BOOK OF ABSTRACT

I. SESSION DESCRIPTION

ID: S8b

Linking nature-based solutions and ecosystem services

	Title	Name	Organisation	E-mail
Host:		Emmanuelle Cohen-Shacham	IUCN Commission on Ecosystem Management	minacs@gmail.com
		Simone Maynard	Australian Rivers Institute, Griffith University Queensland, Australia	maynardsimone@gmail.com
Co-host(s):		Edna Cabecinha	University of Trás-os-Montes and Alto Douro (UTAD), Portugal	edna@utad.pt

Abstract:

Nature-based Solutions (NbS) are actions that protect, restore or sustainably manage ecosystems and the services they provide (rather than conventional engineering solutions), to address major societal challenges, simultaneously providing benefits for biodiversity and human well-being. NbS can be considered as an umbrella concept for interventions that address climate change (e.g. through interventions such as ecosystem-based adaptation and mitigation), disaster risk (through ecosystem-based disaster risk reduction), biodiversity loss, water and food security or human health (e.g. though green and natural infrastructure, ecological restoration), by increasing the number of ecosystem services and the level at which they are provided.

The IUCN framework for NbS includes 8 principles, among them three very important ones referring to the possibility for NbS to be implemented in synergy with another type of solution;

the need for it to be implemented at the landscape scale; and to be implemented while having NbS integrated in policy and actions. These principles are important components for the development of the global standard for NbS, which is planned to be launched at the 2020 World Conservation Congress.

This session will start with a presentation about the NbS definitional and operational frameworks that IUCN and its Commission on Ecosystem Management (CEM) is developing, to address global societal challenges. Time will be provided for 2-3 presentations that focus on the link between NbS and ES. And last, an exercise will be organized to think, as a group, (1) on ways that the ES concept can be beneficial in the development of the NbS concept and its implementation in the field; (2) to get feedback from an ES perspective, on the global standard for NbS.

Goals and objectives of the session:

Present the Nature-based Solutions framework and draft global standard to the ESP community and get feedback on them; have presentation that link ES to NbS and discuss ways to link the two concepts.

Planned output / Deliverables:

Beside the presentations, a draft for a paper linking NbS and ES will potentially be prepared and developed into a full scientific manuscript to submit in a relevant journal.

Related to ESP Working Group/National Network:

Sectoral working group: SWG 8 – ES in Conservation

II. SESSION PROGRAM

Date of session: Thursday, 24 October 2019
Time of session: 10:30 – 12:00

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
10:30-10:35	Edna	Cabecinha		INTRODUCTION TO THE SESSION
10:35-10:45	Edna	Cabecinha	University of Trás-os-Montes and Alto Douro (UTAD), Portugal	Engaging communities into ecosystem services – Valuing Blue and Green Infrastructures in Atlantic landscapes
10:45-10:55	Marylou	Dufournet	Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement, France	Ecosystem services a framework to gather expert knowledge and evaluate nature-based solutions
10:55-11:05	Leena	Finér	UN Environment World Conservation Monitoring Centre, United Kingdom	Demonstration of nature based solutions for promotion of good water quality in boreal forest landscape
11:05-11:15	Laura	Friedrich	UN Environment World Conservation Monitoring Centre, United Kingdom	The engagement potential of ecosystem services: supporting effective stakeholder participation in marine management and conservation
11:15-11:25	Wanhui	Huang	Research Institute for Humanity and Nature, Japan	A nature-based approach to mitigate flood risk improves ecosystem services provision in Shiga, Japan
11:25-11:35	Sien	Kok	Deltares, The Netherlands	The value of Natural Capital Accounting in promoting urban nature-based climate action
11:35-12:00				DISCUSSION

III. ABSTRACTS

The abstracts appear in alphabetic order based on the last name of the first author. The first author is the presenting author unless indicated otherwise.

1. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

Engaging communities into ecosystem services – Valuing Blue and Green Infrastructures in Atlantic landscapes

First author: Vanessa Queirós,

Other author(s): João Cabral, André Fonseca, Martinho Lourenço, Simone Varandas, João Santos, José Aranha, Mário Santos, Sandra M. Monteiro, Rui Cortes, Luis F. Fernandes, Fernando Pacheco, João Paulo Moura, Marco Magalhães, Pedro Ferreira, Denis Bailly, Johanna Beganton, Stephen Hynes, Mariana Milagaia, Pepe Barquín, Edna Cabecinha

Presenting author: Edna Cabecinha

Affiliation: University of Trás-os-Montes and Alto Douro (UTAD), Vila Real, Portugal

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Ecosystems composition, structure and dynamic are changing across the globe as a response to different anthropogenic threats. The alterations on the environment produced by anthropogenic activities can be described as part of the global change process. Consequently, the overexploitation of ecosystems, introduction of invasive species, alteration of biogeochemical cycles and climate and land use/cover changes, are real threats to the natural environment and populations as well. The impact of these factors can cause losses of biodiversity and Ecosystem Services (ES) supply. The long-term functioning of the biosphere and human well-being rely mostly on the good status and resilience of natural and semi-natural ecosystems. The implementation of Blue and Green Infrastructures (BGINs) have been studied as a landscape planning instrument to optimize the spatial arrangement of ecosystems, habitats and practices to promote nature conservation, while delivering ES to populations. The implementation of BGINs will depend primarily on the needs and potentialities of each territory, acting accordingly the stakeholders' interests.

ALICE is a project with eleven partners from Portugal, Spain, Northern Ireland, France and United Kingdom which aims to promote sustainable investments in BGINs through identification of the benefits of ES delivered at the terrestrial-aquatic and land-sea interface

in the Atlantic Region. To assess the major environmental issues in Paiva River (Portuguese case study), a participatory process involving national to local stakeholders was developed. Through a process of collaborative mapping, the identification and prioritisation of the Paiva catchment major problems were structured towards the aim of the project. This approach will also involve the development of participatory scenarios to identify the best implementation of the BGINs solutions to promote ES.

Overall, this study aimed to develop participatory learning approaches to engage local stakeholders for valuing BGINs in Atlantic landscapes.

Keywords: Ecosystem Services; Blue and Green Infrastructures, Nature Based Solutions; Participatory process; Stakeholders

2. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

Ecosystem services a framework to gather expert knowledge and evaluate nature-based solutions

First author: Marylou Dufournet

Other author(s): Victoria Soubeiran, Quentin Robiquet, Morgane Bernard, Nadjwa Pailloux, Marie Degrave, Damien Carat, Muriel Saulais

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Urban storm-water management has slowly shifted from the dominance of traditional sewer systems to the increasing popularity of alternative water management systems providing a wider range of benefits to urban dwellers. These include green infrastructure designed to mitigate water runoff and abate pollution thanks to ecosystem functions, such as vegetated basins, greenroofs or constructed wetlands. Referring to the creation and sustainable management of nature to tackle societal challenges (Eggermont et al. 2015), they can thus be conceptualised as nature based solutions (NBS).

The GIEMU (Integrated Urban Water Management) program aims to assess the benefits of these NBS to improve their design and management.

To assess the benefits provided by various NBS options, the ecosystem service (ES) framework was used. The assessment method is based on a capacity matrix filled by experts from relevant fields, including researchers and practitioners. It comprises 18 NBS types ranked by 38 experts, and covers regulating, cultural ES, and their potential role for enhancement of urban biodiversity. Experts also ranked several context features that might influence the provision of ES, such as management options.

The results point out the ability of these NBS to provide not only runoff quantitative and qualitative regulation, but also local climate and air quality regulation, aesthetic experiences and increased awareness of flood risk, water management and biodiversity issues. Results also demonstrate the critical role of ecological functions and context features for ES optimization. Despite uneven levels of expertise regarding the different ES and NBS types, the variability of experts' evaluations is generally low.

The capacity matrix seems a promising tool to assess ES provided by NBS. It could be converted into a decision making tool for NBS choice and design, as well as a communication tool to promote the application of these NBS in urban planning as a contribution to society resilience.

Keywords: nature based solutions, ecosystem services, integrated water management, expert knowledge, capacity matrix

3. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

Demonstration of nature based solutions for promotion of good water quality in boreal forest landscape

First author: Leena Finér

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Amount of precipitation and frequency of extreme rainfall events are projected to increase in future. Abundant precipitation and rapid snow melt increase the leaching of suspended solids and nutrients to surface waters from managed boreal forests and have high negative impacts on surface water quality. Nature Based Solutions (NBS) may provide means for tackling societal and environmental challenges related to good water quality through ways inspired and supported by nature. In the presentation we will demonstrate a new methodology to implement NBS to mitigate the negative impacts of extreme weather events and forest management on surface water quality. For the study we have established a forest and water dominated open air laboratory (OAL) in Lake Puruvesi catchment located in Eastern Finland. Lake Puruvesi is one of the seven European OALs of OPERANDUM –project (Open-air laboRAtories for Nature based solutions to Manage hydro-meteorological risks) received funding from the European Union's Horizon 2020 research and innovation programme (grant agreement No 776848). At the OALs NBS are co-designed, co-developed and co-deployed with scientists and local stakeholders. At Lake Puruvesi the designing and development of NBS is assisted with science based modeling tools which calculate nutrient and sediment loads under different climate change and forest management scenarios. The NBS consist of a combination of forest management options (e.g. continuous cover forestry) and water protection structures (sedimentation ponds, constructed wetlands etc.). Modeling tools, field monitoring and citizen-science approaches are used for studying the efficacy of NBS for improving the water quality in Lake Puruvesi. A close co-operation with Freshabit Life IP –project is essential for the establishment of NBS.

Keywords: clean water, co-design, nature based solution, open air laboratory

4. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

The engagement potential of ecosystem services: supporting effective stakeholder participation in marine management and conservation

First author: Laura Friedrich

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To achieve their conservation objectives, protected areas, on land and at sea, often have to balance the needs and interests of multiple stakeholders. Ecosystem service assessments can support this by improving the evidence base for better informed planning and management decisions and helping make the case for conservation, but also by facilitating more effective stakeholder engagement. Involving stakeholders in planning, implementation and management of protected areas plays a central role in balancing different interests and securing positive conservation outcomes. Effective engagement can be difficult as conflicts of interest often exist between stakeholders. In the case of marine protected areas, additional layers of complexity are added by the lack of clear physical and jurisdictional boundaries in the ocean and conflictual relationships between different groups resulting from traditionally sectoral marine management. Moreover, there is often a lack of understanding of the connectivity and dynamic complexity in the ocean and the role of marine ecosystems in supporting human wellbeing. Evidence from marine case studies suggests that using ecosystem service assessments in participatory management processes can improve stakeholder engagement, fostering constructive dialogue and collaboration between stakeholders and marine managers.

The study presented here explored this engagement potential to understand how, and under what conditions, ecosystem service assessments can support effective stakeholder participation in area-based marine management and conservation approaches, such as marine protected areas. Drawing from six case studies around the Western English Channel, the study revealed that participation in ecosystem service assessments fosters constructive dialogue and exchange among stakeholders and enables them to gain a better understanding of the broader marine management contexts, from human-ecosystem interactions to other stakeholders'

perspectives. The study also identified a number of enabling conditions that are summarised in a framework providing guidance for the effective use ecosystem service assessments in participatory marine management and conservation processes.

Keywords: stakeholder engagement, participation, ecosystem service assessment, marine protected area, marine management

5. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

A nature-based approach to mitigate flood risk improves ecosystem services provision in Shiga, Japan

First author: Wanhui Huang
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The increased frequency of extreme rain events due to climate change has garnered nationwide attention in Japan. In 2018, Japan enacted the Act of Climate Change Adaptation to foster the formulation of plans at both the national and local levels. In addition to other options, the government of Japan has suggested the use of nature-based solutions across the country to cope with the increased risk of climate-change-induced natural disasters. This study employed scenario analysis to examine the effectiveness of nature-based solutions to mitigate flood risk and their implications on the provision of ecosystem services, such as water yield, sediment retention, nutrient retention, and carbon storage, using Shiga prefecture as a case study. The Shiga prefectural government enacted its own ordinance in 2016 to mitigate flood risk in the face of climate change, which works in combination with existing land use and building regulations in flood-prone areas. In our quantitative analysis, we formulated nine scenarios up to 2050 with combinations of the various levels of land use and building regulations stipulated in the ordinance, as well as alternative future land demands assuming the implementation of growth management policy. Our analysis revealed that current land use and building regulations could mitigate flood risk to some extent by fostering relocation of the residential lands in flood-prone areas to safer areas and converting that residential land to forests and rice paddies. This relocation is made possible by Japan's long-term trend of

population decline that began in early 2000. Our scenario analysis suggested that both flood risk mitigation and ecosystem services provision could be further improved if local governments introduce such a growth management strategy.

Keywords: Flood risk, Land use, Nature-based solution, Ecosystem services, Scenario analysis

6. *Type of submission:* ***Abstract***

S. Sectoral Working Group sessions: S8b Linking nature-based solutions and ecosystem services

The value of Natural Capital Accounting in promoting urban nature-based climate action

First author: Sien Kok
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With climate change, urbanization and overall increasing pressures on natural ecosystems and the services they provide to humankind, the need to reform our natural - and built environment to cope with these trends is increasingly recognized. Nature-based solutions, also called NBS or ecosystem-based adaptation, are particularly promising in adaptation to climate change, but their application is lagging behind. In a Climate-KIC funded project, this paper investigates whether and which kind of Natural Capital Accounting tools can be used to support public and private nature-based climate action in cities and surrounding areas, and lessons learned from their application in practice. Results indicate that the added value of these tools lies in their potential to: 1) support policy making, 2) improve designs and 3) attract new - or redirecting existing - funding streams. However, the use of NCA tools in the context of urban adaptation is still primarily supply-driven, and a stronger link in the tools' output to key decision-making criteria is needed. These criteria may differ depending on the decision-making process (e.g. stormwater management, real estate development, public space management), actor and phase.

Keywords: Natural capital accounting, urban NBS, climate adaptation, decision making processes