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GRUPE

Caisse
des Dépôts

EDITO

As our dear departed friend Jacques Weber used to say, “the best biodiversity offset is one that is not needed”, and obviously, it is better to avoid destroying something than having to repair it. But because human activities frequently have an impact, ecological compensation – defined as the outcome of a mitigation hierarchy (avoid, minimize, offset) and based on ecological rather than financial equivalence – is gradually becoming the norm.

Both the international community and the European Union have committed to slowing down biodiversity erosion by 2020 via the Aichi Targets and European Union strategy, respectively, and biodiversity offsets have been identified as one means of reducing biodiversity loss.

It is in this context that the United States, Germany, France, Spain and other countries are gradually developing biodiversity offset schemes although the big nature protection organisations (IUCN, France Nature Environnement, WWF, etc.) are sometimes a little more circumspect in their approach.

But we need to be aware of two limits to biodiversity offsets. First, in a finite world it is impossible to continue offsetting the increasing dent that we are putting in natural spaces unless we are prepared to reclaim spaces from within cities and infrastructure. Second, ecosystems with all their complexity, infinite variety and interlinked relationships, can never be reconstituted exactly as they were.

So is this an excuse for doing nothing? The accepted approach is based on a method and an objective that can never be applied perfectly but which sets out the conditions for sustainable infrastructure development. The

method involves complying with the mitigation hierarchy – “avoid, minimize, offset” –, i.e., avoiding destruction insofar as possible, and in our view, avoiding all irremediable destruction; minimizing impacts insofar as possible; and offsetting the residual impacts. The overriding objective is no net loss of biodiversity and this means adopting ecological equivalence and compensating for the impact (in all senses of the term). An impossible aim, but one which nevertheless determines a desired outcome consisting at the very least in reproducing the surfaces, species and functionalities destroyed by the infrastructure project being offset.

Biodiversity and striking a balance between economic development and the preservation of the ecosystems on which we depend is an absolute priority and this is precisely why Caisse des Dépôts, in concertation with central government, launched Mission Biodiversité in 2006 (renamed Mission Economie de la Biodiversité [MEB] in 2012) to begin the process of focusing on these issues and coming up with solutions. CDC Biodiversité, France’s first biodiversity offset operator, was duly set up in 2008 and Caisse des Dépôts reaffirmed its commitment by signing up to France’s National Biodiversity Strategy and the Natural Capital Declaration at Rio+20 in 2011 and 2012, respectively. It is all part of CDC Group’s “Ecological and energy transition” priority which is also bound up with partnering national and local development. In the same vein, CDC is deploying a biodiversity strategy in 2014 that makes compliance with the mitigation hierarchy (avoid- minimize- offset) one of its guiding principles and obligatory for any project that impinges on natural spaces.



Edition No. 3 of BIODIV’2050 seeks to contribute knowledge about ecological compensation and partake in the debates currently taking place internationally, in Europe (1979 Birds directive and 1982 Habitats directive) and in France (Grenelle Laws I and II, the Ministry of Ecology’s guidelines on the mitigation hierarchy and the Biodiversity draft legislation currently in preparation).

The debate currently focuses on four issues and possible variants in the approaches of the different actors: ecological equivalence; the risks and opportunities of biodiversity offsets; assessing biodiversity offsets, especially the timeline involved which is becoming increasingly decisive; and issues related to governance and legislation.

BIODIV’2050 No. 3 is structured around these four issues both in their French and their international dimensions and, as ever, the link between economics and biodiversity – which structures the approach of MEB and makes it a pioneer in its field – is paramount.

LAURENT PIERMONT
Director of
Mission Economie de la Biodiversité

A handwritten signature in black ink, appearing to read 'Laurent Piermont', written in a cursive style.

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BIODIV'2050 PRESENTS CURRENT DEVELOPMENTS AND REPORTS ON THE PROGRESS BEING MADE BY MISSION ÉCONOMIE DE LA BIODIVERSITÉ (MEB). THE OPINION SECTION ALLOWS CERTAIN KEY PLAYERS TO GIVE THEIR VIEWPOINTS ON CERTAIN SUBJECTS. THE VIEWS EXPRESSED ARE THEIRS AND THEIRS ALONE.



OPINION

BIODIVERSITY OFFSETS: RISKS, OPPORTUNITIES AND THE CONTRIBUTION OF ECOLOGICAL ENGINEERING.

The views of two scientists.



Harold Levrel, researcher at IFREMER (French Research Institute for Exploitation of the Sea), Environmental Economist at UMR AMURE (IFREMER – University of Western Brittany), tells us about his ideas for biodiversity offsets. His research focuses on society-nature interaction indicators, ecosystem service assessment, biodiversity offsets and recreational uses of biodiversity.

Speaking as an environmental economist, how do you view biodiversity offsets and the related research issues?

There are currently two pitfalls in relation to biodiversity offsets. The first involves treating offsets as the technical solution that will strike a balance between the challenges of development and the preservation of biodiversity. This is a “naive” view of the mechanism because in most countries, the effectiveness of biodiversity offsets is actually the subject of much debate and obviously offsets do not resolve the underlying conflicts between our development model and the preservation of biodiversity. The second pitfall is to consider offsetting as a license to trash the environment and this view needs to be opposed in principle.

As an economist who deals with the preservation of biodiversity, I see offsetting as a worthwhile tool from a conceptual standpoint as it forces people to consider the environment in its own right rather than merely in terms of its potential benefits for mankind. However, the economic approach to offsetting environmental

damage is still too often seen in terms of the consequences of such damage for individual interests. It frequently results in the payment of compensation to people who have suffered damage. Take oil spills that have occurred in France for example. The compensation paid out to fishermen, tourism professionals and local authorities has always been based on lost earnings converted into monetary payments, but nothing is done to compensate for the impacts to the ecosystem itself. Seeking compensation based on the restoration of ecosystems – for accidental or authorised environmental damage – would represent progress when compared to most current practices.

The manner in which biodiversity offset schemes are implemented in most countries raises many questions. While offsetting policies have existed for the past 40 years, applications have taken longer and regulatory mechanisms backed up by human or technical resources are only a recent phenomenon – particularly in the United States where the governance system for offsets has been considerably reinforced since 2008, and in France where the Government decree of 2011 provides

a legal basis for improving the biodiversity offset mechanism. A stronger regulatory framework leads to a stricter approach to biodiversity offsets that should lead to more effective implementation. At the same time, we note a marked increase in research in restoration ecology which should give a much better understanding of what is feasible – or impossible – in the whole area of biodiversity offsets. This is why I think it would be a shame to criticise offsets in principle just when we are improving their implementation and widening the scope of the debate.

As a means to halting biodiversity erosion, what do you consider to be the limits and advantages of biodiversity offsets, particularly in terms of effectiveness and efficiency?

Just like any other tool, biodiversity offsetting may be effective or ineffective in achieving its goal of protecting biodiversity.

The main drawback of offsetting is the lack of rigour in application of the principle and in its stated aims. For example, ecological equivalence between endangered species, ecosystem services or ecosystem functionalities does not have the same meaning or involve the same constraints in terms of feasibility. Moreover, not everything may be offset. If the impact on a natural ecosystem is not possible given what restoration ecology teaches us, we simply cannot accept the damage in question. But such considerations are not taken into account today which discredits the whole notion of biodiversity offsetting. On the other hand, in the case of habitat impacts for which we are able to propose restoration initiatives at another site, offsetting makes perfect sense.

Offsetting, commodification and privatisation of nature

Although biodiversity offsetting is sometimes seen as a means of commodifying nature, we should stress that it is the ecosystem's restoration and rehabilitation that is being bought and sold and not the ecosystem itself. **Harold Levrel tells us what he thinks of mitigation and conservation banking systems in the United States.**

"The biodiversity banking market is very different from the carbon trading market and it is really a hybrid form combining certain commercial characteristics (supply and demand, prices, trades) and other regulatory features such as limiting the size of markets to specific watershed areas or the obligation to set up a fund to safeguard the site's long-term management. The

fact that governments (rightly!) suspect biodiversity bank bosses of wanting above all to turn a profit from the restoration initiatives they undertake has resulted in very strict regulations. This has reduced the areas of uncertainty in the system and boosted interaction between the regulator and the heads of biodiversity banks, thus attenuating opportunistic behaviour. However, the system of standard individual permits is quite market-oriented and relatively unregulated, leaving the door open for opportunistic-type strategies.

Furthermore, we cannot talk of the privatisation of living matter where biodiversity banks are concerned for a number of reasons. First, the land subjected to both the impacts and the

biodiversity offsets is usually private land. Second, setting up a biodiversity banking arrangement usually involves the creation of an environmental easement on the land which takes away the vast majority of the operating rights associated with the plot on a permanent basis. In a nutshell, we put part of the private rights associated with ownership back into the public domain and the status of most plots subject to offsets switches from "private goods" to "club goods" or even "public goods", and not the other way around."

As regards the effectiveness and efficiency of compensatory measures, I believe that the biodiversity banking scheme is the "least bad system" – least bad because it is difficult to talk about a good system when this system owes its very existence to destruction taking place elsewhere. Indeed, the biodiversity banking scheme does help concentrate responsibility for the ecological restoration that underpins the offset scheme among fewer people and this facilitates government oversight. Furthermore, biodiversity banks make it possible to carry out large-scale ecological restoration projects which are recognised as being much more efficient than small or isolated projects. This can be done at a lower cost to society as a whole due to the economies of scale linked to the ecological restoration and the lower costs involved in monitoring and controlling the programmes as well as any sanctions incurred - this is

why we should highlight the efficiency and effectiveness of biodiversity banks. And yet in France, biodiversity banking is frequently perceived as a system that exacerbates a problem rather than resolving it. Its opponents talk of the commodification of biodiversity or the privatisation of living matter. I feel that such arguments point to a "theoretical" conception of the biodiversity offset market rather than any observable reality in the field (see insert).

The question of the mechanism is of secondary importance insofar as it is the system of regulation with all of its organisational advantages that actually makes the mechanism more efficient.

So, as a means to slowing down biodiversity erosion, we need to consider different levels of requirements and heavier sanctions. From an institutional perspective, the challenge consists of

bringing together ecologists, economists, jurists and decision-makers to work on an integrated management strategy and diagnostic review of compensation in specific regions.

How do you think that ecological compensation can help to factor biodiversity issues into decision-making more effectively?

The economist focuses mainly on what compensatory measures encourage stakeholders to do. Do they provide an excuse for continuing to destroy biodiversity by enabling businesses to not have to "prevent" or "reduce" their impacts? Or, do these measures create genuine constraints within development projects and – indirectly through their related cost – provide an incentive to prevent and reduce biodiversity impacts?

But before we focus on the incentive

→ aspect, we need to resituate the principle of ecological compensation within our economic system. One of the main reasons the principle is currently so popular is precisely because it allows us to avoid rethinking our system of production and consumption, so governments need to ask the right questions in the right order. First off, is it possible to offer incentives to adopt development strategies that maximise impact prevention and reduction? Second, how can we advance procedures to offset residual biodiversity impacts in an effective manner? At the present time, development strategies – or approaches to urban development and the accompanying infrastructure to be more precise – are based around the consumption of huge amounts of space and rapid artificialisation of land. This is due primarily to the increasing demand for standalone housing which is obviously in contradiction with the need for urban densification to avoid uncontrolled urban sprawl.

From a corporate perspective, as it is companies who are driving land

artificialisation, if the cost of the offset is very low in terms of the benefits generated by the development project, offsetting will not provide much of an incentive. But the more onerous the ecological restoration, the higher the offset cost and the greater the incentive for the company to prevent and reduce their biodiversity impacts. Ideally, protecting biodiversity and restoring ecosystems would become very advantageous for the private sector (via payments for ecosystem services (PES), offsets using biodiversity banking or tax breaks). Take an example from Florida. In the middle of the real estate crisis, we met a property developer who had chosen to allocate one-third of his plot (800 hectares) for ecological restoration as part of a biodiversity banking arrangement even though it was in an urban development zone. This example shows that if ecological restoration is more advantageous than urban development, the private sector will automatically invest in biodiversity and that such arrangements could become key economic drivers for protecting biodiversity. ■



KEY CONCEPTS

“The mitigation hierarchy”

An approach that requires project owners to design measures to prevent, reduce, or at the very least offset their negative impacts on natural habitats. It may be applied to any type of plan, programme or project seeking administrative authorisation.

“Biodiversity offsets”

Implementation of a series of initiatives – known as compensatory measures – to preserve natural habitats that offset damage caused by a project that could neither be avoided nor minimized.

“Ecological equivalence”

Equivalence between the ecological loss caused by the development project, and the gains generated by the biodiversity offsets. There are various different ways of calculating equivalence.

“No Net Loss”

The stipulation that biodiversity offsets should generate a biodiversity gain that is at least equal to losses arising from the project in question. This is often a controversial concept due to the limits to ecological restoration and should primarily be seen as an objective. If gains are greater than losses, we talk about a net gain.

“Ecological engineering”

Habitat management and devising sustainable, adaptive and multi-functional development projects inspired by, or based on ecological system governance.

Clive Jones, researcher at Cary Institute of Ecosystem Studies (Millbrook, USA) is recognised as a pioneer in ecosystems engineering and ecological engineering. He tells us about the relationship between ecological engineering and ecological compensation. His work focuses on the concept of organisms that help to engineer the ecosystem.



How do you define ecological engineering?

At the present time, most economic systems treat the goods and services provided by nature as externalities. We do not generally pay to benefit from them or administer them (with the exception of natural parks or a really important commodity such as water) because we have externalised them from our economic systems even though we are highly dependent on them. This would not matter if we didn't destroy the environment, but man's impact has simply become too great and we need to manage this impact. An economic approach would suggest that we incorporate non-market goods and services (derived from nature) into an economic framework to make them compatible with the existing system. Ecological compensation is therefore an attempt to reintegrate these goods and services into mainstream economics.

For example, if you drain a wetland to build housing, an ecological compensation approach would require that you restore, replace or recreate a comparable wetland to compensate for the loss of the initial wetland. To put it in economic terms, you need to put some sort of a value on the functioning of the wetland that may serve as the economic basis for determining the amount of compensation required from the developer, or to be paid to whoever restores or creates a new wetland.

Ecological engineering is used to implement compensatory measures. Given the uncertainty concerning ecological knowledge, to what extent do you believe that ecological engineering can make it possible to restore natural habitats?

Because of their complexity, it is very difficult to gain a really comprehensive understanding of ecosystems. Although ecosystem trajectories can be partly predicted from ecological principles, they remain relatively unpredictable. We cannot treat an ecosystem like a machine where you simply change the different parts to get it working again. An ecosystem has a multitude of interacting components influenced by external phenomena and its capacity to adapt, which means that it is in a state of perpetual evolution. Ecological engineering is therefore of limited use for forecasting purposes and this is where economics and ecology clash: economics is a constant quest for certainty.

It is by no means impossible to understand ecosystems and thanks to advances in ecological knowledge, we can hazard a fairly good estimate of future trajectories and intervene to change these. But I believe that restorative action does not always work, and even when it does work, it does not always work out as expected. This is not a problem with the ecosystem but with our understanding of it. In the example of the restoration of a wetland, some of the functions you see will appear and persist over time. While we can predict the creation of a habitat and water purification, we cannot predict how much or for how long.

How do the limits of ecological engineering apply to ecological compensation?

One of the fundamental problems is that when you attach a monetary value to something, this implies a certain degree of

certainty. Economic transactions imply a certain known value for certain functions. This is a bit of an illusion because in reality, economic systems exhibit the same blend of principles, stochastic dynamics and historical inertia. They are also complex, interdependent systems. When you implement a biodiversity offset, you cannot predict exactly what will happen from an ecological perspective. This problem is bound up with the inherent unpredictability of ecological systems faced with the illusory belief in economic predictability.

But neither can we keep ecosystems as they are because even in their natural state they are in a state of flux and we have a huge influence on them. In other words, we can't simply erect barriers to preserve nature and hope that nothing will change, and neither can we turn the clock back. Nature is not a market commodity but incorporating it into the current market-based system may be one way of ensuring that it is taken into consideration and I believe that this is what accounts for the emergence of the principle of ecological compensation. Somebody should pay if they destroy nature and we should pay somebody for trying to restore it. In a rapidly changing world, I don't think that we have yet grasped how to deal with this most effectively.

I therefore believe that we need to shift the conceptions that we have both of society and economics. We need to change mindsets, get away from assumptions of certainty and predictability and embrace the uncertainty that ecology now recognises as inherent to ecosystems.

Read the complete interview on our website



UNDERSTANDING

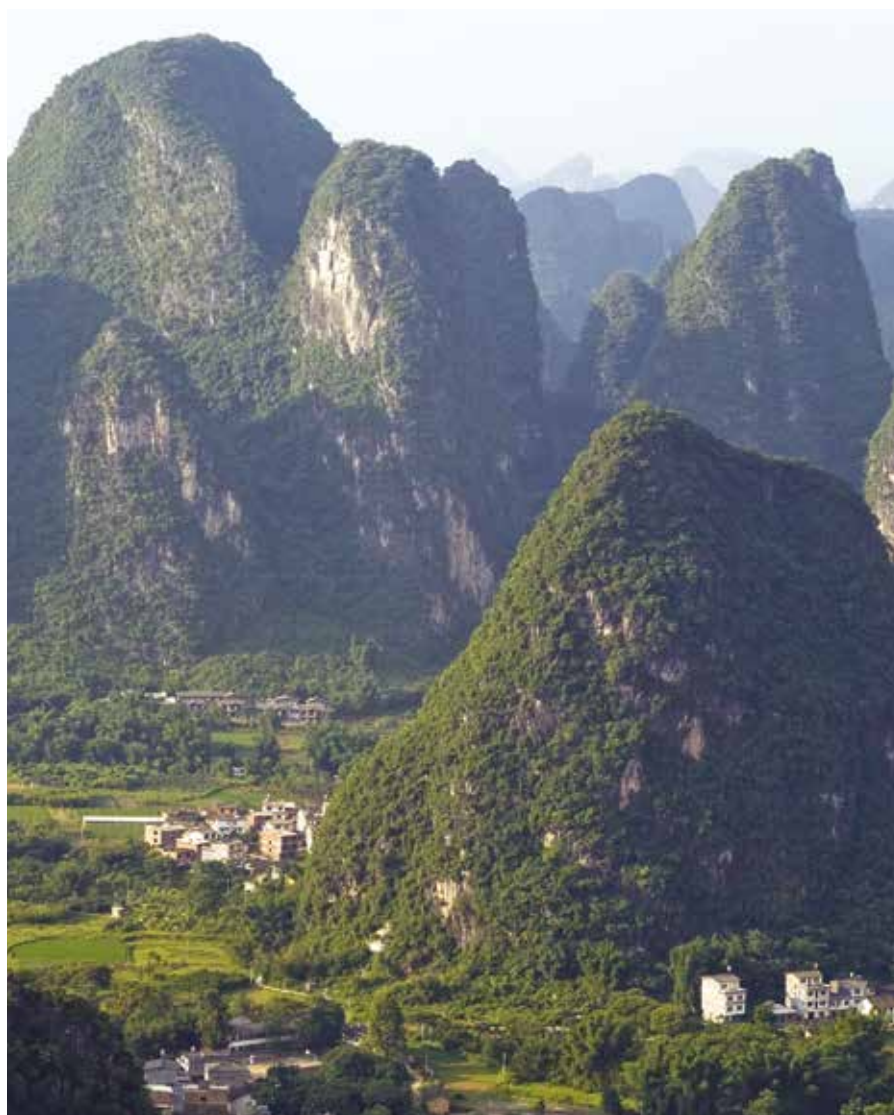
OVERVIEW OF ECOLOGICAL COMPENSATION THROUGHOUT THE WORLD: DIVERSITY OF THE MECHANISM AND ITS IMPLEMENTATION

In 2010, 18 years after the Convention on Biological Diversity (CBD), the 193 Parties adopted a Strategic Plan for Biodiversity that includes the Aichi Targets for 2011-2020. To finance this plan, a lot of countries would like to force the main biodiversity loss drivers to contribute, i.e., industrial activities and development projects – especially urban and agricultural ones – that have such an impact on natural spaces. Ecological compensation has been identified as one of the key ways of checking biodiversity loss between now and 2020. Ecological compensation is an extension of the polluter pays principle and was first tried in the United States and Germany in 1976 before being taken up by other countries over the last 20 years in various guises and in accordance with local regulations. If we consider all forms of these measures, ecological compensation is implemented over 70 different countries.

The importance of the prevention and reduction phases

The vast majority of countries in which ecological compensation is enshrined in legislation (see the map on page 10) require compliance with the mitigation hierarchy, i.e., Avoid – Minimize – Offset. Compensation therefore only comes after efforts to avoid and minimize the impacts of development projects on natural habitats. This order is of capital importance in many countries such as France, Germany or Switzerland. In France, the notion was already included in the 1976 Law on the protection of nature and, more recently, the guidelines of the French Ministry for Ecology, Sustainable Development and Energy focusing on the mitigation hierarchy published in May 2012¹

1 - <http://www.developpement-durable.gouv.fr/IMG/pdf/doctrineERC-vpost-COPIL6mars2012vdef-2.pdf>



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stressed the importance of avoidance and minimisation before any offsetting of impacts is considered. In all planning procedures, the project owner must set out the prevention and reduction measures envisaged to minimize the impact on natural areas. Some countries even restrict habitats that may be impacted, making avoidance obligatory in such cases (1, 2). For example, in Germany, a project is systematically rejected if it destroys a unique habitat or if its impacts

are irreversible and in Switzerland, any biotopes over 200 years old may not be interfered with. In South Africa and New South Wales in Australia, zones of key biodiversity importance must be avoided although exceptions may be made.

On the other hand, less importance is accorded to the mitigation hierarchy in developing countries such as Brazil (1) or India (3).

Different forms of compensation

At the present time, 28 countries have developed a regulatory system of ecological compensation and 31 countries are in the process of doing so (see map on page 10), but there is huge variation in the various different processes set up.

Regulation-based or voluntary compensation?

→ In a number of countries, compensation is mandatory under existing regulations. Regulation-based compensation first emerged in the United States in 1976 before being taken up by Canada, Australia, Germany, France and Switzerland (4). In the European Union, the 1979 Birds directive and 1982 Habitats directive make offsetting of residual biodiversity impacts obligatory at Natura 2000 sites, and an increasing number of developing countries are devising compensation-based policies (5), particularly in Latin America and Asia. However, certain countries that have promulgated compensation legislation frequently fail to apply it due to insufficient funding or expertise (e.g., Vietnam²).

→ On the other hand, we sometimes observe forms of **voluntary compensation** in certain countries with no related legislation. There may be many different reasons for this including:

- ▶ wider acceptance of a project both by the administrative authorities (thence speeding up the relevant authorisations and permits), as well as by the local population and NGOs;

- ▶ anticipation of future regulatory requirements;
- ▶ it enhances the image of the project developer by highlighting pro-biodiversity initiatives;
- ▶ or, as a means of gaining funding for development projects.

More and more financial backers, including banks, investors and international donors are therefore insisting upon ecological compensation as a pre-condition for funding (4).

To date, 79 financial institutions from 35 countries have adopted the Equator Principles³, based on the performance criteria devised by the International Finance Corporation (IFC), a subsidiary of the World Bank. Performance criteria No. 6 (PS6) concerns biodiversity and is based on BBOP guidelines (see Initiative on page 18). Companies that wish to raise funds for their development projects must comply with these principles which culminate in voluntary initiatives in countries where ecological compensation is not a regulatory requirement.

Voluntary compensation strategies are very common in developing countries (4): in Africa (e.g., South Africa, Madagascar, Namibia), Latin America (e.g., Mexico, Colombia, Venezuela) and Asia (e.g., India, Mongolia, Russia).

There are also a number of examples from developed countries such as the Netherlands and Sweden (1). In practice, the bulk of voluntary compensatory measures are to be found in the mining and hydrocarbons sector (4) where financial returns are very high.

3 - The Equator Principles are the environmental guidelines of the International Finance Corporation.

Demand-side, supply-side or financial compensation?

Compensatory measures at present usually take one of the following three forms (6):

→ **Demand-side compensation:** ecological compensation is implemented on a case-by-case basis, either directly by the project owner or by a specialist third party. The project owner generally assumes financial and legal responsibility for ecological compensation. Compensatory measures are implemented “in nature”, i.e., in the form of initiatives to restore, rehabilitate, create or preserve habitats. This is the most common form of ecological compensation, particularly for voluntary initiatives (6).

→ **Supply-side compensation:** the developer is sometimes able to purchase conservation “credits” from a specialist provider (in the public or private sector) to meet its offset obligations. These credits are usually generated beforehand by habitat restoration and rehabilitation measures taken and the number of credits necessary for offsetting the impact of a project is set by the administrative authorities based on the same principles of equivalence as for demand-side compensation.

The cost of the credits reflects the cost of implementing the offsets in nature and this system generally transfers legal and financial responsibility from the project owner to the offset operator. Supply-side compensation is currently being implemented in six countries (United States, Canada, Australia, Germany, Malaysia, and Saipan in the Northern Marianna Islands) and experiments are in

Terminology

“Ecological compensation” or “biodiversity offsets” are not universally accepted terms. Certain countries and regions such as Switzerland, the State of Alberta in Canada or South Africa prefer “replacement” or “remediation” (1, 7). Paraguay refers to “payments for environmental services” (stemming from the “beneficiary pays” principle) for funding related to a compensation system (stemming from the polluter pays principle). Indeed, in China, the term “eco-compensation” links these two concepts under a polluter and beneficiary pays principle (1).

2 - Source: Forest Trends, March 2014.

UNDERSTANDING OVERVIEW OF ECOLOGICAL COMPENSATION THROUGHOUT THE WORLD: DIVERSITY OF THE MECHANISM AND ITS IMPLEMENTATION

→ progress in four more (France, Netherlands, United Kingdom, and most recently Spain⁴) (1, 7).

The mechanism varies considerably from one country to another. For example, in France, it is impossible to transfer legal and financial responsibility from the project owner to the third-party and the State is closely involved in setting up and overseeing pilot schemes. In the United States where the system has been used since the 1990s, an offset market has emerged and the country has more than a thousand Wetland Mitigation Banks and a hundred Conservation Banks (7). In Germany, there are numerous compensation pools but they remain modest in size with few links between them

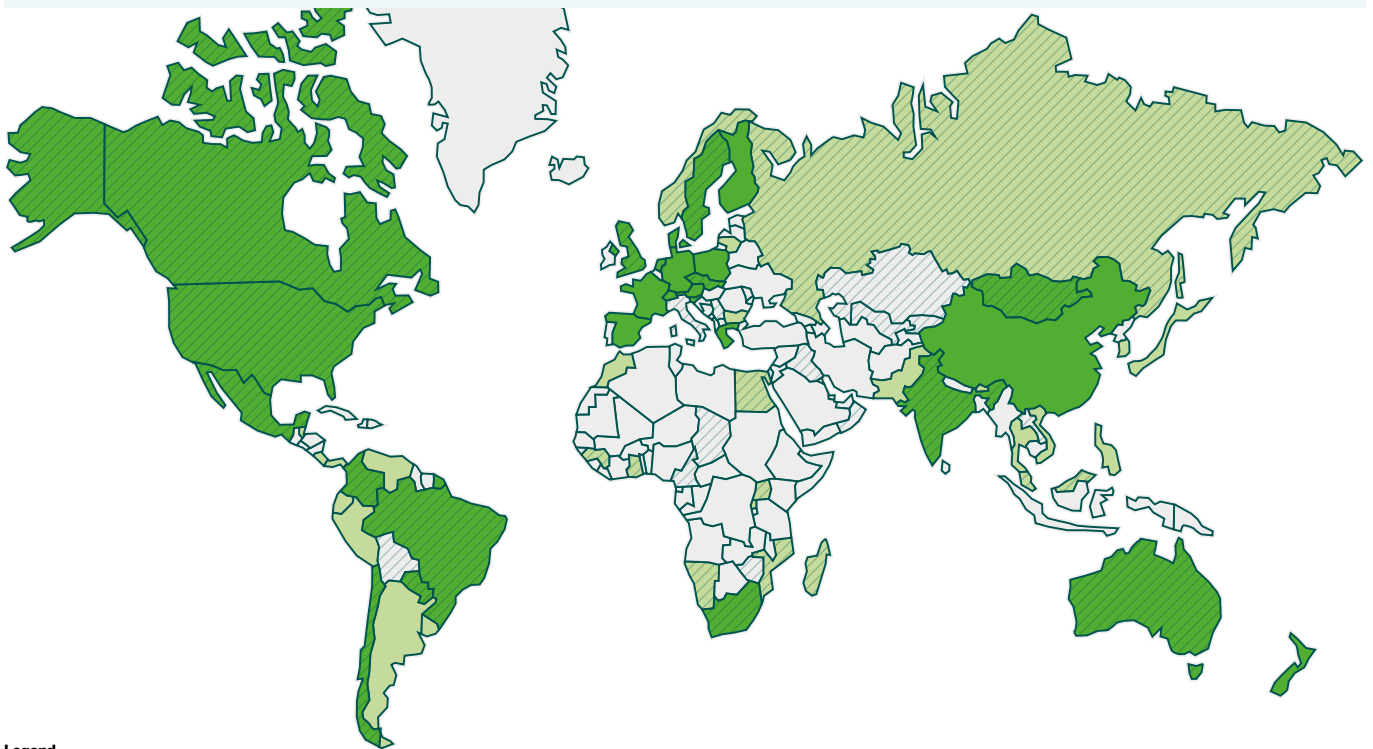
4 - Source: http://us.speciesbanking.com/pages/dynamic/article.page.php?page_id=9114§ion=articles

(see the International article on Page 15). Quebec is in the process of developing a hybrid supply-/demand-side strategy for aquatic habitats which involves an offset provider implementing a surplus of biodiversity offsets with respect to what is demanded by the project owner (1). This surplus is then made available to other developers who may wish to offset their project impacts.

→ **Financial compensation:** compensation may consist of a financial transfer to an outside body (a compensation fund managed by the government or public authority, a public or not-for-profit association that manages public natural resources, foundations or associations for the protection of nature, communes, etc.) (1). Depending on the situation, a financial transfer may be used

either as a last resort when offsetting the impacts in nature proves impossible (e.g., Switzerland, Germany), tolerated even though natural initiatives are preferred (e.g., Netherlands, South Africa, New Zealand, Morocco), or used as a substitute for offsetting (e.g., US, Norway, Finland, India, Brazil, Paraguay, Mexico, Argentina) (1, 6, 7, 8). The sum is fixed by the administrative department and is generally based on the estimated financial resources necessary to offset the residual project impacts. But there are exceptions such as Paraguay and Brazil where the amount corresponds to a percentage of the total amount of the project (1% and between 0% and 0.5%, respectively), or India, where the price is based on the estimated monetary value of the forests which is itself based on revenues from ecotourism and

Countries that implement forms of ecological compensation



Legend

Countries with regulatory ecological compensation mechanisms

Countries developing regulatory ecological compensation mechanisms:

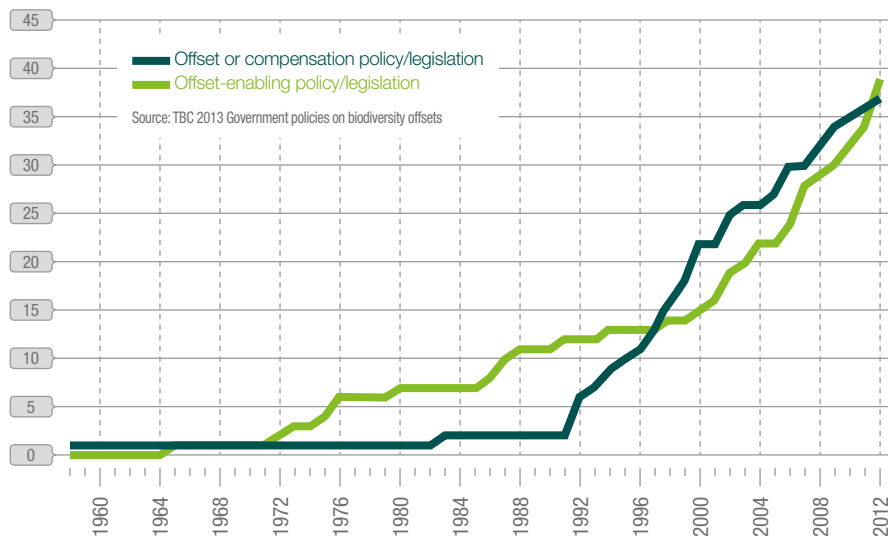
- ecological compensation legislation exists but is not applied or is in the process of being applied;
- ecological compensation legislation is currently being prepared; or
- there is no national legislation but one-off, local ecological compensation initiatives are possible.

Countries with no ecological compensation mechanisms under known legislation

Countries with voluntary compensation initiatives

Figure 2 : The rise in the number of government policies requiring and enabling ecological compensation, by number of countries.

This diagram does not include the 17 policies currently in development.



pharmacology (1, 7). The funds collected are then used by the collecting body to implement pro-biodiversity initiatives and money from a number of projects can be used to fund large-scale measures that target key biodiversity priorities (e.g., forests in Paraguay, Brazil, Mexico or India, or indigenous vegetation in Australia) (7). The funds may also be used as a source of finance for protected areas, notably in developing countries with significant biodiversity challenges such as Brazil, Uganda⁵ or Mozambique⁶. However, the way in which compensation funds are managed often lacks transparency (e.g., Mexico, Brazil, Argentina, India, China) and they are sometimes used to replace

5 - Source: Secrétariat du Fonds Français pour l'Environnement Mondial, March 2013.

6 - Source: Secrétariat du Fonds Français pour l'Environnement Mondial, March 2013.

public funding (e.g., in Brazil) (1), with the result that they are not always allocated to biodiversity initiatives. For example, in India they are generally used to plant exotic species of trees with economic value such as the eucalyptus (3), in which case compensation becomes an economic development tool. In developing countries, notably in Latin America, ecological compensation is frequently associated with "social compensation". In these countries, ecological issues are closely bound up with social issues and financial transfers from compensatory measures may be used to fund local infrastructure development projects (e.g., building a hospital in Brazil⁷, or a school and a library in Chile⁸).

7 - Source: http://www1.caixa.gov.br/relatorio_sustentabilidade_2012/en/environmental-performance/

8 - Source: <http://www.businesschile.cl/en/news/secondary-story/biodiversity-offsets-chile>

Different conceptions of compensatory measures...

... according to scope

Depending on regulations in force in the different countries, the scope of compensation can vary from the broad notion of the environment as a whole to specific components of biodiversity such as protected areas or endangered species, or so-called "remarkable" biodiversity. Most countries use ecological compensation to target their key biodiversity priorities, such as endangered species in Australia, Saipan (Northern Mariana Islands) and South Africa, wetlands in the United States and Canada, indigenous vegetation in Australia and New-Zealand, or forests in India and Latin American countries (1, 7).

In European Union countries, EU directives require that any projects impacting Natura 2000 sites must comply with the mitigation hierarchy. These are rounded out by national regulations which may focus on other areas, e.g., France (protected species and spaces, wetlands, waterways and forests) or the Netherlands (protected species and spaces) (1).

Germany has introduced biodiversity offset obligations across the biodiversity spectrum, applicable to everyone, even individuals, sometimes leading to a certain incoherence in the initiatives deployed (see the International article on Page 15). In some EU countries, offsets only apply to Natura 2000 sites (e.g., Bulgaria) and others have not yet developed any compensatory mechanisms (e.g., Italy, Belgium, Luxembourg, Croatia) (8).

The role of NGOs and associations

NGOs and environmental protection associations play a crucial role in overseeing compliance with compensation obligations, especially in Switzerland, the Netherlands, India or Brazil (1). In practice it has frequently been the NGOs and environmental associations that forced public authorities to implement ecological compensation legislation. In developing countries where compliance with the mitigation hierarchy is not mandatory, the pressure they bring to bear can often force businesses to implement voluntary compensation initiatives that may eventually serve as the basis for national regulations for managing project-related environmental impacts.

→ **...according to objective**

Compensatory measures are generally initiatives implemented “in nature”. They may be “like for like”, targeting the same biodiversity components as they impact, or they may be “like for unlike” (6). Some countries only authorise “like for like” measures (e.g., France and the United States for endangered species, Brazil for forests) (9); others authorise “like for unlike” measures but prefer “like for like” (e.g., the United States for wetlands, the United Kingdom, Switzerland and Germany) (1, 9). Still other countries authorise “trading-up” measures that target a priority that is deemed to be more important than what has been impacted, e.g., United States, the State of Victoria in Australia, the United Kingdom, Germany or South Africa (which requires “like for like or better”) (1, 7). Like for like compensatory measures tend to be

implemented more often, particularly when the objective is no net loss (9). As regards financial transfers, it all depends on how the funds are allocated but compensatory measures are frequently like for unlike (e.g., India) (3).

... according to the duration of the measures

The duration of compensatory measures is extremely variable even within the same country. It depends on the project and may range from five years to perpetuity (1). Generally speaking, the duration of the offset is at least equivalent to the duration of the development project. This is the case in France, India, Mexico and New Zealand, even though practices vary greatly depending on the administration service involved (1). Some countries even insist on perpetuity, particularly in the

case of supply-side measures (e.g., the US, Saipan, the Australian BioBanking programme) (7). A number of different tools may be employed to safeguard compensatory measures over the long term, including land purchase (e.g., Germany, Austria), transfer into government ownership to designate the site as a reserve (e.g., Australia) or the creation of environmental easements⁹ as has been done in the United States (1, 6).

⁹ - An easement is a legal term that could be defined as a voluntary commitment on the part of an owner to curtail their ownership rights in the general interest. Because the easement applies to a land asset and not to a person, it is transmitted to successive beneficiaries. In environmental terms, it consists in defining obligations to do or not to do something on the land in question that are likely to protect the biodiversity of a site from certain types of undesired development or uses. The owner may receive consideration in exchange for such a commitment.

An ever-increasing number of countries are developing ecological compensation schemes so that, even though it remains controversial, compensation has now become very widespread. But different types of ecological compensation lurk behind a single term, i.e., regulation-based or voluntary; demand-side, supply-side or financial compensation; different scopes of application and different durations. Even as each country, State or province struggles to enforce compliance with ecological compensation obligations, the first national registers that record offsetting initiatives appear to indicate that the future promises more effective offsetting of damage to biodiversity, better feedback and greater local and regional coherence.

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INVENTING FACTORING TIME INTO THE ASSESSMENT OF COMPENSATORY MEASURES: KEY ISSUES AND OPPORTUNITIES

Once a development project has gone through the prevention and reduction phases, it is time to start assessing compensatory measures. To achieve the objective of no net loss of biodiversity based on the impacts of a project, it is imperative to conduct the assessment from a number of different angles: biodiversity components, spatialisation and timing of the impact, etc. The duration of the project developer's commitment will depend on the duration of the biodiversity impacts arising from the developer's project.

Although it appears simple at first glance, factoring time into the assessment is a crucial step and it can be both a great opportunity for biodiversity offsetting and a considerable source of risk.

Biodiversity offsets for specific urgent initiatives in favour of endangered species: a new approach to factoring time into biodiversity offsets

French regulations require project owners who negatively impact biodiversity to avoid, minimize, and – as a last resort – offset these impacts. The purpose of compensatory measures is to maintain numbers, surface area, and the hosting and reproduction capacity of the territory, etc. In theory, the mitigation hierarchy (“Avoid – Minimize – Offset”) only concerns species or natural habitats in a healthy state of conservation across the territory. Species or natural habitats in a poor state of conservation would be unable to sustain a further decrease – even a temporary one – in either numbers or surface area. Moreover, maintaining the biodiversity offsets over a sufficiently long period ensures that their ecological added value will endure over the same period as the impacts to be offset.

However, in the case of a project recognised as being of “major public interest” (*intérêt public majeur*), impacts on the habitats of rare and endangered species may be authorised. In this specific instance, two aspects would appear to justify a radically different approach to timing in biodiversity offsets.

- ▶ first, it is absolutely crucial that compensatory measures are effective on the ground before impacts occur for the reasons outlined previously;
- ▶ second, in the case of very seriously endangered species it is important to act strongly and rapidly.



Little bustard (Tetrax tetrax) © Francesco Veronesi

These two conditions could lead to concentrating all or part of the offsets – earmarked for the very long term – in the first years of the programme. For example, offsets concerning 10 hectares over 50 years could be replaced by bigger measures (covering 50 ha) over a shorter time (10 years).

But there is one essential pre-condition for ensuring that this shorter timeframe covering a wider area contributes to maintaining and restoring the numbers

of a species: a concerted action plan (Restoration Plan or National Action Plan) needs to provide for restoration of the species' habitat at the landscape level, taking over from and ensuring the continuity of offsets that have reached the end of their term. Once timing can be adapted to the issues involved, biodiversity offsets can round out public action in favour of endangered species.

This change in paradigm concerning the timing of compensatory measures makes for a more effective contribution to restoring species and endangered habitats to a good state of conservation instead of merely maintaining them in an identical state. Moreover, it does not require project owners to exceed their regulatory biodiversity offset obligations.

There are many endangered species requiring urgent action for which just such an approach would make very good sense. For example, the European mink or the migratory ecotype¹ of the little bustard are on the verge of extinction even as they struggle with the impact of major road or rail projects, and their natural habitat continues to be stretched by ostensibly innocuous projects like the construction of low-rise housing or an agricultural silo. There are only a few hundred individuals of these species left and France has a clear responsibility for conserving them and has made commitments to its European partners.

In a period of severe public policy cut-backs, using compensatory measures for such species within a highly specific and immediate approach does more good than additional financial resources. It brings new approaches and the ability to mobilise the actors involved that are different from those implemented within the scope of action plans.

¹ - An ecotype is a variety, individual or a population of a given species that displays new characteristics adapted to different habitats.

→ Time as a factor of uncertainty for sustaining biodiversity offsets over the long term

For ecological reasons, compensatory measures may have to be conducted over several decades. The implementation of biodiversity offsets is often outsourced and this requires anticipating and objectifying from inception the ecological operations that need to be implemented, planned and costed.

However, long-term planning of biodiversity offsets introduces uncertainty that pushes up the cost of implementation. We will mention four key sources of uncertainty.

The policy for securing land tenure in the area in which the compensatory measures are to be implemented. Two methods may be used: land acquisition involving considerable expenditure, or a formal agreement with the owners. The renewal of such agreements is a significant risk in itself: one of the contracting parties may decide to end their commitment. If this were to happen there are numerous financial consequences: start looking for land again, draw up new action plans (time consuming) or potentially more costly contractual conditions.

Volatility of commodity prices: compensatory measures sometimes take the form of agricultural indemnities linked to a change in practices. Some of these indemnities present little long-term risk, such as switching from intensive to less-intensive grazing methods. But certain

types of agricultural indemnities may involve considerable financial risk when they are tied to international commodity prices, e.g., cereal prices. For example, switching from corn tillage farming to grazing may involve indemnities tied to the market price of corn. Forecasting the price of corn 50 years from now is a tricky business as it is contingent on the increase in the global population, oil and fertiliser prices *inter alia*.

Oil prices: while the link between oil prices and the cost of implementing compensatory measures may not be immediately apparent, there is in fact a significant risk here. Ecological restoration projects frequently require petrol-intensive engines so the cost of using them is tied to petrol prices. Similarly, overseeing deployment and tracking efficiency involves travelling between different sites and here too the cost is directly correlated to oil prices.

Wage inflation: employees are responsible for all project reporting and oversight. Long-term salary trends are difficult to predict but this is still a key variable.

In brief, although management costs may be lower than the initial costs of the ecological work itself, the cumulative amount over a number of years and remeasurement of these costs every year in the light of inflation means that such costs become considerable over time.

Factoring in these uncertainties is not merely a question of cost for project owners or risk for a potential offset operator. Failure to anticipate any financial

risk may jeopardize the feasibility of compensatory measures and have major ecological consequences.

Studying ways of limiting such risks is therefore crucial beginning in the pre-project phase and one way of doing this may be to convert long-term actions into more comprehensive short-term ones (see previous article).

At present, few French project owners or offset operators have set up mechanisms or guarantees that take account of time-related financial risks. This is a major potential problem for the long-term effectiveness of biodiversity offsets and although it is not specifically nature-related, it warrants careful study by the actors involved in biodiversity offsets in France.



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We therefore believe that it is absolutely crucial to rethink temporality in the assessment of compensatory measures to ensure both the ecological effectiveness and financial viability of the measures to be implemented. For example, given the risk of imminent extinction of the European hamster, rapid and massive action is required. And while budgetary restrictions are one of the main limiting factors, technical and economic studies conducted by CDC Biodiversité show that for the same amount of investment, it is more effective to implement a measure over 30 hectares for ten years (renewable) than over 10 hectares for thirty years.

INTERNATIONAL

SPECIFIC FEATURES OF GERMAN SUPPLY-SIDE COMPENSATORY MEASURES: BRANDENBURG AND SCHLESWIG-HOLSTEIN

Germany was the first European country to develop a biodiversity offset strategy. This was first launched in the 1990s and has developed into a highly organised system. In order to find out more about this system, Mission Economie de la Biodiversité (MEB) participated in a research trip organised by Loire-Atlantique département last October. The aim was to find out more about the German system in general and about the specific approaches adopted in the Länder¹ of Brandenburg and Schleswig-Holstein.

Overview

In Germany, obligations to offset damage to biodiversity were first enshrined in the Federal Law on the protection of nature and landscapes (*Bundesnaturschutzgesetz*) of 1976. This legislation, which has only been applied since the 1990s, was amended and expanded in 1998, 2002 and 2010 and constitutes a national reference for each *Land* to draft a decree setting out its own regional guidelines. Permits for development projects are handed out by the authorities of the *Land* and communes who examine *inter alia* all measures included to prevent, reduce – or at the very least offset – negative residual impacts.

In the late 1990s, the German government encouraged the development of market-based instruments that would strike a balance between supply and demand. The compensation offering took the form of “compensation pools” (*Flächenpools*), linked to eco-accounts (*Ökokontos*) (Küpfer, 2008). This has now become the

1 - A *Land* is a federal state within the Federal Republic of Germany, which comprises 16 Länder.



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dominant mechanism and demand-side compensation does not really appear to exist and is certainly not the favoured approach.

German supply-side compensatory measures

Compensation agencies (*Flächenagenturen*) representing the communes, or subsidiaries of foundations created or backed by the Länder, build up a land portfolio by buying up untended forests, fallow land, ponds, etc. Once tenure is secured on these “compensation pools”, they are made available to project owners who wish to implement compensatory measures. The agencies may also anticipate developers’ needs by implementing offsets before any projects have begun. Ecological gains are booked as eco-points in an “eco-account” where

they represent offset credits. Each *Land* has its own method for measuring credits.

A project owner wishing to offset the residual impacts of a project can then either sign a contract with one of the agencies which implements the necessary compensatory measures in one of its compensation pools, or purchase the number of eco-points – determined by the *Land* – required to offset the impact. Thanks to this system of compensation pools, secure land is immediately available on which biodiversity offsets can be implemented and offsets for several projects may be pooled at the same site.

Numerous compensation agencies have developed throughout Germany and there are about 50² of these at the present time. However, most are relatively small and appear to function quite independently without really taking account of ecological and functional continuity between the

2 - Approximation communicated by BFAD in March 2014.

→ various initiatives implemented. The activities of each agency are restricted without exception to its geographical boundaries: administrative logic prevails over ecological logic. There is an umbrella organisation – BFAD (*Bundesverband der Flächenagenturen in Deutschland e.V.*) – which organises a congress every year at which agencies can pool experiences and best practices. 80% of German agencies belong to the BFAD.

Other independent approaches used by local authorities, professional organisations or private bodies do exist but these are not part of the agency network and they operate on more of a competitive footing. This is the case with the parallel system set up by the Schleswig-Holstein Chamber of Agriculture which is focused more on farmers' interests.



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Biodiversity offsets in Brandenburg and Schleswig-Holstein

The Länder of Brandenburg and Schleswig-Holstein have some of the most advanced biodiversity offsets schemes and exchanges between Mission Economie de la Biodiversité and various local operators have helped to shed light on several features of biodiversity offsets in these states.

→ Offsets are focused on measures in favour of “ordinary biodiversity”.

Remarkable species may be given consideration however they are not a priority. Inland or coastal wetlands are the habitats most frequently targeted.

→ **Offsetting obligations are systematically applicable**, including for individuals. Project owners have generally taken the mandatory aspect on board and do not seek to undermine the approach. Indeed, they are usually happy when they encounter an offset operator's services.

→ **While there are many types of offsets, they are usually small in size, covering a small area.** For example, at the Schleswig-Holstein Chamber of Agriculture, the average eco-account represents 5 hectares and 8,000 eco-points, and even the agencies' bigger projects rarely cover more than 60 to 100 hectares.

→ **Payment is on a “one-shot”/“up-front” basis**, i.e., payment in full before any compensatory measure takes place. Where development projects have not yet been approved, pre-project offset studies give rise to partial payment and the full

amount is only paid if the project is actually accepted. For example, with wind farming projects, 5% of the sum due is paid when the contract is signed and the remaining 95% once the project has been approved.

→ In practice, long-term sustainability after the initial term of commitment has expired does not seem to be an overriding concern.

However, a trusted advisor is needed to guarantee the continuity of the action beyond the eco-account holder's commitment term, particularly when it is farmers who are responsible for biodiversity offset obligations.

→ **Eco-accounts represent a real economic alternative** for agricultural land, particularly when it has been left fallow. However, it is a free market and some farmers may sell eco-points for below the market rate leading to problems with long-term management and sustainability in the absence of sufficient resources.

→ **Most stakeholders consider the whole issue of keeping registers and recording eco-accounts to be very important** but a satisfactory solution has not yet been found. Oversight services – when they exist – use tools specific to each agency but there is no widely-used system.

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When compared with the French system, biodiversity offsetting in Germany appears to be more market-oriented with supply-side compensatory measures predominant. Although compensation pools provide reserves of land for future offset projects, the disparity between methods for measuring ecological equivalence and the fragmented nature of the initiatives highlight a lack of local and regional coherence.

The European Union's “No Net Loss” initiative.

A discussion with Laure Ledoux, Deputy Head of the Biodiversity Section of the Directorate-General for the Environment at the EU Commission.



Could you tell us about the “No Net Loss” initiative and its objectives for 2015?

“No Net Loss” is part of the EU Biodiversity Strategy to 2020, for 2015. It seeks to ensure that impacts on both ecosystems and ecosystem services are prevented and reduced when possible, and that residual impacts are offset. It is an essential part of EU strategy for protecting biodiversity because predictions clearly show that if the present situation continues, we will continue to have net biodiversity loss with all the attendant consequences in terms of loss of ecosystem services and cost to society.

Work has already gone into scoping the strategy and key questions have been raised. Should this initiative cover all sectors with an impact on biodiversity, for example? What are the most effective means of preventing and reducing biodiversity impacts and what is the role of existing legislation? Should we set up a biodiversity offset mechanism for residual impacts and what measures of equivalence should we use? We already have possible answers to these questions as part of the feedback from informal consultations conducted through a working group¹ comprising representatives of Member States, experts and representatives of various stakeholder groups. Stakeholders will be formally consulted before the summer.

What role does biodiversity offsetting have within the framework of the work conducted for the “No Net Loss” initiative?

Biodiversity offsetting is seen as the final phase in a much broader strategy aimed primarily at preventing and reducing impacts. It is important to consolidate these first two phases to significantly reduce biodiversity impacts, however, it will probably not be possible to eliminate these impacts completely, so biodiversity offsets will have to be considered. A review of the lessons learned from similar compensatory measures implemented at EU or Member-State level will be used to guide the reflection process.

What impact will this initiative have on existing or future EU directives and regulations?

As part of the development of the “No Net Loss” initiative, we are currently weighing up a number of options ranging from strengthening existing legislation in order to achieve biodiversity preservation targets, to developing an EU legislative framework. The Commission will soon launch a public consultation process concerning the key issues of the initiative before analysing the impact of policy options under consideration. The aim is to come up with concrete proposals by 2015.



¹ - In which Mission Economie de la Biodiversité participated.

INITIATIVES

TOWARDS AN INTERNATIONAL STANDARD FOR BIODIVERSITY OFFSETS: THE BBOP INITIATIVE

The Business and Biodiversity Offsets Program (BBOP) is an international organisation that brings together scientists, NGOs, business and governments to work together and share experiences. It was set up in 2004 by Forest Trends¹ and Wildlife Conservation Society² due to the considerable disparity in international compensatory measures and practices. BBOP currently has over 75 members and seeks to standardise practices for implementing offsetting programmes. It draws on pilot projects implemented

1 - Forest Trends is a Washington-based NGO set up in 1998 that focuses on preserving forests by promoting their economic and societal value.

2 - Wildlife Conservation Society is an international NGO based in New York. It was set up in 1895 to preserve species and habitats throughout the world.



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throughout the world to devise guidelines, methodologies and an international biodiversity offset standard.

This standard sets out the different steps involved in implementing offsets for a given project in line with the BBOP's ten guiding principles (BBOP, 2012):

- ▶ Adherence to the mitigation hierarchy: avoid – minimize – rehabilitate – offset
- ▶ Limits to what can be offset: there are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected;
- ▶ Landscape – taking account of the local context;
- ▶ Achieving the objective of No net loss
- ▶ Additional conservation outcomes: a biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place;
- ▶ Stakeholder participation in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation, and monitoring;
- ▶ Equity: a biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a development project and offset in a fair and balanced way;
- ▶ Long-term outcomes that last at least as long as the development project's impacts;
- ▶ Transparency: the design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner;
- ▶ Science and traditional knowledge: The design and implementation of a biodiversity offset shall be informed by sound science, including an appropriate consideration of traditional knowledge.

BBOP is organising a conference entitled "To No Net Loss of Biodiversity and Beyond" on 3 and 4 June next. It will bring together research bodies, businesses, decision-makers, NGOs and intergovernmental bodies. Mission Economie de la Biodiversité will be partnering the conference and participating in the debate around the themes of how to implement offsets and sustain them in the long-term. MEB will also talk about offset funding mechanisms.

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For more information go to www.forest-trends.org

MEB organises a forum on biodiversity offsets

In June 2014, Mission Economie de la Biodiversité will organise a one-day forum on research issues related to biodiversity offsets. Working groups will be used to stimulate participation and exchanges around current compensation-related issues in France. The aim is to come up with a collective roadmap for research into compensation schemes that ranks research priorities and targets the actors that need to be mobilised. Ecological equivalence and how to implement compensatory measures and sustain them in the long run will be among the major themes tackled.

AN INITIATIVE TO PROMOTE VOLUNTARY COMPENSATION INITIATIVES: FONDS D'INTERVENTION POUR LE PATRIMOINE NATUREL

Fonds d'Intervention pour le Patrimoine Naturel, (FIPAN©) was set up in 2010 to bring together actors involved in ecosystem services (beneficiaries, consumers and managers) using a new approach to territorial governance based around voluntary concertation and cooperation initiatives.

It works by pooling financing put up consumers (e.g., businesses) through the fund and reallocating it to operators (e.g.,

farmers) for “maintaining eco-services”, but it also draws on the goodwill of local actors. It has been developed in partnership with Ter-Qualitechs and Dervenn, and implementation of the concept uses agro-ecology to reconcile economic value, ecological functionalities, uses and the human dimension. It involves key territorial operators – local agri-businesses and

forest operators – working closely together.

Businesses may use the Fund to voluntarily compensate the various impacts of their development projects that are not currently covered by legislation and Eiffage did exactly this for the Brittany - Pays de Loire high-speed train line. The Fund is currently being tested in two new regions.

1 - French non-profit (association loi 1901) – for managing funds and federating local projects.

For more information go to www.fipan.fr



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TOWARDS RESPONSIBLE BIODIVERSITY OFFSETTING: CEN'S ETHICAL CHARTER

For more information, go to www.reseau-cen.org

*Conservatoires d'Espaces Naturels*¹ (CEN) is one of France's biodiversity offset operators. In 2009 CEN drew up an Ethical Charter for its entire network that sets out its values and the conditions for their involvement in, and implementation of biodiversity offset projects. In the Charter, CEN commits to partnering only biodiversity offsets that:

1 - Conservatoires d'espaces naturels are environmental protection associations involved in land management initiatives and running natural sites.

- ▶ guarantee the sustainability of the initiative from a scientific perspective;
- ▶ strike a balance between biodiversity or functionality loss and the planned offset;
- ▶ have preference for the restoration or creation of unprotected habitats rather than the preservation of spaces in good ecological condition; and
- ▶ provide sufficient technical, financial and partnership resources for sustainable management of the offset site.

CEN also reasserts its commitment to the Mitigation hierarchy by reserving the right to refuse to partner an offsetting project, particularly where the damage in question could have been prevented or where development has not complied with existing regulations. *Conservatoires d'espaces naturels* uses this charter to demonstrate its commitment to responsible ecological compensation.

COSSURE "NATURAL ASSET RESERVE": FEEDBACK AND LESSONS LEARNED SINCE 2008

For more information, go to www.cdc-biodiversite.fr

In 2008, CDC Biodiversité set up Cossure "natural asset reserve" – France's first experiment in an offset supply-side scheme – in partnership with the French Ministry for Ecology, Sustainable Development and Energy. The biodiversity offset operator acquired a 357 hectare former industrial orchard in the Crau Plain and carried out major ecological engineering work. Objective: restoring steppe-like close-cropped vegetation typical of the Dry Crau and re-establishing ecological continuity with the surrounding *Réserve Naturelle des Coussouls de Crau*. CDC Biodiversité has entered into a 30-year agreement with the French Ministry for Ecology to manage the site and maintain it as a natural area of grazing land beyond the 30-year period. The biodiversity units

generated by these restoration initiatives may be purchased by developers who "owe" offsets for equivalent biodiversity impacts elsewhere. Ecological equivalence and geographical proximity have been validated by DREAL and to date, 43% of the available biodiversity units have been sold.

In light of the anthropogenic deterioration the site has suffered, there is no guarantee that the indigenous *coussoul*-type vegetation will grow back. Between 2009 and 2012, a doctoral thesis prepared at the Mediterranean Institute of Biodiversity and Marine and Continental Ecology tracked plant dynamics at the site and

experimented with a number of restoration techniques. The findings are encouraging and point to the arrival of plant varieties typical of a steppe-like environment. Moreover, bi-annual monitoring carried out as part of the STOC¹ programme has highlighted the gradual return of most of the steppe-dwelling birds present at the adjacent Natural Reserve, namely, little bustards, pin-tailed sand grouses, Eurasian stone-curlews, and calandra larks.

1 - The STOC program (survey of common birds over time), launched in 1989 mobilises voluntary ornithologists to participate in standard monitoring of common nesting birds and the data gathered is incorporated into recognised national and EU sustainable development indicators.