Creating market for biodiversity by using habitat banking: preliminary assessment of applicability to Finland

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Abstract

The aim of this study is to make a preliminary assessment of the applicability of habitat banking in Finland. The pros and cons of the mechanism as well as the most essential aspects from the Finnish perspective are assessed. The study concludes that habitat banking is one of the mechanisms which could be used in Finland to prevent or slow down the degradation of biodiversity. The mechanism includes ecological and economic risks, and thus the possible implementation in Finland should be preceded by a careful and relatively long-lasting piloting phase. Habitat banking could be used as a mechanism to compensate direct or indirect ecological harms caused to conservation areas e.g. by large scale infrastructural development projects or to compensate negative impacts of peat production. Furthermore, it could be used to compensate harms caused by large-scale development projects to other sites with specific ecological importance. However, the application of the mechanism should be carefully defined and restricted so that compensation demand would not lead to the hindering of ordinary economic activity.

Keywords: Habitat banking, Ecological compensation, Biodiversity, Ecosystem services, Market-based instruments

Background and the aims of the study

The EU 2020 Biodiversity Strategy seeks to ensure no net loss (NNL) of biodiversity and ecosystem services. Loss of biodiversity is caused by many factors, e.g. by changes in land use including construction of infrastructure. At EU level one of the key instruments in securing biodiversity against this pressure are the Habitats and Bird Directives and Natura 2000 network. According to the Habitats Directive development projects which weaken the values of Natura 2000 network cannot be authorized. Only in some cases a permit can be granted, but compensation of the lost nature values is then required. Apart from the Habitats Directive at EU level there is no wider-scale demand for compensation.

One possible mechanism for achieving the target of no net loss is a wider use of compensation mechanisms. However, both in policy and science forums the usability of compensation has been discussed and questioned. It has been debated if nature values in general can be compensated, how effective earlier compensation measures have been and if the use of compensation would more likely lead to giving “license to trash” than to its original aim, i.e. preservation and increase of nature values.

In Finland legislation requires avoidance and minimization of losses to nature. In large-scale projects possible measures aiming to avoidance and minimization are examined in the environmental impact assessment (EIA) process. The legislation does not, however, enable the use of ecological compensation in permit procedures. Requirements for compensation are included only into few statutes.

The aim of this study is to make a preliminary assessment of the applicability of habitat banking in Finland. Habitat banking is an offsetting mechanism, which has been used for a long time e.g. in the USA and Australia. Several European countries use some compensation mechanisms, but habitat banking is widely used only in Germany. In this study the pros and cons of the mechanism as well as the most essential aspects from the Finnish perspective are assessed and recommendations for the

future actions are given. The paper is based on the report prepared for the Finnish Ministry of the Environment (Kniivilä et al. 2014).

1. What are biodiversity offsetting and habitat banking?

Ecological compensation must be considered in the context of the "mitigation hierarchy". This means that compensation should be preceded by prevention and mitigation of negative impacts and used only as a final measure to compensate remaining negative impacts, if proceeding with the development project is considered necessary. The key aim is to ensure that the overall state of biodiversity remains unchanged or improves. As the term "compensation" is somewhat vaguely used and does not always include the idea of no net loss, the term biodiversity offsetting is often used instead. Biodiversity offsets are formalized arrangements for delivering compensation in terms of ecological values to increase biodiversity values or at least to achieve no net loss (ICF GHK 2013). Key principle in compensation is that there are "no go areas", i.e. areas the nature values of which are so valuable that they have to be kept intact (see e.g. OECD 2013, ICMM IUCN 2012).

The Business and Biodiversity Offsets Programme (BBOP) has created a guidance of the best practices for the establishers of biodiversity offsets (BBOP 2009a and b, BBOP 2012). The criteria have been created in cooperation with significant amount of international organizations, governments and private companies. BBOP defines biodiversity offsets as follows:

"Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from development plans or projects after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity." (ICMM IUCN 2012, BBOP 2012).

Offsetting mainly takes the form of measures to restore, rehabilitate, create or preserve habitats (Commissariat général…. 2012). In many countries several of these measures are used and the choice of the measure depends on the circumstances. There are three different mechanisms, which are used to implement compensation (e.g. OECD 2013):
One-off approach: once adverse impacts have been evaluated, the biodiversity offset is carried out by the developer or by a subcontractor.
In-lieu arrangement: a government agency stipulates a fee that a developer has to pay to a third party, to compensate for residual biodiversity impacts.
Habitat banking/Biobanking etc.: once adverse impacts are evaluated, the developer can purchase offsets directly from already existing public or private habitat bank. The price of the credits is often determined in the market.

Finding areas which could compensate lost biodiversity values or ecosystem services is not easy. To fully compensate the loss, they should have at least potential for creation of similar nature values than is lost, be located close enough, be available to be used as a compensation area and bring additional value to existing conservation network. The possibly long time for development of nature values and the associated risks pose further challenges.

2. Habitat banking in the USA

In the USA there are two different compensation programs: conservation banking and wetland banking. Wetland banking is based on Clean Water Act of 1972. The use of conservation banking was begun in mid-1990s. In both mechanisms the developers whose actions are causing damage to nature are obliged by law to compensate the damage. This can be done e.g. by buying credits from habitat banks (conservation or wetland banks).

Habitat banks are sites where resources (e.g. certain habitat type or species) are restored, established and/or preserved (for perpetuity). The aim is to provide compensatory mitigation for impacts of development projects that lead to biodiversity loss elsewhere. The habitat bank sells credits to developers who are obligated to provide compensation (figure 1). The price of credits is often determined by supply and demand. The seller of the credits is the owner of land with biodiversity values (e.g. private landowner, companies, state) and credits are bought by the developers (e.g. companies, state) whose activities harm valuable features of nature. Authorities define rules of habitat banking, monitor implementation and define type, number and release of credits.

The unit of trading is normally a given acreage of strictly defined habitat. Sometimes, instead of acreage, the unit can be e.g. a nesting pair of an endangered bird species or a combination of the size of the area and species composition. For wetlands, functional value of the area and its size have major importance (www.ecosystemmarketplace.com). In conservation banking credits are normally sold only after it can be proved that conservation has been successful. Thus, mere realization of the given conservation measures is not enough. This was not required in all agreements before.

The prices of sold credits vary depending on the characteristics of the habitat, costs of restoration and demand. Already at the beginning of the 2000s the highest prices per hectare were hundreds of thousands of US dollars (Bishop et al. 2008). The cheapest prices were at the same time about thousand US dollars per hectare (Bishop et al. 2008). According to Ecosystem Marketplace portal the average price of wetland credits was in 2008 about 30 000 US$/ha. Prices vary between the US states and wetland types.

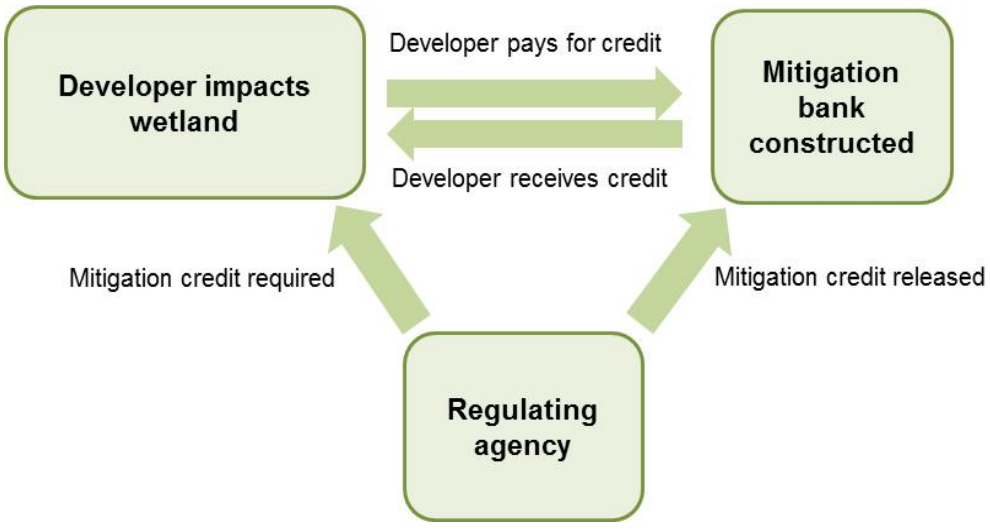

Figure 1. Wetland mitigation bank structure (Hook and Shadle 2013)

Pros and cons of habitat banking

The use of ecological compensation has increased in Europe during the last few years. The aim has been that degraded biodiversity could be compensated by new, high-value areas. In practice, however, this has not always happened and in many cases outcome has been weak (Quickley and Harper 2005a, 2005b, Moilanen et al. 2009, Walker et al. 2009, Maron et al. 2012). One reason for failures has been too simple criteria for compensation, both in terms of replaced habitat and needed time (e.g. Overton et al. 2013). There have also been flaws in practical implementation and monitoring.

Bekessy et al. (2010) consider as problematic e.g. the time-lag related to restoration and the risks of failure. Also some compensation mechanisms allow the use as compensation areas sites which are already threatened and thus do not necessarily bring any additional ecological value to conservation network. Bekessy et al. (2010), however, consider the use of ecological compensation reasonable when it can be proved that compensation area has reached the biodiversity level required. According

to McKenney and Kiesecker (2010) mechanisms should be developed so that it is possible to evaluate the additional ecological value compensation areas are providing, likelihood to reach the ecological targets and time needed to create new ecological values.

If habitat banking is used as a compensation mechanism, it is important to assess the economic factors which impact on land-owners' and entrepreneurs' interest towards the mechanisms and to their willingness to create and use habitat banks. If landowners make their decisions on economic grounds, the net income from habitat banking should be higher than the net income from an alternative land use, e.g. forestry. Habitat banking as an economic activity includes risks related e.g. to ecological failures, regulation and time perspective (no certainty on demand and markets), all these impacting on expected net income.

From the society's point of view a significant factor is the consistency of habitat banking with the "Polluter pays" principle. Furthermore, by using habitat banking markets are created for non-market goods – biodiversity and ecosystem services. Creation of economic value for these goods should lead to more optimal use of resources from the society's point of view. Similarly, private landowners would benefit if they provide public goods in their property.

The use of compensation mechanisms includes ecological and economic risks and researchers' conclusions on the applicability of the mechanism are not unambiguous. However, if implementation is carried out by using good practices, the use of mechanism will lead to no net loss of biodiversity or net gain in biodiversity compared to situation with no compensation demanded.

Applicability of the mechanism to Finland

Factors supporting the implementation of the mechanism in Finland:

+ Finland is a stable society with well-functioning institutes. This is a prerequisite for the success of habitat banking. Strict criteria, involvement of different parties and monitoring of activities are prerequisites for functioning of the mechanism.
+ Private forest owners could find habitat banking interesting as there are already positive experiences of the voluntary forest biodiversity conservation programme METSO.
+ Habitat banking might be interesting activity for Metsähallitus (organization governing state-owned forests) as the organization is already carrying out restoration activities. Habitat banking could also be an additional financing source for Metsähallitus. Furthermore, several Finnish companies find NNL principle interesting and relevant in their activities.[8]
+ There is a significant amount of experience of restoration activities in Finland.
+ Ecological knowledge and information needed for measuring sufficient compensation are well available in Finland.

Challenges and restricting factors:

- It can be challenging to find compensation sites which are ecologically valuable and locate close enough to development sites.
- There may not be enough voluntary demand. Changes in legislation might be needed.
- No certainty of sufficient demand and supply to guarantee economic viability.
- Development of the actual trading mechanism will take years.
- Development of ecological values in restoration sites will take long time.
- Private forest holdings in Finland are small. However, co-operation between forest owners would partly solve the problem.
- The role of state should be assessed. Could the state act as a seller and buyer of nature values and on the other hand also as a regulator of the mechanism? What would be the role of those restoration projects which are already under way?

[8] See e.g. Finnish Business & Society (www.fibsry.fi)

Conclusions and recommendations

If ecological compensation will be used in Finland, compensation should be an option only if avoidance and minimization of loss are not enough to eliminate the problem, and carrying out the development project is still considered essential from the society's point of view.

As in Natura 2000 areas, the requirement of compensation could be considered also in other conservation areas where nature values are weakened. Ecological compensation could be an option also if biodiversity of existing conservation area is indirectly weakened e.g. because of a development project. This could include impacts of large-scale projects like mining and major road construction. Furthermore, the mechanism could be used in peat production by requiring ecological compensation for the use of peatlands of purely or nearly in natural state.

If the aim is to halt biodiversity degradation in accordance with the EU's "no net loss" target, requirement for compensation should include also other sites with specific ecological importance even if they locate outside conservation areas (e.g. habitats conserved by nature conservation act). Which nature values are considered exceptionally valuable and having specific ecological importance, should be explicitly determined, so that requirement for compensation would not lead to heavy bureaucracy and/or hindering and stagnating of conventional development.

Use of compensation would inevitably cause costs. If mechanism will be used in Finland, the developers causing the loss should be obliged, as far as possible and reasonable, to bear the costs. This would also encourage developers to seek alternative solutions to compensation (avoidance, minimization). This would also be in line with the EIA process.

Habitat banking mechanism is a market-based mechanism, but regulation is needed to support it. Use of habitat banking encourages landowners to produce voluntarily ecosystem services of social importance and it increases landowners' possibilities to make choices between different production lines. Use of habitat banking might be a way to move forward from the METSO programme and partly closer to market-based methods in nature conservation. Compensation mechanisms could also partly act as a financing mechanism of METSO.

Use of habitat banking is possible only if landowners/entrepreneurs find the mechanism interesting. The level of interest is dependent on many issues, e.g. clarity on the mechanism, stability and predictability of regulation, the level of demand and expected earnings, risks, and the availability of financing.

In addition to supply it would be important to assess also the level of demand. On what grounds the developers causing losses would be willing to take part in habitat banking? Is voluntary demand enough from the society's point of view or is obligatory compensation needed? Which of the compensation mechanisms or other mechanisms are the ones considered important from the society's viewpoint and what is the role of habitat banking among different mechanisms? In infrastructure projects the buyer of nature values would typically be the government. In more business oriented cases buyers would be private companies. Especially for companies working in international environment it is important that possible new practices in Finland would be in line with international practices. Even if habitat banking is a market-based mechanism, strong involvement of government is also needed. There are risks related to regulation, which impact on the success of habitat banking.

As for example restoration can fail due to ecological risks, the mechanism should be used in those habitats where the likelihood of success is high. Habitat banking could also be combined with the production of other ecosystem services, e.g. carbon sequestration or production of clean water. By producing several ecosystem services instead of one, habitat banking would most likely be more effective.

Habitat banking is one the mechanisms which could be used to prevent or slow down the degradation of biodiversity in Finland. However, the application of the mechanism should be carefully defined and

restricted so that compensation demand would not lead to the hindering of ordinary economic activity. The possible implementation of the mechanism in Finland should be preceded by a careful and relatively long-lasting piloting phase. In the piloting phase sites offered to METSO programme, but not accepted due to budget limits, could form a potential supply pool. However, the use of the mechanism should be examined also in other habitats, e.g. in traditional biotopes, which can be developed in a relatively short time, and in already partly restored mires. Interest of sellers and restrictions they set should be assessed. Similarly the needs and interest of buyers should be examined. Possible buyers in the piloting phase could be e.g. those companies which are already now carrying out compensation in their own activities. Furthermore, in the piloting phase a special emphasis should be given to the verification of the impacts of actions and to assessing the impacts on the costs of public authorities.

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