# A Political Ecology Approach to Biodiversity Offsets

# Addressing Criticisms and Challenges to their Inclusion in the EU 2020 'No-Net-Loss' Initiative

Degree of Master of Science (Two Years) in Human Ecology:
Culture, Power and Sustainability
30 ECTS

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Spring 2016

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<u>Title and Subtitle:</u> A Political Ecology Approach to Biodiversity Offsets: Addressing Criticisms and Challenges to their Inclusion in the EU 2020 'No-Net-Loss Initiative'

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**Examination:** Master's Thesis (Two Years)

Term: Spring 2016

#### **Abstract**

Biodiversity offsets have been proposed as part of the EU 2020 Biodiversity Strategy in order to achieve 'no-net-loss' of biodiversity. However, there is a growing number of criticisms towards the use of offsets, particularly from a political ecology approach. Drawing from analysis of key EU documents and working reports, this thesis examines whether the proposed use of biodiversity offsets in the EU will address these criticisms and challenges. In doing so, it brings together cross-disciplinary literature on the design and implementation of biodiversity offsets, along with studies of previous offsetting cases, including three European cases (UK, Germany and France). Emphasising the political ecology approach, it explores how offsetting has promoted a definition of nature as exchangeable and replaceable, what contradictions this creates in practice, and how the involvement of private sector, government, and non-government has affected their implementation. It connects previous use and design of offsetting with the political ideology of 'neoliberal conservationism,' which presents these features as commonsensical and promotes an uncritical view of development. By assessing key EU documents using these frameworks, the thesis demonstrates where challenges and criticism remain unaddressed in the proposed use of biodiversity offsetting and offers an explanation of why this may continue.

keywords: biodiversity offsets, EU, no net loss, political ecology, neoliberalism, conservationism

# **Table of Contents**

<u>Introduction</u>	1
Research Question and Aims     Structure	2
<ul><li>Structure</li><li>Theoretical Frameworks and Key Concepts</li></ul>	3 4
• Method	7
Scope and Limitations	9
Context of the EU 'No-Net-Loss' Initiative and the Anticipated Use of Biodiversity Offsetting	10
Section I  Re-Examining the Case for Biodiversity Offsetting: Conceptual Foundations	12
Key Debates in Biodiversity Offsetting Literature	13
Currency: Figuring Out How Biodiversity is Valued	13
<ul> <li>Equivalence: Figuring Out What Compensates for Damage to Biodiversity</li> </ul>	14
Time-Lag and Uncertainty: How are Timing and Risk Accounted for in Offset	s? 15
Previous Analysis of Existing Biodiversity Offsets	16
• Emergence of Political Ecological Criticism of Biodiversity Offsets	17
• 'Unavoidable Loss' and the Re-creation of Nature	18
The 'Business Case' for Biodiversity Offsets	21
• Section Conclusion	25
Section II	
Biodiversity Offsetting in EU Strategy: Predicted Use and Potential Consequences	26
<ul> <li>Key Document Analysis on Proposed Use of Biodiversity Offsets in the EU</li> </ul>	27
<ul> <li>Authors, Organisations, and Key Sources of Information</li> </ul>	29
<ul> <li>Patterns in the Framing of Biodiversity Offsets</li> </ul>	30
Addressing Issues of Unavoidable Loss	31
Addressing Issues of Equivalency	32
<ul> <li>Addressing the Design of Metrics, and Issues of Timing</li> </ul>	33
Addressing Issues of Monitoring and Considering Socio-Political Context	34
• Experience with National Biodiversity Offsetting Programmes: Common	
Features and Shortfalls	36

Review and Relevance of Findings: Why are Recommendations on EU	
Biodiversity Offsetting Concerning?	40
Conclusion	42
Bibliography	45

#### Introduction

The use of biodiversity offsets as part of environmental policy has received increasing global attention in the last decade and has recently been proposed as a part of the EU's 'no-net-loss' (NNL) initiative for 2020. The EU NNL initiative promises to ensure that overall levels of biodiversity in the EU are maintained, including habitats outside the protected areas of the Natura 2000 network. Biodiversity offsets have been presented as a possible mechanism in the EU NNL initiative in order to meet these goals, by ensuring any direct destruction of biodiversity is replaced, albeit elsewhere. Although the concept of biodiversity offsets has been supported by numerous proponents (particularly among governments and in the business world), there is growing evidence that earlier biodiversity offset programs have not met desired results of no net loss. While proponents argue that biodiversity offsetting is still an effective policy tool, so long as we continue to strengthen and standardise ecological metrics and improve implementation, those working from a political ecology approach have criticised the core principles of biodiversity offsetting practices. They indicate offsetting could be harmful as a part of environmental policy by undermining struggles to preserve environments and promoting the mindset that nature is calculable and interchangeable.

Biodiversity offsetting is a practice by which developers can compensate for ecological damages by funding or implementing projects that are designed to increase biodiversity elsewhere. In a simple, hypothetical example, a new building development could make plans to remove an area of woodland important to local bird-life. After trying to minimise environmental impact on-site, they find there will still be residual damage to the woodland, so they must compensate for this ecological damage. They commit to converting a larger area of meadow on a different site to woodland suitable as a new habitat for these birds, called a biodiversity offset. This should create equal gains in biodiversity equal to the biodiversity lost through the damage caused on the building site. The building site and offset site are each given a biological value based on a range of factors such as size, quality and possible risks of degradation, and if the calculated additional biodiversity created by the offset is equal (or higher) than the calculated loss, the project is considered to have no net loss of biodiversity. A range of other options might also be used to offset the residual damage, including funding for new ecosystem creation, increasing biodiversity on existing conservation projects (which are

considered of equal or greater importance to what was destroyed), or biodiversity banking, where credits are bought from organisations who have created compensating ecosystems ahead of time.

#### **Research Question and Aims**

Biodiversity offsetting has been discussed as a serious policy option as part of the EU NNL initiative, and although concrete frameworks or legislation have yet to be made, the presentation in key reports suggest that biodiversity offsetting will be used as an EU-wide measure to prevent further net loss of biodiversity. In order to assess how the use of biodiversity offsets might have an impact in the EU, this thesis asks the following research question:

How does the proposed use of biodiversity offsetting in the EU NNL initiative address previous criticisms and challenges of offsetting programmes?

This question can be broken into two sub-questions:

What criticisms and challenges of biodiversity offsetting programs does the EU programme need to address?

By analysing the current literature on biodiversity offsets, this thesis consolidates the major criticisms of these programmes and highlights the key issues that should be addressed in future design. The criticisms and challenges outlined have been drawn from a critical political ecology approach. This means that the consequences of biodiversity offsetting are not assessed on their fulfilment of the stated biodiversity goals of the EU, nor simply focused on conservation of key species and the habitats which support them. Rather, the impacts of biodiversity offsets are considered across intersecting features of EU environments, which rejects the separation of nature and human activity. Therefore, many of these criticisms of biodiversity offsets focus on the re-creation of 'nature' as an active process, and try to consider impacts on ecosystems as interwoven with broader social impacts.

What does the proposed use of biodiversity offsetting in the EU NNL initiative include, and what is likely to be prioritised in its implementation?

Since an official EU biodiversity offsetting program has yet to be launched, this thesis analyses the key NNL initiative proposals, and public documents made by the EU working groups and commissioned reports on the design of EU biodiversity offsets. Together, these primary documents indicate what design features and issues are being prioritised in the proposed use of biodiversity offsetting in the EU. The EU's approach to offsetting should directly address at least some aspects of the criticism, given the significant body of discussion which is increasingly doubtful of how offsetting can deal with complex ecological issues, in addition to fulfilling social and cultural expectations.

#### **Structure**

The main body of the thesis is divided into two sections. The first section outlines the conceptual foundations of biodiversity offsetting and the criticisms and challenges that have been documented in successfully designing and implementing them. It begins by outlining the technical requirements of biodiversity offsets and challenges of meeting conservation goals. It then introduces the criticisms of political ecology, which include issues surrounding the recreation of nature and the connection between implementation problems and the underlying assumptions of biodiversity offsetting. The next subsection extends this criticism to how biodiversity offsets frame unavoidable loss. The last subsection builds on evidence that foundations of biodiversity offsetting have been formulated by a key group of actors who emphasise the 'business case' of offsetting, which has consequences for demonstration of additionality and implementation. This introduces the interaction between the design biodiversity offsets and the political ideology of neoliberal conservationism, as an explanation of why certain features of offsetting are prioritised over other ecological concerns.

The second section comprises of a discourse analysis of the key available EU policy documents and EU-commissioned reports on biodiversity offsetting, in order to assess how

the policy options for NNL are considered and the role of biodiversity offsets are framed, in order to answer the research question. The content and framing of these documents are compared to the criticism and challenges outlined in the literature of the first section. In order to supplement the available material on the formation of an EU-wide biodiversity offsetting programme, an analysis of three European national biodiversity offsetting programmes follows. These existing programmes, in France, UK, Germany, are heavily cited in EU policy recommendation and are therefore considered useful sources for understanding the proposed use of biodiversity offsets in the EU. The recent policy changes in the national programmes and implementation of offsets provide further indication of which issues are being prioritised.

# **Theoretical Frameworks and Key Concepts**

This thesis uses a political ecology approach in order to conceptualise the impact of biodiversity offsetting programmes in both their design and implementation. Political ecology focuses on investigations of how ideas of nature are constructed and how these meanings affect ecologies, often with a focus on power relations. Robbins (2012: 22) notes that it necessarily contrasts with the idea of apolitical ecology, and therefore attempts to reveal essential links between environmental issues and broader socio-economic structures, questioning the technical separation and framing of nature and human intervention. This focuses on the relation to political and economic structures, often with a critical purpose. Understanding who influences the construction of biodiversity offsets and continues to lobby for their inclusion is therefore considered important in identifying the pressures and possible trajectory of biodiversity offsetting in an EU setting.

A political ecology approach is also useful in identifying whether certain features of biodiversity offsets can successfully recreate biodiversity or whether they will clash with the relationships within and between ecosystems. Political ecology recognises that the non-human world is not a neutral backdrop; rather it has biophysical reality which can alter the governance ideas that are imposed upon it (Castree 2008: 133). This reveals and problematises cases where biodiversity offsets create a definition of nature as an exchangeable abstract. For example, Büscher *et al.* (2012: 8) note that ecology's basis in the diversity and

connectivity of ecosystems (and their relations) are in contradiction with capitalism's drive to establish exchange values, severing these relations into separate units. Political ecology therefore establishes the need for biodiversity offsets to address contradictions between relying on abstract conceptions of nature and expecting to fulfil both biophysical and social demands.

This thesis also uses a Gramscian approach by defining the increasing interconnectedness of private sector, government and non-government institutions as a 'historical bloc,' which has been adapted from Igoe, Neves and Brockington (2010: 489). This approach focuses on the existence of hegemonic ideology, which is propagated by key actors and creates an internal logic to reflexively recreate itself, despite inherent contradictions in its application. Igoe, Neves and Brockington (2010) argue that a dominant ideology has emerged in the global conservation movement, as it appears to be increasingly dominated by a narrow set of values and institutions. Büscher *et al.* (2012) have elaborated on this analysis and defined the hegemonic ideology as 'neoliberal biodiversity conservation,' and therefore connected it to previous work on the neoliberalisation of nature. In this ideology, definitions of nature that support commodification and exchange are consistently presented as commonsensical, which actively discourages criticism of economic activity and alternative solutions (Igoe, Neves and Brockington 2010: 492). The alliance of these actors has been traced by numerous authors, through funding streams, official partnerships and exchanges of information and personnel (Macdonald 2010).

Neoliberal biodiversity conservation (hereafter referred to as Neoliberal conservationism), is understood as the dominant political ideology in the design of environmental policy, provides as a means to explain the proliferation of market-based solutions to biodiversity loss despite their apparent contradictions. This is based on two observations: the construction of positive language with an uncritical view of the relation between development and environment, and the rapid proliferation of institutional links between business, government, and larger non-government environmental organisations (Igoe, Neves and Brockington 2010). It is worth differentiating between neoliberal conservationism as an ideology which supports certain features of biodiversity offsetting, and the organisational involvement of private companies in defining and encouraging offsetting. Private sector involvement in the design of offsets is not

tantamount to neoliberal conservationism, as many of its key proponents have been non-government organisations (Fletcher 2012: 301-2). Their role in offsetting is considered separately based on perceived conflicts of interest in the implementation of biodiversity offsetting.

In the literature on neoliberal conservationism, key scholars (Büscher *et al.* 2012) are aware that the term neoliberal is often used to refer to phenomena and situations that aren't necessary comparable, based on initial criticism from Castree (2008). This thesis takes the definition of neoliberal conservationism from Büscher *et al.* (2012: 5), where neoliberal refers a political ideology which 'seeks to subject political, social and ecological affairs to capitalist market dynamics.' As such, neoliberal conservationism does not define a set of practices, but manifests itself in practices by prioritising certain ideological assumptions. Fletcher (2012) makes an important clarification; that this body of criticism does not argue that human wellbeing that is irreconcilable with conservation goals, rather the promotion of economic growth creates environmental problems, even as it claims to resolve them. As such, neoliberal conservationism continues to evade the issue of inequality in its uncritical view of development, much like traditional conservationism rejects arguments that economic inequality and natural degradation are interlinked.

That said, conservation is not so rigorously defined in this body of literature. For example, it is unclear if the concept of neoliberal conservationism represents a distinct form of conservation (possibly newly-emergent) or represents a critique of conservation where its alignment with neoliberal ideologies is emphasised. Büscher *et al.* (2012: 7) describe biodiversity conservation as 'vitally important to capitalism' and claim it functions to reshape nature to fit capitalism, but also say it seems 'to have *become* the friend of capitalism' (emphasis added). Brockington and Duffy (2010: 470) argue that although the alignment of capitalism and conservation is the historical norm, due to its tendency to separate nature from human activity, neoliberal conservation should be considered its most recent stage. This is opposed to the 1970s, where they define conservationism as surprisingly anti-capitalistic. Brockington and Duffy (2010) therefore speak of a defined field of conservation, which has recently undergone a shift it its discourse and seen an intensification of certain practices. This thesis has therefore emphasised the prioritisation of exchangeability and rhetoric of market-

based solutions to conserve nature as being indicative of neoliberal conservationism.

Taking 'neoliberal conservationism' as a basis for the relationship between actors and the context of biodiversity offsetting policy, this paper will argue which features of biodiversity offsetting are likely to be dominant in the design of EU offsetting policy. This builds on observations of previous cases where institutions have pushed particular aspects of biodiversity offsetting to the forefront of this policy. This thesis is not the first to connect the practice of biodiversity offsets with an alignment with neoliberal conservationism, as the link has previously made by Benabou (2014) in reference to voluntary biodiversity offsetting. The connection to existing criticism of neoliberal conservationism will also demonstrate why certain forms of biodiversity offsetting may be increasingly applied despite lack of evidence and extensive criticism from within mainstream ecology.

#### Method

This thesis takes a qualitative approach in analysing key EU documents in order to identify the priorities and considerations of policy-makers in the EU towards the proposed use of biodiversity offsetting. The primary documents analysed are the EU 2020 Biodiversity Strategy (EC 2011), and the document on operational principles of NNL Initiative adopted by the NNL Working Group (EC 2013a), as well as the three EU-commissioned reports on Biodiversity Offsetting. These reports were produced to give policy options for the NNL initiative by the consulting companies. These are 'Policy Options for an EU No Net Loss Initiative' (Tucker et al. 2013), 'Exploring the Possibility for Habitat Banking' (Conway et al. 2013) and 'Study on Specific Design Elements of Biodiversity Offsets' (Conway et al. 2014). Together, these documents and reports detail the major policy considerations which the EU has made publicly available. This thesis uses discourse analysis to examine the content and framing of these documents, in order to assess their presentation of biodiversity offsets and compare it to the criticisms and challenges outlined in the review of literature in section I. In addition, this analysis also looks at the political actors involved in the creation of these documents. This is due to the connection between the interests of these actors and the framing of biodiversity offsets which have a direct relation with the previous criticisms of biodiversity offsetting.

Discourse analysis is defined by Gees (2014a: 8) as 'the study of language in use,' and it is noted that this can involve several different approaches, but often focuses on the content and structure of the data. In this thesis, written documents provide the main source of data. Discourse analysis is not a review of all physical features of the writing, rather the selection is based on what is 'deemed *relevant* in the context, *and* that are relevant to the arguments the analysis are attempting to make,' (Gees 2014a: 136, original emphasis). As such, discourse analysis is not set process, rather a reflexive process that requires the application of different tools of analysis adapted to the task at hand (Gees 2014b: 2). The judgement on relevance is determined by the choice of theoretical framework, in this case the frameworks of political ecology and the conceptualisation of neoliberal conservationism. Discourse analysis is recognised as compatible with the social science conceptualisation of 'discourse,' which Gees (2014b: 156-7) defines as a theoretical tool that allows us to recognise and enact 'characteristic ways of acting, interacting, believing, valuing, and using various sorts of objects..., tools, and technologies in concert with other people.' This permits the connection of patterns in language to issues highlighted in political ecology, such as valuation of nature, the use of offsets as a tool and the framing of how groups interact with 'nature' as a concept and its biophysical realities.

In order to supplement the conclusions of the EU document analysis, this thesis also analyses secondary research on three European national biodiversity offsetting programs. These three national cases are Germany, France, and the UK, which were chosen due to their prevalence in literature on biodiversity offsetting and in the EU policy reports themselves. National programs provide evidence of existing design principles in a European context as well as providing evidence of existing implementation challenges. Previous authors have also analysed the use of discourse in these programs, which are used to support the conclusions drawn in the discourse analysis of key EU documents.

Lastly, in order to develop an understanding of the criticisms and challenges of biodiversity offsetting, section I contains an extended literature review. This literature review is cross-disciplinary, but pays particular attention to the recent literature produced from a political

ecology approach. The literature review also includes what Castree (2008: 133) calls 'evidence-based critiques of nature's neoliberisation,' which focus on case studies of biodiversity offsets, either their design or implementation. These evidence-based critiques allow us to 'concretise, modify, and complicate broad theoretical claims about neoliberalism,' which significantly adds to the specific challenges of biodiversity offsetting that can be drawn from the literature. Though considerable length has been given to this analysis of the literature, this is due to the lack of previous comprehensive reviews of political ecology criticism of biodiversity offsetting, as much of the literature has emerged in the last few years.

### **Scope and Limitations**

This thesis has specifically set out to examine whether the proposed use of biodiversity offsetting in the EU addresses the challenges and criticisms of biodiversity offsets, rather than claiming to analyse the possible impact on EU biodiversity. This is, in part, due to the lack of information available about the eventual impact of biodiversity offsets based on the success of their restoration. The length of time and complexity of biodiversity offsetting means that their success and impact can only be preliminarily assessed where limited studies are available. Much of the literature on biodiversity offsetting therefore focuses primarily on the design stage rather than implementation for the same reason. However, the lack of thorough field assessment of long-term offset performance is arguably also problematic in the present of biodiversity offsets, as it increases uncertain outcomes which undermine its choice as a policy option. It is therefore a major issue when considering how the mechanism is being proposed at an EU-wide level and in what form and extent.

Discourse analysis is also a method with some acknowledged problems of conjecture, which is why Gees (2014b: 37) emphasises the need for the possibility of 'falsification' of the hypothesis, in order to classify it as an empirical study. The 'frame problem' refers to the reliance that discourse analysis places on language as a form of data, which is highly dependent on context to an extent that it can be difficult to disaggregate the relevant context (Gees 2014b: 38). In this sense, 'neoliberal conservationism' is introduced to provide context to the analysis of documents, in connecting the actors and language used in the documents to an established political ideology, which in turn emphasises a particular understanding of

meaning in the key documents. In order to reduce the possibility of forcing the assumptions of neoliberal conservationism onto the texts, the reference of the ideology to particular phrases has been avoided in section II, and instead used to give context to the summarised findings. The 'frame problem' is not restricted to discourse analysis, as it is dependent on interpretations of what the relevant context consists of in any given study (Gees 2014b: 39).

Another limitation of the method is that the chosen documents analysed have an uncertain relation to the eventual proposal of biodiversity offsetting in the EU. The EU approach towards biodiversity offsetting is based on ongoing policy changes and practice, and it is not clear whether these documents, particularly recommendations in commissioned reports, will be equally influential in biodiversity offsets' eventual design. This is partially why analysis of recent changes in national offsetting programmes was chosen to supplement the understanding of the trajectory of biodiversity offsetting in the EU. Theoretical frameworks also help to make sense of patterns in practice and formulation, but Castree (2008) and Bakker (2005) have both discussed the difficulties that analysis of neoliberal ideologies have in exploring changes. This is why this method section as referred to neoliberal conservationism as providing context to use of language and the actors involved, rather than used as a primary argument as to what approaches appear to be favoured by the EU. Despite the incomplete nature of EU policy on biodiversity offsetting, the proliferation of these practices in the EU is a significant shift in biodiversity strategy which deserves academic attention. Given the potential impacts biodiversity offsetting could have, there is also a need for analysis while there is still a significant political window to influence the outcomes of EU biodiversity strategy.

# Context of the EU 'No-Net-Loss' Initiative and the Anticipated Use of Biodiversity Offsetting

A new biodiversity strategy was released by the EU in 2011 with the title 'Our life insurance, our natural capital: an EU Biodiversity Strategy to 2020,' (EC 2011). The strategy was released on the failure to meet targets of the 2006 EU Biodiversity Action Plan, along with commitments made during the international conference on biodiversity. The 2010 EU baseline

study revealed that only 17% of assessed habitats were in favourable conditions, and that almost 25% of European animals faced risk of extinction (EC 2011: 8). The EU 2020 Biodiversity Strategy set six targets, which are based on broad aims and attached to specific actions or require the create of policy in that particular area. These targets together aim to halt and reverse the degradation of biodiversity and their ecosystem services.

This thesis focuses on the headline target and target 1 and 2, which seek to fully implement the existing biodiversity protection legislation in the EU, the key mechanic of which is the Natura 2000 network of protected areas of significant biodiversity, and to launch the 'No-netloss" (NNL) initiative to prevent overall biodiversity loss in areas not protected by existing legislation (EC 2011). The EU policy of no net loss would still allow development (therefore not increasing protected areas), but requires these losses to be somehow mitigated by equal biodiversity gains elsewhere. It is primarily under the NNL initiative that biodiversity offsetting has been recommended, as a means to prevent overall biodiversity loss across all EU terrestrial areas.

Biodiversity offsetting is not an entirely new concept at the EU level, though it has only previously been permitted under EU legislation in very limited conditions.. The Birds and Habitats directive (which governs the Natura 2000 network) was the first to introduce the possibility of limited forms of biodiversity offsets as the last step of achieving NNL of biodiversity in protected areas, and only if vital public interest overrode the strict protection policy of Natura 2000 and protected species (Kramer 2009). The EU commission released guidance on offsets in 2000 and 2001 to achieve this end (Kiesecker et al. 2010: 166). The NNL initiative seeks to extend the goal of NNL of biodiversity to an EU wide scope, to apply to areas not covered by existing biodiversity legislation (i.e. 'non-designated areas') under much less stringent limits and requirements (EC 2011). The attempts to halt overall biodiversity loss in the EU through protected areas and mitigation, including biodiversity offsets, are supported by other initiatives which aim to establish green infrastructure (target 3), address damage from agriculture and forestry (target 4) and promote sustainable fishing (target 5). Target 6 refers to the EU's continuing role in promoting international biodiversity through participation in forums and programs aimed at its own members' overseas territories and broader international programs.

Details of when biodiversity offsetting will be permitted and what requirements it will need to fulfil are still being discussed, and have been the subject of three reports commissioned by the EU (see Conway et al. 2013; Tucker et al. 2013; Conway et al. 2015). As will be elaborated in section II of the thesis, the EU will likely produce a set of guidelines and limitations built on existing biodiversity requirements, if not full legislation and institutional support in implementation and monitoring. Despite sparse mention as a confirmed part of the biodiversity strategy, biodiversity offsetting has been commonly described as 'necessary' for meeting NNL (EC 2013a, Tucker et al. 2013, Conway et al. 2014). Particularly given the support biodiversity offsets have received from a number of large organisations and businesses and the rate of their international implementation, the eventual extent of their use in the NNL strategy and future EU biodiversity initiatives should not be underestimated (Madsen et al. 2011). The use of offsets is expected to build on national frameworks for biodiversity offsetting where they exist. These national programmes are varied in their content, and may remain so. However the EU's focus on developing a 'common valuation' for nature in the new biodiversity strategy suggests that policy-makers are pushing for a single metric to be the basis of offsetting and compensation (EC 2011).

Previous biodiversity offsetting programmes have prompted a significant body of literature documenting notable criticisms and challenges in their successful implementation. The EU should not only demonstrate that they are aware of these shortcomings, though this will be one aspect of the analysis. The EU have indicated that the biodiversity offsets will be based on familiar frameworks (the mitigation hierarchy and BBOP principles), and key documents and strategy meetings have been undertaken with partnership of key organisations who have supported previous international offsetting measures (Tucker *et al.* 2013). Given the past failures of biodiversity offsetting, the onus is on the EU to clearly address the major criticisms and challenges of offsetting to justify its inclusion in EU biodiversity strategy. The next section will introduce these criticisms and challenges, which include both the technical design of offsets as a tool for biodiversity conservation, as well as the critique of the broader impact of offsets using a political ecology approach.

#### Section 1 –

# Re-Examining the Case for Biodiversity Offsetting: Conceptual Foundations

This section looks at the key principles and criticisms of biodiversity offsetting that have been identified by the academic community. These criticisms reveal that are significant problems in determining the 'currency,' 'timing' and 'accountability' of offsets, which will need to be examined in section 2 to see if EU has means to address these issues. Moreover, emerging political ecology critique has argued these challenges are embedded in deeper contradictions, which deal with the classification of unavoidable loss, justification of additionality, and the uncritical approach to the replacement of biodiversity. Assumptions that biodiversity loss is both unavoidable and can be replaced, without a willingness to problematise other aspects of this loss, is a major concern for the use of biodiversity offsetting in the EU. The prioritisation of enabling exchangeability of offsets over these concerns is identified as part of the ideological framework of neoliberal conservationism. This thesis argues that this ideological framework underlies previous approaches to biodiversity offsetting and therefore, along with the criticisms raised in political ecology literature, provides a means to analyse the priorities and trajectory of EU biodiversity offsetting in section 2.

# 1.1 Key Debates in Biodiversity Offsetting Literature

This subsection provides a review of what is considered the 'mainstream' of existing literature on biodiversity offsetting. This extensive body of literature has been produced about the theoretical underpinnings of biodiversity offsets and the key principles by which they should be designed. Since biodiversity offsets are a broad set of mechanisms intended to compensate for development and biodiversity loss in an area, discussion has focused less on what particular activities should be undertaken. Rather, literature has examined the issues that may cause the success or failure of offsetting and the difficult question of what or who is being compensated and how to ensure this takes place with imperfect knowledge and unknown time frames.

Bull et al. (2013) produced a widely cited amalgamation of the key debates, and have

suggested a future research agenda based on the separation between unresolved theoretical problems, and the practical issues of implementation. This approach to studying biodiversity offsets will be criticised using literature from political ecology in subsection 1.2 for the implications it has in understanding how these issues are linked. However, a review of this literature is still important in understanding the key concepts in biodiversity offsetting and to demonstrate the wide acknowledgement of criticisms towards its use.

# Currency: Figuring Out How Biodiversity is Valued

The most extensive issue discussed in literature on biodiversity offsetting is the choice of metrics to measure biodiversity, which in the literature is known as 'currency' (Bull et al. 2013). These metrics provide a numeric value for biodiversity features, quantifying losses and determining the equivalent gains that must be produced by offsetting. This has been debated extensively, as biodiversity has no universal definition, and different elements of an ecosystem are not easily comparable and therefore must be considered in relation. As a result, previous metrics for offsetting, such as simple calculation of land area, have been largely discredited (Bull et al. 2013: 371). Compound metrics based on the calculation of several related measurements of biodiversity are now recommended as the basis for future offsetting programmes. Compound metrics measure different elements of ecological function, such as condition, variety and spatial context. The content of measurements are highly technical and not universal agreed-upon, and are additionally complicated by a new push to include 'ecosystem services,' such as water quality. The construction of these metrics are difficult to assess, particularly for non-experts involved in offsetting, and also require extensive (and expensive) data collection. The expense and technical requirements of compound metrics are likely the reason that simpler metrics are still prevalent, such as the recent DEFRA metric suggested in the UK (DEFRA 2011).

#### Equivalence: Figuring Out What Compensates for Damage to Biodiversity

Equivalence is the issue of what types of ecosystem can said to 'compensate' for each other. Although biodiversity offsets convert losses and gains into a numerical value, there is recognition that there are limits to how 'equal' the offset and original areas can be (BBOP)

2013). This is discussed as a trade-off between inevitable differences in time-frame, context, type, and location, with the key debate being what restrictions should limit these differences. The practice of prioritising close proximity to the initial site and only allowing the same type of ecosystem is known as 'like-for-like.' Bull et al. (2013: 373) argue that 'like-for-like' should be the only use of biodiversity offsets unless losses have 'little or no conservation value.' Others, such as Kiesecker and McKenney (2010), argue 'out-of-kind offsets' could assist precious and at-risk biodiversity and help with the problems of land availability, where offsets have been marginally damaged due to fragmentation when nearer to development.

# Time-Lag and Uncertainty: How are Timing and Risk Accounted for in Offsets?

The last related issues are 'time-lag' and 'uncertainty' which deal with the inherent problems of biodiversity creation and the physical aspects of the environment. Current practice for biodiversity offsetting deals with the 'risk' of reproducing biodiversity in the future primarily through multipliers. Multipliers force the developers to either create a larger offset than the degraded area, or create higher value biodiversity areas, in order to allow for the risk that the offset will fail and to make up for the delay in time. It has been acknowledged that these multipliers are not precisely calculated, and though are intended to presume higher levels of risk, they are not expected to cover other causes of biodiversity loss or the total failure of an offset (Moilanen et al. 2009). Complicating the issue is that offsets have to define longevity of the offset, which is at least necessary for the length of the impact of the development (BBOP 2009). Bull et al. (2013: 373) observed that it is not always defined in offsetting programs who is responsible for maintenance or how it should be achieved, which is highly problematic considering that the time-frame of offsets usually span 50-75 years. These issues have prompted recent discussion of reversibility of losses caused in biodiversity offsets, how it should be defined and whether it should ideally be a prerequisite of offsetting programmes (Gonçalves et al. 2015).

It is also acknowledged that creating larger offsets through multipliers does not actually address the realities of time-lag in offsetting. The temporary loss of habitat for key species is highly problematic, and Bull *et al.* (2013: 373) recognise that the temporary loss of ecosystem services may be equally devastating to communities. Seeing stable biodiversity gains in an

area can take decades, whereas the corresponding development often causes complete biodiversity loss in much shorter time-spans (Bekessy *et al.* 2010). As a solution, Bull *et al.* (2013: 372) have proposed that biodiversity offsets be required to create biodiversity ahead of time through biodiversity banking mechanisms, though Sullivan (2013) has pointed out that this assumes that prior creation of habitats does not in turn create problems of equivalency by reducing requirements of specific geographic location and ecological features.

# Previous Analysis of Existing Biodiversity Offsets

Though the impacts of existing biodiversity offsets are only properly understood over longer periods of study, several researchers have assessed the preliminary outcomes on various sites globally, with the majority having a focus on wetland banking in United States as the longest-running biodiversity offsetting program (Gonçalves *et al.* 2015: 62). Many of these studies raised serious concerns about the effectiveness and accountability of the current iterations of biodiversity offsetting (Curran *et al.* 2013). Not only were goals not met, but the measurements set to provide adequate compensation have been widely decried as insufficient, and without proper accountability to ensure genuine mitigation (Quétier, Regnery and Lavorel 2012; Maron *et al.* 2012). Yet still, these issues are often presented as problems of implementation to be fixed. This has been lead by those calling for better and universalised metrics such as the BBOP and EBV (Essential Biodiversity Variables developed by GEO BON) to provide better performance and exchangeability for wider application (Gonçalves *et al.* 2015: 67).

#### 1.2 Emergence of Political Ecological Criticism of Biodiversity Offsets

As introduced in the theoretical framework section of this thesis, political ecology rejects the separation of social and environmental issues. Instead it views ecological issues as fundamentally interrelated with wider socio-economic structures. This represents a departure from the research agenda that Bull *et al.* (2013) lay out for biodiversity offsets, where issues are divided into categories of conceptual and practical, with the explicit definition that conceptual problems are largely solvable by further ecological research, whereas practical

problems are a matter of governance. A political ecology approach, like the one this paper adopts, links the conceptual foundations with the political issues and the actors involved, which makes these divisions in research agenda unsuited to the task at hand. The following political ecology literature therefore examines the broader context of offsetting programmes, the position of those who advocate for biodiversity offsetting, and the conceptual issues which are not extensively covered by the previous technical literature.

Analyses of biodiversity offsetting from political ecology have only recently emerged, with the exception of Robertson's (2006) critique of commodification of ecosystem services and Walker *et al.* (2009) in their review of issues in biodiversity offset negotiation. Recently, Sullivan (2013), Spash (2015), Moreno-Mateos *et al.* (2015) and Benabou (2014), have all contributed research on the topic. However, the critique of market-based environmental approaches, of which the EU biodiversity offsetting shares a number of conceptual features, is far more extensive, and has contributed to the political ecology discussion of biodiversity offsets. The use of biodiversity metrics and abstraction of nature for exchange feature heavily in the EU NNL initiative, as well as co-operation between business, government and NGOs. This thesis argues that these features are best understood as being dependent on a framework of concepts and assumptions as part of a political ideology, that Büscher *et al.* (2012) refer to as 'neoliberal conservationism.' This approach is used to re-examine the assumptions that biodiversity offsets make in their current practice and discussion, and what is prioritised in the policy-making and implementation stages.

Since the points raised in this body of political ecology literature are extensive, this thesis summarises them in two key issues. The first is the critique of the construction of 'unavoidable loss' through use of offsets as part of the mitigation hierarchy. The use of 'unavoidable loss' in reference to offsetting is introduced by Sullivan (2013). This argues that in the process of biodiversity offsetting, development and residual loss are quickly cast as 'unavoidable,' and replaced with a focus on the possibility of exchange of biodiversity. There are concerns that this has already permitted development that would previously be resisted due to its impact on biodiversity, which may result in the weakening (or continued weakness) of environmental policy. This framing is based around the fact that biodiversity offsets are ultimately an exchange of metrics, as biodiversity itself cannot be physically exchanged. The

transformation of an area to a valued parcel of nature, to be exchanged, is seen as highly problematic for biodiversity and culture, as elements such as temporal context, individual species and geographical significance are lost in this consideration (Arsel and Büscher 2012).

The second key point looks at the network of groups who have generated biodiversity offsetting policy and seek to propagate it. The involvement of the BBOP is constant in the international push for biodiversity offsetting, and this group have been previously recognised a sharing a common framing of biodiversity issues and support for market-based solutions to environment (Benabou 2014). Their connection with the business community and governments has provided useful discussion on the priorities of those involved, and how this affects the practice, design and monitoring of offsets. The theory of neoliberal conservationism also notes that the alliance of powerful groups and the concealing of consequences of development have raised important criticisms about the lack of representation in the use of biodiversity offsetting.

#### 1.3 'Unavoidable Loss' and the Re-creation of Nature

This subsection describes the place of biodiversity offsets in the mitigation hierarchy, and introduces the criticism of the definition of unavoidable loss given in biodiversity offsets. In considering the political context of offsetting programmes, it is acknowledged that companies and governments have shown an interest in promoting development, and often seek to reduce the cost of environmental responsibility to do so (Walker *et al.* 2009). In the case of biodiversity offsetting, this thesis argues that without clear, external enforcement of avoidance and on-site restoration, offsets may be intentionally designed and implemented poorly to reduce costs at the expense of biodiversity loss. This damage is possible due to the simplification of nature during the calculation of offsets, the exclusion of some attributes altogether, as well as a poor record of monitoring and determining the length of offsetting. The potential for offsetting to cause environmental damage is an important recognition of why the EU's inclusion of an offsetting programme could create significant negative impacts.

Both in the BBOP principles and recent forums, it is emphasised that offsetting should not be

discussed as an isolated issue, instead considered alongside existing conservation methods, and that they should occupy the last step of the mitigation hierarchy (BBOP 2013:3). The mitigation hierarchy is a framework which states that in dealing with environmental damage, projects must first seek to avoid environmental impact, then reduce the impact the remaining damage has on biodiversity on-site. Only after these two options have been exhausted are compensation measures, including biodiversity offsets, supposed to be considered. This is problematic because in practice there is often no strong decision-making process to require the exhaustion of options. Sullivan (2013: 84) argues that that this ambiguity of responsibility has allowed projects to frame biodiversity loss as unavoidable based on the mitigation hierarchy. Given the lack of discussion of what constitutes the exhaustion of avoidance and reduction outside of political ecology, the design of biodiversity offsetting programmes have been effectively applied at the same time as other mitigation strategies, rather than following appropriate process.

By uncovering the underlying causes that determine the form of biodiversity offsets and their eventual impact, this thesis argues that political ecology does more to contextualise biodiversity offsetting within the broader picture of environmental practices than the step-by-step process of the mitigation hierarchy. The extent to which the equivalence of these conservation actions can be considered successful when dealing with certain biodiversity losses from development should also be judged on who is leading and monitoring the mitigation process and those who are left out of the decision-making, which is particularly important given the offsets' long time-frame and the acknowledged limits to what can be recreated.

The policy and practice of biodiversity offsets requires a strict redefinition of biodiversity and nature (Hannis and Sullivan 2012). Due to how biodiversity offsets calculate a wide range of species, habitats and corresponding ecosystem functions as movable or exchangeable through offsetting, it has been heavily linked to the process of value production. Arsel and Büscher (2012) described this process as a way of replacing (or repressing) other conceptions of 'nature' in affected areas, with a new metric based understanding of the area. Sullivan (2013) has contributed to the demonstration of how biodiversity offsets can thus cause harm, by giving a logic to the destruction of complex ecosystems. These ecosystems are instead

recreated as simplified benchmarks that can be fulfilled elsewhere in order to allow development to be presented as environmentally neutral or even beneficial.

No-net-loss is implicit in the idea that gains can balance losses, and its integrally connected with the development of environmental measurements for exchange, as being undertaken EU-wide now (EC 2011). What is highly problematic is that by prioritising the possibility of measurable equivalence, the definition of biodiversity shifts from the specific species and habitat specific to a wider definition to accommodate valuation and biodiversity offsets. Moreno-Mateos *et al.* (2015: 554) argue that it is widely recognised that the implications of no-net-loss referring to definable values rather than representing comprehensive coverage of ecosystems means that values must have captured 'critical attributes of ecosystems.' This builds on literature over the possibility of restoration, and the weakness of instrumental-focused values. Moreno-Mateos *et al.* (2015) criticise the lack of non-instrumental values in offsetting, focusing on the unique historical features of many different ecosystems (from old-growth forests to low-intensity managed grasslands)

The drive for measurable equivalence as the main feature of biodiversity offsetting has often taken priority over accounting for complex circumstances. Though the suggested principles for biodiversity offsetting and key reports include the idea that their should be limits to offsets, this has been limited to the use of multipliers to cover failures of offsetting projects (for example time-lag and complex ecosystem chains) by claiming a numeric equivalence. Moreno-Mateos *et al.* (2015: 556) lay out a research agenda to consider ecological loss alongside other neglected losses such as residual loss in time difference, and baseline loss by calculating 'expected' losses. They also discuss conceptual losses such as regulatory loss and undermined funding, as well as the deeper issues of transforming the meaning of 'nature' into an artefact. Some German states have qualitative assessments built into their biodiversity offsetting assessments, but these have been poorly integrated, as these recommendations again become one of several numerical values (Rundcrantz and Skarback 2003). This again divorces the specific features of the project from the exchange.

The principle that offsets should consolidate areas of high biodiversity value has often been pushed as part of the formation of new offset policy (Darbi and Tausch 2010; Hannis and

Sullivan 2012). The consolidation is an attempt to address the ecological realisation that smaller-sized ecosystems like those created in on-site mitigation, usually cannot function like there larger counterparts. The attempt to bring in areas identified as high biodiversity in order to meet broader conservation goals is widely rejected by many ecologists due to the distinct needs of these areas (Curran *et al.* 2014: 618). Offsetting currently appears to lack evidence that it can offer a sustained and thorough program to meet these requirements. Furthermore, an offset creating high biodiversity areas would allow for damage to much larger areas of lower-valued habitats, which would concentrate certain types of habitat while removing large parts of another. Sullivan (2013) gives a case study in the mining sector in Namibia, where the loss of large areas of grassland were proposed to be offset by the protection of several high biodiversity areas without any certain restoration activities outlined in the plan. Even in better managed cases, this process problematically ties development to the preservation of biologically significant areas, demanding a measurable loss of biodiversity and the increasing access of land for development in exchange for the pursuing of existing environmental goals.

# 1.4 The 'Business Case' for Biodiversity Offsets

From the outset, biodiversity offsetting has had a strong emphasis on providing a business case. This means that biodiversity offsets should appear attractive for developers and investors from a monetary standpoint, and thereby engage them more positively in their environmental responsibilities. This has prompted concern about the relative influence and interests of key decision makers, particularly when working in ambiguous frameworks. Benabou (2014: 105-6) traces the emergence of biodiversity offsetting at an international level from the early 2000s as the result of dialogues between the International Union for Conservation of Nature (IUCN) and the International Council on Mining and Metals. The mining industry was facing problems with access to land, particularly in areas of high conservation, and pressure to take responsibility for residual impacts on biodiversity. Following this, ten Kate *et al.* (2004) released a report on the 'business case' for biodiversity offsets, which led to the creation of the BBOP as part of the pro-business Forest Trends Group. The BBOP itself is a collaboration of different organisations, which include the International Finance Corporation, The Biodiversity Conservancy, The Nature Conservancy

and Conservation International, with Rio Tinto and Shell also part of the group until 2008 (Benabou 2014: 111).

Organisations and academics draw the key principles of biodiversity offsets from BBOP documents as the central source. They are widely cited in literature and directly referenced in the EU strategy and working group papers (EC 2013b). Their central role in defining biodiversity offsets means that we should question whether these principles are detailed enough to ensure positive impacts of biodiversity offsetting, and analyse what the principles take for granted and which criticisms they have not addressed. Given the involvement of private companies in the formulation of international biodiversity offset principles, political ecology has been understandably interested in the emphasis on the 'business case' in programme design and what consequences it is likely to have in changing environmental activities. These suggest that biodiversity offsets could provide 'regulatory goodwill' for development, which provides the benefit of defined risk (again, on principles influenced in the interests uncritical to developments) and possibly easier access to land under the guise of good environmental stewardship. Benabou (2014: 112) suggests that this may explain the increase in voluntary 'no-net-loss' commitments in the private sector, along with the interest from the financial sector, who see the possibility of extending biodiversity offset markets as a new type of asset.

Walker *et al.* (2009) focused on the issues of biodiversity offsetting by conceptualising the processes as a negotiation. They argue that the weak technical design and enforcement issues of offsets are predictable results, due to the priorities of offsetting principles to facilitate exchange and the motivations of the social groups involved in the negotiation. Due to the necessarily imprecise and project-based considerations to find a suitable currency for a site, Walker *et al.* (2009: 151-3) conclude that the discounting of vital aspects of the site are embedded in the bargain between direct participants, which comprise primarily of developers and technical public officials. Even with clear rules, the coincidence of interests between officials and developers are likely to prioritise development and the minimisation of offsetting costs within the ambiguous exchange restrictions currently in place. Biodiversity offsetting can also fulfil the interests of the state as a method of neutralising its responsibility for environmental damage by off-loading it to the private or civil sectors (Castree 2008: 148).

Complicating this is the overlapping membership of officials responsible for designing offsets and the developers who are required to fulfil them. MacDonald (2010) has identified close links between key individuals in influential organisations, sometimes moving between the private sector and NGOs, which partly explains the transfer and use of common logics of neoliberal conservationism and presentation of the issues. Benabou (2014:111) has also demonstrated the role of close personal links through organisations in the case of biodiversity offsets, such as ten Kerry, who moved from the UN Conference on Environment and Development into private investment and consultancy companies, before founding the BBOP. Igoe, Neves and Brockington (2010) have argued that the new (since the 1990s) alliance of business, government and non-government organisations have played a large role in setting mutually agreed logics over how the environment is to be managed. Büscher *et al.* (2012) defines these logics as forming a political ideology, which has been termed 'neoliberal conservation.'

The dominance of neoliberal conservationism is associated with a particular relationship between key institutions, including governments, non-government organisations and corporations. Igoe, Neves and Brockington (2010) define this alliance as the 'sustainable development historic bloc,' and emphasise the importance of these links as demonstrating the maintenance of dominant ideology in conservation. Though some large conservation NGOs have openly rejected the extent that international conservation forums and programmes seek input from the private sector, others have enthusiastically supported these links and played large role in providing technical support and open collaboration (Benabou 2014: 110).

Concerns about the priorities of key participants are under more scrutiny given the common framing of biodiversity offsets as an overwhelmingly positive initiative more often than a compensation scheme. The principle of offsetting as providing additionality is often taken as an opportunity to phrase an offsetting program as a positive environmental action rather than an attempt at regaining what is directly lost through planned environmental damages. Additionality refers to the proof that the activities that are undertaken on the offsetting site should be demonstrably greater in ecological value than if the activities were not undertaken (Bull *et al.* 2013). It also provides an argument for 'development-led' offsetting as a broader

solution environmental degradation through offsetting to markedly improve environmental conditions. However, additionality has been unfulfilled in certain existing programmes. US species banking has, for example, been revealed to have an overarching practice of claiming 'preservation' of already formally conserved habitat (Pawliczek and Sullivan 2011).

Benabou (2014: 114) describes the proving of additionality a 'tightrope walking exercise' which encourages developers to present chosen offset sites as being under threat, in order to lower the eventual cost and scope of the offset. Particularly if a dynamic baseline is used, the assumed loss of biodiversity of a developed area can be so high as to only require modest offsetting results. This 'locks in' the potential decline of the offset site, allowing developers to proceed with actual destruction of habitat and species of the developed site, and only take responsibility for re-creating a degraded level of biodiversity (Moreno-Mateos *et al.* 2015). Temple *et al.* (2010) noted this in their case study of a Rio Tinto offset in Madagascar, where the previous 10 year degradation was extrapolated to 2065, guaranteeing that even if the offset is successful, the result will be as if this current rate of loss continued for the next 50 years. Providing additionality could include 'trading-up' to more conservation-valuable offsets if allowed by the offsetting framework. As discussed in the previous section, this legitimises the conservation of one type of habitat based on the destruction of another on the merit of equivalence.

Optimistic graphs like those provided by the BBOP purposefully show proportional overreaching of environmental impact, but at the same time documents are aimed at potential investors present offsetting as a more cost-effective solution to meeting company's environmental requirements (BBOP 2013). When issues of uncertainty are included, it is hard to see what would motivate consistent overreaching of biodiversity targets in project-based biodiversity offsets.

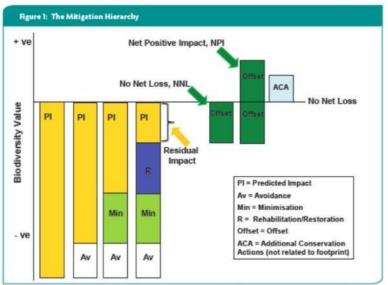


Figure 1. 'The Mitigation Hierarchy' (BBOP 2013: 3)

Adapted fro Rio Tinto & Government of Australia

Use of graphs and language to simplify the non-technical hopes of biodiversity offsetting is considered a characteristic strategy of offsetting and demonstrates the primary focus on clean technical processes over realistic assessment of the processes. Igoe, Neves and Brockington (2010) argue that the positioning of these solutions as commonsensical relies on the creation of 'spectacle.' In this case, a 'spectacle' describes the act of presenting conservation solutions in a way which conceals any verification of the actual impacts and relations they are supposed to create and people and organisations are suppose to value. This is an argument to interpret why the logic of biodiversity offsets as 'equal compensation' and 'no-net-loss' is constantly restated, while an understanding of the impacts of the initial damage to biodiversity and consequences of incomplete 'restoration' are widely absent from reports and policy considerations.

#### **Section Conclusion**

In conclusion, a review of available literature has demonstrated that there are many acknowledged issues with current biodiversity offsetting practice. The consensus is that there are numerous ecological complexities that need to be addressed in making biodiversity offsets

that can be said to demonstrate measurable no net loss, including neglected or unresolved issues with time-lag, risk and what should be considered equivalent. Political ecology has in turn criticised key concepts that underlie the current practice of offsetting, questioning the extent to which offsets can be considered to provide areas that function as a replacement for environmental damage caused by development. This thesis connects biodiversity offsets to the political ideology of neoliberal conservationism, built on evidence of political networks which prioritise the exchangeability and uncritical approach to development projects. Past experience in offsetting programs has highlighted the difficulty of monitoring and legislating to ensure that responsible action is taken to the best of our knowledge and precaution is used when actions are not sure to produce good ecological outcomes. These previous findings suggest that biodiversity offsetting would be detrimental to EU biodiversity, particularly if many of these criticisms are not effectively addressed in the formation of EU policy and the resulting guidelines, legislation and monitoring that this will entail.

# Section II Biodiversity Offsetting in EU No-Net-Loss Initiative: What is being Discussed?

Having reviewed the major criticisms and challenges of biodiversity offsetting in the previous section, this section examines the EU biodiversity strategy in more detail. In order to assess the proposed inclusion of biodiversity offsets and elements of the strategy and accompanying discourse that indicate how it will be implemented, this thesis relies on an analysis of key EU documents and EU-commissioned reports on the use of biodiversity offsetting. These documents help us understand the role that the EU intends for biodiversity offsets within its 2020 No Net Loss (NNL) initiative in lieu of final legislation or guidelines, which are still in formation. The documents are assessed to examine whether the EU is addressing the criticisms and challenges of biodiversity offsetting brought up in the previous section. This includes looking at the sources of information considered and the language used in the description of the scope and limitations of biodiversity offsetting. The concept of 'neoliberal conservationism' is connected to patterns of language and previous use by actors involved in advocating the international spread of biodiversity offsetting. This has been used to make arguments about the trajectory of policy development in the EU, as well as create

explanations as to why certain concepts and issues of biodiversity offsetting are prioritised over others.

As outlined in the method section of the introduction to this thesis, the primary documents analysed are the EU 2020 Biodiversity Strategy (EC 2011) and the document on operational principles of NNL Initiative adopted by the NNL Working Group (EC 2013). Also analysed are the three EU-commissioned reports on Biodiversity Offsetting, which were produced to give policy options for the NNL initiative. These are 'Policy Options for an EU No Net Loss Initiative' (Tucker *et al.* 2013), 'Exploring the Possibility for Habitat Banking' (Conway *et al.* 2013) and 'Study on Specific Design Elements of Biodiversity Offsets' (Conway *et al.* 2014). In order to supplement the conclusions, this analysis will be followed by a discussion of commentary on existing European biodiversity offsetting programmes. The three cases chosen within the European context are Germany, France, and the UK, primarily due to their frequent reference in policy recommendations and academic literature. These cases will therefore likely influence the future of biodiversity offsetting in EU through existing frameworks and practices. These cases also provide further evidence to assess the potential impact of biodiversity offsetting and highlight systematic issues in their implementation.

### 2.1 Key Document Analysis on Proposed Use of Biodiversity Offsets in the EU

This section will now examine the available EU documents and relevant recommendations and comments from associated organisations that give us an indication whether the criticisms of biodiversity will be address and what issues are being prioritised in discussion. This begins with an explanation of the documents' position in the EU's process of developing policy on biodiversity offsets. In 2011, the EU released its communication on its 2020 biodiversity strategy, entitled 'Our life insurance, our natural capital: an EU Biodiversity Strategy to 2020' (EC 2011). The document proposed 6 targets and 20 actions, which together contribute to the overall goal of 'halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020' (EC 2011). These documents are important to understand the overall framing of the EU's approach to its biodiversity after the failure of its 2010 goals and continuing degradation thereof. The clearest shift, outlined in the beginning of the strategy, is a new focus

on environmental valuation and ecosystem services, which are centrally placed in strategy through the overarching initiative to create a common valuation of EU biodiversity. This shift has been attributed largely to the agreements that the EU made in the 2010 Nagoya Convention on Biological Diversity and in the results of a commission- sponsored project with TEEB (EC 2011).

Within this biodiversity strategy, target 2 'Maintain and Restore Ecosystems' contains action 7, which proposed the development of an EU No Net Loss (NNL) Initiative. Its text specifically suggests that NNL could be achieved 'through compensation or offsetting schemes' (EC 2011), and as such discussion of biodiversity offsetting has featured heavily in policy documents since then. In 2014 the NNL initiative was opened to a public consultation, which was concluded in 2015, but as of yet this has not produced any concrete suggestions for EU biodiversity offsetting programmes or supporting legislation. The last major stage of EU 2020 biodiversity strategy has been the 2015 mid-review, which showed poor performance on biodiversity targets and mentioned the ongoing difficulties in ensuring implementation and funding for the existing Natura 2000 program (EC 2015).

In 2012 the EU parliament proposed a resolution for the NNL initiative to be operationalised, and a working group was formed. The working group adopted documents in 2013 that defined the scope and objectives of the NNL, as well as operational principles, which also identified broad stakeholder positions (separated between industry and NGO representatives). These documents included discussion of biodiversity offsets under the compensation framework as part of the mitigation hierarchy, establishing additionality as a requirement and requesting the EU make clear and transparent rules for measuring equivalence and developing a legally binding framework if offsets were to be used (EC 2013a: 6). From these two documents, the 'operational principles' document (EC 2013a) has been chosen for analysis as it generates concrete principles as recommendations for how biodiversity offsets will be implemented in the NNL, whereas 'scope and objectives' largely situates the NNL within existing EU policy, which contains little reference to biodiversity offsetting as a new mechanism (EC 2013b).

The EU has commissioned three reports in order to explore the policy options for the NNL initiative, all of which explicitly discuss biodiversity offsetting in detail (Conway *et al.* 2013;

Tucker *et al.* 2013; Conway *et al.* 2014). The 'Policy Options for an EU No Net Loss Initiative' (Tucker *et al.* 2013) (hereafter 'Policy Options Report') devotes contained a section detailing the possible scope and requirements of a biodiversity offsetting programme based on national experience in programmes in UK, France, Germany and others. 'Exploring Potential Demand for and Supply of Habitat Banking in the EU' (Conway *et al.* 2013) (hereafter 'Habitat Banking Report') examines the possibility of biodiversity offsetting through habitat banking schemes and how they would be integrated into the EU's biodiversity strategy, also through analysis of current European habitat banks, where land for offsetting is created ahead of time and sold to developers. The most recent report is 'Study on Specific Design Elements of Biodiversity Offsets' (Conway *et al.* 2014) (hereafter 'Biodiversity Offset Design Report'). This report has been analysed in more length than the previous, as it has the EU use of biodiversity offsets as its focus and contains the most recent recommendations publicly available.

# Authors, Key Organisations, and Key Sources of Information

There are recurring names among the authors and contributors of the three EU-commissioned reports and the NNL working group document analysed in this thesis. All three reports were made by or in partnership with the US consulting service ICF international. The authors of all three reports included Mavourneen Conway and Matt Rayment. Kerry ten Kate, head of the BBOP, who Benabou (2014) identified as a key individual in the framing of a 'business case' for biodiversity offsets, is listed as a contributor for all three policy reports and is a member of the NNL working group. Fabien Quétier is also a contributor and member across all analysed documents, representing a more critical voice of biodiversity offsetting.

The 'Policy Options Report' (Tucker *et al.* 2013) references a reasonable selection of literature identified in section I, including Bull *et al.* (2013), McKenney and Kiesecker (2010), as well as more critical ecology literature such as Maron *et al.* (2012) and Temple *et al.* (2010) Sources of information in The 'Habitat Banking Report,' when discussing the potential design of biodiversity offsets, primarily references McKenney and Kiesecker (2010) for general design and BBOP resources (Conway *et al.* 2013). Other references largely refer to details of case studies. BBOP principles are also given as Annex II of the NNL working group

operational principles, and they are referenced throughout the text, though not specifically adopted as EU principles (EC 2013: 10-11).

### Patterns in the Framing of Biodiversity Offsetting

Across all analysed documents, biodiversity offsetting is presented as having an important role to play in the fulfilment of no-net-loss. Though the NNL working group document is less direct, the subsequent reports argue that despite problems, offsets 'can provide an effective means of delivering conservation outcomes in Europe,' (Tucker *et al.* 2013: 213-4). This is largely built on the restating of the lack of current legislative framework that applies to biodiversity loss outside the protected areas of the Natura 2000 network (Conway *et al.* 2013: xiv). This is also in context of the EU Environmental Impact Assessment directive (EIA) providing no specific obligations (Conway *et al.* 2013: 7). All three reports were explicit in the statement that most 'risks' of biodiversity offsets could be 'addressed through careful design and implementation,' (Tucker *et al.* 2013: 216).

From discussion of the operational principles of the NNL (EC 2013a), it is clear that contribution of biodiversity offsets to positive gains in biodiversity is expected to be limited. The burden of the EU strategy to achieve these 'gains' in ecosystem health lies in some combination of a) increasing the health of Natura 2000 areas as stated in target 1 and 2, while preventing further degradation through protection and/or offsetting, and b) increasing the health of unregulated ecosystems through the green infrastructure and agricultural programs while preventing further degradation through EIA's and the mitigation hierarchy, with offsetting as a final resort. This means that as best understood from the strategy, biodiversity offsets are not expected to provide a significant improvement that would meet the biodiversity goals, but expected to contribute to the halting of degradation.

The idea of using offsets in a way that clashes with Natura 2000 areas has been explicitly rejected by the EU NNL Policy Options report (See EC 2013b; Tucker *et al.* 2013: 216). However, in other parts of both of these documents, there are suggestions that an extension of biodiversity offsets could be used as a type of compensation to meet other conservation goals,

such as linking with the Natura 2000 areas. This is a major continuing issue of contention, as offsets are presented either as a possible source of funding or a way to 'consolidate' areas, and encourage the development of biodiversity 'markets' similar to international biodiversity banks existing in the US and Australia. There is also remark that new developments are 'in theory quite likely to affect' Natura 2000 protected areas due to their extensive coverage (Conway *et al.* 2013: 10).

The most recent 'Biodiversity Offset Design' report suggests that some areas within the Natura 2000 network considered 'individually insignificant or indistinct' could be offset through 'like-for-like' without the strict commission guidelines, though possibly still with strict location requirements to maintain the integrity of the network,' (Conway *et al.* 2014: 309). In the NNL Working Group, industry members suggested that the NNL initiative could be used to meet international commitments and economic and social cohesion goals, whereas NGOs argued that the primary aim should be 'biodiversity protection and enhancement' (EC 2013: 2). Reports suggest that proposing offsets can fulfil other policies for example, 'such planning and measures can enhance the potential for offsets to contribute to strategic goals such as the enhancement of Green infrastructure, ecological networks or climate adaptation,' (Conway *et al.* 2014: 312). This is concerning as it undermines the principle of additionality, where offsets cannot replace existing environmental responsibility. Given the evidence presented in section I on the problems of additionality in the implementation of offsets, there is a concern that the use of offsets in this way will indeed undermine existing environmental policy and protection, and instead connect them to the permission of new development projects.

#### Addressing Issues of Unavoidable Loss

The mitigation hierarchy has been strongly stressed in EU biodiversity strategy from its inception (EC 2011), and has also been referred to in the NNL working group as 'appropriate avoidance, minimization, and restoration measures,' followed by compensation (EC 2013: 1). It is constantly restated as a vital context for biodiversity offsets in subsequent working reports and in response to received stakeholder concern (Conway *et al.* 2014). However, the details of the other stages of the mitigation hierarchy are not often not discussed in any length compared to the details of offsetting.

It is also stated that offsets should not justify 'unacceptable' impacts, which may require prohibiting the practice in some cases of 'unique habitats or irreversibly loss' (Conway *et al.* 2013: 4). However, this prohibition does not consider the possibility of accruing loss of biodiversity over widespread application of offsetting, which would be the case is it became a mandatory EU-wide practice. Though each stage of the mitigation hierarchy is considered separately in the NNL working group operational principles, there is acceptance that 'in practice... design of avoidance, mitigation and compensation measures happens to some extent simultaneously,' (EC 2013: 5). It is clear from the NNL working group report that the definition and requirements of the avoidance step will be important in the proposed use of offsets. There is a sharp divide between the language used by NGOs, who argue for an assessment of public interest based on residual impact before offsetting is used, and industry, who asked that the EU NNL initiative should not result in 'new obstacles to economic activity (EC 2013: 4).

# **Addressing Issues of Equivalency**

In the 'Policy In the 'Habitat Banking Report' the terms 'like-for-like or better' and 'trading-up' are used to describe the compensation that biodiversity offsets should provide, though this is not strictly defined and expected to differ based on 'the context and policy requirements,' as well as physical conditions (Conway *et al.* 2013: 58). This is framed as providing the possibility to offset areas where the 'supply of offsets is limited' due to the availability of land that can feasibly be restored. Dune and rocky habitats are identified as the most limited, though the suggestion reads as though the scarcity of these habitats should instead encourage them to be offset by creating 'better' habitat offset options. This is followed by the concern that possibility of offsetting through 'averting risk of damage or degradation' in the EU is heavily constricted by the EU responsibility to protect these types of habitat (Conway *et al.* 2013: vii).

This is extended in the 'Biodiversity Offset Design' report into the suggestion that habitats not considered 'of Community interest' or part of the Natura 2000 network could be offset through 'trading up,' in some cases, whether they were considered scarce or not (Conway *et al.* 2014:

309). In these cases, the language in discussing what should determine the equivalency of biodiversity offsets presents it as an issue of supply of suitable land for biodiversity offsets, rather than of a restriction to what type of habitats should be offset. This creates concern about the repeated calls to be 'flexible' with issues of equivalency, as it does not seem to properly address the underlying question of why certain habitats are limited in their ability to be recreated. The positive language of 'like-for-like or better' obscures the underlying claim that damage to an area can be compensated by an offset of an entirely different type of biodiversity, which severely distorts the concept of compensation for biodiversity loss.

### Addressing the Design of Metrics, and Issues of Timing

Though the EU has not released guidelines on what metrics should be used in its biodiversity offsetting programme, the operational principles adopted by the NNL working group mentioned both the need for 'a very high degree of accuracy' as well as the recent development of 'pragmatic and stable' metrics (EC 2013: 3). The EU-commissioned report on 'Biodiversity Offset Design' recommended that common principles should be put in place rather than establishing an EU-wide standardised set of metrics (Conway et al. 2014). In its consideration of which metrics to base these principles on, the report ultimately recommended the simpler 'habitat area x standard value,' which give a number to each type of habitat based on recorded biodiversity prior to the offset and its size. This does not assess the habitat on its current condition or directly assess the relation between the damaged site and the functions the offset is suppose to provide. This metric was recommended due to its moderate cost and reliance on expert judgement to assign a value to the biodiversity in the specific ecosystem, in addition to the fact that the use of this metric was already widespread in German offsetting programmes. This metric was recommended over focus on specific species or additional consideration of site conditions due to the complexity of these processes. Interestingly, the report also noted that metrics that included ecosystem services were not yet developed, would be time-consuming and expensive to gather and ultimately difficult to quantify or value in a reliable and transparent way (Conway et al. 2014: 82). In the 'Habitat Banking Report' the metric most discussed is the DEFRA metric from the UK, and UK and the US are the most commonly cited case studies (Conway et al. 2013: 95-6).

There are many yet uncovered issues in addressing biodiversity offsetting in the available reports that were identified in the literature in section 1 of this thesis. Most notably, the issue of time-lag has been rarely mentioned, despite being a widely recognised problem for implementation and conceptual design of offsets. The time scale for habitats to be fully functioning (thus providing demonstrated benefit) is defined as taking 'possibly more than 50 years... while others may be created or restored within 10 years, (Conway et al. 2013: 58) though later acknowledges studies that claimed many EU habitats of unfavourable conservation status would like take 100-150 years (Conway et al. 2013: 59). This has consequences for the possibility of having measures put in place before the offset can be granted, as this would represent a major delay in development. The issue of interim time between the creation of offsets is briefly mentioned, with two suggestion given to address time-lag being habitat banking, and the use of multipliers (phrased as 'appropriate discount rates') (Conway et al. 2013: 101). The reports again suggest 'most (if not all) habitats are restorable, if given sufficient time' (original emphasis), though some time-scales mean that 'essentially irreplaceable,' metrics are suggested to account for time-lag (Conway et al. 2013: 61).

The 'Habitat Banking Report' (Conway 2013: vii) explicitly states that factors other than 'availability and/or accessibility' of land for offsets and 'timescales' are 'of less concern.' This conclusion relies on the assumption that areas of high biodiversity are already protected in the EU, or that the mitigation hierarchy should limit the losses of more distinctive habitats. However, as discussed in section I, avoidance based on prior calculation of residual damage is not adequately enforced, and together with compensation mechanics such as offsets actually contribute to the framing of biodiversity loss as 'unavoidable,' (Sullivan 2013). In addition the idea that biodiversity offsets would make development of high biodiversity 'too costly' to undertake relies on monetary disincentivisation, rather than assessment of the biodiversity itself (Conway *et al.* 2013: 59)

### Addressing Issues of Monitoring and Considering Socio-Political Context

It is clear that much of the recommendation for biodiversity offset use is dependent on the EU and member states developing significant institutional capacity, which this thesis argues

represents a significant cost and focus of resources. The documents analysed feature constant calls for monitoring, strict legislation and/or significant guidance on implementation and design issues are framed as necessary to ensure the proper use of biodiversity offsets. The requirements listed are significant, and include defining clear targets, checking applications and all stages of the mitigation hierarchy, ensuring fair and transparent monitoring, establishing an 'enabling framework of incentives and/or property rights,' (Conway *et al.* 2014: 312; Conway *et al.* 2013: 105-6). Habitat banking or the creation of offsets for use prior would also require an accreditation system (Conway *et al.* 2013: 116) The concerns are also based on feedback from the introduction of offsetting guidelines for Natura 2000 areas, which indicated that the relevant authorities 'felt rather unprepared' for the valuation and comparison of habitats (Conway *et al.* 2013: 11). The expected 'high administrative and transaction costs' are listed as a weakness in biodiversity offsetting (Tucker *et al.* 2013: 216). However, the discussion of funding issues and comparative gains (for example, the opportunity to properly fund Natura 2000 protection) are not integrated with sections that establish the 'necessity' of biodiversity offsetting in fulfilling the NNL initiative.

Regarding the social and political context and the effect that it has on the fulfilment of biodiversity offsets, little is said. The 'Habitat Banking Report' has only a small section on 'social and administrative constraints' and only mentions the possibility of 'unanticipated public backlash' and the length of administrative procedures as limiting what is feasible for offsetting (Conway *et al.* 2013: 65). It is stated that government, developers and landowners are likely to be the three parties involved in offsetting, but that 'local level engagement' can also be very important to gain public acceptance (Conway *et al.* 2013: 104). In terms of monitoring, it is interesting to note that although 'lack of enforcement' is often connected to the poor performance of offsets, the 'Habitat Banking' report never explicitly discusses the pressure that interests of developers or government may have on the fulfilment of offsets, only the public (Conway *et al.* 2013: 116-7).

The 'Policy Options Report' however does reference the concern that developers will 'forgo the proper application of the mitigation hierarchy' though there is no explicit reference to evidence that the implementation stage of offsetting can be adversely affected by interests to reduce cost or timing (Tucker *et al.* 2014: 310). Also, despite the frequent reference that

monitoring and planning should be transparent, the political ecology critique that issues of public interest are poorly represented in the design of offsets does not appear to be addressed in any significant sense.

In conclusion, the documents analysed a particularly positive tone to the application of biodiversity offsets. The outline of key issues in offsetting is more precautionary in tone in the NNL working group report (EC 2013), whereas the three reports are explicit in the necessity of biodiversity offsetting and its ability to overcome the identified issues. Though it is difficult to know from the available evidence how these recommendations will be implemented by the EU, or how the EU will interpret these viewpoints, it does represent a large cohesion of opinion and recommendations of publicly released material for the EU to consider.

## **2.2 Experience with National Biodiversity Offsetting Programmes: Common Features** and Shortfalls

The most recent EU-commissioned report stated that though the biodiversity offset should be a legally binding contract between the developer and the state, the regulation for the offset would be based on existing regulatory arrangements where possible, to be guided by common EU principles (Conway et al. 2014: 86). This is reinforced in the NNL working group's adopted operational policy, which refers to a 'common implementation framework' which would be based on 'existing experience as well as the specificities of each Member State,' (EC 2013: 3). Therefore, the features of existing national offsetting programmes (and their respective successes and failures) are likely to continue to have an impact on the results of EU offsetting, as well as influencing the regulation in countries which have not had previous offsetting legislation before. This section looks at the design, framing and patterns of implementation of three existing national cases of biodiversity offsetting, in order to understand the development and impact of these offsetting policies. The national cases selected are offsetting legislation in Germany and France, and recent pilot programmes and policy development in the UK. Recent shifts in the design of national offsets and the form in which they are implemented are of particular interest, as these could inform the final direction of EU policy on biodiversity offsets.

Germany and France have the longest existing practice of biodiversity offsetting within Europe, and have both implemented over 100 offsets based on national guidelines in the last 10-15 years. This allows us to analyse the patterns in the execution of these programs where data is available and connect them to the intentions of the policy. The German biodiversity offsetting programme was introduced as part of legislation that built on the 1976 Impact Mitigation Regulation (IMR), which aims to compensate for development caused damage across whole ecosystems. In the European context, Germany has the longest experience with developing offset metrics and requirements and putting them into practice, with significant areas assigned to offsetting measures (Conway *et al.* 2014). The details of German offsets are largely dependent on the different states' choice of metrics and processes, meaning that there are very different experiences available.

The French biodiversity offsetting programme has nearly 100 existing cases, and is unique in its availability of data on these existing sites, though many of these offsets are too recent to make observations about their success (Regnery, Couvet and Kerbiriou 2013). Biodiversity offsets in France were also possible under 1976 obligations to compensate for impacts on the environment, though the practice has only been recently applied in any large scale (Tucker *et al.* 2013). As a result in 2010 French Environmental Impact Assessments were updated to require descriptions of offsetting measures to determine the liability of developers, with the permit authorities responsible for monitoring (Conway *et al.* 2015:128). Prior to this change, biodiversity offsets were often last-minute solutions to unresolved impacts that have proven to be poorly designed.

The UK has relatively few practical cases and currently has only a voluntary framework for offsets, but is used as a case study due to its feature in several reports and academic papers, which suggests its developing policy appears to be influential in the wider EU context. The UK has also encouraged the practice of habitat banking, specifically presenting the option to buy credits from landowners and businesses, and emphasised biodiversity offsets as a new business opportunity (Hannis and Sullivan 2012). The UK environmental department DEFRA has created an 'ecosystems markets task force' which has promoted offsetting.' However, the lack of participation in offsetting pilot programs opened in 2012 means that so far examples

of offsets are only available at a local council level. Regardless of this lack of experience, biodiversity offsetting has recently been accepted in the UK green paper, which suggests it will become a national policy regardless.

The details of how these national offsets are designed and which metrics are used to calculate equivalence is varied. In France, the government provides guidelines in implementing offsetting, which considers protected species and their habitats, including connection functionality. As such, requirements are ultimately determined on a case-by-case basis using a variety of methods (often habitat area with risk multipliers). Offsets must be 'like-for-like' as they need to demonstrate functional equivalence as well as located in proximity to the damaged site, though in practice real-estate values often play a large role in determining location (Quétier, Regnery and Levrel 2014). Unlike the proposed ecosystem valuation being undertaken as part of the EU biodiversity strategy, the German offsetting programme does not legislate how to assess the initial state of the ecosystem. It does specify that species, habitats, and ecosystem functions such as aesthetics and soil, water and air functions should all be assessed. Also, some federal methods also make heavy use of 'qualitative reasoning' to assess unique considerations on a case-by-case basis, though the strength of these requirements have varied widely depending on the experts used (Conway *et al.* 2015).

In the UK, which has the most recently developed guidelines for design, there has been a great deal of controversy surrounding the DEFRA-created metric which is to be the basis of offsetting. It has been widely criticised as too simplistic in assigning a habitat value based on three categories of biodiversity (low/moderate/high) and the relative degradation of area (DEFRA 2011). However the metric has also been praised for being transparent and easy to implement. The discussion over the problems of having a habitat-based metric without considering the need for certain species has led to concerns with the ability of biodiversity offsetting programs to co-exist with national and EU species protections (Woodfield 2013).

An important trend is the treatment that these national cases have recently taken to the offsetting of different kinds of habitats, i.e. 'out-of-kind' offsets that promote the replacing of one habitat for a different type. This has been the case in the 2002 and 2009 amendments in Germany, which loosened restriction for creating 'out-of-kind' offsets in order to create

aggregated offsets (compensation pools) that favour prioritised conservation goals (Darbi and Tausch 2010: 10). This shift also creates problems for comparing the loss of biodiversity with the features required for biodiversity offsets, which puts more pressure on metrics to demonstrate equivalence in a transparent way. The UK similarly encourages 'trading-up' with the promise that offsetting will result in more aggregated habitats of national importance (Hannis and Sullivan 2012).

As discussed in the literature review in section I, the available studies on the outcome of biodiversity offsets are severely limited. As Gonçalves *et al.* (2015) summary of case studies indicate, this is particularly true of European offsets, as the primary studies conducted have been in the US and Australia. However, both Sullivan (2013) and Regnery, Couvet and Kerbiriou (2013) have examined existing cases for the UK and France respectively. This was largely limited to the design stage, as offsets in both of these countries have not existed for a significant length of time, which in itself is a concern for making offsetting an EU-wide requirement. Some patterns have been observed that suggest there may be implementation problems in the existing case. The observations from a selection of 85 offset sites in France revealed that offsets have been given less land than affected area, assumes the ability to create areas significantly richer in biodiversity than the current site (Regnery, Couvet and Kerbiriou 2013). They also observed that areas defined as having multiple nationally red-listed species were often offset focusing on a limited number of those species, and often species already present on the offsetting site.

Both Sullivan (2013) and Regnery, Couvet and Kerbiriou (2013) observed that offsets undertaken as part of development proposals did not have any measures to avoid 'temporary' species loss, and therefore did not address issues of time-lag. In addition, both demonstrated cases where approval of biodiversity offsets was given despite these plans being 'incomplete' at the planning stage. In the case of the UK site, offsetting was also used to justify the reduction of other existing planning requirements. Evidence that these recent biodiversity offsetting programmes in Europe are not meeting their basic principles in the design stage, particularly in favouring quick approval and ignoring issues of timing, further underlines that these criticisms of biodiversity offsetting do not appear to have been addressed at either an EU or national European level.

# 2.3 Relevance of Findings: Why are Recommendations on EU Biodiversity Offsetting Concerning?

Based on the previous theory section, review of existing European offsetting programmes and the analysis of key documents and reports on the proposed EU use of biodiversity offsets, this section summarises the extent that previous criticisms have been clearly addressed. Based on the criticism and challenges outlined in section I, there are three major areas which present significant concern in the EU use of biodiversity offsetting:

- the possibility of undermining existing protections, by creating a justification to develop despite irreversible damages and high uncertainty of restoring these losses elsewhere, as well as 'locking in' losses.
- the burden placed on effective monitoring and stricter controls on fulfilling the mitigation hierarchy and limits on how offsets can be done.
- The transformation of habitats, where with loss of unmeasured or less valued features.
   This changing definition of what is decided as valuable, combined with sanction to destroy what is not, changes the character of existing areas in the EU.

Despite the evidence and recommendations of conservationists that the difficulty of successfully offsetting areas of high biodiversity, the EU proposals for biodiversity offsets is still unclear about its expected relation to the Natura 2000 framework. These areas have already been identified as high-value biodiversity, and have their own protection and compensation programs which are only suppose to permit development and offsetting in extraordinary circumstances. However biodiversity offsets are continually pushed as a solution under arguments that existing protected areas are insufficient, particularly being fragmented, which could break with the principle of additionality and therefore put current levels of biodiversity protection at risk. Evidence from national case studies also suggests that in implementation there is a risk that biodiversity offsets will be overstated in terms of land necessary or the level of biodiversity possible for restoration/re-creation, which is concerning given that offsets are particularly unsuited to delivering on high biodiversity demands.

This is not only an issue of allowing more damage through weakening of protection for development, as measured losses can also occur in offsetting if baseline levels are set low and

this degradation is locked-in. There is extensive work suggesting an incentive for developers to do this, particularly on a case-by-case basis, that would require strong safeguards to circumvent this feature of offsetting (Walker *et al.* 2009). Otherwise, offsets may cause damage if they become a preferred option in mitigation due to lower costs and perceived risks, as well as making a conceptual case for classing impacts as 'unavoidable' at lower thresholds. Due to the complex nature of the setting of biodiversity offsets and the current state of scientific disagreement over the possibility of re-creation and high demand of metrics for equivalence, the risk and cost for the EU to provide legislation, guiding programs and monitoring is significant if they intend to address the technical failings of previous offsetting. Given the continual struggle of implementing current protections like the Natura 2000 and the lack of formulated strategies and knowledge about EU marine ecosystems, the opportunity costs of developing an EU-wide offset programme should also be considered.

Finally, there appears to be favour for a flexible approach to issues of equivalency and the development of pragmatic metrics. 'Like-for-like or better' and focus on metrics to determine the limitations of offsets results in a design of biodiversity offsetting as one that explicitly transforms habitats at a loss of unmeasured or less valued features. This changing definition of what biodiversity is decided as valuable, combined with sanction to destroy what is not, changes the character of existing areas in the EU. This has been a persistent argument in political ecological critique towards offsetting, and situates power as a core concern when we talk about the future of habitats or what are often termed 'natural areas' in the EU. The consequences of the German introduction of lower requirements for 'out-of-kind' and similar pushes in the UK offsetting proposals as a sign that these methods are being increasingly accepted against the position of mainstream ecology literature, and re-branded as 'like-for-like or better' and 'trading-up' to soften the reality of the changes they represent. This is consistent with the prioritisation of exchangeability identified in neoliberal conservationism, which creates further concern for the trajectory of biodiversity offsetting use in the EU.

#### Conclusion

At the outset of this thesis, it was noted that the EU 2020 biodiversity strategy was introduced in the shadow of the failure of previous goals and the recognition that in 2010 attempts to set up Natura 2000 and halt the loss of biodiversity in the EU were unsuccessful. In this context, the proposal to cover biodiversity loss in non-protected areas with a no net loss initiative, through the use of biodiversity offsets, is expressed by proponents in the EU as a positive step. However, after reviewing the literature on the criticisms and challenges for biodiversity offsets in section I, there is a substantial argument that the use of biodiversity offsets could have a negative impact on EU biodiversity. Using existing literature linking the ideology of neoliberal conservationism to the obscuring of the redefinition of nature, this thesis introduced criticisms that biodiversity offsetting has previously prioritised exchangeability over ecological concerns and remained uncritical to development through the framing of unavoidable loss.

Based on discourse analysis of key documents and supporting evidence from national offsetting frameworks in section II, this thesis has identified that several of these criticisms were mentioned, but criticisms of time-lag, equivalence, additionality, and consideration of social context and representation remain unaddressed. Furthermore, proposals advocating 'like-for-like or better' and the connection of offsets to other existing conservation goals indicate that in these issues, policy may intensify practices which have already been heavily criticised. In addition, the key EU documents and recent national cases show that the development of metrics as a refined approach to the complexities of ecologies, if it is possible, has been halting, as compromises are made between the promise to capture the essential features of an area, and a need for ease of use and exchangeability. As such, the promise to address ecosystem services as part of biodiversity offsets has been largely unfulfilled.

The reliance on monitoring to resolve these issues was identified as representing a significant cost to the EU, and represents a major commitment based on its frequency in the analysed documents. If the EU releases guidelines, legislation or capacity-building for biodiversity offsetting without clearly engaging these criticisms, resulting offsets are likely to recreate the failure of past experiences and the loss of biodiversity and ecosystem services in EU will

continue. In addition, the current proposals of exchangeability for offsets continue to discount issues of time or relocation that are vital to ecosystem function, so it is highly likely that these issues must be designed outside of metrics with their own enforceable guidelines. Lastly, in the implementation of an offsetting scheme, policy makers must recognise problems with power and decision-making, create more demands for responsibility and restrictions on offsetting practice, and consider social impact in an interactive way rather than through prior valuation.

In order to explain why biodiversity offsetting is being considered as an EU-wide mechanism despite these past failures to deliver on even its own definition of no net loss, or at very least lack of substantial evidence, this thesis introduced an analysis of the network of its proponents and ideology of neoliberal conservationism. The heavy use of business framing for biodiversity offsets is found in a common terminology and the prioritisation of issues such as exchange and flexibility. The business case has been less explicit in the EU technical reports on biodiversity offsetting, and several recommendation, such as making the use of offsets mandatory, prohibiting its use for certain habitats and cautious towards the idea of habitat banks. However, the direction of the UK and Germany national offsetting in recent years, in allowing the conscious replacement of different habitats, suggest some of these suggestions are under pressure. Particularly, the evidence of contradictory stances on the application of offsetting to assist the Natura 2000 are concerning. The uncertain relation of offsets to the Natura 2000 areas could pose a risk to EU environmental protection and result in a weakening of the program.

With the EU biodiversity strategy's definition of no net loss and the attention given in technical reports, the inclusion of biodiversity offsets is being strongly advocated. So long as biodiversity offsetting is implemented or pushed as a part solution to environmental degradation, there should be continuing critique of the priorities key decision-makers, which are public officials, technical experts and business developers. There is a lack of input in EU proposals on how biodiversity offsets would deal with the criticism that the decision-making process is in favour of the developers, and though the EU noted civil society preference for avoidance and the need for monitoring, there has not been any suggestions that these issues are being strongly considered. In continuing to argue that biodiversity offsets do not properly

account for public interest, there is a research gap in the impacts of offsets on the wider population, such as loss of ecosystem functions, culture and access, that could prove invaluable in this regard.

In conclusion, the EU approach suggests that the key criticisms of biodiversity offsets remain largely unaddressed. The discussion of offsets in this paper explicitly drew from a political ecological standpoint to suggest that there were considerable impacts of previous offsetting use, as rather than a method of conserving or replacing what biodiversity we have, even the successful application of offsets does not acknowledge the transformation of nature within limited input from the public. The concerns raised that there will be a reduced focus on avoidance, or that the failure to deliver proven gains in biodiversity indicate that biodiversity offsets are a waste of time and resources to consider better environmental policy options, such as critically addressing the underlying causes of biodiversity loss.

Word Count: 15914

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