector. The feature 'Opportunities to apply the concept of Ecosystems Services (ES) to the Waterborne Transport Infrastructure (WTI) sector' is enclosed as integral part of the TOR. The 'Orientation Paper' sets the conceptual starting point for the main objective of the TOR, which is to deepen the guidance on how to use ES in practice for the WTI sector.

The WG is to provide a definition of Ecosystem Services and a specification on how to successfully apply ES in WTI projects. Methodological and technical information on ES identification, mapping, assessment and management in terms of good governance in the WTI sector will be given. The WG identifies and summarizes relevant conclusions for the navigation sector and provides signposting to further guidance on how to successfully and supportively operate with ES in WTI projects.

It should be written using understandable terms and as appropriate integrate existing frameworks, such as those recently developed by the PIANC EnviCom Permanent Task Group 3 on Climate Change and Navigation and the Waste Assessment Guidance of the London Convention. The WG will give consideration to the role, influences, and implications of climate change for ES.

3. Earlier reports to be reviewed

see collection of relevant reports and literature in the annex.

4. Scope

The Working Group will develop a report that

1. defines the concept of Ecosystem Services (ES) as a common starting point,
2. identifies, characterizes, assesses, and substantiates available methods, approaches and documents,
3. links the ES concept to relevance for the WTI sector and projects. In this phase an explicit link to the Working with Nature concept will be identified,
4. demonstrates existing approaches and best practices worldwide having relevance for the WTI sector that have successfully applied the concept of ES,
5. explores and describes the added value, benefit and support when successfully applying ES in WTI projects,
6. then deploys options to integrate the ES concept in WTI projects (including mapping, modelling, valuing, and good governance),
7. and depicts a framework for guidance on beneficially applying ES in the WTI sector (including recommendations for best available methods).

5. Intended Product

The report will serve as a reference book describing the methodological basis of the ES concept and analyzing its applicability for the WTI sector. The report will form a basic benchmark in giving guidance on how to beneficially use ES in practice for the WTI sector.

6. Working Group Membership

Members of the WG should include representatives from the target audience, i.e. consultants, regulators and contractors, Port Authorities and environmental management practitioners. The range of expertise should cover at least practical port design, construction knowledge on WTI, geomorphology, physical processes, ecology, GIS, risk assessment, hydraulics, hydro-ecological modeling and regulatory processes, and environmental economics as well as socioeconomics. **Members from outside the PIANC community who are experts on the topic of ES or parts of it are welcome.**

7. Relevance to Countries in Transition

The report will be written for a broad interdisciplinary audience spanning numerous fields including project design, environmental assessment, civil engineering, dredging operations and regulations. The intent is to focus specifically on end-users who have decision-making responsibilities, and contractors who implement the projects conforming to guidelines developed through the assessment and management process in both developed and transitional countries. The report will be written in a straightforward manner that will be easy to understand in both venues.

8. Climate Change

The report will consider the role, influences, and implications of climate change and will integrate current knowledge from reports produced by the PIANC Permanent Task Group on Climate Change (PTGCC).

Annex (relevant reports and literature)

- PIANC. 2011. PIANC Position Paper, Working with Nature (October 2008, revised January 2011).
- PIANC. 2012. Waterborne Transport, Ports and Waterways: A Review of Climate Change Drivers, Impacts, Responses and Mitigation.
- CEDA. 2013. Ecosystem Services and Dredging and Marine Construction. A CEDA Information Paper.
- CICES. 2013. Common International Classification of Ecosystem Services (CICES): Consultation on Version 4. Report to the European Environment Agency. Authors: Haines-Young, R. and Potschin, M.
- MAES. 2014. Mapping and Assessment of Ecosystems and their Services. Indicators for ecosystem assessments under Action 5 of the EU Biodiversity Strategy to 2020. 2nd Report. Technical Report 2014-080. DG Environment, European Union. ISBN 978-92-79-36161-6, doi: 10.2779/75203

- SEEA. 2014. System of Environmental-Economic Accounting 2012. Experimental Ecosystem Accounting. eds.: United Nations, European Commission, Food and Agriculture Organization of the United Nations, Organisation for Economic Co-operation and Development, World Bank Group. ISBN 978-92-1-161575-3.
- TEEB. 2013. A synthesis of approaches to assess and value ecosystem services in the EU in the context of TEEB. Authors: Roy Brouwer, Luke Brander, Onno Kuik, Elissaios Papyrakis and Ian Bateman. University Amsterdam, Institute of Environmental Studies.
- WAVES. 2014. Designing pilots for Ecosystem accounting. eds.: Wealth Accounting and the Valuation of Ecosystem Services, World Bank Group.
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- Kareiva, P. H. Tallis, T. H. Ricketts, G. C. Daily, and S. Polasky. 2011. *Natural Capital: Theory and Practice of Mapping Ecosystem Services*, Oxford University Press, Oxford, 365 pp.
- Keune, et al. 2015. Emerging ecosystem services governance issues in the Belgium ecosystem services community of practice. *Ecosystem services* 16: 212-219. ISSN 2212-0416.
- National Research Council. 2005. *Valuing Ecosystem Services: Toward Better Environmental Decision-making*, National Academies Press, Washington, DC, 277 pp.
- Sander et al. 2015. 'The Matrix Reloaded': A review of expert knowledge use for mapping ecosystem services. *Ecological Modelling* 295: 21-30. ISSN 0304-3800-Amsterdam, Elsevier Science.
- Sander et al. 2015. Detecting ecosystem service trade-offs and synergies : a practice-oriented application in four industrialized estuaries. *Ecosystem services* 16: 378-389. ISSN 2212-0416.
- Turner, R. K., S. Georgioui, and B. Fisher. 2008. *Valuing Ecosystem Services: The Case of Multi-functional Wetlands*, Earthscan Publishing, Sterling, VA, 229 pp.
- Vrebos et al. 2015. Mapping ecosystem service flows with land cover scoring maps for data-scarce regions. *Ecosystem services* 16: 28-40. Issn 2212-0416-13.
- Wainger, L. A., and J. W. Boyd. 2009. Valuing ecosystem services, pages 92-128 In: McLeod, K., and H. Leslie (eds) *Ecosystem-based Management for the Oceans*, Island Press, Washington, DC.