

THE USE OF MARKET-BASED INSTRUMENTS FOR BIODIVERSITY PROTECTION - THE CASE OF HABITAT BANKING

Summary Report for
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eftec



Institute for
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In collaboration with:

STRATUS CONSULTING



Pels Rijcken
& Droogleevers
Fortuijn *advocaten*
en notarissen



Kerry ten Kate

Jo Treweek

Jon Ekstrom

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REGISTRATION NUMBER 183887

eftec
73-75 Mortimer Street
London W1W 7SQ
tel: 44(0)2075805383
fax: 44(0)2075805385
eftec@eftec.co.uk
www.eftec.co.uk

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Lead Authors: Ian Dickie (eftec), Graham Tucker (IEEP).

Project team: Ian Dickie, Ece Ozdemiroglu, Matthew Cranford (eftec); Graham Tucker (IEEP); Holger Ohlenburg, Wolfgang Wende (Technical University of Berlin); David Chapman (Stratus Consulting); Joshua Bishop (International Union for Conservation of Nature); Edward Brans, Roelof Reinders (Pels Rijcken & Droogleever Fortuijn); Jon Ekstrom; Kerry ten Kate; Jo Treweek.

Contributing researchers: Elodie Chene (International Union for Conservation of Nature); Brice Quenouille (CDC Biodiversite); Zara Phang, Chelsea Thomson (eftec); Marianne Darbi (IÖR); Colleen Donovan (Stratus Consulting).

Reviewers: Ece Ozdemiroglu (eftec), Rob Tinch (eftec).

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Executive Summary

This is the summary report of the consortium led by Economics For The Environment Consultancy Ltd (eftec) and the Institute for European Environmental Policy (IEEP) for the contract for European Commission Directorate-General Environment on “The Use of Market-based Instrument for Biodiversity Protection - the case of habitat banking” (ENV.G.1/ETU/2008/0043). A Technical Report of this work, including a list of definitions of key terms, is available at:

<http://ec.europa.eu/environment/enveco/index.htm>.

Habitat banking is “*a market where credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time*”.

Debits and credits refer to the quantity of loss and enhancement, respectively, of biodiversity. A debit is unavoidable residual¹ damage to biodiversity, and a credit is an additional action to benefit biodiversity (which may include avoiding other existing or potential damage).

Habitat banking is one method of delivering biodiversity offsets²; turning offsets into assets that can be traded, effectively creating a market system for compensation liabilities. Although this can be done voluntarily, a viable market will only be created by regulation that defines equivalence between those debits and credits, and enforces compensation obligations on those creating debits, thereby ensuring sufficient levels of demand.

The objectives of a habitat banking system should be to:

1. Make the parties responsible for activities that damage biodiversity pay for/restore the damage (i.e. internalise the cost of damage). Depending on the response to these potential additional costs, this may prevent damage to biodiversity; and
2. Provide additional biodiversity benefits by creating further investment in conservation and allow exploitation of economies of scale, whilst also guarding against risks of net loss of biodiversity.

¹ Residual damage is that which remains after application of preceding steps in the mitigation hierarchy (See Technical Report Section 4 for a discussion of appropriate use of off-site credits in this context). Residual damage is that left after mitigation in Habitats Directive and impact assessment terminology, and after primary and complementary remediation in ELD terminology.

² Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity. (BBOP (2009) BBOP Biodiversity Offset Design Handbook. BBOP, Washington D.C.)

Our comparison of habitat banking to other market based instruments suggests that it can offer a useful additional instrument to help biodiversity policy move towards a no net loss objective. The development of some form of no net loss policy will be essential for the EU to halt further biodiversity loss, which is the current target for biodiversity to be reached by 2010 and likely to be part of the future post 2010 targets. Moreover, the creation of market incentives can stimulate private investment in biodiversity conservation, and facilitate economies of scale and efficiencies in delivering biodiversity offsets. We also identify a number of other opportunities and risks associated with delivering biodiversity conservation through habitat banking.

Our analysis of these ecological and economic factors outlines an approach to habitat banking, within the EU that balances two tradeoffs:

- A free market that gives the buyers and sellers flexibility and fosters activity, versus a regulated market that mitigates the potential risks for biodiversity, buyers and sellers; and
- Intervention by the EC needed to ensure a level playing field, versus flexibility to allow compensation approaches to develop more freely in accordance with the different legal, ecological and other circumstances in different Member States.

As shown in Figure ES.1, we believe the balancing of these tradeoffs requires slightly different designs of how a habitat banking system can be implemented depending on the type of biodiversity resource and significance of damage to it. Figure ES.1 uses four categories of biodiversity. Compensation through habitat banking for damage to the most critical biodiversity (category I) is not appropriate and/or feasible. For the other three categories (II strictly protected, III Less protected and IV Widespread), three options (A - C) are identified:

- A. Providing a supply of habitat/species (credits) which may, in specific circumstances, be used to compensate for adverse impacts on Natura 2000 sites.
- B. Enabling more effective application of the mitigation hierarchy (e.g. through impact assessments and planning regulations) for impacts on other important biodiversity in Europe, in particular supporting a system of compensation for significant adverse residual effects on species populations and their habitats outside Natura 2000 sites (e.g. from substantial infrastructure projects).
- C. Providing a mechanism for offsetting cumulative impacts on biodiversity (other than that covered in options A and B, and thus likely to be less endangered) that are minor when considered in isolation, but are cumulatively a significant factor in ongoing biodiversity decline and loss in the EU and mostly not compensated for at present. This would represent a new compensation obligation for biodiversity damage, covering biodiversity impacts that do not qualify under options A and B above because a) the habitats or species are not

in an endangered state or not rare enough (i.e. widespread and common species), or b) the damage is not significant enough.

| | I. Critical | II. Strictly protected (A) | III. Less protected (B) | IV. Widespread (C) |
|-----------------------------------|-----------------------|--|---|--------------------------------|
| Legal status | EU Laws & Directives | | National policy priorities | Limited |
| Compensation driver | - n/a | Habitats & other Directives - Guidance | Weak - planning laws | None |
| | | | New mechanism required to ensure no net loss | |
| Potential market | None for debits | Small | Currently small, but potentially large | |
| Equivalence approach? | - | Detailed, case by case | | Simple checklist, possible fee |
| Equivalence like for like? | Trading up to credits | Strict | Strong | Weaker (trade up) |
| | | | | |

Figure ES.1. Outline of different aspects of a habitat banking system according to the conservation status of the biodiversity involved

Option (A) could occur under current laws, but would likely need additional guidance (e.g. on Habitats Directive Article 6(4)). For options (B) and (C) to be effective, there would need to be additional laws and/or regulations and/or guidance and/or monitoring capacity to create the obligation to compensate for unavoidable residual damage to biodiversity, and therefore an incentive to purchase credits.

An efficient system could then entail different equivalence approaches for ensuring the ‘like-for-like or better’ compensation principle is achieved for different types of biodiversity. For (A) and (B), the methods to calculate loss and gain of biodiversity would require specific analysis of the particular debit, and thus represent a ‘bespoke’ equivalency analysis. For (C), in order to reduce transaction cost, a simpler system is envisaged, involving the use of pre-determined checklists to calculate debits. These can be applied to a pre-defined list of biodiversity features, with impacts categorised according to simple designations of habitats³. These simply calculated debits from minor residual impacts could be compensated through equivalent credits purchased in

³ These tables and multipliers (for use only with the least significant impacts) would be based on earlier fieldwork that established average ecological requirements.

a habitat banking market or ‘over-the-counter’ through a public agency (which manages the supply of credits, and prevents monopoly power causing price fluctuations). Alternatively, they could be compensated through a fee in lieu of credit paid to an independent fund.

An important feature of the system is the substitution between categories (shown by the red and green arrows in the Figure ES 1). Damage to I is not dealt with in the system, so the red arrow starts with II, and shows that biodiversity in one category cannot be traded for that in lower categories (to the right). However, ‘trading up’⁴ from a lower category into those to the left (including into category I) is allowed, or even encouraged, in order to maximise nature conservation benefits, including through credits from critical biodiversity, where feasible.

The potential for habitat banking is limited at present as the demand for credit will be low due to the limited scope of current compensation requirements for damage to biodiversity in relevant supporting laws. If the current requirements are strengthened or new requirements are created in line with objectives for no net loss of biodiversity, then a viable habitat banking market could be developed in the EU. On the basis of our analysis of the benefits of habitat banking, we propose that further action to develop habitat banking as a policy tool in the EU is justified.

⁴ ‘Trading up’ refers to a process through which compensation delivers biodiversity credits of greater value (e.g. more threatened conservation status) than that damaged. This implies pre-determined categorisation of the conservation status of biodiversity resources, and allowance for this in equivalence calculations.

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Key terms and abbreviations

The term ‘habitat banking’ can refer to both species and/or habitats. In the context of this study, habitat banking is analogous to ‘conservation banking’ and ‘biodiversity banking’. Various other terms used in the literature on habitat banking are also ambiguous. The Technical Report of this study contains a glossary of key terms, but the following are clarified here at the start:

- **‘Mitigation’**: Actions taken as an integral part of a damaging project or activity to minimise the damage. The remaining residual impacts are what require compensation.
- **‘Compensation’**: Compensation is a recompense for some loss or service. As defined in this study it relates to measurable biodiversity outcomes, and not indirect actions such as awareness activities or financial payments to affected parties (although this does not exclude payments within the process, as long as the end result is a biodiversity outcome). Habitat banks and biodiversity offsets are both mechanisms for delivering compensation.
- **‘Offsetting’**: Measures taken to compensate for any residual significant adverse impacts that cannot be avoided, minimised and/or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity.
- **‘Credit’**: An expression of the quantity of environmental enhancement or avoided damage delivered as a result of compensation actions.
- **‘Debit’**: An expression of the quantity of loss suffered as a result of environmental damage.
- **‘Checklist based System’**: Assessment of debits, and sometimes credits and equivalency, based on pre-determined information about the ‘type’ of damage and biodiversity (incorporating any necessary variations).

The following abbreviations are used in this report:

| | |
|-----------------|---|
| BBOP | Business Biodiversity Offsets Program |
| BD | Biodiversity |
| CAP | Common Agricultural Policy |
| CBD | Convention on Biological Diversity |
| CO ₂ | Carbon Dioxide |
| DECC | Department of Environment & Climate Change, New South Wales, Australia |
| DSE | Department of Sustainability and Environment, Victoria, Australia |
| EEA | European Environment Agency |
| EIA | Environmental Impact Assessment |
| ELD | Environmental Liability Directive |
| ELI | Environmental Law Institute |
| ES | Ecosystem Services |
| EU | European Union |
| FCS | Favourable Conservation Status |
| HD | European Habitats Directive |
| IMR | Impact Mitigation Regulation (Germany) formed under the Federal Nature Conservation Act (the Eingriffsregelung) |
| Ha | Hectare |
| HB | Habitat Banking |
| HWBD | European Habitats and Wild Birds Directives |
| MBI | Market Based Instrument |
| NGO | Non-Governmental Organisation |
| NNL | No Net Loss |
| OECD | Organisation for Economic Cooperation and Development |
| SAC | Special Area of Conservation |
| SEA | Strategic Environmental Assessment |
| SPA | Special Protection Area |
| TDR | Tradable Development Rights |
| USD | United States Dollars |

1. Introduction

This is the summary report of the consortium led by Economics For The Environment Consultancy Ltd (eftec) and the Institute for European Environmental Policy (IEEP) for the contract for European Commission Directorate-General Environment on “*The Use of Market-based Instrument for Biodiversity Protection - the case of habitat banking*” (ENV.G.1/ETU/2008/0043).

This research project has examined the potential use of habitat banking in the EU as an economic instrument for biodiversity protection. This report summarises the findings of the research presenting:

- An introduction to the objectives of the project (Section 1);
- A summary of the pros and cons of using habitat banking as a policy instrument within the EU (Section 2);
- An outline of the basic components that potential habitat banking schemes in the EU (Section 3) can contain;
- A summary of guidelines necessary to deal with some of the practical issues and risks that arise with habitat banking (Section 4), and
- Recommendations on key principles, implementation, and market feasibility (Section 5).

In 2001 the EU Heads of State and Government undertook to halt the decline of biodiversity in the EU by 2010 and to restore habitats and natural systems. But despite this, biodiversity continues to decline and it is clear that the 2010 target will not be met^{5 6}. One of the most important causes of this decline is the impact of development projects (e.g. for housing, industry, tourism, transport, energy or water related requirements).

There is a wide range of regulatory, economic and other instruments in the EU that aim to support sustainable development whilst reducing environmental impacts to acceptable levels. Despite these, developments and other activities result in significant residual impacts on biodiversity even after appropriate avoidance, mitigation⁷ and remediation measures. It is therefore necessary to seek policy

⁵ EEA (2009) Progress towards the European 2010 biodiversity target – indicator fact sheets. Compendium to EEA Report No 4/2009, European Environment Agency, Copenhagen, Denmark.

⁶ European Commission (2009) Report from the Commission to the Council and the European Parliament. Composite Report on the Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive.

http://ec.europa.eu/environment/nature/knowledge/rep_habitats/docs/report_en.pdf

⁷ These are defined here as measures that are aimed at minimising / reducing the negative impact of a plan or project, during or after its completion. Mitigation measures are an integral part of the specifications of a plan or project.

instruments that deliver compensation for such residual impacts in order to avoid cumulative losses of biodiversity. Habitat banking is potentially an economic instrument that can be used to effectively deliver compensation for biodiversity loss.

Various approaches to organising biodiversity offsets and using habitat banking have been attempted around the world, including banking systems in the US and Australia, and offset programmes in South Africa. Experience is more limited in the EU. Apart from extensive habitat compensation pools in Germany (covering thousands of hectares), relatively few compensation actions have been undertaken (e.g. under Habitats Directive Art 6(4)), but interest in habitat banking is growing as evidenced by recent projects exploring its role (e.g. in France, the UK). These experiences are driven both by public and private interests and are reviewed in an Appendix to the Technical Report, and lessons from them have been drawn on.

2. The potential for habitat banking

As mentioned in the Introduction, habitat banking is an economic instrument that can potentially be used to effectively deliver biodiversity compensation needs. This section introduces the concept of habitat banking and its potential benefits and risks.

2.1 What is habitat banking?

Habitat banking is a biodiversity compensation mechanism that is based on the concept of biodiversity offsets which are, according to BBOP⁸: *“measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. The goal of biodiversity offsets is to achieve no net loss, or preferably a net gain, of biodiversity on the ground with respect to species composition, habitat structure and ecosystem services, including livelihood aspects”*.

This project defines habitat banking as: *“a market where credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time”*. Biodiversity credits and debits in the context of this project include both habitats and species.

Offset approaches have developed to address (ex-ante) the foreseeable impacts of projects. Credits from habitat banking can be purchased ex ante for planned projects and can also be used to compensate (ex-post) for accidental damage to biodiversity,

⁸ BBOP (2009)

for example due to pollution incidents under the Environmental Liability Directive (ELD).

Actions that create credits include the restoration or creation of habitats or measures that enhance the viability of species populations (e.g. removal of alien predators). They can also include the protection of valuable habitats that are at risk of loss or degradation (the so-called averted-risk offsets), even though the additionality that these actions may provide is a complex issue (see Section 4.2). Additionality of an action refers to the requirement that the outcomes it delivers would not have occurred without the action.

In the case of offsets, the debit and credit are quantified separately for each and every case (even though offset delivery may be undertaken in a single location to satisfy demand for more than one offset requirement). This is not the case in habitat banking: credits can be assessed once, created in different quantities and locations and stored. They need not be designed to match exactly a given debit at the time of creation. This independence of credits from debits at the creation stage is the key feature distinguishing habitat banking from offsets.

2.2 Current drivers of habitat banking in the EU

There are currently different drivers of demand to offset residual biodiversity damage. Predominantly these relate to legislation for biodiversity conservation and planning laws, in other words, legislation that requires mandatory biodiversity compensation for residual impacts. At present EU legislation is limited to protected areas (such as Natura 2000 sites under the EU Habitats Directive (HD)) and the incidents covered by the EU ELD. An analysis of the legal framework suggests such compensation measures are normally strictly regulated and must be project-specific offsets that are like-for-like and normally within or close to the project development site (more so for the HD).

At a national level, planning and environmental impact assessment procedures enable the development of compensation measures for residual impacts (e.g. that are part of the project proponents' development proposals after appropriate application of the mitigation hierarchy⁹). Currently in EU Member States, legal requirements for such measures, and their enforcement, are variable.

In addition to these, commercial considerations, such as the management of business risks and liabilities, access to investments, accreditation requirements, public

⁹ The mitigation hierarchy is a principle that actions should be taken in the following priority order - where appropriate: (i) avoidance of impacts; (ii) minimisation of impacts; (iii) rehabilitation / restoration measures taken on the ecosystems impacted; and (iv) compensation measures for significant adverse residual impacts.

relations and Corporate Social Responsibility (CSR) objectives also create incentives for 'voluntary' demand for offsets.

Currently, the potential demand for credits may be insufficient to support a market because of the:

- Strict like-for-like compensation requirements under the Habitats Directive (described below in Section 3.1);
- Limited enforcement of most national compensation laws and regulations (including the ELD);
- Varying levels of protection and enforcement (e.g. through impact assessments and planning processes) in different parts of the EU for biodiversity that is not strictly protected by EU legislation; and
- Unpredictable and fluctuating levels of voluntary activity.

However, if appropriately regulated and formalised, the market could benefit from dynamic effects: by creating more efficient compensation mechanisms, habitat banking could lead to better enforcement of compensation requirements where previously impracticalities or cost concerns were a barrier.

2.3 What are the potential benefits of habitat banking?

A range of economic benefits from habitat banking can be identified, relating to economies of scale, reduced transaction costs (both of regulation and of pairing up buyers and sellers) and the introduction of a market incentive for biodiversity conservation on private land. Analysis based on economic theory and practice (summarised in Table 2.1 below) finds that habitat banking compares favourably to other market based policy instruments for biodiversity. This favourable comparison is contingent on it being possible to design an efficient system, which balances regulatory controls of risks (see Section 2.4) with freedom for the market to operate.

The market created by habitat banking could be similar to that created by tradable permits for units of emissions. However, unlike some environmental goods (like carbon), the unit value of credit provision in habitat banking will be location specific. For biodiversity, not only the cost and price of a unit of biodiversity credit are different but the biodiversity value of that credit is also location dependent due to the heterogeneous nature of habitats and species. Thus credits in some locations are likely to be more valuable in biodiversity terms than in other locations, and hence providing the credit on the same or near the site that is damaged may not be the most effective compensation measure.

Assuming variation in the costs of restoration or conservation, across "similar/equivalent" habitats, it may be more cost-effective to allow off-site

compensation than to deny further conversion of habitat to other uses. Moreover, to the extent that compensation actions exhibit economies of scale, it may be even more cost-effective to allow banking or other forms of providing larger scale compensation rather than require case-by-case (smaller) offsets. Thus habitat banking can enable economies of scale to be realised in terms of reduced cost of generating each unit of credit.

There are also potential major ecological benefits (or ecological returns to scale) from habitat banking, relating to:

- More effective, and in some cases ex-ante (and therefore more reliable), delivery of existing biodiversity policy objectives and of compensation requirements;
- Greater impacts and increased long-term viability of large-scale measures (also potentially from pooled¹⁰ offsets);
- Reduced habitat fragmentation from strategic and selective placement of compensation measures (e.g. to link up, increase the size of, or buffer Natura 2000 sites);
- The option to trade up measures to address higher conservation priorities, and
- The opportunity to efficiently address cumulative impacts from small-scale or low impact developments for which there is no legal requirement for compensation.

While the only way to really know if a market can work is to establish it and see, there must be sufficient chance of policy success for its establishment to be a worthwhile Government and business activity. It is expected that demand for credits for restorable habitats that are subject to predictable rates of degradation and loss (e.g. inter-tidal saltmarshes from port developments and flood defence schemes), and some strictly protected species (e.g. Great Crested Newt) would generate enough demand to support a habitat banking market. Therefore, we consider habitat banking has a sufficient chance of success to be a reasonable policy instrument to pursue.

¹⁰ The collective organisation of resources to deliver compensation requirements for debits from more than one source, usually ex-post of damage. They have some features of habitat banking (like economies of scale), but not others (they do not produce a market for the supply credits).

| Table 2.1: Comparison of habitat banking to other relevant market based instruments | | | | | | | |
|---|--|---|---|---|--|--|---|
| Instrument | | | Economic Rationale | | | Environmental Effectiveness | |
| Type | Theory | Practical Issues | Burden | Gain | Efficiency | Effect | Long-term |
| Habitat banking Features | <ul style="list-style-type: none"> • Polluter pays • Can deliver fixed policy objective (e.g. no net loss), but cost (price) can fluctuate. | <ul style="list-style-type: none"> • Careful design of system essential, especially rules on equivalence, monitoring and evaluation • Over designed market may not function | <ul style="list-style-type: none"> • Private finance • Successfully implements polluter pays • Risk of non-additional actions | <ul style="list-style-type: none"> • Avoid biodiversity loss • Possibilities for Trading up¹¹ or other strategic objectives | <ul style="list-style-type: none"> • Economies of scale at several stages of compensation • Potential financial and ecological benefits • Reduced transactions costs | <ul style="list-style-type: none"> • No net loss • Potential for net gain • Incentive to conserve biodiversity • Difficult to assess for long-term credits | <ul style="list-style-type: none"> • Direct resources to conservation priorities (e.g. valuable habitat or climate change adaptation) |
| Comparison of habitat banking (HB) to other MBIs | Favourable HB has fixed objectives (NNL), but price fluctuates - appropriate to heterogeneous resource like biodiversity and thus likely more efficient for biodiversity than a tax-based solution. | Acceptable <ul style="list-style-type: none"> • Potential problems shared by HB and other instruments targeted at biodiversity | Favourable <ul style="list-style-type: none"> • No additional cost to public sector (other than regulatory costs, which can be recovered from HB providers). • Minimal deadweight loss • Competition minimises prices | Favourable <ul style="list-style-type: none"> • HB gives individuals incentive to go beyond minimum compensation requirements • Design for biodiversity policy needs possible. | Acceptable <ul style="list-style-type: none"> • HB creates market incentives at several stages of biodiversity conservation process • Detailed design and oversight may raise transactions costs. | Favourable <ul style="list-style-type: none"> • Potentially creates efficient system for delivering compensation requirements • Environmental outcome fixed at baseline (no net loss) (in theory) | Favourable <ul style="list-style-type: none"> • Mechanisms to ensure permanence can be built into system • Unclear incentives for long term monitoring |

¹¹ Process through which compensation delivers biodiversity credits of greater value (e.g. more threatened conservation status) than that damaged.

2.4 What are the potential risks of habitat banking?

There is a series of theoretical and practical risks to achieving biodiversity objectives with habitat banking that could lead to unintended economic costs and environmental consequences. Although some of these are risks that apply to any policy poorly designed and/or implemented, they still need to be addressed in the design of an effective and efficient habitat banking system. Three risks are outlined here.

The first risk is the potential for habitat banking to introduce perverse incentives, such as what has been termed as 'licence to trash'. This is the case if habitat banking leads to approval of damaging developments that would not have been permitted in the absence of compensation options. This and a number of other perverse incentives are discussed in more detail in Section 4.1.

The second risk is associated with the difficulties of ensuring additionality. Credits sold in a habitat banking system may not in fact be additional but simply displace activity, i.e. when biodiversity enhancements sold as credits would have happened anyway. The stronger and more efficient the existing biodiversity conservation practices are, the harder additional conservation actions may be to supply, as more actions are expected to happen anyway, and therefore, the more stringent rules will be needed to define additionality of credits. For example, if enhancement measures to existing Natura 2000 sites were to be counted as credits, there is a major risk that this can displace Member States' legal obligations to achieve favourable conservation status as stated in the Directive. This issue is discussed further in Section 4.2.

Additionality can also be compromised if policy actions are displaced or there is leakage of damaging activities. Mandatory conservation actions, which should be independent of damage to other biodiversity resources, do not generate additional credit and hence should not be funded through habitat banking. Leakage can occur for compensation measures that generate credit by averting risk. This can arise where the additional areas of habitat protected to generate such credit do not obviate a threat (e.g. from mineral extraction), but merely displace it to another area.

The third risk is potential resistance to offsets and banking from developers or other stakeholders. As with any new environmental policy, some stakeholders are likely to oppose the imposition of new restrictions on habitat conversion on the (disputable) grounds that this could bring increased financial and bureaucratic costs and therefore slow economic growth and reduce employment. However, as a market mechanism, habitat banking works to internalise environmental costs in a least-cost manner, and to the extent that it helps apply existing legal requirements in a lower-cost fashion (via reduced transactions costs), it is likely to attract support. Other stakeholder objections to habitat banking (voiced mainly from communities and environmental NGOs) may include concerns about a credit being is too

distant from the debit for communities to continue to realise certain benefits (e.g. recreation) from it.

The precautionary principle should be applied in the management of risks. For example, higher (than 1) compensation ratios (between debits and credits) can be used in relation to risks that credits are not additional, and credit suppliers can be required to provide a financial bond against the risk that environmental enhancements or other actions are not delivered successfully. Guidelines for managing these and other risks are discussed in Section 4 of this report, and in the Technical Report.

3. Suggested features of a habitat banking system

This Section outlines the key design features for a potential habitat banking system in the EU. It presents the overall system design in terms of the role of habitat banking within the overall biodiversity policy, different tiers of trade possible, different actors in the habitat banking market and what could be traded, where and when.

3.1 Overall system design

The overall system design is the product of the existing drivers for demand (as outlined in Section 2.2) and the benefits habitat banking could provide. This creates three different ways that credits within a habitat banking system could potentially support EU biodiversity policy objectives, particularly regarding the achievement of no net loss:

A. Providing credits to meet the requirements of the current legislation at EU level. The first relevant context is compensation for residual impacts on Natura 2000 sites. However, Article 6(4) HD specifies strong like-for-like rules that mean credits will have to be specific to the type, location and scale of debits (biodiversity damage)¹². This restriction is likely to reduce (but not eliminate) the opportunities for habitat banking, and means that equivalence must be determined through bespoke assessment of each case. Our analysis of major infrastructure development types in the EU suggests that there would be little demand from Natura 2000 compensation requirements for the types of credit that most habitat banks would provide.

HD articles concerning the conservation of important landscape features (Art 10) and strictly protected species (Art 12) imply the objective of no net loss of such features and species, but do not explicitly require compensation actions. Improved and strengthened guidance recognising a role for compensation for residual biodiversity damage in relation

¹² Under Natura 2000, compensation measures tackle significant impacts (that have to be avoided as much as possible) and are envisaged only in the absence of alternative solutions and if the project can justify imperative reasons of overriding public interest.

to these Articles could potentially stimulate substantial demand, but this would depend on individual Member State's interpretation and implementation in national laws/policies.

The ELD requirements for compensation can be viewed as less stringent than HD in terms of having a like-for-like ecological match, though care still needs to be taken to ensure habitat banking achieves no net loss. However, ELD's scope is more extensive as it defines types of off-site compensation (to compensate when remediations are not fully effective and/or for interim loss). Therefore habitat banking is more likely to be suitable for ELD (including interim losses) than HD, but ELD related credit demand may also be low and unpredictable. The Directive has so far not yielded a significant number of cases in most Member States due to the slowness of transposition and implementation. In addition, the primary objective of ELD is prevention of incidents by making the financial cost of likely damaging activities greater to those undertaking them, and hence it may lead to more prevention rather than more compensation actions.

The EIA and SEA Directives are also potentially relevant here, as they provide many of the steps required to identify debits, even though at present they do not lead to much actual compensation activity.

- B. Providing credits to offset residual damage on species populations and their habitats, which are of conservation importance, but for which compensation is not currently a legal requirement.** Here, new EU-wide regulatory drivers would be required to create demand for credits to compensate for residual impacts on biodiversity. Although such requirements exist in some Member States (e.g. through planning regulations), their strength and enforcement are currently variable. This would be further strengthened by policies that require no net loss of biodiversity. The important nature of the conservation resources affected would require bespoke calculation of equivalency between debits and credits.
- C. Providing credits to offset cumulative impacts on biodiversity that are currently not covered by any legal requirements.** Such impacts are often insignificant when considered in isolation, but when considered cumulatively are a significant factor in ongoing biodiversity declines in the EU. New legal drivers would be needed to generate demand beyond what there would be voluntarily. The credit trade for this type of damage needs to be simpler to reduce transaction costs since the individual low level impacts (e.g. housing developments on previously agricultural land or damage covered by ELD but not deemed significant) may not justify bespoke calculation of equivalency between debits and credits.

As the above discussion implies, the different mechanisms within a habitat banking system should be applied according to the conservation status of the biodiversity impacted, the scale of damage and the options for compensation (e.g. additionality and feasibility of protection and/or restoration). For example, risk aversion offsets are likely to have greater risks of not

being additional in the long-term in the EU, and need to be strongly justified and/or used as a last resort. These features are the axis of Figure 3.1 below. Compensation measures are more appropriate where they address residual impacts on biodiversity components further toward the bottom left of the diagram - when the biodiversity is more widespread/less threatened and there are more compensation options (additional protection, restoration or re-creation). Towards the top right of the diagram, biodiversity is of very high value and even irreplaceable, thus equivalency of credits cannot be ensured. This type of biodiversity is not suitable for habitat banking and strong legal instruments need to be in place to protect these resources and avoid impacts on them.

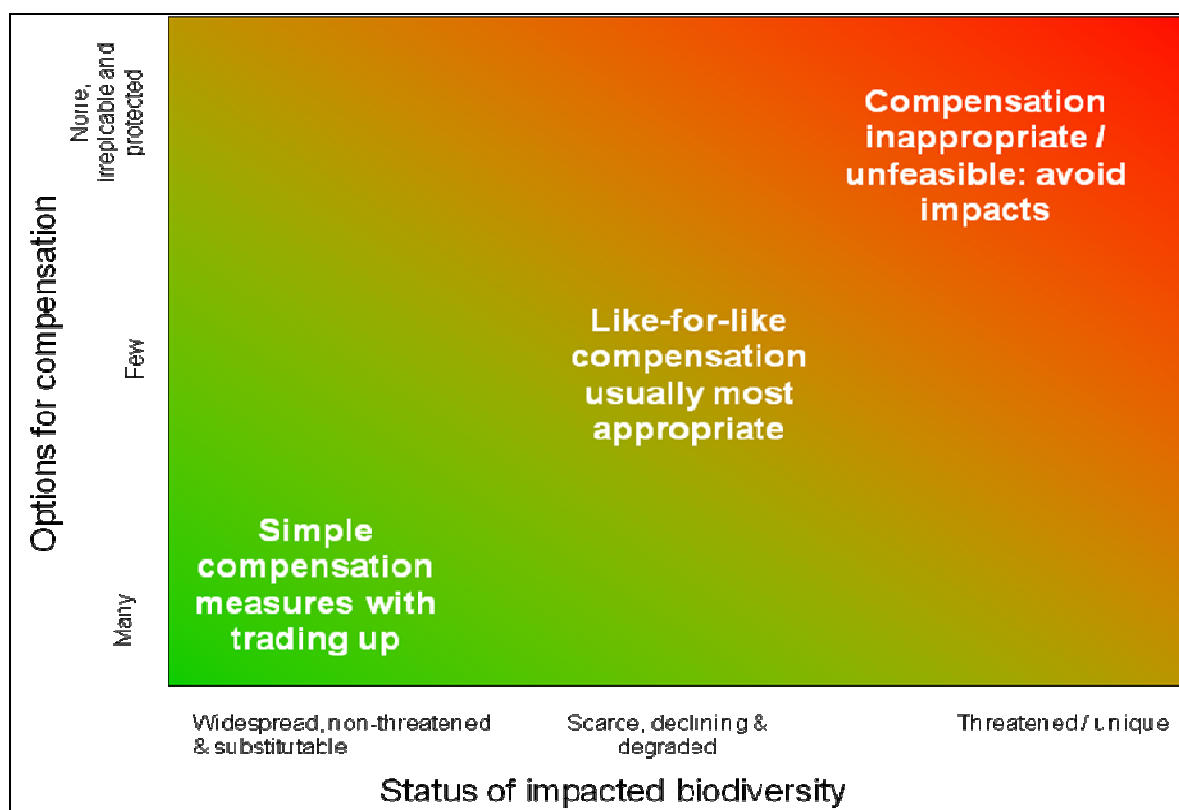


Figure 3.1: Appropriateness of compensation in relation to the type/importance of impacted biodiversity and availability of reliable compensation options¹³.

There needs to be further analysis on how to define the boundaries between the categories in Figure 3.1, involving guidance criteria and expert judgement, in terms of differentiating between different types of biodiversity. International and national conservation actions, lists of endangered species and habitats and so on will be helpful here.

Table 3.1 provides further detail on different aspects of the biodiversity - compensation options combinations presented Figure 3.1. It outlines the current compensation regime that applies to them and also indicates the possible future regimes that need to be in place for

¹³ Adapted from BBOP (2009).

habitat banking to be appropriate and to function. Finally, the table concludes with an indication of whether and what type of habitat banking would be appropriate in each case.

Thresholds between the categories in Table 3.1 need careful definition, based on existing thresholds in current laws and policies where possible and appropriate. The threshold between categories III and IV is particularly complex, and may require new thresholds to be defined to distinguish between biodiversity falling into each. For example, there are species that are widespread in the EU but rare in particular countries, so the appropriate level for categorisation would need to be decided.

Trading between categories in Table 3.1 can occur only if credits are purchased from a higher category ('trading-up' from the right of the table to the left). It is not appropriate to purchase a credit from a category that is lower than that of damaged biodiversity that is being compensated (no 'trading-down' from the left of the table to the right).

Three types of compensation mechanism emerge the above discussion summarised in Table 3.1¹⁴:

- **Bespoke offsets** (for category II in Table 3.1) - where strictly regulated compensation is required due to legal instruments but compensation options are limited. Debit needs to be calculated specific to the damage case and credit needs to be created also specifically. These offsets will be too limited in number and case-specific to predict and prepare credit for in advance. Therefore, this type of damage will be outside the scope of habitat banking.
- **Credit trading with bespoke equivalence methods** (for category III and in some cases category II in Table 3.1) - where compensation for residual damage is encouraged or required due to policy instruments (such as impact assessment and planning processes), there are appropriate reliable compensation options and credits can be estimated in advance. Debits and credits need to be assessed on a damage specific basis, using the most appropriate methods to the case (bespoke equivalence methods). There is currently some demand for trade, but this would be significantly increased by an EU No Net Loss (NNL) policy underpinned by strengthened, or where necessary new, legislation.
- **Credit trading with simple checklist-based assessment of debits** (for category IV in Table 3.1) - where compensation is currently not required but could be encouraged by an EU NNL policy and new legislation, and individual debits would be too small to justify estimating bespoke equivalence in detail, debits could be determined using a pre-defined list of biodiversity features. The purpose is to keep the transaction costs sufficiently low to ensure cumulative effects that are not compensated at the moment are compensated

¹⁴ Note that Category I in Table 3.1 is not suitable for any form of offsetting or credit trading. No negative impact should be allowed.

under a habitat banking system. Here debits could be compensated through three methods:

- i. Purchase of equivalent credits in a habitat banking system, with equivalence also assessed through pre-determined rules;
- ii. Purchase of credits over-the-counter from a public agency (which manages the supply and price of credits); or
- iii. A fee in lieu of credit system, with payments made to an independent fund, which would purchase credits from habitat banks to offset several debits at once.

Methods (i) and (ii) are carried out in Victoria, Australia. In (iii), the suggested independent fund would have sufficient credit buying power to pursue strategic conservation priorities to maximise the benefits of delivering no net loss. However, such a fund would need to be carefully designed to guard against possible risks of introducing fee-based systems, including political interference, by:

- Being legally constituted with multi-stakeholder governance (i.e. not a purely government run body);
- Having the sole purpose of using the fees to ensure no net loss (and wherever possible, net gain) of biodiversity; and
- Having an obligation to adjust damage costs according to the costs of purchasing credits, to ensure that fee-levels remain adequate to implement no net loss of biodiversity.

Bespoke offsets are outside the scope of habitat banking. The other two mechanisms estimate the credits in the same way but differ in the way debits are estimated and credits are purchased. While for credit trading, equivalency rules and methods would need to be implemented in full, in a checklist-based system pre-determined checklists and/or menu of values could be used. Section 3.3 provides further discussion on this in addressing the question of what is traded.

Many aspects of Table 3.1 need to be examined in detail, and an expanded version of the Table appears in the Technical Report. In particular the effectiveness of the system will be dependent on:

- Accurate assessment of the status of biodiversity by types and the likely impacts;
- Clear definition and enforcement of thresholds for the level of damage that is significant enough to trigger compensation requirements;
- Reliable assessment of the potential risks and benefits of compensation options generating credits; and
- Appropriate implementation of the mitigation hierarchy.

| Table 3.1 The different aspects of a habitat banking system according to the conservation status of the biodiversity involved | | | | |
|--|--|--|--|--|
| Biodiversity categories | I. Critical (irreplaceable) and protected | II. Threatened and strictly protected (e.g. HD habitats/species) | III. Scarce or declining and unprotected (e.g. in national Biodiversity Strategies and Action Plans) | IV. Widespread Widespread, stable, common, of sub-national significance |
| Current Features | | | | |
| Legal status | Under strict international protection (e.g. HD) for habitats and species features, and/or equivalent national protection | | Not legally protected, but often recognised priorities for conservation and presence taken into account in impact assessment /planning processes | Limited or none (may exist but not triggered by individual impacts because deemed insignificant) |
| Compensation driver | Not appropriate | Compensation required as last resort, strict No Net Loss (NNL) (e.g. in HD Art 6(4)) | Conservation priorities, but planning/development control processes variable, NNL not always enforced | No compensation mechanism for impacts individually deemed insignificant or their cumulative effects |
| Possible Future Features | | | | |
| Compensation driver | Not appropriate | Required as last resort, strict No Net Loss (NNL) (e.g. in HD Art 6(4)) | <i>New (or extended) mechanism</i> to ensure NNL | <i>New (or extended) mechanism</i> to deal with cumulative impacts to ensure NNL |
| Damage impact to trigger compensation | Not appropriate | Any significant residual impact on condition of the biodiversity resource, as per legislation | Any significant* residual impact on the condition of the biodiversity resource. *Thresholds to be defined | Any residual impact as goal is to achieve NNL on biodiversity, or could be triggered by EIA requirement |
| Potential for compensation | Restoration not feasible (at least in reasonable time frame) | Like-for-like compensation required and sometimes feasible through restoration in reasonable timeframes. | Like-for-like or traded up compensation often feasible through restoration in reasonable timeframes. | Compensation normally quick and straightforward, like-for-like not necessary, greater benefits may be provided by trading up |
| Potential market | None | Very small due to strict regulation of potential impacts. | Currently small, but potentially large if new instrument in place to trigger demand for credit, credit supply likely to respond. | Currently none, but potentially very large if new instrument in place to trigger demand for credit, credit supply likely to respond. |
| Conclusion | | | | |
| Appropriate compensation, type of habitat banking | Debit trading not appropriate Could give credits for trading up | Usually bespoke offsets, but credit trading appropriate and possible in some cases | Credit trading (with bespoke equivalence) | Credit trading (checklist-based debit assessment, possible fee in lieu of credit) |

3.2 How will habitat banking operate?

On the basis of the discussion above, in particular what is and is not appropriate for habitat banking in Table 3.1, Figure 3.2 places habitat banking within the overall context of compensation for residual biodiversity damage and shows that habitat banking is appropriate when there is damage that requires compensation but does not require bespoke offsets to be created, i.e. Categories III and IV in Table 3.1. Figure 3.3 demonstrates how credit trading using bespoke equivalency methods and checklist-based options outlined above would operate.

The figures introduce different actors in the habitat banking market: ‘buyers’ who seek ways to compensate the damage they cause; ‘sellers’ who create credits; and ‘third parties’ who play different roles. As a market driven by regulation, there must also be regulators who oversee the process, including the third-party roles, and ensure the system runs smoothly and is not affected by the risks outlined in Section 2.4. These actors and their roles are described in more detail in the Technical Report and summarised below.

- **Buyers**

Buyers will be those who seek ways to compensate the residual impact of their activities on biodiversity, for example developers or those liable for damage from pollution incidents. While buyers could seek compensation both because of their legal obligations or voluntarily, our analysis of the potential for habitat banking in the EU indicates that the voluntary demand will be low. Currently, outside the designated sites, legal requirements for compensation in the EU are limited to weak planning agreements, and these are not always fully enforced (and so any offsets are voluntary and driven by corporate social responsibility). This could mean that, under current conditions, demand for compensation credits are likely to be too low for a habitat banking to function extensively and hence the need for new regulation / guidance expressed in Table 3.1. So the level of demand from buyers will mainly be driven by the extent and adequacy of the enforcement of compensation laws and regulations. In the case of the checklist-based system resulting in a fee in lieu of credit, the funds would then be used to buy biodiversity credits from within the habitat banking system, making the independent body administering the fund (e.g. a Trust) a buyer.

- **Sellers**

Suppliers of compensation credits will be those with suitable land for whom creating and selling credits offers profit opportunities. Establishing a habitat banking system will potentially incentivise all types of landowners and land managers (private, corporate, NGO and possibly public sector) to supply credits. Suppliers may sell the credits themselves, or through a broker acting as an agent (for example in securing credits from multiple sources to compensate for a large or complex damage case). The supply of credits will be determined, inter alia, by the feasibility of protection or restoration of the biodiversity involved, and the opportunity cost of suitable land. It will also be influenced by the ability to demonstrate additionality of the biodiversity in the credit over an appropriate timescale, and the propensity of potential credit sellers to actually enter the market.

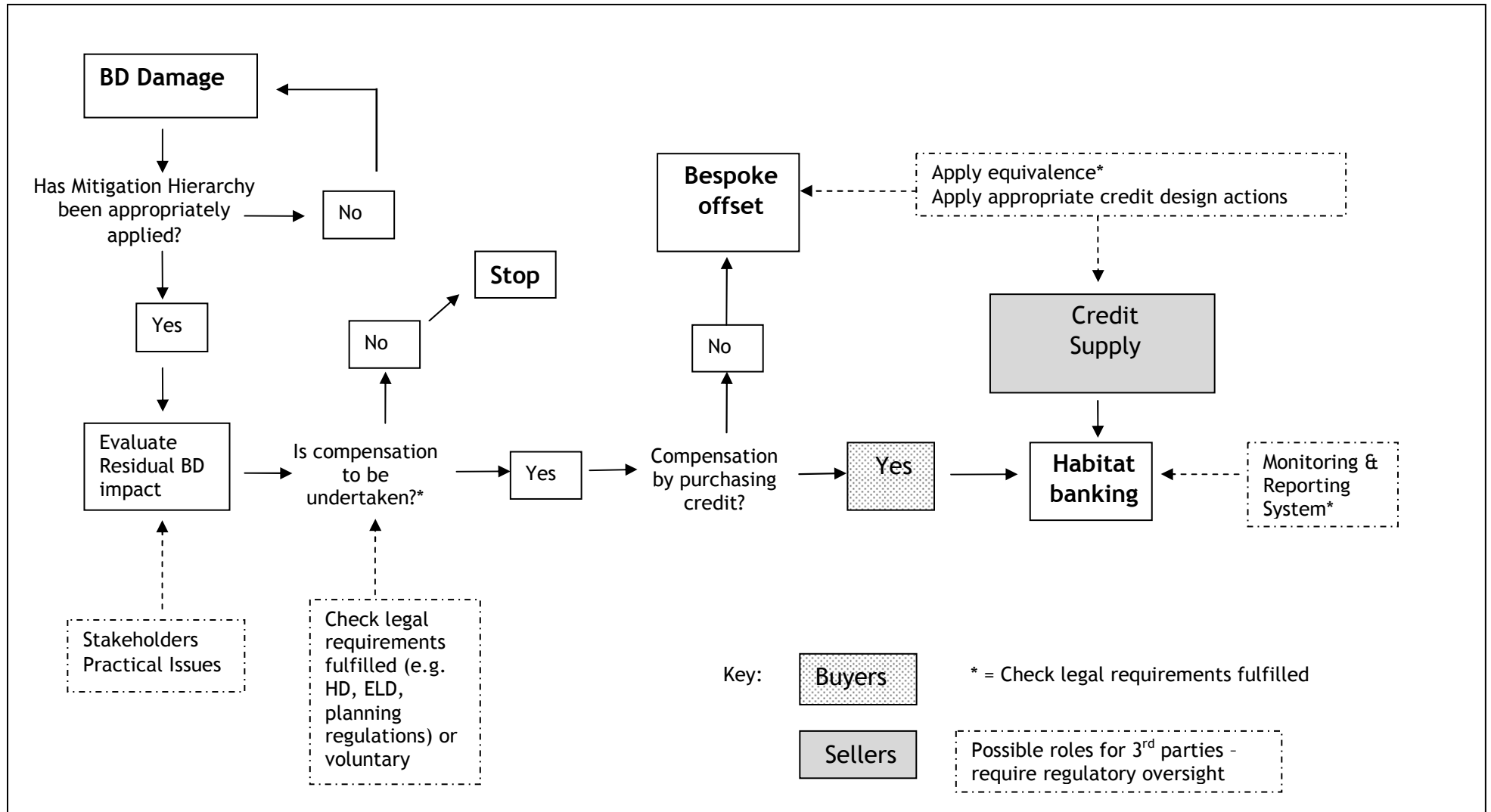


Figure 3.2: Role of Habitat Banking in Process of Compensating for Residual Biodiversity Damage

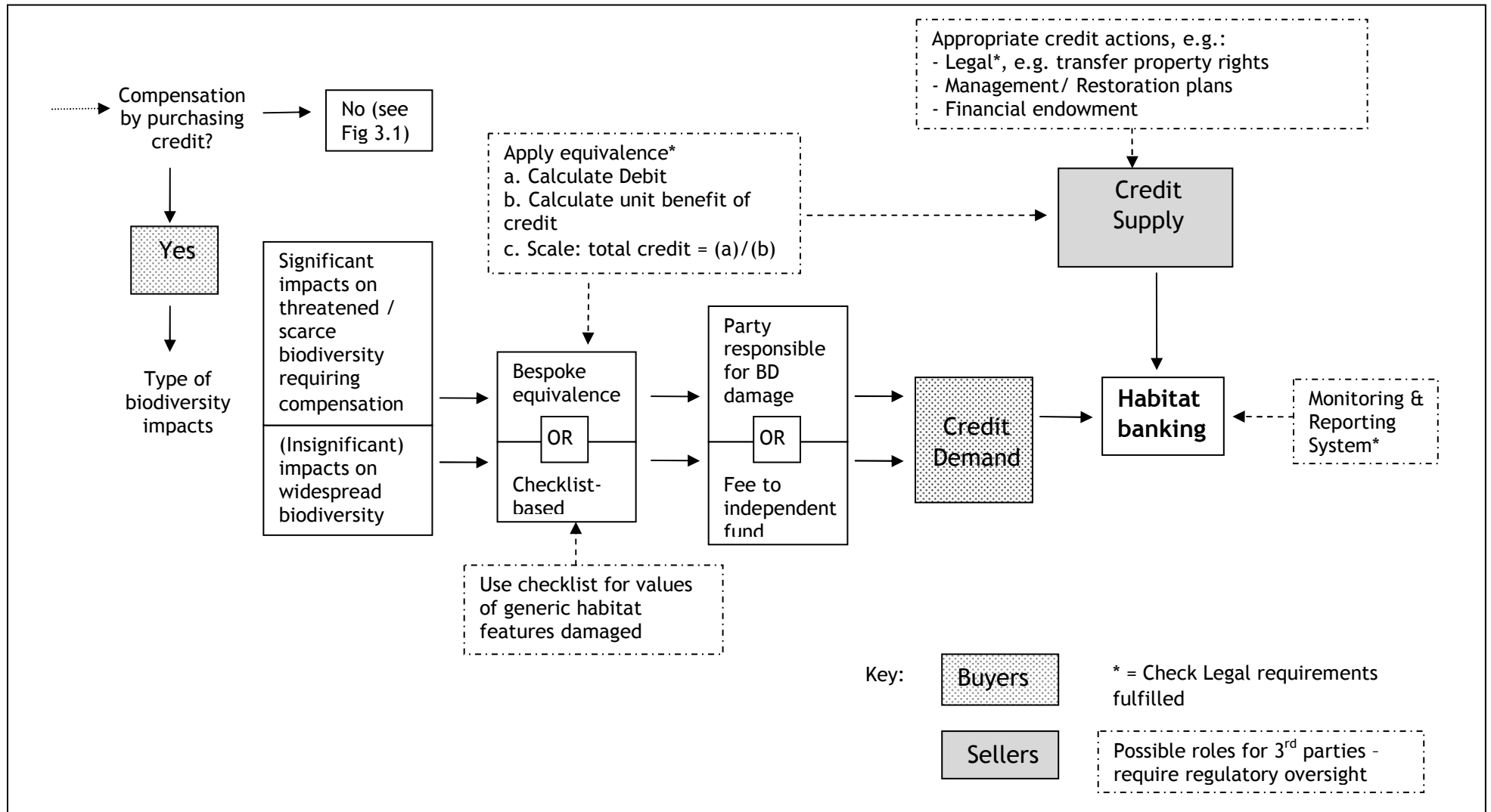


Figure 3.3: Process of Matching Debit and Credit in the Habitat Banking System

- **Regulators**

Regulators are needed to set up the legal basis for a system like habitat banking and also oversee its functioning. Regulators should be either a competent nature conservation or environmental authority (or a publicly appointed specially created body with a similar remit).

Such a body would oversee the monitoring and auditing of ecological, legal (e.g. property rights) and financial requirements. Secondly, it would establish a strategic approach to habitat banking by ensuring that:

- It is used effectively and becomes a reliable instrument to compensate for damage caused to the biodiversity protected under the current EU's nature conservation directives and other current and future laws; and
- It fits (with necessary adjustments) within the existing programming and planning processes, nature and wildlife legislation, spatial planning, agricultural, climate, energy and transport policies and institutions.

In order to achieve this, the regulators should issue guidance on how to estimate debits and credits and ensure equivalency between the two, certification of credits, and monitoring and auditing of ecological, financial, legal (e.g. property rights) and financial requirements, and protecting the public interest.

In some systems, the State also has a role in brokering deals between buyers and sellers, registering credits, and sometimes acting as a buyer. Their purchases may be either for long term land management of high biodiversity value areas, or on a rolling fund basis, securing high conservation priority land that can later be established as a credit site, with the costs covered retrospectively by developers' purchase of credits.

- **Other Stakeholders**

A range of other ("3rd party") stakeholders, who may not play mandatory roles but will still be essential to the success of habitat banking, include:

- Local communities whose agreement to proposed land use changes is a key aspect of the planning process.
- NGOs that manage land may be significant suppliers of credits. For example, when undertaking habitat creation or enhancement projects, they could sell credits to raise funds (and retain part as net biodiversity gain). The credits created will of course have to be additional to the status quo activities of the relevant NGO. Long term land management activities might also be appropriate for NGOs to undertake, as the management objectives would be aligned with their charitable objectives.
- Insurers and other financial service providers will have increasingly important roles in particular to guarantee credits over long periods of time or even

perpetuity (e.g. to manage endowment capital in terms of risks and underwriting payments).

- Brokers and traders currently specialising in other markets (e.g. carbon trading) could also be involved in habitat banking to act as 'bankers'.
- Technical experts (ecologists, lawyers, traders, economists and others) will also be involved in determining debits, credits and equivalency, and monitoring and auditing on behalf of the regulators.

The habitat banking system described in Figures 3.2 and 3.3 includes the following roles for the above parties:

1. **Debit and credit assessment and verification** - although buyers and sellers may calculate their debits and credits, at a minimum this should be independently verified, e.g. by a regulator or an independent contractor;
2. **Regulation** - oversight ensuring trades are executed to deliver legal/other requirements; and
3. **Independent audit** - giving an independent judgement on equivalence between debit and credit, and monitoring the delivery of the credit over its lifetime. This could be conducted by the same agents as (1).

Within the proposed checklist-based system, the roles described above would be simplified and/or merged in order to reduce the transaction costs of the system without compromising its quality. For example, the debit and credit assessor role would be limited to verifying that the pre-determined checklist is applied correctly rather than doing bespoke assessment of debit for each transaction.

In the case of a "fee in lieu" of credit system (which is one option for a simple checklist based system) an independent biodiversity fund (e.g. a Trust comprising biodiversity conservation NGOs, statutory biodiversity conservation bodies and other biodiversity experts), would then be responsible for dispersing the accrued funds. The rationale for this being that such a body would ensure funds are used to deliver clear biodiversity outcomes and would be best able to judge how to use the collected funds for the highest conservation benefit (e.g. the type and location of credits that should be purchased).

There may be a need for professional qualifications and skills for agents performing some roles within a habitat banking system (e.g. such as those responsible for monitoring and auditing). These qualifications could potentially be organised through professional bodies and may support employment.

Finally, the public regulator should ensure transparency of any habitat banking system. Full documentation of all aspects of debit and credit calculation and trades should be placed on the internet to allow public access and scrutiny of trading, the execution of roles outlined above, and decisions taken by the regulator.

3.3 What will be traded in a habitat banking system?

Most biodiversity offset systems, and habitat conservation goals, relate to both the size of land and its ecological condition (i.e. quality). Therefore it is logical that credits and debits in a banking system are also calculated on the basis of habitat area and quality, with additional considerations handled through adjustment factors (e.g. to allow for presence and/or abundance of different species). Habitat banks that are for specific species can use the carrying capacity of a habitat (e.g. number of breeding pairs that a site can support) for the species as the basis of credits.

The type and quantity of credit that can be used to compensate a given debit are determined by equivalence requirements. Equivalency methods are used to ensure that the compensation for damage is adequate, i.e. the credit is equivalent to the debit. Experience to date (see Technical report Section 7) shows that equivalence methods are a key determinant of the appropriate balance, between a functioning market and delivering biodiversity objectives (i.e. between oversimplification and overregulation in a habitat banking system). Key factors in establishing this balance in the EU will include: equivalency related issues such as the type of resource or service being compensated, locations and minimum sizes of areas used to provide credits, legislative requirements for compensation, bio-geographical boundaries of the banking system or systems, the biodiversity management systems already in place and also transactions costs of addressing these issues.

Different equivalency methods are available, which are covered in depth by the REMEDE Toolkit¹⁵. The Toolkit, which is based on the experience with these methods in the US and similar methods in the EU, is applicable to both HD and ELD contexts, and presents a conceptually simple framework for ensuring equivalency between the debit and credit:

- a) Add up all the losses (debits) caused by the damage;
- b) Determine the amount of benefit expected per unit of credit; and
- c) Divide (a) by (b) to get the total units of credits needed.

The Technical Report (Section 4) of this project outlines a suggested method to equivalence in the context of habitat banking. In practical application, the choice of equivalence methods can be complex. It is dependent on a mixture of technical and practical considerations (e.g. baseline condition, and abundance at credit sites of the biodiversity that has been damaged).

The checklist based system requires a simpler implementation of the equivalency principles. It could involve a menu of values for damage to generic biodiversity

¹⁵ Resource Equivalency Methods for Assessing Environmental Damage in the EU www.envliability.eu

features, from which debits can be calculated. Determining the content of such checklists would require detailed field work in advance. There is precedence in using such generic estimates, for example within the systems for agri-environment schemes, which in some cases, are administered based on generic costs of maintaining or restoring valuable features in the landscape (e.g. hedgerows, streams, mature native trees).

3.4 When and for how long will the credits be needed?

Credits will be needed to compensate only for residual damage. Residual damage is that left after mitigation in Habitat Directive and impact assessment terminology, and after the primary and complementary remediation in ELD terminology. For other policy instruments, the definition of residual damage, and the 'appropriate' application of the mitigation hierarchy, may need further guidance to ensure consistency. In practical terms, potential buyers should consider whether they would need credits as early as possible: for example, when they are starting their planning application for a development, when a damage causing incident occurs or an imminent threat is identified.

In terms of the provision of credit over time, as long as it delivers biodiversity policy objectives (i.e. presumably of no net loss), the system should be flexible in order to:

- Operate both *ex ante* (e.g. for HD), and *ex-post* (e.g. for ELD interim losses) of damage occurring;
- Apply discounting (where appropriate) to adjust for impacts over and between different time periods and interim losses; and
- Allow flexibility of timing of some credit sales (e.g. for compensation measures with a high certainty of success), for example through allowing the sale of a portion of credits at regular stages of implementation actions (securitisation). This would reduce the time lag in receiving revenues from, and therefore increase the profitability of, investments in credits.

Discounting¹⁶ can be used to adjust the value of flows of goods and services in different years. In other words, discounting is used to calculate equivalence over time. This implies that the number of credits may not be the same as the number of debits in absolute units (e.g. ha), but the value of the two is equated when the different timing and duration of debits and credits are taken into account. Under the ELD, if a debit occurs for a limited period (until the baseline conditions are recovered) and an equivalent credit (in terms of hectares) is delivered over a longer time period (e.g. in

¹⁶ Discounting refers to the procedure of assigning a lower weight (the discount factor) to a unit value that occurs in the future than to that unit now. The further into the future the value occurs, the lower is the weight attached to it.

perpetuity), taking discounting into account, the number of credit hectares can be less than the number of debit hectares.

A more technical issue is what discount rate to use when evaluating habitat debits and credits over time. An extensive literature discusses the theory of discounting in relation to environmental assets and what the discount rate should be (e.g. as applied in The Stern Review¹⁷ and TEEB). Guidance should be provided by the regulators as to what discount rate should be used in equivalency analysis.

A further timing issue is the period over which debits occur and credits must be guaranteed. Some damages requiring compensation may be temporary (e.g. under ELD), and so credits may only be required over a limited time period. On the other hand, biodiversity policy objectives, including Habitats Directive requirements, are not time-limited. Therefore, credits will be required in perpetuity to compensate for permanent damage. Perpetuity is extremely difficult to guarantee, but credits can be secured within the current land-use systems by firstly establishing appropriate property rights over the land in question, and secondly allocating sufficient resources to manage the biodiversity. The latter can be delivered through an endowment, a capital asset which provides revenues that are sufficient to fund the management of the credit in perpetuity (or a time-limited period if appropriate).

3.5 Where will debits and credits be located?

The geographical scope of the habitat banking system will be defined in relation to criteria on:

- Ecology - appropriate geographic scale to deliver compensation, e.g. within a coherent bio-geographical unit. For example, it might be appropriate to trade inter-tidal saltmarsh within the southern North Sea (e.g. between the Netherlands and Eastern England), and wetland habitats within major river basins (e.g. Lower Danube);
- Socio-economic - recognising the needs and location of specific groups impacted by the biodiversity damage (such as cultural ties to particular habitats or species) in which case compensation should benefit the same human population that suffered the damage, there may be other social goals (e.g. regeneration through improved natural environments). This will need to be worked out on a case by case basis, depending on the biodiversity benefits being considered in the credit (for example, the ELD requires services to human populations to be considered, but HD does not); and

¹⁷ Stern (2006), *Stern Review on the Economics of Climate Change*, Cambridge University Press. European Commission (2008) *The Economics of Ecosystems and Biodiversity (TEEB)*, An Interim Report.

- Governance - systems being in place to monitor and manage the banking (credit and debit) activities across the area defined. For trading to take place across political boundaries, this will require coherence of monitoring and management practices (e.g. mutual acceptance of data), and cooperative governance arrangements, between different jurisdictions.

Sometimes combining these criteria could lead to more than one type of credit or compensation. For example, as well as an ecologically chosen credit, additional actions at a different location may be needed to compensate affected human populations.

Governance restrictions do not imply that credits and debits must be within the same Member State. However, if the bio-geographical area within which trades can occur (or 'Service Area', see Technical Report Section 9.2) crosses political boundaries, the authorities for the different political areas will need to work within a framework that ensures effective governance so that biodiversity objectives are delivered. The need for such a framework justifies a possible role for a habitat banking system that is supported by European Community level legislation or guidance (e.g. to define minimum standards and criteria for acceptable approaches). Consistency is required at EU level so that:

- Habitat banking is in line with the EU environmental legislation it will support (Wild Birds and Habitats and Environmental Liability Directives);
- Potential suppliers and buyers of credits benefit from the certainty and transparency of an EU wide policy; and
- Habitat banking, which internalises a major environmental externality and changes the incentives faced by different economic activities, does not distort the single European market and reaches its full potential for economic efficiency and environmental effectiveness.

As stated above, this consistency will enable trades across political boundaries. These might only occur in exceptional circumstances (e.g. where compensation for a particular damage cannot be delivered within a Member State's boundaries). Alternatively it might facilitate the development of an EU wide system that coherently implements habitat banking across Member States, allowing for systematic EU wide trading of credits. However, the development of such a system is dependent on it meeting necessary ecological and social credit location criteria (as above).

4. Guidelines on Key Issues

The main principles of habitat banking system design (not specific to the EU) are outlined in Section 9 of the Technical Report. That section covers issues of:

- Legal authorities;
- Site characteristics;
- Credit releases;
- Evaluating equivalence;
- Financial assurances;
- Technical operations;
- Engaging stakeholders; and
- Evaluating success.

This rest of this Section reviews a number of guidelines in relation to implementing habitat banking in the EU, in particular to address the risks associated with habitat banking that are outlined in Section 2. The guidelines are subject to the necessary policy developments, in particular new legal requirements to stimulate sufficient demand for credits to make habitat banking a viable system. The formulation of such laws would influence the final form of habitat banking.

4.1 Avoiding perverse incentives

Section 2.4 above and the Technical Report identify a number of perverse incentives. These are a key area to manage in the design of a habitat banking system.

- **License to Trash**

This refers to the outcome that by making compensation measures easier and cheaper, habitat banking could lead to some developments, or greater residual damage, being allowed that would otherwise be refused permission. In fact, habitat banking is not a tool to permit a development, and should not be allowed to influence the decision-making behind permitting developments. Habitat banking comes into the equation only after the need for compensation is determined and banking is proposed to meet that need more effectively and efficiently.

The success of habitat banking is dependent on an effective system to ensure that the current rules to decide whether developments should go ahead do not change because of habitat banking. Ultimately, society must determine what constitutes an acceptable trade-off between avoiding and mitigating impacts on-site, versus off-site compensation through offsets or habitat banking. To avoid the 'license to trash', regulators must effectively apply and enforce the mitigation hierarchy, with careful

consideration of the appropriateness of avoidance, mitigation and compensation measures. “Appropriate” should entail consideration of whether avoidance and mitigation measures are more beneficial to biodiversity conservation (taking into account their cost-effectiveness, risks and reliability) than compensation measures.

- **Crowding Out of Biodiversity Gain**

Habitat banking could lead to the most suitable sites for habitat creation and biodiversity gain to be consumed to provide credits that compensate for damage. This would deliver no net loss but remove the opportunity to use the same areas for net gain. Thus, demand for biodiversity credits could ‘crowd out’ net biodiversity enhancement opportunities, raising the costs of delivery of policy targets for net gains of threatened habitats. While under individual offsets there may be additional opportunities for net gain at lower marginal cost, habitat banking creates an incentive to sell such opportunities as credits for other debits, rather than use them for net gain. Possible solutions to this problem are that:

- i. A public agency intervenes in the market, setting the rules to ensure some net gain (e.g. through higher compensation ratios, see Section 4.3), or
- ii. Credits are purchased and ‘retired’ (without matching them to a debit) by a public agency (or by an NGO with public funds).

- **Accommodating Variable Biodiversity Baselines**

The assessment of both credits and debits is relative to the baseline condition of the biodiversity impacted. There are variable baselines of biodiversity status within different parts of the EU. Reflecting these in a habitat banking system could provide an incentive not to improve, or to allow degradation of, biodiversity. Over time, this may give an incentive to policy makers to weaken/lower biodiversity protection and funding, so that more actions qualify as additional under banking and are removed from State remits. It could also penalise Member States which undertake stronger biodiversity conservation measures, in that States with weaker measures have easier (and cheaper) offsetting opportunities. This could impact on Member States’ management of Natura 2000 sites (e.g. with respect to the state of the Natura network). Again, this can be guarded against by effective enforcement of existing regulations. This incentive is greater if ‘averted risk’ credits (see Section 4.2 for a definition) are allowed within the habitat banking system.

- **Landowner Views**

Habitat banking deals may be seen as unfair by owners of land that already has high biodiversity value since maintaining such value would not be seen as additional and not qualify for credit. They could therefore have an incentive to allow their land to deteriorate, or may make demands for higher payments in return for the biodiversity they currently conserve. The problem is a greater risk if the implicit value placed on biodiversity through the cost of meeting compensation requirements is not reflected in

the design of policies that aim to preserve biodiversity. This could put new pressures on existing nature conservation policy incentive mechanisms (e.g. by requiring higher payments for agri- or forestry- environment schemes). The seriousness of this risk, and solutions to it, are not well understood at present.

Furthermore, landowners may regard designation of land used for credits for nature conservation purposes as a risk, as it may put permanent restrictions on land use. This is only a minor problem if credits have been sold in perpetuity (it restricts future options for developing the land and purchasing appropriate compensation credits), but is more significant if credits are time-limited. This risk may be hard to mitigate as conservation status may be an obligation for the relevant agency to designate (i.e. not something they can exercise judgment on). Therefore, particular rules may be needed to clarify whether credit sites that are designated are subject to the same management regimes, in particular any support payments, as designated sites that were not created as credits.

- **Damage In Advance of Baseline Definition**

Implementing the stronger compensation laws/requirements that are necessary to support sufficient demand for a habitat banking system to operate in the EU brings a specific risk. During the period between the announcement of the laws and their implementation, landowners will have an incentive to undertake damaging activities to avoid compensation obligations. The damage would then be part of the baseline conditions, against which debits and credits are judged. This can be avoided by retrospective application (but this is complex and not necessarily workable), or application from the date of the announcement of a proposed law, if implemented.

- **Threshold Effects**

Under a range of different systems for compensation, determining which system applies will be defined by thresholds of impact. For impacts close to these thresholds, there is likely to be an incentive for those responsible for damage to attempt to qualify for the lower category of damage by fraudulent means, and therefore face less stringent compensation requirements. This can be managed, to a certain extent, by clear definition of thresholds, and by publication of relevant information on all cases, allowing public scrutiny and clearly establishing relevant precedents.

Each of these perverse incentives would need to be borne in mind if design of habitat banking is developed further. In addition, they highlight a potential hidden cost of increased regulatory resources in related areas in order to ensure efficient operation of the system and avoid perverse incentives.

4.2 Additionality of credits and displacement of impacts

A fundamental requirement for all compensation measures is that they must provide additional benefits, i.e. credits cannot be based on biodiversity outcomes that would have occurred anyway. Thus offsets and habitat banking should not be used as a mechanism for delivering conservation outcomes that are already required under legislation such as the Habitats or Birds Directives. For example, Member States have obligations under the Habitats and Birds Directives to manage habitats within Natura 2000 sites (and, where necessary, elsewhere) according to the ecological needs of the habitats and species of Community interest - in order to maintain or restore them to Favourable Conservation Status (FCS). This means that the additionality of credits from compensation measures, such as habitat restoration or enhancement actions, in protected areas is particularly difficult to prove.

Protected areas (even locally protected areas) that are subject to legislation or a management agreement etc. that requires certain conservation standards to be met can only provide additional credits from actions that go beyond these standards. Thus credits can only be created within Natura 2000 sites if they are actions that go beyond the required management under the Directives (e.g. measures going beyond FCS). This is the case even though it is recognised that in practice, conservation targets for Natura 2000 sites are not being met. In other words, while enhancements might be additional compared to the current situation, they would not be additional compared to existing legislative obligations on the management of Natura 2000 sites. Their use as habitat banking credits risks undermining the pursuit of these obligations, and therefore is not recommended. A similar additionality concern arises with compensation measures outside protected areas in relation to biodiversity policies (e.g. habitat restoration under Biodiversity Action Plans).

The most significant additionality problem in the EU outside existing protected areas relates to risk aversion compensation measures. Averted risk relates to the removal of a threat to biodiversity for which there is reasonable and credible evidence (e.g. by entering into agreements such as contracts or covenants in which property rights allowing the conversion of habitat in the future are forgone in return for payment or other benefits). The theory is that such protection reduces the overall loss or degradation of habitats. However, such benefits can only be realised where there are significant areas of remaining habitat that are:

- Worth maintaining in their current condition (even if only for future restoration);
- Unprotected; and
- Subject to significant and predictable levels of loss or degradation.

Therefore, in practice the inclusion of habitat protection measures such as risk aversion offsets is constrained for a number of reasons. Firstly, in Europe, a large

proportion of habitats that are worth protecting are likely to be already protected (if only at national or local scales) or receiving some form of payment for environmental services (e.g. agri-environment funding). Secondly, although many habitats are clearly subject to ongoing losses and degradation, future trends are very difficult to predict and therefore the biodiversity compensation gains that protection will provide are very difficult to reliably predict. Thirdly, protection of one specific area of habitat may simply lead to the displacement of the threat to another area, resulting in no impact on the overall rate of loss (often referred to as leakage).

As a result of these constraints, offsets and habitat banks that rely on risk aversion alone (e.g. without additional restoration benefits) are likely to be inappropriate in many situations in the EU, unless very high credit to debit ratios are used in the schemes (see Section 4.3 below). The onus should be on the seller to provide evidence of the additionality of their credits and displacement risks, which must then be considered carefully by the regulator. Adjustment ratios could then be agreed accordingly, as discussed below.

4.3 Use of Adjustment Ratios

Adjustment ratios are used in habitat banking to alter the size of a credit, relative to a debit by a certain factor (ratio). Some reasons for using adjustment ratios are part of the basic consideration of equivalence, such as:

- Differences in the ecological value and condition of impacted habitats / species populations and credit sites (e.g. to facilitate trading up), and
- The role of impacted biodiversity in terms of ecosystem services and/or services of socioeconomic value to local human communities or society as a whole.

Ratios may also be applied to factor in other considerations to the habitat banking process, such as:

- Uncertainty in measurement of biodiversity debits and credits;
- Uncertainty of the long term success of compensation;
- Advance crediting: uncertainty of and time lags in future delivery (for ex-ante sales of credits);
- Account for risks of non-additionality, especially for averted risk credits (if they are allowed, see Section 4.2 above);
- Achieve targets for net gain of biodiversity, and
- Role of habitat in landscape in terms of ecological processes.

As these lists show, the use of adjustment ratios is suggested in many areas of offset design literature. They may help deliver equivalence between differing resources (e.g. in trading up) and therefore increase possible transactions in the market. However, using a ratio adds complexity and transactions costs. Moreover, using ratios repeatedly to make adjustments for different factors within a habitat banking system could be confusing. Therefore, they need to be considered collectively as a design feature.

4.4 Ecosystem Services

Ecosystem services (ES) are services provided by the natural environment that benefit people¹⁸. The protection and enhancement of these services are a key anthropocentric reason for undertaking conservation policies, and can be included in habitat banking systems through consideration of ES in the units of credit and debit used. In fact, there are examples of how ecosystem services are already the subject of separate market instruments in Europe (e.g. carbon, through the EU ETS, and water catchment protection rights that are the subject of payments in some Member States).

However, how other ES can be included in biodiversity credits and debits need careful consideration as this could have both positive and negative aspects. Positively, including ES should mean that damages can be more fully assessed and compensated, covering the valuable links between biodiversity and ES. It would also better link to the ELD, which requires compensation for the loss of ES. On the other hand, if there are conflicts between biodiversity objectives and ES provision for anthropocentric uses (e.g. recreation), including ES could transfer resources away from the former to the latter. Such risks can be managed, for example by prohibiting substitution between services¹⁹.

We suggest that consideration of ES should not dilute the core purpose of habitat banking - to deliver no net loss of biodiversity. However, a habitat banking system should be able to include ES where desired, and should also be able to work in parallel to existing markets, allowing simultaneous selling of credits for different ecosystem services, but not different components of biodiversity, from a single unit of land. These multiple ES credits should be registered at the same time as the biodiversity credits in different markets if possible (as doing so separately and retrospectively reduces additionality), and the management measures required for one type of credit must not conflict with generation of another type of credit (in particular biodiversity).

¹⁸ Millennium Ecosystem Assessment (2005) Ecosystems and human well-being: Biodiversity synthesis. World Resources Institute, Washington, D.C.

¹⁹ ES included in credits might be limited to those related to ecological functions of the biodiversity resource impacted, meaning that swapping one service for another, e.g. water purification services for recreational space, would not be allowed.

4.5 Strategic Goals

From a biodiversity perspective, it is desirable to allocate offset effort where landscape-scale or strategic benefits for conservation will be optimised. Coordinating compensation measures with land use planning at a strategic level, where biodiversity conservation is one of a number of key considerations, and availability of land is limited, can help to reduce fragmentation, conserve priority areas and ensure offsets satisfy minimum viable area requirements.

The following strategic goals, which could create conflicts, are relevant here:

- Climate change adaptation, like locating habitat away from areas vulnerable to sea level rise, or to accommodate predicted range shifts in species and habitats;
- Strategic nature conservation objectives, like delivering larger habitat blocks or conservation of priority habitats and species;
- Provision of ecosystem services (assuming these are outside the habitat banking system, see Section 4.4 above), like protection of watersheds or accessibility of natural green space;
- Social goals, such as creating accessible natural environments close to certain communities to aid regeneration, and
- Planning and economic development objectives, such as avoiding areas with certain planned land uses, in order to accommodate agglomeration of sectors reliant on other land uses.

Habitat banking creates an overall system that allows for consolidation of compensation (rather than compensation undertaken on a case by case basis) which means there is capacity to design the approach to compensation to contribute to a number of these strategic goals.

For habitat banking to support strategic goals, it is necessary to have enabling legislative and planning frameworks in place (e.g. established conservation plans with clear priorities supported by reliable information) and also reputable or certified organisations willing and able to supply the necessary conservation services in a co-ordinated and competent fashion. In the absence of clear strategic biodiversity plans, a beneficial strategic outcome may nevertheless be achieved provided that 'like for like' rules and suitable receiving areas are clearly defined.

5. Recommendations

On the basis of the summary presented here and further details in the Technical Report, we recommend that the EU could develop habitat banking as an additional biodiversity policy tool according the following key principles, implementation issues and market potential.

5.1 Principles and Implementation

Within an overall policy to incentivise compensation for residual biodiversity damage, we recommend that:

Key principles:

1. An EU biodiversity policy should be developed that aims to ensure no-net-loss or net positive impact on biodiversity to underpin the delivery of the 2010 (and assumed similar subsequent) target of halting the loss of biodiversity. As part of this, impact assessment and planning processes (e.g. EIA and SEA) should be strengthened to consistently require, at a minimum, no net loss through a biodiversity compensation system.
2. The biodiversity compensation system should be more comprehensive than a habitat banking system alone and should accommodate different approaches to achieving no net loss in different circumstances (e.g. both ELD and HWBD).
3. The objective of the compensation system should (in line with biodiversity policy) be firstly to encourage appropriate actions that firstly avoid, then reduce the level of biodiversity damage, by internalising the external costs of damage within development projects and other activities (depending on the legal status of the biodiversity and the cause of damage); and secondly to facilitate full compensation for the residual biodiversity damage that remains, in order to deliver no net loss (and wherever possible, net gain) of biodiversity. (Note: this would be a change from the status quo, which sanctions residual loss.)
4. Where compensation/offsets are required or encouraged (for instance, under the HWBD, the ELD or national impact assessment and spatial planning processes), the policy should aim to establish habitat banking as an efficient means to deliver biodiversity damage compensation. Habitat banking should be developed in a way that will allow market activity to choose the best type of compensation mechanism, whilst encouraging schemes that provide the greatest strategic biodiversity benefits (e.g. trading up or facilitating climate change adaptation).
5. Habitat banking should be designed to ensure sufficient volume of credit trading and long term delivery of credits. It should be developed hand in hand with appropriate regulations and the establishment of adequate administrative capacities in regulatory authorities. These measures are necessary to ensure impacts are properly assessed (e.g. under SEA and EIA), that compensation

measures are properly located, financed, implemented, monitored and managed in perpetuity, and to avoid potential perverse incentives.

Implementation recommendations:

6. Habitat banking should use two approaches to implement the requirement for equivalence depending on the importance of habitat and scale and severity of the impact with regards to biodiversity:
 - A. **Bespoke equivalence** where an individual project or incident will result in significant residual impacts (e.g. on strictly protected biodiversity where compensation is legally required, or where it is currently encouraged or required due to policy instruments such as impact assessment and planning processes). Residual damage (debit) and required compensation (credit) will be assessed using approved methodologies. Further guidance will be needed for these methodologies, but in general, this approach is distinguished from B in that cases that justify bespoke equivalence will require more technical effort, data and time.
 - B. **Checklist-based system** to lower transaction costs where an individual project or incident may not itself result in significant residual impacts, but, taken cumulatively with others, is likely to contribute to significant losses of unprotected biodiversity. The damage (debit) in these cases will be assessed by using pre-prepared list of damage estimates based on biodiversity categories, designation of habitats and scale of impact. Further work will be necessary to create such a checklist of damage values. The buyer who will look up the required debit amount for their case from such a checklist could either i) buy the equivalent credit in a habitat banking market (with the agreement of the relevant authorities), ii) over-the-counter purchase of credits (from a public agency, which manages the supply and price of credits), or iii) pay a fee to an independent fund which purchase equivalent credits on behalf of all those paying into the fund. Such a fund (e.g. a Trust) could reduce the transaction costs for individual buyers and through bulk purchasing of credits ensure strategic objectives are met. However, such a Trust needs to be designed so that it is free from political interference and it has a duty to ensure no net loss (and wherever possible, net gain) of biodiversity.
7. Habitat banking should entail a necessary role for a public regulatory body which has oversight of the system, is independent of the main sources of demand for credits (e.g. the land-use planning system), and regulates the roles of the parties involved in trading.

8. The overall policy should include rules and guidance²⁰ to support existing standards of biodiversity conservation in line with existing laws (especially the HD, ELD) and policy goals, in particular:
- Authorities should ensure that the mitigation hierarchy has been properly applied before approving compensation measures. The hierarchy states that the actions (avoid, minimise, restore, offset) should be followed in order where “appropriate”. Within a system where habitat banking provides compensation options, “appropriate” should entail consideration of whether avoidance and mitigation measures are always more beneficial to biodiversity than compensation measures. The aim should be to compare the conservation benefits of the various potential mitigation and compensation measures (taking into account their cost-effectiveness, risks and reliability) to identify the combination that provides the greatest net conservation benefits.
 - The reliability of credit-provision activities needs to be taken into account in accordance with the precautionary principle. Thus compensation options with higher risks of failing to deliver no net loss should be avoided for habitats and species of high conservation importance with measures focussing on avoidance actions (assuming they are most likely to be reliable).
 - Regulators should give a high priority to scrutinising compensation proposals with respect to their likely long-term additionality and the risks of leakage. Particular care needs to be given to proposed compensation measures that are within existing protected areas, or aim to provide credits by risk aversion measures. In accordance with the precautionary principle, equivalency should take note of the risks of credit failures.
 - Care should also be taken with the approval of compensation measures that are not based on reliable and established biodiversity management techniques, or take a long-time to provide biodiversity benefits. Where they are providing compensation for Natura 2000 features or other habitats and species of very high conservation value, credits should not be released from such compensation measures until they are sufficiently well established to provide reasonable certainty of their long-term success. However, this requirement will restrict market liquidity, so in relation to biodiversity outside Natura 2000 sites, more flexibility may be appropriate. This may be provided by allowing sale of credits at earlier stages in the credit-creation process (such as when management plans and ring-fenced

²⁰ www.env-liability.eu

[www.http://bbop.forest-trends.org/index.php](http://bbop.forest-trends.org/index.php)

Taking account of existing rules such as the REMEDE toolkit²⁰ and the Principles on Biodiversity Offsets developed by the Biodiversity and Business Offsets Programme - BBOP (2009).

funding are in place), and could be aided by some kind of protection against failure of the credit (e.g. a bond).

9. Some initial capacity-building measures may be needed to ensure that regulators and traders have similar expectations of habitat banking and are able to undertake the functions required to deliver their roles. Existing experience (particularly in Germany) and pilot schemes (such as those in France) can assist with this process and with establishing the roles and processes involved in habitat banking.

Further research questions:

10. In order to halt biodiversity loss, what alterations to legislation, or new regulations/legislation, would be needed to create additional triggers for compensation for damage to biodiversity? (e.g. options to cover additional projects and activities not covered by EIA, or planning/programming processes that do not fall under SEA).
11. Analysis of sources of environmental damage, in particular private sector projects passing through the planning system, in order to estimate amounts of damage occurring to biodiversity with different levels of protection, in order to more accurately estimate likely demand for credits?
12. Is sufficient biodiversity data available across the EU to support the suggested categorisation of biodiversity in Table 3.1 and calculation of equivalence (we believe there is for most habitats and species that are likely to be affected by habitat banking)? Data needs are complex, for example to define the baseline status, in different Member States or biogeographical trading areas, of widespread biodiversity not covered by EU Directives.
13. How will transaction costs vary with specific options for designing habitat banking. We propose a checklist-based system to lower transaction costs for individually insignificant impacts (see B above), but as policy options are developed in more detail, transactions costs should be researched further.
14. Ecological research to establish metrics within a checklist-based system, if this is taken forward, for calculating debits, and for determining equivalent credits or a fee in lieu of credit.

5.2 Potential Habitat Banking Market in the EU

While there is some evidence of interest in habitat banking through voluntary actions, the potential for habitat banking is limited at present. This is because the volume of demand for credits will be low due to the limited scope of current compensation requirements for damage to biodiversity in relevant supporting laws. If the current requirements are strengthened or new requirements are created in line with objectives for no net loss of biodiversity, then a viable habitat banking market could be developed in the EU.

The effectiveness of habitat banking as a policy tool will depend, inter alia, on:

- The extent of new policy mechanisms implementing the no net loss of biodiversity objective by requiring compensation for damage, and therefore stimulating demand for credits;
- Effective enforcement of these mechanisms, guarding against risks (such as license to trash); and
- Independent regulation of the system, that ensures at least equivalent compensation for damage, and encourages trading up and strategic considerations in order to maximise biodiversity benefits.

None of these conditions are effectively established within the EU. However, capacity to undertake/implement them is present, and so each could be developed relatively easily, possibly within 2-5 years. With these conditions in place, it would be feasible to use habitat banking as a policy tool in addition to existing biodiversity policy instruments in the EU. However, they would need to be instigated by appropriate policy decisions, which would be negotiated and agreed between Member States and the Commission. Therefore, the development of a habitat banking system in the EU would likely take at least 10 years.

Habitat banking requires a framework that ensures effective governance so that biodiversity objectives are delivered. European Community level laws or guidance could provide such a framework and ensure consistency with related legislation, across the single market, and across political boundaries. This may facilitate the development of an EU wide scheme that coherently implements habitat banking across Member States.