

Compensation For Biodiversity Loss

Advice to the Netherlands' Taskforce on
Biodiversity and Natural Resource

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May 2011

Colofon

This report should be cited as follows:

Steven de Bie, Bopp van Dessel, 2011 Compensation for biodiversity loss – Advice to the Netherlands' Taskforce on Biodiversity and Natural Resources. De Gemeynt, Klarenbeek (the Netherlands). Pb2011-002

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Advice to the Taskforce

In 2010, the No Net Loss-initiative (NNLi) analysed, requested by the Taskforce Biodiversity & Natural Resources, the effectiveness of current legislation and regulation with respect to mandatory compensation, assessed gaps in knowledge and methodology that might hamper effective voluntary compensation, executed two pilot projects with companies/ institutions and exchanged views with (groups of) stakeholders and experts. All of this to help the Taskforce to advise to the Dutch Government on how to improve current biodiversity policies, particularly with respect to voluntary biodiversity compensation.

NNLi looked at ways to get voluntary compensation by businesses more widely accepted, implemented and effective, specifically in the Dutch context and also reviewed mandatory biodiversity compensation regulations and practices to learn from this experience and look for synergies.

The NNLi offers the following recommendations and advice:

1. BBOP-approach and principles are a good basis for compensating the loss of biodiversity due to new and existing activities; however they need to be elaborated to better account for other drivers than 'change of habitat';
2. Voluntary biodiversity compensation, driven by company policy and business case, has great potential to contribute to halting / reversing of biodiversity decline outside protected areas;
3. Adopt a broad 'compensatory conservation' approach with less emphasis on 'like-for-like', recognizing the additional opportunities for biodiversity conservation above compensating for loss of direct land take (by new projects) only;
4. Explain consistently and clearly the differences/synergies between themes like global warming, sustainability, CSR, PPP, Cradle to Cradle, and biodiversity management including compensation, encourage integration and develop a certification or a 'green' quality mark for voluntary biodiversity compensation plans to reduce (reputation) risks;
5. Pilot compensation-banking: establish large compensation areas in the main characteristic ecosystems to accommodate the individual compensation requirements, mandatory and voluntary, to avoid scattering and compensation inefficiency;
6. Start a vigorous communication process on the importance of biodiversity conservation and its loss and the necessity for compensating that loss; emphasize the role for business in reducing and compensating the loss of biodiversity due to their activities;
7. Eliminate stacking of compensation regimes; only the strictest compensation regime should apply where compensation for biodiversity and nature loss is required; one set of compensation principles should be developed for both mandatory and voluntary compensation;
8. Create one supervising body for biodiversity compensation;
9. The business case for companies to compensate their impact on biodiversity is not very obvious (yet); pioneers should be stimulated and facilitated; strive for synergy with TEEB;
10. It is urgent to back up theoretical voluntary compensation by many good business cases.

Advies aan de Taskforce

In 2010, heeft het No Net Loss-initiative, op verzoek van de Taskforce B&NH, een analyse uitgevoerd naar de effectiviteit van de huidige wetgeving met betrekking tot verplichte biodiversiteit compensatie, leemten beoordeeld in de kennis en methodologie die effectieve vrijwillige compensatie in de weg zou kunnen staan, een tweetal pilot projecten uitgevoerd, en ideeën uitgewisseld met (groepen) stakeholders en deskundigen, teneinde de Taskforce te helpen bij de advisering van de Nederlandse regering hoe het huidige biodiversiteit beleid te verbeteren, met name waar het gaat op compensatie van biodiversiteitsverlies.

NNLi heeft de bestaande mogelijkheden bekeken om vrijwillige biodiversiteitscompensatie bij bedrijven meer geaccepteerd, uitgevoerd en effectief te krijgen, specifiek voor de Nederlandse situatie, en evalueerde daartoe ook de verplichte biodiversiteitscompensatie wet- en regelgeving en praktijken om hiervan te leren en synergie te zoeken.

NNLi biedt de volgende aanbevelingen en adviezen aan:

1. De BBOP benadering en principes vormen een goede basis voor de compensatie van biodiversiteitsverlies teneinde van nieuwe en bestaande activiteiten; echter zij moeten worden uitgewerkt teneinde andere factoren voor biodiversiteitsverlies in de beoordeling te kunnen betrekken;
2. Vrijwillige biodiversiteitscompensatie, gedreven door bedrijfs beleid of business case, kan een grote bijdrage leveren aan het stoppen/keren van biodiversiteitsverlies buiten beschermde gebieden;
3. Kies voor een brede 'compensatory conservation' benadering van biodiversiteit met minder nadruk op 'like-for-like' waarmee de mogelijkheden voor biodiversiteitsbescherming additioneel aan compensatie voor alleen het verlies aan habitat worden erkend;
4. Leg de verschillen en synergie duidelijk(er) en consistent(er) uit van thema's zoals klimaatverandering, Duurzaamheid, CSR, PPP, Cradle to cradle, en biodiversiteit bescherming incl compensatie, stimuleer integratie hiertussen, en ontwikkel een keurmerk voor vrijwillige biodiversiteitscompensatie om het risico van reputatieschade voor deelnemende bedrijven te reduceren;
5. Probeer habitat-bank uit: ontwikkel grote compensatiegebieden voor de belangrijkste ecosystemen om effectiever in individuele compensatiebehoeften te kunnen voorzien;
6. Start een brede en intensieve communicatiecampagne om het belang van biodiversiteit (behoud) voor de mensheid en de noodzaak om verlies ervan te compenseren duidelijk te maken; benadruk de rol van het bedrijfsleven in het verminderen en compenseren van biodiversiteitsverlies; zoek aansluiting bij TEEB;
7. Vermijd stapeling van compensatie regimes; (alleen) het meest stricte regime dient in werking te treden indien compensatie van biodiversiteit vereist is; ontwikkel één systeem van compensatie principes voor zowel verplichte als vrijwillige compensatie;
8. Zet een onafhankelijke instantie voor toezicht op compensatie op;
9. Het is de hoogste tijd om vrijwillige compensatie in de praktijk, op grote schaal uit te gaan voeren en goede business cases te genereren!

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Acknowledgements

We are very grateful to the Municipality of Den Helder and a large international chemical company for their collaboration in piloting the No Net Loss concept.

Henk Simons (IUCN Netherlands) helped us in analysing the current legislation and regulation and assessing the need for further research around compensation. Chapter 4 and 5 benefitted from his work; we thank him very much.

Arthur Eijs, John van Himbergen (both from the Ministry of Infrastructure and Environment (I&M)) and Eric van Zadelhoff en Paul Vetter (both from the Ministry of Economy, Agriculture and Innovation (EL&I) as well as Bas Roels (EL&I Regiebureau Natura 2000) provided us with their valuable comments for which we are very grateful.

We also thank Yolanda van Schaijk (CREM), Mark van Ootschot (PBL) and Bart Beerlage (C-mer) for their input and very interesting and constructive discussions.

Preface

In 2009 the Dutch government established the Taskforce Biodiversity and Natural Resources (B&NR) to advise on how to improve current biodiversity policy and management. From the start this Taskforce B&NR made it clear that economic instruments and in particular the internalization of environmental costs in production costs of goods and services, and hence in their price, would receive special attention in the work of this Taskforce.

Compensation of damage to biodiversity is one of the mechanisms to settle environmental costs. It concerns creating new opportunities for biodiversity, which as a minimum equals the residual impact after a company or organization has attempted to avoid, prevent and mitigate that impact.

The Taskforce B&NR considers it important to pilot *voluntary* compensation by companies and institutions, in addition to current Dutch legal regimes that demand compensation when activities impact on nature values in certain categories of protected areas (in particular Network of Protected Areas EHS, and Natura2000 areas), on certain categories of species. Therefore the Taskforce B&NR decided to collaborate with the international Business & Biodiversity Offset Program (BBOP). This collaboration should focus on the following themes:

- Articulating advice for the advancement of voluntary compensation and a related policy,
- Articulating advice for aggregating compensation and creation of a system of biodiversity banking (including bio-credits trading)
- Execution of pilot projects that add value to BBOP's thinking such as agriculture, tourism, urbanization.

The Taskforce B&NR regards No Net Loss of biodiversity as the point on the horizon symbolizing the ultimate objective, the ambition of our society. This ambition comprises the avoidance and mitigation of impacts with ultimately full compensation of the residual impact as the essential conclusion. This ambition plays at different scales: global, (inter)national, local and at project or company level.

In February 2010, the Taskforce B&NR asked us to start the No Net Loss initiative (NNLi) and carry out a programme of actions that would deliver on the above three themes, all in the context of a voluntary No Net Loss ambition for private sector companies. Actions should include the following:

1. Piloting voluntary 'no net loss of biodiversity' through a number of projects with companies or institutions,
2. An assessment of gaps in knowledge and methodology that might prevent effective voluntary compensation,
3. An analysis on the effectiveness of current legislation and regulation with respect to mandatory compensation,
4. Communication with target groups.

Voluntary compensation of biodiversity loss applies to areas where there is no legal obligation for compensation of the loss of species or habitats. Therefore, this (voluntary) biodiversity compensation is driven by company policy/business interest.

With this report the NNLI informs the Taskforce B&NR on the outcomes of the above program of actions and formulates recommendations and concept advice on how an effective voluntary compensation mechanism could look like in the Netherlands and under which conditions.

After giving an introduction and some definitions in chapter 1, in chapter 2 the current situation with respect to voluntary biodiversity compensation by businesses is described and the NNLI pilot project summarized. In Chapter 3 the most important lessons learned concerning voluntary compensation are analyzed. In chapter 4 we review the interface with mandatory compensation: the models, practice, strong and weak points and gaps. Chapter 5 presents the overall conclusions and recommendations of NNLI 2010.

1. Introduction

1.1 Biodiversity compensation and No Net Loss

1.1.1 What is biodiversity?

When raising the subject of biodiversity compensation in whatever discussion platform, the first question many people will ask is: 'What is biodiversity?'. This is despite the fact that we as humans are, directly and indirectly, fully dependent on biodiversity.

Biodiversity comprises the global diversity of ecosystems, species and genes, ranging from deserts to tropical rainforests, from fish in the sea to micro-organisms in the soil, from genetic variety within livestock to that within agricultural crops. The following definition is the one used by the Convention on Biological Diversity and being applied globally (see www.cbd.org):

"The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic systems and among the ecological complexes of which they are part, this includes diversity within species, between species and of ecosystems."

The significance of biodiversity is generally explained through its key role in the provision of ecosystem services. Examples of ecosystem services delivered are food, fresh water, wood and fibre, medicines, soil fertility, climate regulation, building materials, inspiration for scientific and technical development, genetic resources, flood regulation, and recreation facilities (MEA 2005). The unprecedented, current rate of biodiversity loss throughout the world should therefore be a major concern to the business society (UN 2010) and creates a certain responsibility given the fact that our collective economic activities have benefitted from biodiversity but at the same time largely contributed to this loss and still do.

1.1.2 What is biodiversity compensation?

In view of the continued global decline in biodiversity, different initiatives are searching for ways to conserve and strengthen existing biodiversity. Compensation for biodiversity loss is a frequently discussed subject in that context. The Business and Biodiversity Offset Program (BBOP) defines it as:

"A set of actions that lead to measurable conservation outcomes, designed to compensate for residual biodiversity impacts that arise from the activities of an existing or new project and that remain after appropriate prevention and mitigation measures have been implemented" (see <http://bbop.forest-trends.org/>)

The ultimate goal of biodiversity compensation is clear: to achieve a situation of 'no net loss' of biodiversity and if possible a 'net gain' of biodiversity in the sense of species composition, habitat structure, and ecosystem functioning and services, including the use by and cultural values to mankind (livelihood aspects).

There are two possible approaches to the principle of compensating for biodiversity loss:

1. *Compensation* (in a strict sense) or 'offset': on-the-ground identification of the potential loss of biodiversity due to the take of land (habitat) by a new project or activity, preceding the start of such project or activity, and the design of compensation formats for that loss,
2. *Compensatory conservation (but often named Compensation as well)*: identification of loss of biodiversity that might occur due to a project or activity in broad sense (i.e. including other drivers than just loss of land), including historic loss, and of options to compensate for that loss.

The first approach, compensation or offsetting, is forward looking, predicting the possible loss of biodiversity as a result of only change of original habitat, based on thorough studies in the field.

The second approach focuses on all possible drivers for biodiversity loss, such as emissions to air, noise and light but also including change of land, even not excluding historic loss (e.g. original land take or other impacts which happened in the past). It comprises 'offset' in case it concerns a new activity requiring change of habitat. It can be considered as an extension of the first approach. See table 1.

Voluntary compensation could be just *compensation* but also *compensatory conservation*, depending on the choice the taker of the initiative makes.

Mandatory compensation in the Netherlands could be both also: either *conservation* (e.g. Law on Spatial Planning or Forestry Act) or compensatory compensation (according to the Nature Conservation Act).

Table 1 Options for biodiversity compensation

Case	Land use change required?	Compensation (= BBOP, EU Habitat Directive, Dutch Nature Conservation Act)	Compensatory conservation (= No Net Loss initiative)
New industrial site, infrastructure or housing	Yes	Compensation for predicted biodiversity loss through acquisition of land designed to build up biodiversity to the level of the original habitat	Compensation for predicted biodiversity loss due to take of land with original habitat and other (future) pressure factors ¹ through acquisition of land and other compensation mechanisms
Existing plantation or industrial site	No	No compensation for biodiversity loss	Compensation for biodiversity loss due to current resource take and use, and all other pressure factors (and -if agreed- also from the past, including land take)

¹ Pressure factors include all sources of potential harm to the environment resulting from a business process

In voluntary biodiversity compensation many opportunities for biodiversity compensation and restoration are overlooked when the focus is just on the loss of area and compensating for that loss. Indirect drivers or pressure factors for loss of biodiversity such as emissions to air or withdrawal of water have larger impact on biodiversity than the land take itself and often much more difficult to define. And if the supply chain is included it poses another set of challenges.

BBOP supports the 'compensation' approach. The philosophy behind is that if one really wants to conserve biodiversity the original habitats should not be destroyed. The BBOP compensation principles and guidance developed are based on that philosophy. However, given the fact that (in a situation like the Netherlands much) land use change has been taken place already and/or is taking place and the fact that biodiversity decline in the Netherlands is not driven by new land take but the result of the (residual biodiversity footprints of) ongoing activities, compensating the loss of the original habitat alone is not adequate to prevent further biodiversity loss. It is just the least that should be done.

Despite the highly valued, ground-breaking work done by BBOP over the last years business buy-in is limited for adopting the BBOP approach: companies shy away from the offsetting approach because of its requirements for detailed pre-compensation work and its rather rigid approach which does not fit very well with the day-to-day management of business activities (see further chapter 2).

In comparison more can be achieved for biodiversity conservation through the compensatory conservation approach: the broad analysis of biodiversity loss, retrospective and prospective, possibly even including supply chains and/or life cycle scope. NNLI favours this approach for the following reasons:

- There is hardly any real nature left in the Netherlands; what is left has a protected area status; nearly all changes to land concern areas that have been changed in the past but still containing biodiversity;
- The pressure factors such as N-deposition, water fertilization, water distraction, have a much larger impact on current loss of biodiversity values, nature and ecosystem functions in the Netherlands. Also, negative effects of an industrial activity in the Netherlands on biodiversity outside the country, e.g. via raw materials, can outweigh the local Dutch biodiversity loss by far. Discarding the opportunity for compensation of those losses, is giving away an excellent opportunity for biodiversity conservation.

NNLI recommends that in voluntary compensation for biodiversity loss offsetting is the minimum one should do but without any detailed pre-work, and that a company or organization should do more where possible, i.e. including the impacts from other drivers in that compensation effort.

Transparent and systematic compensation is an effective tool to conserve biodiversity but complex. This complexity can partially still be explained by a lack of knowledge and experience (though the number of compensation cases is increasing), partially because biodiversity is complex in itself (no two hectares are the same), and partially because of the many interfaces between human activities and biodiversity.

1.1.3 What is No Net Loss?

No Net Loss of biodiversity could be compared to carbon-neutral for climate change: it is the ambition to conduct activities in such a way that after adding positive and negative impacts zero net environmental impacts result. This way, a (business) activity is made sustainable with respect to biodiversity. Hence, for a company No Net Loss is an ambition, policy or target being met through (voluntary) compensation efforts at the level of its activities throughout its business.

Also in the Netherlands, more and more companies see the value of Sustainable Business, Maatschappelijk Verantwoord Ondernemen (MVO, Responsible Business) or Corporate Social Responsibility and the corresponding business case. However, the No Net Loss-initiative notes that in all of these approaches, biodiversity is often (partially) overlooked. Companies are unaware of this incompleteness and assume that biodiversity is managed adequately when adopting one of the above sustainability policies. Therefore No Net Loss has to be included into the Sustainable Business agenda as a separate subject to pursue. However, biodiversity is more difficult to handle than energy efficiency or climate change, because of its multiplicity, complexity and difficulty (for now impossibility) to express 'biodiversity' in one unit (like CO₂-equivalent for climate change).

The loss of biodiversity caused by a (business) activity can never be reduced to zero through avoidance and mitigation: at least activities need space and/or have an interaction with their environment, which changes the habitat and as a consequence affects biodiversity. Therefore there is always a residual impact

Implementation of a No Net Loss policy has therefore two essential elements:

1. Careful application of the mitigation hierarchy to reduce the biodiversity footprint to a level as low as reasonably possible,
2. Qualitative and quantitative measurement and compensation of the 'residual' biodiversity footprint that remains after all mitigation measures.

See also Figure 1.

A No Net Loss ambition as part of the Corporate Sustainability Policy cannot be adopted without acceptance of the principle of voluntary compensation for the residual footprint where mandatory compensation is not required.

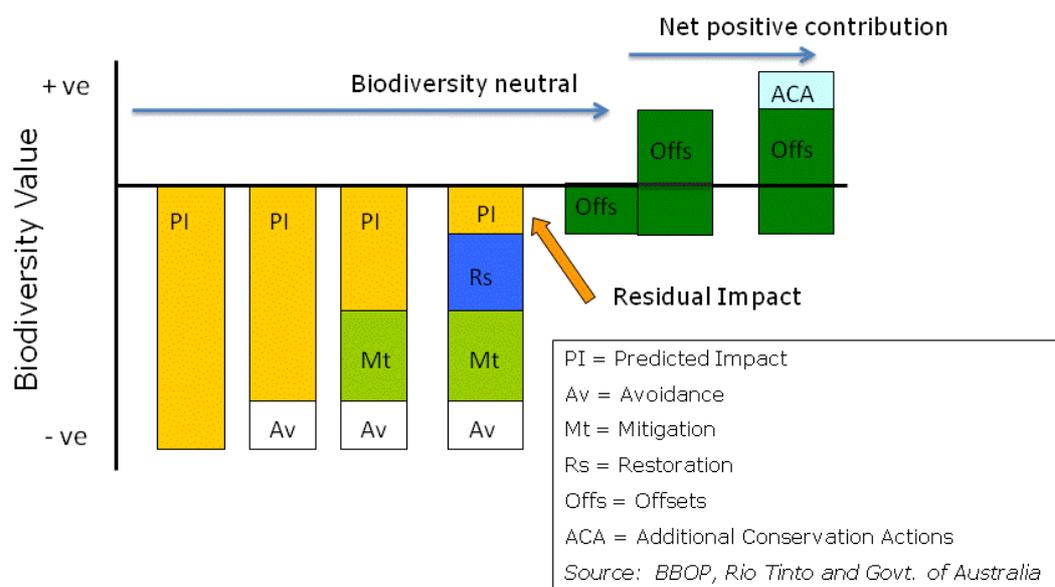


Figure 1 Position of biodiversity compensation in the mitigation hierarchy.

1.1.4 Is there a case for voluntary compensation of biodiversity loss?

Mandatory compensation of biodiversity loss is well organized in the legislation and regulation in the Netherlands: the Nature Conservation Act, Law on Spatial Planning, Flora- and Fauna Act and the Forestry Act demand compensation for the loss of species and habitat, and in case of the Nature Conservation Act also for loss due to drivers such as disturbance.

However, the coverage of these laws is such that there is opportunity for voluntary compensation:

- Most man-related activities (living, transport, business including agriculture) take place outside protected areas (<10% of the onshore territory), and at many locations where no protected species are being impacted on,
- Legislation does not apply outside the Netherlands where in particular Dutch business has most of its impacts,
- Apart from the Nature Conservation Act legislation relates to only compensation of land taken / habitat loss whereas through other drivers such as emissions to air or noise, biodiversity is also impacted and voluntary compensatory conservation offers many chances,
- Compensation for loss occurred up and down the supply chain is not covered by any legislation or regulation,
- And biodiversity loss that occurred in the past is excluded in the mandatory compensation but can be addressed in voluntary compensation schemes offering opportunities for significant biodiversity restoration.

In summary the NNLI concludes that there are many opportunities for companies, organizations and institutions to compensate their negative impact on biodiversity remaining after mitigation.

2. Business and the voluntary compensation of biodiversity

2.1 Introduction

In the Netherlands, *voluntary compensation* of biodiversity loss is very new and under development. No legal frameworks, regulations nor formal guidelines apply. For companies or organization interested in voluntary compensation, this has the advantage of a maximum of freedom whether to do it or not and, if so, how to do and implement. On the other hand, the experience is that companies perceive this as a risk: in absence of clear guidelines or maybe even certification, there is the risk that a voluntary biodiversity compensation plan/effort, initiated for very positive reasons, may turn into a (for the company) undesired stakeholder and/or media discussion on whether it is good enough.

The Dutch government would like the No Net Loss ambition being adopted by Dutch business. The interface between business and biodiversity compensation is discussed in this chapter: what issues does business encounter when trying to compensate for their biodiversity impact?

2.2 The Business case for voluntary compensation

Voluntary compensation of biodiversity is, by definition, not pushed by any legislation or regulation. Nevertheless, there are a number of very good business reasons to choose for a voluntary no net (biodiversity) loss approach:

- To preserve and maintain access to natural resources which are essential to the company and for society,
- To demonstrate commitment to the Corporate Social Responsibility principle,
- To develop a market position and such a competitive edge by being able to demonstrate the sustainable use of natural resources, amongst which biodiversity,
- To comply with the company commitment to a No Net (biodiversity) Loss ambition,
- To maintain investors relationships,
- To improve the company's image, 'License to Operate' or the relationship with stakeholders,
- To proactively develop expertise and anticipate future legislation on biodiversity loss compensation,
- Drive new views and innovation.

Once the business case is clear to the management of a company, companies might start exploring the compensation road and 'pilot' biodiversity compensation. Especially (multinational) corporations operating in (international) areas of high conservation value where regulatory frameworks are absent, take up voluntary compensation. Sometimes they use their own standard and verification system to draw up a system that specifically

suits their needs and demands. Voluntary compensation can even become an integral part of a corporation's environmental management policy (see box 1).

2.3 Business experience with compensation

Driven by (combinations of) different factors, biodiversity compensation initiatives start by gaining knowledge about the concept of biodiversity compensation, which gives the compensation process and outcomes a 'personal' interpretation. That in turn is strengthened by the choices made on the scope of the pilot, e.g.:

- Which 'pressure factors' to include: land take, noise, light, emissions, effluents, etc.?
- How to frame the business activity with respect to life cycle: 'gate to gate', 'cradle to gate', 'cradle to cradle'?

Box 1 Biodiversity compensation by Rio Tinto

Rio Tinto is one of the world's leading mining companies. The company strategy states that: "Our aim is to have a net positive impact (NPI) on biodiversity. We, therefore, need to demonstrate that our actions have positive effects that outweigh the inevitable negative effects of the physical disturbances and changes of land associated with mining. In 2006, our biodiversity programmes have been focused on two key issues that affect our ability to achieve goal: Being able to effectively measure and communicate our impacts on biodiversity and the performance of our management actions.

[...]

The opportunities for minimising negative effects and creating positive outcomes will vary greatly from one project or operating site to another. As a first step, our operations use mitigation measures, which include actions designed to avoid, minimise and rectify negative impacts. Offsets (sustainable conservation actions) and other conservation actions (capacity building programmes, livelihood initiatives) may then be necessary to compensate for the residual, unavoidable harm to biodiversity and help us to achieve a net positive impact on biodiversity.



NPI is a long term goal and a challenge for us. We are working in partnership with international conservation NGOs, who play a key role in progressing our understanding of biodiversity conservation issues and practical approaches to its management. By working together, we aim to raise the bar within the industry sector as a whole. "

Source: http://www.riotinto.com/ourapproach/5273_biodiversity.asp

- How to frame the business activity in time: current activities only, including historical land take, including all historical impacts and biodiversity losses?
- Which weighing factors to apply to ensure adequate compensation: 1:1, 1:>1, 1:>>1?

Recognizing the potential of voluntary biodiversity compensation besides or in addition to legislation driven compensation, various initiatives started in the Netherlands (similar to developments abroad) to discuss and pilot ways of biodiversity compensation:

- In 2008 representatives of three companies, three NGOs and two government departments came together to pilot biodiversity compensation from a business perspective and ultimately to develop practical guidance for biodiversity compensation, the 'BioCom' project (see 2.3.1);
- In 2009 design, engineering and consultancy company Arcadis examined the idea of establishing a nature compensation bank: buying agricultural land and subsequently developing 'new' nature there in order to sell those areas to parties in need for compensation of biodiversity loss as a result of economic development. They followed the example of wetland banks that exist since the early 80-es in the US.
- In 2010 the Taskforce B&NR commissioned the NNLI to identify difficulties in the assessment and implementation of compensation, both mandatory and voluntary. This report presents the results of that work.

These initiatives explored biodiversity compensation to find workable answers to the questions above.

2.3.1 Business and Biodiversity Offset Program

Some companies have joined up with the **B**usiness and **B**iodiversity **O**ffset **P**rogram (BBOP, <http://bbop.forest-trends.org/>) and make use of their principles, guidance and supporting materials. BBOP is the leading partnership between companies, governments and conservation experts to explore biodiversity offsets. They are:

- Demonstrating conservation and livelihood outcomes in a portfolio of biodiversity offset pilot projects;
- Developing, testing, and disseminating best practice on biodiversity offsets; and
- Contributing to policy and corporate developments on biodiversity offsets so they meet conservation and business objectives.

BBOP developed a set of 10 key principles to guide biodiversity compensation (the 'BBOP-principles'):

1. No net loss
2. Additional conservation outcomes
3. adherence to the mitigation hierarchy
4. limits to what can be offset
5. Landscape context
6. Stakeholder participation

7. Equity
8. Long-term outcomes
9. Transparency
10. Science and traditional knowledge

The BBOP pilot project portfolio consists of five pilot projects, see <http://bbop.forest-trends.org/pilot.php>). These pilots are:

- The Ambatovy Project, Madagascar
- Akyem Gold Mining Project, Ghana
- Bainbridge Island, United States
- Potgietersrust Platinums Limited (PPRust), South Africa
- Strongman Mine, New Zealand

All of those projects concern mining activities apart from the one on Bainbridge Island which is related to urban development. Some of those projects started when the program began, others joined the program thereafter. Development of an offset plan and its implementation is on a voluntary basis. So far, the pilot projects are still in the process of identifying the most suitable option for biodiversity offset.

The compensation efforts are limited to land take only, other biodiversity impacting pressures are not being considered.

But, as explained in chapter 1, these are large, new projects, (to be) developed in unspoiled areas, and as such practically less relevant for the Dutch context.

2.3.2 BioCom

There are very few (if any) examples on private sector companies that (1) assess all of their business activities, including activities from product chain partners up and down the supply chain; (2) identify the (potential) negative impacts on biodiversity as a result of these activities; and (3) analyze how biodiversity consequences occurring could be compensated for. These three elements constituted the motive to develop the BioCom project: '**Biodiversity Compensation: towards concrete plans and guidelines for businesses**' (2008-09). The BioCom project piloted the above approach with the aim to:

- Prepare practical, doable compensation plans for (a part of) the business activities of a limited number of Dutch private sector companies that have a direct impact on biodiversity through their actual footprint and an indirect impact through their supply chain partners;
- Explore a design for no net biodiversity loss throughout the supply chains; and
- Obtain insights in the unknown potentials for business advantages, practical objections and pitfalls, knowledge gaps, as well as the guidance / support/ facilitation potential of governmental bodies and NGOs in the field of voluntary biodiversity.

The working model, being private sector companies, NGOs and government jointly working towards practical compensation plans for the companies involved, should deliver fit-for-purpose compensation plans for these companies, acceptable for society and should feed into developing legislation and policy in the Netherlands.

In BioCom the Dutch government, two NGOs (HIVOS, Wetlands International) and three companies - BioX Group BV (energy), Kruidenier Groep BV (food services), and Koninklijke Houthandel G. Wijma & Zonen BV (timber), worked together. They were supported by contributions of the Netherlands Environmental Assessment Agency (now PBL) and IUCN-NL.

The project delivered three compensation plans, one of them now in an advanced stage of implementation. In the compensation plan prepared with and for the Kruidenier Groep BV the selected compensation option resulted in net positive biodiversity gains because the import of Austrian beef cattle was replaced by using traditional Dutch Blaarkop cattle (figure 2) suitable to graze marshy meadows which in turn supports the conservation of meadow birds. More details in Box 2, full details in De Bie & Van Schaick (2011).



Figure 2 Dutch 'Blaarkop' cattle

Box 2 BioCom: biodiversity compensation by private sector companies including the supply chain

Representatives from the business community, government and non-governmental organisations participated in the Dutch BioCom initiative which was financed by the (former) Dutch Ministry of Environment. The focus was on how biodiversity compensation could be achieved starting from a business perspective with the aim of developing a practical approach and gaining concrete experiences.

Different from BBOP, BioCom also considered the effects of relevant supply chains on biodiversity and the consequences thereof for compensation, recognizing that this needed special attention, in particular on supply chain responsibilities and boundary setting, indirect effects and historical loss.

The methodology used for assessing residual biodiversity impact derived from the standardized Impact Assessment and LCA-type of tools. The Mean Species Abundance (MSA) biodiversity index was applied to adjust the loss of area for its current biodiversity value.

The timely involvement of a broad set of stakeholders is highly relevant. This concerns both stakeholders in the impact and the compensation areas. Additional benefits of timely stakeholder involvement are that different ideas and solutions may come up other than anticipated by the company.

BioCom distinguishes four options for organizing and managing future compensation initiatives: using existing systems or initiatives; outsourcing execution and management of the drafted compensation plans to a third party; the company executing the compensation plan; and finally setting up a new compensation system, e.g. a biodiversity credit bank.

2.3.3 The pilots under the No Net Loss initiative

For NNLI a number of (smaller and larger) companies have been approached and invited to join. Only two pilot projects could actually be started and largely completed in 2010:

1. A harbour area development plan, initiated by the Municipality of Den Helder and de facto consisting of two projects, a harbour extension project and a nature development project. The harbour extension project involves mandatory compensation for the proposed extension of the Den Helder harbour into the Marsdiep/Balgzand area, part of the Waddenzee, which is a Natura2000 area and natural World Heritage site and part of EHS. As such, this project is not a pilot for voluntary compensation, but nevertheless very useful to test the NNLI methodology. Very interesting elements in this pilot are:

- At the start the project was a very early, conceptual phase of design and development. As a consequence project designs changed frequently at later stages, which offered an interesting opportunity to see how the changing plans would affect biodiversity (foot print). Also good experience was gained how to deal with the lack of detailed plans and information, very early in the project;
- From hydrodynamic modelling, executed on the request of NNLI, it became clear that that initial harbour designs did influence a wider marine/estuarine area in an unacceptable way; consequently, plans needed to be adjusted through changing size, shape and location as these three factors are the three determinants for the size of the hydro-geomorphic impacts;
- Determining and weighing biodiversity and its loss in this dynamic marine environment provided a good learning experience;
- Alongside the process of defining and quantifying pressure factors and compensation options, we run a stakeholder dialogue process, consisting of 4 workshops and bilateral contacts between the NNLI-team, Municipality of Den Helder and key stakeholders;
- The NNL-process resulted in a set of 5 compensation options, not elaborated but in line with the early stage of development of the project, see figure 3.

For full details see attachment 2.



Figure 3 Options for compensating the loss of biodiversity due to Den Helder harbour extension (from NNLplan Den Helder in Steven de Bie & Bopp van Dessel, 2011)

2. An existing chemical factory, owned by a multinational company. The company insisted on confidentiality until the moment that the prepared NNL-plan would indeed be adopted and its implementation approve; this to ensure a very careful expectation management (see lessons in chapter 3). The NNL-plan focussed on the ongoing activities of an existing plant, which brings along a number of challenges, compared to the more current biodiversity compensation for newly to be developed projects.

Very interesting elements in this pilot are:

- The factory had been on the same location for a very long time (at least 80 years) and has seen a long history of infrastructural extensions and modifications,
- The factory is situated on a business/industry park, resulting in overlap and accumulation of the impacts caused by the chemical factory and those the results of by neighboring industrial activities,
- Biodiversity loss by this plant is not caused by current land take, but by other direct and indirect (pressure) factors such as emissions to air, water distraction and discharge, light, etc all the result of the factory's operations. Nevertheless the company decided to include historical land take into consideration accepting the fact that former land change had created the industrial site where the factory had been built,
- In a continuous communication with the company, the challenge how to match voluntary biodiversity compensation with the company's business case was discussed.

For further details see attachment 3.

2.4 Principles and conditions for voluntary compensation

To make voluntary biodiversity compensation by businesses a success, the approach should be flexible and pragmatic, with as little as possible paper work, on one hand and credible and well appreciated by stakeholders on the other.

The NNLI adopted a number of base principles to create an optimum in flexibility and pragmatism:

- The calculation of biodiversity loss ('footprint') and compensation task will be based on a '80-20' approach: focus on key ecological drivers and elements, not on details, so that with a relative modest investment (20% of the time it would take to perform a full study) a relative good study (80% of scientific completeness) can be obtained;
- No (extensive) ecological studies and/or fieldwork should be necessary.

Also a number of boundary conditions are chosen to prevent voluntary compensation to become a 'license to kill' (i.e. an excuse to destroy any habitat or an excuse to replace mitigation measures by cheaper compensation):

- Compensation is the last step of the mitigation hierarchy: it comes into play only after all reasonable avoiding or mitigating measures have been taken and No Net Loss has not yet been achieved;
- The validity/equality of the compensation should be convincing enough. Very detailed, scientific attempts to prove this are not a suitable way in voluntary compensation (too time consuming/expensive). Therefore the calculation of biodiversity loss should be conservative and the calculation of the compensation task should be 'generous' (if necessary using compensation factors) enough to convince relevant stakeholders;
- Voluntary compensation is applied in non-protected areas, which usually harbor no irreplaceable biodiversity values.

2.5 How to get more private sector companies to compensate biodiversity loss?

Although companies show interest in and are supportive to the idea of NNL and voluntary compensation and despite a strong business case, it is very difficult to have them signing up a pilot project. Reasons are the assumed high requirements of time and resources, no financing available for hiring external expertise, and sustainability priority laying elsewhere such as with climate change or sustainable supply.

Following the experience of pilot projects in BioCom and under NNLI, a number of measures to facilitate or stimulate companies to embark on voluntary biodiversity loss compensation have been identified:

- In general, the understanding by the general public, including companies, of the importance of biodiversity to mankind and the need for its conservation is low. Investing in education and communication on what biodiversity is, why it is important and how biodiversity is a boundary condition to our society, also in the

Netherlands, will help creating a better baseline for participation in voluntary compensation;

- In the public debate, biodiversity compensation is quite mistrusted and feared as a 'license to destroy' ecologically valuable areas. Companies feel that this contributes to a higher reputational risk, when applying compensation voluntarily. Therefore it is important that the discussion on the opportunities and threats of biodiversity compensation is continued, broadened and intensified, based on the good examples of compensation practices and sound science;
- A better integration, coordination and communication with respect to the various (often government-driven) sustainability-related initiatives is needed. Companies complain to miss an overriding vision, which could serve as an 'umbrella' or guidance framework for Sustainable Development management. Clarification of the coherence of the various initiatives will help to plan and motivate company staff;
- Cost-Benefit Analysis of successful biodiversity compensation efforts should be encouraged as this will demonstrate the value of this concept and support the business case;
- The approach to biodiversity compensation advocated by the NNLI is new (though a continuation of the BioCom one) and still in an experimental phase. Currently, participating in the NNLI is rather 'open ended' in the sense that neither success nor positive appreciation is guaranteed. Further development of the methodology to a more standard approach, including certification or other quality mark for the process and/or the resulting NNL-plan, would reduce the hesitation of companies to participate.

3. Lessons learned from voluntary biodiversity compensation pilots

3.1 General lessons

In our contacts with the companies that finally decided not to participate in the NNLI, we learned that:

- In general, companies are definitely interested to hear and learn about biodiversity, managing biodiversity including compensation, and the NNLI. The motivation for this interest varies from company to company;
- Companies experience a pressure to do more and more with respect to sustainability issues (e.g. CO₂, biodiversity and water management) and various initiatives such as CSR, sustainable purchase, cradle-to-cradle, Global Compact, etc. Companies perceive that all these initiatives that look at their business operations and management, are different issues to deal with separately. They fail to see that the difference between these initiatives only reflects different perspectives: they look through a different lens at the business operations. The pressure factors that one looks at through the biodiversity lens overlap to a certain extent with the drivers for global warming (i.e. emissions to air). Hence by working on emission reduction companies implicitly mitigate their impact on biodiversity. Similar with regards to the other concepts or initiatives. But each time there remains an area not covered by the other initiative(s); it does not suffice to stick to just the climate agenda or water management,
- Companies feel overwhelmed by the complexity of biodiversity compared to global warming and assume ample time, resources and effort required to perform the task of biodiversity impact assessment and seeking compensation options; the tension between corporate policy makers (often in favor of participating in more and new initiatives) and operational staff (coping with already high workloads) is not helpful in taking away this perception.

In summary most companies:

- Are reluctant to add more issues to the growing list of sustainability challenges,
- Have the feeling of not having the time to do more 'experiments', and
- Refuse to contribute financially to biodiversity compensation pilots (other than in time/kind) as the direct financial benefit is not visible and only demonstrable at the end of the process.

Consequently, these 'barriers' to a broad support among companies for the compensation of biodiversity loss due to their activities have to be removed. Communication, clarity on the interface with other government-driven initiatives, and financial incentives are among the required measures.

The following key lessons are learned from the two pilot NNLi-projects:

- 'Voluntary' compensation is often perceived as not always so voluntary. Starting a project to prepare a NNL-plan, involving internal staff (employees) creates expectations that all kind of positive biodiversity measures will be taken. The decision not to implement the NNL-plan (too expensive, impractical, no real biodiversity gain possible ...) is then difficult to take, will be challenged/disputed, and disappointment or perhaps even disagreement with staff may be the result, leading to negative communication and lower image value for the company. Therefore company management does consider the participation as not voluntary and carrying quite some risks. If the process includes also external stakeholders (NGOs, government) then this will strengthen the negative appreciation. Signing a confidentiality agreement may solve this problem but ultimately the methodology and quality assurance processes for NNL-plan should be sufficiently robust to reduce or eliminate these company risks and convince company management;
- Throughout the NNLi-process the organizations that participated became more interested and demonstrated increasing enthusiasm because in that process their understanding of the process and the thoroughness of tools employed grew;
- Scoping issues were solved constructively and with ambition. For example: the chemical factory, although originally targeting for a NNL-plan for the ongoing operations only, decided to include historical land take into the scope and investigated the possibility and consequences to include a cradle to gate approach for two product streams;
- Methodology-wise, the NNLi-i toolkit is adequate to develop a sound NNL-plan, accepted by the company and/or stakeholder groups, but probably by no means complete. Particularly questions like 'how to deal with cumulative effects', 'how to weigh the impact on biodiversity by various pressure factors, ecologically', 'how to deal with highly dynamic habitats/environments', etc. do need more thinking to answer adequately in future and possibly adjustment of current or the development of new tools;
- Extending the NNLi-analysis to include the supply chain, i.e. larger part of a product's life cycle (cradle to gate, cradle to grave or even cradle to cradle) which is most useful in the Dutch context, is possible (also demonstrated by BioCom) but very often the value of that effort is limited due to low availability of existing data. To address particularly aspects like land take and disturbing pressure factors (e.g. light, noise, consequences of water usage) would involve interaction/cooperation of suppliers and/or clients;
- Most companies/people can be quite easily convinced of the general importance of biodiversity for mankind, but to build the business case for voluntary compensation by an individual company requires more effort. Even in a quiet and undisputed business-stakeholder situation, answering the question 'why would we do this?' often lacks sufficiently strong arguments.

3.2 Methodology in the voluntary compensatory conservation approach

NNLi applied the compensatory conservation approach to biodiversity compensation. In that approach the assessment of biodiversity loss and compensation measures is derived from and build upon the requirements defined for the EIA process in the Dutch Environmental Law. See figure 5 for an overview and table 2 for a detailed description of the steps to be taken to arrive at a No Net Loss (NNL) plan.



Figure 4 Process for identifying biodiversity loss and compensation options

Table 2 Detailed steps to identify biodiversity loss and compensation measures

	Step	Explanation
1	Objective	Description of what the planned activity tries to achieve and setting of objectives for the NNL-process and plan
2	Planned activity	Detailed description of the planned activity and its execution during construction and operation phase, including framing in time and space (inclusion of chain/life cycle elements?)
	Context of the planned activity	Overview of existing plans and projects that relate to the planned activity and could influence the compensation efforts
	Current situation	Assessment of the current biodiversity, ecosystem functions and values, including the autonomous development to the extent that the planned activity could potentially influence those; should be described in terms of sensitivities and ecosystem drivers
3	Pressure factors	Qualitative and quantitative assessment of the threats resulting from the planned activity to the environment

	Effects	Description of the consequences of the above threats for species, ecosystem sensitivities and drivers of ecosystem functions
4	Mitigation Residual impact Biodiversity footprint Gaps in knowledge	Identification of measure to avoid, prevent or mitigate threats to become effective Define the impacts that remain despite best efforts to avoid and reduce through mitigation Translate residual impacts to compensation units Overview of gaps in knowledge in current environmental baseline situation and consequences for identifying potential impacts on biodiversity
5	Compensation options	Identification of compensation options Needs and conditions for implementation
6	NNL plan	Concise overview of steps 1-6
7	Implementation	Implementation of NNL-plan, including monitoring
	<i>Stakeholder engagement</i>	<i>Engagement with relevant stakeholders throughout the process</i>

We will elaborate on a few of those steps.

Ad 1 Planned activity: when describing the planned activity it is important to demarcate the activity: does it include the whole supply chain and product chain or not, and if so, does it include only those parts where the initiator (company, institution or private person) is able to influence or control the activity and hence, the related impacts (see figure 5)? This question forces the initiator to look at the boundaries to be set for its responsibility which in turn determine the extent compensation will be defined.

Responsibility is often clear from a sheer financial point of view: it concerns the activities for which the initiator bears legal responsibility. However, supply chain management and responsibility are rarely limited to legal aspects. It predominantly focuses on ethical topics in the field of sustainable development for which no legislation exists.

Generally, the actual supply chain responsibility taken is based on three pillars:

- *Societal pressure*: stakeholders, in particular consumers and investors, feel that a company should take responsibility,
- *Feasibility*: the feasibility to carry the biodiversity (financial) burden caused by supply chain partners
- *Accountability*: acknowledging that biodiversity loss and compensation could be accounted for throughout the supply chain .

See De Bie & Van Schaick (2011) for an elaborated discussion on supply chain responsibility.

Ad 2 Current baseline situation: the biodiversity baseline situation can be described at various levels of detail, depending on available funds for that assessment, the necessity to meet requirements set by legislation, etc. In case of Natura2000 areas, specific information on the status of certain species, their population dynamics or habitats is

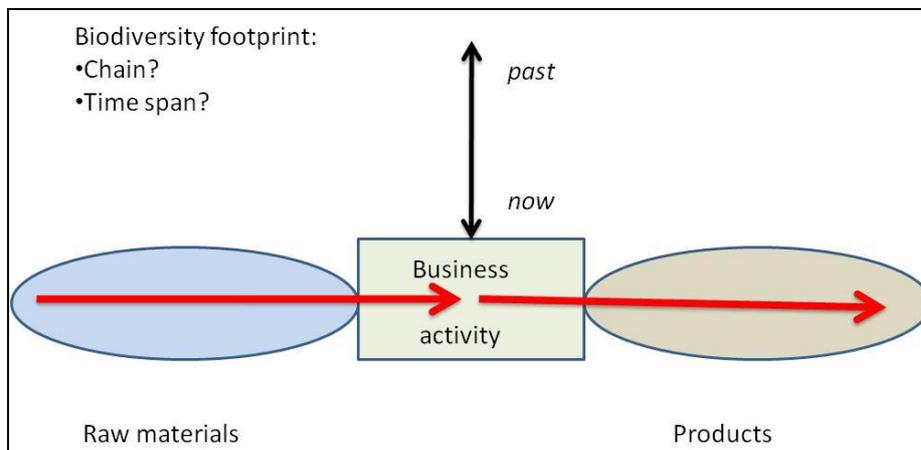


Figure 5 Delineation of the activity under consideration

required which sometimes warrants in-depth studies. Otherwise the question is to what detail the baseline needs to be described. Opinions differ.

Any description is a snapshot of a dynamic system and therefore incomplete. A systematic way of describing the occurrence of species is using the Mean Species Abundance (MSA) index (see box 3), or the ReCiPe methodology for Life Cycle Assessment Impact Assessment as developed by CE Delft and others. Often a tiered approach could be followed, e.g. MSA index at smaller scale, followed ReCiPe at a larger scale, etc.

Box 3 Mean Species Abundance index

The Mean Species Abundance (MSA) index provides information on the occurrence of species and their abundance compared to the species composition and abundance in an undisturbed, reference situation. The originally present, natural biodiversity is referred to as MSA= 1, whereas a situation with all biodiversity disappeared has a MSA=0. In principle the size of the compensation area can be smaller than the impacted site as seldom its natural biodiversity has been lost entirely, residual MSA>0 (see example). MSA is based on large data sets.

Example:

Impact area	:	10 km ²
Residual MSA score	:	0.1
Compensation area	:	9 km ² to its originally present biodiversity

Modified from: Alkemade et al. (2009) GLOBIO3: A Framework to Investigate Options for Reducing Global Terrestrial Biodiversity Loss. Ecosystems 12, 374-390

Comparing current and future species diversity and abundance with those in an undisturbed situation, the index provides a basis for identifying the impact on biodiversity and the gap to be closed by compensation. However, the index only relates to species diversity and abundance, meaning that ecosystem functions still need to be described for later separate impact assessment

Ad 3 Pressure factors: any activity whether initiated by a private sector company or from a government institution requires goods and services that biodiversity provides as input for that activity. Examples of such inputs are land, raw materials, water and energy. This 'consumption' causes an impact on biodiversity, see figure 5. An activity also produces also 'discharges' as a by-product, such as emissions, waste, radiation, light and noise. These also can have an impact on biodiversity. These pressure factors are more or less similar to the drivers for ecosystem change and erosion, identified by the Millennium Ecosystem Assessment as (MEA, 2005).

Boundary setting with respect to the extent impacts are considered is necessary. The production of capital goods (such as machinery) and other inputs (such as fertilizer) is generally excluded.

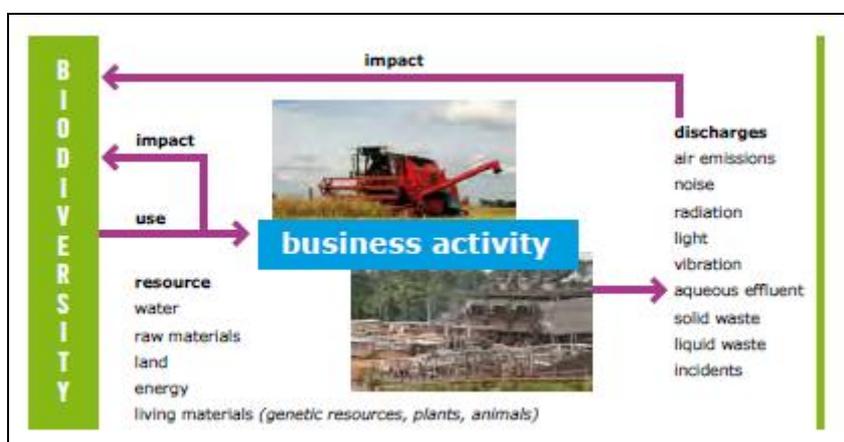


Figure 6 Impacts from a business activity on biodiversity

Ad 4 Mitigation: Critics of compensation by private sector companies often use the argument that allowing companies to compensate for their impacts would give them a 'carte blanche', 'greenwash' to undertake all sorts of biodiversity-impacting activities.

However, almost all compensation schemes require application of the mitigation hierarchy (or pre-compensation process), which comprises:

1. *Avoiding* negative impacts, through relocating to or starting activities in industrialized zones,
2. *Reducing/moderating/minimizing* negative impacts, for example by changing the design of an activity thus aiming for lower impact levels,
3. *Rescue*, through relocation or translocation,
4. *Repairing/reinstating/restoring* negative impacts after ending the activity.

After applying the mitigation hierarchy (figure 7) there almost always remains an impact on biodiversity, the 'residual impact'. The residual impact might include the historical impact, but not necessarily. Bringing that residual impact under one denominator results in the *net biodiversity footprint*.

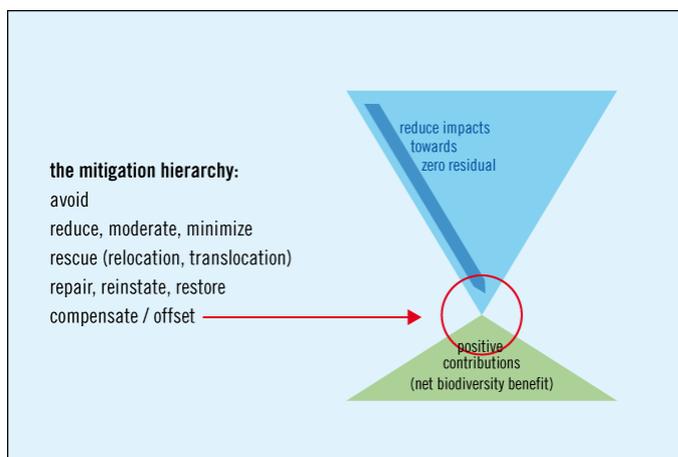


Figure 7 The mitigation hierarchy (from De Bie & Van Schaick, 2011)

Ad 4 Biodiversity footprint: We define 'biodiversity footprint' as the summation of all pressures that have potential consequences for biodiversity and are remaining after the mitigation.

Strict compensation regimes (see chapter 1) could define the area of original biodiversity to be impacted and use that information as the biodiversity footprint and as a starting point for the compensation plan. This definition is not useful in the compensatory conservation regime. First, this approach deals not just with direct land take but with many more drivers for biodiversity loss (see chapter 1). Moreover in situations where already established activities are ongoing, the original biodiversity can no longer be measured at the location itself, but at best estimated or calculated, e.g. by using the MSA approach (see box 3).

Therefore we decided to follow a different approach to assess the biodiversity footprint. Similar to the 'climate change' theme where emissions to air are translated into one currency, the CO₂ equivalent, we tried to roll up all impacts into a limited number of currencies that are relevant in the context of biodiversity compensation. We succeeded to group quantified impacts into four pressure categories:

- Land take (this category includes direct land take by the activity itself, but could, depending on the framing of the NNL-plan, include also the direct and indirect land take as a consequence of disturbance (noise, light) and resource use: all commodities out of nature, agriculture, etc. required to carry out the activity (produce the product))
- CO₂ equivalents
- Water use
- Miscellaneous

Where possible, we translated pressures as much as possible into land take, as compensation can then take the form of land being set aside for biodiversity. Noise, vibration and light can relatively easily be translated into area disturbed. Transformation of CO₂ equivalents into land affected appeared to be too laborious and resulted in a figure that was rather meaningless. All emissions to air were therefore dealt with as CO₂ equivalents, impacting on biodiversity through their impact on global climate. Water use is a measure for the consumption of the provisioning service 'fresh water', and can also be an indirect measure for habitat quality.

There are, however, pressures that cannot be expressed in any of these three groups. We put those collectively in the fourth, so-called 'miscellaneous' category. It concerns aspects such as ecotoxicity, acidification or eutrophication. A multiplier to the compensated land area could be used to compensate for such impacts, to be decided on a case-by-case basis through an educated guess by experts.

Ad 5 Compensation options: When identifying the potential loss of biodiversity, including ecosystem functions, there often are more than one species or habitat being negatively affected. The question then is where compensation should focus on to achieve a no net loss: is it on the loss of a habitat, or its function for certain species (e.g. migratory birds) or on the effect that CO₂ emissions indirectly have on the planet's biodiversity? And: how can then success be measured?

In case of the compensation for the loss of habitat, it is advised to identify at the start what the habitat-specific characteristics are and how to measure them because those need ultimately be achieved in the compensation area.?

The key question is how to measure successful compensation? And the selection of the compensation option is influenced by what no net loss should look like.

Also the question is relevant whether a degraded area or (just the opposite) an area with a high biodiversity value be given a preference for compensation 'investment', see figure 8. It could be argued that investing in areas with a high biodiversity value is preferred, if there is a risk of damage or degradation of this biodiversity without such intervention.

The two issues above emphasize that a case-by-case approach and stakeholder consultation are needed when committing to compensation for biodiversity loss.

Compensation for direct and indirect land take has to be calculated on a 1:1 basis. However, to counterbalance uncertainties (such as whether the right biodiversity-related sensitivities and drivers have been identified) and risks (whether the compensation outcome will indeed be that what has been lost) a multiplier can be used to increase the chance of success, a factual no net loss (as in EHS compensation, see chapter 4). The magnitude of that multiplier is situation-dependent and should be discussed and agreed in consultation with experts and stakeholders.

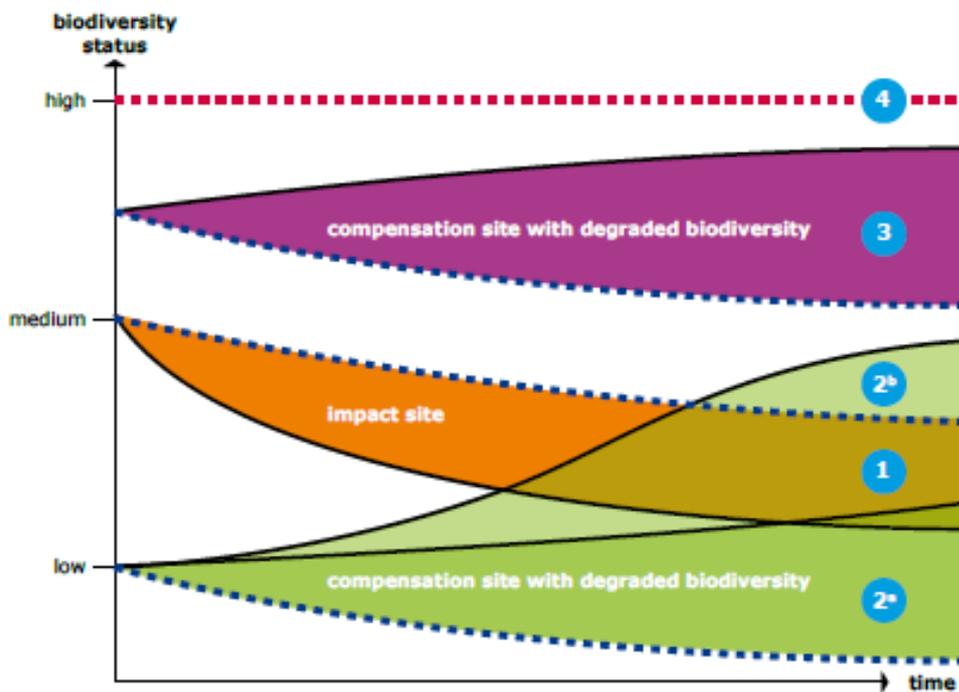
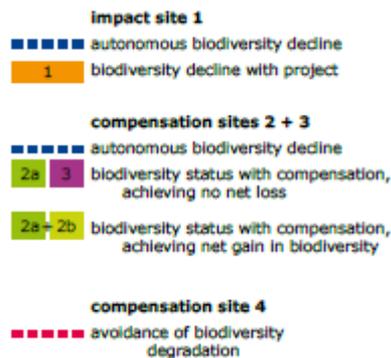


Figure 8 No net loss of biodiversity – measuring against the baseline (from De Bie & Van Schaick, 2011)



Ad 6 No Net Loss plan: A No Net Loss plan should address the following subjects but not limited to (after BioCom 2011):

- *Mitigation hierarchy*: demonstrating the use of the mitigating hierarchy prior to compensation,
- *Cumulative effects*: specifically those cumulative effects through the supply chain and across ecological boundaries,
- *Stakeholder engagement*: engagement with relevant stakeholders in the preparation and implementation of compensation plans,
- *Science base*: use of (recent) scientific insights and data,
- *'No-net-loss'*: how is no net loss achieved, favouring a 'like for like' ,
- *Timing of compensation*: considering when compensation is about to take place (preferably to be in place before starting the new activity),

- *Duration of compensation*: the period of time during which the compensation area is guarded against future negative impacts,
- *Location*: location of the compensation area compared with the area that is being compensated for,
- *Additionality*: demonstrating that compensation outcomes are additional to existing or planned measures to conserve biodiversity,
- *Land and user rights*: demonstrating that existing land and user rights have been respected during the purchase, design and management of the compensation area,
- *Transparency*: insights in the logic behind the decision to compensate and the shape that is given to compensation,
- *Proportionality*: comparing the efforts, costs etc. linked to the implementation of a compensation plan to the loss on biodiversity,
- *Synergy*: not only for benefits to biodiversity, but also to stakeholders such as local communities,
- *Costs*: demonstrating that costs remain manageable and arrangements be made with regard to the allocation of costs,
- *Problem shifting*: demonstrating that there are not any mechanisms negative to biodiversity or related stakeholders in motion as a result of the implementation of the compensation,
- *Feasibility*: practicality of the compensation plan,
- *Responsibility*: defining deliverables and responsibilities,
- *Monitoring and reporting*: defining monitoring parameters and reporting formats.

3.3 Lessons from voluntary compensation pilots

We refer to De Bie & Van Schaick (2011) for an extensive discussion on 'Lessons Learned' with respect to the compensation methodology. A number of these BioCom lessons were also encountered in the NNLI pilots. Here we summarize the lessons that are learned in the NNLI pilots (see chapter 2).

Historical loss

Historical loss of biodiversity is the difference between the original, 100% natural biodiversity and the biodiversity still present upon the start of the planned activity. The main issue here is the question of responsibility: who takes up responsibility and who is willing to compensate for that loss? Business profits today result from that historical land use change. So in the view of certain stakeholders, companies should take this historical loss into account when compensating their biodiversity footprint. Moreover, the current, continued economic activities prevent the land from returning to a more natural situation.

But why should the initiator of a project, e.g. a private sector company, take (part of the) responsibility for historical biodiversity losses while society as a whole – thus including customers, governments, etc. – can collectively be held responsible for the continued biodiversity loss? They profited from such economic activities as well.

There is no legal requirement for taking up historical loss into compensation plans. Consequently, it is a matter of principles, feasibility, code of conduct, and/or stakeholder pressure whether or not to do. NNLi decided to advise for a 'no but ...' approach: to start with compensating for the current direct and indirect loss of biodiversity, but covering (a part of) the historical loss for reasons of ethical trading, marketing or enhancing stakeholder relations. Compensation of all historical loss (not just land take, but also including all indirect losses caused by pressure factors) was discussed in one of the pilots, but considered 'not realistic'.

Supply chain responsibility

Supply chain responsibility has been defined as taking compensation responsibility for impacts on biodiversity up and/or down the chain of suppliers and customers, that arise from activities that are beyond the immediate control of the one that takes the compensation responsibility.

Should a company or organization take responsibility for direct and indirect negative biodiversity impacts in the supply chain (independent of where it sits in the supply chain)? There is mounting societal pressure to do so, especially on those companies that are considered to be leading in supply chains. (e.g. Initiatief Duurzame Handel (IDH) www.dutchsustainabletrade.com/nl/home).

The extent to which a company should take supply chain responsibility is often clear from a legal point of view but not just limited to legal aspects. It predominantly focuses on ethical topics related to sustainable development and Corporate Social Responsibility for which no legislation exists. That is the entry point for stakeholders for their call upon companies to take up 'chain responsibility'.

In practice it comes down to the extent it is 'feasible' for a company to carry the biodiversity burden caused by supply chain partners. It remains difficult to decide how the boundaries of responsibility for supply chain impacts in principle should be dealt with. This depends on issues such as power and influence of that company in its supply chain(s), costs involved and opportunity to incorporate any costs in the price, and the cooperation of supply chain partners.

Extending the focus of the NNL-plan from gate-to-gate to cradle-to-gate or cradle-to-cradle is possible for a number of parameters if the company is well-organized in terms of environmental management and relatively easy for CO2 eq. emissions, water discharges. For more location-specific parameters such as land take, origin and effects of water use, noise, light, reporting systems may not contain such information and additional search with suppliers is needed. Many companies will not be able to do all that and so not capable of compensating all biodiversity losses throughout their supply chains.

Like-for-like

'Like for like' is a compensation goal that generally strives for a compensation outcome that is similar to the biodiversity loss due to business activities, created in the same geographical area and habitat type.

Legislation and many stakeholders favour a 'like for like' goal in biodiversity compensation projects. However, ecosystems are changing over time and in space due to changing biotic and a-biotic processes, which could in the end cause compensation outcomes to deviate from the ones aimed for. Hence one should not be too strict with to holding to this principle.

But is the best 'best conservation outcome' always follows from the like-for-like compensation? 'Like for unlike' solutions could well create much higher biodiversity gains (see also 3.2 figure 5) and show more additionality. The risk of adopting the 'best conservation outcome' could be that it leads to the easiest and/or cheapest compensation options rather than assessing local opportunities and needs. Furthermore, it can lead to the degradation of more difficult to restore ecosystems and ecosystem services that are being overexploited and not maintained or gained in another place.

Additionality

Biodiversity compensation should be additional to gains already being delivered through other programmes such as protected area management plans or interventions by other parties, such as governments or NGOs.

Also in mandatory compensation, additionality is a legislative condition (e.g. EU Habitats Directive, Dutch Nature Conservation Act) and should be adhered to when drawing up compensation plans.

But which action is additional? Is enabling better management of an existing nature reserve considered an additional biodiversity profit or a 'pervert' mechanism? Is supporting changing farming practices to more organic farming with biodiversity improvement an additional biodiversity benefit or just an economic switch to a market niche? It touches upon what is understood by best conservation outcomes.

We advise to define additionality more practically with clear boundaries of its interpretation, and develop practical guidance that includes integration of the like-for-like, additionality and best conservation outcome principles.

Pressure factors

Quality compensation plans need qualitative and quantitative on pressure factors in order to enable assessing the actual and/or potential consequences of those pressures for local, regional and sometimes global biodiversity.

When describing the pressures in the NNLI pilots and in BioCom, we experienced that collecting the necessary data often meets three types of problems:

- Lack of data because use of resources and/or emissions and discharges are not registered, because e.g. the resources are 'free' or impacts not considered important,
- Lack of consistency in data because data are not centrally aggregated; consequently, information on one resource or discharge is registered differently throughout the organization,
- Lack of specific data because of a shortage in knowledge with respect to the origin of the product or the location / application of certain production processes, especially in case of activities up or down the supply chain over which the company involved does not exert control.

In the (partial) absence of data it makes sense to weigh the efforts of data collection for certain pressures and the costs involved for those efforts with the possible risks imposed by those pressures on biodiversity: most efforts and costs should be spent on getting a clear picture of the biggest threats to biodiversity throughout the supply chain in question.

Finally, we concluded that the use of (global) models, literature data, etc. in combination with local, pressure-related data to the extent possible gives the best possible quantitative picture of the pressures on biodiversity.

When considering existing activities, there are some issues that need further discussion and investigation:

- How to deal with cumulative or overlapping impacts of pressure factors at an industrial area? Who is accountable for what?
- How to measure the effect of noise and light on biodiversity and how to compensate for those impacts?
- What is a good year of reference to start mapping biodiversity impacts from an existing activity: the current year, the start of the activity, time of land use change, year the Convention on Biological Diversity was signed (1992),?

The practical guidance on compensation methodology should address these questions and come up with practical advice.

Indirect effects

Indirect effects occur often as the result from a combination of political and social circumstances, such as a lack of local land use planning, poor legal enforcement or poverty.

But indirect effects on biodiversity resulting from business activities can be much larger than the direct impacts. Whereas many NGOs and authorities feel that these indirect effects deserve attention in biodiversity assessments and compensation plans companies recognizing their responsibility for their own activities point out that the occurrence of indirect effects should be dealt with at a higher level (e.g. governments, international conventions).

Stakeholder attention for indirect effects is increasing and a higher responsibility is expectedly from companies. Financial institutions already demand their clients more and more to incorporate potential indirect effects in their social and environmental assessments (e.g. International Finance Corporation Performance Standard nr 6).

MSA methodology

The MSA index is considered a very valuable and useful parameter to express the (potential) loss of biodiversity against the original or current biodiversity situation. It applies where the loss of habitat and indirectly of ecosystem services are considered. Also it is an independent, transparent indicator for measuring compensation effectiveness.

At the level of an individual species or group of species it is not a valid tool and the same holds when the area under consideration is small. In such cases one needs (a) different parameter(s).

Still, the MSA methodology is under discussion as it is said to be coarse and general. We experienced that the MSA methodology delivers good starting points for assessing the land use footprint; sometimes, but should be complemented/combined with location-specific on the ground data for better results in order to decide on the compensation priorities. Such location specific information may include information on the habitat type, species information, such as species richness, level of endemism, Red List species, etc. Hence, 'just' increasing the MSA of other areas is not a desirable compensation option. It should be used in coherence with like-for-like, additionality, and best conservation outcome.

From the>NNL and BioCom pilots we conclude that the MSA methodology should be improved (e.g. refinement of categories, inclusion of additional pressures) to better suit the needs of biodiversity compensation.

Compensation of CO₂

CO₂ emissions (or equivalents thereof) have an impact on biodiversity through the climate change it causes. Some species profit from the climate change, most not. In general, global models show that global warming brings more species to the edge of extinction. It therefore makes sense to include CO₂ compensation when drawing up biodiversity compensation plans.

Global models can establish a link between CO₂ emissions, global warming and biodiversity loss and express this link in 'natural hectares lost'. These models are not easily applicable on a project, i.e. when looking at the quantity of tons CO₂ emitted by a certain activity / supply chain. The models' outcome are 'hectares' but where to compensate, which ecosystems? To compensate for CO₂ emitted, it appeared to be easier and better explainable to stakeholders to compensate via existing carbon-offsetting schemes.

Compensation of water use

Many economic activities require water. It is foreseen that water shortage becomes more and more a reality for an increasing number of places due to climate change and overexploitation of fresh water resources. Fresh water shortages affect biodiversity, though on a local scale. Local geo-hydrological modelling data can demonstrate the true impact of economic activities on water distraction and supply regimes.

Proper geo-hydrological modelling data often lack, in particular in less developed countries, and therefore the alternative option of using national water stress in countries in the supply chains can be used as a first indicator to assess the extent water extraction might impact on biodiversity.

Compensation of miscellaneous pressures

It is (still) impossible to translate the pressure of 'miscellaneous' factors on biodiversity into currency suitable for compensation. One solution is the application of a multiplier to 'land take' (see 3.2).

3.4 Compensation by design

3.4.1 Quantity versus quality

In voluntary compensation, the like-for-like versus like-for-unlike discussion is highly debated, e.g. in BBOP. Also in the Netherlands the option to depart from the 'area or habitat compensation' (adding new area to the original area to make up for the loss) as generally prescribed by legislation for mandatory compensation and focus more on compensation inside the remaining, same habitat ('quality' compensation) is increasingly placed on the table, including the Dutch parliament.

In Natura2000 areas the spatial coherence is important and compensating the loss of area a critical condition; qualitative compensation within the protected area is not permitted. But could a quantitative loss of habitat or species be compensated by upgrading the quality of another area of that same habitat or species? NNLI asked for legal advice on this issue to learn what could be a suitable approach for voluntary compensation. The conclusion is that qualitative compensation for area loss of protected nature values is possible under the Nature Conservation Act. See box 4 for details. Consequently, this option is open also to voluntary compensation.

Box 4 Quality for quantity?

In the permits issued so far under the Nature Conservation Act it has been accepted that quantitative loss of habitat types are compensated for by qualitative gain elsewhere: 10% quality improvement of 50 ha of a habitat type can be the offset of 5 ha loss of that same habitat type. Especially in the North Sea coastal zone and the Wadden Sea this 'rule' has been applied. But 1 to 1 compensation remains the starting point. If the compensation of the loss of nature values cannot be achieved in a compensation area, then more compensation is required: multiplier compensation. Given some recent court rulings it may be assumed that indeed quality improvement as meeting the compensation requirement for area loss is acceptable and legally possible as long as this compensation is sufficiently extensive. The conclusion is that qualitative compensation for area loss of protected nature values is possible under the Nature Conservation Act. The condition is that such compensation at least meets the 1:1 ratio. Also the story that indeed the measures will lead to quality improvement, needs to be plausible.

From Eelerwoude (2010)

Another question that relates to the one above is: can the loss (quantitative or qualitative) of a certain habitat type or biodiversity be compensated by (quantitative or qualitative) gain of another type? The perceived risk of such a policy change is that it ultimately could lead to predominantly 'easier' solutions with 'quick' results and that rare habitats or biodiversity that require a long period of time to develop and mature will disappear. Again NNLI asked for legal advice. The conclusion is that compensation beyond the restoration or improvement of a certain habitat type seems to be an option in the Netherlands. However, as it is a novelty, a court ruling is desirable in case of mandatory compensation. See box 5 for more details.

Box 5 Compensation outside the impacted habitat or species?

A look over the borders is helpful to find an answer to this question. In Germany where the regulation on compensation is less strict, the ADC rules allow for compensation that enables maintaining the integrity of the Natura2000 network by taking appropriate, necessary measures. It is interpreted that in Germany compensation between, preferably adjacent habitat types is possible.

But is what is allowed in Germany also possible in The Netherlands? The Nature Conservation Act refers to 'compensating measures' without mentioning whether this applies to habitat types or species. Hence, the Dutch legislation seems to offer some possibilities to compensate beyond habitat type and species. Another conclusion is that the interpretation of the compensation requirement in the NB-law is unnecessarily strict: the legal text does not require 1:1 compensation per habitat type. Even at the EU level compensation 1:1 to species or habitat is not required. Therefore compensation between types should be possible also in The Netherlands! However, as it is a novelty, a court ruling is desirable

From Eelerwoude (2010)

The option to compensate the loss of habitat or species with another habitat or species or with qualitative improvement of (remaining) habitat provides flexibility. There are however some risks as well. The major one is that such flexibility will ultimately lead to:

- The disappearance of 'difficult' ecosystems due to lack of space and cheaper alternatives. A guiding principle might be that no substitution of loss is allowed with lower categories ('trading down') but that 'trading up' to higher value habitats or species is encouraged,
- The emergence of conservation ghettos because compensation schemes favour qualitative improvement above maintaining the size of the protected area; this will go at the cost of the connectiveness of protected areas (network) and enhance the probability of isolation that ultimately will negatively affect species diversity!

Hence a note of caution on liberal criteria for compensation is appropriate.

3.4.2 From many crumbs to a few pies: aggregation of compensation

The current legislative regime requires compensation on a case-by-case basis. The evaluations by VROM-Inspectie (2006), Algemene Rekenkamer (2007) and Zuidelijke Rekenkamer (2009) revealed the inadequacy of the compensation regime at this point: most compensation efforts are small, postage stamps, and not successful in conserving biodiversity (see 5.1).

For voluntary compensation we see the following main shortcomings of this case-by-case approach:

- Many individual projects and developments will still allow for an overall impact on nature and biodiversity such as fragmentation and isolation of habitats, that ultimately will result in biodiversity loss for which no compensation takes place; therefore the robustness of the remaining biodiversity will decrease despite the individual compensation efforts;

- Lack of an integrated, ecosystem-based view on compensation in ecosystems that could steer the compensation where it is most effective in terms of ecosystem functions.

The NNLI pilot Den Helder clearly demonstrated the difficulties in trying to arrive at a like-for-like compensation:

- It is hardly possible to create the same type of habitat that will disappear,
- The robustness of that compensation if successfully created, is doubtful,
- The question is whether that type of compensation is what the ecosystem needs for its viability, etc.

The question is then what is the alternative that does not have these shortcomings or at least less. We advocate for radical change here: leaving the strict like-for-like approach and investing in **large, ecosystem-based compensation areas** that accommodates the individual compensation efforts. The advantages are many, the major ones being:

- Better conservation outcomes due to the larger size and alignment with the sensitivities and rivers of the relevant ecosystem,
- Less administration, in particular with respect to project permitting,
- Faster project development,
- More effective monitoring,
- More cost-effective.

A risk of this strategy could be that it may seem or become too easy to compensate biodiversity loss and facilitate a 'license to kill/destroy' any habitat by simply buying a share in such a large, ecosystem based compensation area. By applying the mitigation hierarchy carefully and strictly and involving a sufficient large, representative and diverse group of stakeholders, this can and must be prevented.

Strategic planning tools that can facilitate the choice of location for such large compensation areas exist, such as the Planologische Kern Beslissing (PKB) and Strategic Environmental Assessment (SEA) at the national level, and Reconstruction Plans and Structure Visions at the provincial level. The SEA has the advantage that it is recognized by EU as a tool enhancing good governance, and adopted as formal procedure (EU SEA Directive).

In the NNL plan for the harbour extension of Den Helder we advocate this option of a large, ecosystem-based compensation area as the best solution to combine economic development and nature conservation in and around the Wadden Sea, a Natura2000 area (attachment 2).

Legislation and regulation need to be changed to allow this model for mandatory nature and biodiversity compensation. In Germany the option for larger, centrally coordinated compensation areas already exists (LEI, 2010) and perhaps the German legislation could serve as an example for what has to be changed in that respect in the Netherlands.

The above does not apply to voluntary compensation for the loss of habitat or species and so nothing stands in the way to establish such large compensation for voluntary compensation. However voluntary compensation efforts should preferably developed in conjunction with such large areas for the mandatory compensation to achieve best conservation outcomes, increase effectiveness and decrease costs.

Once decided to opt for large areas for compensating the loss of nature and biodiversity, this opens the way to broaden the concept and couple landscape compensation with nature compensation.

3.4.3 Compensation bank and biodiversity credits

The call for large compensation areas have been heard before but always with a commercial connotation: conservation or habitat banks. Indeed it is a little step from the designated compensation areas as described in 3.4.2 to commercial compensation and habitat banks. The basis for a commercial compensation bank is that it sells biodiversity credits that are generated at the land set aside for that purpose. The biodiversity value, upfront created, is translated into points (or credits). The project developer or local government buys a volume of credits that (at least) equals the biodiversity loss (this requires a measuring system that allows for that calculation).

The main differences between the commercial compensation bank and the 'designated compensation areas' as defined above are:

- Not the national or provincial government but private parties set up the compensation areas and manages these for compensation objectives,
- No link to Natura2000 areas and EHS unless national or provincial spatial plans require compensation banks to make that link,
- License granted on the condition of performance,
- Transparent financial mechanism: 'you get what you buy'.

Several studies have been made in The Netherlands to explore the feasibility of such compensation banks, e.g by Nationaal Groenfonds (National Green Fund) and Arcadis (a consultancy company)(see 1.3). Both identified opportunities for such banks to channel biodiversity compensation alongside large infrastructural works (e.g. Ruimte voor Rivieren) and an opportunity to combine carbon offsets with biodiversity compensation. Till this moment such efforts have had little success. Reasons are:

- There is no governmental policy that encourages compensation biodiversity loss being achieved through the involvement of compensation banks,
- No official status for the compensation banks,
- No recognition for the credit system that banks will employ to offset biodiversity loss,
- No official recognition of credits bought as proof for sound biodiversity compensation,
- Lack of expert capacity that oversees the complete field of biodiversity compensation that enables potential compensation banks to manage the risks involved in trading biodiversity credits.

However, compensation or habitat banks provide a potential financial mechanism that could support aggregated biodiversity offsets, while combining public and private funding. This is of particular interest against the current perspective of declining public funds in The Netherlands for nature conservation. Habitat banking, compared to other market based instruments, can offer a useful additional instrument to help biodiversity policy move towards a no net loss, the EU target set for 2020 (IUCN, 2010).

A recent research report found 39 existing biodiversity compensation programmes around the world, with another 25 programmes under development. There are over 600 offset banks worldwide and a conservative estimate of the global annual market size of \$1.8 – 2.9 billion (Madsen et al., 2010).

Various aspects that are related to commercially managed compensation areas need to be analyzed and solved such as:

- What are advantages and disadvantages compared to government-run compensation areas,
- How to set up a credit system, what can we learn from the carbon credit domain,
- How to consistently measure biodiversity loss and gain across a variety of habitats and ecosystems,
- How to compensate for the part of loss that is created outside The Netherlands,
- How to set a price for the credits?

We suggest inviting interested parties to come up with detailed plans for establishing a compensation bank that address the above uncertainties and other.

Ultimately one might see a national policy that sets a limit to the volume of credits on an annual basis. Such a 'cap-and-trade' system will drive innovative solutions to mitigate impacts on biodiversity above compensation. See also CE (2008).

Compensation areas managed by compensation banks could function as the engine for regional economic development: local produce (e.g. 'IJsselstreek' products), small-scale tourism (walking, biking, adventure trails), sports such as golf and canoeing. Such additional activities require a business entity to run the compensation area, entrepreneurship.

3.5 Governance and Communication

3.5.1 Governance

In principle one could make a clear distinction in governance and implementation of biodiversity compensation between mandatory and voluntary regimes. In a regulated compensation regime, such as in the EU and the Netherlands, laws, regulation and procedures have been put in place. However, weaknesses are experienced in the governance and monitoring. The evaluations of biodiversity compensation projects in the Netherlands (Algemene Rekenkamer 2007, Zuidelijke Rekenkamer 2009a,b) also exposed a number of governance weaknesses and failures (see box 8).

But an evaluation of voluntary compensation projects by BBOP (BBOP 2009) revealed similar deficiencies. Lack of capacity within companies to implement compensatory conservation was identified as a major weakness. Birdlife International (2010) lists other weaknesses, among some related to governance:

- Weak objectives,
- Lack of criteria about what can be compensated,
- Simplistic or poor standards,
- Poor regulation and oversight

And in voluntary (and in mandatory) compensation, third party verification and monitoring throughout the whole process is generally insufficient or lacking.

In the Dutch compensation landscape one might see large compensation areas being developed that are managed either through a national or provincial authority (in the designated areas) or by commercial compensation banks. Whereas these organizations are well capable to run their business, we see the need for an independent party that oversees the compensation mechanism (mandatory and voluntary) including the methodology of identifying and measuring biodiversity loss and compensation efforts, the compensation outcome and its contribution to the larger ecosystem-based functions, and reporting. Also this party should supervise the biodiversity credit system and guarantee its transparency and credibility.

We advise to set up a new office for this task, small and focused in order to be effective, to be paid for by surtax on the compensation costs. Several independent organizations exist that can serve as a model for this organization to be set up (e.g. the Commissie MER). None of the existing ones could easily accommodate this task at short notice as it involves certain knowledge and experience that they lack at this moment.

3.5.2 Monitoring and reporting

Voluntary compensation plans should include detailed monitoring during implementation of compensation measures to ensure their effectiveness in the long term. The Natura2000 authority (usually the provincial government in the Netherlands) has responsibility in adapting compensation measures in the case that they prove insufficient. The proposed office for managing biodiversity compensation should be given similar authority.

Monitoring of compensation measures for the whole life of the project should include objectives, responsible bodies and resource needs and indicators. If measures show a low level of effectiveness, the objectives should be modified accordingly.

But as stated before the evaluations of biodiversity compensation projects in The Netherlands (Algemene Rekenkamer 2007, Zuidelijke Rekenkamer 2009) showed inadequate monitoring and enforcement by government. Therefore the adequacy of the methodology to measure biodiversity loss and compensation effectiveness has to improve. That methodology needs to be science-based while absorbing practical experiences. It should include the components as habitat, species and functionality (ecosystem services). Such a methodology needs to be practical and cost-effective and avoid any overly detailed and cumbersome data collection!

Box 6 Calculating biodiversity loss and gain and quantifying residual loss

There is no single, best way to measure loss / gain and a wide range of 'metrics' for quantifying biodiversity have been developed to address policy requirements for 'no net loss' over the last 40 years. These include various measures of area, ecosystem function or structure and population status. The majority use some measurement of land area as a basic unit for calculating the conservation gain that must be achieved, but vary in terms of how land measurements are adjusted to account for differences in the composition, structure and function of biodiversity, and thus its condition.

Habitat is a useful concept for loss / gain calculations, because it lends itself to identification of areas of land and uses these as a proxy for 'carrying capacity' with respect to individual or multiple species. Most offset methods consider the areas of land available to key species, species populations or communities /assemblages and also the capacity of these areas to support them in a viable condition (generally referred to as 'habitat quality'). In this case, measures of area are generally combined with some measure of quality, health or condition of the habitat.

There are also situations where measures of habitat area and quality are not a good proxy for losses at the species level, and it is necessary to carry out more detailed population assessments. There are several approaches currently under development which are intended to deal more effectively with the viability of species populations and their persistence in space and time. Species-specific assessments may be advisable for key species, particularly where these are highly threatened or where significant residual adverse impacts are not directly linked to amount, structure or configuration of habitat, but are expressed more directly at population level (for example through disturbance or road kill).

From BBOP Biodiversity Offset Design Handbook
<http://bbop.forest-trends.org/guidelines/odh.pdf>

3.5.3 The rationale for biodiversity compensation and public perception

One of the root causes of the global decline of biodiversity is its public nature: everybody utilizes biodiversity free of charge and it cannot be claimed by one single party. It has no specific owner and, as a consequence its meaning and value are often underestimated and underappreciated. If human activities (unavoidably) lead to loss of biodiversity, this loss is rarely incorporated into the price of the products: a classic 'tragedy of the commons'.

The value of biodiversity conservation to society becomes clear and more and more scientifically supported: for food, clean water and a healthy living environment to name a few we are depending on biodiversity. The Millennium Assessment (MEA 2005) and more recent The Economics of Ecosystems and Biodiversity (TEEB) project (TEEB 2010) have gathered many examples and knowledge on the (use and non-use) values of ecosystems and their biodiversity. Most vulnerable to loss of biodiversity are local communities in developing countries, as they are most directly dependent to natural resources.

Environmental legislation around the globe aims to reduce the negative impacts of human activities on the environment and to prevent biodiversity loss. And despite that

effort, biodiversity still is in decline because all activities, new projects, large ones as well as ongoing, small activities, have a residual footprint with respect to biodiversity. Legislation is able to reduce footprints, but not to eliminate them. And if activity levels remain high, like in The Netherlands where environmental legislation is 'tough' and well adhered to, the net result is an overall decline in biodiversity. Compensation is then the mechanism to repair and to establish a (more) sustainable situation.

Box 7 About the Economics of Ecosystems and Biodiversity (TEEB)

The world is fast coming to realise that we have been consuming natural resources at an alarming rate. The history of post-War economic growth has been one of unsustainable consumption: unsustainable for the planet's ecosystems, for its species diversity and, indeed, for the human race. By some recent yardsticks of sustainability, our global ecological footprint has doubled over the last 40 years to the point that, if the whole human population consumed at this rate, we would need 4-5 planet Earths just to keep up, just to sustain us.

By and large, we in the developed world seem to have disconnected ourselves from Nature and are struggling to find the "value of Nature." Take a look around: nature is the source of much value to us every day – this can be spiritually, culturally, health-wise or economically; and yet the benefits we receive from Nature mostly bypass markets, escape pricing and defy valuation. The lack of valuation has become an underlying cause for the observed degradation of ecosystems and the loss of biodiversity.

With this in mind, the study on The Economics of Ecosystems and Biodiversity is compiling, building and making a compelling economics case for the conservation of ecosystems and biodiversity. The study is drawing on expertise from around the world to evaluate the costs of the loss of biodiversity and the associated decline in ecosystem services worldwide, and to compare them with the costs of effective conservation and sustainable use. The intent of the study is to sharpen awareness of the value of biodiversity and ecosystem services and facilitate the development of effective policy, as well as engaged business and citizen responses.

From: <http://www.teebweb.org/Home/tabid/924/Default.aspx>

With the general public in the Netherlands this perception of importance and urgency of biodiversity conservation and compensation is lacking or at least not very well developed. Biodiversity is often perceived as 'nature' and associated with wildlife documentaries or spending Sunday afternoons or holidays in the forest: a pleasant or interesting side issue to day-to-day life. Biodiversity has moved too far away from our 'normal life' to understand and appreciate our dependency on it to survive. It also is a consequence of our life style and the life cycle of (raw materials for) the products we use. The Parties that have signed up to the Convention on Biological Diversity (CBD), have agreed to an extensive programme for reducing the loss of biodiversity and transition to a more sustained way of living. So far the effectiveness of the agreed actions does not meet the targets and expectations. Partly due to the fact that the urgency to make it a priority is not felt.

Many companies perceive the issue of biodiversity as one more item on the already demanding 'things to do for sustainability' list. They have sympathy for the idea of voluntary compensation of residual biodiversity loss, but plea for time to deal with the other sustainability issues, already on the list, first.

In general, it can be concluded that, at this moment in time, biodiversity loss and compensation is not felt as an urgent priority, by the general public or by any group in society including most private sector companies.

Hence an intensive communication programme is immediately needed to raise the awareness of society for the need of biodiversity conservation, the chances it offers and the risks of not doing that. And to make them familiar with the idea that biodiversity is at the basis of what we daily do. All multi-media options have to be utilized, from TV and radio spots to Twitter, from adverts to community meetings.

In 2010, NNLI had conversations and meetings with a variety of large and smaller companies and organized/participated in a number of public events (a.o. Leaders for Nature, VVM-seminar, Environmental Fair, and National Sustainability Congress).

In these meetings and in the public debates, the opportunities and threats of biodiversity compensation have been discussed. The key messages we took from those discussions are:

- Voluntary compensation of biodiversity loss is apparently something which must be handled and communicated carefully: it is complex matter and therefore providing examples of what it is probably works better than definitions.
- Many people state that compensation should never become a 'License to destroy' (any impact or biodiversity loss becomes acceptable if you compensate enough). Communication-wise this is a key issue as this is a concern which was expressed in almost every discussion;
- Biodiversity compensation-related discussions are often presented as 'difficult and vague', dealing with high complexity and many uncertainties, or as too simple: blockage of large infrastructure projects because of the presence of one butterfly species To strike a better balance and to convince a wider public of the usefulness of this mechanism, good examples of effective, biodiversity compensation projects with no net loss of biodiversity should be communicated in a clear, simple and honest way;
- Methodologies to measure biodiversity loss and compensation need tuning to scale to better accommodate more local conditions and specific situations;
- So far, biodiversity compensation seems to be the prerogative of ecologists and biodiversity specialists. There has been little attention to look at it from other perspectives, socio-cultural or socio-economic (ecosystem services) points of view;
- Striking the right balance with (voluntary) biodiversity compensation is tricky: simply exchanging one type of habitat or species for a totally different one (or on a totally different location) is opposed by many stakeholders. But, strictly adhering to the 'like for like'-principle makes the tool very rigid and is often not practical and effective either;

- There is no generally accepted framework of guidelines, rules or regulations for voluntary compensation, as is the situation for mandatory compensation (laid down in legislation). This may pose a risk for the principle/tool, but also for biodiversity conservation.

We advise setting up a vigorous communication programme to inform the individual civilian about the importance of biodiversity. Also more pilots of voluntary compensation will help to gain knowledge and expertise, and demonstrate the usefulness of biodiversity compensation.

At those meetings and debates we also received some good suggestions, e.g.:

- Use of a sensible cut-off point for the compensation of historical loss, e.g. 1992 (the start of the Convention on Biological Diversity) or 2010 (International Year of Biodiversity). A point in the future was not acceptable as this would encourage excessive cultivation;
- Do not invent new methodologies for biodiversity compensation but the existing toolbox with e.g. LCA and Impact Assessment;
- Do not emphasize the differences between mandatory and voluntary compensation where there might be no differences in the execution of both;
- Distinguish between being liable, feeling morally responsible and influencing the supply chain when discussing the extent a company should take on biodiversity compensation beyond its own activities;
- Give explicit attention to ecosystem services in biodiversity compensation.

In the discussions with companies, biodiversity and environmental professionals and public, a number of recommendations were brought forward to strengthen the above communication process and enhancing its impact factor with the public:

- Politicians should be more committed to and involved in creating a societal acceptance of biodiversity compensation. This requires a broad dialogue between politicians and society. Having a real dialogue is then important in that respect. We advise to involve communication professionals in setting up and guiding this dialogue;
- Also working with prominent and respected members of society such as former statesmen, company CEOs or celebrities, acting as an ambassador for biodiversity compensation, may help to promote the concept;
- Communicate successful compensation projects as show cases how compensation can contribute to biodiversity conservation and to society;
- Particularly successful cases of biodiversity compensation by companies should be facilitated and communicated to stimulate the participation in voluntary compensation by colleague companies;
- Emphasize that adopting the mitigation hierarchy is the rule to reduce the risk for a 'license to destroy'; only then does compensation definitely have the potential to make a difference;
- Enough time should be planned for stakeholder consultation, throughout all phases, from planning to implementation and monitoring;

- Finally, a stronger involvement of civil society organizations – nature and social – could enhance the acceptance and performance of biodiversity compensation efforts, both in terms of methodology and governance.

4. Interfaces with mandatory compensation

4.1 Introduction

The focus of the NNL-i is on voluntary compensation of the residual biodiversity footprint of (business) activities, driven by Corporate Policy and/or the business case and differs as such from legislation driven, mandatory compensation.

However, as there has been far more experience with mandatory compensation of biodiversity loss and a number of aspects are very similar (e.g. methodologies to measure biodiversity, principles to be applied, criteria to assess equality of loss and compensation, etc.) it is valuable to look at mandatory compensation, learn from that experience and find synergy.

In this chapter, legislation for mandatory compensation of biodiversity in The Netherlands/EU and international is described, their effectiveness analysed and lessons learned for voluntary compensation identified, with special attention for methodologies.

4.2 Mandatory compensation in the Netherlands/EU

4.2.1 Compensation in legislation and regulation

This section discusses the EU and Dutch legislation and regulation that are applicable to compulsory compensation in the Netherlands. For an extensive description see attached reports (IUCN 2010; Eelerwoude, 2010; Weijer, 2011) that have been prepared on NNLI's request.

The EU 'umbrella' legislation and regulation

The European Natura2000 network has been developed within the EU to ensure a robust and coherent network of protected areas across Europe to conserve biodiversity. Guiding in the proclamation and management of these Natura 2000 areas is the Habitats Directive (92/43/EEC). This directive stipulates that compensatory measures are taken before damage to the biodiversity of the area under consideration can occur.

The general rule is that only projects can be granted permission in a Natura2000 area that do not affect the biodiversity/nature in that area. Any planned project, for which the chance of significant negative impacts on a Natura 2000 area cannot be excluded, needs to undergo an appropriate assessment to determine its implications for the site. The competent authorities can only agree to the project (i.e. issuing a permit) after having ascertained that it will not adversely affect the integrity of the site. Derogations are possible in case no reasonable alternative location can be found and the plan or project is of overriding public interest. In that case compensatory measures have to be taken to offset the unpreventable negative effects of the project so that the overall coherence of Natura2000 is maintained and no net negative impacts remain.

The Environmental Liability Directive (2004/35/EU) applies after damage has taken place. This Directive is based on the 'polluter pays' principle, and regulates prevention

and remedy of damage to protected animal and plant species, natural habitats and water resources.

Compensation in Dutch legislation and regulation

The formally protected conservation areas in the Netherlands where compensation applies under Dutch laws and regulations include Natura2000 areas under the Birds and Habitats Directives, the Network of Protected areas (EHS) under the Nature Conservation Law ('Natuurbeschermingswet' or NB-wet in Dutch) and other public natural areas under the NB-wet, e.g. the (State's) Natural Monuments (Natuurmonumenten) (see e.g. Graaff & Vader 2005 for an overview).

An area is proclaimed a Natura2000 area based on the Nature Conservation Act (NB-wet) for the conservation of a plant or animal species or a habitat as described in the EU Bird and Habitat Directives. Compensation is described in the NB-wet as a condition for permitting.

A regime of 'no-unless' applies for Natura2000, similar to the EU Natura2000 principle: no activities that impact on the functioning and the values of these natural areas are allowed, unless there are no alternatives available and the project is of overriding public interest. In case a project is allowed to continue in line with this regime, and no alternatives can be found and mitigation measures have been taken, then compensation is required preceding the planned activity.

EHS is a coherent network of important nature and biodiversity-rich areas in the Netherlands based on the 'Nota Ruimte'. Any plan for activities in EHS is subject to the assessment whether such an activity can be allowed in an area that fall within the boundary of EHS. Within EHS are intrinsic features and values that guide conservation. These features and values are based on targets derived from current and potential values. A no-unless regime applies also here; mitigation is mandatory and residual impact has to be compensated. Under special conditions compensation is a preferred option above mitigation.

Criteria and conditions for compensation are described in 'Spelregels EHS' (2007). Key elements are: no net loss of area, quality and integrity, location of compensation has to be connected to the area that will be impacted. Compensation is not to be used to speed up achieving management objectives. Compensation within EHS is sometimes permitted but under strict conditions.

Nearly all Natura2000 areas are also part of EHS, but on land they constitute only approximately 50% of that network.

Additionally, compensation may apply to activities in areas that under the Forestry Law (Boswet), the Flora and Fauna Law (FF-wet), or under provincial regulations for smaller public natural areas or areas other than nature areas. The Law on Spatial Planning provides the legal framework for the conservation of these areas as is the Spatial Planning Memorandum 'Nota Ruimte'. Both include provisions on compensation. Further provisions on implementation and regulation of compensation are formalised in regional spatial and development plans.

4.2.2 How does legislation guide the compensation process?

EU Habitats Directive¹ for Natura2000

The main guiding principles that the Habitats Directive provide are:

- Compensation constitutes the “last resort” and should only be considered when a project cannot take place elsewhere, there is no reasonable alternative, the project is of ‘overriding public interest’ and mitigation measures to the extent feasible have been applied.
- All compensatory measures needed to ensure the protection of the overall coherence of the Natura2000 network have to be taken. They should aim to offset the negative impact of a project and to provide compensation corresponding to the negative effects on the species and habitat(s) concerned.

Other in the context of this report important additional guidance² is:

- Compensatory measures should be *additional* to the conservation actions which are normal practice under the Habitats and Birds Directives and obligations laid down in EU law; the measures should go beyond the normal/standard measures required for the protection and management of Natura2000 areas;
- Best efforts should be made to assure compensation is in place before the damage to the Natura2000 area takes place. If this is not (fully) achievable, extra compensation for the interim loss should be considered in the meantime. Time lags might only be admissible if it is ascertained that they would not compromise the objective of ‘no net loss’ to the overall coherence of the Natura 2000 network;
- Particular attention should be paid when the negative effects of a project take place in rare natural habitat types or in natural habitats that need a long period of time to provide the same ecological functionality. Under these circumstances, the zero option of not undertaking the plan or project should be seriously considered;
- Compensation measures should be the most appropriate in relation to the type of impact predicted;
- Compensatory measures must be within the same bio-geographic region or within the same range, migration route or wintering area for bird species;
- The ratio between the area of compensation and the relative size of the area affected, should be generally well above 1:1. Compensation ratios of 1:1 or below should only be considered when it can be demonstrated that despite this smaller area, the measures will be 100% effective in reinstating structure and functionality of the area;
- Compensatory measures must not jeopardize the preservation of the integrity of any other Natura2000 site that contributes to the overall coherence of the network.

¹ From ‘Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC’ (EC 2007).

² From the same EU Guidance Document

Guidance documents to EU directives are of a non-binding nature. Member States are free to choose their own, appropriate way to implement practical measures and have the primary responsibility to ensure that the purpose of the Directive is served. In the last resort, it rests with the European Court of Justice to interpret the Directives.

Dutch legislation

The rules and principles as provided by EU apply to compensation in Dutch Natura2000 areas and are laid down in the Nature Conservation Act.

Although similar in many ways, the Dutch Natura2000 compensation rules are stricter than those for EHS compensation. A major difference is that biodiversity loss in EHS can be compensated for through developing or designating a new area as part of that EHS, but also through financial compensation, as a payment to the 'Nationaal Groenfonds' (National Green Fund). This latter option is only eligible when physical compensation is completely or partially impossible. In practice this hardly ever occurs despite the perception that land is not available for physical compensation (see 4.1.4).

Box 8 'Regiebureau' Natura2000: guidance of compensation

The intergovernmental Regiebureau Natura2000 is established in April 2008 to coordinate and direct the development of Natura2000 management plans within the given time frames. The Regiebureau is independent, positioned in between parties, i.e. the authorities, entrepreneurs, NGO's and other Natura-2000 stakeholders.

In the history of the Regiebureau Natura2000, there have been three large projects in which biodiversity compensation has been accepted as an element in the package to make a new development, causing biodiversity losses, acceptable according to Natura2000: Development of the Maasvlakte-2, (further) development of the Eemshaven and a bridge over River Rijn near Nijmegen.

Relatively new formats to meet the EHS compensation requirements are the 'EHS Balance approach' (EHS Saldobenadering) and the 'redefining EHS' (EHS Herbegrenzen) as defined in the Spatial Planning Memorandum 'Nota Ruimte' in 2006.

For the EHS Balance approach projects with a potential impact on the integrity of the EHS are not assessed on an individual base, but their individual compensation obligations are combined into one, under the strict conditions that a net improvement of the EHS takes place both in quality and quantity, and that a spatial policy is formulated for the area that includes part of the EHS.

Redefining EHS for other than ecological reasons can be used by the Province for smaller projects in exceptional cases to adjust the boundaries of the EHS with the purpose of project development as well as improving the quality of the EHS. Further conditions under which both instruments may be applied are stated in the guidance document 'Spelregels EHS' (LNV, VROM, 2007). These options are not open for compensation of biodiversity loss in Natura2000 areas.

Similarities and differences between Natura2000 and EHS

A major similarity between the compensation regimes of Natura2000 and EHS is the condition that no net loss of biodiversity and nature may occur. Another one is that compensation has to be additional with respect to current policy defined for the area under consideration. Finally both regimes tend quickly to require for compensation at a >1:1 ratio

Both regimes differ in the degree of freedom allowed to meet the conditions set for compensation. Natura2000 relates to the specific conditions for (qualifying) species and habitats whereas EHS intrinsic values and features are allowed to be compensated in a qualitative way, even financially!

More differences in compensation requirements under Natura2000 and the EHS are:

- Location of compensation: for Natura2000 areas this compensation should take place in the same bio-geographical region, for EHS in the direct vicinity or otherwise as close as possible.
- Inside or outside: for Natura2000 areas compensation could be sought in a natural area that already has formal protection, as long as there is improvement of the quality relative to the impact of the compensation project. In principle, EHS compensation cannot take place in an area that already has formal protection, although some Provinces have formulated policy that allows deviation from this rule;
- Timing of the compensation: there are strict policies for compensation in Natura2000 areas, being that the compensation should be in place before the impact takes place. Regarding EHS compensation the timing of realising the compensation should be related to the timing of the impacting project.

Other differences relate to the adherence of the mitigation hierarchy and to legal and financial instruments.

Natura2000 compensation is considered to be more difficult and more restrictive than that for EHS areas. This is mainly due to prescribed procedures and the governance of the compensation process.

4.2.3 Governance and management

EU-Member States are responsible for management of Natura2000 sites within the own national territory. This includes ensuring effective and sufficient compensation measures. Depending on national governance structure, the competent authorities to guide the compensation process are in many countries found at sub-national authority level (e.g. Provinces / States). However, national authorities are obliged to communicate the compensatory measure to the EU Commission, and it is the Commission's role to appreciate the manner in which the conservation objectives of the site in question are pursued.

At some moment in the compensation process a Steering Committee is required to design and assess compensatory measures, establish implementation procedures and design management and monitoring plans. Wide-ranging consultation with relevant agencies and organisations is needed as are public consultations. Ultimately, the Court can decide whether a project can proceed or not.

The role of the party responsible for project development and implementation is to adapt the project according to the requirements resulting from the assessment processes. In line with the 'polluter pays' principle, the project developer also bears the costs of the compensation measures.

Compensation of biodiversity impacts are implemented throughout the EU with experiences well documented for several Member States (see e.g. Vader et al 2007). For some Member States compensation is seen as a last resort which is not used often. For some other States, the compensation mechanism is actively sought to receive permission for projects and developments, which would otherwise not have been approved! The latter is primarily the case for areas with high population and/or development pressures such as in the Netherlands and areas of Germany (Vader et al 2007). In terms of governance and management, Natura2000 compensation in the Netherlands seems to be stricter than EHS compensation. The prime reason is that a Natura2000 area has a legal status enforceable by court under the Nature Conservation Act (NB-wet) of 1998 that follows the EU guidelines.

The realization of EHS depends on the translation of this commitment into regional spatial plans and local development plans. The Spatial Planning Memorandum 'Nota Ruimte' which includes the main provisions on EHS compensation should be seen as indicative for State, regional and local governments but is not binding for governments, civilians and companies (Algemene Rekenkamer 2007). According to the Memorandum, EHS conservation should be executed by the Provinces (in regional plans) and Municipal authorities (in development plans). The Provinces are the main competent authorities with responsibility for implementation of EHS compensation, similar to compensation related to the Nature Conservation Law and Natura2000. Formal objection and appeal are organised following existing spatial planning procedures according to the Law on Spatial Planning (WRO).

Municipal authorities are thus responsible for preparing development plans that form the legally binding framework for authorities, companies and civilians for any spatial development, including nature conservation and EHS policy. They also decide whether a project is of overriding public interest and to what extent compensation is required. The Municipality often is also the initiator of the impacting project. The regional plans of the provinces serve as reference for the municipal development plans; provinces supervise correct translation. Since the adoption of the new Law on Spatial Planning (2008), the regional and development plans are (gradually) replaced by a 'structure vision' ('Structuurvisie') developed in collaboration by the national authorities, provinces and municipal authorities. The policy objectives of this structure vision are translated into local development plans setup by the municipal authority that require updating every ten years.

For Natura2000, the competent authority to guide the compensation trajectory is the provincial authority; the Ministry of EL&I oversees whether all considerations are taken into account properly. If different categories with different laws for compensation requirements apply to one area, generally speaking, the most strict laws and regulations apply, but governance and management principles from different laws apply, often resulting in complex procedures to be followed by the project initiator and associated parties.

For protected areas outside Natura2000 and EHS are other regimes that describe the conditions for compensation, often at the provincial level.

4.2.4 How is compensation described and perceived in the Netherlands/EU?

In the Netherlands the compensation principle is described in various laws and regulations, strongly related regulations adopted by EU (in particular Natura 2000). Legislation focuses on compensation related to change of protected habitat (in terms of area) or certain critically endangered species.

Increasingly, compensation is being perceived by parts of the Dutch society as an obstacle to development. This is often the result of the limited space available in the Netherlands and as a consequence the difficult, time consuming discussions and administrative processes on spatial planning. This makes the identification for compensation areas difficult. With regard to compensation in Natura2000 areas, the good examples are rarely heard of but the extreme cases, where 'a multi-million project is being delayed because of the occurrence of some snails, worms or mice', get much media attention and require disproportionate energy (e.g. the case of four badgers removed at the cost of € 300,000 - Volkskrant 11 Jan 2011). Consequently, the implementation of an in itself good policy is being jeopardized. To some extent, this is due to insufficient information on species and their habitats, their sensitivities and related uncertainties, but also to a general undervaluation of the importance of biodiversity/ecosystem services to society and mankind.

On the other hand, the strict Natura2000 approach, expresses the importance of (high) biodiversity (areas) and stresses Nature's societal value. This gives a clear signal to politicians, governments and civilians to think twice if proposed developments would result in negative impacts to Nature2000 areas.

As the necessity of compensation for habitat loss has not been well communicated in the past (nor is it today...), the general public does not know what it is all about and its necessity is questioned. Also the government has difficulty in accommodating the compensation requirement in its national and regional policies (see example Hertogin Hedwigepolder).

The overall result is that disputed, mandatory compensation cases are often settled in court, and the outcome not always being the best for biodiversity.

4.2.5 Effectiveness of current compensation schemes

There is general consensus that the application and fulfillment of conservation and compensation rules and principles, and the control of the execution of compensation projects have been insufficient (VROM-Inspectie 2006, Algemene Rekenkamer 2007, Zuidelijke Rekenkamer 2009, LEI 2010). These evaluations identified some major weaknesses and deficiencies in the design and implementation of mandatory compensation despite the fact that the policy on nature compensation has become stricter (e.g. Spelregels EHS 2010). Two major issues were:

- Inadequate application of the 'no unless' ('nee tenzij') principle, and
- Compensation procedure is insufficient or only partly implemented.

See box 9 for details.

Box 9 Evaluation of mandatory nature compensation in the Netherlands

Various analyses have assessed the effects and effectiveness of Nature compensation as laid down in the context of the Nature Conservation Act (NB-wet) and the Law on Spatial Planning (WRO) (VROM-Inspectie 2006, Algemene Rekenkamer 2007, Zuidelijke Rekenkamer 2009). These evaluations identified some major weaknesses and deficiencies in design and implementation of mandatory compensation, and the two major issues are:

- Inadequate application of the 'no unless' ('nee tenzij') principle, and
- Compensation procedure is insufficient or only partly implemented.

With respect to the 'inadequate application of the 'no unless' principle the following was observed:

- Not all available knowledge and information has been considered or included in the 'no unless' assessment, due to a.o.: insufficient ecological knowledge and expertise with local governments, use of outdated information, and fragmented local government policies;
- The extent of the loss of nature is often unclear and disputed, and therefore also the need for compensation, due to different opinions or interpretations of 'determination of the nature loss';
- Alternatives, both in terms of economic development options and locations, are insufficiently considered and analyzed in the assessment, due to insufficient experience and knowledge of concerned project developers and local governments;
- The principle 'overriding public concern' is insufficiently substantiated (sometimes not justified).
- Public appeals often lead to delay but hardly ever to cancelling of the proposed development. There is still little jurisprudence on the 'no unless' principle.

With respect to the compensation procedure being insufficient or only partly implemented, it was observed that:

- Mitigation (of the damage to or loss of nature) is not taken seriously, due to ignorance of project developers and local governments;
- Compensation itself is poorly realised in practice, due to lack of planning and integration of compensation measures in spatial planning, lack of compensation options (suitable locations are scarce and often expensive), inadequate monitoring and enforcement by government, and inexperience with compensation practices (it is 'complex').
- Insufficient guidance, supervision and (quality) control by provincial authorities.

There has been an overall lack of transparency, strictness and timeliness in realisation of the compensation (measures). The above weaknesses are the major cause that compensation targets have not been achieved and that biodiversity is being lost. For instance, in the province of Noord-Brabant only five of the more than twenty projects have realised the required compensation (ha of forest or nature with certain species composition)(Zuidelijke Rekenkamer, 2009). In 2007, the national government and provinces, in consultation with nature conservation organizations, developed new EHS-guidelines (Spelregels EHS, 2007) to improve the implementation of biodiversity compensation. It is still too early to assess the effect of these guidelines.

From IUCN (2010)

Difficulty in finding suitable compensation locations and the lack of overviews of both compensation locations and of projects requiring compensation are named as the underlying causes. Obviously improvement is needed.

Legislative requirements demand that compensation projects are located near the area where the damage to or loss of nature and biodiversity occurs. The outcome is an increasing number of small compensation sites ('crumbs') where it is difficult to develop nature or provide the conditions for natural ecological process that will bring back the nature and biodiversity originally lost. From an ecological viewpoint these small areas are less effective than the total area in one large plot: fewer boundaries per unit area and hence larger robustness.

Two other issues that leap to the eye are:

- Is it worth investing in compensation efforts when the targeted ecosystem or habitat type is very difficult to restore? The general feeling is no, and when that criterion becomes part of the decision process it may lead to impoverishment of nature and biodiversity;
- Are the rules for financial compensation (as a last resort under current EHS regulation) sufficiently helpful to create conditions for practical compensation? Because the 'distance' between payment and compensation effort and result is large, the link between loss and compensation does not exist. The payment becomes more of a tax and has nothing to do with the intent to reduce the footprint. Also, factual compensation is decoupled from the permit to execute the activity.

In summary: there is a clear need for clarity and simplification around the compensation mechanism: targets, roles, responsibilities, etc. Compensation is considered to be complex, non-transparent and rigid, without clear demonstrable outcomes. That has to change. In particular as the present national policy on nature conservation is 'withdrawing': diminishing the importance of conservation, decreasing the area for nature protection and removing any national rules additional to EU legislation and regulation that were put in place to safeguard the particular Dutch situation of biodiversity and nature conservation. But what we face may also provide opportunities to re-design the compensation mechanism such that ultimately it will lead to better conservation outcomes.

4.2.6 Different regimes applicable to one area: the stacking problem

The legislation and regulation around biodiversity conservation is often considered to be complex, and difficult to understand and manage, due to more than one compensation regime as a result of different policies. Apart from Natura2000 areas conservation and compensation policies also differ between provinces.

Most Natura2000 areas coincide with EHS: areas listed under the EU Habitats Directive all fall in EHS, and partly those listed under the Birds Directive. There is no policy-linkage between Natura2000 targets and EHS conservation objectives. Consequently, for many of those areas more than one conservation regime (and hence more than one compensation regime) applies: stacking of policies.

In practice this means that a project may face more than one legal regime for biodiversity compensation with different criteria and different content requirements. Formally each status situation demands an individual, independent decision. The 'Spelregels EHS' provide a step-wise approach for situations that are subject to more than one regime. First step is the identification of measures required under the strictest regime, i.e. the Nature Conservation Act. If other negative impacts remain, not being covered by step 1, e.g. remaining values as part of EHS area such as area, coherence, or quality, then additional compensation measures have to be formulated. Thereafter one has to assess whether a permit under the Flora-and Fauna Act requires additional measures. Finally measures such as replanting under the Forest Act have to be identified. The step-wise approach has to be followed, even in case a step does not identify the necessity of taking compensation measures.

This stacking of policies, and therefore of different processes to go through, each with their specific requirements, is undesirable from the point of the project initiator. Also it does not benefit the case of nature conservation: these processes are looked at as just a series of (administrative) obstacles and the understanding for the necessity of compensation and for nature conservation in general diminishes! Simplification by elimination of processes and standardization of criteria and methodology are the way forward: the strictest regime should apply and one standard set of principles for both mandatory and voluntary compensation.

In 4.2.5 we identified the wish to simplify and standardize the regulation and execution of biodiversity compensation. One option that could also be instrumental in simplifying the existing process is the combination of starting a new economic activity with nature development in one plan/project. If planned well by balancing negative and positive effects, such a combination does have a no net loss and probably a net gain for biodiversity at the bottom line. If such a combined project would take place in a Natura2000 area, perhaps no permit under the Nature Conservation Act would be required. The same may apply to activities in EHS. Because this option for internal balance played in one of the NNLI pilots, legal advice was sought. The conclusion is that the combination of an economic activity and nature development cannot be presented as one project as defined in the NC Act; consequently, the effects on biodiversity cannot be balanced internally upfront, apart from nitrogen deposition. However, it can be argued that if the consequences of an economic development project in conjunction with other projects, i.e. nature development in that same region, are not significant, then no permit under the NC Act is required. Seeking approval by the High Court for this approach is advised. See box 10 for details.

Box 10 Economic activity and nature development in one project?

A distinction has to be made between project and plan. The Dutch NC Act requires a permit for projects and other activities that potentially have a significant effect on the habitat(s) and /or species for which the area has been designated. This follows from the EU Habitats Directive although the directive does not give clear definitions for project or plan. But the EU Court links the project definition in the EIA directive to that of the Habitats Directive. It then follows from jurisprudence that an economic activity that includes nature development to mitigate significant effects on nature, has to be considered as two separate projects. They have different objectives and consequently both projects have to be evaluated and permitted individually.

Balancing the negative effects resulting from one project with the gain for biodiversity of the other one is not (yet) possible (apart from N-deposition). Nature development as mitigation measure is only possible if mitigation relates to the same habitat type or species that is impacted. The formulation of the planned activities as one 'plan' is not a feasible road either as at a later stage the individual components have to be evaluated and permitted on an individual basis. However, during the evaluation of the potentially significant effects of the economic activity, the accumulation of such effects due to other projects has to be considered. It can be argued that if positive effects are the result of a projects they should be included in that counting as well, thereby reducing the level of effects to 'not significant'. Then no permit under the NC Act should be required. Approval by the High Court for this approach is advised.

From Eelerwoude (2010)

4.2.7 Existing guidance on compensation methodology

Guidance from EU Directives³

The methodology for development and implementation of the (mandatory) compensatory measures is outlined in the Guidance Document '*Managing Natura2000 sites*' (EC 2000) and the '*Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC*' (EC 2007). These guidance documents do not contain a strictly defined methodology but rather facilitate translation of Natura2000 compensation to national implementation. Prior to compensation measures being considered, assessments have to be conducted on the likely damage on species and habitat functions of the proposed project, used to determine the appropriate compensation measures. The following methodology is outlined by the EU:

assessment of the (potential) impact of a project likely to affect Natura2000 areas should "guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the [Natura2000] network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts" (EC 2007). Existing Environmental Impact Assessment (EIA) procedures can be used – and usually are in practice – to assess baseline conditions, potential impacts and foreseen residual impacts after mitigation measures

³ Partially based on IUCN (2010)

have been taken. To a great extent, the methodology for establishing impacts on Natura2000 areas lean on existing EIA methodology, ultimately determining what has to be compensated both qualitatively and quantitatively.

Regardless of the impact assessment methodology applied, the EC Guidance Document (EC 2007) provides some methodological requirements that must be met in the assessment, the main ones being:

- The assessments should include all elements contributing to the site's integrity and to the overall coherence of the network, including structure and function and the role of the site's ecological assets; area, representativeness and conservation status of the priority and non-priority habitats; population size, genetic pool, age class structure and conservation status of species under Annex II of the Habitats Directive or Annex I of the Birds Directive that are found on the site.
- They should include a comprehensive identification of all the potential impacts likely to be significant on the site, including cumulative impacts.
- The impact assessment and characterisation of the biological integrity should be based on the best possible indicators specific to the Natura2000 areas which must also be useful to monitor implementation in later stages.
- The assessments should apply the best available techniques and methods to estimate the extent of the effect on the biological integrity of the site and should provide for incorporation of the most effective mitigation measures, in order to avoid, reduce or even cancel the negative impacts on the site.

The EU documents also provide requirements to ensure targeted compensation, for example: identification of the total number of/principle species affected and estimates of their population sizes; identification of the habitat functions that will be adversely affecting the species that depend on them; identification of the measures needed to offset the damage to the habitat functions and species affected.

The Dutch guidance

The official guidance on how to meet mandatory compensation is very limited and primarily focuses on compensation outcomes and related conditions and criteria. Any activity planned inside a Natura2000 area or EHS is subject to a Environmental Impact Assessment process (EIA or 'MER'). The EIA process precisely describes the elements to examine (see 'Handleiding' MER⁴), from activity and pressure factors to mitigation and monitoring (see also 3.2). Implicitly one assumes that this suffices methodology-wise to assess the biodiversity footprint and compensation content, and therefore it is silently used as the standard.

The 'rules of the game' for EHS compensation ('Spelregels EHS', 2010) mention only the following methodological rules:

⁴ <http://www.commissiemer.nl/default.asp?onderwerp=watismer&type=handleiding>

- To compensate for the qualitative loss of nature values during the time that the new area needs for development to a mature stage, a correction factor has to be applied to the area of compensation. Four categories have been identified:
 - A development time of less than 5 years: no correction
 - A development time between 5 and 25 years: factor 1.33 to be applied
 - A development time of 25 and 100 years: factor 1.67 to be applied
 - A development time above 100 years: uncertainty with respect to the development outcome vis-a-vis the original situation and a case-by case solution has to be agreed
- If qualities that are to be lost due to the planned activity, cannot be developed again (due to a very long development time, see above, or due to absence of suitable conditions outside EHS) values of comparable quality have to be developed (see also chapter 5)

4.3 Mandatory compensation internationally

Only a limited number of countries has appropriate regulation for biodiversity compensation though this is generally limited to specific ecosystems and habitats, defined protected areas and / or selected species. In most countries policies are absent. There are no comprehensive and generally accepted regulations for compensating negative biodiversity impacts as far as most of the world's ecosystems and genetic species are being concerned.

Existing regulatory and legislation-based requiring compensation is limited to a few countries but rapidly developing. For a long time the Federal Clean Water Act and the Endangered Species Act in the United States require mandatory compensation. Other countries with mandatory compensation for biodiversity loss are Australia, Brazil, Canada, Mexico, EU and Switzerland. Also South Africa is developing guidance for biodiversity offsets. See BioCom (2011) for an extensive overview of existing biodiversity compensation legislation. As concluded in chapter 3 general applicable guidance on compensation remains scarce and a case-by-case approach is often applied.

There is no international convention yet that very clearly requests the compensation of biodiversity loss. The Convention on Biological Diversity (CBD) refers to compensation as an option for maintaining and restoring biodiversity, e.g. as part of the Ecosystem Approach, but so far has not succeeded to bring all Parties to a unanimous position and subsequently adopt a Decision that call the Parties to implement this concept in national legislation. Consequently, the compensation for the loss of biodiversity being embedded in national legislation is restricted to a limited number of countries although the number is growing.

In a number of international standards, compensation is mentioned as an instrument to reduce the overall impact of a proposed activity or project. The International Finance Corporation's Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management (April, 2006) is a leading institution in this respect and addresses compensation under mitigation measures which 'will be designed to achieve no net loss of biodiversity where feasible, and may include a combination of actions, such as post-operation restoration of habitats, offset of losses through the creation of ecologically comparable area(s) that is managed for biodiversity and/or compensation to direct users of biodiversity. However, no concrete, internationally accepted guidelines how to do this are available yet.

4.4 Voluntary and mandatory compensation compared

The section above summarized the mandatory compensation regime in the Netherlands. When comparing it with the voluntary compensation approach, the differences are not that many and similarities dominate:

- The Nature Conservation Act requires compensation for biodiversity loss similar to the compensatory conservation approach we advice for voluntary compensation,
- The methodology employed in mandatory compensation also follows the EIA process and hence, is largely similar, including the use of corrections factors,
- Following the mitigation hierarchy is a condition in both regimes
- Both emphasize compensation measures that result in outcomes to be close to that what is predicted to be lost, although the freedom in the voluntary approach to decide otherwise is larger; however, also in the mandatory compensation for loss of biodiversity in EHS the outcomes are less strict defined: even financial compensation is allowed.

Hence, not only the objective of compensation effort but also the way to achieve that compensation outcome is grosso modo the same for both regimes. There is a case to streamline mandatory and voluntary compensation regimes: adopting the same compensatory compensation approach, using the same toolbox for identifying potential impacts and exploring compensation options and even combining compensation efforts in the field. It will make biodiversity compensation more unified, transparent and with an independent office overseeing the compensation process, more effective and acceptable.

A real difference is the role of the authorities: in mandatory compensation the authority (local, provincial and/or national) has a decisive role as the compensation is part of a permit process. In voluntary compensation that role is much less and de facto limited to approving change of use of land to biodiversity conservation. There is no legal ground to forbid voluntary compensation through acquiring land for such purpose.

Evaluation of mandatory compensation identified some major deficiencies and weaknesses in design and implementation: inadequate application of the 'no unless' principle, and insufficiently or partially implemented compensation (see 4.2). A larger-scale introduction of voluntary compensation could benefit from these lessons.

Finally, there is a growing antipathy against mandatory compensation as it is considered to go at the cost of economic development and limit sustainable business (e.g. farmers). Pressure is growing to loosen the strings and make the compensation regime more flexible. Here is a chance for voluntary compensation to demonstrate that economic development and biodiversity compensation are not contradictory and can deliver positive outcomes for both.

5. Conclusions, recommendations and advice

5.1 Voluntary compensation opportunity in the Dutch situation

A comparison of approaches to biodiversity compensation has been made. A biodiversity compensation approach that focuses on land take and new activities only cannot adequately neutralise the residual biodiversity footprint of (business) activities. In the Dutch situation (with mainly existing activities, all leaving a residual footprint, limited but many) such an approach would not optimally contribute to halting and reversing biodiversity decline. An approach in which also the (indirect) loss of biodiversity due to drivers other than land use change is taken into account (i.e. the 'compensatory conservation' approach) is more useful as it can neutralise the residual footprint and offers interesting additional opportunities for biodiversity conservation and even recovery. We advise the Dutch government to adopt the 'compensatory conservation' definition as the appropriate definition for biodiversity compensation in the Netherlands, for both mandatory and voluntary compensation.

If voluntary biodiversity compensation (i.e. in areas where no legal compensation obligation applies) would be accepted as a normal element of corporate/business responsibility and compensation tasks would be coordinated well (e.g. in the format of large compensation areas, bio-credit systems or EHS), business could significantly contribute to conservation, maintenance and recovery of biodiversity

5.2 Business piloting biodiversity compensation and No Net Loss

The companies, approached by the NNLI, were all interested in the concept of biodiversity compensation. On the other hand, they are very reluctant to actually participate. An analysis of the reasons for this reluctance was made and ways to lower the barriers were explored:

- For most companies biodiversity is not (high) on the agenda or they struggle with the issue of biodiversity as it is not very clear to them what it is and why it is important (to them). The Dutch government is advised to vigorously communicate the necessity of biodiversity conservation and explain the role that business, especially small and medium-sized companies, needs to play in reducing and compensating the loss of biodiversity due to their activities.
- Companies are confused on how this issue relates to 'other Sustainable Development issues'. The growing number of requests to participate in SD initiatives ('does this never stop?'), all with consequences for human and financial resources, makes companies reluctant to contribute to pilot projects, even the so called 'front runners'. It is advised to explain consistently and clearly the differences between themes like global warming, sustainability, CSR, PPP, Cradle to Cradle, biodiversity, and encourage integration and demonstration of synergy between these themes.
- The development of No Net Loss plans may generate expectations with internal (employees) and external (NGO's, authorities) stakeholders. If so, then it may not be easy to explain why not to implement a No Net Loss plan, even with good

reasons. Therefore, companies do perceive voluntary compensation as 'not so voluntary' because of this business risk.

- Companies are concerned that voluntary compensation initiatives may not be appreciated and accepted by stakeholder (group)s and may lead to criticism and disputes on methodology, adequacy and acceptability. In such cases, a voluntary, positive intention may turn against the company and cause reputational damage. It is advised to agree on one consistent, standard methodology to measure biodiversity and its loss while strengthening its scientific basis and to develop a certification or a 'green' quality mark for biodiversity compensation plans. This could reduce the reputational risk for participating companies and thus their hesitation to join the No Net Loss initiative. Finding a common approach with mandatory compensation is an option.
- In general the companies that joined biodiversity compensation pilots are enthusiastic about the result. Successfully completed and implemented biodiversity compensation pilots will demonstrate the usefulness and effectiveness of the compensation mechanism, and in particular will emphasize the additional value of compensation as the last step in the mitigation hierarchy. This will in turn create sufficient momentum to make the NNLI 'self-developing'. It is advised to encourage (leading) companies in the Netherlands exploring options for biodiversity compensation, e.g. by joining the NNLI. To get this started, the provision of incentives (participation at no costs but time, public attention for successful projects) for pioneering companies, is required.
- A platform should be established to collect and share experiences and lessons learned on the practicalities of biodiversity compensation, from the different initiatives, both mandatory and voluntary. This platform should also steer further development of tools/Best Practices and serve as a helpdesk for those developing and implementing compensation plans.

5.3 NNLI experiences

Present biodiversity compensation practices, mainly restricted to mandatory compensation, follow strict rules, generate obligations to carry out detailed (biodiversity) studies and focus on case by case compensation. Generally, companies try to stay away from this type of approach. To stimulate a wider (voluntary) participation by businesses and to improve conservation outcomes, alternative strategies should be developed (in addition to the existing ones):

- It is advised to introduce more flexibility in the way biodiversity and nature loss are compensated in Natura2000 areas and EHS without losing the intent of the compensation obligation; allowing some degree of quality compensation for quantity loss, a like-for-unlike approach where like-for-like is not possible or effective and through intelligent combination of economy and nature in one project are some options to explore.
- It is advised to define a compensation regime that takes the viability of the protected area and the integrity of the ecosystems it comprises as fundamental values to conserve, while preventing that conservation ghettos emerge.

- It is advised to establish large compensation areas in the main characteristic ecosystems of The Netherlands to accommodate the individual compensation requirements, mandatory and voluntary.
- It is advised that commercial compensation banks are set up and recognized as helpful in meeting the compensation demand and supporting biodiversity conservation.
- An independent party should be established that oversees the compensation mechanism (mandatory and voluntary) including the methodology of identifying and measuring biodiversity loss and compensation efforts, the compensation outcome and its contribution to the larger ecosystem-based functions, reporting, and to supervise the biodiversity credit system.
- The knowledge and familiarity of the general public and companies of the importance of biodiversity (ecosystem services) to mankind and businesses is very limited, which is a barrier to explain the need and urgency for biodiversity compensation as a tool. In order to overcome current scepticism and disbeliefs, it is advised to plan and execute a vigorous communication programme to inform societal groups, private sector and the general public in the Netherlands of the importance and urgency of biodiversity conservation and need for compensating.

5.4 Suggestions for improving voluntary and mandatory biodiversity compensation

Following a review of Dutch regulations and guidance for mandatory biodiversity compensation and discussions with experts and stakeholders, a number of suggestions for improvements of the system are identified and discussed:

- Laws and regulations that include the 'compensation' principle in broad sense exist and new ones are under development but adequate guidance is scarce on "how" to identify the biodiversity footprint and define the necessary compensation. Consequently, organizations and private sector companies that see value in compensating for their biodiversity impact do not have much to build upon yet. Practical comprehensive guidance should be developed on the methodology of biodiversity impact assessment and compensation using existing knowledge (from BioCom, NNLI, BBOP) to ensure consistent approach to compensation planning and execution. This guidance should address how and to the extent that indirect effects have to be included in the assessment and compensation.
- Municipal authorities play an important role in (mandatory) biodiversity compensation. However, they often lack the required competencies and experience to deal with this complex matter for a thorough and balanced decision-making process. Also, they tend to be biased to economic development and often adopt the 'yes-unless' approach when it comes to economic activities impacting on protected areas, whereas the 'no-unless' stance should be taken. Provincial authorities should be charged with the responsibility for decisions regarding any development in protected areas including compensation, on the basis of their regional and policy plans. They have the required experts (ecologists). This would simplify the process and guarantee better conservation outcomes.

- To eliminate stacking of compensation regimes, only the strictest compensation regime should apply where compensation for biodiversity and nature loss is required.
- To eliminate different criteria and conditions for compensation, one set of compensation principles should be developed, valid for both mandatory and voluntary compensation.
- The standard Environmental Impact Assessment methodology should be adopted for identifying threats and mitigation measures and for defining residual environmental impacts, including biodiversity and applied in all situations where biodiversity compensation is considered, mandatory and voluntary.
- The Dutch Government is advised to adopt a 'no but ...' approach to the request for compensation of historical biodiversity loss; compensation should target the current direct and indirect loss of biodiversity, but parties are allowed covering (a part of) the historical loss for reasons of ethical trading, marketing or enhancing stakeholder relations.
- Best conservation outcome is preferred above like-for-like in case achieving the latter is not feasible or requires excessive costs measured against conservation priority and chances of success.
- We advise to define additionality in a practical way with clear boundaries of its interpretation, and develop practical guidance that includes integration of the like-for-like, additionality and best conservation outcome principles.

6. Epilogue

The original version of this report has been reviewed by and discussed with a number of people. In those discussions it became clear that voluntary and mandatory biodiversity compensation represent different worlds of perception:

- Mandatory compensation aims (as the last step in the mitigation hierarchy) to defend biodiversity hotspots against threatening activities by legal means and requires guarantee that no biodiversity changes occur;
- Voluntary compensation is applied (as the last step in the mitigation hierarchy) in non-hotspot areas and aims, driven by business policy to develop opportunities to eliminate the residual biodiversity foot print of a (business) activity in a flexible and efficient way and does not require detailed guarantees, but needs to be credible enough to convince stakeholders.

Both worlds are valuable and important and, also given the many similarities (methodological, issues to be solved, how to manage uncertainties, science required, stakeholder management), it is recommended to bridge the differences and to develop an 'and-and'-strategy.

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8. Attachments

1. Report Eelerwoude
2. NNL plan Den Helder
3. Summary NNLplan Chemical company
4. Summary Report BioCom
5. Report IUCN Netherlands
6. Report Mariska Weijer
7. List of communication events

The above reports are available on request.