BOOK OF ABSTRACT

I. SESSION DESCRIPTION

ID: T14d

Biodiversity and ecosystem service offsets using spatial nature compensation measures

	Title	Name	Organisation	E-mail
Host:	Prof. Dr.	Wolfgang Wende	Leibniz Institute of Ecological Urban and Regional Development	w.wende@ioer.de

Abstract:

This session deals with the new concept of biodiversity and ecosystem services offsets. Offsets obey a mitigation hierarchy and reflect the precautionary and polluter-pays principle in regard to project impacts. This session offers insights into current debates on biodiversity and ecosystem services policies, with outlining theoretical principles and the latest research findings. At the same time the focus is on practical application and case studies. The session puts a particular focus on ecosystem services offsetting concepts.

Goals and objectives of the session:

The aim of offsetting schemes is to achieve no let loss or even net gain of biodiversity and ecosystem services offsets. The session's objective is to show best practice examples from around the world and exchange experiences on how to apply such offsetting schemes. Methods for offsets calculation, so called metrics, will be illustrated. Today there is a lively international discussion among practitioners and scientists on the optimal legal framework, metrics and design of habitat banks to ensure the success of biodiversity and ecosystem services offsets and to minimise the risks of failure or misuse. Contributing to the debate, this session presents the activities and practices of biodiversity offsetting already implemented in selected EU member states and beyond, and the lessons that can be learnt from them. Participants may be surprised at how much experience already exists in these countries.

Planned output / Deliverables:

Creating a joint ISI journal paper illustrating the overall outcomes and including every speaker of the session (e.g. in Land Use Policy or Biological Conservation and/or Ecosystem Services Elsevier Journals).

Related to ESP Working Group/National Network:

Thematic working group: TWG 14 – Application of ES in Planning & Management

II. SESSION PROGRAM

Date of session: Monday, 21 October 2019
Time of session: 15:30 – 18:00

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
15:30–15:45	Martina	Artmann	Leibniz Institute of Ecological Urban and Regional Development (IOER)	Impact mitigation regulation in Austria – theory and practical implications for biodiversity offsets
15:45–16:00	Ingemar	Jönsson	Kristianstad University	Environmental compensation as a policy tool in Swedish municipal planning
16:00–16:15	Linda	Lundmark	Lund University, Sweden	Governing land use policies for compensation in Swedish municipalities: With specific focus on Helsingborg municipality
16:15–16:30	Adeline	Bas	ElfER, France, Germany	Integrating ecosystem services into the Environmental Impact Assessment framework: what relevance?
16:30–16:45	Barbara-Almeida	Souza	University of São Paulo, Brasil	Is there synergy between offsetting impacts on biodiversity and ecosystem services? Insights from an iron mining project in Brazil

Time	First name	Surname	Organization	Title of presentation
16:45–17:00	Marianne	Darbi	Helmholtz Centre for Environmental Research UFZ, Germany	Biodiversity offsets between regulation and voluntary commitment – towards a context sensitive and ecosystem level based differentiation of compensation measures
17:00–17:15	Anne	Böhnke-Henrichs	NABU – Nature and Biodiversity Conservation Union, Germany	Where offsetting schemes fail to avoid biodiversity net loss – current examples from the North Sea and Baltic Sea
17:15–17:30	Chiara	Cortinovis	Lund University, Sweden	Beyond traditional zoning: from ecosystem service mapping and assessment to performance-based criteria for urban planning
17:30–18:00	Wolfgang	Wende	Leibniz IOER	Discussion and wrap up of the session

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***

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Impact mitigation regulation in Austria – theory and practical implications for biodiversity offsets

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Twenty-seven percent of Austria's territory is protected by environmental legislation. However, the current biodiversity monitoring report warns that the country's species and habitat diversity is under threat due to decreasing upland farming, increasing fragmentation of agricultural land and ongoing land take. The "Biodiversity Strategy Austria 2020+" aims at conserving the local biodiversity implicitly linking strategies dealing with impact mitigation recommending a functional relationship between compensation areas supporting a habitat network. Under Austria's federal system, the legislation and implementation of nature protection falls under the jurisdiction of the federal states. This means that rather than some universally applied national law on nature protection, there exist nine different nature protection laws set by the states. These differ substantially in detail and quality between the various states. The environmental impact assessment (EIA) requirement under the Austrian Environmental Impact Assessment Law 2000 (UVP-G 2000) is the only legal measure that applies relevant material laws in one concentrated procedure. Thus, in Austria there are two main legal bases for impact mitigation regulation: (a) nature conservation legislation and (b) UVP-G 2000. In this presentation, the legal basis for the impact mitigation regulation in Austria is presented. Its practical implementation is exemplified on the example of the Austrian federal state Salzburg. Thus, only Salzburg provides detailed, objective guidelines on how to evaluate and determine project impacts on the environment and landscape and their related compensation requirements. In view of an efficient implementation for an EU-wide No Net

Loss initiative, the presentation reflects in the end on Austrian experiences and conclusions from Austrian practitioners for an European Offset Strategy.

Keywords: Biodiversity strategy, offset strategy, environmental impact assessment, nature conservation legislation, project offsets

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

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Integrating ecosystem services into the Environmental Impact Assessment framework: what relevance?

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The European Environmental Impact Assessment (EIA) is a regulatory framework for the implementation of the mitigation hierarchy and more specifically for ecological compensation. Currently, EIA focuses on biodiversity to ensure a No Net Loss of biodiversity. Integrating Ecosystem Services (ES) into mitigation hierarchy through EIA is increasingly being discussed in order to achieve a social and biodiversity No Net Loss. Many institutional initiatives have been launched to address this matter such as the European Biodiversity Strategy to ensure a No Net Loss of biodiversity and ES by 2020 (European Commission, 2011). The private sector is also taking up this issue through international standards for biodiversity and ES mitigation used for projects in development countries (IFC 2012, BBOP 2012).

This interest for integrating of ES into EIA by public and private actors is also reflected in the scientific community who is very active on the topic. Approaches to assess ES in EIA (e.g. Mandel & Tallis 2016, Geneleti et al. 2016), and the benefits and difficulties of this practice (e.g. Jacob et al. 2016, Wawrzyczek et al. 2018) are widely addressed in the scientific literature from a theoretical perspective.

Before going further in the direction of applying the mitigation hierarchy to ES, it seems important to consider the relevance of this widening of the EIA framework: does it improve current practices? What are the risks? Does the current EIA structure allow for an optimal integration of ES?

We propose to answer these questions and discuss the relevance of including ES into EIA through an analysis of guidelines and environmental assessment practices in France and to attempt a comparison with the situation in Germany, where the application of the mitigation hierarchy is broader than in France.

Keywords: Environmental Impact Assessment, Ecosystem services, Mitigation hierarchy, France, Germany

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

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Where offsetting schemes fail to avoid biodiversity net loss – current examples from the North Sea and Baltic Sea

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In Germany, about 30% of all marine species are classified at least as “endangered”. One major driver of this are offshore (infrastructure) projects, as identified by Germany’s Red List. This driver is addressed by biodiversity offsetting schemes which are well established in German approval procedures and intend to achieve a ‘no net loss’ of biodiversity alongside (infrastructure) project implementation or land use changes.

My contribution will provide a brief overview how offsetting schemes are generally implemented in marine ecosystems in the German North Sea and Baltic Sea. Based on specific offshore projects (Nord Stream 2 Pipeline, Fehmarn fixed link, offshore wind farms) shortcomings in current biodiversity offsetting are analyzed. Deficits include, for instance, (a) monetary compensation to replace actual compensation measures; (b) unsolved challenges in

restoring certain habitat types such as sea grass meadows; (c) underestimating project impacts; (d) neglecting certain habitat functions such as migration routes; (e) incomplete mapping of protected habitats.

These shortcomings pose a risk to marine ecosystem services. It will be discussed whether a true 'no net loss' can be achieved and how net loss can be reduced or avoided in the future.

Keywords: Biodiversity offsetting, restoration, compensation, marine ecosystem

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

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Beyond traditional zoning: from ecosystem service mapping and assessment to performance-based criteria for urban planning

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Traditional planning approaches are proving to be inadequate to address the challenges of today's urban development. Traditional zoning and related sets of rules contrast with the need for flexible and place-specific criteria to evaluate the impacts of urban transformations. A possible alternative is that of performance-based approaches, where urban transformations are not assessed in terms of compliance with plan's regulations, but rather in terms of performance, i.e. contribution to achieve plan's objectives.

In this research, we developed and tested a performance-based planning system where requirements for urban transformations are defined based on the analysis of ecosystem service (ES) supply and demand. The proposed planning system assumes a twofold objective: i) to limit as much as possible the negative impacts on ES supply, and ii) to increase the provision of highly demanded ES. Accordingly, the assessment of urban transformation is carried out using two maps: an impact map providing an overall indicator of the current level of ES supply, and a cluster map identifying areas characterized by similar profiles of ES

demand. The impact corresponds to the required level of performance, quantified by a score that urban transformations must gain by implementing appropriate actions. Actions can be chosen from a list of nature-based solutions and their score depends on the priority of the related ES in the cluster where they are realized.

The proposed planning system has been tested on the city of Trento in collaboration with local stakeholders. The application considered seven relevant urban ES and different illustrative types of urban transformations included in the current plan (e.g., in-fill developments, large urban expansions, new industrial sites). Despite its complexity, the approach is transparent and rational and, compared to traditional zoning, it shows the potential to manage the effects of urban transformations in a more effective and equitable way.

Keywords: urban planning, performance-based planning, ecosystem services, urban transformation

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

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Biodiversity offsets between regulation and voluntary commitment – towards a context sensitive and ecosystem level based differentiation of compensation measures

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We witness a global and alarming biodiversity crisis and an ongoing loss of species and their habitats. In response, a number of – also contested – tools and approaches are being trialed and promoted. Biodiversity offsets are one of these approaches. While they deserve to be critically examined, the debate about them has seen a lot of oversimplification and lack of practical evidence. With the growing uptake of biodiversity offsets in the private sector on the one hand, and with the initially envisaged, but failed introduction of a mandatory compensation scheme at EU level under the scope of the EU No Net Loss initiative on the other, the discussion about voluntary vs. mandatory offsets has risen to particular attention.

However, biodiversity offsets are far more complex than this distinction of two types of biodiversity offsets implies. In particular, they not only have to consider the project level, but also the level of the ecosystem and landscape context as well as different stakeholders that may be affected (including the associated ecosystem services). Therefore, this study presents an attempt for a refined typology including seven types of biodiversity offsets, taking into account different contexts, governance arrangements and drivers. It draws on a detailed analysis of theoretical concepts to explain the voluntary implementation of biodiversity offsets and uses an internet based (netnographic) research approach. Furthermore it builds on a broad worldwide explorative base of 72 practical examples and presents in-depth case studies for each type. The results show some global tendencies that allow for recommendations for different locations, contexts and stakeholders.

Keywords: voluntary biodiversity offsets, environmental compensation, no net loss, impact mitigation

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

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Environmental compensation as a policy tool in Swedish municipal planning

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In the struggle to reach the national environmental policy objectives, environmental compensation has emerged as a possible policy tool that may contribute to achieving the objectives. In Sweden, environmental compensation is legally mandated mainly in cases of exploitation within Natura 2000 areas and nature reserves, which is handled through the Swedish Environmental Code. In contrast, regulatory support is weak when it comes to compensation for impacts arising from municipal development (e.g., housing, schools, hospitals, local roads, etc), even though detailed development planning is required through the Planning and Building Act. Despite this, some municipalities have voluntarily mainstreamed environmental compensation into their planning processes. In the research

project "MuniComp" (2018-2020) we investigate the more progressive use of environmental compensation in planning in two Southern Swedish municipalities, Lomma and Helsingborg (in the province of Skåne). We analyze the models and processes of compensation used, and planning cases where compensation have been applied, in terms of general aspects and criteria for environmental compensation and in light of the constraints of the Swedish legislative context. In the presentation, the compensation models and some of the results from the compensation cases will be presented.

Keywords: Environmental compensation, municipalities, Sweden, policy instrument, MuniComp

7. *Type of submission:* ***Abstract***

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Governing land use policies for compensation in Swedish municipalities: With specific focus on Helsingborg municipality

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Land use policies to compensate for environmental destruction in protected nature areas (e g. Natura 2000), is implemented in Sweden through strict legal structures, regulated under the Environmental code. However, in some cases, in areas not covered by the legal requirement of an ecological assessment, compensation measures have been applied in municipalities in Sweden as part of their spatial planning. These measures are implemented in an ad-hoc manner ranging from loose applications to more formalized assessment structures. This study will explore and broadly map land use policies for compensation in Swedish municipalities to gain understanding of its policy design, how it is applied and how widespread it is at a national level. In a second step, a case study will be conducted in the municipality of Helsingborg, Sweden and its application of land use policies for compensation. The case study will be divided into two parts. First, we examine in what way land use policies for compensations is organized within the municipality and secondly we explore the process in which scientific knowledge is considered and used in practice as well as the form in which this knowledge is

included. For example, which assessment tools (e.g. matrixes and indicators) are used and which ecological theories and data is considered. In order to answer these questions document analyses will be conducted, on grey literature (mainly comprehensive plans and their underlying reports as well as specific reports from Helsingborg municipality). In addition, interviews will be performed with key stakeholders working with compensation measures in Helsingborg municipality.

Keywords: compensation, conservation, biodiversity, green space governance

8. *Type of submission:* ***Abstract***

T. Thematic Working Group sessions: T14d Biodiversity and ecosystem services offsets using spatial nature compensation measures

Is there synergy between offsetting impacts on biodiversity and ecosystem services? Insights from an iron mining project in Brazil

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Biodiversity offsets aim to achieve no net loss of biodiversity through balancing residual unavoidable losses caused by development projects. To what extent they also compensate for impairment of ecosystem services (ES) is not only a matter of conceptual development, but also a topic in need of empirical evidence from actual offsetting. This paper explores synergies between offsetting impacts on biodiversity and ES of one iron mine located at a high biodiversity area in Brazil. For this purpose, we: (i) performed an Ecosystem Services Review to identify impacts on ES (ii) reviewed the project's social and environmental management plan to identify and analyse programs capable of addressing impacts on ES; (iii) mapped the project footprint, offset areas, monitoring points and local communities affected by the project. Results from the Ecosystem Services Review revealed unidentified social consequences of biophysical impacts of the project. The review of programs showed some with potential to encompass impacts on ES, especially provisioning services, although they were not designed with this intent. The biodiversity offset plan is focused on sensitive ecosystems and conservation outcomes, with low potential to encompass ES impacts. Finally, the results from the mapping demonstrated that the implementation of the programs were based on aleatory

sample without consider the local com communities affected by the project as a criterion to plan and implement these programs.. We concluded that there are few synergies between biodiversity and ecosystem offsets, especially when the biophysical and social impact assessment are not performed in integrated way. Therefore, ES offsets require a specific approach, followed by ecosystem service review that can be planned and implemented with biodiversity offset.

Keywords: biodiversity offsets, environmental and social management programs, ecosystem services, mining