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Unnatural Markets: The politics of biodiversity offsetting and failed environmental market-making in England

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Abstract

This thesis examines the biodiversity offsetting programme for England initiated by the UK government in 2011 and abandoned in 2014. Offsetting enables developers to purchase biodiversity credits, representing conservation gain somewhere else, to compensate for residual loss on the development site, ensuring no net loss of biodiversity overall. Recent years have seen increasing interest globally in market-based instruments for nature conservation, which advocates promise will deliver win-win outcomes, facilitating economic growth and safeguarding of nature at the same time, through market efficiencies. Political ecologists, on the other hand, have long highlighted the contradictions encountered in efforts to commodify nature. Drawing on Marxist political ecologies and literature on the neoliberalisation of nature, this thesis examines why the UK government was unable to establish its proposed biodiversity offsetting programme in a particular geographical and historical setting, in a climate of fiscal austerity and growth-orientated deregulation. As the government attempted to enrol sympathetic actors, disputes soon emerged over the purpose and technical details of the proposals. Deeper tensions were quickly revealed: the government's non-negotiable position that offsetting should impose no new costs on developers, that it should be voluntary and that no new resources would be provided for planning authorities administering the policy locally, meant that it could not convince offsetting's advocates – let alone its detractors – that it would achieve either meaningful biodiversity outcomes. Nor could it stimulate a substantial offset market, which it hoped would lubricate the planning system and accelerate land development, which was its primary goal. The thesis explores how the government's non-interventionist, strictly pro-growth conditions played out in different moments of the policymaking process. It argues that it was precisely offsetting's appeal to government, predicated on its promise of a win-win for development and conservation, in a neoliberal world of limited and diminishing public resources, which undermined the possibility of its implementation. Though the English case is specific, the thesis concludes that this underlying tension appears politically hard-wired into the very concept of offsetting, raising questions over its meaningful implementation anywhere.

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Acronyms

ALGE Association of Local Government Ecologists

BAP Biodiversity Action Plan

BBOP Business and Biodiversity Offsets Programme

BES British Ecological Society

BIS Department of Business, Innovation and Skills

CIEEM Chartered Institute of Ecology and Environmental Management

CAA US Clean Air Act

CBD Convention on Biodiversity

CEP Collingwood Environmental Planning Ltd

CIL Community Infrastructure Levy

CWA US Clean Water Act

DCLG Department of Communities and Local Government

DEFRA Department for Environment, Food and Rural Affairs

EAC House of Commons Environmental Audit Committee

EBI Energy and Biodiversity Initiative

EFTEC Economics for the Environment Consultancy

EIA Environmental Impact Assessment

EMTF Ecosystem Markets Task Force

ESA US Endangered Species Act

EU European Union

FFI Flora and Fauna International

HLS Higher Level Stewardship

IA Impact Assessment

ICMM International Council on Mining and Minerals

IEEP Institute for European Environmental Policy

IFC International Financial Corporation

IEMA Institute for Environmental Management and Assessment

IUCN International Union for Conservation and Nature

LPA Local Planning Authority

LGE Local Government Ecologist

MBI Market-based instrument

MEA Millennium Ecosystem Assessment

NEA UK National Ecosystem Assessment

NEWP Natural Environment White Paper

NPPF National Planning Policy Framework

OECD Organisation for Economic Cooperation and Development

PES Payment for Ecosystem Services

PPS9 Planning Policy Statement 9

PS6 Performance Standard 6

RDA Regional Development Agency

RPC Regulatory Policy Committee

RSPB Royal Society for the Protection of Birds

RSS Regional Spatial Strategy

RTC Red Tape Challenge

SERR Smarter Environmental Regulations Review

TNC The Nature Conservancy

TWT The Wildlife Trusts

Introduction

This thesis is about how and why nature is conserved, and contemporary efforts to use environmental markets and economic instruments to reconcile the demands of land-based economic development and growth with the need to protect nonhuman life in its path. Its empirical focus is on an abandoned attempt by the UK government to introduce a formal 'biodiversity offsetting' policy into the English land use planning system, between 2010 and 2015. Biodiversity offsetting refers to a mechanism designed to neutralise the impact of land development on nonhuman habitats and species. It does this not by proscribing environmental damaging projects *per se*, but by insisting that such activity is only permissible if ecological loss in the development footprint is materially compensated for by the recreation or protection of equivalent ecologies elsewhere, paid for by the developer. The goal is that there is measurably no *net* loss of biodiversity overall, using biodiversity metrics to quantify ecological value. Though offsetting is something of an umbrella term for a variety of similar practices, it is widely thought of as a market-based instrument, through which 'offsets' are bought by developers from offset providers to meet the requirements of environmental compliance.

Over the past decade or so, the use of offsetting has attracted increasing attention from policymakers and researchers, and has been implemented in approximately 50 countries and localities around the world. Its widening appeal for governments rests largely on its promise to meet political, environmental and legal pressures to address biodiversity loss, without compromising the social and economic benefits generated by one of its major material drivers, land development. For its most enthusiastic advocates, a well-designed offsetting system can deliver 'win-win' outcomes for the economy and environment, facilitating sustainable growth by harnessing the efficiencies of the market, and making nature's economic value visible. The UK government drew heavily on this narrative, hoping that establishing an offsetting system would both lubricate the planning system to enable an acceleration of development in a stagnating economy, supposedly constricted by environmental laws governing the regulation of land, while at the same time delivering ambitious but faltering conservation targets.

Yet biodiversity offsetting is a complicated and controversial conservation tool, with limited evidence of success on the ground. Governments and others face a complex array of technical, institutional and political challenges when trying to implement offsetting in a meaningful way. It has deeply divided conservationists. For those opposed, offsetting represents a compromise too far with an economic model and vested interests at its centre which need reining in, giving 'license to trash' to those most responsible for the continuing destruction of natural habitats and loss of wildlife on an industrial scale. Many raise moral objections to the notion that biodiversity can be meaningfully priced and traded, arguing that the drive towards economic value desecrates and displaces nature's inherent, irreplaceable and non-instrumentalist values, the defence of which lies at the heart of the conservation ethic. Those who have embraced offsetting say they recognise the dilemmas it poses, but at the same time see opportunity in the context of enduring policy failures and lack of credible alternatives.

Moreover, they deny that economic valuation is the be all and end all, but argue that it provides a language and set of tools which decision-makers understand, and allows conservationists to make their voices heard where it matters. Working with rather than against the grain of business provides scope for the refinement of a robust and consensual instrument developed through partnership, which can benefit from the resources and dynamism of the private sector as much as the expertise and understanding of conservationists.

I am sympathetic with the former, though I find the narrative built around traditional nature conservation somewhat romantic and blind to the movement's long history of complicity with capitalist development, (neo)colonial rule, and all manner of socially regressive ideas and practices. Relatedly, I would challenge recurrent conservationist tendencies, embedded in many of these criticisms, to construct a wild nature 'out there' which needs protection from human expansionism. When I first encountered biodiversity offsetting in 2013, I was leafing through the UK Conservative-led government's 2011 Natural Environment White Paper, which set forth plans to roll out such a system in England. Coming from a political and intellectual background in Marxist-orientated, left-wing environmental activism, the proposals immediately struck me as a move towards the financialisation of nature. In this I was heavily influenced by Larry Lohmann's brilliant dissection and critique of carbon emission markets in the *Socialist Register*, titled 'Financialization, commodification and carbon: the contradictions of neoliberal climate policy', in which he claimed:

> It is probably not too much to say that since the 1980s, one of the unvoiced mottos of carbon markets' more sophisticated supporters in government and the private sector has been to stop effective climate action before it starts (2011a, p. 95).

The analysis and conclusions appeared germane to biodiversity offsetting too, and the topic looked like something which could be usefully studied in more depth, since the social and environmental consequences of this nascent component of the new 'green economy' seemed as though they would be far-reaching. While I still believe the basic premise of Lohmann's argument holds true, the reality, as explored in this thesis, was more complicated, ordinary and small-scale. While much of the language, logic and transnational institutional infrastructure around biodiversity offsets mirrors that of carbon markets, this turned out to be only part of the story. Rather than a cynical tool created at the behest of large development interests, those I found advocating for a formal offsetting programme in England were mostly highly committed environmentalists, ecologists and conservationists, even if there were many I disagreed with politically and in terms of their views on offsets. Yet by the time my fieldwork had come to an end, the policy had been abandoned before nationwide implementation, after it became apparent those technical, institutional and political problems which commonly beset offsetting could not be satisfactorily resolved. The question posed in this study then is why the UK government failed altogether to overcome these combined obstacles, in a particular historical moment and geographical context.

A burgeoning literature has illuminated much about the problems experienced in trying to meaningfully implement the biodiversity offsets around the world, which is thoroughly reviewed in

Chapter 4. As well as the considerable policy literature extolling the virtues and benefits of biodiversity offsets, a large amount of technical research has been produced on the challenges presented by ecological complexity and uncertainty. It has highlighted the limitations of natural scientific knowledge in being able to fully and accurately measure biodiversity, to provide widely accepted definitions of ecological equivalency, and to address the practical difficulties of delivering conservation gain on which offsetting rests. This work has revealed much about offsetting's material and technical limits, and the need for tools, safeguards and restrictions on use to manage common risks of failure on the ground. Another part of the literature has focused on issues surrounding the construction of the institutional architecture, regulations and mechanisms needed to operationalise offsetting as a market-based instrument, designed to ensure compliance and standards are effectively met, while contributing to wider strategic vision of ecological restoration. This work has shown the dilemmas faced by policymakers, as they attempt to compose functional regulatory frameworks in a complex social landscape of competing demands and constraints, which can enable optimal outcomes for the environment and economy.

A third set of literature has taken a more critical perspective, drawing attention to the political dimensions of offsetting, and its place within today's 'green economy' paradigm. Much of it is aligned with work on the neoliberalisation of nature, and has traced the policy's historical evolution alongside the development of other environmental markets, market mechanisms and economic instruments over the past several decades. This work has challenged many of the conceptual presuppositions of offsetting, while highlighting the constitutive role of unequal power relations in its design, application and effects. Moreover, in explaining the many problems encountered in practice, critical scholars have drawn on theoretical work on the commodification and marketisation of nature to highlight underlying social and ecological contradictions which are far from reconcilable. In essence, the thesis follows the lead of this literature in its examination of the English offsetting policy, the experience of which deeply resonated with the themes identified in the neoliberalisation of nature. Yet capitalism has always been adept at managing to resolve its contradictions, however partially, temporarily and unevenly. The growth of environmental markets is a case in point, and offsetting has only become more prominent in recent years on the global stage, despite its shortcomings. So why not here and now? And what are the implications?

It is that question which is addressed over the coming pages, based on an in-depth study of the aborted introduction of a biodiversity offsetting system to England between 2010 and 2015. Empirically, it draws on a very large amount documentary data related to the UK government's proposals, collected and analysed between early 2013 and late 2015. Fieldwork carried out between late 2013 and early 2015 involved semi-structured interviews with 36 individuals engaged in the policymaking process, either in its design or implementation at various scales. In addition, data was collected through participant observation at four policy-focused events, taking place between late 2013 and the middle of 2014. The thesis itself was written between October 2015 and November 2016. A fuller account of the methods used in given in Chapter 6. To answer the overarching question

of why the policy was abandoned, the thesis is structured around the aims and objectives detailed below.

1: Research aims and objectives

The aim of the thesis was to critically examine the ultimately failed moves to develop and implement a national biodiversity offsetting programme, in the land use planning system in England, between 2010 and 2015. It looks to shed light on important political questions of contemporary nature conservation and biodiversity offsetting in particular, orientated by the broader theoretical lens of the neoliberalisation of nature. The research had five interrelated and overlapping objectives, in order to realise the overall aim:

I. To explain the motivations and theoretical underpinnings of moves to introduce biodiversity offsetting into the English planning system, as a response to biodiversity loss and development pressure.

II. To identify the various actors and interests involved in the policymaking process, and their specific roles in the policy's design, implementation and contestation.

III. To assess the key moments of consensus and conflict around the establishment of biodiversity offsetting in England, and uncover the tensions, dilemmas and deep contradictions which emerged during the policymaking process.

IV. To analyse the reasons for the government's eventual retreat, paying close attention to political economic and ecological factors as well as technical and institutional challenges faced, and to reflect on the wider implications of this failure for biodiversity conservation in England.

V. To discuss the implications for the increasingly popular use of programmes and tools known as biodiversity offsets around the world, and similar attempts to reconcile economic and environmental goals through developing neoliberal environmental policies and market-based instruments for nature conservation.

The more detailed research questions are to be found in Chapter 5.

2: Structure of the thesis

The thesis consists of 11 chapters, split into three main parts. The first four chapters build a comprehensive conceptual framework for the study, based on secondary academic and policy literature. Chapter 1 provides the most broad and abstract theoretical foundations of the thesis. It constructs a conceptual framework, based on critical political ecology underpinned by various Marxist theories of the capitalist relation to nature, which elucidates the particular social and historical form capitalist natures take. Furthermore, it explains how the internal contradictions of capitalist natures generate socially mediated crises, and degrade the conditions of capitalist production. It ends with a short account of the ecological crises which animated modern environmentalism in the 1960s and 1970s, which ushered in a raft of legislation designed to protect 'nature' from the damaging effects of

capitalist industrialisation – laws which have been significantly modified but still form the basis of many environmental protections today. The chapter helps situate contemporary nature conservation as both a product of and response to the social and ecological contradictions of capitalism. Chapter 2 develops the theoretical framework further, through a constructive engagement with the literature on the neoliberalisation of nature and neoliberal conservation, as a distinctive set of ideas, policies and practices through which nature has been governed in the wake of the combined economic, environmental and political crises of the 1970s. This chapter provides conceptual tools for apprehending the significance of certain characteristics of offsetting as a 'market-based instrument', at the same time as orientating the thesis around particular thematic questions opened up by the literature, animated by a recognisable set of logics, processes and effects.

Chapter 3 is the first chapter which deals substantively with the topic of the thesis. It does three things, which both define and contextualise offsetting, and help specify it as an example of the neoliberalisation of nature. First, it provides a description of the mechanism, as commonly used in the policy and academic literature, together with key terminology needed for the subsequent discussions. Second, it presents a historical account of the development of biodiversity offsetting, from its origins in regulations governing the protection of important wetlands in the United States in the 1970s, through to its rise as a globally recognised policy instrument, promoted widely by international institutions and adopted by governments and businesses around the world. Finally, it introduces the core arguments mobilised by its advocates today, which construct offsetting as a flexible market-based instrument, capable of resolving conflicts between development and conservation with 'win-win' outcomes. Chapter 4 provides an in-depth review of the technical, institutional and critical literatures on biodiversity offsetting outlined earlier in the Introduction. It furnishes the reader with an understanding of the major themes of academic debate surrounding offsetting, many of which are germane to the case study. Furthermore, it helps specify what is distinct about biodiversity offsets as a neoliberal policy instrument, and the significance of certain biophysical, geographical and institutional features which underpin its peculiarity and variation in practice.

The second part of the thesis consists of two chapters, which lay out the aims, objectives and research questions for the empirical study, and the methods used to do so. The content of Chapter 5 is self-explanatory, while Chapter 6 lays out the methodological approach of the research. It begins with some discussion of the ontological and epistemological basis of the thesis, drawing on the conceptual apparatus constructed in the first two chapters. It then turns to a justification and detail of the largely qualitative approach taken, followed by a substantial description of how the empirical data was generated and analysed, together with an overview of the all the data collected through obtaining key documentation, semi-structured interviews and participant observation. The chapter ends with some discussion of problems encountered during the research, and the limitations of the findings.

The last five chapters then comprise the final part of the thesis, consisting of four empirical chapters and one discussion chapter. Chapter 7 is largely descriptive, and constructs a thorough policymaking history of biodiversity offsetting in England. While on the one hand it gives the reader background

information and a reference point from which to navigate the remaining chapters, it also provides vital context for the subsequent analysis. It brings into view the role of key actors and events which precipitated offsetting's rise and fall, the political economic circumstances which shaped its trajectory. Of particular pertinence was the UK government's interest in offsetting in the wake of the global financial crash of 2008. The new administration developed their proposals while implementing a programme of deep fiscal austerity, and as part and parcel of a series of planning reforms and environmental deregulation aimed at removing regulatory barriers to economic growth through land development. Together with other factors covered in the chapter, this heavily constrained and mediated subsequent efforts to establish a voluntary offsetting system, and lay at the root of the myriad problems the government faced. Chapter 8 lays out the policymaking landscape through which the proposals moved. Its role is twofold. First, it maps out a rough synthesis, in the form of a table, of the political positions of all the main stakeholder groups the government needed to enrol to operationalise its preferred system, including the national government itself, its allies in the green business sector, local planning authorities, conservation NGOs, developers and landowners. Second, using this table, it explains how the government and its allies managed to construct a fragile consensus around the desirability of a formalised offset programme, based on overlapping interests and the promise of a 'win-win' for development and conservation, generated through market efficiencies.

Chapter 9 then explores and analyses in depth some of the underlying tensions and divisions concealed by this surface-level agreement, by focusing on disputes around the appropriate technical design features of the government's proposals. These debates followed similar tropes to those identified in the Chapter 4's literature review, and concerned issues of measurement, equivalence, the quality of ecological assessments, and the limitations of ecological restoration. Yet the tensions were not merely technical, but political too, and concerned whose interests would be served by specific characteristics of the metric. Moreover, possible resolutions were constrained by the government's insistence that market functionality and cost effectiveness were the most crucial aspects of the system, which environmental groups felt would compromise offsetting's ecological outcomes. As a result, politically conditioned and unresolved tensions over the technical aspects of offsetting threatened to destabilise consent for the methods of quantification at the heart of the policy. Chapter 10 examines the similarly mediated controversies over the institutional architecture, the capacity of regulatory bodies and the scope of offsets to force developers to comply with no net loss requirements. Like the previous chapter, the unwillingness of the government to impose any additional costs on developers proved deeply damaging to its efforts to enrol the actors it needed to operationalise offsetting. Eventually, all the major groups walked away from what had become an increasingly controversial policy, at around the same time as the government's leadership decided to block offsetting, on the grounds that even a voluntary system risked placing unacceptable, additional regulatory burden on developers.

Chapter 11 concludes the thesis with a long discussion and reflections on the implications of the study, for offsetting in England and more generally, as well as for the neoliberalisation of nature literature.

Chapter 1: Capitalist and Liberal Natures

Introduction

These opening two chapters aim to build a broad theoretical framework for the thesis, based on two related sets of critical environmental studies literature: neoliberal natures and neoliberal conservation. They are designed to both provide a framework with which to understand the development of biodiversity offsetting, as well as a set of critical tools with which to investigate what unfolded in England between 2010 and 2015. The reason for engaging with these particular literatures is as follows. Biodiversity offsetting, as explained in the introduction, is usually identified as a market-based instrument designed to deliver specific conservation outcomes, discursively justified by its purported ability to reveal or foreground nature's 'value' in economic decision-making processes. These signal features have significant resonance with a set of interrelated philosophical, programmatic and practical tropes that have come to be associated with the neoliberalisation of nature (Castree, 2010). The literature on neoliberal natures, though in some ways a disparate and uncoordinated body of theoretical and empirical work, has furnished us with a broad critical framework and set of tools for understanding and interrogating society's relation to the biophysical world, at multiple levels and scales, in what has been termed the neoliberal era – a period beginning sometime in the 1970s and continuing through to the present day. As a critical environmental research agenda, it begins from the premise – shared by the present author – that there is something profoundly wrong with the existing social and environmental order, in its ability to deliver social and ecological outcomes which are just and sustainable, for humans and the rest of nature.

As will be elaborated in Chapter 2, the neoliberalisation of nature is treated as distinct from what came before in variety of ways (Bakker, 2010b; Castree, 2008b, 2008a). Importantly, the literature makes the case that neoliberalism is necessarily an environmental as well as a political economic project, which has and continues to be constituted through its relationship with the discursive, material and symbolic emergence of environmental limits and crises in the 1960s and 1970s. While all societies are foundationally constituted through their relation with the rest of nature, the neoliberalisation of nature is viewed as specific in the way these historical natures and the depletion of environmental resources have been confronted, mediated and governed in the context of neoliberal or capitalist growth imperatives. Before delving into this literature, Chapter 1 gives space for the author's own conceptual understanding of the relationship between human societies and the rest of nature, and between capitalism and the biophysical world in particular. This conceptual work undergirds the foundational proposition above that nonhuman natures play an active and relational role in putatively social processes, and alludes to the influence of political ecology on neoliberal natures (see for instance Bakker & Bridge, 2006). Political ecology is more than an ontological viewpoint specific to neoliberal natures. It encompasses a broader set of theoretical and methodological approaches to nature-society relations, which can help frame an understanding of the historical natures of capitalist modernity. In situating the neoliberalisation of nature in relation to

capitalist modernity as an environmental project in general, a political ecological take provides a framework with which to trace through and differentiate from what I will term capitalist natures, identifying continuities and changes in nature-society relations.

As will become clear, I lean more towards the Marxist end of the theoretical spectrum of political ecology and neoliberal natures – though I join James McCarthy (2012, p. 184) in seeing compatibility between Marxist and other approaches to neoliberalism and nature, such as poststructuralism. While any comprehensive review of this diverse field is far beyond the scope of this opening chapter, there are two salient methodological features worth dwelling on. Firstly, political ecology refuses the discrete separation of an external nature from society under capitalist modernity, instead foregrounding the relational complexity of socio-natural entanglements in all aspects of society's relation to the rest of nature. Drawing from an eclectic mix of theoretical traditions, socio-environmental change is understood as a continually unfolding set of uneven, contested and contingent historical and geographical processes, through which human and nonhuman natures are assembled, co-produced and interwoven – materially and symbolically, discursively and politically, at different spatial and temporal scales (see for example Peet et al., 2010; also Bryant, 2015; Perreault et al., 2015). Secondly, these are never ecologically or socially neutral in logic, process and effect, but are irreducibly political, mediated through relations of power, such as class, race, gender and so on (Heynen et al., 2006, pp. 11–12). What I present in Chapter 1 is a selective political ecological take on these relations, combining insights from Marxist political ecologies[1], particularly the work of Smith (2010a), Moore (2015), Foster (2000), Burkett (2014) and O'Connor (1998), with a focus on the role of classical liberal thought in the symbolic and discursive production of capitalist natures.

Chapter 1 provides an overview of capitalist modernity's relation to nature in general, as both historical and abstract. It aims to foreground the notion that all forms of social organisation are necessarily environmental projects as well, but that capitalism constitutes and is constituted by a specific constellation of historical natures, materially and symbolically, proceeding in the following manner. Section 1 starts with the materialist notion of the production of nature in general, and moves to the development of the specifically capitalist production of nature, highlighting the importance of processes of commodification, capitalist value, and primitive accumulation. Section 2 roughly synthesises the symbolic and ideological roles played by classical liberal thought and the Cartesian scientific revolution, in producing and ordering modern capitalist natures. Section 3 reviews three sets of contradictions, theorised by mostly Marxist writers, internal to capitalist natures: (i) alienation and the metabolic rift; (ii) fictitious commodities and the 'second contradiction' of capitalism; and (iii) use-value and exchange-value and nature's 'free gifts'. Section 4 then briefly outlines how some of these

[1] By Marxist political ecologies, I refer not only to the work of self-proclaimed eco-Marxists or political ecologists, but also others who have dealt substantively with the question of 'nature' (for reviews, see e.g. Henderson, 2009; Castree, 2000).

contradictions have played out as ecological crises which have animated the world since the 1960s, as context leading into the subsequent chapter on the neoliberalisation of nature.

1: Capitalist Natures

1.1: Humanity in nature and the production of nature

The starting point for Marxist political ecologies revolves around humanity's relationship with the rest of nature, as they appropriate and transform the biophysical world, in the form of use-values, in order to meet their own needs. This is described as a process of metabolic exchange between humans and the rest of nature, mediated by the sensuous and productive activity of human labour-power (and other biophysical processes) (see variously Moore, 2015; Loftus, 2012; Smith, 2010a; Castree, 2000; Foster, 2000). Human nature and labour-power were understood by Marx to be fundamentally part of nature in a universal sense; products of nature and subject to its most basic laws. Humanity could never be separated and survive apart from the nonhuman world, but at the same time existed in differentiated and dialectical unity with the rest of nature. According to Marx, what differentiated human natures was the development of the ability to separate mental and manual aspects of labour, and use mental conceptions to intentionally design that which they materially produce. From this perspective, humanity's history and societal development as part of the rest of nature is fundamentally the story of the social appropriation and production of various use-values, to meet human needs for survival and reproduction, and the subsequent production of new needs (Smith, 2010a). Both human and nonhuman natures are understood to be the ultimate sources of wealth, and labour is both a social and a natural process, as are the products of this process of metabolic exchange. This historically unfolding process of socio-natural metabolism at once transforms (or produces) human nature and social relations, as well as those of and with the rest of nature. This is the basic premise upon which Smith (2010a, chap. 2) builds his 'production of nature' thesis, where, extrapolating from Marx, he argues that production in general – not only of the material creations of human labour but institutions, and the legal, economic and political rules of society as a system (Loftus, 2012, p. 11) – is necessarily the production of nature. Smith describes the production of nature as the ongoing and uneven process through which nature is at once internalised by humanity and the system of production, and nature is increasingly produced as socio-natures out of society[2].

1.2: Commodification, value and capitalist production

As human societies developed beyond those of subsistence, the production of nature allowed for the conditions for commodities to emerge, where commodities are described as products of labour which could be traded for other use-values. Commodities take on the form of exchange-values as well as use-values, where exchange-value allows for the trade of specific quantities of use-values, made

[2] As Henderson puts it, the: "point of the production of nature idea is that it is not sufficient to think of nature as that which is not human, nor sufficient to say that nature includes the human" (2009, p. 281).

commensurable through a universal equivalent, usually money. Importantly, the abstraction through which use-values are made equivalent is the socially necessary labour time (or abstract labour) to make a commodity. This is the definition and measure of a commodity's value, which its exchange-value is said to represent[3]. Producers are able to obtain different use-values through selling their products for money, with which they can buy other commodities through markets: the C-M-C circuit. For Marxists, commodification describes production increasingly motivated *by or for exchange*, synthesised here by Prudham (2009, p. 125) as the:

> interlinked processes whereby: production for use is systematically displaced by production for exchange; social consumption and reproduction increasingly relies on purchased commodities; new classes of goods and services are made available in the commodity-form; and money plays an increasing role in mediating exchange as a common currency of value.

As Smith explains, the social production of 'second nature' under capitalism is increasingly the production of nature as exchange-values. This takes place, according to Prudham (2009, pp. 125–6), through two interrelated moments of commodification. The first is market expansion – the development of relations of exchange across greater distances of time and space: *stretching*. The second is the systematic increase in the provision of goods and services in commodity-form: *deepening*.

For Marx, a capitalist society is one organised according to the generalised production of commodities, where expansive commodification is driven by a peculiar and transformative logic of the law of value combined with the nature of capital. Under capitalist social relations, rather than selling commodities in order to buy other commodities, capitalists bring money-capital to the market with the purpose of making more money: perpetual accumulation of surplus value, or the constant search for profit and the pursuit of money as an end in itself over and above particular use-values. The simple circuit of C-M-C driving production changes to M-C-M', where M' represents the original investment plus a certain quantity of surplus value. Marx described the nature of capital as:

> value in process, money in process … It comes out of circulation, enters into it again, preserves and multiplies itself within circulation, emerges from it with an increased size, and starts the same cycle again and again (Marx, 1990 p. 256).

By its very nature, capital has to expand to survive (Henderson, 2009, pp. 270–2). Commodification is therefore the lifeblood of capitalism, not only producing and remaking nature as exchange-values, but on a world scale, bringing more and more facets of human and nonhuman nature into the orbit of capitalist value relations. On the one hand, the growing scope and scale of commodification is necessary as an outlet for the continued expansion of capital; on the other, various features of capitalist competition tend to erode profits over time, meaning individual capitalists are forced to seek to constantly renew the conditions of profitability. Both capitalists and workers are ultimately caught

[3] The specific value-form of commodities, which values abstract labour while devaluing all other forms of human and nonhuman natures, has important implications for Marxist political ecologies of crisis, as will be discussed shortly.

up with and reliant upon, and subordinated by this restless, systemic process of accumulation for their own reproduction.

1.3: The commodification of land and labour-power

Due to the expansive nature of capital as value in motion, the commodification of labour-power as wage labour becomes a precondition for capitalist production. This is for two reasons. First, workers, through wage labour, are required to generate value and produce a growing number of commodities. Second, capitalists need people to purchase their commodities so that the value of those commodities is realised, and the expansion of the proletariat provides one major source for this (Prudham, 2009, p. 127).

The creation of wage labour is linked historically on the commodification of land, and the often violent process of primitive accumulation[4]. This was described by Marx (1990) and Polanyi (2001), whose work is also central to many Marxist political ecologists, as fundamental to the development of industrial capitalism. The enclosure of the commons, in separating labour from the land and the means of production, forced people to enter the cities to sell their labour-power for a wage, so that they could buy commodities to survive. It subordinated workers to the system of capitalist value, accumulation and profit, since they required both employment and the ongoing production of commodities to meet their needs (Wood, 2013). At the same time, the commodification of labour-power created a series of separations from the rest of nature, not only from the land and means of subsistence but from the products of their labour, now appropriated by the capitalist and alienated from themselves.

The law and measurement of value and the production of nature as exchange-values turned on the establishment of abstract and linear time, but it equally turned on two other real abstractions which were central to the modernist project: abstract space and external nature (Moore, 2015). The commodification of land required the imposition, through various state-led methods of territorialisation, of abstract space: a flat and geometric space made up of “empty, exchangeable units” (Crang, 2005, p. 203) or as Lefebvre described it: “space … that is homogeneous yet at the same time broken up into fragments” (Lefebvre, 1991, p. 342; see too Smith, 2010a; Harvey, 2007a). This meant mapping, coding, surveying and quantifying space and nature, the subject of Section 2.

2: Cartesian binaries and liberal natures

2.1: The Cartesian scientific revolution

The more or less materialist account outlined above provides a useful starting point for understanding the nature of capitalist natures. However, the transformations of nature-society relations exceed the

[4] It is important to note, however, that primitive accumulation should not generally be seen as a historical artefact of pre-capitalism, but as a systemic tendency of capitalist development (e.g. Bonefeld, 2011; Glassman, 2007; Harvey, 2007b; de Angelis, 2006).

material, as should be clear from the processes of separation taking place through capitalism's historical development and law of value. For political ecologists 'Nature' is social and natural, material and symbolic (e.g. Castree & Braun, 2001; Braun & Castree, 1998). Moore highlights the important epistemological and ideological groundwork implicit in the transformation of nature-society relations, and the so-called domination of nature (in the Baconian sense) of the modern era:

> The notion that social relations (humans without nature) can be analyzed separately from ecological relations (nature without humans) is the ontological counterpoint to the real and concrete separation of the direct producers from the means of production (2015, p. 19).

From a Marxist-orientated perspective, these are mental conceptions which have material force and application in the world (at the same time as being products of socio-natural relations), both productive and destructive, liberating and oppressive.

Moore sees the 'violent abstractions' (2015, p. 21) of the Cartesian scientific revolution as equally foundational to the project of capitalist modernity (see also Merchant, 1990) as the process of primitive accumulation:

> If the accumulation of capital is the proletarianization of labor, it is also the production of knowledges aimed at controlling, mapping, and quantifying the worlds of commodification and appropriation. For early modern materialism, the point was not only to interpret the world but to control it: 'to make ourselves as it were the masters and possessors of nature' (Descartes, 2006, p. 51). In the history of capitalism, the 'material' and the 'symbolic' form an organic whole (Moore, 2015, p. 20).

Advances in the fields of cartography and the physical and natural sciences were critical to socially constructing and re-envisaging space, time and nature as external and discrete quantifiable objects, which could be separated and bordered, observed and measured, and ultimately made into exchangeable parts. This moves us beyond the economic realm of commodity production, foregrounding the critical territorialising activities of the state in the ongoing process of environment-making through the construction of new property regimes, physical infrastructure and scientific knowledge (see in particular Parenti, 2015; but also Robertson & Wainwright, 2013; Whitehead et al., 2007; Mitchell, 2002; Scott, 1999; Luke, 1995).

By invoking the Cartesian revolution (otherwise referred to as the Age of Enlightenment or Reason), Moore is talking about more than merely scientific methods, binding historical natures with what he calls the 'technics' of modern civilisation: empire, science and culture (2015, pp. 58–9). He is talking of a full-spectrum transformation, encompassing the realms of philosophy and social theory, literature, art and so on, in how nature came to be framed and symbolically represented as one half of a nature-society binary (see Watts, 2005), and as an external object of reality (see for instance Smith, 2010a, chap. 1 on the 'ideology of nature'; Williams, 2005; Cronon, 1992 on the social construction of 'wilderness' in the United States). Cartesian thought denoted the discursive construction, based on Descartes' separation of mind over body, of a series of hierarchical dualisms – male-female, reason-emotion, culture-nature, self-other, subject-object and so on – which would structure the dominant

philosophical and analytical worldviews of the modern capitalist era, and facilitate new regimes of rational control and organisation.

2.2: Liberal natures

The ideas of classical liberalism, built on this emergent ontological landscape, furnished capitalist natures with philosophical underpinnings which both justified and naturalised *laissez faire* capitalism and free markets. The intersection of the rationalist claims of Descartes, Bacon and Hume with classical liberal ideas about human nature and the individual – as well as the natural wealth of the Earth – provided the ontological and moral cornerstone of liberal political economy. The sanctity of the individual rights pivoted on the model of human nature found in Rousseau, Hobbes and Locke, bringing together ideas of violence and order, freedom and property – and a critical role for the state in enforcing those rights to protect the individual. The prefigured and self-interested individual was the agent standing at the centre of the free market orthodoxy and trade liberalisation propagated by Smith and Ricardo, where the material concern of individuals and national prosperity rested on the value-generating activity of labour, and the productive transformation of an external nonhuman world into private property for use or sale (Foster et al., 2011, chap. 1). As Harvey (1996, pp. 124–5) puts it: “the domination of nature was viewed as a necessary prerequisite to emancipation and self-realization” to eighteenth century political economy.

Later the reimagining of the individual as utility-maximising, turning on Mill and Bentham, as well as Say and Bailey (Robertson & Wainwright, 2013; Foster et al., 2011), would provide the basis for the marginal revolution and birth of neoclassical economics and markets. The neoclassical revolution would abolish use-value altogether in favour of the fully relativist concept of value as exchange-value. As will be explained in Section 3.3, this would leave the realm of ‘nature’ with no value in and of itself in modern economics, but only through exchange, under conditions where it was an endlessly substitutable external category (Mirowski, 2013, p. 335).

Locke, meanwhile, is seen as particularly important figure in providing the intellectual case for private property as the natural outcome of the mixing of labour with nature (McCarthy & Prudham, 2004, p. 277). With the initial phase of primitive accumulation representing such a formative yet contested moment of modern capitalism’s development, justifications for privatisation were crucial. This turned critically on a dual logic. While the enclosure of the commons generated the scarcity necessary for the constitution of generalised wage labour[5], classical liberalism reconstructed scarcity as a natural and external condition of the land. This is most clearly apparent in the pessimism of Malthus’ conservative ruminations on overpopulation. As Ross observes, ideas of absolute scarcity have always been a “political tool, skillfully manipulated by the powerful whenever it suits their purpose” (1994, p. 16). Mansfield (2008a, pp. 4–5) agrees, arguing how private property is envisaged as more than natural by Locke, but also as a deliberate transformative device (based on a socially generated

[5] As Foster et al. (2011) also point out, there is no exchange-value in conditions of abundance.

scarcity) which disciplines its owners, incentivising productivity. The other side of the coin placed a more optimistic faith in the efficiency of free markets to combat this scarcity, undergirded by strongly enforced private property rights, by raising productivity through competition and specialisation.

Though the two appear in some tension, the Promethean drive behind market expansion aimed at escaping existing material constraints is at once born of necessity, on the grounds of supposedly naturally imposed resource scarcity. Harvey again:

> The genius of eighteenth-century political economy was this: that it mobilized the human imaginary of emancipation, progress, and self-realization into forms of discourse that could alter the application of political power and the construction of institutions in ways that were consistent with the growing prevalence of the material practices of market exchange. It did so, furthermore, while masking social relations and the domination of the labor that was to follow, while subsuming the cosmic question of the relation to nature into a technical discourse concerning the proper allocation of scarce resources (including those in nature) for the benefit of human welfare (1996, p. 131).

The ambiguity in classical liberal thought around the potential and desirability for perpetual growth gave way somewhat following the marginal revolution (and later the neoliberal turn in economics, see Mirowski, 2013, pp. 335–6). Neoclassical theory posited all goods and services as limitlessly substitutable, including environmental resources, which meant there could be no natural limits to economic activity – reinforcing the notion that free markets were the most efficient mechanisms for overcoming scarcity. At the same time, the thermodynamic paradigm on which neoclassical equilibrium markets were modelled, would later form the basis for mainstream environmental thinking around the limits of economic growth in a closed system (Walker & Cooper, 2011; Mirowski, 1992).

3: Marxist political ecologies of contradiction and crisis

3.1: Alienation and the metabolic rift

The critical question underpinning much of Marxist political ecology regards how these relations at the heart of capitalist production are bound up with the advent and playing out of increasingly large-scale environmental crises, of rising social concern since the 1960s. Smith's production of nature thesis is of uneven geographical development more than crisis. It shows how the generation of second nature under capitalist modernity is not under human control but the consequence of both intentional and unintentional production, unfolding in contingent yet historically specific ways. As Castree (2000) summarises, the production of nature is a "continuous *process* in which nature and capital *co-constitute one another in temporally and geographically varied and contingent ways*" (p. 28), and that "in *particular* times and places in relation to *particular* environments capitalism is ecologically harmful whereas in others nature is produced in ways that have positive social and ecological effects" (p. 30). While the penetration of capital into nature gets ever deeper, and nature's

subsumption more intensive (Smith, 2006; Katz, 1998), the nature internal to capital is greatly variegated and unpredictable (Harvey, 1996)[6].

The production of nature thesis does however link capitalist production, nature and alienation. For Smith, the capitalist production of nature led producers to increasingly producing a social nature external to themselves, which is then appropriated from them by capital. As such, it is a process through which people are progressively separated and alienated from the products of their labour and, by definition, from the rest of nature. For Foster (1999, p. 383), the alienation of nature or the "material estrangement of human beings in capitalist society from the natural conditions of their existence" was central to Marx's concept of the metabolic rift. The 'irreparable rift' between "human production and its natural conditions" (Foster, 1999, p. 370) Marx identified during the second agricultural revolution related to the reproduction of soil fertility, which Foster contends can be extrapolated as a general theory of environmental degradation under capitalism.

The rift in the metabolic exchange between human beings and the soil emerged as a consequence of the simultaneous development of large-scale industry and large-scale agriculture (Foster, 2000, p. 156), reflected in a growing antagonism between town and country. Soil fertility had become a major issue between 1830 and 1870, during the reconfiguration of agriculture as a primarily commercial enterprise. Commercial agriculture saw the export of produce to distant burgeoning industrial centres, where waste built up or expelled into the sea, breaking the nutrients cycle which had previously replenished the land. This rift saw the soil become increasingly exhausted, with its further exploitation requiring the import of fertiliser from other parts of the world to replace what had been lost, as well as the industrial development of fertiliser which characterised the second agricultural revolution (Foster, 1999, p. 373). As a result, agriculture ceased to be self-sustaining, since it was now reliant on inputs from a separate industry, a situation exacerbated by the increasingly long-distance nature of trade as capitalist production developed, while the production of fertiliser was equally dependent on extraction and the depletion of land elsewhere.

At the other pole of this process, Marx recognised how the feeding of growing industrial centres with food, labour and natural resources was also resulting in the build-up of pollution and waste in the towns and cities. This included material flows other than from agriculture, and allowed for a more generalised understanding of the contradictory relationship between capitalist production and the natural conditions of its reproduction. As Foster observes, Marx recognised that this growing antagonism between town and country – the geographical expression of the metabolic rift constituted by the new spatial division of labour – was being replicated on an increasingly global scale, as "whole colonies saw their land, resources, and soil robbed to support the industrialization of the colonizing

[6] It should be noted that Harvey's (2015, chap. 16) most recent work argues that the contradictions of capital's relation to nature and accumulation of unintended consequences of its production are becoming increasingly dangerous at the current inflection point of exponential capitalist growth.

countries" (2000, p. 164). This separation was also central to the generation of the symbolic dichotomy between society and nature.

Foster's development of the metabolic rift emphasised Marx's view that the exploitation of the worker under capitalism was bound up with the exploitation of the land, and capitalism's unsustainability intricately linked with primitive accumulation and the commodification of land. It was for this reason, Foster et al argue:

> Few things were more important, in Marx's view, than the abolition of the big private monopolies in land that divorced the majority of humanity from: (1) a direct relation to nature, (2) the land as a means of production, and (3) a communal relation to the earth (2011, p. 60).

The critique of land commodification takes us back to Polanyi (2001) as another influence on many Marxist political ecologies, particularly through the work of O'Connor (1998).

3.2: Fictitious commodities and the 'second contradiction' of capitalism

For Polanyi, the commodification of land and labour, foundational to the formation of market society, saw the creation of 'fictitious commodities' – fictions because they are emphatically not produced for exchange, but the very substance of society, nothing more than "the human beings themselves of which every society consists and the natural surroundings in which it exists" (Polanyi, 2001, p. 75). The commodification of land and labour represented for Polanyi a radical disembedding of society from nature, a tearing apart of the inseparable socio-ecological conditions of (re)production. The splicing up of nature into discrete, exchangeable units was, he contended, inimical to the deep and complex relations which constitute the realities of human and nonhuman natures. The monetary exchange-values assigned to them in a market society simply cannot express their full social, cultural and environmental values or the totality of their functions and relationships. These would always be produced outside of exchange relations to some degree. As a result, labour and land will be undervalued if treated as commodities, due to the necessarily incomplete nature of that commodification, and will tend to be overexploited and degraded over time. As Polanyi puts it:

> while production could theoretically be organized in this way, the commodity fiction disregarded the fact that leaving the fate of the soil and people to the market would be tantamount to annihilating them (2001, p. 137).

The consequence, as Polanyi argues has been the case historically, is a tendency towards what he calls the 'double movement', whereby pressure from social forces and movements, both reformist and radical, will eventually compel governments to intervene to mitigate the negative social and environmental effects of markets.

O'Connor's (1998) synthesis of Polanyi's ideas with those of Marx leads him to argue there is a 'second contradiction of capitalism': a tendency for capitalist production to perennially under-produce the social and environmental conditions – ecological resources and processes, labour-power and communal social life – for the reproducing and sustaining of capitalist social relations. According to O'Connor, capitalism is entirely dependent on these conditions as use-values for the production of material wealth, but as they are all generated outside of the relations of production, they are

undervalued and appropriated as free and eternal gifts, resulting in their degradation and despoliation. Capitalism is theorised as producing its own scarcity through undervaluing its conditions. This tends to induce social movement opposition and state regulation – the "real [political] substance of the second contradiction" (Henderson, 2009, p. 276) – since those conditions and use-values tend to be of great importance to ordinary people. Ultimately, the second contradiction raises the prospect of rising costs of the reproduction of the conditions of production.

3.3: Use-value and exchange-value and nature's free gifts

Marxist political ecologists have extrapolated from and augmented Marx's critique of political economy in various ways to develop ideas of environmental contradiction (see e.g. Walker, 2016). For both Foster and Burkett, there is a fundamental ecological critique to be found in Marx's own oeuvre. Foster sees one of these as immanent in the contradiction between use-value and exchange-value, or the problem of the Lauderdale Paradox: the distinction between public wealth (understood as the totality of use-values) and private wealth (as the sum of exchange-values) in classical political economy (Foster et al., 2011, chap. 1). Lauderdale suggested that increases in overall wealth, measured by increases in private wealth or exchange-values, necessarily entailed the diminishment of public wealth, since value in exchange would only exist under conditions of scarcity of available use-values. For the classical political economists, however, public wealth was not valueless. Breathable air for instance, clearly had substantive and intrinsic use-value, even if it had no (relative) exchange-value. The same went for myriad other vital aspects of 'nature', yet value as the measure of wealth could not account for them, unless they became scarce and took on exchange-value (Foster et al., 2011, pp. 54–6).

Locke and Ricardo therefore insisted on the distinct conceptual separation between wealth and value, or use-value and exchange-value. However, since the paradox could not be resolved, use-value was always ultimately subordinated to value as measure of wealth, and with production geared towards the accumulation of surplus-value, Marx noted how nature as a fundamental source of wealth was in fact treated as a 'free gift' under capitalism, as explicitly advanced by the physiocrats, Smith, Ricardo, Malthus and Mill (Foster et al., 2011, pp. 59–61). The proto-marginalists and precursors to neoclassical economics – such as Say, Bailey (see Robertson & Wainwright, 2013, pp. 895–6) and Mill – would ultimately reject the Lauderdale Paradox and category of use-value altogether. All that 'counted' was economic value-added as measured by GDP and its equivalents. In practice neoclassical economics relegated nature, and its associated social costs and benefits, to the realm of externalities and welfare economics.

The contradiction remained implicit however, since the idea of nature as free gift continued to underpin the capitalist economy, leading to two problems for the environmental sustainability of capitalism (Foster et al., 2011, pp. 67–9). First, the presumption of infinite exchangeability – that natural resources could simply be substituted by another factor of production – meant neoclassical economics could get no grip on material existence, and the natural conditions of capitalist (re)production. As Foster et al. put it, there is ultimately no feedback mechanism to prevent

environmental degradation which takes place, for example, through the metabolic rift. Second, not only does the distinction and focus on the production and accumulation of exchange-values over use-values devalue the importance of abundant reproductive processes, the expansion of value necessarily feeds on the destruction of public wealth. If 'environmental' use-values only become valuable by becoming scarce, this means the imperative of value accumulation actually makes waste and destruction rational under capitalism, since they provide new opportunities for profit, while their negative effects continue to be externalised onto society and the rest of nature (Foster et al., 2011, p. 69).

Burkett (2014, chap. 6) develops the idea of capital's 'free appropriation' of nature's gifts further, signalling its central importance to accumulation since commodity production always involves a combination of abstract labour with 'natural conditions'. Reemphasising how natural conditions contribute to the use-values of commodities, he shows how 'nature' is appropriated as use-values which specifically serve value accumulation – that is, the 'forces of nature' are selectively utilised as means of production which increase labour productivity without requiring more labour (i.e. cost nothing in terms of value composition as a whole). For Burkett (2014, chap. 9), this brings about two potential crises. The first is the metabolic rift as explained by Foster, which he describes as environmental. The second, which he calls economic, relates to recurrent episodes of shortages of raw materials, since leaps in labour productivity translated directly into "huge increases in the throughput of matter and energy drawn from and emitted into the natural environment" (Burkett, 2014, p. xviii). Raw materials in this sense meant those supplied out of and limited by biological, ecological and geological conditions, which could not be reproduced independently by capitalist enterprise. The accelerating pace of capital accumulation and its appetite for raw materials increasingly outstrips the capacity of these processes to replenish these raw materials, leading to supply shortages and rising input costs for capitalists.

Burkett (2014, p. xx) notes how capitalism has typically managed to resolve these crises by treating "workers and the natural conditions of production as separate inputs" that can be reorganised spatially and technologically, and through a 'slash and burn' strategy across space. More recently Moore (2015) has built on this analysis to argue these crises have always been historically resolved through capitalism's Cheap Nature strategy. He suggests that both successive reconfigurations of human and extra-human natures, combined with geographical expansion, have been at the heart of capitalism's waves of accumulation since around 1450. Like others, Moore (2015, p. 51) sees the peculiar value-form under capitalism, through which value is determined by labour rather than land productivity, as necessarily devaluing all forms of work and energy other than commodified labour-power. Raising labour productivity, however, requires ever-increasing inputs of unpaid work and energy, and as such the accumulation of value in co-constituted by another moment of value relations, called the zone of

appropriation: capitalism's Cheap Nature strategy[7]. Crucially, this a process of activating and mobilising unpaid work and energy of non-capitalised human and nonhuman natures outside of commodity production, the flows of which can increase labour productivity.

To sustain accumulation cycles, the zone of appropriation needs to outpace that of commodification, in order to stave off the problem of rising value composition and declining profitability (Moore, 2015, chap. 5). The appropriation of Cheap Nature therefore takes place through non-economic processes and procedures, called regimes of 'abstract social nature'[8]. New regimes of abstract social nature have historically been produced through geographical frontier expansions combined with scientific advances (broadly defined). However, these 'ecological revolutions' are one-off events, and each new configuration eventually becomes exhausted relative to the demands of capital (Moore, 2015, chap. 6). Moore contends that the prospect of new frontiers – as yet untapped sources of cheap food, energy, natural resources and human labour – is quickly receding. For Moore, capitalism's ecological question is ultimately not so much about what capitalism is doing to the environment, but how much longer nature can provide capitalism with what it needs in terms 'socially necessary unpaid work'.

4: Environmental crisis

The environmental history of capitalism has been a turbulent one, and can be theorised according to the relations and contradictions of capitalist natures described above. The global spread of value relations and spectacular growth inaugurated by the industrial revolution has been constituted through an accelerating metabolism of human and nonhuman natures as so-called taps and sinks to feed and regulate the increasing pace of capitalist production and consumption, industrialisation and urbanisation. In the current moment we are confronted with a series of 'converging crises' (George, 2010) on an increasingly planetary scale, and as Harvey (2015) argues in recent work, capital's relation to nature has become one of its most 'dangerous' contradictions, even if political attention has moved elsewhere since the economic crisis beginning in 2008. Climate change and efforts to curb global warming, and to some extent global biodiversity loss ([Millennium Ecosystem Assessment] MEA, 2005), have been the most visible. Yet the more ubiquitous character of current environmental problems is represented by the apparent breaching of three of the nine 'planetary boundaries' identified by the Stockholm Resilience Centre, and the near-breach of several others, which demarcate a 'safe operating space' for humanity (Steffen et al., 2015; Rockström et al., 2009; see also Angus, 2016; Foster et al., 2011), as well as the growing consensus that humanity has been the driving force behind these processes, of a new geological age called the Anthropocene,

[7] Moore (2015, p. 53) classifies the Four Cheaps necessary to undergird labour productivity as food, energy, natural resources and labour-power (especially unpaid reproductive work).
[8] The corollary to abstract social labour.

inaugurated by the industrial revolution (Steffen et al., 2007; but see Moore, 2016, for some conceptual critiques).

The playing out of capital's contradictory relation to nature has long involved disruptive episodes of resource exhaustion, the build-up of waste and pollution and so on in certain places. Yet it was the 1960s and 1970s that saw the formation of modern environmentalism, which culturally and politically permeates today's crises. This was not a period which represented a sudden material tipping point for capitalist natures, but was one which certainly saw increasing visibility of its effects on a variety of scales. Growing environmental consciousness was punctuated by a number of iconic cultural events, such as the first images of the Earth from space and the publication of *Silent Spring* (Carson, 2000), enabled and refracted through new state-developed technologies and ways of seeing. Mediated through the technologies and ideological narratives of Cold War militarism, environmental issues were often narrowly conceived and propagated in relation to their implications for national security and geopolitics (e.g. Ross, 1994). As such, the environment was constructed – both scientifically and politically – as constituting external and observable threats in a fundamentally violent world, in need of monitoring and control, shaping the regulatory regimes enacted in that time (Ioris, 2014; Whitehead et al., 2007).

These ways of seeing operationalised in the geopolitical context of the Cold War combined with a series of political, discursive and cultural antagonisms and crises manifesting themselves in civil society, arising in response to concern around catastrophic ecological and civilisational collapse, particularly relating to the prospect of nuclear apocalypse, and exacerbated by the oil crisis of the 1970s. While the radical environmental movement made ecological matters a vital pillar of the new social movements, centred on a critique of the social and environmental effects of industrial society, materialist culture and alienation (if often remaining somewhat blind to the material conditions and concerns of the majority of humanity), much of environmental discourse had a more conservative register. Malthusian ideas returned to the fore, with the so-called *Limits to Growth* (Meadows et al., 1972) using computer modelling to predict the imminent material overshoot of modern industrial society, while overpopulation once again gained popular intellectual ground (e.g. Ehrlich, 1971; Hardin, 1968).

Nevertheless, pressure from civil society, especially from the new environmental movement, was key to the enactment of important environmental legislation, aimed at tackling air and water pollution as well as species extinction, in many of the advanced economies in the heyday of post-war social democracy and state intervention. The establishment of these latterly defined 'command-and-control' regulatory protections (see, e.g. Holling & Meffe, 1996), however, took place right on the cusp of the political and economic crisis of Fordist-Keynesian model of development, which would ultimately usher in the neoliberal era. During the 1980s, environmental issues became increasingly internationalised, with recognition of the need for coordinated cross-border action over new problems such as acid rain and ozone depletion, leading to the subsequent ascendance of the sustainable development agenda. This would see issues such as climate change, urbanisation and global

biodiversity loss take centre stage in environmental politics, and the Rio Earth Summit of 1992 open legally binding, global conventions to curb (most famously) climate change and biodiversity loss, for signature[9]. Importantly, the trajectory of modern environmentalism came to both shape and be shaped by what has come to be known as neoliberalism, to which Chapter 2 now turns.

[9] These were the Convention on Biological Diversity (CDB), the Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification. It also importantly produced the Rio Declaration on Environment and Development, Agenda 21 and the Forest Principles.

Chapter 2: Neoliberalisation of Nature and Conservation

Introduction

This second chapter reviews literature on the neoliberalisation of nature and conservation, following on from the conceptual apparatus presented in Chapter 1. The neoliberalisation of nature is a vast and heterogeneous field, focusing on two of the most contested and all-encompassing objects of inquiry to be found in the contemporary social sciences and humanities. As Raymond Williams (1983, p. 219) said, nature is probably the most complex word in the English language, while some have gone as far as question whether neoliberalism should be used at all by political economists (Barnett, 2005), due to the increasing lack of theoretical and analytical precision and coherence associated with the term. This chapter will consider some of these debates, but the main intention is to use the neoliberalisation of nature literature as an orientation for the aims, objectives and research questions of the thesis. The argument made in the chapter is that the literature on neoliberal natures gives important context and analytical tools for the empirical work on issues such as biodiversity offsetting, while neoliberal conservation provides an extra element of specificity.

Biodiversity offsets are policy instruments intended to deal with this particular set of issues, and the specific problematic of reconciling economic growth, in the form of land development, with globally agreed efforts to stem the decline of biodiversity – one of the most pressing environmental crises of today's world. Hence the second focus of this chapter is on neoliberal conservation, since this thesis is ultimately an investigation into how and why 'nature' is conserved today, and the dilemmas and contradictions encountered in ongoing efforts to do so. The neoliberal natures literature has shone important light on the changing goals, procedures and effects of environmental management in the neoliberal era, but initially produced relatively little on the topic of (biodiversity) conservation – i.e. the governing and protection of nonhuman species, habitats and life processes, outside of food production and biotechnology. As a result, since the late 2000s neoliberal conservation studies emerged and developed as a relatively discrete subfield, tracing the longer-term trajectories of conservation theory and practice as a distinctive mode of environmental protection and management – with its own set of values and methods traditionally viewed as more hostile to economic growth than other forms of environmental governance. According to this literature, conservation has been undergoing its own path-dependent process of neoliberalisation, analogous with the neoliberalisation of nature more generally (Büscher et al., 2012).

The chapter starts by outlining what I understand by the term neoliberalism (Section 1), presenting neoliberalism as worldview, policy programme and practices, as well as a geographically variegated yet hegemonic phenomenon. Section 2 turns to the neoliberalisation of nature and conservation as a mode of analysis, that refers to related yet distinct historical formations, emerging out of the convergent economic and ecological crises of the 1960s and 1970s. After a brief overview of the two topics, the section reviews three major themes found in these literatures that are of relevance to the thesis: privatisation and enclosure, marketisation and commodification (Section 2.1); eco-

governmentalities and shifts from government to governance (Section 2.2); and the constitutive role of human and nonhuman resistance to the variegation of neoliberal natures (Section 2.3). The review is necessarily selective in focus, and somewhat descriptive, but as a whole is designed to outline a broad schema of the author's understanding of the neoliberalisation of nature and conservation, and to provide a conceptual and analytical framework for understanding contemporary reformulations of nature conservation practice. Section 3 completes the chapter, reflecting on the conceptual framework constructed in Chapters 1 and 2, and how it orientates the rest of the thesis. Chapters 3 and 4 will then look at some of the debates and questions opened up in more detail, bringing them to bear on the historical and geographical development of biodiversity offsetting.

1: Neoliberalism

As noted above, neoliberalism has become an increasingly messy and debated term, but one I believe to be useful nonetheless in positioning the study of biodiversity offsetting. This section provides a synopsis of neoliberalism as deployed and contested by social scientists as a worldview, policy programme, and set of practices as observed and critiqued in the 'real world'.

1.1: Neoliberalism as worldview

In describing neoliberalism as a worldview, I mean a set of ideas analogous to those of classical liberalism, developed among a relatively small cohort of thinkers associated with the Mont Pelerin Society, most notably Friedrich von Hayek and Milton Friedman, and the Austrian and Chicago schools of economics, and from the German ordo-liberal tradition (Davies, 2014; for some recent in-depth intellectual histories, see Dardot & Laval, 2014; Peck, 2012; Mirowski & Plehwe, 2009). The early neoliberals – though the term 'neoliberalism' has long been disavowed by its proponents – saw their ideas as succeeding those of classical liberalism, a failed project they believed to have been flawed (Mirowski, 2013, chap. 2). As an intellectual and political project, neoliberalism was set up in reaction to the rise of totalitarian fascism and communism, but also against the perceived illiberalism of bureaucratic planning and social democracy of the post-war settlement (Davies, 2014, p. 29). At the heart of neoliberal thought was an extreme normative position with regard to the individual liberty and freedom, as an ideal which should be promoted above all others (Harvey, 2007b, chap. 1). For governments, this would translate to taking an active role in maximising the independence of individuals, and dismantling bureaucratic structures and institutions – both inside and outside the state – which foist collective or redistributive agendas on society, and impinge on particular neoliberal notions of freedom (Castree, 2010, p. 9). The programmes with which neoliberal governments should pursue these objectives will be discussed shortly, but for individuals the corollary of non-interference is a heightened position of personal responsibility. Following Foucault (2010), many have focused on the notion of neoliberal governmentalities, and the reconstruction of the individual as so-called *homo economicus* (e.g. Dardot & Laval, 2014; Gane, 2013; Ferguson, 2010): the competitive and entrepreneurial self, as portrayed in Becker's (2009) writings on 'human capital'.

Another core feature of neoliberal thought has been the status of the market as principal mechanism for efficient delivery of the goals of liberty and freedom (Castree, 2010, p. 9). The market is seen as an appropriate instrument to deploy outside of the realm of the economy, with markets or market-like instruments put forward as both legitimate and desirable ways of conducting and organising social, political and environmental life, over deliberative and collective decision-making processes (Davies, 2014). The market is presented as a natural phenomenon with emergent properties, intrinsically superior to any other form of governance, with an epistemological quality specifically juxtaposed to any kind of centralised planning (Mirowski, 2013, p. 54). This notion, most closely associated with Hayek, says that only the market can hope to process the complexity of individuals' inherently partial knowledge and subjective, ever-changing preferences, into clear information through price signals – where value and price are understood as synonymous. Combined with its radical commitment to a particular type of individual liberty, usually inseparable from private property, free market exchange is envisioned as the ultimate crucible of democracy under neoliberalism, while traditional notions of democracy as popular sovereignty have been treated with a certain level of ambivalence (Davies, 2014; Mirowski, 2013). This leads Davies to define neoliberalism at the most basic level as the "disenchantment of politics by economics" (2014, p. 4). Following Foucault's (2010) observation that the state's new reason for being was one of pursuing economic growth as its core social policy, many have focused on the state's explicitly strong role – though denied at the level of popular public discourse as propagated most expertly by Friedman – as a central point of departure from the philosophy of classical liberalism. The state's role goes far beyond that of so-called night-watchman. This shift rested on the early neoliberals' conclusions that *laissez faire* fell apart due to non-intervention[10], and a belief that markets and the liberal order would need to be actively imposed and policed, and the individual continually reshaped accordingly (Mirowski, 2013, pp. 58–9)[11]. While resolutely anti-planning in one sense, neoliberalism has always been an explicitly constructivist state-led project (Bonefeld, 2010, 2012).

1.2: Neoliberalism as policy programme

Despite its emergence in the 1930s, the worldview of neoliberalism was largely considered extremist, and remained politically marginal until the crisis of Keynesianism in the 1970s. At this moment, however, neoliberal ideas began to make serious inroads into the consciousness of political leaders capable of taking power, with the Pinochet dictatorship often thought of as the first 'neoliberal' government, following the Chilean coup of 1973. This was crucially followed by the first elected neoliberal leaders among the advanced economies, with Margaret Thatcher and Ronald Reagan winning power in the UK 1979 and US in 1981 respectively. Precipitated by the economic turbulence

[10] Though as Polanyi (2001) showed, the formation of market society in England was fundamentally reliant on state intervention too.

[11] Neoliberalism disavowed classical liberal ideas of preformed individuals based on natural laws and rights.

of the 1970s and 1980s, the spread of neoliberal doctrine was rapid[12]. By the 1990s and the fall of the Soviet Union, neoliberal ideas were largely hegemonic, embedded in governmental thinking and the institutions of global governance. As a recognisable policy programme, through which the neoliberal worldview as the constructivist and normative project sketched out above might be realised, many came to connect neoliberalism with the economic doctrine of the Washington Consensus (Wade, 2010; Saad Filho, 2005). However, the far-reaching scope of 'ideal type' neoliberal programmes has been observed to go well beyond what is traditionally thought of as the economic realm, as outlined below, adapted from Castree's (2008b, 2010) framework.

Privatisation and *marketisation* are sometimes taken together under the banner of commodification (e.g. Harvey, 2007b), but can at the same time be undertaken separately as distinct strategies. Privatisation refers to the establishment of clear private property rights to previously unowned, commonly owned or state-owned aspects of the social, cultural or biophysical world, creating legally enforceable regimes of exclusive use and access. Marketisation describes the subjection of processes and things to market logic which were not so before, such that they can be given a price and traded as commodities between legally distinct entities (which do not need to be private individuals or groups).

Deregulation and *reregulation* have been described as twin logics of neoliberal programmes (Castree, 2008b; Peck & Tickell, 2002), even if the former is more recognisable in mainstream public discourse, as the rolling back of the state (e.g. Peck & Tickell, 1994). Deregulation denotes the removal of supposedly inefficient and pejoratively named command-and-control regulation (for instance relating to finance, labour and the environment), with the purpose of freeing individuals and businesses from the shackles of state bureaucracy and interference, promoting greater self-sufficiency and flexibility (e.g. Peters, 2009). Increased market competition meanwhile is expected to raise standards on a more voluntary basis, if demanded by consumers. Reregulation, or 'roll out' neoliberalism (Lockie & Higgins, 2007; Peck & Tickell, 2002; Snyder, 2001), describes the more interventionist role of the state in creating markets, and crucially, in actively maintaining 'competitive' markets. The state is discursively reconfigured with a more enabling and managerial brief, tasked with intervening "*for* the market economy, not, as it were, *in* it" (Castree, 2010, p. 10).

Remaking of state, civil society and individuals in market image describes the final set of common features frequently observed in neoliberal programmes. Firstly, residual non-privatised public institutions are reorganised and restructured to mirror entrepreneurial market actors (Ferguson, 2010). On one level, this means the increased use of market proxies to govern public bodies, and increased use of internal markets, standardised instruments of measurement and auditing processes;

[12] Though neoliberalism's quick ascendance to hegemonic status was in some ways fortuitous, many historians are keen to point to the political savvy and fastidious planning undertaken by the Mont Pelerin Society, and particularly the role of its global network of associated think tanks aimed at influencing politicians and policymakers, and its targeted infiltration of key university institutions, especially law and economics departments (Davies, 2014; Mirowski, 2013).

putting government departments and subnational authorities in direct competition for funding streams; and opening up to competitive tendering of specific functions, such as everyday operational activities and service delivery (Jessop, 2002, p. 461). This is connected to a growing role for civil society organisations (charities, NGOs, 'communities' and so on) in providing services, particularly social and environmental, withdrawn by the state (Miraftab, 2004; Kamat, 2004; Petras & Veltmeyer, 2001). These groups are encouraged to professionalise by reconfiguring their organisational cultures and structures in the image of commercial enterprises (Evans et al., 2005). Within this formation state-civil society relations are recomposed, with a heightened individualisation and devolution of responsibility away from the national state (Brenner & Theodore, 2002; Peck & Tickell, 2002; see also Brenner, 2004; Swyngedouw, 2004), while an ethic of self-reliance is cultivated and imposed on lower levels of government, as well as other institutions, producers and consumers, communities, families and individuals, who are increasingly tasked with their own reproduction.

1.3: Neoliberalism as set of policy practices and processes

This broad programme has been rolled out in various and variegated forms around the world, via a number of concrete policy tools, practices and processes. Again, despite the public disavowal of the state by neoliberals, the programmes and policies outlined above and below are very much government and state-led. The transformative logic of neoliberalism at once reconstitutes the state in a more hands-off and hands-on role. While relinquishing direct responsibility in some ways, to enable individual liberty and competitive markets to flourish, the state's remit is at the same time deeply interventionist and managerial[13]. Macro-economic policies are some of the more recognisable, including the targeting low inflation rates and balanced budgets, restrictions on government borrowing, money creation and tax-and-spend policies, alongside a preference for floating exchange rates and independently (or market) set interest rates. The liberalisation of trade, investment and ownership rules, and the removal of subsidies, together with tools (such as tax breaks) to incentivise 'entrepreneurial' activity all aim to increase market competition (Castree, 2010, p. 11).

The state acts in various ways to open governance and decision-making processes to non-state actors, in a bid to devolve responsibility to civil society groups and organisations. State functions and services are increasingly subjected to procedures of audit and measurable target-setting, connected with systems of incentives and penalties for success and failure. These practices have been extended to the regulation of the economic, social and environmental realms, either state-enforced or voluntary, where sectors are routinely encouraged to self-regulate, using industry standards and accreditation

[13] It should be noted that since the financial crash of 2008 and major recessions in most of the advanced economies, many of these cornerstone policies below have been abandoned for extended or indefinite periods, with some raising the spectre of a 'post-neoliberal' era. Others however have emphasised the flexibility of neoliberal doctrine in times of crisis, and how 'states of exception' have long been constitutive to neoliberalism and its rhetorical goal of preserving the market above all else (Davies, 2014; Mirowski, 2013). Furthermore, while some objectives have been suspended or temporarily deprioritised, others have been pursued with renewed vigour under the auspices of austerity.

schemes for example, to ensure good practice[14]. Collectively-orientated rights (e.g. environmental protections, labour rights, wage and rent controls) meanwhile are actively eroded, through legislative or other means, allowing and encouraging businesses and people to act under more flexible conditions. Focus is instead put on the individual, with policies focused on constant education and (re)training, such that labour is more adaptable, and designed in ways which encourage self-reliance, risk-taking and entrepreneurialism.

The other side of these policies promoting individual responsibility has seen a more disciplinary role for the state. With regard to social security functions, state support is shifted progressively towards 'workfare' (Peck, 2002), increasingly made contingent upon recipients undertaking various self-improvement actions to improve their employability, such as training courses and unpaid work, with perceived non-compliance potentially resulting in sanctions and withdrawal of support. This more punitive character of the state is reflected too in a greater concern for 'law and order'. Though rhetorically committed to individual liberty, free expression and so forth, the neoliberal state is also seen as taking an "uncompromising approach to rule breakers, 'trouble-makers', and those who otherwise cause social disruption and infringe upon the rights of others" (Castree, 2010, p. 11). The state is observed in this respect to embody a more revanchist and violent dimension (MacLeod, 2002), with criminalisation of supposedly transgressive activities a key feature of neoliberalism (see for example Wacquant, 2009)[15].

1.4: Neoliberalism as impure, variegated but hegemonic

The policy practices outlined above are far from invariant in the real world. Many authors have highlighted the impurities of 'actually existing' neoliberalism (Larner, 2003; Brenner & Theodore, 2002). In more recent years the idea of neoliberalisation as process – rather than neoliberalism as a 'thing' – has been developed further, placing "the geographical, temporal, and sectoral variability of neoliberalisations" (McCarthy, 2012, p. 184) at the heart of a contemporary research agenda on the topic (Brenner et al., 2010a, 2010b). According to these authors, differentiation and variegation should be recognised as overarching and constitutive features of neoliberalism, as it plays out in the real world as a process of uneven regulatory development, interacting with, facing resistance from and being redirected by, other social structures and circumstances. As a result, plural neoliberalisations – uneven and incomplete, hybrid and heterogeneous – are hypothesised as the present-day and ongoing reality of neoliberalism. According to this line of thought, there are still core logics and tendencies to the project of neoliberalism, but these are now deeply embedded and hegemonic rather than transformative, and more difficult to dislodge (Peck et al., 2010).

[14] Such governance mechanisms are increasingly important with the state extracting itself from direct responsibility for various social and environmental issues.

[15] In some parts of the world at least, this is also connected to rising incarceration rates, predominantly among the most marginalised groups and people of colour.

While many of these ideas rest on the materialist and structuralist foundations of regulation theory, it should be noted there is a deep ideological and cultural current to work on neoliberalism as well, with emphasis placed on neoliberalism centred on a 'politics of inevitability' (Peck, 2004, p. 394). Pronouncements regarding the 'end of history' and the persistence of Thatcher's famous idiom 'there is no alternative' are seen as instructive of neoliberalism's status, as the (re)establishment of the natural order. Frederic Jameson's (2003) oft-repeated quote: "it is easier to imagine the end of the world than to imagine the end of capitalism", meanwhile, has become shorthand among many critics for neoliberalism's deep and debilitating penetration of the popular cultural imaginary and consciousness (Fisher, 2009).

2: Neoliberal Natures and Neoliberal Conservation

The previous section laid out the main contextual logics and processes behind the proliferation of markets and market-like mechanisms over the past several decades, and describes how they have played out in the real world. The now expansive literature on the neoliberalisation of nature brings this framework to bear on the environmental realm, but also challenges more orthodox ideas about what neoliberalism is. The development of a distinctive field, relating to how nature (such as 'biodiversity' in the current study) has come to be governed in this manner, highlights the relative lack of attention given to this topic in the vast amount of writing on neoliberalism. Situated in relation to other critical takes on neoliberalism, work on neoliberal natures points to something more than an empirical blind-spot, but a lacuna with greater implications.

By combining political ecological analysis of capitalist modernity in general with the historical and geographical specificity of the neoliberal era, this literature rejects the Cartesian abstractions and external nature it sees as recapitulated in most critical studies of neoliberalism. The premise of the neoliberalisation of nature is that the formation and unfolding of neoliberalism is necessarily and inseparably social, economic and environmental. 'The environment' is not something that can be added on, since the crisis out of which neoliberalism arose was irreducibly economic, social and ecological – meaning it cannot be separated or relegated, theoretically or practically. From this perspective, neoliberalism is not simply a social formation which acts upon or interacts with nature, but a set of processes which are irreducibly co-constituted and unfold through nature-society relations and crises. Taking this as a starting point, the literature seeks to uncover what exactly is new and specific about the ongoing reconfiguration of nature-society relations which takes place through the neoliberalisation of nature, understood as a geographically variegated set of processes and effects. The burgeoning theoretical and empirical literature has been geared towards analysing and explaining how and why neoliberal environmental governance of different natures, in different places and at different scales, unfolds contingently and unevenly, mediated by factors which are historical and geographical, social and natural, material and symbolic.

Nature conservation clearly has an important part in all this. However, as a specific area of environmental governance it was largely unexplored in the early days of the neoliberal natures literature. As a result, neoliberal conservation studies began to develop as its own subfield a little later, gathering pace as a relatively autonomous body of research from around 2010 (Büscher et al., 2012; see Castree & Henderson, 2014, for a critique). While the general themes are largely analogous, there are several particularities to bear in mind. As mentioned in the introduction, the neoliberalisation of conservation should be viewed to some extent as a path dependent process. Environmental conservation, as opposed to management more generally, has historically had something of a peculiar and ambiguous relationship with capitalism (Büscher & Arsel, 2012; Adams, 2004). In one sense, conservation is seen as a moment of a Polanyian double movement, pushing back against the encroachment and destructive effects of market society on the natural environment. As a movement, conservation orientates its discourse and activity around attempting to protect or promote certain values considered to be in tension with instrumentalist or utilitarian values.

The increasing neoliberal character of conservation is posited as the subordination of these values to capitalist growth imperatives, or at least a concerted effort to bring them into greater harmony (Büscher et al., 2012). At the same time, conservation has always been historically bound up with capitalist and class power, as well as a variety of colonial and neo-colonial discourses and practices of (often violent) dispossession (Adams & Mulligan, 2012; Brockington et al., 2008). Important too is conservation's modern concern with governing and protecting 'biodiversity', a new and interdisciplinary concept coined in the US as recently as 1986 (see Farnham, 2007). Biodiversity became the subject of the newly created field of conservation biology, an explicitly normative 'crisis discipline' (Takacs, 1996), containing all kinds of assumptions about nature-society relations and economic and population growth, and is widely recognised as both scientifically and politically contested (e.g. Vadrot, 2014; Lanzerath & Friele, 2014; Robin, 2011; Zimmerer, 2009).

The rest of this section provides a review of three major themes found in these literatures, which will be crucial for analysing the empirical case of biodiversity offsetting. They are: (i) privatisation and enclosure; marketisation and commodification; (ii) eco-governmentalities and shifts from government to governance; and (iii) human and nonhuman resistance to the neoliberalisation of nature. Though what follows is brief, many of these topics and debates will be returned to in more detail in Chapter 10.

2.1: Privatisation and enclosure; marketisation and commodification

As with the literature on neoliberalism in general, privatisation and commodification are two of the defining features of the neoliberalisation of nature (e.g. Himley, 2008; Castree, 2008b; Heynen et al., 2007; Heynen & Robbins, 2005). In fact, many mainstream treatments of neoliberalism highlight 'nature' as a particular target for these twin neoliberal strategies (e.g. Harvey, 2007b, p. 160), as realms typically non-privately owned, and either un-commodified or de-commodified under previous modes of governance. Privatisation of nature is often associated in the literature with large-scale transfers of wealth from public to private hands, and what Harvey has popularised as 'accumulation

by dispossession'. Commodification meanwhile, and the growing use of market-based instruments (MBIs), are viewed as furthering the core rationalities of market governance and capitalist techniques of valuation. Privatisation is not strictly necessary for marketisation, but the two are intimately entwined under neoliberalism. Tradeable commodities clearly need to be legally alienable from their owners, while the assignment of exclusive property rights over parts of nature is designed with the purpose of enabling use and access to be sold, as a way of generating income, and encouraging entrepreneurial attitude to environmental management. Consequently, there is much overlap between the arguments highlighted below, as the processes tend to be interpenetrating and not easily separable.

2.1.1: Privatisation and enclosure

Enclosure and privatisation may well be motivated by opportunities for rent-seeking and consolidation of class power and wealth (e.g. Harvey, 2007b), but its environmental rationale has long been underpinned by a distinctly neo-Malthusian logic (Katz, 1998), frequently justified according to the 'lifeboat ethics' of Garrett Hardin's (1968) 'tragedy of the commons'. As Mansfield argues, the broader theoretical position behind privatisation rests on the classical liberal assumption that it is through the improvement of private property that wealth is generated. This in turn is deemed to operate in a self-disciplinary manner, reinforced by market competition, through which private property regimes are said to spur new and more efficient management practices (Mansfield, 2008a, pp. 3–4).

Empirically, water privatisation has featured heavily in this part of the literature (Bakker, 2003, 2010a; Swyngedouw, 2005), as has work on the liberalisation of concession rights for transnational capital in the extractive sectors (Gordon & Webber, 2008; Liverman & Vilas, 2006; McCarthy, 2004). The social and environmental implications of growing concentration of corporate agribusiness has long been of concern to critics of neoliberalism. In more recent years, the issue of 'land grabbing' for various forms of 'green' production, rent or speculation (in relation to biofuels, renewable energy or carbon offsetting schemes, for instance) has caught the attention of scholars of the neoliberalisation of nature and conservation (Holmes, 2014; Corson et al., 2013; Fairhead et al., 2012). With the rising focus on new income-generating forms of conservation – 'selling nature to save it' as McAfee famously (1999) put it – as strategies for economic development and poverty alleviation, such as ecotourism (Ojeda, 2012) and Payment for Ecosystem Services (PES) schemes (Shapiro-Garza, 2013; Corson & MacDonald, 2012; Kosoy & Corbera, 2010), privatisation and enclosure have become central to debates around neoliberal conservation as well (Benjaminsen & Bryceson, 2012; Corson, 2011b; Robbins & Luginbuhl, 2005).

Many of these latter forms of green grabbing are connected to the growth of tradeable permit regimes. These have generated another tranche of empirical case studies, and include environmental policy instruments such as tradeable emission rights (Bond, 2012; McNish, 2012; Lohmann, 2011b), fish quotas (Mansfield, 2004) and water quality credits (Robertson, 2007). Much of this work stresses the deeply interventionist role of the state in creating and enforcing new property regimes (Kelly & Peluso, 2015; Robertson, 2006a). This part of the literature is crucial with respect to considering biodiversity

offsets as a set of neoliberal environmental mechanisms, since they ultimately boil down to tradeable conservation credits or development rights, constructed and certified as the saleable property of their holders. Advanced scientific practices are seen as crucial in the construction of new rent-seeking property regimes, concerning newly constructed or previously undiscovered entities and processes at different geographical scales (Pellizzoni, 2011). Biotechnology (Neimark, 2012; Prudham, 2007; McAfee, 2003) and atmospheric science (Lohmann, 2011a) have frequently been the focus of empirical study, while various theories such as the 'industrialisation of nature' (Boyd et al., 2001) or the 'real subsumption of nature' (Smith, 2006) under neoliberalism have been associated with the production of new and frequently financialised natures. Again, the state is seen as an absolutely critical actor in these processes, with some highlighting the instability of highly contingent formations of capital, science and law at the centre of commodity definition, as in the case of wetlands banking (Robertson, 2006a).

As with the literature on neoliberalism in general, a great deal of geographical unevenness and variegation has been seen as a defining feature of the privatisation (and commodification) of nature. While some of the reasons for this relating to resistance will be discussed in Section 2.3, it should be noted here that both processes have been observed as exceedingly difficult. Socio-legal geography has shown how cultural and institutional property relations are specific, and as Blomley (2008) insists, property is a verb as well as a noun, a practical process which tries to simplify a whole host of complex, heterogeneous and contradictory social, ecological and legal factors (see also Kay, 2015). As an effect privatisation is usually partial and incomplete (Mansfield, 2008b; Bakker, 2003). However, though property is ultimately a highly contested socio-natural relation, it has nevertheless been a critical factor in the neoliberal recomposition of nature-society relations.

2.1.2: Marketisation and commodification of nature

The marketisation and/or commodification of nature is another area of central importance in the literature on the neoliberalisation of nature (Prudham, 2009; Castree, 2003) and conservation (Büscher et al., 2012). As discussed in Section 1, 'the market' is endowed with a special quality in neoliberal thought, a supposedly unique capability to generate information about value in complex phenomena through price discovery. The justifications for 'market environmentalism', as it is sometimes termed (e.g. Bailey, 2007; Bakker, 2005), rest on the market's related ability to deliver efficiency, spurring innovation via competition and more rational decision-making in the allocation of natural resources, goods and services (O'Neill, 2007). In nature conservation these theoretical tropes have been increasingly mobilised in support of extending the use of markets and market-based instruments to achieve policy goals, namely reconciling competing economic and ecological demands under the rubric of 'win-win' outcomes (Fletcher, 2013; Roth & Dressler, 2012; Arsel & Büscher, 2012).

Much work has also been done on the process of nature commodification, theorised by Castree (2003) as a series of moments which splice bits of nature up into discrete and fungible entities; unbundled from their social and ecological context, standardised, measured and quantified, made

commensurable in time and space, all so they can ultimately be circulated as alienable, tradeable commodities. Commodification's increasing scope and scale constitutes a core theme of neoliberal natures, with authors surveying the ever deeper penetration of capital into the circuits of life from the smallest to the largest scales (Prudham, 2009). These are backed up by a wide range of empirical cases (e.g. Kosoy & Corbera, 2010; Robertson, 2004; Liverman, 2004), as well as a growing body of work nature's financialisation – the creating and circulation of 'green' bonds, derivatives, futures and other speculative financial products (Sullivan, 2013b; Bracking, 2012; Lohmann, 2011a; Smith, 2006). Some have made the case that the capital's extension into previously uncommodified parts of the nonhuman world constitutes a mode or strategy of accumulation in its own right, viewed as an outlet for surplus value (Büscher & Fletcher, 2015; Bumpus & Liverman, 2008; Smith, 2006; though see Dempsey & Suarez, 2016).

As with work on privatisation, there is a focus on the growing prevalence of regulatory markets in tradeable rights, permits and quotas, and similarly novel markets actively constructed to govern a variety of contemporary environmental problems (such as climate change, overfishing or ozone depletion). The intellectual origins of these markets can be traced back to seminal texts and ideas of neoliberal thinkers like Ronald Coase (1960) and John Dales (1968), both important figures in the development of environmental economics (Felli, 2015; Gómez-Baggethun et al., 2010). Empirical work by Robertson (2006a) in particular has drawn attention to how commodities need to be actively made and imposed by the state in these markets, but often also require the legitimating enrolment of a variety of experts and different interests at different scales, such as scientists, lawyers, NGOs and so on. It is important to remark here that marketisation and commodification do not necessarily indicate the same thing, and there is some discussion over whether the creation of regulatory markets denote commodification in the strict sense (see for instance Robertson, 2007). Some aspects of the human and nonhuman world have proved exceedingly difficult to fully commodify, but the neoliberalisation of nature also incorporates the use of market proxies outside the commodity circuit. To reiterate a point from Section 1, neoliberalisation is as much marked by the inscription of market rationalities across socionature as it is by commodification or privatisation *per se*, and techniques of measurement and valuation, as well as other internal market-like organisational techniques, are frequently deployed in efforts to drive efficiencies in non-commodified areas of environmental governance (Gómez-Baggethun & Ruiz-Perez, 2011).

Other approaches highlight the symbolic and discursive work in reconfiguring or reassembling nature into more pliable economic categories. Büscher et al (2012, p. 8) talk about neoliberal conservation "infusing conservation policy and practice with the analytical tools of neoliberal economics", a process which can be observed in the reconstitution of nature as 'natural capital' (MacDonald & Corson, 2012) or biodiversity credits (Sullivan, 2013a). These necessarily involve symbolic reconstructions of nature, drawing on the Cartesian methods outlined in Chapter 1, which allow 'nature' to be viewed as objective and external, and to be mapped, measured and divided in abstract time and space – all critical to the process of commodification. As Prudham (2009, p. 124) points out, it is also the semiotic

constructs themselves which are often subject to commodification, something which seen as particularly prevalent in the neoliberalisation of nature conservation (Büscher et al., 2014; for critical reviews see Lansing et al., 2015; Castree & Henderson, 2014).

As demonstrated by the literature, nature's marketisation and commodification is frequently found to be deeply uneven, impure and incomplete. Many reasons have been offered in explanation, not least of which are the many practical limits and tensions met in trying to abstract nature from specific socio-cultural and spatio-temporal contexts (Lee Peluso, 2012; Prudham, 2009; Sullivan, 2009; Robertson, 2006a). The biophysical world tends to be unpredictable and frequently elides the systems of bordering and classification needed to make it fungible, and the maintenance of markets often requires constant intervention as a result (Bakker & Bridge, 2006). As will be returned to in more detail in Section 2.3, some scholars see the implications of both privatisation and commodification as often ambiguous in outcome, precisely because of their indeterminacy. However, for Büscher and his fellow authors, commodification represents the core ecological contradiction of capitalism, accelerated under neoliberalism, in the manner in which it cuts up the "[d]iversity, connectivity and relationships … crucial for the resilience of ecosystems … in order to produce, sell, and consume their constituent elements" (2012, p. 8; see also Kosoy & Corbera, 2010). The issue raised is not merely that the abstractions and simplifications wrought through commodification are reductionist, or devalue some aspects of nature, but that they have very material consequences in the way nature is managed in practice. Whether nature 'resists' or not, the integrity of complex interrelationships is nonetheless degraded by the 'violent abstractions' of commodification, yet markets are presented as the solution to a crisis or crises of which they are the primary cause (Spash, 2015; Büscher et al., 2012; Lohmann, 2011a; Bakker, 2010b; O'Neill, 2007). Moreover, the effects are social as well as ecological, and found to exacerbate poverty and inequality (Fletcher, 2012; McAfee, 2012; Corbera et al., 2007).

2.2: Neoliberal environmental governance

As discussed in Section 1, neoliberalism is closely associated with state restructuring, changing state-civil society relations and a shift from government to governance, sometimes theorised together as a new mode of social regulation. These approaches have been mirrored in the literature on the neoliberalisation of nature, with respect to changing modes of environmental governance and regulation, and their socio-environmental logics and effects (Bridge & Perreault, 2009; Himley, 2008). Here I draw attention to two areas of work most relevant for the thesis, namely the changing nature of environmental regulation away from command-and-control government, towards more voluntary and partnership models of governance; and work drawing on Foucault's notion of neoliberal governmentality, to shine light on the reordering of nature-society relations taking place through the neoliberalisation of nature.

2.2.1: From government to governance

Neoliberal reregulation is generally understood to be part constituted by moves toward more flexible and other non-binding forms of regulation (McCarthy & Prudham, 2004, p. 276), and has seen innovations in voluntarist and private forms of regulation (Collard et al., 2016). Through this process, the state's relationship with the private sector is understood to be shifting away from so-called command-and-control modes of environmental protection, which had become increasingly prevalent between the mid-1960s and mid-1970s, towards more flexible, cooperative and enabling arrangements (Ioris, 2014). In the neoliberal era, the state is viewed as taking a more 'light touch' approach, and firms, industries and sectors encouraged to self-regulate and develop their own standards (Newell, 2008)[16]. The shift towards more flexible forms of governance has on the one hand been associated with the neoliberal logic of deregulation (Prudham, 2004); on the other with specific forms of market friendly reregulation (Bumpus & Liverman, 2008; McCarthy, 2004). Much work has been done on the creation of new public-private partnership governance organisations as central to these moves, often hybrid in nature, bringing together a variety of state and non-state actors across scales (Reed & Bruyneel, 2010; McCarthy, 2005a).

Neoliberal conservation studies have focused heavily on this area, particularly the role of high-scale or transnational bodies and institutions in building or imposing the institutional architecture for market-based governance (Fletcher, 2014; Corson & MacDonald, 2012; MacDonald & Corson, 2012; McAfee, 1999). Together with the focus on the growth of public-private partnerships, attention is frequently given to the roles played by non-state actors within governance, particularly private sector organisations (MacDonald, 2010) and NGOs (Corson, 2011a). Duffy (2006) for instance examines the increasingly powerful role played by large international NGOs in influencing policy in Madagascar and southern Africa, and the political implications of their mediation through close relationships with international donors and financial institutions. Another significant component of devolved responsibility relates to the growth of certification and labelling schemes, which have developed alongside the more general shift towards voluntary standards over strong state regulation. Research here has looked at a range of sectors, such as forestry (Klooster, 2010, 2005), food and agriculture (Bacon, 2010; Higgins et al., 2008; Guthman, 2007), and fishing (Foley & Hébert, 2013; Baird & Quastel, 2011). Though the rise of standards is seen in some ways as a response to public pressure and campaigning, these new forms of governance – and the rise of Corporate Social and Environmental Responsibility practices more generally – are also presented as decisively neoliberal in character. Authority, it is argued, is ultimately placed in the market, with mixed results (Collard et

[16] For some authors (Himley, 2008, p. 441; McCarthy & Prudham, 2004, p. 280), these new approaches are also connected to the normative environmental discourse of ecological modernisation (Mol & Spaargaren, 2000), which posited that economic growth could be dematerialised and ultimately decoupled from environmental harm through technological innovation. However, I will leave this to one side here, along with the related sociological theory around 'risk society' (Beck & Lash, 1992).

al., 2016), while the development of standards and certification schemes turn largely on notions of consumer agency and competition (Liverman, 2004).

Other parts of the literature have theorised the shift from government to governance alongside processes of rescaling under neoliberalism (e.g. Cohen & McCarthy, 2015; Reed & Bruyneel, 2010). Certainly, the devolution of functions to non-state actors and creation of hybrid governance institutions, referred to as scaling out in this literature, has been bound up with the rescaling of some governance mechanisms up and down (Apostolopoulou et al., 2014; Liverman, 2004). Meanwhile, authors have highlighted how this has been complicated by the co-constitutive role of environmental issues, such as environmental politics, nonhuman natures and biophysical processes, in the production of scale (Neumann, 2009, p. 399; see also Cohen & Bakker, 2014; McCarthy, 2005b; Swyngedouw & Heynen, 2003). However, the degree to which rescaling has been constitutive of the neoliberalisation of nature, as opposed to a contingent effect, remains unclear, and the issue remains somewhat marginal within the literature.

2.2.2: Neoliberal environmental governmentalities

Related to work on governance has been the mobilisation of ideas of environmental governmentality (see Darier, 1999) – which has variously been referred to as eco-governmentality (Bridge & Perreault, 2009), green governmentality (Rutherford, 2007; Luke, 1999) and environmentality (Fletcher, 2010; Agrawal, 2005) – and their intersection with neoliberalism. Neoliberal environmental governmentality draws largely on Foucault's writings on governmentality, biopolitics and decentred notions of power, but expands them to conceptualise how the governing of biological and ecological life, processes and populations are critical to the production of social or socio-natural order (e.g. Rutherford, 2007; Braun, 2007, 2000). According to Bridge and Perreault (2009, pp. 489–91), eco-governmentalities have been useful in illuminating three aspects of environmental governance in particular: the production of green knowledge and expertise; the creation of environmental subjectivities; and the role of national projects of power in making particular natures visible, which grant 'epistemological' access to nature to certain groups.

Discursive approaches have been used by a number of authors (e.g. Bäckstrand & Lövbrand, 2006; see also Fischer & Hajer, 1999; Hajer, 1997), and are important to the framing of neoliberal conservation alongside ideas of ideology (Büscher et al., 2012) and virtualism (Fletcher, 2013; MacDonald & Corson, 2012). Governmentality is however perhaps more prominent in the literature (e.g. Boelens et al., 2015; Dressler, 2014; Fletcher & Breitling, 2012), as with Wynne-Jones (2012), for instance, who uses the concept of neoliberal governmentality and hegemony to critically analyse the role of conservationists as expert intermediaries in the development of PES schemes. This is related in turn to writing stressing the role of environmental subject formation: the way in which "individuals and communities internalise environmental objectives and rationalities" (Bridge & Perreault, 2009, p. 490; drawing on Robbins, 2007; Agrawal, 2005; see also Holmes & Cavanagh, 2016). Guthman for instance considers about how contemporary food activism in California "intersect[s] with neoliberal rationalities: consumer choice, localism, entrepreneurialism, and self-

improvement" (2008, p. 1171). Others meanwhile have looked at the biopolitical dimensions of conservation biology as a scientific discipline, which rules over matters of population, life and death (Srinivasan, 2014; Biermann & Mansfield, 2014), as well as in other emerging forms of nature conservation and environmental management in the Anthropocene (Cavanagh, 2014).

The role of knowledge and expertise, in the construction and legitimation of market governance, is a theme of particular interest to those writing about markets for biodiversity, ecosystem services and natural capital (Turnhout et al., 2014; MacDonald & Corson, 2012; Goldman, 2006; Robertson, 2004). Studies such as these have helped illuminate how biophysical processes and objects are made legible through specific governmental rationalities and techniques, particularly quantification and audit (Cook et al., 2016; see also Fioramonti, 2014; Demeritt, 2001), mobilising an array of calculative devices and tools of measurement, which make certain aspects of nature visible but others not. The focus on legibility is connected more broadly to matters of technocratic rule (see Mitchell, 2002; Scott, 1999) and the central role of the state-led territorialisation (Bridge, 2014; Watts, 2004; Peluso & Vandergeest, 2001) – not just a process through which power is produced, but crucial to the rendering of space and nature external and abstract. The insights from these studies are particularly pertinent to the case study, where the defining and measuring of biodiversity, and the construction and stabilisation of standardised offsets as tradeable credits is central to the operationalisation of these kinds of market-based instruments. The chapter now finally turns more substantively to the issue of resistance to the neoliberalisation of nature and conservation.

2.3: Human and nonhuman resistance to the neoliberalisation of nature

Resistance to the neoliberalisation of nature is the final feature of the literature surveyed here. In the realm of environmental policy, neoliberalism rarely has its own way. As the Section 2.1 briefly mentioned, moves to privatise and commodify nature are often frustrated by the intransigence of human and nonhuman natures, resulting in an uneven geographical landscape of incomplete neoliberalisations and hybrid governance arrangements. While Sections 2.1 and 2.2 laid out some of the core processes of the neoliberalisation of nature, this third element of the literature points to the playing out of key tensions, fissures and contradictions of capitalist natures, as described in Chapter 1. It deals not only with the ways neoliberalisation is resisted, but are also how neoliberal natures are themselves *products of* resistance.

2.3.1 Human resistance

In terms of origins, it is important to note how neoliberalism's rise to hegemony coincided with the birth of modern environmentalism, and the politicisation of a variety of environmental issues by new social movements. According to McCarthy and Prudham (2004, p. 278), this can be viewed alongside the establishment of strong Keynesian era environmental protections (in the advanced capitalist countries at least) as part of a Polanyian double movement, through which social movements and the state moved to temper the harmful social/environmental effects of market society. The subsequent neoliberalisation of nature can then be seen as part of a wider strategy which sought to contain the

political threat posed by environmentalism to the state and capital. Felli (2015) for instance argues the purpose of environmental markets, as designed by neoliberal theorists like Coase and Dales (but also drawing on Hayek), was fundamentally to depoliticise the notion of environmental limits, while simultaneously helping secure capital accumulation. Büscher et al. (2012) claim that quelling or sidelining dissent is one of the primary functions of the neoliberalisation of conservation (see also MacDonald & Corson, 2012). Combining insights from political ecology and autonomist Marxism, Nelson (2015, 2014) makes the case that the 'neoliberal counterrevolution' and neoliberalisation of nature were in part constituted by capital's recuperation and redirection of the creative excess of environmentalism and nonhuman nature.

Whether neoliberalism's relationship to modern environmentalism and 'limits' is intrinsic or contingent remains a source of some debate. What is more readily agreed upon is the endurance of resistance and social movement activity around issues of environmental degradation and its uneven socio-ecological impacts, and to the neoliberal 'solutions' proposed and imposed by the state, capital and global governance organisations. One of the four sections of *Neoliberal Environments*, edited by Heynen et al. (2007), is dedicated to 'resistance'. Mansfield's (2008b) collection *Privatization* similarly brings together a series of case studies which demonstrate how the creation of new private property rights around nature is rarely untroubled or complete. Examples abound of resistance to neoliberal policies that restrict access to vital resources and services, such as water, land and energy, whether through privatisation, land grabbing, liberalisation and unaffordable price hikes, or the removal of public subsidies (Latorre et al., 2015; Matose, 2014; Perreault, 2008, 2006; Bakker, 2007). Many of these cases coalesce around so-called 'livelihood' issues, but environmental resistance often targets the knowledge claims and value frames embodied in neoliberal environmental policies too (McAfee & Shapiro, 2010; Robbins & Luginbuhl, 2005; Laurie & Marvin, 1999; Escobar, 1998). The role of expert scientific knowledge, usually presented as purely technocratic, often comes under particular scrutiny and contestation, especially when seen as propping up narrow and utilitarian visions of nature, in tension with the multiplicity of ways people relate to and value the nonhuman world (Turnhout et al., 2013; McAfee, 2003).

While the case studies attest to the various resistances to efforts to neoliberalise nature, the critical question for many scholars is not so much whether the neoliberalisation is resisted, but how and to what extent? More contentious are the implications (see for instance Bakker, 2010b, pp. 728–9). Moves to neoliberalise nature are often observed to have been redirected because of resistance, resulting in a geographically uneven landscape of environmental regulation and governance (Dibden et al., 2009; McCarthy, 2006). On the other hand, resistance is often seen as recuperated by processes of neoliberalisation (Guthman, 2008, 2007; Holifield, 2004). For some, these are expressions of the failure of neoliberalisation in many cases, while for others this hybridity (through which tensions and contradictions are incorporated and contained) should be seen as a constitutive element of how nature becomes neoliberal, and a feature of its adaptability in the face of resistance.

2.3.2 Nonhuman resistance

It is not only human resistance which impedes the neoliberalisation of nature. Of central importance to the literature is how nonhuman natures behave in disruptive ways, helping to shape variegated outcomes in different times and places (Bakker & Bridge, 2006). Different bits of nature require neoliberalism to be adaptive in its tactics and responses. The material and discursive nature of biodiversity for instance presents particular problems which condition and shape the trajectories of 'neoliberal' policies like biodiversity offsetting. As with human resistance the results can be somewhat ambiguous, raising questions of how we define the outcomes and evaluate their socio-ecological consequences. The outcomes are uneven and frequently not as they were designed, yet are not uniformly negative (Bakker, 2010b). From a Polanyian perspective, it is clear nature can only ever be partially incorporated into capitalist modes of organisation. 'Land' (or nature) is a 'fictitious commodity' because it will always be produced outside of the capitalist relations of production. A number of studies have shown how various biophysical properties and processes of the nonhuman world, which operate outside these relations, exceed and run contrary to imperatives of privatisation and commodification. Neoliberal policies, which demand nature be made divisible, commensurable, quantifiable and ultimately fungible, meet natures which are difficult to abstract from their surroundings as discrete and individuated objects, and tend to be impure and qualitatively different in different times and places (Prudham, 2009; Castree, 2003).

While much research focuses on the biophysical properties of particular natural resources, such as water (Bakker, 2003), there has also been a growing interest in ecological processes in relation to neoliberalisation. This part of the literature has paid attention to the shifting foundations of natural science, and specifically the rise of the 'new ecology', otherwise known as non-equilibrium ecology, away from existing homeostatic systems theory. Non-equilibrium ecology, emerging around the 1960s as the dominant paradigm in ecological science, has stressed the dynamic, unstable, indeterminate and nonlinear nature of ecological processes (Walker & Cooper, 2011; Zimmerer, 2006, 2000; Leach et al., 1999). Again, the nature of nature is said to be uncooperative and tends to refuse the imposition of neoliberal categories. The inherent unpredictability and uncertainty of the biophysical world is posited as another significant obstacle to nature's neoliberalisation, since the delineation of stable objects across time and space is crucial to the construction of fungible commodities. This trope of the literature is of specific relevance to the topic and biodiversity offsetting and nature conservation, which today are increasingly concerned with managing and sustaining ecological processes and 'services' through neoliberal means (Robertson, 2006a).

A word of caution should be noted however, as expressed by a number of scholars (e.g. Scoones, 1999), which relates in part to the problematic conflation of neoclassical and neoliberal economics (see Mirowski, 2013). Walker and Cooper (2011) for instance make the case that the dominant position of resilience theory in the new ecology, based on complex systems and second-order cybernetics theory, shares much theoretical ground with Hayek's ideas of spontaneous market

order[17]. These common roots allowed for, they say, resilience theory's adoption as a neoliberal "methodology of power" relating to risk management in realms such as security, finance and development economics, where complex social-ecological systems' adaptability and dynamism is a function of their financial, biophysical or organisational 'capital' (Walker & Cooper, 2011, p. 147; though for others the threat of recuperation or containment is far more contingent, e.g. Braun, 2015; Nelson, 2014).

The issues outlined above again point to political ecology's influence on the neoliberal natures literature, and the mobilisation of insights from the natural sciences to challenge the political economy of environmental governance. However, as Bakker (2010b, p. 717; see also Bakker & Bridge, 2006) points out, the bulk of work on neoliberal natures suffers from relatively narrow, dualistic and anthropocentric conceptions of 'the environment', due to an empirical overreliance on natural resources. This trend, she argues, has underplayed various non-anthropocentric and more profoundly non-dualistic modes of thought, based on relational ontologies, cyborg theory, hybridity and socionature and so on, which have radically decentred notions of agency (Bennett, 2009; Lorimer, 2007; Whatmore, 2006). Emphasising deep heterogeneity of hybrid socionatures and against attempts at unifying notions of nature, Bakker (2010b) argues for greater incorporation of the active cultural, libidinal and emotional roles of affective bodies – of humans, companion species and bio-cultural entities – into theoretical work on neoliberal natures. Collard and Dempsey (2013) for instance call attention to particularities and uneven geographies of the commodification of what they call 'lively commodities', using the examples of exotic pets and ecosystem services (see also Lorimer, 2010). From this perspective, more traditional political economic approaches to the neoliberalisation of nature may have highlighted the sometimes troublesome characteristics of the nonhuman world as objects of neoliberal governance, but have failed to really develop any notion of nonhuman subjectivity, as a co-constitutive element of social and economic life (Braun, 2008) – in effect recapitulating the foundational political ecological demand to reject Cartesian binaries and view nature as material and symbolic, social and ecological (Braun & Castree, 1998).

3: Situating biodiversity offsets in the neoliberalisation of nature

Overall, the purpose of these first two chapters has been to situate the development of biodiversity offsetting in a wider context, while providing an orientation and series of conceptual tools with which to analyse the English case study. Drawing on Chapter 1, it is possible to understand the development of contemporary nature conservation policies, such as biodiversity offsetting, as expressions and responses of capitalism's internal environmental contradictions. More concretely, the establishment of increasingly comprehensive environmental legislation in the 1960s and early 1970s (in the advanced capitalist countries at least), was designed to protect certain use-values and conditions of

[17] The limitations of human knowledge in an infinitely complex world, remember, is critical to Hayek's claim regarding markets' epistemological superiority as an information processor.

production not accounted for by the prevailing political economy. Though shaped partly by popular and social movement pressure to tackle environmental degradation, the environmental legislation of that period reflected the top-down and paternalistic characteristics of the post-war social compact. Today's 'neoliberal' policies need to be understood as descendants of these 'command-and-control' laws, which have gone through decades of mutation and reconfiguration, increasingly mediated at higher scales through international conventions. Chapter 3 provides some detail of the historical trajectory of biodiversity offsetting along these lines.

Chapter 2 set out some defining characteristics of what might be neoliberal about biodiversity offsetting, before we move into detailed discussion of the mechanism in Chapters 3 and 4. Offsetting is frequently presented as a market-based instrument for conservation, designed to render biodiversity's value economically visible and incentivise certain actions, superseding command-and-control regimes. Its historical development, meanwhile, clearly resonates with critiques of environmental markets reviewed in this chapter, as instruments designed to depoliticise ecological degradation, while facilitating development-led accumulation. The insights of the work reviewed here also help explain the geographically and institutionally variegated landscape of 'actually existing' systems described in the offsetting literature – an array of hybrid mechanisms, standards regimes, economic instruments and tradeable permits. In addition, the manifest problems encountered by offsetting regimes, reviewed in Chapter 4, can be usefully explained in terms of the difficulties of subjecting nonhuman nature to economic logics and categories. The neoliberal natures literature helpfully points too to the importance of nature's symbolic and material particularities. In the case of offsetting, biodiversity's ecological complexity and indeterminacy, together with its peculiar and contested status as both scientific object and political construct, have proved enduringly troublesome, requiring frequent reregulation to limit the scope of commodification and its negative consequences. These themes will be revisited in Chapter 4, and again in the Chapter 10.

Chapter 3: Biodiversity Offsetting – definitions, the history and the case for

Introduction

The third and fourth chapters move onto the of biodiversity offsetting. Chapter 3 is somewhat descriptive, providing an overview of what biodiversity offsetting is, where the policy came from, and the key arguments mobilised in its favour by proponents. Though descriptive, it is nevertheless orientated by the framework laid out in the previous chapter, and is intended to show how offsetting can reasonably be theorised and analysed as a case of the neoliberalisation of nature. In view of progressing the thesis, the chapter's purpose is twofold. First, it introduces key concepts, terminology and narratives associated with offsetting, which will be vital for understanding the academic literature reviewed in Chapter 4, and the debates which took place in England and are analysed in the later empirical chapters. Second, it contextualises the UK government's moves to develop an offsetting system, in terms of the policy's historical and geographical development. This allows for the identification of commonalities and differences in the case study compared to what has come before, and follows the insistence within the neoliberal natures literature as to the importance of paying close attention to the specificities – biophysical, cultural, institutional and so on – of particular neoliberal environmental policies.

Chapter 3 is structured as follows. Section 1 lays out a brief and largely technical overview of biodiversity offsetting as it is understood today. Though the policy is characterised by a high level of geographical variation, some basic technical definitions, standards and principles are widely agreed upon – even if their interpretation, deployment and effectiveness are the source of continued debate and contestation. This provides explanation of key terminology used in the literature, and the rest of the thesis. Section 2 sketches a broad-brush picture of the historical development of biodiversity offsetting, from its origins in regulation governing the protection of wetlands in the US from the early 1970s, through to its prominence today as one of the major 'market-based instruments' (MBIs)[18] for dealing with biodiversity loss, promoted by some of the most influential governance organisations, corporations, governments and NGOs around the world. It highlights key ideas, actors and conflicts in the development of offsetting, touching too on conditioning relations of power. While not going into detail of how various iterations of offsetting have functioned, this section historically and politically situates the policy's contemporary appeal to various interests. It also serves to explain how the definitions, standards and principles outlined in Section 1 were politically constituted through conflict and compromise, with ongoing implications. Lastly, Section 3 presents the claims made in favour of offsetting by its main proponents. This is laid out in four parts: (i) the business case; (ii) the

[18] I put 'market-based instruments' in scare quotes because, as will become clear, there is some debate over biodiversity offsets being classified in these terms. However, the term is widely applied of offsetting in the literature, and will continue to be used with this caveat.

conservation case; (iii) the economic case; and (iv) the regulatory case. As will become obvious, these claims strongly correlate with many of the tropes identified in the last chapter as key to neoliberal environmental policies. A brief summary is then given of key points to take forward[19].

1: Biodiversity offsets: definitions, principles and terms

1.1: What are biodiversity offsets?

The family of conservation mechanisms known as 'biodiversity offsets' has its origins, as will be discussed in the next section, in laws enacted in the 1970s protecting US wetlands. Today, biodiversity offsets has become something of an umbrella term to describe a variety of mandatory and voluntary conservation policies and practices, often but not always described as MBIs (e.g. eftec et al., 2010), including wetlands mitigation banking, habitat credit trading, species banking and many others (see for instance Madsen et al., 2010). Though there is much variation around the world in how these schemes operate, and multiple definitions (e.g. IUCN, 2014; OECD, 2013; Doswald et al., 2012; McKenney & Kiesecker, 2010; eftec et al., 2010; ICMM, 2005; ten Kate et al., 2004), there exist some broadly agreed features and principles which qualify particular procedures as biodiversity offsets.

Among the most commonly cited are those developed by the Business and Biodiversity Offsets Programme (BBOP), an organisation and transnational coalition founded in 2004, dedicated to the promotion of biodiversity offsets worldwide and the establishment of recognised standards. BBOP describes biodiversity offsets as:

> measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity (2013, p. 4).

BBOP has also developed ten guiding principles designed to govern offsets (which are far from universally adopted, but see **Table 1**), Bull, Suttle, Gordon, Signh and Milner-Gulland argue there are three major features of biodiversity offsets which make them unique:

> (i) they provide additional substitution or replacement for unavoidable negative impacts of human activity on biodiversity, (ii) they involve measurable, comparable biodiversity losses

[19] Before proceeding, a quick note on sources for Chapters 3 and 4 is necessary. A significant portion of the writing drawn from and reviewed in these chapters comes from the so-called 'grey literature'. The reason for this is that while biodiversity offsetting is an increasingly prominent topic of academic scholarship, an unusually high proportion of the literature is produced by non-academic institutions, such as private companies, public agencies and NGOs. At the same time, there is significant overlap between material produced by academic and non-academic institutions and authors, both peer-reviewed and non-peer-reviewed, and much cross-referencing between them (see Coralie et al., 2015). As a result, it is difficult to disentangle these literatures, and somewhat arbitrary to do so. Leaving aside this 'grey literature' would significantly hamper broad coverage of the issues.

and gains, and (iii) they demonstrably achieve, as a minimum, no net loss of biodiversity (2013, p. 370).

Based on these two main definitions, some basic terminology used in the literature is explained in Section 1.2[20].

Table 1: BBOP's 10 principles

1	***Adherence to the mitigation hierarchy*:**	A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy
2	***Limits to what can be offset***	There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected
3	***Landscape Context***	A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach
4	***No net loss***	A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity
5	***Additional conservation outcomes***	A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations
6	***Stakeholder participation***	In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring
7	***Equity***	A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities
8	***Long-term outcomes***	The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity
9	***Transparency***	The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner
10	***Science and traditional knowledge***	The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge

Source: BBOP *Standard for Biodiversity Offsets* (2012b, pp. 17–22)

[20] Other key terminology will be explained as the chapter progresses. However, for a more comprehensive glossary, see BBOP (2012a).

1.2: Key terms in the biodiversity offsetting literature

1.2.1: The mitigation hierarchy

The mitigation hierarchy, originating as the mitigation sequence governing the protection of wetlands in the US (see Section 2), denotes the consecutive steps which must be followed when considering to offset environmental damage, and designates compensation or offsetting as the *last resort* after other measures have been taken. The mitigation hierarchy consists of three or four steps: (1) avoid harm; (2) mitigate or minimise unavoidable impact; (3) rehabilitate or restore degraded or lost ecosystems; (4) compensate for or offset residual, unavoidable damage. In many cases step 3 is collapsed into step 2, leaving a three-part hierarchy: avoid, mitigate, compensate.

Avoidance refers to the prevention of impacts occurring in the first place, and questions whether the project is necessary in its proposed location and scale, and if the nature and timing of its activities can be adjusted. *Mitigation* and *minimisation* are used interchangeably, though mitigation is more commonly used[21]. Mitigation is usually interpreted as on-site measures (i.e. within the development footprint) which reduce the intensity and extent of damage resulting from development activities during its lifetime. *Rehabilitation* and *restoration* refers to actions taken after particular development activities have ceased, and degraded habitats or ecosystems are restored to their prior condition as far as possible (see e.g. ICMM, 2005).

Compensation and *offsetting* are sometimes used synonymously, but not always. Rather than reducing direct impact which results from development activity, compensation aims to provide benefit elsewhere to make up for that unavoidable damage. As such, they are usually distinguished from other measures as conservation actions taken off-site in another location (i.e. outside the development footprint). Offsetting is a specific form of compensation, which assumes some level of ecological equivalence between the environmental damage caused by the development and the compensation offered in remediation. Compensation more generally could include non-ecological benefits, such as the building of physical infrastructure or monetary payment, whereas a biodiversity offset would exclusively involve positive conservation actions such as ecological restoration or preservation (known in offset terminology as ‘averted risk’ or ‘avoided loss’), in order to replace lost biodiversity value, such that there is no net loss. The two techniques will be explained in more detail later in Chapter 4, but it should be briefly noted that there are limits to ‘offsetability’. It is generally recognised that some ecosystems and components of biodiversity are too unique and difficult to replicate.

[21] Mitigation will be the term favoured for the rest of the thesis, as the most commonly used word in the literature. The reason minimisation is sometimes deployed is that mitigation is technically the term assigned to the whole process – hence wetlands mitigation banking’s name. However, since the final compensatory/offsetting step has become the focal point over time, mitigation has increasingly become synonymous with earlier-stage on-site minimisation measures.

1.2.2: No net loss

All offset programmes and schemes aim to achieve at least no net loss of biodiversity, or net gain in some instances. This identifies the centrality of quantitative measurement and accounting in biodiversity offsetting. Offsets use metrics to calculate the biodiversity value of a site before development takes places, setting a baseline (which can be fixed or moving) against which loss and gain can be measured. Though there are a great many metrics in use around the world, each instance of offsetting is required to apply the same metric throughout the process – i.e. use a consistent currency to account for loss and gain. Biodiversity loss or debit is calculated as the residual fall in biodiversity value relative to the baseline, resulting from development activity. This can be compensated for or offset by an equivalent gain in another location, achieved by the purposeful and certified uplift in biodiversity value of another site through the actions of ecological restoration, creation or preservation, measured in the same way against a baseline, over a pre-determined length of time. A biodiversity credit is derived from this uplift in biodiversity value, and can either exist and be acquired pre-packaged from a certified 'bank', where the restoration or creation has already taken place, or in the form of contracted future work to be carried out. Offsets can either be provided by developers themselves through work on their own land, or purchased from third party providers (public or private), but must be financed by the developer. To achieve no net loss, any residual losses must be balanced out by at least an equivalent gain, so there is no overall loss. The 'net' is what allows for the trade of offset credits to achieve conservation goals, alongside the assumption that loss and gain can be defined as ecologically equivalent in some abstracted sense, in time and space (though there are often certain restrictions or caveats).

1.2.3: Additionality

The final major stipulation is that credits can only be derived from additional conservation activity. Ecological gain is considered additional if the conservation actions and outcomes would not have occurred anyway, even if the development project was not taking place and financing the offset.

1.2.4: Biodiversity

What is meant by biodiversity is often not stipulated in definitions of offsetting, but rather assumed under the rubric of nature conservation. In its most abstract sense, biodiversity refers to the variability of living organisms at the various levels of genes, species, communities/assemblages, and ecosystems. Though there is no universal measure for biodiversity and its meaning is not necessarily straightforward or uncontroversial, offset metrics attempt to quantify biodiversity or its value using proxies attached to various components of biodiversity, such as:

> species diversity, functional diversity and composition, ecological integrity or condition, landscape context (e.g., connectivity, landscape position, adjacent land uses or condition, patch size, etc.), and ecosystem services (including people's use and cultural values) (BBOP, 2012c, p. 15).

Nearly all these terms are open to some degree of interpretation, and require further clarification and criteria to be operationalised. The ongoing contestation of these and other key terms, rules and goals

of offsetting have proved difficult to resolve, for reasons which are both technical and political. These disputes are covered in Chapter 4, while the rest of the thesis explores how these issues played out in England. First though, the chapter turns to the story of how and why biodiversity offsetting, as a conservation tool with the specific components outlined above, emerged in the way it did. It gives both historical context as to why certain debates are so prominent today, at the same time as providing some of the political economic contours which condition how they play out.

2: The history of biodiversity offsetting

2.1: US wetlands protection, Section 404 and compensatory mitigation

Biodiversity offsetting, as it is known today, originated in policy shifts around the federally mandated protection of wetlands in the US in the post-war period, as governments, business and environmentalists tried to negotiate ways of balancing economic development with environmental protection. Mitigation of the detrimental effects of development upon wildlife had first become enshrined in law as early as 1958, when the updated Fish and Wildlife Coordination Act posited the environment as a 'public good' equivalent to development, with impacts of the latter on the former needing to be mitigated accordingly. As a tool, Lave observes, mitigation was developed at this time from a position of weakness as a tactic for regulators to "salvag[e] *something*" (2014, p. 66) in the face of rampant development. It was not until the beefing up of environmental regulation in the early 1970s that mitigation was made a requirement rather than simply a request, enshrined in the National Environmental Protection Act of 1970. The Federal Water Pollution Control Act (1972), retitled the Clean Water Act (CWA) in 1977, provided guidance as to how mitigation was to be defined and carried out, institutionalising a regulatory permitting system. It was one of a raft of major pieces of legislation of the so-called command-and-control era in the US, which amended and significantly strengthened existing environmental regulation, aimed at addressing the consequences of rapid economic development, particularly industrial pollution and urbanisation. The other two of particular significance were the Endangered Species Act (ESA) (1973) and Clean Air Act (CAA) (1970), the stories of which are interwoven with the development of offsets.

Though public good remained largely justified in economic terms, the implications of these legislative changes were quite radical, partly in response to heavy public pressure from the nascent environmental movement (Pittman & Waite, 2009, chap. 2). Section 404 of the CWA stipulated that all development involving the dredging or discharge of other materials into US waters required permitting, to minimise damage to aquatic ecosystems. Permits were to be granted or denied by regulators, in the form of district branches of the US Army Corps of Engineers, overseen by the newly created Environmental Protection Agency (EPA) which was given veto power, and with further input expected from federal wildlife agencies (since there is often overlap between CWA and ESA requirements). The development of mitigation as a tool was not initially considered a particularly important part of the 1972 CWA. The main questions revolved around the scope of the CWA's

jurisdiction, since it was anticipated that regulators would simply deny or veto permits to environmentally inappropriate projects, with developers modifying their plans as required, if necessary. However, due to political pressure from the powerful development lobby and its allies in Congress to speed up the permitting process, and the regulators' related reticence to deny permits in practically any circumstance, mitigation quickly became the central feature of the regulation in practice, growing as "a consequence of the agencies' minimal use of their CWA authorities" (Hough & Robertson, 2009, p. 17; see also Pittman & Waite, 2009, chap. 3)[22]. Across the board where mitigation was required, it was clear from the very early days that regulators' priorities were to request or demand compliance in a manner which did not compromise or impede development. This has broadly been a feature of offsetting schemes ever since.

Mitigation requirements, when they were used, often took the form of off-site compensatory mitigation through the creation of new or restoration of degraded wetlands, or compensation as it is now commonly known[23], which had first been established at the Ramsar Convention on wetlands in 1971 (Hrabanski, 2015, p. 143). The 1977 amendments to the CWA significantly simplified the permitting regime (partly in a bid to speed up the processing of applications) in a manner which made compensatory mitigation the regulatory norm[24]. In effect this laid the foundations for spatial abstraction, through which distinct wetlands in different places could be considered ecologically commensurable. Though the mitigation sequence was formally established as part of the definition of 'mitigation' in 1978, the sequence was rarely followed in practice, with compensatory mitigation often the first option rather than the last resort (Hough & Robertson, 2009; Robertson, 2000). This reflected the continued aversion to permit denial on the part of the Corps and EPA, especially in the face of concerted deregulatory attack during the Reagan years. Importantly, developments during the 1970s had established compensation as the primary mechanism for complying with mitigation requirements. While the move towards market environmentalism was already on the horizon by the late 1970s[25], this quite separate development in the permitting system was both crucial and somewhat serendipitous. As Lave remarks: "once compensation was firmly in place as a mitigation strategy in the environmental regulatory field, it was not a large leap to imagine marketizing the whole process" (2014, pp. 67–8).

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[22] Regulators were already under severe pressure to speed up decision-making, since the number of applications was consistently outpacing capacity to process them. This was in part due to the complexity of determinations, but also limited capacity of the agencies themselves.

[23] As a result, mitigation under wetlands protection in the US became synonymous with off-site compensatory mitigation or compensation, rather than on-site minimisation or mitigation. This accounts for the odd discursive dissonance between mitigation and compensation in the biodiversity offsets literature.

[24] This was also the year that air pollution offsets first became officially sanctioned in California under the CAA (Robertson, 2013a, 2013b).

[25] Investigations into the potential for environmental markets as alternatives to command-and-control regulation began during the Carter administration, as the ideas of Coase and Dales slowly filtered through to policymakers (see Robertson, 2013a, 2013b). As Robertson points out however, the driving concern at this stage appeared to be geared more towards flexibility than markets *per se*.

2.2: From attacks on command-and-control regulation to 'no net loss'

Subsequent developments in mitigation took place during the Reagan and Bush years, though it would not be until the 1990s that functioning compensation credit markets would appear. For Bonneuil (2015) offsetting's evolution between 1973-90 is marked most heavily as a period of environmental backlash and regulatory roll back, with mitigation measures under fairly consistent attack from their inception, held up as prime examples of inefficient and increasingly intolerable command-and-control regulation (see also Hrabanski, 2015; Robertson, 2004). Mitigation took concerted flak from a well-organised conservative business movement, backed by an intellectual critique that environmental regulation was costly and uneconomical, following the lead of Chicago School Law and Economics, and that resource governance was best privatised, the contention of the 'new resource economics' inspired by Hardin and Coase (Bonneuil, 2015, pp. 486–8)[26]. This issue formed a crucial battleground during the Carter-Reagan presidential race, and during the triumphant Reagan's first term:

> federal agencies acted under formal regulatory directives (and informal political directives) to reduce the coercive nature of environmental regulation. In the case of Section 404, this took the form of Corps resistance to using EPA's environmental criteria to issue permits. Early in Reagan's first term, the Presidential Task Force on Regulatory Relief identified the Section 404 regulatory program as 'a priority program for review' (Hough & Robertson, 2009, p. 20).

This deregulatory drive was hugely significant; there was even talk of Section 404 being abolished altogether (Pittman & Waite, 2009, p. 42). At the same time, attacks on mitigation requirements as a barrier to free market enterprise were increasingly matched by criticism from environmentalists over the evidential failure of mitigation policy to deliver on the ground (Robertson, 2004, p. 363). This was principally due to regulators' failure to impose requirements (a situation exacerbated by political pressure and severe budget cuts), a lack of clarity over the rules, and poor quality (largely unregulated) compensation. Despite opposing viewpoints, there was a kind of consensus from both sides that the regulation was inadequate as it stood, jurisdictional scope was unclear and needed clarification, and alternatives were needed.

The 1987 National Wetlands Policy Forum, bringing together divergent interests and convened by the EPA, managed against the odds to articulate this consensus around the concept of 'no net loss', later picked up almost by chance by Bush Sr. in his presidential election campaign (Pittman & Waite, 2009, chap. 7; Robertson, 2004, p. 363). The term had been coined in 1985 as part of wetlands policy in New Jersey, but in reality no net loss merely formalised an effective compromise which had been developed between the various actors and agencies in the 1970s, which had established compensation as the primary focus of mitigation (Robertson, 2000). No net loss became national policy soon after, with the 'net' once again foregrounding compensatory mitigation as the core focus,

[26] This reflected the growing role of economists in public policy from the 1960s onwards, through which environmental issues were increasingly framed in economic terms, and 'resources' treated as factors of production which could be substituted for others such as fixed capital or labour. In terms of the interpretation of mitigation requirements, this meant the economic benefits of development could be seen as justifying environmental damage on a cost-benefit analysis.

enabling the formation of compensation markets. During Reagan's second term, market solutions were increasingly sought as more flexible tools to deal with environmental issues, following the path begun under the Carter administration. This built on the success of market devices in battling acid rain where the CAA had previously failed (Mann & Simons, 2015, p. 146), and the market orientation was cemented by the influential 'Project 88', the cross-party initiative during the Bush Sr. presidential campaign promoting ways of harnessing market forces for protecting the environment (Bonneuil, 2015, p. 489). For weakened environmentalists, the markets appeared to offer the best way of managing the ongoing deregulatory attack without upsetting ascendant business interests. No net loss seemed an opportunity to both streamline the regulatory process, while containing those forces intent on opposing regulation altogether (Mann & Simons, 2015, p. 328).

2.3: Banking and the emergence of mitigation credit markets

With compensation recognised as the primary mechanism to deliver mitigation, and no net loss establishing policy objectives in a broadly quantitative register (even if rarely demanded in practice), the conditions for marketisation were nearly in place[27]. The primacy of compensation enabled the idea of mitigation 'banking' to ease and speed up the permitting process: the generation of off-site compensatory mitigation in advance of a development project as credit, which could then be used to pay off the debit created through development damage. While the concept had been around for some time, banks were first used in the early 1980s, overwhelmingly by public agencies on their own land for internal use. The first commercial sale of banked wetland credits took place in 1986, but the *ad hoc* development of a system of commercial banking only began in earnest in 1991, on the back of federal guidance on the practice, and somewhat uneven enactment of no net loss legislation across a number of states. The first entrepreneurial mitigation bank was set up in Georgia in 1992, and the first sale of credits from an entrepreneurial bank took place in Florida in 1994 (Hough & Robertson, 2009, pp. 24–5), but the number of commercial enterprises then expanded dramatically from 1995, following further federal guidance produced across all the relevant agencies, which more clearly sanctioned commercial banking. 1995 also saw the emergence of species banking in California, which applied the concept of compensatory mitigation banking, in the form of habitat creation or restoration, to the mitigation requirements of the ESA (Mead, 2008, p. 11).

Wetlands banking in the US has moved on significantly since the 1990s, into a large-scale commercial industry. Today it is one of the most developed environmental markets in the world, worth several billion dollars, and is the model on which numerous biodiversity offsetting markets and mechanisms are now built (Madsen et al., 2011; Robertson, 2006b). Much of the story has been that of the

[27] Pittman and Waite sum up the situation for which banking offered a supposed 'free market' solution like this: "By the mid-1990s, everyone in wetlands regulation realized the 404 permitting system was broken. Developers complained bitterly that a permit to wipe out even a small wetland took too long to get, driving up their overhead costs. Environmentalists complained that permits came too easy, and what was offered in replacement offered too little and usually failed. The regulators themselves realized they were overwhelmed by the number of applications and that could do little beyond checking to make sure the forms were filled out correctly" (2009, p. 252).

consolidation of a wetlands banking industry as an economic and political force; state-facilitated efforts at standardisation and (often increasingly market-orientated) reconfiguration of governance rules to resolve ongoing problems and meet new goals; and disputed attempts to refine of the scientific tools and forms of measurement central to wetlands commodity definition, production and exchange. In short, the history of wetlands banking shares many themes and similarities with other case studies reviewed in Chapter 2, particularly as an ongoing and incomplete process of nature commodification. Though a controversial and unstable process (see Robertson, 2004, 2006a), with at best mixed results, in terms of the ecological performance of compensation schemes, it is for Hough and Robertson (2009, p. 25) indisputable that wetland banking has significantly improved the quality and governance of compensation measures (as distinct from mitigation in general).

2.4: Corporate interest in voluntary biodiversity offsets

As mentioned, the development of species banking – trade of habitat-based compensation credits – was intertwined with that of wetlands mitigation banking, partly due to certain procedural similarities between the CWA and ESA, but also because wetlands ecosystems were often also home to endangered species. This provided the conceptual bridge between wetlands mitigation and non-aquatic conservation banking, and biodiversity offsets in general. Various forms of biodiversity offsetting were soon taken up by other governments, most notably in Australia (Miller et al., 2015), while the mitigation hierarchy and goal of no net loss were replicated in conservation strategies around the world. The role of large-scale corporate interests was also critical in the shaping of biodiversity offsetting as a transnational phenomenon. Seen as a successful instrument in the US at streamlining compliance procedures and reconciling divergent economic and environmental objectives, the tool attracted the particular attention of the mineral extractives sector, whose high environmental impact was largely unavoidable due to the specific locations of certain natural resources – many of whom began developing their own voluntary no net loss policies and industry standards (Virah-Sawmy et al., 2014; Benabou, 2014).

Importantly, the development of voluntary no net loss and offsetting standards were business-led, turning on the identification of biodiversity loss as material (financial) risk to firms (Dempsey, 2013; see e.g. KPMG, 2011; KPMG et al., 2011; UNEP-FI, 2010; PWC, 2010; F&C Asset Management, 2004), rather than the result of ongoing regulatory negotiation and compromise – since most of their operations took place in parts of the global south where no net loss policies and regulations were not in place. This material risk was the basis of the 'business case' for offsetting, which was more resolutely market-oriented, and where development activity was even more non-negotiable. Instead it foregrounded markets' potential as non-antagonistic instruments for settling disputes (Benabou, 2014, p. 118), and at the same time constructed biodiversity as financial risk – something which could simultaneously be viewed and pursued as a profitable opportunity (Dempsey, 2013, p. 42).

Major multinationals, especially mining companies, were concerned about a number of potential and interconnected business risks associated with biodiversity loss and the large-scale environmental impacts and dependencies of their operations. Public pressure, changes to regulation, new lending

and procurement standards and physical scarcity of resources all presented risks. The anticipation of new regulation and standards was perhaps of greatest concern, but addressing them pre-emptively offered 'first mover advantage' (Dempsey, 2013, pp. 45–6). At the same time, reputational damage done to extractive industries for their high environmental impacts galvanised moves towards the development of recognised standards for no net loss and voluntary offsets (Benabou, 2014, pp. 105–6). This was a bid to improve the image of the sector and help guarantee license to operate, and more speed and certainty around access to finance, resources and supply chains, and markets. The mining sector, led by Rio Tinto (Penca, 2015, p. 95; see also Rio Tinto, 2004), was at the forefront of these efforts, through the formation of the Global Mining Initiative in 1999 and later creation of the International Council on Mining and Minerals (ICMM) in 2002. Participants in a joint workshop held in 2003 between ICMM and the International Union for Conservation of Nature (IUCN) agreed to explore biodiversity offsets as a strategy to reduce mining's environmental footprint (Benabou, 2014, p. 105; see ICMM, 2005). Early moves had also been made in 2001 by a group of oil and gas companies, who teamed up with a number of international environmental groups including Flora and Fauna International (FFI), IUCN and The Nature Conservancy (TNC), to form The Energy and Biodiversity Initiative (EBI), which had also proposed no net loss as a minimum industry standard in 2003 (Mann & Simons, 2015, p. 329; see also EBI, 2003).

Further business-led and market-orientated developments continued through a series of international workshops, policy forums and publications. This period saw the consolidation of a relatively small cohort of experts, drawn from big business, environmental organisations and consultancies, financial institutions and investors. These initiatives crystallised the growing role of partnerships between the private sector and major conservation NGOs in the development of offsets. It was out of these that the 'business case' emerged (ten Kate et al., 2004), culminating in the creation of the Business and Biodiversity Offsets Programme in 2004, an organisation dedicated to promoting the use of offsetting worldwide (Benabou, 2014, p. 106). Contained within the market-orientated Forest Trends group, BBOP brought together a range of actors from the emergent biodiversity offsetting constituency, as well as government departments (see BBOP, 2013). This constituency, their interests and their market-orientated perspective has been key to the spread of biodiversity offsetting around the world in the past decade.

2.5: Global governance institutions, market-based instruments and biodiversity offsetting

BBOP has done much to shape biodiversity offsetting over the past decade. Its leaders have emphasised the potential for collaborative win-win outcomes through offsetting, and have been crucial in cohering the discourse more solidly around tradeable permit markets, framing nature conservation as a major opportunity for private companies and investors akin to carbon markets (Hrabanski, 2015, p. 146). On top of lobbying, BBOP has developed widely recognised principles and standards for offsetting, alongside policy design handbooks and the specialist online platforms *Ecosystem Marketplace* and *SpeciesBanking.com*, which link together a range of water, carbon and biodiversity markets, and act as central information and exchange hubs for market actors (Mann &

Simons, 2015, p. 329). The organisation also offers its expertise and guidance to organisations and governments looking to develop offsetting programmes.

The spread of biodiversity offsets on the international stage was never simply a business-led initiative however, and the overall impact of organisations like BBOP on the global policy landscape should not be overstated. Since the 1980s, the influential Organisation for Economic Cooperation and Development (OECD) had been spearheading efforts to move beyond command-and-control regulation, pressing for the deployment of market mechanisms and other 'flexible' economic instruments in environmental policy (see also Mann & Simons, 2015; Hrabanski, 2015, p. 145). This rested particularly on the role played by tradeable permits in tackling acid rain and air pollution during the 1980s, and the nascent field of environmental economics (see Gómez-Baggethun et al., 2010). Since the mid-2000s, the OECD has been actively promoting biodiversity offsets, around the same time the utilitarian ecosystem approach was becoming an increasingly prominent feature of the literature (Coralie et al., 2015; Hrabanski, 2015, p. 147; see OECD, 2013). Such efforts filtered through to other major global governance institutions and documents, most notably the Brundtland Report of 1987 and the Rio Summit in 1992, which saw the inauguration of the Convention on Biological Diversity (CBD), all of which advocated for greater use of MBIs to meet environmental objectives. 20 years later, the green economy and environmental markets were the very centrepiece of Rio+20.

By 2010 and moving into the present decade (during which the UK government moved to develop its own formal policy), a number of other major organisations and institutions joined the ranks of those promoting or exploring biodiversity offsetting, as well as developing technical manuals, standards and other types of policy material. Among the more prominent examples, the CBD's Financial Resources and Mechanisms group has been working on and promoting offsets since 2010 (Hrabanski, 2015, p. 148); mandated at the World Conservation Congress of 2012, the IUCN established a similar group working on the development of an offsets policy, publishing a major technical paper in 2014 and policy statement in 2016 (IUCN, 2016, 2014); the International Financial Corporation, the lending arm of the World Bank, integrated offsets into its 2012 'Performance Standards' on new loans (IFC, 2012), on which the Equator Principles have long been based, which are particularly important in the world of banking and investment; the Cross Sector Biodiversity Initiative, formed in 2013 and bringing together the oil, gas, mining and financial sectors has since been developing best practice guidelines to meet IFC requirements (CSBI, 2015); and the European Commission has, since 2012, committed to developing a No Net Loss strategy, including offsetting, for the whole of the European Union (European Commission, 2012). Biodiversity offsetting and similar instruments are now the mainstay of smaller scale conservation events, such as the IUCN-convened World Conservation Congress and World Parks Congress, while recent years have seen governmental programmes multiplying around the world. The latest comprehensive *State of Biodiversity Markets* survey undertaken by *Ecosystem Marketplace* counted 45 existing compensatory mitigation programmes operational, with another 27 at various stages of investigation or development (Madsen et al., 2011) – and these numbers have

risen over the past five years. The US remains home to by far the largest and most developed markets, with much of the experience, data and expertise which comes with it, as well as many of the more influential organisations and individuals – though early policy transfer to Australia has made that another important node for knowledge exchange (see Coralie et al., 2015). Finally, a variety of large corporations and banks are increasingly developing their own policies and material related to biodiversity offsets (e.g. Credit Suisse & McKinsey Centre for Business and Environment, 2016; NatureVest & EKO Asset Management, 2014; Credit Suisse et al., 2014).

Despite the impressive rise of the policy over the past decade, its success should not be overblown. Though international agreements through the CBD exist to curb and halt biodiversity loss, there is no intergovernmental framework analogous to those governing carbon markets and emissions trading[28]. Consequently, biodiversity offsetting practices have developed in a markedly uneven manner, often on a voluntary basis at the sub-national level. Partly as a result, biodiversity loss remains a marginal issue for most companies, and efforts to develop agreed-upon metrics and standards have been frustrated. Many members have left BBOP over the decade of its existence, while other organisations like the EBI have broken up – providing one explanation for the proliferation of alternative tools and standards (Benabou, 2014; Dempsey, 2013). These issues be explored in Chapter 4, but for the moment it stands as a reminder that despite biodiversity offsetting's often apparent ubiquity, its future is far from certain or guaranteed.

3: The appeal of biodiversity offsetting: a win-win for the economy and environment

Proponents offer a number of arguments in favour of the expanded roll out of biodiversity offsets, as a conservation tool capable of delivering 'win-win' outcomes for economic development and environmental sustainability. The historical account of offsetting's formation and establishment on the global policy landscape above gives a sense of the highly contingent nature of its development as an MBI. Its appeal today however, among policymakers, supranational bodies, various parts of the global business community and many of the more powerful conservation organisations, can be located in this specific yet overarching narrative, which promises that seemingly intractable dilemmas and trade-offs between development and conservation are reconcilable, through no net loss strategies and policies enabled by tradeable offsets. The case made by advocates has a number of related components, which have been divided below as the business case, the conservation case, the economic case and the regulatory case. Each element comprises claims of how biodiversity offsets can provide benefits for different sectors and interests and ameliorate problems relating to regulation of biodiversity loss. Many of the texts drawn on in this section also identify a number of risks and

[28] However, an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) was established in 2012, aimed at playing a similar role as the Intergovernmental Panel on Climate Change (IPCC) at the science-policy interface (Turnhout et al., 2014).

limitations associated with biodiversity offsets, which are not detailed here, but are reviewed in Chapter 4.

3.1: The business case

Since the mid-2000s the business case has come to the fore in the discourse around biodiversity offsets. As explained in the previous section, the emergence of the business case was largely the result of collaborative work between the extractive industries, particularly the mining sector, and some of the large conservation organisations and financial institutions. It laid the foundation, from an instrumental point of view, for moves towards the use and standardisation of biodiversity offsets, and occurred in response to the identification of a series of business risks associated with biodiversity loss, namely reputational, operational and physical, regulatory, market and product, and financial (Dempsey, 2013, p. 45).

3.1.1: License to operate

The first element of the business case is often considered the most salient, and primarily concerns regulatory risk. Access to land and license to operate are the most basic requirements for any development project, and will nearly always necessitate some kind of state approval or permitting (Darbi, 2015, p. 4). This is likely to be more difficult where development will have a high impact on the natural environment, and an increasing number of governments are pursuing no net loss policies and/or stipulate adherence to the mitigation hierarchy in environmentally sensitive or protected areas (The Biodiversity Consultancy, 2014; ICMM & IUCN, 2013, pp. 12–13). For businesses, siting operations in such areas might be favoured for any number of strategic or commercial reasons, while extractive industries are constrained to some extent by geology and the locations of particular mineral deposits (ICMM, 2005, pp. 5–6). The development and refining of biodiversity offset mechanisms has a clear advantage for businesses in these scenarios, if they facilitate easy compliance with prevailing rules, and allow development to proceed without financial or reputational risks associated with legal challenges, delays in permitting and possible fines. Even where existing protections are weak, concessions or permits will still require present and future 'regulatory goodwill', especially in competitive environments where demonstration of best practice may give one company the edge over another (ten Kate & Inbar, 2008, p. 197). There is also an anticipatory element related to regulatory risk, with the possibility of realising first mover advantage for companies developing offsets before they become mandatory, and the potential for forward-thinking businesses to "shape policy, and possibly legislation, in the future" (ten Kate et al., 2004, p. 44).

3.1.2: Reputation and Corporate Social and Environmental Responsibility

As discussed in the previous section, reputational damage to mining companies provided part of the impetus behind the development of voluntary offsets. As ten Kate and Inbar note, environmentally damaging activities are often extremely controversial:

> Examples in the mining and oil and gas sectors reveal project costs of hundreds of millions or even several billion dollars stemming from delays in regulatory approval and the

commencement of operations and operations blockaded by communities (2008, p. 197; see also Rainey et al., 2015).

Consequently, part of the business case revolves around using biodiversity offsets to showcase a commitment to the goals of sustainable development (ICMM, 2005, p. 6) as part of corporate social and environmental responsibility (CSER) portfolios (The Biodiversity Consultancy, 2014, p. 6). Developing offset schemes which are transparent and accountable, meanwhile, is expected to improve relationships with local communities, environmental organisations and other stakeholders, helping secure so-called 'social license to operate' and regulatory goodwill in sensitive areas, where companies need to be perceived as good partners in development (ten Kate & Inbar, 2008, p. 197).

3.1.3: Access to finance

Though there is some debate over the importance of CSER with regard to relationships with local communities and environmentalists (Darbi, 2015, p. 4), the integration of biodiversity offsets and no net loss into companies' reputational strategies is increasingly tied to concerns over access to finance and lending conditions (ICMM & IUCN, 2013, pp. 13–15). The establishment of the Equator Principles has become hugely significant, especially since the use of the mitigation hierarchy and offsets were integrated into the environmental safeguard Performance Standard 6 (PS6) (see IFC, 2012). Since PS6 has been adopted by all the Equator Principles Financial Institutions (over 80 in total) and a number of the regional development banks, large developers are increasingly likely to encounter loans with offsetting conditions attached. On top of the standards stipulated by most of the large-scales lenders, proponents also argue the integration of biodiversity offsets into business strategies is likely to generate higher investor and creditor confidence, with respect to "risks related to governance, social, environmental and ethical issues" (ten Kate & Inbar, 2008, p. 197).

3.1.4: Efficiency

The fourth part of the business case relates to several ways offsets viewed as more efficient and cost-effective than other approaches to biodiversity impact. The demonstration of best practice is assumed to simplify compliance procedures, reducing delays resulting from lengthy negotiations. Consequently, permitting should become quicker, simpler and more certain, while offsetting may also prove to be cheaper than further on-site mitigation measures (ten Kate & Inbar, 2008, p. 197). This claim rests partially on the assumption that offsets will offer more flexibility over how companies comply with biodiversity obligations, and, as we will see shortly, that the stimulation of market competition in the provision of offsets will increase choice and drive down the price of credits. The other aspect of the efficiency argument focuses on long-term risk planning, and the ability for companies to transfer biodiversity risks and liabilities to third parties through commercial offset agreements (The Biodiversity Consultancy, 2012, p. 5; ten Kate & Inbar, 2008, p. 193; ten Kate et al., 2004, p. 44).

3.1.5: New markets and business opportunities

The final aspect of the business case points towards the business opportunities and new markets, opened up by the development of biodiversity offsetting strategies and regulatory systems (see for instance Duke et al., 2012, pp. 26–7). There are opportunities for new entrepreneurial ventures and expansion of services provided by ecological consultants and others involved in the restoration industry. In addition, landowners "may find that land which was previously considered useless, or at least not very financially productive, can now generate income through the sale of offsets and/or other long term conservation measures" (ten Kate et al., 2004, pp. 43–4) – or as Bayon (2008, p. 130) puts it, there is an opportunity, through the development of biodiversity banking programmes, of changing species on the land "from liabilities to assets". The private sector is expected to play a more significant role in global biodiversity conservation in the future, as envisaged by the CBD and TEEB (ICMM & IUCN, 2013, p. 15), with first-mover advantage again projected as paying dividends.

3.2: The conservation case

The other side of the win-win case for biodiversity offsets regards the benefits for conservation, the arguments for which have been embraced and promoted by a number of leading conservation organisations.

3.2.1: The power of numbers: accountability and transparency

The first advantage identified centres on how biodiversity offsetting as a conservation tool provides quantifiable outcomes (Gardner et al., 2013). Offset metrics make it easier to 'capture' the biodiversity value of a site in an unambiguous way, including low level impacts which are often ignored as insignificant. No net loss, calculated through transparent and consistently measured loss and gain, make accounting for and evaluating conservation actions more straightforward (Briggs et al., 2009, p. 117). This in turn is argued to make negotiation, monitoring and enforcement of mitigation measures more straightforward for regulators, and compliance simpler to evaluate. The use of 'hard numbers' is also held up as an effective and persuasive way of communicating impacts of development to businesses and non-experts (BBOP, 2014).

3.2.2: Partnership and influence over developers

The communicative aspect of quantifiable offsets, or 'speaking the language of business', foregrounds the reconciliatory work offsets are anticipated to perform. As White writes of conservation banking in the US:

> It has become a practice that satisfies not only the laws and their requirements but goes further, and creates business practices that suit the needs of developers, private investors and natural resource agencies. Most importantly, it creates biological and ecological preserves that are environmentally worthwhile (2008, p. 34).

The divergent goals of development and environmental protection are not only supposed to be technically balanced through offsets, they are also designed with the intention of reconciling the antagonistic relationship between businesses and conservationists. As Kareiva, Lalasz and Marvier

put it: “Instead of scolding capitalism, conservationists should partner with corporations in a science-based effort to integrate the value of nature's benefits into their operations and cultures” (2011, p. 35). Supporting and informing the “right kind of development”, such as ‘development by design’ (meaning offsets, see Kiesecker et al., 2009), is expected to “be more effective and far more broadly supported, in boardrooms and political chambers, as well as at kitchen tables” (Kareiva et al., 2011, p. 36). In this reframing of conservation, development is no longer seen as necessarily incompatible with curbing biodiversity loss, and developers can rather be seen as crucial partners in driving conservation forward (see also Kumaraswamy & Udayakumar, 2011).

3.2.3: Financing conservation

For advocates, the potential role for biodiversity offsets to leverage private finance for conservation activity is at the centre of their appeal (e.g. OECD, 2013; eftec & IEEP, 2012; Quintero & Mathur, 2011). There is a wide perception that the funding required to meet global biodiversity targets cannot be met with public resources, which are not only inadequate but declining (Jenkins et al., 2004, p. 34; see also Caldecott & Dickie, 2010). By incorporating the polluter pays principle in a manner which internalises the costs of biodiversity loss into the development process, offsets are said to offer the opportunity of mobilising billions of dollars (Kiesecker et al., 2009, p. 265). Assuming all compensatory action is additional, the widespread implementation of biodiversity offsetting would therefore mean more conservation (ten Kate et al., 2004, p. 14).

3.2.4: Conservation planning

Proponents argue there are considerable advantages afforded by the flexibility offered by offsets as opposed to rigid mitigation requirements, and the possibilities for strategic conservation planning to create or maintain strong and resilient ecosystems at more appropriate ecological scales, and redress habitat fragmentation (McKenney & Kiesecker, 2010, p. 174; White, 2008, p. 34). The flexibility of off-site compensation means that conservation actions can be targeted at more appropriate areas at the landscape scale, where they will be most cost-effective, likely to succeed and unlikely to come under development pressure in the medium-term (ten Kate et al., 2004, pp. 18–19). If ‘trading up’ is permitted as well as ‘like for like’ compensation, then the offsetting of cumulative low level impacts can contribute to high value sites (Darbi, 2010, pp. 9–10), which are more likely to receive protection in the future. Strategic conservation planning, especially in the form of banking schemes, could involve the aggregation of offsets, augmenting and consolidating the biodiversity value of a particular area, or the reconnection of fragmented ecosystems through wildlife corridors (ten Kate et al., 2004, p. 16). Through strategic design, it is argued, recreation or restoration projects are more likely to succeed and become ecologically robust, while generating cumulative gains and economies of scale for conservation, enabled and optimised through the pooling of resources and expertise (eftec et al., 2010, p. 5; ten Kate & Inbar, 2008, p. 193).

3.3: The economic case

Undergirding both the business and conservation case is a clear economic rationale, where reconciliation between the two is framed in terms of multiple, utilitarian benefits (for instance regarding finance, business opportunities and cost savings). There is also a specific economic case made for offsetting from the perspective of environmental economics, which advances the role of MBIs over command-and-control regulation in driving efficient outcomes. This element promotes banking and "market[s] for compensation liabilities" (Caldecott & Dickie, 2010, p. 8) over other kinds of offsets, and foregrounds the active role of the state in ensuring strong property rights and adequate levels of liquidity through regulatory intervention (Bayon & Jenkins, 2010, p. 185; Bayon, 2004, p. 14).

3.3.1: Market failure and price

The first important aspect of the economic case is the framing of biodiversity as a public good, with market failure the cause of biodiversity loss (Alvarado-Quesada et al., 2013, p. 3):

> The economic system is not broken. It is doing exactly what it was set up to do: deliver more of what people value – or at least more of what imperfect price signals say people value – and less of what they don't (Bayon, 2008, p. 137).

The purpose of economic instruments like offsets is to "provide 'correct' price signals to producers and consumers" (OECD, 2013, p. 29) by internalising the externality of biodiversity loss (eftec et al., 2010, p. 94).

3.3.2: Financial (dis)incentives and decision-making

The use of incentives and disincentives is key to the economic case behind offsetting (Rajvanshi, 2015). Making biodiversity loss visible on the balance sheet, by imposing a significant cost on damaging activity, is argued to be the most plausible route to changing the minds of powerful decision-makers toward more sustainable practices, appealing directly to businesses' self-interest (OECD, 2013, p. 68). As Bayon and Jenkins put it: "[i]mposing a price is by far the most effective way of forcing businesses to develop without damaging nature" (2010, p. 184). The other side of this part of the argument is the crucial creation of an incentive for landowners to carry out positive conservation activities (Jenkins et al., 2004, p. 35). It is the ability to sell endangered biodiversity as offsets that is said to "give it a value" and allows liabilities to be turned into assets (ten Kate et al., 2004, p. 20), enabled by the enforceable property rights of an offsetting regime (Alvarado-Quesada et al., 2013, p. 3) and the imposition of no net loss (Bayon & Jenkins, 2010, p. 185).

3.3.3: Efficient outcomes

Lastly, economic theory is used to forward the idea that offsets should provide a flexible and low cost route to no net loss (Coggan, Buitelaar, S. Whitten, et al., 2013, p. 223; see also Bräuer et al., 2006, pp. 28–30). Efficient land use and allocation of resources is central to the economic case (eftec et al., 2010, pp. 94–7), where "market forces work in favor of biodiversity conservation" and business (TEEB, 2010a, p. 159; see also Bayon, 2004, p. 20; Jenkins et al., 2004, p. 36). Conservation is said to be incentivised on land where there are low opportunity costs, while competition is expected to

both drive costs down and quality up. More liquid markets meanwhile are seen as offering significant advantages, by reducing complexity and the transaction costs usually associated with compensation agreements (Caldecott & Dickie, 2010, p. 10), as well as savings through economies of scale (eftec et al., 2010, p. 5).

3.4: The regulatory case

The final piece of the case in favour of offsetting pertains to its overall benefits as a regulatory approach. The regulatory case could equally be described as the governance case, since it goes beyond the specific advantages for regulators, and encompasses the offsetting's purported ability to satisfactorily resolve a number of competing demands for policymakers.

3.4.1: Resolving conflict in meeting competing policy goals

While offsets offer significant new sources of finance for conservation, flexibility for planners to direct ecological restoration strategically, and to do so in an efficient and cost-effective way, it is important to note that they promise to do so without impeding development or economic growth in the process (TEEB, 2010a, p. 157). If designed well, they should make environmental compliance simpler, quicker and more certain for business. By appealing to multiple stakeholders and interests, advocates argue, offsetting can provide an effective and far less politically antagonistic way of governing biodiversity loss with respect to development pressures. In support of such claims, proponents point to the success of other tradeable rights and permitting programmes around the world governing industrial air and water pollution, and managing common pool resources such as fisheries and water resources effectively at low cost (ten Kate et al., 2004, p. 21; see also Bayon, 2004). Supporters also suggest there are encouraging results according to various measures, especially finance leveraged and volume of restoration projects promised, in places where offsetting and banking schemes are well-established, relative to previous regulatory regimes (Duke & ten Kate, 2014).

3.4.2: Capacity and resources

Limited resources and capacity among regulatory agencies should make offsetting particularly appealing for policymakers and among regulators. Beyond the need for private funding for conservation activity itself, the capacity for regulating environmental impact is under serious and increasing strain in most parts of the world, with government agencies responsible for administering permitting and planning rules expected to process applications as quickly as possible, to allow development to be delivered in line with growth imperatives and other social needs (White, 2008, pp. 39–40). Again drawing on the experience of existing programmes, advocates argue offsetting and especially banking systems offer simple and objective tools for making decisions, which can both significantly reduce approval time and administrative costs for regulators (ten Kate et al., 2004, pp. 22–31). On top of this, when it comes to monitoring and enforcement, the preferable option of a market system creates far greater incentives for offset suppliers, where the liabilities are legally transferred to a third party provider (Kormos et al., 2015, pp. 10–14).

3.4.3: Standardisation

Most importantly, the regulatory case turns on the advantages attributed to offsetting as a policy tool bringing standardisation to the governance of development impact. The clarity and certainty afforded by standardised regulatory rules and forms of measurement should make processing applications significantly simpler for bureaucratic decision-makers, while reducing time and resources spent on both deliberation and verification, increasing the transparency of the process and limiting the scope for appeals and/or further negotiation with developers (Hawdon et al., 2015, p. 7). The main argument here is that no net loss and offsets should be significantly simpler and cheaper to audit than prevailing approaches. Most promoters of biodiversity offsetting argue for a mandatory system as a result, where the rules and metrics are clear and consistent, since this is essential in constructing a level playing field for business to operate on, as well as creating the necessary demand (and competition) for an offset market to emerge (ten Kate et al., 2004, p. 36). Though some short term costs are expected in setting up the system, and continued oversight is necessary, the anticipation is that these will fall in the medium to long run, as market efficiencies kick in (Bayon, 2004, pp. 14–15).

4: Key themes in the development of offsetting

Chapter 4 now moves on to reviewing the ongoing academic debates around biodiversity offsetting in detail, addressing technical and institutional issues around design and implementation, as well as perspectives from more critical literature. Together, Chapters 3 and 4 provide important reference points for debates which took place in the UK between 2010 and 2015, and helps hone the specific research questions laid out in Chapter 5. Before moving on, however, it is worth briefly highlighting certain motifs on which the thesis pivots, and came into view in Chapter 3. As will become clear, there were striking parallels in the story of the English policy's emergence, and the historical account of offsetting's development told in Section 2. Offsetting was proposed by the UK government in a moment of backlash against environmental regulation, intersecting with a reform programme aimed at liberalising the planning system, constructed as a relic of the command-and-control era which was impeding development. At the same time, UK conservation policy was being part-driven, mediated and constrained by legally binding biodiversity conventions and governance regimes on higher international scales, both European and global. In pulling through other themes, the English programme was heavily backed by a green business coalition, mobilising very similar arguments to those outlined in Section 3. Other environmental interests, meanwhile, were attracted on the basis of the evidential and abject failures of the prevailing mitigation regime, as they were in the US. Part of the appeal was the possibility of at least being able to standardise and maybe consolidate the process. In analysing the English experience, what is most interesting is why the process broke down, what was different and what the implications might be. For now though, the thesis turns to the key academic debates about offsetting.

Chapter 4: Biodiversity offsetting in theory and practice: technical, institutional and critical debates

Introduction

This final chapter before moving onto the methodology and empirical analysis reviews the existing academic literature on biodiversity offsetting. It provides more specific conceptual tools to analyse biodiversity offsetting as a multifaceted, complex, and contentious policy tool. Offsets require the successful alignment and enrolment of a range of actors from different fields and sectors. Questions relating to the political economy and political ecology of environmental policies need to be asked with reference to a range of ongoing debates around offsetting outside these fields, including environmental science and ecology, conservation, planning and law. Though the coverage of these issues is somewhat limited by the author's lack of expertise in these disciplines, an overview is nevertheless necessary to get to grips with the nature of the controversies and frictions analysed later in the thesis. Together with Chapter 3, this chapter introduces many of the concepts and debates referred to in the oral and written data collected during fieldwork. It should be noted that many of the divisions, positions and debates laid out in Chapter 3, Section 3 and those in Chapter 4 are not necessarily mutually exclusive, but porous and overlapping.

The chapter explores the core debates relating to successful design and implementation of biodiversity offsets, discussions over its appropriate scope and use as a conservation tool, along with critical perspectives on the policy. It does so in three parts. Section 1 reviews scientific and technical issues, focusing on: (i) the limits of ecological science; (ii) measurement, biodiversity currencies and notions of ecological equivalence; (iii) techniques of accounting for biodiversity loss and gain; and (iv) offsets as avoided loss and ecological restoration. Section 2 covers governance and institutional challenges, looking at: (i) implementation and compliance; and (ii) perverse outcomes and unintended consequences. Sections 1 and 2 provide an overview of literature which is broadly supportive of biodiversity offsetting in principle, but contingent on a variety of factors to be considered justified and effective in practice. While recognising and identifying limitations and dangers to offsetting, the literature surveyed in this section is largely not of a 'critical' political register, as defined at the beginning of Chapter 1. These two sections look most carefully at the pragmatics of offsetting, and debates over how best to operationalise and make the policy 'work' in meeting its stated objectives. It should be noted that though not of a critical political register, the issues discussed are highly contested and there is little overall consensus. Some authors are very critical of offsetting itself, concluding that various technical and institutional issues are ultimately intractable, such that its potential efficacy and coherence are compromised as a result.

Section 3 reviews the most critical literature on biodiversity offsetting. The work reviewed here tends to be highly sceptical of offsetting's potential success on its own terms, and critical too of its likely or observed consequences for people and the rest of nature. It suggests that resolution of the dilemmas identified in the opening sections are more heavily mediated and conditioned by political economic

and socio-ecological contradictions than is generally recognised. Importantly, this section brings biodiversity offsetting into sharper focus with respect to the critical perspectives outlined in Chapter 2, linking the broader framework of analysis to the empirical case, adding meat to the conceptual bones in the process. For the most part, work reviewed here is to some extent theoretically grounded in the literatures on the neoliberalisation of nature and conservation, but draws too from other parts of critical environmental studies. In terms of content, it looks at: (i) offsetting as commodification and marketisation; (ii) offsetting as neoliberal environmental governance; and (iii) environmental and social consequences of (and resistance to) offsetting. The section and chapter concludes with a reassessment of biodiversity offsetting as an example of the neoliberalisation of nature and conservation, in light of the literature reviewed in this chapter, and provides three possible frames of analysis to take forward.

1: Scientific and technical debates

1.1: The limits of ecological science

There is agreement across the spectrum that biodiversity offsetting is an exceptionally difficult mechanism to design and put into practice. In the first place, the very nature of 'biodiversity' is widely recognised as inherently difficult, perhaps impossible, to fully know, measure and value in all its complexity (Moreno-Mateos, Maris, et al., 2015; ten Kate et al., 2004; Purvis & Hector, 2000; Salzman & Ruhl, 2000; but see Pereira et al., 2013). Tools which have been developed always measure one or a variety of proxies, which only offer partial representation of (particular aspects or components of) biodiversity (Bull, Suttle, Gordon, et al., 2013). The many ways in which biodiversity is defined and valued consist of components which are themselves tough to isolate and measure, and require different methodological approaches often in tension with one another (Moreno-Mateos, Maris, et al., 2015). There are clearly political dimensions to these difficulties too which relate to biodiversity's curious social construction and historical assembly (e.g. Vadrot, 2014; Takacs, 1996). One of offsetting's most intractable problems is the incorporation of explicitly socially and culturally determined values, framed as ecosystem services, into 'scientific' forms of measurement. These issues will be returned to in more detail later in the chapter, but in this section the focus remains largely on the biophysical characteristics which create dilemmas for offsetting.

In biophysical terms, biodiversity is widely understood to be composed of a series of dynamic, interpenetrating and often nonlinear ecosystemic processes operating at every temporal and spatial scale (Zimmerer, 2009). How these spatio-temporal dynamics play out, and the cumulative impacts of various forms of environmental and socially-induced change, tend to be highly contingent and specific (Bull, Suttle, Singh, et al., 2013; Kujala et al., 2013). Non-equilibrium ecology (e.g. Zimmerer, 2000) suggests that trajectories of biodiversity change are both uncertain and unpredictable, and frequently exhibit the emergent properties of complex systems (Moreno-Mateos, Maris, et al., 2015). Biodiversity is also by definition endlessly heterogeneous across time and space, and always context-

specific. This creates problems with abstracting, commensurating and quantifying biodiversity's ecological value (Bull, Suttle, Gordon, et al., 2013), while biodiversity's unpredictability makes engineering conservation gain a highly challenging and uncertain endeavour (Maron et al., 2012; Bekessy et al., 2010).

Under these circumstances, the use of 'sound science' is seen as paramount for offsetting's successful roll out (IUCN, 2014, p. 12). However, the scientific foundations of biodiversity offsetting – i.e. the tools for understanding and dealing with biodiversity's complexity and unpredictability – are generally considered to be immature. As Burgin points out, relative to physics, chemistry and mathematics: "ecological, biological and restoration sciences are underdeveloped, and much more imprecise and complex" (2010, p. 53). Furthermore, the tools employed rarely draw from the latest scientific developments (Calvet et al., 2015; see also Bull, Suttle, Singh, et al., 2013), and their adaptability to rapidly changing environmental contexts (e.g. in the face of climate change) is regarded as a particular challenge. The instruments used in practice are rather inexact, and often require subjective interpretation and judgement (Wotherspoon & Burgin, 2009, p. 68; see also Robertson, 2006a), exacerbated by large gaps in available, standardised and useful data. A number of potential sources of bias have also been identified in the literature. At the operational level, it is often not clear how to interpret guidance and manuals (see also Kelly et al., 2011; Clare et al., 2011), and though quantitative biodiversity offset metrics aim to provide objective, hard numbers, it is generally recognised that there is still considerable room for error, misinterpretation and difference of opinion (e.g. Bull, Suttle, Gordon, et al., 2013; Kelly et al., 2011; Cook et al., 2010; McCarthy et al., 2004).

Some authors characterise the risk of bias running deeper, with subjective judgements built into every stage of the offsetting process (Wotherspoon & Burgin, 2009). Kujala, Burgman and Moilanen (2013) argue that as well as the frequently covered epistemic uncertainties of conservation, stemming from lack of knowledge and natural variation, bias is possible as a result of the under-examined categories of linguistic and human decision uncertainty. Linguistic uncertainty refers to the vagueness, ambiguity, context dependency and under-specificity and indeterminacy of key theoretical concepts and procedural terms. Human decision uncertainty meanwhile points to both the significant degree of subjective judgements involved in decision-making, and the role of values and interests (such as the preferences and ontological viewpoints of individuals) in influencing them, especially in situations where policy objectives are defined in socio-political terms, which may conflict with strictly scientific recommendations. These factors may have significant effects, but are frequently absent from discussion in the literature (Kujala et al., 2013; Regan et al., 2005, 2002b).

Whether offsetting is scientifically based and supported by evidence remains something of an open question. Fallding is one of many authors to emphasise that limitations like those mentioned above "do not appear to have been effectively recognised in policy approaches to date" (2014, p. 17). Most of the literature surveyed here accepts that biodiversity will always remain unknowable to some degree, however sophisticated the biological and ecological sciences become. Some believe such

obstacles to be largely an issue of comprehensive data, which can be overcome via coordination between ecological researchers and consultants (Hill & Arnold, 2012; see also BBOP, 2009a, p. 14), but others see these limitations as potentially fatal for offsetting's success (e.g. Moreno-Mateos, Maris, et al., 2015; Walker et al., 2009). In any case, the combination of biodiversity's biophysical nature and the immaturity of its underpinning scientific disciplines present particular, interpenetrating challenges for offsetting. One is epistemological, in terms of whether no net loss can be satisfactorily and objectively verified: a problem of assessment and measurement. The other is practical, and concerns the effectiveness of conservation actions: a problem of outcome. These dilemmas feature prominently in the debates I now discuss in more detail.

1.2: Measurement: currencies and equivalence

The premise of no net loss revolves around the notion that loss can be compensated for by at least an equal quantum of biodiversity gain. In order to demonstrate and achieve this, offsets require consistent currencies, capable of measuring loss and gain as fungible units (i.e. in equivalent and substitutable terms) which facilitate trade or exchange (ICMM & IUCN, 2013, p. 23). However, since there is "no single metric that objectively captures the full extent of biodiversity, which itself has no universal, unambiguous definition" (Bull, Suttle, Gordon, et al., 2013, p. 373; see also Gardner et al., 2013; BBOP, 2012a), currencies have to rely on proxies instead – with the proviso that they represent biodiversity as commensurable across time and space, and at the same time reflect ecological reality. A decision needs to be made at the design stage over what aspect of biodiversity is to be compensated (BBOP, 2012a, pp. 27–8): no net loss of what? The currency may denote equivalence of some ecological value, such as ecosystem function, structure or composition (including particular species or habitats), relate to instrumental values derived as ecosystem services beneficial to human well-being, or non-instrumental values such as cultural and non-anthropocentric values (Moreno-Mateos, Maris, et al., 2015, pp. 554–5; see also Calvet et al., 2015, p. 7363; Quétier & Lavorel, 2011). They may focus on individual attributes and encourage 'like for like' exchanges, which aim for instance to preserve endangered species or other conservation priorities, but often use compound metrics combining multiple attributes.

No common currency has emerged, and according to BBOP (2009a, p. 14), there are over 100 biodiversity metrics in operation around the world today. These take a multiplicity of different forms, as laid out in by ICF Consulting and IEEP (2014, pp. 6–35; but see also Clarke & Bradford, 2014; Quétier & Lavorel, 2011; BBOP, 2009b) and **Table 2** below.

Table 2: Types of biodiversity metrics and currencies

Metric type	Description, features and advantages	Disadvantages and criticisms
Area-based	• Simple area-based metrics originally used in US wetlands mitigation, and still in use in some places • Now largely discredited	• Very simplistic, unreflective of ecological value
Habitat-based	• Early habitat-based metrics combine area with ecological values in calculation; more common today and used widely in Germany • Numerically score the ecological value of a site, according to significance of various features present, such as naturalness, species richness and diversity, rare species, etc. • May also incorporate a site's potential to provide certain ecosystem services positively related to biodiversity	• First generation habitat-based metrics viewed as overly simplistic • Usually require further specification and differentiation when implemented on local level
Habitat Hectares	• Developed in Victoria, Australia; have become widely adopted • Considered more sophisticated in determining actual quality of a site's biodiversity against certain benchmarks, using a different key variable and integrating condition assessments into calculation • Condition assessments may take into account factors like age, connectivity to other habitats, integrity of species communities present or ecological processes such as nutrients cycles, soil type and structure, hydrology and so on • More recent metrics have combined both habitat-based approaches, calculating value according to area, standard values and condition; now common in offsetting schemes in the US; English metric broadly based on this model	• Habitat Hectares has been criticised for failing to account for dynamic processes, and presenting too static a snapshot of a site's value; identified as a particular problem when evaluating semi-natural habitats • Despite increased complexity of newer models, still regarded as too simplistic
Species-based	• Aim to either protect species of high conservation value (e.g. protected or endangered species), or use presence and viability of certain indicator species as basis for approximating biodiversity value • Indicator species might either be a signal of the health of an ecosystem or the species most sensitive to disturbance • In guise of habitat suitability assessments (originally developed by the US Fish and Wildlife Service), species-based metrics have been employed in the US under ESA, and widely across Europe as part of mitigation requirements of the Habitats and Birds Directives • Generally viewed as encompassing the most refined and rigorous metrics; some now utilise genetic analysis techniques across landscapes	• Highly particular and complex, needing to account for very specific ecological needs of target populations; process becomes even more complicated when several species are involved, requiring significant expertise and extremely good data
Replacement cost	• Developed in Germany, used largely to aggregate in-lieu payments for small scale offsets, where developers pay fee calculated according to the average cost of replacing the affected habitat multiplied by the area of impact • Payments go to public agency which uses them to directly fund offset measures of equivalent cost	• Generally seen as only suitable for low value biodiversity

Ecosystem services	• Aim to offset and deliver no net loss of ecosystem services, as set out by the CBD commitments, IFC standards and under development in the EU • Generally focus on localised impacts for people and communities (sometimes attempting to utilise local knowledge), other than where loss of carbon sequestration services is a concern; look to mitigate and compensate losses of cultural and amenity values, flood prevention and other regulatory services • Some suggestion of possibility of separating biodiversity and ecosystem service metrics, as well as disaggregating the latter into simpler, singular units for specific services • Yet to be widely operationalised in offsetting schemes because of these difficulties, though some have been partially incorporated into existing metrics in both Germany and US wetlands mitigation	• Context-specific nature of ecosystem services make precise quantification and commensuration particularly problematic • High number of services, measured using different units, means great difficulties when attempting to meaningfully combine data

Sources: ICF Consulting and IEEP (2014); Gardner et al. (2013); Briggs et al. (2009); Gibbons and Lindenmayer (2007); McCarthy et al. (2004); Parkes et al. (2003)

1.2.1: Simplicity versus complexity?

Biodiversity currencies necessarily capture different values, and those which are not accounted for are not compensated for (Moreno-Mateos, Maris, et al., 2015, p. 554), or at least not counted (for comparative impacts of different metrics on no net loss calculations, see Bull, Milner-Gulland, et al., 2014). Simplistic metrics have a number of drawbacks. On the one hand, relative to many other tradeable environmental credit systems, such as sulphur dioxide or carbon emissions, biodiversity is exceptionally difficult to simplify and measure (Salzman & Ruhl, 2005, p. 9). As a result, 'crude' metrics (Brownlie et al., 2013, p. 27) are often criticised for using poor surrogates which fail to capture enough of biodiversity's multi-dimensional values, leading to unmeasured biodiversity loss. As Walker et al put it: "Unavoidably, simple biodiversity currencies are inadequate; they facilitate nominal biodiversity accounting, but omit, obscure, or conceal biodiversity features and noninterchangeabilities" (2009, p. 151). Conversely, simple metrics can end up being overly restrictive, especially with rules specifying in-kind compensation, which can inhibit the supply of appropriate offsets (Habib et al., 2013; Gibbons & Lindenmayer, 2007, p. 28). In this sense, simple metrics might be not fungible enough to enable market liquidity. The use of compound metrics is often put forward as a way of better reflecting the full complexity of biodiversity as well as facilitating more trading (see for example Gonçalves et al., 2015; IUCN, 2014; Brownlie et al., 2013; Quétier & Lavorel, 2011; BBOP, 2009a). Compound metrics however do not necessarily help (Bull, Suttle, Gordon, et al., 2013), as they can instead add further scope for inaccuracies, and arbitrary judgement calls in the face of knowledge and data gaps, while making offsets less transparent in the process (ICF Consulting & IEEP, 2014, pp. iii–iv).

At the same time, adding further levels of complexity can equally lead to further restrictions on trades, if compensation is demanded that meets multidimensional criteria (Calvet et al., 2015, p. 7369). The

more ecological values incorporated into biodiversity currencies, the less fungible they become (Salzman & Ruhl, 2005) – a consequence of how biodiversity is rendered equivalent according to specific attributes which cannot be necessarily be superimposed upon each other (see e.g. Brownlie et al., 2013, p. 29). This is partly a practical concern. In different places, different values may or may not be compatible with each other. Compensating for one does not mean an equal gain in the other, since the units are not the same, will not map onto one another and may be mutually exclusive. The relationships between biodiversity, ecosystem functions and ecosystem services for instance are uneven, and there are significant gaps in understanding how they interact (Robertson et al., 2014; Palmer & Filoso, 2009). The dilemma of which currencies to use has led to some to suggest greater use of disaggregated metrics. However, unbundling (and the reverse process of credit 'stacking') and compensating for different aspects of biodiversity and ecosystem services is fraught with its own conceptual and practical difficulties, in terms of measuring and accounting for multiple values simultaneously (see Robertson et al., 2014).

1.2.2: Ecological equivalence: type, location, temporal

At the heart of the problems outlined above is the issue of ecological equivalence, from which biodiversity currencies are derived, and what can and cannot be rendered commensurable and substitutable (Calvet et al., 2015, p. 7363). The question of ecological equivalence remains a topic of significant debate within the offsetting literature, most commonly focusing on equivalence in three intersecting registers: type, location and temporality. Others add ecological or landscape context and ecological complexity as further concepts which need to be taken into account (Quétier & Lavorel, 2011, p. 2994; see e.g. van Teeffelen et al., 2014; Salzman & Ruhl, 2005; Bruggeman et al., 2005). Each generates problems for the creation of standardised currencies and metrics (though see Gonçalves et al., 2015). The stipulation that loss and gain be equivalent ultimately means various restrictions on exchanges, and tiered systems of allowable trading need to be put in place, according to how 'offsetable' biodiversity values are judged to be in different contexts.

Equivalence in type refers to the question of whether no net loss demands that offsets must be of the same kind (Walker et al., 2009; Salzman & Ruhl, 2000). Should an offset replace the same type of habitat, with the same functions, as is being lost at the impact site? It is widely agreed that in-kind offsets make it far easier to show equivalence between loss and gain than out-of-kind exchanges – though some argue that socially engineered habitats (i.e. a restoration offsets) cannot be considered equivalent to a naturally occurring habitats, even if both are of the same kind and are treated as such in practice (Moreno-Mateos et al., 2012; see also Mossman et al., 2012). Others note how replacement of in-kind habitat will not necessarily result in replacement of functional values, meaning functions themselves need to be measured and offset alongside diversity (Bull, Suttle, Gordon, et al., 2013). Most metrics require in-kind or like-for-like exchanges (Quétier et al., 2014), though 'kind' may be defined according to different classification systems, from the level of species or habitat to those of ecological communities or ecosystem type.

Location is another significant challenge when trying to commensurate loss and gain. The further away an offset is the less similar it is likely to be, due to geographical variation (Bull, Suttle, Gordon, et al., 2013). A site's geology, geomorphology, hydrology and climate, as well as its connectivity with surrounding areas, all heavily influence the geographical specificity of biodiversity values (Moreno-Mateos, Maris, et al., 2015; Walker et al., 2009). Limited knowledge and data regarding how these intersecting processes operate (together with ecological and landscape contexts and interactions) make predicting future equivalence of an offset in a different spatial context fraught with difficulty (Quétier & Lavorel, 2011; Walker et al., 2009; but also see Kujala et al., 2015; van Teeffelen et al., 2014). Ecosystems serve dissimilar functions in different contexts, and as already mentioned, the value of ecosystem services tends to be highly dependent on location. Flood prevention services or amenity values of a forest are no use to a community if replanted 500 miles away. Spatial equivalence is one of the main reasons offset markets remain operational only at the subnational level, and international biodiversity offsets are rarely contemplated.

Temporal equivalence can be understood in two ways. The first intersects with spatial equivalence in terms of the ecological and landscape context of offsets, with Moreno-Mateos et al. (2015) making the case that a site's uniqueness is partly down to particular and contingent historical events. The legacy of fires, human disturbances, invasive species, co-evolutionary processes and so forth have profound short and long term effects on biodiversity. These are conditions which cannot realistically be replicated, and the dynamic change ecosystems will undergo in the future remains too unpredictable or unknowable to claim equivalence over time. The second and more common issue identified in the literature is the temporal lag between impact and the delivery of compensation (Gibbons & Lindenmayer, 2007). There is a question mark over whether conservation gain, realised in the future, can make up for loss of functions and services in the intervening period, especially when restoration or recreation offsets often take decades or even centuries to reach full maturity (Evans et al., 2015; Moreno-Mateos et al., 2012; Moilanen et al., 2009). At the same time, the further into the future offsets are projected, the less certain the outcome, in terms of whether restoration is successful in delivering equivalent gain at all.

For some authors, biodiversity's incommensurability is one of the greatest barriers to operationalising meaningful offsetting policies (e.g. Walker et al., 2009). While Ives and Bekessy (2015) point to the irreconcilable dissimilarities between scientific equivalence and value equivalence, Moreno-Mateos et al. (2015) make the case that biodiversity is, by definition, nearly always non-substitutable in any meaningful sense. Most authors are not so pessimistic and take a less absolute approach, while recognising the limits to ecological equivalence, and the need for certain restrictions and regimes of adaptive management (Quétier & Lavorel, 2011).

Nearly all offset currencies and metrics incorporate ratios and multipliers to counterbalance and hedge against problems of non-equivalence, while time discounting is also used sometimes to deal with time lags (Overton et al., 2012; Pouzols et al., 2012; Bekessy et al., 2010; Moilanen et al., 2009). For instance, metrics often require proportionately more conservation gain to be delivered the longer

the expected time lag between impact and offset maturity, the riskier the restoration project, or the further away an offset is located from impact. This aims to disincentivise less desirable offsets which are less likely to be equivalent, or at least raise the possibility of delivering enough equivalent gain. The scientific integrity of multipliers however is generally regarded as questionable and the ratios somewhat arbitrary (Moilanen et al., 2009; Regan et al., 2002a), in part due to lack of useful data to predict levels of risk (Quétier & Lavorel, 2011; but see Laitila et al., 2014; Pouzols et al., 2012). Studies have suggested existing ratios for restoration offsets are almost invariably inadequate, and given levels of uncertainty, long time lags and expected failure rates, most currencies would realistically range from 10:1 up to and beyond 100:1 (Curran et al., 2013; Pickett et al., 2013; Maron et al., 2012; Moreno-Mateos et al., 2012). Such ratios are viewed as largely impractical, given the costs involved and limited availability of land.

Banking systems are often presented as the most promising solution, or even prerequisite, to tackling issues of time lags and uncertainty, by having offsets in place prior to impact (Bekessy et al., 2010). Banks however, which consolidate conservation gains in one site, by definition require large areas and tend to be located far from impact sites. This tends to undermine spatial equivalence and frequently, by extension, equivalence of type as well (Calvet et al., 2015, pp. 7265–6; Ruhl & Salzman, 2006). On top of this it is difficult to predict well in advance which types of offsets will be required in the future. There are also other practical concerns, particularly relating to raising enough capital to deliver offsets years or decades in advance of payment (Salzman & Ruhl, 2005), especially when future demand cannot be assumed. Banks are moreover not immune to the technical difficulties surrounding restoration offsets, and frequently fail to deliver on their initial objectives.

The final set of measures widely used to alleviate concerns over non-equivalence is the use of exchange restrictions, and designating certain areas as strictly non-offsettable (Gordon et al., 2011). In terms of the problem of spatial equivalence, offset systems tend to deploy rule-of-thumb restrictions on the proximity of offsets to impacted areas (ten Kate et al., 2004; Salzman & Ruhl, 2000). As well as the use of multipliers, this includes absolute limits, where offsets cannot be located outside a predefined geographical area, or beyond a maximum distance from impact. In order to satisfy ecological equivalence of type, in-kind compensation is usually specified, though out-of-kind offsets are employed in various systems (Quétier & Lavorel, 2011). However, as some note, offsets located in close proximity to developed areas engender their own set of problems and uncertainties (e.g. Latimer & Hill, 2007). Landscape-level conservation planning is seen a crucial tool here. Even though it is much harder to demonstrate equivalence, many in the literature argue out-of-kind trading should be acceptable in some circumstances, especially where impacts on low value sites can be ‘traded up’ – otherwise known as ‘like-for-like or better’ – for gains in high value habitats and species (Bull et al., 2015; Pilgrim, Brownlie, Ekstrom, Gardner, von Hase, ten Kate, Savy, Theo Stephens, Temple, Treweek, & Ussher, 2013; Bull, Suttle, Gordon, et al., 2013; Levrel et al., 2012; ten Kate et al., 2004). Though this approach somewhat elides the issue of strict equivalence, many authors suggest excluding various high value species and habitats from trade altogether. This involves the

identification of thresholds, over which some habitats and species are deemed irreplaceable to all intents and purposes, because they are too unique, valuable or rare, or near-impossible to re-establish within acceptable timeframes or degrees of certainty (Vanderduys et al., 2016; Pilgrim, Brownlie, Ekstrom, Gardner, von Hase, ten Kate, Savy, Theo Stephens, Temple, Treweek, Ussher, et al., 2013; Maron et al., 2010). There is much debate over the boundaries of such exclusions, but even the more optimistic authors believe that if no net loss is a serious and non-negotiable proposal, then offsetting should only encapsulate the most common species and easy-to-replicate habitats (Curran et al., 2015; Quétier et al., 2015; Regnery et al., 2013).

1.3: Accounting for no net loss: baselines, scale and longevity, additionality

Beyond decisions over what to measure, and the scope of exchange restrictions, there are a variety of questions surrounding the accounting procedures and rules involved in defining and delivering no net loss (Bull, Suttle, Gordon, et al., 2013). Most significantly, these relate to the specification of the baselines against which loss and gain are calculated; the spatial scale to which no net loss refers; the longevity of offsets; and how additional conservation actions are to be distinguished. None of these factors are trivial and can have profound implications for the meaning of no net loss and the likelihood of success in meeting those objectives, as discussed at length in the literature (Bull & Brownlie, 2015; Thébaud et al., 2015; Gordon et al., 2011).

Defining biodiversity baselines at both the sites of impact and compensation is a crucial matter for offsets (Gordon et al., 2011; eftec et al., 2010). Though it is often assumed that baselines simply denote the state of a site at a particular moment in time, biodiversity is rarely static (Bull, Suttle, Gordon, et al., 2013). Prevailing trends and anthropogenic or non-anthropogenic impacts mean that counterfactual scenarios should be taken into account, in which the condition of biodiversity could be expected to improve or be degraded over time without the presumed action (Bull, Gordon, et al., 2014). For instance, in circumstances where biodiversity is declining regardless of the specific development-related loss, an offset should not be expected to reverse that trend. Rather, the requirement should be that development does not make things worse, since no net loss only stipulates impact neutrality. Dynamic baselines also enable the use of 'averted loss' offsets, through which halting expected loss (e.g. protecting an area under development pressure, or controlling an invasive species on an existing site) can be categorised as a conservation gain (Moilanen & Laitila, 2016). There are, however, several risks associated with using dynamic baselines. Predicting and confirming future trends and the supposed impacts of counterfactuals is far from straightforward. Lack of data and ecological uncertainty are exacerbated the further into the future offsets are projected (Bull & Brownlie, 2015). Inaccurate baselines can underestimate the loss caused by a development, or exaggerate the gains resulting from conservation actions (Gordon et al., 2015). Some authors insist that baselines and objectives should be adapted and updated regularly to correct for errors and change, while others argue compensation requirements should always be based on the worst case scenario (Bull, Gordon, et al., 2014; Bull, Suttle, Singh, et al., 2013). Furthermore, it is increasingly recognised that the use of dynamic baselines to calculate no net loss will frequently 'lock in'

trajectories of decline (Maron, Bull, et al., 2015; Gordon et al., 2015). Though possibly justifiable at the project level, the cumulative impacts could be very dangerous at the landscape scale. There is a related concern with averted loss offsets, which several authors observe necessarily involve overall loss, since loss is never replaced by new biodiversity (Moilanen & Laitila, 2016; Curran et al., 2015, 2013). In these contexts there is an overriding concern that no net loss is something of a misleading term, especially when it is so rarely explicitly specified (Maron, Bull, et al., 2015), and risks being inappropriate and counterproductive for conservation efforts (Moreno-Mateos, Maris, et al., 2015; Gordon et al., 2015).

The second accounting issue applies to the spatial scale at which no net loss is measured. The distinction between no net loss at project and landscape level is highlighted in the literature by several authors (e.g. Bull et al., 2015; van Teeffelen et al., 2014), and increasingly recognised as a major policy issue (BBOP, 2012a). Though many authors point to the importance of landscape level planning in designing offset schemes and programmes, no net loss at this scale is very rarely an objective of offsetting (Fitzsimons et al., 2014). Moreover, authors have noted that most policies do not specify their project level focus, with the consequence that offsets are commonly assumed to aim for no net loss at a landscape scale when they are not (Quétier et al., 2014; Bull, Suttle, Gordon, et al., 2013). Delivering at this higher scale through offsets is widely recognised far more ambitious, requiring different forms of measurement and further consideration of cumulative impacts (Curran et al., 2015); 'leakage' and the dilemmas of using restoration or avoided loss offsets (Moilanen & Laitila, 2016; BBOP, 2012a); and other factors which make achieving no net loss far more difficult in practice (Bull, Gordon, et al., 2014).

A third issue relates to the temporal scale of offsets. As already discussed, the time lag between impact and offset maturity introduces one problem. Duration of offsets presents another, which has become increasingly prominent in recent years, especially in light of conditions regarding longevity not being met (Gonçalves et al., 2015; Brown et al., 2014). Question marks surround how long offsets should last, and the ecological, economic and regulatory practicalities of maintaining sites in the long term, in the context of dynamic environments and changing political and economic circumstances (Norton & Warburton, 2015; Bull, Suttle, Gordon, et al., 2013). The general consensus says that offsets should last at least as long as the development impacts (Quétier et al., 2014; Pilgrim, Brownlie, Ekstrom, Gardner, von Hase, ten Kate, Savy, Theo Stephens, Temple, Treweek, Ussher, et al., 2013), assuming onsite impacts are reversible (Bull, Suttle, Gordon, et al., 2013; BBOP, 2012b). If impacts are considered irreversible, offsets should be secured and protected in perpetuity (Bos et al., 2014; Gardner et al., 2013; McKenney & Kiesecker, 2010; Godden et al., 2003). However, as Bull et al. (2013) explain, 'in perpetuity' rarely means forever, and around 30 years is a typical outcome of negotiations in practice. Since full maturity of restoration projects can often take over 100 years (Maron et al., 2012), this remains a significant point of contention for the coherence of no net loss beyond very quick and easy-to-replicate habitats.

The fourth problem identified is the condition of additionality, which says that conservation gain can only be counted if the activities would not have happened anyway (e.g. Brown et al., 2014; Maron et al., 2013; McKenney & Kiesecker, 2010). Demonstrating additionality necessitates plausible counterfactuals arrived at in a transparent way (Maron, Bull, et al., 2015). On one level, the problem is clearly philosophical. However, additionality is more concretely identified as dependent on factors such as the strength and effectiveness of other protective conservation measures at various scales, and context-specific vulnerabilities of particular habitats and species (Brown et al., 2014). More problematically, as will shortly be discussed, additionality is one of several issues germane to concerns around perverse outcomes of offsetting, in undermining wider conservation strategies (Gordon et al., 2015). Most recent debates have centred on whether offsets which contribute to protected areas can legitimately be considered additional, given that governments are already technically obliged to fund them as part of existing conservation commitments, even if they are failing to do so (Githiru et al., 2015; Pilgrim & Bennun, 2014). For Maron, Gordon, Mackey, Possingham and Watson (2015) for instance, offsets in protected areas must either be invalid, or an admission must be made that there is no intention to meet CBD targets. As with many other issues outlined in this section, there is no obvious resolution to the dilemma, beyond suggestions of more transparent presentation of the trade-offs involved in decision-making.

1.4: Conservation gain: restoration offsets and avoided loss

The final part of the literature focused on the more technical issues around offsetting regard the delivery of conservation gain, through averted risk (or avoided loss) offsets, or restoration offsets (including recreation and enhancement activities, see BBOP, 2012c). As should be clear from the preceding pages, there is significant and continuing debate over which approach is more appropriate, depending on the circumstances and priorities of an offset scheme or policy. Off-site compensation is most typically associated with restoration offsets, as the most intuitive form of conservation gain (Maron et al., 2012). This involves the recreation, restoration or enhancement of an area of land to a higher quality or condition of biodiversity, measured against a crediting baseline, using the techniques of restoration ecology. However, as previously indicated, restoration science remains a relatively undeveloped field and imprecise practice. As frequently referenced in the offsets literature, the scientific integrity of ecological restoration remains questionable (Evans et al., 2015). In practice, it requires the simplification of vastly complex systems and faith in a series of ‘myths’, including the validity of certain methodologies, the idea of ‘end points’ for restoration, and the ability to control, accelerate and replicate ecosystemic processes (Hilderbrand et al., 2005). The reality is that there is still uncertainty over whether physical and biological interventions into ecosystems work at all as intended (Moreno-Mateos, Meli, et al., 2015; Hobbs et al., 2011), and restoration remains highly variable, unpredictable and risky by definition. As Aronson, Clewell and Moreno-Mateos (2016) put it, the aim is not about creating a product, but rather helping processes re-establish themselves on a trajectory. As such, restoration ecology is partly about embracing uncertainty, rather than meeting set criteria.

Many of the problems identified in this part of the literature mirror others already touched upon, particularly around measurement, unpredictability and lack of data. Palmer and Filoso (2009) for instance stress how simplified valuation and measurement techniques may end up accelerating degradation and loss. Halme et al. (2013) raise the problem of maintaining connectivity in time and space, as well as the challenge of assessing functionality. Bullock et al. (2011) note the conflicts which can arise between competing objectives focusing on biodiversity and ecosystem services. Restoration is also a very slow process. Time lags can be very long (Maron et al., 2012), far longer than the duration offsets are expected to last, generating risk of bottleneck effects (Gardner et al., 2013). Moreover, based on the limited data available, many have observed that the empirical picture for restoration over the long term is at best mixed (Maron et al., 2012; Suding, 2011). Many projects fail altogether, often for unknown reasons, after restoration activities and monitoring have ceased (Curran et al., 2013; Maron et al., 2012). Even those perceived to succeed rarely result in the full restoration of structure and function (Burgin, 2008), as highlighted in the case of wetlands restoration (Moreno-Mateos et al., 2012).

While not necessarily insurmountable, the challenges relating to restoration ecology have major implications for offsets and the goal of no net loss. Failure to recognise its limitations leads to unrealistic offsetting proposals and frequent failure (Treweek & ten Kate, 2014), and there remains a substantial gap between the rhetoric and reality of no net loss (Maron et al., 2012). Consequently, some suggest no net loss through restoration offsets may be feasible only in very limited circumstances (Pilgrim, Brownlie, Ekstrom, Gardner, von Hase, ten Kate, Savy, Theo Stephens, Temple, Treweek, & Ussher, 2013; Pilgrim, Brownlie, Ekstrom, Gardner, von Hase, ten Kate, Savy, Theo Stephens, Temple, Treweek, Ussher, et al., 2013; Regnery et al., 2013). In light of this, it is not obvious that robust offsets will be any more flexible than command-and control-regulation (Gibbons et al., 2015). Some authors suggest there are promising avenues and opportunities for improving the predictability of the speed and success of different restoration practices (Suding, 2011), such as greater use of computer modelling (Bullock et al., 2011). This is seen as a key priority (Halme et al., 2013), in the setting of performance standards for instance (Matthews & Endress, 2008). Many authors make the point that the existing use of multipliers is wholly inadequate from an ecological perspective (Curran et al., 2015; Maron et al., 2010; Moilanen et al., 2009). However, the deployment of very high offset ratios is widely accepted as equally unrealistic.

Some see it as vital that a more diversified range of tools is utilised to sufficiently deal with the risks of loss, delays, uncertainties and failure rates associated with restoration offsets (Gardner et al., 2013). Time discounting and conservation banks provide two options, as discussed earlier. Another is to allow the use of avoided loss offsets, where the definition of conservation gain turns on averting a plausible risk to existing biodiversity (Moilanen & Laitila, 2016). This risk, upon which a declining baseline rests, might include development pressure, the presence of invasive species which need to be managed, or financial uncertainty surrounding an existing management scheme. The offset could involve money to purchase the land and put in under protection, funding for continued management

and so on. Avoided loss offsets are widely used, though aggregated information is sparse (Maron, Bull, et al., 2015). While they lack the unpredictability of future success associated with restoration offsets, and can contribute to conservation objectives (Brownlie & Botha, 2009), they are not immune to problems of uncertainty. In particular, limited data feeds into the considerable epistemological difficulty of verifying counterfactuals and baseline trends (Maron, Bull, et al., 2015). As discussed at the beginning of this subsection, inaccurate baselines can lead to significant losses beyond existing rates of decline. More importantly perhaps, the use of averted risk offsets in general is viewed by many as stretching the definition of no net loss to the limits of its coherence (Maron, Gordon, et al., 2015; Curran et al., 2015). In practical terms, they necessarily lock in trends of decline, as a consequence of assuming trends of decline to be already determined (Maron, Bull, et al., 2015), while at scales higher than the project level they may prove fatal for no net loss through direct and indirect leakage (Moilanen & Laitila, 2016) – one of several potential unintended consequences of offsetting.

2: Governance and institutional debates

2.1: Implementation and compliance: oversight and regulatory integrity

Institutional and regulatory questions have also been central to debates around the effectiveness of offsets. Though voluntary offsets have become popular among certain corporate actors, most offset activities are the result of governmental policies and legislation (eftec et al., 2010). These include habitat and species legislation, specific no net loss and biodiversity offset programmes, planning and permitting regimes, and Environmental Impact Assessment (EIA) (see Doswald et al., 2012; ten Kate et al., 2004). Public sector agencies at the very least set the basic rules governing offsets (eftec et al., 2010), but it is widely acknowledged that functioning systems require strong regulatory commitment on the part of local and national government (Santos et al., 2015). Since it is the imposition of mitigation measures and no net loss requirements which drives demand for offsets (Fox & Nino-Murcia, 2005), mandatory systems – in which developers are required to follow official offset procedures to obtain development rights – are overwhelmingly favoured in the literature over voluntarist approaches (IUCN, 2014). Effective regulation is also seen as essential in what is far from a competitive marketplace (Santos et al., 2015), with long-term outcomes dependent on ensuring compliance through the verification and ongoing monitoring and enforcement of offset conditions (ICF Consulting & IEEP, 2014; eftec et al., 2010; Fox & Nino-Murcia, 2005). Securing long-term compliance and outcomes meanwhile rests on a number of legal instruments, binding contractual agreements and permitting conditions. These include mechanisms to secure offset finance; stipulate long-term management and monitoring plans (which specify actions and performance standards); secure rights over and long-term use of land for conservation purposes (such as land purchase or lease as well as conservation covenants or easements) (ICF Consulting & IEEP, 2014; IUCN, 2014; Brown et al., 2014).

Establishing and overseeing an offset programme requires significant technical and legal expertise, as well as the capacity to gather and process information, and verify and enforce conditions when necessary (Brownlie et al., 2013). Though many of the components outlined above may be substantively dealt with and overseen by non-state actors, responsibility ultimately rests with the state and public agencies. There are many potential issues to be managed. As described earlier in the chapter, there are several moments within the process where the subjectivity of the tools and mechanisms, combined with conflicting objectives of different actors, tend to lead to disputes over the validity of particular offsets (Wotherspoon & Burgin, 2009). Developers are generally expected to resist the imposition of offsets, since they imply further costs (Walker et al., 2009; Salzman & Ruhl, 2000). However, if planning and permitting procedures do require compensation, developers will aim for the most part aim for offsets which are cheap (both in terms of the price of credits and transaction costs), and granted as quickly as possible (and thus favour simple and predictable compliance procedures). In short, developers have incentives to minimise their compensation commitments as far as possible, in a manner which risks undermining the goal of no net loss.

As Hill and Arnold (2012) note, it will usually be the job of consultant ecologists to ensure developers comply with regulatory requirements. These actors are in a unique position, arising from their possession of particular skills and knowledges. However, as Wotherspoon and Burgin (2009) make clear, their impartiality and independence is crucial yet should not be assumed. Their position is potentially open to abuse, and they sit at the centre of an array of conflicting interests, including the developers who pay for their services. Consultants play an increasingly important role in offsets, partly as a result of the relative decline of public funds available for conservation activities and regulation (Wotherspoon & Burgin, 2009). As a result, implementation by third party providers, who are not directly beholden to the developers control, is almost universally favoured in the literature (e.g. Bos et al., 2014), a feature which simultaneously aims to promote competition. However, offset providers are observed to have financial interests of their own, in obtaining verification of their restoration projects, so that they can sell credits, while they also have incentives to exaggerate the biodiversity value of those projects (Walker et al., 2009). Like developers, they benefit from simple currencies which allow for fast processing and high frequency trading. This tends to run contrary to the robust and restrictive exchanges much of the techincal literature sees as necessary to ensuring no net loss, because these add risk and require heavy investment in data gathering, monitoring and so on. In light of these broadly acknowledged risks, the independence and impartiality of those who verify and regulate offsets is seen as crucial to successful programmes (Fitzsimons et al., 2014; eftec et al., 2010), as is comprehensive monitoring and enforcement of permit conditions.

Among the regulatory challenges for offsetting, the combined issues of compliance, monitoring and enforcement are widely discussed in the literature, and remain ongoing difficulties for offsets, even in the most developed systems (Bull, Gordon, et al., 2014). Non-compliance with offset requirements is one of the most enduring problems for achieving no net loss, and appears to be the norm (Treweek & ten Kate, 2014; Bull, Suttle, Gordon, et al., 2013; Walker et al., 2009; Gibbons & Lindenmayer,

2007), based on existing studies of offsets and other compensation regimes (Brown, 2014; Burgin, 2011; Norton, 2008; Matthews & Endress, 2008; Quigley & Harper, 2006). Compliance usually relates to actions required by offsets rather than outcomes (Treweek & ten Kate, 2014), and does not necessarily correlate with successful restoration (Matthews & Endress, 2008). However, offsets are still potentially sensitive to even very low levels on non-compliance (Bull, Gordon, et al., 2014), leading to net loss (Quigley & Harper, 2006). In terms of persitent areas of non-compliance, a variety have been identified and discussed. It is commonly observed that there is an unwillingness on the part of traders (i.e. developers and offset providers) to comply with conditions (Habib et al., 2013; Walker et al., 2009). The setting of appropriate performance standards is regarded as tricky, with conditions often defined too leniently by regulators, but are also sometimes too difficult to achieve (Matthews & Endress, 2008), while Bull et al. (2013) make the observation that subsequent and frequent revision of regulation creates uncertainty in compliance more generally. In the case of fish habitat offsets in Canada, Quigley and Harper (2006) show how impact is frequently higher than authorised by permits, while compensation delivered falls short (Habib et al., 2013; see also Bull, Suttle, Gordon, et al., 2013). Brown (2014) meanwhile notes how administrative conditions are more likely to be met than action-based requirements in New Zealand, and that public sector bodies are more likely to comply than those in the private sector.

Inadequate monitoring of offsets is seen as another significant issue yet to be resolved. Without long-term and comprehensive monitoring, it is impossible to know if no net loss has been achieved (Bull, Gordon, et al., 2014; Pickett et al., 2013), or whether failure and non-compliance is being under-reported (Treweek & ten Kate, 2014; Bull, Suttle, Gordon, et al., 2013). Lack of monitoring makes it very difficult to evaluate success, deploy adaptive management techniques and build evidence-based conservation policy in the future (Bos et al., 2014). Again, evidence suggests that monitoring is uncommon (Villarroya et al., 2014; Burgin, 2011), and there is often ambiguity over who the burden of proof should fall on (Bull, Gordon, et al., 2014). When it does take place, outcomes are rarely measured for long enough (Bull, Suttle, Gordon, et al., 2013). Drayson and Thompson (2013) say there has been little improvement in monitoring techniques in the last 15 years, and that information is frequently too vague to make meaningful evaluations. In addition, enforcement of conditions by regulators is routinely lacking. Several authors note that both monitoring and enforcement are hindered by a significant limited capacity, expertise and experience among regulators in particular, but also private and third sector actors (Wotherspoon & Burgin, 2009; Norton, 2008). Treweek and ten Kate (2014) highlight the availability of trained staff, data and comprehensive guidelines as significant challenges for assessing, delivering and regulating offsets effectively.

Failure to follow the mitigation hierarchy is another area highlighted by various authors (Clare et al., 2011; Burgin, 2011), though as both Treweek and ten Kate (2014) observe, there is little evidence to suggest that formalised offsetting makes this worse. Despite ‘avoidance’ being universally recognised as the most important step in achieving no net loss, Clare et al. (2011) argue that the mitigation hierarchy is systematically ignored for several reasons, including: vagueness in policy guidance over

how avoidance and minimisation should be interpreted; developers deliberately finding loopholes and workarounds, or defining project purpose so narrowly that alternative sites are impossible; and a presumption that permits will always be granted, combined with a lack of credible enforcement of conditions (see also Hough & Robertson, 2009; Pittman & Waite, 2009). Application of the mitigation hierarchy is hindered further by a shortage of comprehensive data at the landscape scale, meaning regulators lack the information as to which areas should be avoided before applications are made.

A number of strategies are promoted to ameliorate these problems. There is some consensus that it is regulators or accredited third parties who should be carrying out monitoring and verification of offsets to ensure public confidence, though these activities should be paid for by the developer (e.g. eftec et al., 2010). The formalisation and standardisation of clear rules is a recurrent theme in the policy literature (Brown, 2014; IUCN, 2014; eftec et al., 2010); so are calls for greater transparency (Santos et al., 2015; IUCN, 2014), such as making monitoring information publicly available (Bos et al., 2014). Cost effectiveness often seems to take precedence over the use of more comprehensive survey methods and data collection (Cook et al., 2010), with Habib et al. (2013) for example arguing that simplicity is the key to improving auditing processes. Fox and Nino-Murcia (2005) make the case that conservation banks make for more straightforward oversight by amalgamating offsets in single sites. In order to alleviate the strains on regulatory capacity, various authors suggest NGOs should be engaged more readily to support regulators, along with community and citizen-based monitoring schemes, which are deemed good for engendering transparency and legitimacy too (Santos et al., 2015; IUCN, 2014; Clare et al., 2011). A larger role for intermediaries and brokers has also emerged in the literature in recent years, where they are presented as potentially independent actors capable of consolidating and reducing high transaction costs (Santos et al., 2015; Coggan, Buitelaar, S. M. Whitten, et al., 2013; Coggan, Buitelaar, S. Whitten, et al., 2013).

Despite increasing consensus around the design of ideal-type offsets and standards in the policy literature (IUCN, 2014; see for example BBOP, 2012b), some authors remain sceptical that long-running regulatory problems can be resolved (Maron et al., 2016; Walker et al., 2009). For instance, simplifying bureaucratic audit procedures can be said to elide rather than confront regulatory problems associated with ecological complexity and uncertainty. They aim to streamline compliance processes and increase trading, rather than improve environmental outcomes *per se*, even if they benefit buyers, sellers and regulators. Walker et al. (2009) argue that the consistently evidenced failures of offsets are politically and administratively systemic rather than contingent. For them, offsets reflect and reproduce existing inequalities in power between development and environmental protection interests. The case-by-case nature of offsets favours resource-rich developers. This is reinforced by information asymmetry, whereby those vested interests in favour of offsets tend to benefit from greater access to information than those opposing them, and can exploit the ambiguous (and often opaque) nature of survey data in negotiations.

Moreover, Walker et al. (2009) claim, regulators are far from neutral. Instead, their interests tend to coincide with those of developers over environmental interests, and they are generally reluctant to

accept the financial and political costs of opposing more powerful actors (see also Pittman & Waite, 2009). Clare et al.'s (2011) findings place such institutional issues at the heart of wetlands mitigation failure as a whole, with Clare and Krogman (2013) elsewhere arguing that 'bureaucratic slippage' and 'agency capture' are among the most intractable challenges faced by offsets. Though most of the literature takes a less critical stance, there is frequent acknowledgements that political and economic pragmatism restrict the effective scope of offsets in practice (Gibbons et al., 2015; e.g. Curran et al., 2013; Maron et al., 2012; Moilanen et al., 2009). For Walker et al. (2009), this suggests no net loss is used as something of a 'symbolic policy' constructed by policymakers, which acts as a discursive trick to legitimise the *status quo* and diffuse opposition through its promissory claims, while guaranteeing little in terms of environmental outcomes.

2.2: Perverse outcomes and unintended consequences

In recent years, more authors have begun questioning some of the policy's broader implications, in light of its rising popularity, and growing evidence from the more established systems. These include both some of the perverse incentives and outcomes of certain design features as briefly mentioned before (e.g. Maron et al., 2016), as well as more far-reaching consequences for the nature of biodiversity conservation and the biodiversity policy landscape. As will become clear, the issues discussed suggest some movement beyond debates about offsetting's technical feasibility and coherence, and are beginning to open up more normative questions about the social, political and ethical effects of offsetting and market-orientated environmental policy more generally. As previously touched upon, perverse incentives and outcomes are now increasingly recognised as presenting significant risks to the delivery of no net loss. Bull et al. (2015) for instance note how offsets which allow out-of-kind exchanges and focus on funding conservation activities for rare species or habitats, could unintentionally lead to heavy losses in those more common and less valuable, threatening their conservation status over time. There is too growing concern that offsets can entrench or even exacerbate trends of decline (Maron, Bull, et al., 2015; Gordon et al., 2015). This happens because baselines are set according to 'business as usual' scenarios, and no net loss in reference to declining trends actually 'locks in' those scenarios of decline into the future. Moreover, as offsetting becomes more prevalent, embedded baselines of decline are increasingly likely to influence and cement the background, business as usual trajectory. Decline may even be exacerbated if the baseline is incorrect, and as Maron et al. (2015) indicate, there is always a political dimension to establishing counterfactuals, and incentives for various actors to exaggerate or even manipulate them.

Indirect leakage is another unanticipated consequence of offsetting gaining attention (Moilanen & Laitila, 2016). Direct leakage refers to the phenomenon whereby losses on a higher scale are not actually avoided via averted risk offsets, but simply displaced to another location (i.e. pressure on biodiversity is concentrated somewhere else in the region or locality), though this should be subject to offsets in turn. However, indirect leakage occurs when development pressures become geographically reconfigured and emerge more strongly outside the programme area, which is almost impossible to trace and account for through local or regional no net loss policies. Moilanen and Laitila

(2016) point out this is mediated and aggravated by market forces, through which development pressures in general intensify in places where environmental protection is weaker – a problem of large multinationals being able to exploit uneven regulatory geographies.

I have already highlighted debates related to interactions between offsets and funding for protected areas, and the question of additionality (e.g. Githiru et al., 2015). Again, authors have begun warning of the perverse incentive for governments to use the private money levered through offsets as a substitute for public spending on conservation more generally, especially in times of constrained public finances (Pilgrim & Bennun, 2014). This could lead to a 'crowding out' effect, through which governments champion and facilitate wider use of offsets while gradually reducing their own commitments to conservation actions and protections (Maron, Gordon, et al., 2015) – commitments which tend to be more certain and longer-term than private equivalents (Moreno-Mateos, Maris, et al., 2015). Crowding out of voluntary conservation work is seen as another risk, whereby volunteer work either gets sucked into offset projects, or declines if people become unwilling to give their time for the benefit of developers (Gordon et al., 2015).

The risk that offsets can weaken existing regulation if 'done badly' is widely recognised (e.g. Gardner et al., 2013), but there appear to be growing doubts over whether this is merely contingent. Generating a well-functioning (i.e. large and liquid) market may actually be in conflict with strong regulatory protections (Gordon et al., 2015). As Walker et al. (2009) assert, offsets give regulators discretion over whether strict protections can be circumvented, and the overwhelming focus on the final stage of the mitigation hierarchy in policy guidance can motivate them to readily skip avoidance and minimisation (see also Hough & Robertson, 2009). Offsets are said to blur the line over what is acceptable and what is not, while encouraging the perception that strong protections can be (legitimately) bypassed if you have enough money (Moreno-Mateos, Maris, et al., 2015; see also Ives & Bekessy, 2015). Especially in the context of regulatory retreat offsetting often accompanies, this feeds into concerns regarding regulatory capture, and the problematic nature of case-by-case negotiations between developers and regulators, as their capacity gets eroded (Moreno-Mateos, Maris, et al., 2015; Clare & Krogman, 2013).

Beyond the issues covered above, more questions are being raised over the social and political implications of biodiversity offsets. The idea of no net loss as a symbolic policy (Walker et al., 2009) was discussed in previous subsection, and speaks to fears that offsetting has become something of a misleading concept, which risks generating complacency among the general public over the successes of conservation policy (e.g. Gordon et al., 2015). According to some of the most critical voices in the mainstream literature, the win-win narrative deployed in favour of offsets is highly spurious, but acts to substantially depoliticise the arena of biodiversity conservation, neutralising criticism. As argued by these critics, offsetting both symbolically elides the general incompatibility between perpetual development-fuelled growth and ecological sustainability (Moreno-Mateos, Maris, et al., 2015), while postponing longer-term social and legislative change into the future (Curran et al.,

2015), through focus on short-term procedures which quickly become ends in themselves (Walker et al., 2009).

While the academic literature tends to be more sanguine over the mechanism's overall prospects, Moreno-Mateos et al. (2015) make the point that offsetting is usually defended as 'better than nothing'. Either way, Curran et al. (2015) claim, a false choice is laid out between offsetting or business as usual. First, however, they note offsets are not necessarily better than nothing, since they have involved modifying existing policies, as part of a wider process generally seen as weakening protections (Moreno-Mateos, Maris, et al., 2015). At the same time, they emerged partly in response to calls for more effective regulation from environmentalists, which would have seen alternatives arise. Though a focus on strengthening regulatory muscle and enforcement could have been one approach (Walker et al., 2009), Moreno-Mateos et al. (2015) suggest looking towards more democratic models such as Multi-Criteria Evaluation (see Martinez-Alier et al., 1998), an alternative approach designed to deal with complex decision-making involving incommensurable trade-offs, through deliberative public participation, which combines top-down with bottom-up knowledge.

Finally, several authors have recently begun questioning the ethical implications of offsetting on the wider conservation landscape. According to Ives and Bekessy (2015), offsetting represents something of an alteration in the ethical foundations of and motivation for conservation, in a manner which remains largely unexamined. For them, the transactional basis of protection shepherded in by offsetting, where biodiversity is treated as a commodity, is in danger of counterproductively eroding ethical barriers, based on moral objections, to the destruction of nature. As Ives and Bekessy (2015) see it, offsetting involves a move in the direction of a more utilitarian logic, which they argue is an ethical framework dominated by economic and technical arguments, to the neglect the multiple, but often unique and place-specific values that people tend to attach to biodiversity. Moreno-Mateos et al. (2015) are in agreement, and raise concerns that offsetting shifts nature protection away from special moral responsibility towards institutionalising it as an increasingly technocratic problem of accounting. This tends to omit important ethical questions over the value equivalence between natural and 'artificial' landscapes, or the social and political implications of strongly anthropocentric narratives grounded on the replaceability of biodiversity by technological means (Moreno-Mateos, Maris, et al., 2015).

3: Biodiversity offsetting as the neoliberalisation of nature: critical debates

This final section brings the framework developed in the first two chapters to reflect on the material covered so far in Chapters 3 and 4. Here I introduce more critical work on biodiversity offsets, which largely positions itself in conversation with literature on the neoliberalisation of nature. In this section I make the preliminary argument can biodiversity offsetting can be characterised in terms of the neoliberalisation of nature, based on the historical, rhetorical and technical-institutional picture built thus far. I construct this case in four registers, roughly following themes of the Chapter 2. First, I

reflect on biodiversity offsetting as a case of the commodification of nature, and of marketisation. Second, I look at offsets as exemplifying shifts from government to governance in environmental policymaking, as well as aspects of neoliberal governmentality identified by certain authors. Third, I focus on particular critiques which challenge offsetting on grounds of environmental effectiveness, social inequity and injustice, and also highlight resistance to offsets. Fourth, I consider the implications of offsets in reconfiguring nature-society relations.

Together these aspects give shape to biodiversity offsets as a specifically neoliberal set of environmental policy devices. However, they also highlight the great variation and indeterminacy of policies and practices which take place under the broad definition of biodiversity offsetting introduced at the beginning of Chapter 3. As a result, offsetting elides a formulaic, singular description or interpretation. Instead, I go on to offer several (overlapping) propositions or lines of enquiry, from the perspective of the neoliberalisation of nature. I open up questions regarding biodiversity offsets as: (i) an accumulation strategy; (ii) environmental market-making; and (iii) the economisation of nature. These will be carried forward to inform the research questions in Chapter 5. In taking the thesis forward, part of the purpose of this final section of Chapter 4 then is to orientate the thesis again, and ask exactly what type of environmental policy it was that the UK government had abandoned by 2015.

3.1: Biodiversity offsetting as commodification and marketisation

Theoretical overviews and reviews of neoliberal conservation have tended to depict biodiversity offsetting as a prime example of market-based conservation, where biodiversity is increasingly constructed and treated as a commodity (e.g. Arsel & Büscher, 2012; Büscher et al., 2012). Though this specification is rarely elaborated upon, studies focused directly on the subject have approached offsetting as a process of commodification in itself, through which biodiversity comes to bear capitalist value, from several angles. They have also described the difficulties frequently encountered, and constitutive moments of political struggle in the construction of commodities. At the same time, offsetting's general status as a market-based instrument meanwhile has been increasingly challenged, through critical examination of actually existing institutional and legal arrangements of operational systems.

3.1.1: Offsetting as commodification

Many authors have pinpointed the construction and exchange of simplified, saleable units in their analysis of offsetting. Drawing on Harvey (1996) for instance, Robertson's (2000) early work on wetlands mitigation banking in the US argues the establishment of 'no net loss' involved four constitutive moments amounting to a core (albeit incomplete) commodification process: functional abstraction, monetary valuation, spatial abstraction, and exchange. Similarly, Pawliczek and Sullivan (2011) describe three stages of marketisation using Kosoy and Corbera's (2010) framework in their survey of US conservation banking: reduction of natural processes to standardised units of exchange, the assigning of single exchange values to those units, and the linking of buyers and sellers through a market or market-like exchanges.

Other writers have put more emphasis on the performative aspects involved in commodification (drawing on e.g. Callon, 2007; Callon & Muniesa, 2005). Looking at the English case, both Sullivan (2013a) and Carver (2015) highlight the role of the biodiversity metric as a 'calculative device' critical to symbolically remaking biodiversity into a commensurable and exchangeable object. Carver pays special attention to how this moment in the construction of value is necessarily preceded by particular discourses, assembled through institutional networks, which act to shift the ideational and normative framing of nature, such that it can be valued economically. This aspect of the critical literature will be returned to shortly (Boisvert, 2015; see also Benabou, 2014), but for now it is important to note how abstraction plays a vital role for these authors in the creation of simplified biodiversity units, necessary for offsetting, which can be measured in equivalent terms across type, space and time (see also Hannis & Sullivan, 2012; Robertson, 2004). Abstraction of this kind helps reconstruct biodiversity as a specifically capitalist nature, which can be broken up into quantifiable and exchangeable parts, but would not usually be considered sufficient for its commodification (see e.g. Castree, 2003).

Dauguet (2015) makes precisely this claim however from a more conventional Marxist perspective, using French no net loss policy to demonstrate his point. Leaving aside the institutional structure of offsets, he argues, it is the core process of functional abstraction which constitutes commodification, since it is designed – through definition, qualification, and quantification – to produce 'commensuration space' and exchangeability between sites. Functionality in the abstract, Dauguet shows, is the actual substance of biodiversity credits, conjured as "natural labour-power" (2015, p. 536), where a variety of functionalities are made equivalent through standardised condition assessments. Impact assessments then grade functionalities in numerical form, expressing Functionality in a commensurable way, on a scale of impact intensity. The accounting method uses an equation to compute the previous assessment stages into singular units of loss and expected gain, whereby functionalities are made mathematically equal, even though the functions and habitats assessed are qualitatively different. This process, driven towards exchange accounting, which displaces scientific ecological language, Dauguet says, is common to all offsetting systems, and signifies an ontological shift where biodiversity value is always expressed as an exchange value, rather than something of physical or material quality. Robertson makes a similar case, but argues the commodification of ecosystem services – through the stages of classification, categorisation, unbundling and stacking of services – in the creation of wetland mitigation credits in the US represents something even more profound: the attempted definition of what he calls 'abstract social nature' (2012, p. 389). Robertson goes further than Dauguet, and describes the measuring and making of nature as commodity as a socially necessary abstraction, comparable to the transformation of human labourers into (abstract) social labour, whereby nature becomes a value-bearing participant in the labour process. According to Robertson, the goal is to recast nature as services, a pre-existing commodity where money does not merely represent value, but becomes 'the real community' (2012, p. 397).

None of these authors present the commodification processes they describe as straightforward or complete. As the review of the technical literature showed, deciding what to measure and finding standardised methods to do so has proved exceedingly difficult, due to the ecological variation, complexity and uncertainty of biodiversity, as well as it subjection to political contestation. From a political ecological perspective, relational and situated nature-as-biodiversity elides simplification, individuation and alienation. Biodiversity can only be exchanged in credit form, which ultimately only involves the conservation of an abstraction (Hannis & Sullivan, 2012; see also Apostolopoulou & Adams, 2015; Ghosh, 2015). While the environmental implications of these "anti-ecological" abstractions (Sullivan, 2013a, p. 95) will be returned to, this is not necessarily where the main barriers to (and crisis tendencies of) commodification are identified. For Dauguet (2015), the crucial contradiction in offsetting is internal to commodification, resting in the definition of 'special qualities' which make particular sites valuable. Impact sites must have certain ecological qualities which make them important or scarce enough to offset, but not too unique that they are considered irreplaceable. It is planners, he says, who must ultimately define these special qualities in such a way to overcome the contradiction. However, as we have seen, this is scientifically contested, and ultimately politically mediated since there is no recourse to any intrinsic or natural qualities of biodiversity. Rather, it is about defining socially recognised standards of measurement, or as Robertson and Wainwright put it: "there is no transcendental value, there is only a struggle over the terms of substance and measure, unique to each historical moment" (2013, p. 900).

Robertson (2012, 2006a) has drawn attention more specifically to the moment of measurement and pivotal role of ecological science in determining the stability of these necessary abstractions. He argues that ecological science is increasingly called upon to act as a 'metrical technology' in wetlands banking markets, capable of rendering stable representations of commodity value in the 'articulation' between science, capital and the state (Robertson, 2006a). The degree to which ecological science and its tools are capable of doing this uncontroversially however is limited, yet the pressure of translating ecological information into a form 'legible' to capital tends to outweigh accuracy and scientific integrity. This problem cannot be resolved by more data or better science, Robertson says, since adding more layers of complexity tends to heighten the scope for controversies and difficulties in articulation, as the ecological coherence of individuated services becomes harder to sustain. If unchecked, this could reach crisis point where scientists even withdraw their consent as to the adequacy of these social abstractions as bearers of value (Robertson, 2012), leading to the possible breakdown of the capitalisation process. Such a tendency, moreover is likely to be fomented by ecosystem service entrepreneurs pushing for the expansion and differentiation of service definitions to grow the value of their assets. As Robertson concludes: "it is in attempting to capture the proliferation of ecological distinctions that capital is potentially destabilized" (2006a, p. 384), though ecological scientists and the state could always pull back from the brink. Consequently, it is the moment of measurement which is located as potentially the most critical site of ontological instability, political struggle and mediation – an issue which will be revisited in a subsequent section.

3.1.2: Offsetting as marketisation?

While many have focused on the moments of measurement and quantification, there has also been significant work looking too at exchange and trading, or the marketisation of biodiversity through offsetting. These studies have been inclined to challenge the market status commonly attributed to offsets, while critically examining the nature of market-based instruments (MBIs) used in conservation policy more broadly (Vatn, 2015; Boisvert et al., 2013; Pirard, 2012). Chapter 3, Section 3 drew attention to the ways in which certain market-based tropes around efficiency, incentives, flexibility and so on have been mobilised in rhetorical support of offsetting, which will be reviewed shortly. Here however I dwell briefly on studies of the institutional and governance arrangements of actually existing offset schemes and programmes.

There is some consensus across this part of the literature that offsets do not constitute 'markets' for biodiversity in any conventional sense. As some authors have observed, it is not biodiversity which is traded at all, but rather paper representations of abstractions, or certificates, which promise the fulfliilment of certain obligations, but only have value if validated by the requisite environmental authorities (Kill, 2014; see also Ghosh, 2015). While market exchanges are usually expected to involve the transfer of private property rights, this is not the case with offsets where the actual commodity is not well defined. This is attested by Boisvert (2015) in her examination of conservation banking, where she shows for instance that no net loss is not actually stipulated by the ESA, and offsets would more accurately identified as tradeable development rights (see also Vaissière & Levrel, 2015, in relation to wetlands banking).

Offsets also rarely involve free voluntary exchange, a feature usually attributed to markets (Boisvert, 2015). Supply and demand for credits is entirely created and controlled by state directive (Robertson, 2007), and like other MBIs modelled on cap and trade systems, offsets are paradoxically dependent on command-and-control mechanisms while purportedly trying to escape their rigidity (Vatn, 2015). Hahn et al. (2015) suggest it is the regulatory and safeguarding aspects of offsets which are their most prominent features. As Hackett (2015b) makes clear in the case of forest offsets in Alberta, Canada, the state has if anything moved to limit the extent of free market trading to avoid uncertain outcomes. Especially with conservation banking, exchanges tend to be negotiated on a case-by-case basis. The market is very small and concentrated, due in part to the constraints which result from spatial incommensurability. Each transaction is unique, and though trading platforms such as SpeciesBanking.com have made some progress as information clearing houses, there is little market transparency, nor opportunities for price discovery (Boisvert, 2015; Pawliczek & Sullivan, 2011).

If biodiversity offsets cannot be thought of strictly as markets, they are nevertheless usually described as MBIs, displaying some common market-like traits. What this means however is subject to some debate. Hahn et al. (2015) argue that what underpins economic instruments (which they counterpose to MBIs) is an instrumental, or utilitarian logic. Similarly, Pawliczek and Sullivan (2011) highlight the incentive structure or profit-driven motives of offsets. Historically, offsetting was developed to introduce flexibility into environmental compliance (Boisvert et al., 2013). Though the mobilisation of

price signals is often identified as the defining feature of these kinds of market devices, Boisvert (2015) says there is little which binds the various mechanisms together, other than being defined in general opposition to command-and-control regulation, however tenuous that might be in practice.

What is clear from the varying accounts in the literature is the difficulty in satisfactorily classifying and defining biodiversity offsets as environmental markets or MBIs. They are increasingly characterised as hybrid arrangements, situated somewhere between market systems and command-and-control regulation (Froger et al., 2015; Vaissière & Levrel, 2015) – as a result of institutional renovation rather than overhaul (Hrabanski, 2015). If anything, offsets are marked most prominently by their institutional heterogeneity in different contexts, rather than market-orientated homogenisation or convergence (Froger et al., 2015; Hrabanski, 2015; Lapeyre et al., 2015). Consequently, this makes evaluation of biodiversity offsets as environmental markets somewhat tricky. On the one hand, it clearly unsettles the market foundations and assumptions upon which claims for offsetting's efficiency are based (Hahn et al., 2015), as well as pointing to the importance of uneven regulatory roll out, and the need to pay attention to historical, geographical and institutional particularities. On the other, it creates difficulties in the making of evidence-based conclusions about offsets, their efficacy and socio-ecological ramifications, based on their identification as market devices (e.g. Pirard & Lapeyre, 2014).

3.2: Offsetting as neoliberal environmental governance

The issues outlined above resonate with much of the literature on the neoliberalisation of nature. They reject a simple story of state retreat and market takeover. Whether considered a market mechanism or not, offsetting involves considerable intervention and reregulation. The state has always been essential in terms of commodity definition and validation, the imposition of regulatory directives requiring no net loss and so on. The state has also taken up a central enabling role in the recomposition of governance arrangements and articulation of regulatory markets, a process which authors have observed as taking place together with shifts from government to governance, and reconfigurations and rescaling of state-civil society and ecological relations (e.g. Apostolopoulou, 2016; Sullivan, 2013a; Robertson, 2006a, 2004). The nature and implications of this shift has garnered significant attention in the critical literature too. Authors have pinpointed the expanded role of business interests, connected with an increasingly economic and technical rationality, identified at multiple scales, taking place through the rise of offsetting. This in turn is seen as significant in reconfiguring both material relations of power, and the discursive framing of biodiversity conservation and its relationship with development.

Many authors have identified a distinct constituency, exemplified in the membership of BBOP, which has developed around offsetting, involving oil, gas and mining companies, NGOs, financial institutions, international organisations and various government departments and consultancies (Mann & Simons, 2015; Benabou, 2014; Sullivan, 2013a). As explained in Chapter 3, this community has been influential in shaping standards and regulations around offsets, and has a particular political orientation, described by Mann (2015) as expert-driven, elitist and business-led. This constituency has been particularly important in the mutation of transnational governance, through the development

of standards, and consolidating power as experts at the interface between national experience and global governance through forums such as the CBD (Penca, 2015). At the national level, authors have shone light on the crucial discursive role played by this transnational policy community, in enabling and legitimising offsetting, even if practices on the ground are quite divergent from the rhetorical frames they call upon (see Brock, 2015; Seagle, 2012; and also Carver, 2015; Mann & Simons, 2015).

Questions about the rhetorical, discursive and performative work of biodiversity offsetting are also commonly raised in the critical literature (e.g. Benabou, 2014). Boisvert (2015) for instance contends that conservation banking is an example of the 'economisation' of nature, rather than its commodification or capitalisation *per se*, with the performative effects of increased market rhetoric and logic (incentives, price signals etc.), in shaping behaviours, institutions and so on, as the goal rather than starting point for these policies. The result is that existing regulatory regimes are not so much revolutionised, but have become associated with new expectations and representations (Boisvert et al., 2013). The other symbolic work emphasised by various writers has been the policy's framing as a techno-managerial solution to conflicts between conservation and development, with Brock (2015) for instance problematising how offsetting gets constructed as anti-political as a result of this shift. Both Sullivan (2013a) and Carver (2015) stress the role played by the 'calculative rationality' of biodiversity metrics in the depoliticisation of planning processes, by rendering values in strictly technical terms, while others note how the dominance of technical expertise in practice – often combined with commercial confidentiality – is used to the exclusion of public deliberation in decision-making, shutting out local communities and dissenting voices (Spash, 2015; Apostolopoulou & Adams, 2015). For all of these authors, offsetting is far from neutral, but its technical framing obscures deeply contentious realities, and the politically loaded nature of its conceptual and practical tools (Neimark & Wilson, 2015; for discussions on the political nature of scientific knowledge production and data in relation to offsets, see Lave, 2012). According to Mann (2015), the problems and dilemmas of design and implementation of offsets (as outlined in Sections 1 and 2) are political as much as they are technical, and reflect conflicts over values, worldviews, cultural needs and so on (Sullivan & Hannis, 2015; see also Mann et al., 2014). In the context of offsets in parts of the global south, Brock (2015) and Seagle (2012) also underline the disciplinary aspect of such approaches, where these narratives paint poor and subsistence-based communities as backward and anti-progress, and as the real culprits behind continuing ecological degradation, in contradistinction to the modern rational state and business-as-saviour (see also Tregidga, 2013, for a take on the role of accounting in biodiversity offsetting as a form of governmentality).

Another important critique of the discursive shifts connected to the rise of offsetting concerns the repositioning of development activity as necessary driver of conservation. As Sullivan (2013a; Hannis & Sullivan, 2012; Pawliczek & Sullivan, 2011) in particular has argued, conservation-as-offsets is entirely development-led, where demand and investment are dependent on environmental harm. In critiquing what they call the "circular logic of 'unavoidability'", and the reinterpretation of conservation

as development-led, Hannis and Sullivan warn that offsetting may “serve to obscure the key issues of who decides what development, and what environmental damage, is unavoidable where, and why” (2012, p. 8). By tying conservation to land development and impact, environmental damage is always implicitly accepted, and debates around offsetting are moved on to questions of how to optimise biodiversity conservation and achieve the least bad outcome of inevitable harm, eliding the particular political choices made along the way (Spash, 2015; Apostolopoulou & Adams, 2015).

How these broadly-defined rhetorical and governance shifts have played out on the ground is generally observed to be rather complicated and context-specific, mediated by geographical particularities and constellations of power. Vatn (2015) highlights the implications of power being ceded to intermediaries in certain systems, whose income rests on transaction costs and frequent exchanges, while Mann and Simons (2015) note the disruptive influence profit-maximising banking interests have had on the environmental functioning of conservation banking. Pawliczek and Sullivan (2011) emphasise the significance of the movement of institutional domains from the public sphere to privatised exchange platforms in that same marketplace. However, experiences differ considerably. Taking another approach which combines perspectives from the regulation school and institutional political economy with post-structuralist political ecology, Robertson (2004) frames the development of wetlands banking as an attempt by the state to regulate ecological relations, but in a way which would also stabilise relations of power and accumulation. Robertson highlights how the contradiction between the differentiation and homogenisation of wetlands commodities has played out in the contingent and stubbornly uneven geographical development of market governance in the US, as different institutional arrangements have cohered in different places and subsequent standardisation has proved difficult.

Hackett (2015b, 2016) observes different forces at play again in Alberta, Canada. Here, the state has not created or facilitated a formalised market, but retains significant control over voluntary offsets involving industry and NGOs. According to Hackett (2015b), the state’s intention in Alberta appears to be to stabilise existing patterns of resource use, shoring up a somewhat undiversified local political economy and powerful interests, including the state itself. It does this by restricting the potentially destabilising effects of market forces rather than ceding power to the private sector. While offsets are mobilised by oil sands companies and other extractive interests to help maintain their license to operate, the state is able meet certain objectives to extend public access to forests, by shaping the parameters of these exchanges. This, Hackett (2016) says amounts to a deliberate reordering of the landscape, through which an expanded public realm created through offsets lubricates private wealth generation and accumulation through extraction elsewhere. There appear to be some similarities in the case of biodiversity banking in Borneo, Malaysia, where Brock (2015) recounts how the state has used the policy in a particularly instrumental way to regain control over its forests and conservation policy, and where offsets became viewed as a way to ‘get things done’ by a particular coalition of interests. While the offsetting has little to do with marketisation or environmental objectives here, it

could be mobilised in a manner which did not threaten dominant interests, and at the same time facilitated the continued expansion of palm oil production on the island.

The specificities of these cases give credence to Mann and Simons' (2015) claim that offsetting tends to be difficult to operationalise across different cultural and socio-ecological settings. For Mann and Absher (2014), it is important to dwell on the instability of many of the coalitions and institutional arrangements around offsets, and how the coherence of the overarching 'market logic' is frequently disrupted by ever-changing circumstances and unanticipated events. As they explain, these disturbances often lead to policy adjustments which play out as politically-mediated conflicts rather than functional recalibrations. Returning to Hackett's (2015a) work however, these contingencies allow for ambiguity of outcome, as exemplified by the way First Nation communities in Alberta have been able to appropriate offsets to some extent for progressive ends, in securing greater control over traditional territories and alternative forms of social and cultural sustainability.

3.3: Environmental and social consequences of (and resistance to) offsetting

Much of the critical literature discusses the difficulties and risks raised in the mainstream technical and policy literature, and the lack of evidence of offsets' effectiveness on the ground. There is widespread scepticism about whether these technical and institutional barriers are surmountable, and authors emphasise the irreversible damage legitimised in exchange for uncertain and unlikely gains. In short, there is doubt that offsetting presents a viable option for curbing biodiversity loss, or for reconciling growth and conservation in the manner proposed by advocates. The effects of offsetting are instead expected to be largely negative, both environmentally and socially, while concealing and depoliticising more antagonistic nature-society relations beneath. As Chapter 3, Section 3 showed, the notion of market efficiencies plays a crucial role in offsets' purported ability to create win-wins and resolve conflicts between development and conservation. As Robertson (2007) among others has demonstrated, the assumptions underpinning this logic do not hold in these types of environmental markets, and as indicated in Section 3.1, the heterogeneous and hybrid institutional arrangements of actually existing offset policies and schemes make them hard to evaluate on such terms (e.g. Vatn, 2015).

The attraction of offsets nevertheless persists, with green economy advocates in the policymaking, business and NGO communities committed to using economic instruments and markets to make nature's value visible. Sullivan (2013a) is one author who suggests a perverse logic at play in a model whereby conservation value is only made visible by the threat of biodiversity's destruction, via development permits being issued. Among critics of environmental economics, Spash (2015) has most comprehensively attempted to detail the theoretical flaws in the economic model on which biodiversity offsetting rests. As he explains, offsetting is based on a neoclassical market model which looks to assign economic value to biodiversity on a piece of land (its conservation value mediated by the cost of its replacement in this case), such that its marginal benefits are made explicitly visible in a cost-benefit analysis, against the opportunity cost of leaving the land undeveloped. The purpose is to incentivise land development in areas of least marginal benefits, resulting in an efficient allocation

of resources and maximum societal benefit. Increased efficiency and higher profits from development can then be used to support conservation in areas with lower opportunity costs through offsets.

First, Spash claims that this model is consistent with what he calls 'optimal species extinction', since it provides a method which remakes biodiversity as perfectly substitutable with other types of capital. This creates a situation where 'bulldozing biodiversity' can be viewed as the economically efficient and rational thing to do, in places where there is a supposed 'over-allocation' of habitats and species (resonating, in a sense, with the problems of the Lauderdale Paradox discussed in Chapter 1). Second, Spash argues that the model is problematically static, failing to account for how economic growth pressures will necessarily increase the opportunity costs of leaving land undeveloped, and that this is unlikely to be corrected because of well-recognised flaws in the valuation methods of environmental economics, and related metrical techniques of biodiversity offsets, as determinants of welfare maximisation. Though advocates respond that a regulatory approach can be separated from the model of optimal supply on which it is based, Spash suggests the effects of this particular economic logic are more insidious than is realised, in undermining direct regulation, legal restrictions, planning, public participation and so forth, and in empowering development interests more generally. Third, he maintains the win-win logic is based on a basic accounting error, since the growth opportunities created for business in nature conservation are in fact production costs, rather than final products. As a result, maximising welfare could only result from economic activity which created something of substantial extra value, over and above the costs of environmental repair. For Spash, these fundamental flaws should raise difficult questions for conservationists who continue to support a policy mechanism which appears to be neutral at best, on a theoretical level, but rarely achieves its environmental objectives in practice given its technical limitations and governance problems.

For other authors, offsetting's environmental failures can be theoretically explained according to irreconcilable tensions between its economic rationale and the realities of ecology. I have already noted the epistemological tensions involved in translating ecological data into the 'nature that capital can see' (see Robertson, 2006a). A central element of this critique stresses the questionable scientific integrity of the metrical technologies employed in the service of capital, designed to calculate ecological value as quickly and uncontroversially as possible (see also Lave, 2014). For Sullivan (2013a), one of offsetting's more irresolvable problems is the 'anti-ecological' premise underpinning biodiversity metric, or as Apostolopoulou and Adams (2015) put it, the dominance of financial over ecological logic. In attempting to represent biodiversity in the form of exchange values, they argue that biodiversity is reconstructed as discrete and divisible units, interchangeable in time and space (see also Brock, 2015; Carver, 2015; Robertson, 2012). From such an angle, this deeply deterritorialising logic removes biodiversity from its specific and complex ecological, cultural, social and historical contexts, severing its relations and values associated with particular places, which will always be incommensurable and their loss irreplaceable. Returning again to the groundwork prepared in Chapter 1, it is possible to read Polanyian-inflected critiques in opposition to offsets,

suggestive of how nature's value is always produced outside relations of exchange, and cannot be captured adequately in that framework.

Some have also highlighted offsetting's contribution to deepening the nature-culture divide, both conceptually and spatially (Spash, 2015; Apostolopoulou & Adams, 2015; Hannis & Sullivan, 2012). That is, human and nonhuman life are not conceived of capable of coexistence. Rather, 'nature' is seen as needing to be moved away from human activity if it is to be protected, but also something to be controlled and rationally administered by experts. While abstraction and the construction of exchangeability might be seen as acts of largely symbolic violence on the ontological status of nature, they nevertheless have very real material effects, with the manifest and unsolvable tensions between commodity and ecology visibly playing out in the instability of institutions, and failures to achieve no net loss on the ground (Carver, 2015; Robertson, 2012; Vatn et al., 2011).

Though the long-term material outcomes are to some extent unknown, there are clear indications that they will be socially and geographically uneven, and likely to be regressive. These raise significant questions regarding the social equity and the socio-spatial consequences of offsets (Apostolopoulou, 2016; Apostolopoulou & Adams, 2015; Benabou, 2014; Robertson & Hayden, 2008). Authors have highlighted the heightened concentration of wealth in monopolistic and privatised conservation banks (Pawliczek & Sullivan, 2011), and common concerns that offsetting works in favour of a further consolidation of corporate power (Spash, 2015). There is also criticism of how the broader trend of privatisation of conservation is likely to restrict access to land on which local communities depend, and increasingly connections are being made between offsets and accumulation by dispossession through 'green grabbing' (Kill & Franchi, 2016; Brock, 2015; Ghosh, 2015; Sullivan, 2013a; Seagle, 2012).

In reconsidering themes from Chapter 2, the issue of resistance to offsetting is interestingly underexplored in the literature, though Hackett's (2015a) account of First Nations' appropriation and redirection of offsets for their own purposes tangentially speaks to this (see also Brock, 2015). On the other hand, there is something of an implicit connection to be made between biodiversity's unpredictability as frequently talked about in the critical literature, based on the insights of nonlinear and non-equilibrium ecology, and the notion of the nonhuman world resisting neoliberalisation, requiring reregulation and constant interventions. Clearly too, this is not merely a natural phenomenon, as these aspects of offsets intersect with the politicised scientific disputes discussed in Section 3.1.1, over biodiversity value's social determination. Moreover, it is struggles over the value(s) of biodiversity in the design of offsets, which have been more readily identified by critical scholars in terms of resistance and conflict, and as sites where multiple and irreconcilable worldviews collide (Sullivan & Hannis, 2015; see also Mann et al., 2014).

3.4: Biodiversity offsetting as the neoliberalisation of nature?

In taking the work done over the first four chapters forward, I now introduce three possible conceptual frames with which to analyse and understand the abandoned national offsetting programme in

England. Each approaches the overarching topic from a different angle or vantage point, as a series of question marks. They are pitched as overlapping rather than mutually exclusive analytical viewpoints, but may offer both complementary and competing interpretations. They animate different agendas and ideas, illuminate the roles of different actors, and are able to calibrate their analytical focus at different levels and scales, emphasising either the more concrete or the more abstract. Though the frames below are only outlined briefly, they will be explored and expanded upon as the thesis goes on.

3.4.1 Offsetting as accumulation strategy?

This frame looks at offsetting as a project of capital accumulation, along two lines of enquiry. First, it queries the extent to which offsets can be understood as avenues for direct accumulation. From this perspective, biodiversity offsetting can be explained as a state and capital led commodification project, aimed at enabling land-based wealth accumulation through the capitalisation and privatisation of nature, and extraction of rent. This sees biodiversity offsetting as a prime example of a stretching and deepening of commodification taking place in the green economy (see Chapter 1, Section 1.2 and Chapter 2, Section 2.1; and also comments on 'green grabbing' in Section 3.3 of this chapter). Alternatively, it raises the possibility of offsetting as an indirect accumulation strategy, of a different order, whereby offsets essentially act as proxy instruments aimed at facilitating accumulation elsewhere. This draws on the conclusions reached by Hackett (2016) in his case study of Alberta, Canada, where he describes the governance of voluntary offsets and reordering of the landscape as crucial to lubricating oil sands extraction. From this perspective, offsets are inscribed with the core purpose of removing environmental barriers to accumulation. In particular, it considers the logic of capital, the role of land development interests and the green business sector in driving offsets.

3.4.2 Offsetting as environmental market-making?

This second approach has clear connections with the first, but is less concerned with accumulation *per se*, and more with the process of market-making. Accepting the limitations of defining biodiversity offsets as environmental markets, market-making is used here in the rhetorical sense as advanced by offsetting's advocates, and also refers to the hybrid institutional arrangements described throughout this chapter and the last. The purpose of this perspective is to refocus attention on the various tensions and dilemmas encountered through the twin processes of deregulation and reregulation (see Chapter 2, also Castree, 2008b), and the specific technical, biophysical and institutional difficulties associated with building and articulating these kinds of 'market' devices identified in this chapter. It gives particular consideration to the role of the state, and its efforts to enrol the actors required to cohere a governance regime and national offsetting programme.

3.4.3: Offsetting as the economisation of nature?

The final frame takes forward the notion of neoliberalism as the "disenchantment of politics by economics" (Davies, 2014, p. 4) from Chapter 2, Section 1, and dovetails with Boisvert's (2015) description of conservation banking as the economisation of nature in Section 3.2 of this chapter, and

offsetting's place within conceptual world of ecosystem services and natural capital. This last viewpoint characterises the widespread introduction of biodiversity offsetting as designed to depoliticise the growing imperative to curb biodiversity loss, much akin to Felli's (2015) discussion of the development of environmental markets more generally (see Chapter 2, Section 2.3). Economisation is used deliberately, and is less concerned with the market status or novelty of offsetting, but rather its reframing as a techno-managerial issue, where the goal of efficiency becomes central. Efficiency here is specifically framed according to market-based principles and evaluation techniques, mobilising the power of quantification and rational accounting, transparent audit, economic incentives, price signals and so on.

The economisation approach is concerned with the implications of this reframing, and sees offsetting partly in terms of governmentality, as a tool of control with clear disciplinary functions, capable of reconfiguring relations of power around land development and nature conservation. This analytical framework helps pinpoint the presence (or absence) of specific narratives and practices of offsetting, the exclusion of certain interests, ideas and values. This is not to imply that offsetting is not resisted. Rather, it raises questions as to why it comes to be accepted, rejected or mobilised by different groups and interests, in particular contexts and circumstances, in ways which frequently deviate from the surficial objectives or initial intentions behind the policy, in ways that may ultimately be difficult to reconcile.

These three frames are now taken forward into the research aims, objectives and questions in the next chapter.

Chapter 5: Research Aim, Objectives and Questions

Before proceeding with the methodology in the next chapter, I reintroduce the research aim and objectives from the Introduction, and lay out the detailed research questions which inform the rest of the thesis.

1: Research Aim

The aim of the thesis is to critically examine the ultimately failed moves to develop and implement a national biodiversity offsetting programme, in the land use planning system in England, between 2010 and 2015. The thesis looks to shed light on important political questions of contemporary nature conservation and biodiversity offsetting in particular, orientated by the broader theoretical lens of the neoliberalisation of nature.

2: Research Objectives

The research has five interrelated and overlapping objectives, in order to realise the overall aim of the research project:

I. To explain the motivations and theoretical underpinnings of moves to introduce biodiversity offsetting into the England planning system, as a response to biodiversity loss and development pressure.

II. To identify the various actors and interests involved in the policymaking process, and their specific roles in the policy's design, implementation and contestation.

III. To assess the key moments of consensus and conflict around the establishment of biodiversity offsetting in England, and uncover the tensions, dilemmas and deep contradictions which emerged during the policymaking process.

IV. To analyse the reasons for the government's eventual retreat, paying close attention to political economic and ecological factors as well as technical and institutional challenges faced, and to reflect on the wider implications of this failure for biodiversity conservation in England.

V. To discuss the implications for the increasingly popular use of programmes and tools known as biodiversity offsets around the world, and similar attempts to reconcile economic and environmental goals through developing neoliberal environmental policies and market-based instruments for nature conservation.

3: Research Questions

In order to meet these objectives, the thesis will answer the following questions with regard to the English biodiversity offsetting programme:

1. What was the policymaking history of the construction of, and subsequent retreat from, developing a national biodiversity offsetting system in England?
    a) Who was involved in the construction of policy, its design and implementation?
    b) What was the sequence of events, and how did the policymaking process unfold, during the period 2010-2015?
    c) How were the plans to introduce biodiversity offsetting mobilised and contested for different purposes during this period?
    d) How did the policymaking process play out, and what were the outcomes?

2. Why did biodiversity offsetting emerge in England in 2011, as a flagship government policy aimed at reconciling conflicts between nature conservation and land development?
    a) What were the historical and political conditions, at different geographical scales, which underpinned biodiversity offsetting's appearance in England in 2011?
    b) What were the government objectives for a national biodiversity offsetting policy, and what was the theoretical case made upon which the policy was built?
    c) How were the various non-state actors enrolled, how did they frame the need for an offsetting policy, and what were their objectives and criteria for a successful system?
    d) Which technical-ecological and governance themes emerged during the policymaking process?
    e) What were the areas of agreement, and how did they form the basis for potential consensus, alliance-building and articulation of different interests?

3. Empirically, why did the national policy never come to fruition?
    a) What sources of tension, disagreement and controversy arose during the policymaking process, and what problems did these create for operationalising offsetting?
    b) What were the underlying political economic and political ecological causes of these tensions, and what were the deep contradictions that proved irresolvable in this particular case?
    c) What are the implications for the future of biodiversity offsetting, nature conservation and environmental markets in England?

4. How can we theorise the English experience, and what are the implications for academic debates around the neoliberalisation of nature and conservation?

    a) What does the empirical study reveal about the difficulties around biodiversity offsetting and environmental market-making in general?

    b) How well does the existing literature explain the failure of the English programme?

    c) What other factors were at play which could either supplement or challenge conventional accounts of the neoliberalisation of nature and environmental market-making?

Chapter 6: Methodology

Introduction

This chapter presents the overall strategy, and description and justifications of the methods used to meet the objectives. It explains, with reference to the conceptual framework and literature reviewed in the first four chapters, the philosophical reasoning behind the use of qualitative methods in the study, the research design and the particular forms of data collection employed. The chapter provides an overview of how the data was collected over the course of the study, in the form of key documentation, in-depth interviews and participant observation, as well as a summary of the sources. There follows a section on how the data was analysed in order to meet the objectives and answer the research questions. The chapter concludes with a reflection on some of the methodological difficulties encountered during the course of the project, and limitations to the overall thesis.

1: Philosophical foundations of the research methods

The methods used in this thesis reflect ontological and epistemological implications of the framework explained in Chapters 1 and 2, and calibrated further in light of the specific research topic, in Chapters 3 and 4. To briefly recapitulate, Chapters 1 and 2 sought to develop an approach to the neoliberalisation of nature, based on an eco-Marxist inflected reading of critical political ecology. This focused on the historical production of capitalist natures, mobilised through modern Cartesian development of abstract time, abstract space and external nature, and their enduring contradictions. The bases for these tensions and contradictions are understood to originate in the violent abstractions of capitalist production and Cartesian thought, which act to impose specific symbolic and material orders upon all aspects of the complex, heterogeneous and interwoven social and natural (or socio-natural) worlds. The larger conceptual framework developed in Chapter 2 argues that the neoliberalisation of nature works to unevenly intensify these processes as strategies of accumulation and control, and as a response to the historical and geographical playing out of contradiction and crisis explored in Chapter 1. This was posited to take place through the increasing privatisation and commodification of nature, and the subjection and regulation of human and nonhuman natures to economic and market-like logics and techniques, but which tend to meet some kind of resistance or redirection. The approach taken suggests that other, more just socio-environmental realities and assemblages are possible, and the socio-ecological conditions of possibility can be, and continually are, shifted, according to political design, though unpredicted and unintended consequences are inevitable.

1.1: Ontological issues

The framework developed in the early chapters suggests that a qualitative or mixed methods approach might be appropriate for several reasons. The political ecological critiques of the

capitalisation and neoliberalisation of nature, both conceptually and practically, are based partly on ontological grounds. It challenges the premise that 'nature' can be coherently simplified, separated out into divisible component parts, abstracted and valued in equivalent and purely quantitative, exchangeable terms. Drawing on insights from ecology and the natural sciences, there is a presumption that organisms cannot be meaningfully separated from their environments, which are mutually constitutive and entangled at different spatial and temporal scales. Added to this, the material properties and qualities of the nonhuman world are heterogeneous and not meaningfully commensurable, and the processes through which different components interact and interpenetrate are unpredictable and nonlinear, frequently creating friction with the 'flat' ontologies and artificial boundaries of capitalisation and neoliberalisation. Qualitative methods were therefore required in part to apprehend the role distinct biophysical qualities of particular nonhuman natures play, in particular contexts and through geographical variation in regimes of environmental regulation.

As well as ecological context, the conceptual framework highlights the role of biogeographical, historical, social and cultural factors in the constitution of place-specific natures, which elide quantitative forms of analysis. Such methods are viewed be inadequate for unearthing and explaining the particular textures and peculiarities at play, and the manner in which nonhuman natures are socially and well as ecologically embedded. This expanded ontological premise is also germane for an investigation where value and values play such a pivotal role. In more radically non-anthropocentric accounts, nature is sometimes understood to have its own inherent or intrinsic values, which are necessarily irreplaceable and cannot be expressed through exchange-value and monetary valuation. In the more materialist accounts, nature is often conceptualised as embodying incommensurable use-values, which are historical, socially mediated and culturally produced. Again, these kinds of values are not truly commensurable and cannot be fully captured quantitatively, yet this tends to be obscured and hidden by capitalist modes of measurement and organisation, and requires careful unveiling. The task of this thesis, and how these methodological premises are taken forward, was to uncover and explore how these tensions and peculiarities mediated and were dealt with through human decision-making processes and conflicts in a particular socio-ecological context. Revealing and exploring how these relationships, hidden values and contingent events played out could only be effectively carried out through a deep and qualitative approach.

Building on these ideas of nature as socially embedded and mediated, the political ecological reading of nature-society relations is based on the premise that hard distinctions between the social and natural world are ontologically misleading, including the Cartesian notion of an abstract, external nature. The boundaries between the social and the natural are explicitly unclear within the approaches employed in this thesis. Socio-nature is an ontological concept which is relational and historicised, through which human and nonhuman worlds are intertwined through socio-ecological processes and internal dialectical relations, as explained in the first chapter. Social and environmental change are understood as co-determinate processes. While the natural nonhuman environment is

clearly transformed in important ways by human activity for instance, socio-spatial processes too are predicated on the metabolism and circulation of physical, chemical, or biological components.

Of particular methodological importance here was a presumption that socio-environmental change and assemblages are never socially or ecologically neutral, but materially and discursively contested and contestable terrain. They unfold unevenly across time and space, and questions of ecological regulation are always fundamentally political, mediated through relations of class, race, gender and so on, hence the wording of project's overall aim and its objectives. Identifying, tracing and unpacking the political nature and the power relations at the heart of the antagonisms and contingencies of capitalist and neoliberal natures in a particular time and place is delicate work. It requires the careful piecing together of a complicated and multidimensional story, possible only through a qualitative approach. To be clear, the focus on qualitative methods here is not a rejection of quantitative methods, but presents a foundational philosophical and ontological claim that they are insufficient for analysing the nature of complex and politically-mediated socio-natural entanglements, such as the subject matter of this thesis, in serious depth. This is why a mixed methods approach was necessary, though quantitative data was only used from secondary sources.

1.2: Epistemological implications

The ontological framework of the thesis had several important epistemological implications which needed to be taken into account. The materialist basis of Marxist political ecologies conceptualise objective reality as existing prior to social development. Matter and first nature preceded human history (Smith, 2010b), so while thought and knowledge are intimately related to this material reality, they are never identical. The material world cannot be reduced to human perception of it, but nor can nature be separated as an external object. Rather, the ontological premise that humanity lives in differentiated unity with the rest of nature means that knowledge cannot be produced from outside those relations. Since these relations are inherently political, when people produce and mobilise knowledge, they implicitly do so from political positions and standpoints. This must of course include the researcher's positionality, and acknowledged in the explicitly normative dimension of the conceptual framework.

Epistemologically, the premise that people cannot step outside their positionalities and knowledge is never politically neutral had important methodological implications for the thesis. Qualitative methods were essential for untangling the variously constituted political positions of people and groups involved in the policymaking process, and its implementation on the ground. As well be detailed shortly, this was achieved through careful triangulation, piecing together of contextual constraints, dominant and marginalised ideas and narratives, assumptions, frames and so on. Desk-based research and documentary analysis was crucial in assembling the complex historical and geographical context, at multiple scales, of the construction of policy. It also provided evidence of the broad theoretical assumptions made by different parties. However, uncovering the deeper political motivations and positions of various actors, and the struggles taking place on the contested terrain of policymaking and implementation, through lobbying, negotiation and the mobilisation of different

arguments and discourses, as well as the undocumented experiences of implementation, called for more in-depth methods, including qualitative interviews.

This is not to imply that quantitative methods have no place in the understanding of nature and society. It does not deny the usefulness of the natural and physical sciences, nor posit scientific knowledge as nothing more than a social construction with no objective material substance. A special point should be made here about the natural sciences, since conservation biology and ecological science (and conservationists and ecologists) sit at such an important intersection of this topic. As should be clear, the conceptual framework draws on insights from the natural sciences in challenging the possibility of adequately expressing and valuing nature in wholly uncontroversial, quantifiable and commensurable terms. Political ecology retains a critical stance towards scientific knowledge however, stressing the problems with the predominant methodological treatment of nature as external object, and insisting on recognition of the social and political components of reality. With this in mind, qualitative methods were vital in revealing how environmental knowledge was positioned, mobilised and mediated, and how certain ecological issues were privileged over others.

2: Research design and methods

The main purpose of the thesis was to critically examine the construction and attempted rolling out of biodiversity offsetting in England, as a way of balancing conservation commitments with the pressures of land development. At the most basic level, the research was concerned with both the content and impact of policy. At a deeper level, it proffered to explore the theoretical underpinnings and justifications of biodiversity offsetting as a policy; and the interests and political motivations of the various social actors involved; and how their unequal levels of power and influence affected the policymaking process, in its creation, contestation and abandonment. Furthermore, the study was designed to interrogate the integrity of the theoretical approach on which the policy is based, and say something about the contingencies which shaped its geographical specificity.

2.1: The research design and case study approach

Reflecting on the theoretical framework developed in the first two chapters and its philosophical foundations, using a case study approach was particularly appropriate. It enabled the interrogation of context and particularity, crucial aspects of a conceptual approach which highlights the importance of geographical unevenness, variation and contingency. According to Yin (2003), using a case study approach is useful for empirical research in which ‘how’ and ‘why’ questions feature prominently, as with this thesis. Case studies can be described broadly as those, firstly, which examine a contemporary phenomenon where the boundaries of both phenomenon and context are unclear; and secondly, where the variables of the research are many and complex, require multiple sources of data for triangulation, and which benefit from prior theoretical development in order to inform and guide data collection and analysis (Yin, 2003, pp. 13–14).

The subject matter, biodiversity offsetting, was a contemporary phenomenon which was being tested, rolled out and modified in England during the period of study. It was also part of a wider national nature conservation strategy which was only in an initial phase of a much longer-term trajectory. As such, the research was not simply a history of biodiversity offsetting in England, though some of the same techniques were used, including documentary review and analysis. There was an ongoing national policymaking process between 2010 and 2015, as well as six two-year pilots, ending in early 2014, and a number of independent supplementary projects happening at the local level. Its contemporary and ongoing nature allowed for a wider variety of data collection, in the form of direct observation and interviews with people involved in the events, crucial for case study research (Yin, 2003, pp. 5-9). The importance of these types of data collection in this study will be expanded upon shortly.

The case itself was made up of a number of components. These included, but were not limited to, the formal policymaking process in government; its political, legal and institutional context at multiple scales; wider socio-ecological processes and environmental change; actors, both public and private, from government and civil society playing different roles and with divergent interests; the playing out of tensions, conflicts and negotiation through the design and implementation of policy at different scales; and the concrete piloting and implementation of policy in material planning practices. Untangling the complexities of these processes and ordering them thematically for data collection and analysis required considerable prior theorisation, as developed in the first four chapters. As the variety of issues above demonstrates, the case study model was the most appropriate strategy for this particular topic and study, where disentangling and understanding the complex relations was crucial (Stake, 2000).

2.2: The research methods

There were several factors which shaped and constrained the direction of the thesis, specific to the actual case. The study was of an ongoing policymaking process, the piloting of which was announced as part of a new national nature conservation strategy in mid-2011. Local trials ran from March 2012 for two years, with offsetting integrated into local planning policy and tested a discretionary tool to be applied during development control, where land development was expected to cause residual biodiversity loss. Technical papers and guidance were written for the pilots, including the establishment of a habitat-based metric to measure biodiversity loss and gain, together with guidance for local authorities, developers and offset providers. The most advanced national proposals came in the form of a consultative Green Paper released in September 2013, though it was widely recognised that the policy had been dropped towards the end of 2014, with a General Election only months away. Given the programme was abandoned three years after it was announced, and due to the timescales involved in land use planning and offsetting processes, there was very little happening ‘on the ground’, even during the two-year local pilots. Only a handful of offsets had been preliminarily agreed, and I am only aware of one case where work on an offset site had commenced. The scope to investigate the social and environmental effects of actual offsets in England was therefore limited. As a result,

the richer data was to be found by focusing on the live debates, conflicts and negotiations around policy design on a national level and through the pilots, and the manner in which the government and other key actors positioned themselves, in relation to the ongoing efforts to test and recalibrate potential tools and governance mechanisms, and in response to unfolding events. This had implications in terms of who was targeted as research participants and the nature of the interviews, and what other data was collected, as explained below.

Briefly, however, from early 2013 I started reviewing the academic and policy literature. At the same time, I began collecting the documentary data detailed in the next section, and undertook some initial analysis, which continued throughout the period of study. Interview preparation begun in mid-2013, with interviews themselves taking place between October 2013 and March 2015. A handful of these were followed up in early 2016 during analysis, for further clarifications and updates. Transcription and analysis began immediately. The first event attended for participant observation took place in December 2013, and the last in June 2014. I now explore in detail the methods employed.

2.2.1: Documentary data

There was a very large amount which could have been collected and analysed, especially after the UK government released a consultative Green Paper on its plans in September 2013. This required a selective approach. Much of the actual data compiled for analysis took the form of documentation. This data came from a wide range of sources, and included government policy documents and guidance, technical manuals, commissioned and non-commissioned reports and papers from non-state actors, and a variety of news stories, blog posts and other material published online. An overview of the key documentation is presented below in **Table 3**.

There were clear advantages to using documentary evidence with the case study approach. In general, the use of documentary data is consistent with the ontological and epistemological premises of the case study approach described above, where contextualisation and the piecing together of complex, partial positions is necessary (Mason, 2002). In a practical sense, as Yin (2003, pp. 85-8) writes, documentation is stable and can be repeatedly reviewed; it is unobtrusive and is not created as a result of the study; it tends to be exact, in terms of names, references and details of events; and finally it provides broad coverage over time, of many events and many settings. Added to this must be the high level of digitalisation of documentary material in the UK, which made access to the majority of data both cheap and simple. These are clear benefits for Mason (2002), who also points out that the data contained in documentation may not be available elsewhere.

For the thesis, documentary data provided evidence of the socially constituted and politically contested nature of the policymaking process. It was possible to gather official government policy proposals, aims and objectives, and the reports and research documents that underpinned them. Added to this were the intersecting policies, laws, commitments and so on, which gave indication of the relation between offsetting and other official objectives and constraints. There was also evidence that could be drawn from the ongoing evaluation of piloting and experimentation, and evolution of

policy ideas in government. Finally, there was considerable documentation emanating from non-state actors in reports, position papers, consultation responses, articles and so on, as well as ongoing media coverage of the policy's development.

Much of the documentary evidence outlined above was used to build the preliminary policymaking history and context for its emergence, laid out in Chapter 7. It provided data with which to ascertain who were the principal people, organisations and networks, and the nature of relationships among them, as well as evidence of significant events, controversies, and alternative pathways abandoned. Using documentation to identify who was prominent in, and who was being excluded from, the central debates, gave a sense of the ways numerous groups were being enrolled, the sorts of expertise and resources drawn upon, and the rough distribution of power in the policymaking process. Furthermore, it was possible to map out key technical, institutional and political themes being discussed and disputed; the ways in which the policy was narrated and conceptually situated by different groups; and the kinds of environmental, social, economic and scientific arguments mobilised to justify distinct positions.

Part of the goal was to build up a picture of the areas of consensus and disagreement, alignment and tension between assorted social groups, and inconsistencies and omissions prevalent in the literature. Beyond this however, the documentary data contained a substantial amount of technical and institutional detail surrounding the policy, and a large quantity of primary and secondary empirical research used to back up the varied positions of different actors. Together, the many aspects drawn from the documentary data provided a springboard for the interviews, including names, topics and reference points for interview questions. The documentary evidence was also later used to triangulate and corroborate data obtained from the interviews themselves, and the four policy-focused events attended during fieldwork.

In terms of data collection, a number of techniques were employed. To begin with, online searches with keywords were used, after which promising references within the first set of documents were followed up in the same way, as were others mentioned in interviews and public events at later points in the research. Subsequently, a more systematic approach was put in place. This took the form of setting up a Google Alert service for new online material with relevant keywords, along with fortnightly searches of Twitter. Gradually, subscriptions were set up to relevant mailing lists and RSS feeds of organisations, media outlets and other websites publishing content about or related to biodiversity offsets.

Most of this material was freely downloadable online as PDF or Word documents, though much was picked up in hardcopy form at events as well. There were some which were either unavailable or prohibitively expensive, which was obtained by email request or in person from individuals when possible. In particular, a significant number of written consultation responses were not available online, nor was there an accessible database of the submissions. It was reasonably easy to guess however, through familiarisation with the policymaking history, which organisations would have submitted to this, and who to approach for a copy. Online articles and webpages were saved,

categorised and tagged using the programme Evernote, while downloaded documents were kept in similarly labelled folders, as were paper copies of documents. In terms of categorisation, documentary evidence was organised according to sectoral relationship to policy (e.g. government and state; environmental NGOs), and subcategorised as specific organisations or bodies (e.g. Defra, Natural England, Environmental Audit Committee). Media coverage was labelled with respect to the aspect of policy reported on (e.g. local offset proposal, national policymaking development or controversy).

The following table gives a list of documentary data collected, reviewed and analysed during the course of the research project, giving information on when it was published and by whom, as well as some additional notes. The list is non-exhaustive, and other documentary evidence was collected and analysed. However, though not all the literature is referenced in the empirical chapters following the methodology, it all does inform the thesis as a whole.

Table 3: Documentary data

Category	Author(s)	Document(s)	Notes
Key policy documents	ODPM (Office of the Deputy Prime Minister) and Defra (Department of Environment, Food and Rural Affairs)	*Planning Policy Statement 9: Biodiversity and Geological Conservation* (PPS9) (2005) and guidance	Previous planning policy and guidance on biodiversity conservation and land development, requiring compensation in some circumstances
	Defra	*Biodiversity Offsetting: Discussion Material (2010)*	Published after the 2010 General Election
	Defra	*Natural Environment White Paper: The Natural Choice: securing the value of nature* (NEWP) (2011)	National nature conservation policy document, built on concepts of ecosystem services and natural capital Announces piloting of biodiversity offsetting
	Defra	*Biodiversity 2020: A strategy for England's wildlife and ecosystem services* (2011)	National biodiversity strategy
	DCLG (Department for Communities and Local Government)	*National Planning Policy Framework* (NPPF) (2012)	Planning reform and new national guidance Includes replacement of PPS9
	Defra	Guidance for offsetting pilots, aimed at local planning authorities, developers, and offset providers, as well as technical paper (2012)	Four documents
	Defra	*Biodiversity Offsetting Green Paper* (2013) together with impact assessment and public consultation document	Most advanced proposals of national programme
	Various	Pilot scheme offset plans, guidance, and supplementary material	Mainly local planning documents, but also online information on local authority and

			partner organisation websites
	Defra	Government summaries and responses to various other reports – e.g. Green Paper consultation (2014)*, Environmental Audit Committee report (2014) (see below), pilots evaluation (2016) (see below)	*Publicly released in 2016
	DCLG	Online planning guidance for biodiversity and ecosystems	National planning guidance which shows how to apply biodiversity offsets
Government-commissioned reports and research	Jo Treweek (Treweek Environmental Consultants) et al.	*Scoping study for the design and use of biodiversity offsets in an English Context* (2009)	Research commissioned under the previous Labour government into biodiversity offsetting
	John Lawton et al.	*'Making Space for Nature': a review of England's wildlife sites* (2010)	Commissioned under previous government, but published after General Election Basis for NEWP strategy, known as the 'Lawton Review'
	UK NEA (National Ecosystem Assessment)	*UK National Ecosystem Assessment* (2011) and supplementary material	Commissioned under previous government, published alongside NEWP Second major document underpinning NEWP, modelled on global Millennium Ecosystem Assessment
	GHK and eftec	*Costing potential actions to offset the impact of development on biodiversity* (2011)	
	Ecosystem Markets Task Force (EMTF)	*Ecosystem Markets Task Force Interim Report* (2012) *Realising nature's value: The Final Report of the Ecosystem Markets Task Force* (2013) and underpinning research reports	Set up out of NEWP to explore business opportunities in the green economy
	David Tyldesley and Associates	*Planning Policy and Biodiversity Offsets: Report on Phase II research - Effectiveness of the application of current planning policy in the town and country planning system* (2012) *Planning Policy and Biodiversity Offsets: Report on Phase III research - application of a new biodiversity offsetting metric to an existing sample of real-life historic cases* (2012)	

	Collingwood Environmental Planning and The Institute for European Environmental Policy (IEEP)	*Evaluation of the Biodiversity Offsetting Pilot Phase: Interim Report* (2013) *Indicative Costs of Current Compensation Arrangements for Biodiversity Loss: Illustrative Case Studies* (2013)* *A review of recent biodiversity offsetting practice in Germany* (2014)* *Evaluation of the Biodiversity Offsetting Pilot Programme* (2014)*	*Publicly released in 2016
	Forest Trends	*Exploring lessons learned from biodiversity offsetting markets in other countries that could inform appraisal of options for delivering offsets in England. Final report to Defra* (2014)*	*Publicly released in 2016
Other reports, research and non-government-commissioned material	Environment, Food and Rural Affairs Committee	*Natural Environment White Paper: Fourth Report of Session 2012-13* (2013) Annual reports on Defra's performance	All-party Parliamentary Committee reviewing Defra's activities
	Environmental Audit Committee (EAC)	*Biodiversity Offsetting: Sixth Report of Session 2013-14* (2013) and all transcribed oral evidence	All-party Parliamentary Committee public inquiry on biodiversity offsetting
	Association of Local Government Ecologists (ALGE)	*Ecological Capacity and Competence in Local Planning Authorities: What is needed to deliver statutory obligations for biodiversity?* (2013)	
	British Ecological Society (BES)	*Biodiversity Offsetting - What Does the Science Say?* (2013)	
	Policy Exchange	*Nurturing nature: policy to protect and improve biodiversity* (2012)	
	Country Land and Business Association (CLA)	*Private Solutions to Public Problems: Developing Environmental Markets* (2009)	
	Environment Bank	Various reports and material, including position papers, advice and information for offset stakeholders, press releases, articles, guides and technical papers	Offset broker
	Natural Capital Initiative (NCI)	*Towards no net loss, and beyond: Addressing practical challenges for biodiversity offsetting in the UK* (2010) *Towards no net loss and beyond: Addressing scientific knowledge and environmental information*	Workshop reports

		challenges for biodiversity offsetting in the UK (2010)	
	Aldersgate Group	*Pricing the Priceless: The business case for action on biodiversity* (2011)	
	eftec and Climate Change Capital	*Habitat banking: scaling up private investment in the protection and restoration of our natural world* (2010)	
	BBOP	*To No Net Loss of Biodiversity and Beyond: A Summary of Discussions at the Conference, 3-4 June 2014* (2014) and BBOP literature relevant to the English case	
	Various – e.g. Royal Society for the Protection of Birds (RSPB), Friends of the Earth (FoE), FERN, Valuing Nature Network, Grantham Institute, Institute of Coastal Engineers, eftec, GHK Consulting, IEEP, Aldersgate Group, Crown Estate, Natural England, Natural Capital Committee	Other technical and policy reports, position papers, research studies etc. – focusing on biodiversity offsets, nature conservation and environmental policy and regulation By NGOs, academic and scientific bodies, professional organisations, policy consultants, business groups and public bodies	
Written evidence for consultations and public inquires	Various	Green Paper consultation (2013) responses from: Energy UK; Aldersgate Group; Home Builders Federation (HBF); British Property Federation; Linden Homes; Lafarge Tarmac; Minerals Products Association (MPA); ALGE; BES; Chartered Institute of Ecology and Environmental Management (CIEEM); Institute of Environmental Management and Assessment (IEMA); Environment Bank; Campaign to Protect Rural England; FERN; FoE; National Trust; RSPB; The Wildlife Trusts (TWT); Woodland Trust; Bat Conservation Trust; Friends of the Lake District; Berkshire Local Nature Partnership; Cotswolds Conservation Trust; National Parks England; Wildlife and Countryside Link; CLA; National Union of Farmers (NFU); The Land Trust; Royal Town Planning	33 in total

		Institute; Policy Exchange; Natural England	
	Various	Written evidence to the EAC public inquiry: Renewables UK; Aldersgate Group; HBF; Lafarge Tarmac; MPA; IEMA; Chartered Institution of Water and Environmental Management; Field Studies Council; Yorkshire and Humber Ecological Data Trust; Northwessex Downs Area of Outstanding Natural Beauty Unit; Bexley Natural Environment Forum; Environment Bank; Buglife; FoE; National Trust; RSPB; TWT; Woodland Trust; Amphibian and Reptile Conservation Trust; CLA; NFU; Policy Exchange; Michael Hannis and Sian Sullivan; Professor Colin T. Reid	26 in total
Other reports and material	Various	Papers presented and other material from events attended (see Table 3)	
	Various	Material produced with regard to the EU/European Commission's 'No Net Loss Initiative', including research and policy papers, consultation submissions and responses	
Other sources	Various	Specialist websites and publications (e.g. *ENDS Report*, *Ecosystem Marketplace*, SpeciesBanking.com, *In Practice*)	
	Various	Professional and personal blogs (e.g. ecologists, conservationists and environmentalists, campaigners, scientists, planners)	
	Various	Planning applications with offset proposals	
	Various	Other online material (e.g. press releases and public statements, webpages of organisations engaged with offsetting, campaign websites and Facebook groups)	

In order to construct the policymaking history, a timeline of events was built up over the course of the research, comprising major publications, controversies, public statements, news stories and so on.

This was partly done through systematic familiarisation with documentation. The first stage involved a quick reading, which helped filter out documents which were substantive copies of one another. Then a deep reading of the more important material was carried out, extracting key information, themes, quotes and so on relevant to the research questions, annotating printed copies of documents and then consolidating and organising descriptive and reflective notes on Evernote. This process was frequently repeated with some of the key documents, since initial perceptions and interpretations needed to be re-examined, as new information and insights came to light through other sources. As particular themes emerged, comparative analysis was undertaken between and among categories (together with data from interviews and events), with further notes made on distinct themes and issues, highlighting points of consensus, disagreement, instability, variation and so on. Through this kind of analysis, it was possible to reconstruct the policymaking process around key themes, revolving around interpenetration of a series technical-ecological, institutional and political issues, which could then be examined and analysed further, orientated by the conceptual framework and research objectives and questions.

There are of course limitations to the use of documentary data collection and analysis as a research method. As Yin (2003) is careful to point out, "every document was written for some specific purpose *other than* those of the case study being done" (p. 87). Documents are likely to be biased in some way, may be inaccurate and should not be taken as literal recordings of events, but as constructions based on selected information. Given these drawbacks, documentary evidence could only be used to augment evidence and corroborate information from other sources. As Mason (2002, p. 108) notes, documents are never "directly or straightforwardly 'evidential' or 'representational'", and should be used "*alongside several other methods* of data generation". In the case of biodiversity offsets in England, the fact that most of the accessible documentary evidence was written with public consumption in mind signalled one limitation. There was clearly much which was omitted and concealed from official reports. To give one example, the roles played by the UK Treasury and large developers were not particularly visible from documentation. As became clear through the interviews, their influence was either implicit or exerted through unrecorded interventions and conversations. Other useful documents were also inaccessible, such as negotiations going on at the local level between planning authorities and developers, for reasons of commercial confidentiality. While the absence of certain actors and information from documentation was itself significant, other methods were required to assemble a more comprehensive picture.

2.2.2: Semi-structured interviews

The second major source of data was collected through 36 in-depth interviews. Interviewees came from a wide range of expert and non-expert backgrounds, but were targeted in light of their having some kind of engagement with, or relevant knowledge about, the biodiversity offsetting policy in England. Among them were policymakers, planners, public sector and private sector ecologists, policy consultants, developers, conservationists, landowners, farmers, scientists, researchers, practitioners, local and central government officials, NGO workers, brokers, green business

representatives, economists, local community activists, pilot leaders, and think tank employees. An overview of those interviewed is presented in **Table 4**.

There were numerous reasons qualitative interviews were particularly useful for this research. Returning to the ontological and epistemological framework, it is understood that people's mental conceptions of the world are reflections, even though necessarily incomplete, of social and material reality. As explained, people have inescapably political and contextual positions, in and through the ways the social and material world is produced. Using qualitative interviews was a way of excavating and generating data about people's positionalities and accounts of the policymaking process, through conversational (re)construction (see Mason, 2002, pp. 63–4). On a practical level, in combination with documentary evidence, they were also used to corroborate evidence relating to the policymaking history, such as chronologies of events, the participation of particular actors and so on. Interviewees held information otherwise unavailable, and conversations opened new avenues of enquiry, such as documentation, actors and events not on the public record, or examples of the policy in practice which had not been reported (Yin, 2003, p. 90; see Mason, 2002, p. 66).

With the right techniques and questions, it was possible to yield the more nuanced positions of human actors, rather than those solely in line with the dominant discourse. For example, it enabled probing at the mood in different camps relating to the government's proposals, and the degree to which public statements were accurate portrayals of people's thoughts. As Mason puts it succinctly, it is a method which involves:

> an understanding of depth and complexity in, say, people's situated or contextual accounts and experiences, rather than a more superficial analysis of surface comparability between accounts of large numbers of people [through formal surveys and one-size-fits-all structured interviews] (2002, p. 65).

Semi-structured interviews could be designed specifically with respect those interviewed, with each conversation expected to be more fluid and self-reflexive (Yin 2003, p. 89). This meant seeking out and incorporating the biases of respondents, and trying to unravel socially constituted political positions, bases of knowledge, constraints on action, and so on.

Looking specifically at the research case study, using interviews enabled access to the in-depth knowledge and expertise of key groups of actors, such as ecologists, planners, and land managers. It granted access to developments and experience of efforts to implement offsets at the local level, and of existing policy practices, which tended to be less well documented. Crucially, interviews meant talking to people about the nature of relationships between different actors and groups, and the kinds of discussions taking place within networks that were largely unrecorded. The interviews also gave clearer insight into how people actually interpreted written policy and guidance, and were a tool to gauge relative levels of engagement and familiarity with the policy proposals, and the degree of understanding distinct players had of the detail.

In-depth interviews were used to try to unearth hidden motives, nuances and tensions, and ask specifically about issues absent from official discourses and documentation, such as conflicts,

constraints, personal predictions and other more explicitly subjective opinions. Through this, it was possible to dig too at the ways technical, institutional and political issues intersected and blurred. This was partly because interview data tended to be relatively raw and unfiltered at its best, but also because the nature of conversation enabled dwelling on certain things, reflexive follow-up questions, and delving further into the ideas undergirding various standpoints beyond those explicitly acknowledged.

In order to generate this kind of data, open-ended questions covered a variety of topics. These included participants' professional lives, expertise, and histories, and how they or their organisations had come to engage with biodiversity offsets. Interviewees were asked about their perspectives on offsets and the policy in general, particular moments and narratives, and to reflect on events and policy developments they had knowledge or experience of. More stylised questions interrogated specific statements they or their organisations had made publicly. They were asked to talk about their own experiences relevant to the policy's design and implementation, and how they viewed other actors' motives, objectives and actions. They were asked too about their own predictions and worries about the plans, particular problems they had encountered or envisaged, and possible alternatives. Other questions covered technical and governance aspects of the proposals, and their interpretation of policies, guidance and key terminology.

The initial stage of preparation for the interviews involved gathering possible names and contact details. This was done through identifying authors of reports, articles and so on, the names of people mentioned or listed in those documents, and those writing or making public statements. On top of this online searches were used to find relevant personnel in key organisations, such as those responsible for policy work, biodiversity conservation, planning or environmental compliance. This enabled the building of a substantial database of potential participants, which was used for an initial wave of interviews. After this, interviewees and others were asked to suggest other people to approach, while new names appearing in conversations and at events were also added to the database, which was used to keep a record of names, organisations, email addresses and phone numbers, and details of any previous contact. Contact details were gathered either through documents, online searches, or requested from other interviewees or organisations. Some were contacted first using Twitter, where they were asked to contact me if they were willing, while others were approached in person at public events.

In terms of approaching participants, a first email was sent either directly or via a central organisational address if individual contact details could not be found. This email contained an information sheet and consent form, and explained the purpose of the research, why they specifically had been identified and some broad parameters of what the conversation would cover and entail. A reminder email was sent two weeks later if there had been no response. Except for a handful of particularly important individuals, no more emails would be sent if there was still no reply, but the success rate was remarkably high, and many could also be approached in person at policy-focused events. If the response was positive or asked for further information, I persisted by email or phone

until an interview could be suitably arranged, preferably face-to-face, but alternatively by phone or via Skype, unless they became obviously unresponsive. Overall around half those contacted agreed to be interviewed.

In total, 20 interviews were conducted face-to-face in mutually agreed settings, while the other 16 were done over the phone or Skype. Informed consent forms were always signed prior to interview, and stored as hard copies by both the participant and researcher. The interviews lasted between 20 and 120 minutes, averaging 40-80 minutes. A digital audio recording of each was made and stored with permission, along with handwritten notes during the conversation. In terms of content, the interviews involved between five and fifteen questions, both general and individually tailored. Most were semi-open ended, though some were precise about, for instance, a specific event or statement with which they were associated. The questions however acted more as a rough guide, and there was considerable scope to go off-script.

Immediately post-interview, handwritten reflections were made on paper. This included notes on what went well in the interview, unexpected difficulties, the general tone of the conversation and what could be improved upon next time. It was also used to mark particular tropes which had been apparent, responses which had stuck out as well as surprising oversights, points which needed clarifying, following up or which had opened potentially new avenues of enquiry. These notes were later copied onto a single file on the computer, to be revisited during more comprehensive analysis. Over time, each interview was listened to again and fully transcribed, and the transcriptions read twice on paper, on which annotations were made. Consolidated notes were then transferred into one large table, where interviews were categorised according to sectoral or individual engagement with the policy. This table contained two main substantive columns. The first was a bullet-pointed description of the interview, consisting of topics, arguments, claims made and so on. The second contained my own analytical notes in line with the research questions, highlighting major themes and framings, internal inconsistencies and discrepancies with other sources, unexpected or striking elements of the conversation, links to other data, the post-interview reflections and further questions. The singular table was then used as the basic point of reference for the interviews, which could then be reviewed again in detail as required, and analysed, compared and triangulated with other data.

Table 4 provides a broad summary of the 36 individuals who were interviewed as part of the research, and their roles in the policy's design and implementation. For simplicity, to avoid double-counting and for ease of anonymity, they have been categorised according to the primary roles about which they were interviewed.

Table 4: Interview participants

Primary role	Number of interviewees	Key roles and forms of engagement with offsetting programme	Interview codes
Central government officials	2	• Policymakers and civil servants • National level policymaking, support with pilots, public engagement and consultation	Interviews 1a, 1b
Local government ecologists	5	• Official and supplementary pilot scheme leaders • Part of local planning authorities with ecological expertise, creating strategic local offset plans, and negotiating offsets with developers and providers • Local level trialling, feeding into national policymaking	Interviews 2a, 2b, 2c, 2d, 2e
Planners	1	• Officer at national level association • Involved in lobbying on behalf of professional planners, expected to have central oversight and strategic planning role in offsetting programme at local level	Interview 3a
Ecologists and natural scientists	5	• Private freelance and consultancy ecologists and members of professional associations • Practitioners and researchers with expertise in ecological science and other relevant fields • Professional experience with offsets, development and infrastructure projects, ecological restoration and management • Private consultants working for clients such as developers, utilities companies and planning authorities, would be asked to use offset metrics and advise developers, regulators and providers • Public sector academics/researcher involved in providing scientific advice to government • Key stakeholders as experts and practitioners	Interviews 4a, 4b, 4c, 4d, 4e
Environmental NGOs and conservationists	7	• Third sector membership organisations committed to nature conservation as a core aim, either through land management activities and/or lobbying and campaigning • Frequently involved as stakeholders in planning process, commenting on applications; sometimes campaigning against particular developments • Some potential offset providers as landowners with experience and expertise in ecological restoration and management • Operating at national level, many at local level as well, as key stakeholders in nature conservation and environmental policymaking	Interviews 5a, 5b, 5c, 5d, 5e, 5f, 5g
Green business	2	• Individuals and representatives of ‘green economy’ sector • Includes commercial interests in development, extraction, consultancy, finance, accountancy and brokering • National level lobbying	Interviews 6a, 6b
Developers	5	• Developers of housing, energy and extractive sectors • Officers of individual developers and associations, with responsibilities for environmental compliance	Interviews 7a, 7b, 7c, 7d, 7e

		• Key stakeholders in local and national level policy with regard land development regulation and environmental compliance, involved in consultation and lobbying	
Landowners and potential offset providers	1	• Rural landowners and managers, including farmers, expected to act as private sector offset providers • Experience of land-based nature conservation policy and management • Key stakeholders as actual and potential offset providers at local level • Involved in national level consultation and lobbying	Interview 8a
Policy consultants	3	• Staff members of professional consultancies • Researchers and authors of commissioned reports into offsetting • Operating and national and European/global level	Interviews 9a, 9b, 9c
Think tanks	1	• Policy officer at independent think tank • Author of non-commissioned report on public policymaking with regard to biodiversity conservation and offsets • National level lobbying	Interview 10a
Local campaigners	4	• Local community activists and NGO officers, involved in campaigning against particular developments with offsetting proposals • Local level campaigning	Interviews 11a, 11b, 11c, 11d
Total	**36**		

There are several further observations to be made about those who were interviewed. Despite the manner in which they are classified in the table of the previous section, there was a certain fluidity about interviewees' individual positionalities within the process, because there was considerable overlap of various registers. First, organisations and their members fulfilled different functions simultaneously. For instance, an NGO could at once be a local campaigner, a landowner and potential offset provider, and a conservation organisation operating at a national level. A consultant ecologist could be part of the green business lobby as well as an individual practitioner or researcher. Second, individuals could have roles at different organisations at the same time. Industry representatives worked as policy consultants and vice versa, for instance. Many participants had also formerly worked for other organisations. NGO officers had been local government planners in the past, policy consultants had previously been officers of environmental organisations. Third, there was significant overlap in terms of expertise, which partly explained why so many had held similar posts in each other's organisations. Most participants were trained or had professional experience in one or more of the following: planning, ecology and environmental management, (environmental) economics, and policy work.

In practical terms, this meant conversations frequently moved to participants' roles and experiences in other professional capacities, though this was not the case for the non-NGO local campaigners

and for very few of the developers. As such, though there is only one interviewee who has primarily interviewed as a 'planner', there were nine – including the local government ecologists – who talked about their current or previous experiences as professional planners, in either the public or private sector.

As with documentary evidence, interview data has its own risks and drawbacks. Though a crucial form of data gathering, interviewing is "hard, creative, active work" (Mason 2002, p. 67), and requires thorough planning. Restrictions on resources also needed to be considered. Finding, approaching, gaining informed consent, confirming access to secure and quiet locations and preparing for interviews took considerable time, while face-to-face interviews involved significant travel costs relative to limited funds. Preparation time was also substantial, since this involved researching individuals' engagement as far as possible, and constructing comprehensive interview protocols, as advised by Creswell (2007, p. 133).

Another matter to consider, following Mason (2002), was taking into account the ethical issues attached to research. The safety of myself and interviewees, was paramount, despite the relatively straightforward nature of this project from that perspective. Basic steps were taken to ensure ethical conditions were met. Informed consent, which incorporated guarantees for the secure storage and confidentiality of data was a prerequisite. Participants' wishes to remain anonymous were respected and honestly appraised. Any information given 'off the record' was treated as such, and any related secondary evidence found was only used if no potential harm could come to the original source (following Creswell, 2007, pp. 141–3). Interviews did not attempt to glean private or personal information, and questions were not about traumas, tragedies or illegal activities. They were also designed with care to avoid accusation, confrontation or discomfort to respondents. They did however relate to matters of public policy and politics, and everyday experiences and relations in workplaces. It was important to be aware of and sensitive to the potential harm caused to respondents' comments being made public through publication, and to be wary of any personal or private information divulged about other parties who have not given informed consent. Informed consent was explicitly open to renegotiation during the interview process, as the respondent became more aware of what precisely they were consenting to. This made as clear as possible without compromising the research objectives, as advised by Mason (2002, pp. 79–82). Though the actual research project did not throw up significant difficulties in this regard, ethical considerations did occasionally restrict the use of interview data collected, including off the record comments and information which could have risked anonymity.

It was crucial too, as the researcher, to be aware of my own active and self-reflexive role as the interviewer, and the challenges this posed in terms of generating further bias or stunting the fluidity of the conservations (Mason 2002, p. 66). This for instance meant finding ways to simplify questions or have back-ups, so as to avoid situations where the participant might lose confidence. Sure-footedness and dexterity were critical, since the interviews by their nature were somewhat unpredictable, and various techniques were needed to open up some conversations and bring others

back on topic. This needed as balanced and careful an approach as possible, avoiding leading questions and so forth, and employing questions framed as 'how' rather than 'why', as a way of producing more open and less defensive responses from participants (Yin 2003, p. 90). Nevertheless, as Yin warns, interviews "should always be considered *verbal reports* only" (2003, p. 92). While uncovering the political positionalities of different actors was central to the research objectives, unchecked bias could have easily resulted in misleading data, as could respondents' fallibilities in terms of accurate memory and articulation of events, names and so forth. As anticipated (see Mason, 2002, p. 65), interviewees tended to interpret questions differently, and sometimes they misunderstood them completely, on more than one occasion because of misplaced assumptions on the researcher's part about levels of technical knowledge.

Bearing these many factors in mind, it was important not to be over-reliant on interviews in general or individual respondents in particular, which is why the research made use of as many different sources and types of information as possible. Some of the difficulties encountered and limitations of the data gathered are further reflected upon in Section 3.

2.2.3: Direct and participant observation

A final set of data was collected through participant observation, at four policy-focused events about biodiversity offsetting. These comprised two major conferences, a county level meeting of local government ecologists, and a public meeting and workshop put on by activists opposed to biodiversity offsetting. As detailed in **Table 5**, the events encompassed a wide range of actors engaged with the policymaking process in some way, operating at a variety of geographical scales.

This method was useful on a number of fronts. Returning again to the ontological underpinnings of the research, which stipulate the centrality of relationships in understanding complex social phenomena, participant observation proved to be a valuable tool. As Mason notes, participant observation can add "depth, complexity, roundness and multidimensionality in data" (2002, p. 86). Attending and observing events meant access to unique data, where key actors engaged were debating offsets and interacting directly with each other, as a policy community, in different settings and contexts. This was data which would otherwise have been difficult to collect (Yin, 2003, p. 94). Through direct observation, with limited active participation, it was possible to observe certain conversations, behaviours, narratives, conflicts, the ways people acted, reacted and so forth, and gain some sense of the power dynamics at play in the room. It made it easier to pick up which issues animated different groups, which discussions were absent or shut down, and indeed which actors were not there. Furthermore, relatively passive observation meant that data was not being generated by the researcher, in the way interview data was heavily mediated by the specific relationship between interviewer and interviewee, and the specific questions asked.

By attending public events and meetings set up with distinct purposes, based on different premises about offsetting, it was also possible to learn something about the shared perspectives of different groups of actors. The starting point for discussions among local government ecologists deviated

significantly from that of the activist-led public meeting, as did the physical settings, the demographic make-up of attendees and the mood of discussions. For example, an internal meeting of local government ecologists revealed concerns and opinions not shared in multi-stakeholder events or public forums. While this might appear obvious, it added layers of texture to the nature of the parallel debates which would have been difficult to pick up through other methods. Finally, attendance at events provided a useful way of meeting future interview participants, and reference points for reflection in those conversations.

Finding out about relevant events was fairly straightforward. As with identifying documentation, online approaches proved fruitful: online searches, Google Alerts, RSS feeds, signing up to newsletters and so on. On top of this, details of each event were passed on by interview participants and other contacts. In the case of the county level ALGE meeting, an invite to attend was extended by an interviewee who would also be present, as a prelude to the interview. With the two conferences, registration and attendance fees were both necessary.

In terms of data collection, all events were attended in person. The three public events (i.e. the two conferences and activist meeting) largely revolved around pre-planned talks, panels and workshops, including question and answer sessions and general discussion. The ALGE meeting was a roundtable meeting, discussing regular business relating to local issues, experience of new policy and guidance, and so on. For the most part, this meant listening and watching others speak and interact. Each event involved refreshments during which attendees engaged in networking and other interaction with acquaintances and colleagues, where it was possible to engage in conversations with other participants. In the case of the two conferences, this included meals as well. These allowed for the generation as well as collection of data, outside a formal interview setting.

Handwritten fieldnotes were made wherever possible, with explicit permission in the case of the ALGE meeting, since it was not a public event. Descriptive notes were taken on who was there, the physical settings, what was talked about, said and asked, particular themes which dominated, the observed tone of discussions and how different groups interacted, areas of agreement, tension and so forth. Immediate reflections were written when the events ended too, and at the end of each day for the two-day conference. These notes were later written up on Word, and organised according to themes, and, if applicable, compared to official summaries of events published at later dates. Added to this, material available at the events (e.g. programmes, hand-outs, booklets) was collected for later analysis. The data collected was then analysed alongside documentary and interview data, for purposes of corroboration and so on.

An overview of the data collected through participant observation is presented in **Table 5** below.

Table 5: Events attended for participatory observation

Event	Date	Purpose	Attendees	Codes
County level meeting of the Association of Local Government Ecologists (ALGE) – unnamed English county	December 2013	• Two-hour meeting of local government ecologists from local planning authorities across the county • Discussing, among other things, the implementation of biodiversity offsets on a local level, including some recent planning applications	Approximately 10 people (local) Local government Local government ecologists from the county and district planning authorities, local conservation NGO representatives	PO1
Chartered Institute for Ecology and Environmental Management (CIEEM) Spring conference: 'Biodiversity Offsetting' – Birmingham, UK	March 2014	• Day-long practitioner conference focused on biodiversity offsetting proposals in England • Presentations from people actively involved in policymaking and implementation process in England, and people with practical experience of restoration, compensation, offsetting, policymaking etc. from England and abroad (e.g. Australia, US)	Approximately 250 people (almost all UK-based) Civil society, government, business CIEEM members (professional ecologists; private and public sector; practitioners and researchers) Other UK-based biodiversity offsetting stakeholders (e.g. developers, NGOs, government officials)	PO2
2nd Forum on the Natural Commons (Nature Not for Sale) – London, UK	June 2014	• Evening meeting preceding BBOP conference above, organised by Nature Not for Sale group • Designed to challenge BBOP and biodiversity offsetting in England and abroad, bringing together critical academics and researchers, campaign organisations and NGOs, local campaigners • Presentations and panel discussions focusing on failures and injustices of offsetting and similar nature conservation policies, framed critically as commodification, privatisation, land grabbing, 'license to trash', etc.	Approximately 80 people (international presenters, but mostly UK-based audience) Civil society Critical academics and researchers; global justice-campaigning NGOs (e.g. World Rainforest Movement, Transnational Institute, Friends of the Earth International); conservation NGOs; ecologists; local campaigners and community activists, members of the public	PO3

Business and Biodiversity Offsets Programme's (BBOP) international summit: 'To No Net Loss and Beyond' – London, UK	June 2014	• First international BBOP summit, celebrating 10-year anniversary, co-organised with Defra and the London Zoological Society • Two-day conference bringing together stakeholders in mitigation and offsetting from across the world, discussing key developments in policy and practice, and key challenges (technical and governance) – e.g. tools, finance, standards • Large plenary sessions and several dozen smaller workshops, focused towards knowledge-sharing, advice, collaboration, capacity-building, lobbying, etc.	280 (international) Business, national and local government, global governance, civil society BBOP staff, members and partners; government officials and policymakers, regulators; global governance bodies (e.g. CBD, World Bank, European Commission); business leaders, extractive and energy companies, infrastructure, retail, forestry, agriculture, banks (i.e. financial institutions) and investors; consultancies and small businesses (e.g. conservation banks); ecologists and practitioners; NGOs (supportive and critical); academics and researchers, think tanks and policy consultants	PO4

There were of course drawbacks with this method. In a practical sense, the cost of attendance was generally high, especially for the two fee-paying conferences. This meant a limited amount of data could be collected in this way, as more would have been beyond the research budget. In terms of collecting the data, there were certain difficulties associated with the form of note-taking required. Keeping comprehensive and accurate notes throughout an event was not easy, and required high levels of concentration. It was easy to make mistakes or miss important information, while taking too many notes presented risks of recording too much 'noise', and also restricted the participation element of the exercise, presenting something of a dilemma (Creswell, 2007, p. 139). Though in the case of the BBOP conference much was videoed and later uploaded to YouTube, this was not the case for any of the other events.

The risk of bias in this data was another concern. Bias could be induced where other participants were particularly aware that they were under observation by the researcher (Yin, 2003). In most cases the presence of multiple researchers was well-known, and a common and expected occurrence at such events, which may have had some limited impact on behaviour of participants. However, in the small county level meeting of local government ecologists, I was particularly 'visible' to those attending as a participant observer, even though I had only planned to be, and tried to remain, an observer during the meeting. In this case, participants' behaviour certainly was affected, and on several occasions I was treated as an expert in the room. For the participant observer, this was related to another risk of bias through becoming too much of an 'insider' within the policy community itself

(Yin, 2003, pp. 94–6). Given that the participative dimension of this method was very restricted, this did not prove a significant issue, though there is more to say on this more generally in the final section.

3: Reflections, difficulties and limitations

There are several things worth dwelling and reflecting upon, since the research project came to an end, such as unexpected events which occurred, problems encountered and related limitations to the findings and conclusions. The most obvious challenge was the abandonment of the policy during the thesis. Though never officially announced, it became clear at the very end of fieldwork that implementation was not going to be pursued on a national level. This changed the aim of the research and central questions quite significantly, from a focus on how the policy's implementation might play out, to one which questioned why it had been aborted. Though this did not render the data collected useless, it did present challenges, since questions about the policy's non-implementation had clearly not been asked of interviewees, while evidence of its demise was only apparent by the lack of activity and secession of public statements made by the government.

The controversial nature of the policy at large created opportunities and risks. Debates were live and developments were happening all the time, which had some impact on interview data, discussed shortly. Throughout the period of fieldwork though, the main challenge had been in keeping on top of the proliferating data, and academic literature, which was being published in ever-increasing volume. Getting up to speed with the key terminology, and the frameworks with which different expert groups interpreted that terminology, was demanding too. Not only did I need to understand language directly about biodiversity offsets, I needed knowledge of key terms and ideas around planning, ecology, economics and the law, none which I have expertise in, in order to engage in meaningful conversations with different interviewees.

Unsurprisingly, the all-consuming nature of the research frequently meant biodiversity offsetting often felt like a 'bigger' policy issue than was really the case, and this perception needed to be kept in check. More unexpected were my own changing sensitivities to the policy and the community of actors promoting it. As explained in the Introduction, my feelings towards biodiversity offsetting and many of those advocating for it softened considerably, and became increasingly nuanced, during fieldwork. As should be clear, I retain deep scepticism over its practical and political implications for a variety of reasons. However, by spending so much time 'inside' the topic, and among a community of accommodating and committed people, it was sometimes difficult to keep hold of that critical perspective and wider context, when the parameters of debates and conversations were difficult to puncture. In this, attending the critical activist workshop in June 2014 was extremely helpful, as were subsequent academic conferences with fellow political ecologists.

There are of course limitations to this thesis, and some additional notes are necessary on the comprehensiveness and quality of the data. In order to keep the project manageable, decisions had to be made over what was beyond the reasonable scope of the project. Early on, I decided that what

was going on in the pilots would not be my central focus, due to the lack of activity in most of them. On the national level, I chose to largely bracket out part of the legal debates around the policy, and specifically discussions about Conservation Covenants, a mechanism proposed to secure land for offsets. In part this was something of an arbitrary move, but it was also a result of the lack of attention given to it in both documentation and interviews. This might, however, have been the result of another limitation with the data: the under-representation of landowners and managers among interview participants.

In general people were very receptive to being interviewed, but others were harder to reach, as reflected in the make-up of interviewees in **Table 4**. Getting hold of the relevant people to speak to in large development organisations was tricky, but not impossible. The same was the case for local campaigners. I did meet many dead ends however, particularly among landowners and farmers, and non-ecological planners. In part this appeared to reflect how much interest these actors had in the topic, and meant there was something of a risk that the 'expert' bias of the sample could detract from the actual context in which they were operating, with too much weight given to the shared assumptions of relatively small groups of 'insiders' and their actions. Furthermore, several potential participants who I expected to have some unique insights declined or never responded to requests, including individuals in key government departments and agencies, politicians and a couple of pilot leaders.

In terms of data quality, some interviews were better than others, and interference on one recording made parts impossible to transcribe. Though some were forthright, other participants were cagey, and there was a level of tangible concealment in certain cases. On occasion this was due to poor interview preparation or technique. There also appeared though to be an element of individuals being wary of what they said about other organisations or people from a relatively self-contained policy community (excluding most of the developers and local non-NGO campaigners), where there were many personal and professional connections (even if this made life easy in other ways as a researcher). In light of these various issues, there are certainly gaps in the data and diversity of perspectives, though this was mitigated in part by the fortuitousness of many interviewees' previous professional experiences.

The final point returns to the first, that of the abandonment of the national programme. Between the changing situation and a necessary reconceptualisation of the research problem, much of the content of the interviews turned out to be less important than first thought, particularly focus on commodification *per se*. Interestingly, as other themes emerged after fieldwork had come to a close, much of the easy conversation at the beginning of interviews, designed to settle participants, became more obviously useful in addressing new questions.

Bearing in mind these methodological issues and limitations, the thesis now turns to analysis of the empirical research, with a long chapter on the history of the English proposals and the context in which they emerged.

Chapter 7: Biodiversity offsetting in England – a policymaking history

Introduction

This chapter tells the story of the development and abandonment of the national biodiversity programme in England. It mostly covers events between 2010 and 2015, the only parliamentary term of the Conservative-led coalition government, during which the rollout of a formal national policy was explicitly under consideration, but also some of the important contextual factors from the preceding years. The purpose is partly to construct a policymaking history as a reference point for the deeper analysis of the remaining chapters, giving an impression of key actors, moments, and the trajectory and flow of events during that period. More importantly however, the chapter highlights many of the intersecting factors which contributed to the particularities of the experience in England.

The first section focuses on the events before the official announcement of offsetting's local piloting in 2011. It includes the experience of existing planning mechanisms concerned with biodiversity, and offsetting's take-up by the Conservative party in opposition. Section 2 outlines how the policy was expected to operate in relation to new approaches to nature conservation and reform of the land-use planning system, in the context of fiscal austerity in the years after the global banking crisis of 2008. Section 3 tells the story of the national policymaking process in the run-up to the launch of the local pilots, as more detail was added to the government's initial ideas. Section 4 takes a closer look at what happened with the pilots themselves, which ran for two years until April 2014. The fifth section of the chapter returns to the national level, describing the fast-moving events between the start of the pilots and the point where it became clear the policy had been dropped, towards the end of 2014 in the run-up to a new General Election. A final summing up is made in Section 6, highlighting certain themes germane to the overall analysis.

1: Biodiversity offsetting in England before the Natural Environment White Paper

In June 2011 the Conservative-led coalition government, which had come to power the previous year following a post-General Election agreement with the Liberal Democrat party, released its Natural Environment White Paper (NEWP) (Defra, 2011a). Titled *The Natural Choice: Securing the Value of Nature*, the White Paper was the first of its kind in over 20 years, setting out a long-term vision for nature conservation for England[29]. The framing, content and objectives of the NEWP will be returned

[29] The nature of devolved powers to the nations of the UK meant that the strategy itself only applied to English territory, though various aspects of the proposals and institutions set up as a result of the White Paper applied to the UK as a whole. For clarity, from this point on, (national) government refers to the UK Conservative-led

to shortly, but it is mentioned here since its publication marked the moment the local piloting of a voluntary approach to offsetting was first officially announced in a governmental policy document, with a view to nationwide rollout into the planning system. Biodiversity offsets were defined in the White Paper as "conservation activities designed to deliver biodiversity benefits in compensation for losses in a measurable way", where the developer offsets residual biodiversity loss by "secur[ing] habitat expansion or restoration elsewhere" (Defra, 2011a, p. 22). Its purpose was to "improve the implementation of the requirements of the planning system for biodiversity" (p. 22), through the pooling of resources for higher quality compensation, and making the process of managing biodiversity impacts more straightforward and cost-effective. This early statement of intent was thin on detail. However, what appeared to delineate biodiversity offsets from the biodiversity compensation and mitigation requirements contained in existing planning policy was the proposal of a formalised set of procedures for negotiating and delivering compensation, by way of a consistent national policy and tools of quantitative measurement.

1.1: Previous and existing policy

Prior to the publication of the White Paper, compensation for adverse biodiversity impact from land development stemmed from both domestic implementation of European legislation and other international conventions ratified by UK governments, and national nature conservation policy relating to land use planning (Rundcrantz & Skärbäck, 2003; Cowell, 1997). Under the Ramsar Convention of 1971, damage done to designated Wetlands of International Importance development deemed in the "urgent national interest" (Ramsar Bureau, 1973 Article 4.2; quoted in Cowell, 1997, p. 303) has long required compensation, following adherence to the mitigation hierarchy (described in Chapter 3). Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which form the Natura 2000 network of sites under the legally binding European Habitats (1992) and Birds (1979) Directives respectively, were similarly bound to strict adherence of the mitigation hierarchy, in line with agreements to maintain internationally protected species and habitats. In cases where development is of "overriding public interest", the member state is required to "take all compensatory measures necessary to ensure the overall coherence of Natura 2000 is protected" (in Treweek, 2009, p. 53; European Commission, 1992). Both the European Environmental Impact Assessment (EIA) Directive (1985) and Strategic Environmental Assessment Directive (2001) have been viewed as more ambiguous, yet still oblige, "where possible", demonstration during the pre-development phase of the measures of prevention, mitigation and compensation to be taken (see Treweek, 2009, pp. 53–4).

On the national level, the most important policy which biodiversity offsets would affect was the national Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9) (ODPM, 2005), and its related guidance. PPS9 had superseded the 1994 Planning Policy Guidance 9: Nature

coalition government (2010-15), though references to land-use and conservation policy are assumed to be applicable only at the scale of England (not Scotland, Northern Ireland or Wales), unless stated otherwise.

Conservation, which had institutionalised the UK's biodiversity commitments through the CBD, in the form of the UK Biodiversity Action Plan (BAP) (UK Biodiversity Action Plan Steering Group, 1994), and European legislation into planning. PPS9 covered planning obligations relating to English sites "of biodiversity and geological conservation value" (ODPM, 2005, p. 5). These included the international sites outlined above (i.e. SPAs, SACs and Ramsar sites), as well as a whole tranche of nationally designated areas, from heavily protected Sites of Special Scientific Interest (SSSIs), designated under the Wildlife and Countryside Act (1981), to non-statutory local wildlife sites[30] (see also ODPM & Defra, 2005). Among other things, it required 'material consideration' of biodiversity impacts from land development, and made concrete in planning the government's Biodiversity Duty. This duty, written into the Natural Environment and Rural Communities Act (2006)[31], obliged public authorities to consider biodiversity conservation as far as possible alongside other functions. Though there were no standard mitigation requirements emanating from the Biodiversity Duty on developers or planning authorities, PPS9 made clear planning authorities should in principle aim to "maintain, restore or add to biodiversity" in line with national conservation targets, and that planning permissions should be refused if "significant harm cannot be prevented, adequately mitigated against, or compensated for" (ODPM, 2005, p. 3). Supplementary documents gave 'good practice' guidance on implementing and enforcing the mitigation hierarchy as part of development control and planning conditions, and how PPS9 should be integrated into the Regional Spatial Strategies and Local Development Frameworks[32] (see ODPM et al., 2005).

1.2: Towards a formal biodiversity offsetting system in England

By the mid-to-late 2000s, it was widely recognised among the UK nature conservation community that existing policy was failing to adequately slow biodiversity loss, and the CBD target to halt this trend by 2010 would be missed (Defra, 2010a; EAC [House of Commons Environmental Audit Committee], 2008). Despite what appeared a significant volume of legislation, policy and guidance aimed at reducing and compensating for biodiversity loss resulting from land development, conservation measures were not being effectively implemented through planning, especially in the cases of non-international sites. Various causes were frequently highlighted as undermining a successful regime: ambiguous, complicated and caveated policy statements and guidance, which allowed biodiversity to be demoted relative to competing planning objectives and functions; non-compliance and poor practice on the part of planning authorities and developers; weak or non-existent enforcement and monitoring; and lack of ecological expertise in local authorities (e.g. Drayson &

[30] PPS9 also explicitly covered regional and local sites (Regionally Important Geological Sites, Local Nature Reserves and Local Sites); ancient woodland, veteran trees and other important natural habitats; networks of natural habitats (i.e. stepping stones and wildlife corridors); previously developed land; and biodiversity within developments, as well as protected species identified under European and national legislation.

[31] The Biodiversity Duty had originated in statutory law in the Countryside and Rights of Way Act (2000), and had been updated by the NERC Act (2006). NERC also established Natural England as the new statutory agency with general purpose of ensuring nature conservation and the goals of sustainable development.

[32] These were the major strategic subnational spatial planning documents at the time, which would all become void by 2012, together with PPS9.

Thompson, 2013; Atley & Morad, 2009; Treweek, 2009; Latimer & Hill, 2007; Treweek & Thompson, 1997). Compensation, on the rare occasions when it was made a condition of planning consent, tended to be done on an *ad hoc* basis, often negotiated through Section 106 agreements[33].

Among those concerned with the state of conservation policy were a number of individuals and organisations pushing for a formal and standardised biodiversity offsets or habitat banking programme, drawing on many of the arguments outlined in Chapter 3. The suggestion that such a system might be appropriate and effective in the English context was first mooted by government in 2007 (see Defra, 2007, p. 13), under the Labour administration. Defra subsequently commissioned a major scoping study led by well-regarded consultant ecologist and expert on offsets, Jo Treweek (2009). The study, produced in collaboration with other experts, many of whom were associated with BBOP, provided a very comprehensive overview of how an offsetting system could operate in the English context, including the steps to be taken and the risks and limitations which would need addressing.

It is worth noting that interest in offsetting coincided with a shift in thinking at Defra (2007), where chief scientist Bob Watson, a co-chair of the international Millennium Ecosystem Assessment (MEA), was a key figure in pushing for the department to embed a modern ecosystem approach into nature conservation policy (interview 1a; and see Lawton & Rudd, 2016, 2014). In 2007, the government took up the parliamentary Environmental Audit Committee's recommendation for the UK to undertake its own comprehensive National Ecosystem Assessment (NEA). Using the same model as the international study, it was designed to "enable the identification and development of effective policy responses to ecosystem service degradation" (UK NEA, n.d.). Commencing in March 2009, the NEA was completed under the Conservative-led administration in June 2011. Another study initiated by Defra and adopting an ecosystem approach, was set up in late 2009. Chaired by another notable figure, Professor John Lawton, it was charged with reviewing England's wildlife and ecological network, and the possibilities for a landscape-level restoration strategy. The Lawton review, as it became known, reported to Defra after the new coalition government came to power, and included biodiversity offsetting as one of many mechanisms to consider. However, it appears there was little appetite or capacity to move forward with any concrete proposals for offsetting from the Labour government at the time, who were more concerned by this point with the ongoing political fallout of the global economic crisis, following the banking crash and large-scale bailouts of 2008.

It was in this context that the Conservative party, in opposition, became interested in biodiversity offsets, at around the same time in 2009. One of the most vocal advocates of offsets and critics of existing arrangements at the time was David Hill, deputy chair of Natural England, the non-departmental state agency and regulator responsible for nature conservation. Hill was an enthusiastic

[33] Section 106 agreements refer to a mechanism under the Town and Country Planning Act (1990) for imposing legally enforceable planning obligations on developments, which would not otherwise be granted consent. They are designed to ensure mitigation of adverse, site-specific impacts (including environmental impact), such that the development is acceptable in planning terms.

proponent of a market-based approach based on the Australian and US systems (e.g. Hill & Gillespie, 2009; Briggs et al., 2009; Latimer & Hill, 2007), and had co-founded an offset brokering business called the Environment Bank in 2007. According to Hill himself, having spent two unsuccessful years pressing policymakers to consider an offsetting or banking system, he found a receptive audience in the Shadow Secretary of State for the Environment, Nick Herbert. A meeting was quickly arranged with the Conservative shadow planning ministers, after which Hill said they were "pushing at an open door" (Kenny, 2010).

In April 2009, the Conservative party's leader and future prime minister David Cameron proposed a national 'bio-banking' system and the use of 'conservation credits' in a speech in Oxfordshire (Gray, 2009a). Herbert, who was driving the agenda at this point placed the mechanism explicitly in the context of "limitations on public spending and … [looking for ways] to secure new forms of investment in conservation" (quoted in Gray, 2009b). The next month saw publication of *Private Solutions to Public Problems* by the Country Land and Business Association (CLA, 2009), a powerful lobbying organisation acting on behalf of landowners, traditionally influential over the Conservative party. Launched at a conference attended by Hill, Herbert (with whom the CLA had been in discussions) and other shadow planning ministers (Hodge, 2009), the report called for the establishment of environmental markets, including biodiversity offsetting, which could mobilise "the creativity, energy and resourcefulness of private enterprise" (CLA, 2009, p. 2) in a time of strained public resources:

> Properly regulated and with the right legal structures in place, self-interest – the powerful driving force behind markets – can be harnessed to create new markets to support the delivery of environmental outcomes (p. 3).

Other meetings to discuss the potential for offsets, convened by Herbert, took place around this time too, bringing together many of the NGOs, the Environment Bank, Policy Exchange and others (interviews 4f; 5b). A year later, following the General Election of 2010, the Conservatives formed the coalition, which Cameron (2010a) later promised would be the 'greenest government ever'. Concrete policy proposals for a national offsetting system began soon after, in line with the pledge made in the Conservative party manifesto.

1.3: Towards the Natural Environment White Paper

Following the General Election, offsetting's early champion Nick Herbert did not become the government's Environment Secretary, but was given ministerial positions in the Home Office and Ministry of Justice. Instead, Caroline Spelman was appointed as Defra's new Secretary of State, whose opinions on offsets were known to be less supportive (interviews 6a; 9a). Nevertheless, under her leadership Defra officially started the process of developing policy options for a national system, which would form part of the Natural Environment Paper White the following year, to be integrated with forthcoming planning reforms.

Having publicly announced its intentions in its November business plan, Defra produced a discussion paper the next month (Defra, 2010b). This launched the first consultative phase of the policymaking

process, responded to by a cross-sectoral group of interests[34]. It outlined the government's objectives for a national programme, the parameters and context in which it would be expected to operate, while raising some early questions regarding design. The discussion paper explained that offsets would first be trialled at a local level, and called for an expression of interest from local planning authorities. It also presented roughly how the policy was envisaged to form part of the government's White Paper, which would be published six months later. In addition, it described how the proposals would be consistent with the strategy laid out in the recently published Lawton review (Lawton et al., 2010), which would inform the broader nature conservation strategy under development. While some level of support was clear at this stage (see e.g. RSPB, 2010), a number of concerns emerged too, many of which would persist and never be resolved[35]. In particular, there was significant scepticism among moderately and strongly supportive practitioners and experts at Defra's plan for a voluntary rather than mandatory system[36], which was viewed as likely to be inadequate (ENDS Report, 2011b).

An early costing study was also commissioned to GHK Consulting and the Economics for the Environment Consultancy (eftec), modelled on some basic assumptions about existing trends and various iterations of rules and multipliers. The report (Rayment et al., 2011), which would later be used in Defra's (2011b, 2013b) two impact assessments, was published in March 2011, and estimated an annual cost of between £50m and £400m for developers by 2015, though the authors and the Environment Bank believed this to be somewhat conservative. Around the same time, articles reporting on offsets and discussing the instrument's merits and possible scope in England and the UK started appearing more frequently, in specialist magazines such as the *ENDS Report* and the Chartered Institute for Ecology and Environmental Management's (CIEEM) *In Practice*. Alongside the government's own work meanwhile, other bodies began engaging in offsets too, in order to inform and influence the impending policy discussions. The Natural Capital Initiative, a partnership formed in 2009 between a number of research institutes, the Society of Biology and the British Ecological Society, held three workshops aimed at tackling various practical, scientific and design issues between June and December 2010, bringing together a cross-section of interested stakeholders (see NCI, 2010a, 2010b, 2011). Adding to the burgeoning literature, eftec and Climate Change Capital produced a report on habitat banking in the UK (Caldecott & Dickie, 2010), making the economic case for a strong regulatory market to lever private finance for conservation.

In June 2011, the UK government published its White Paper (Defra, 2011a), at the same time as the launch of the UK NEA (2011). As will be discussed shortly, the NEA, together with the Lawton review, provided the conceptual framework for the government's overall nature conservation strategy. Defra (2011c) also published a response to Lawton, highlighting the recommendations within it regarding

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[34] Those who participated included local government actors, NGOs, developers, consultants, academics, landowners and managers, professional associations from relevant fields, and some who worked with offsets professionally (see Defra, 2011e).

[35] These issues will be dealt with in detail in subsequent chapters.

[36] As a voluntary system, offsetting could be used at the discretion of planning authorities or developers to meet planning requirements, but developers would never to obligated to use the mechanism.

the use of biodiversity offsetting. The White Paper pledged to launch six voluntary-based two-year local biodiversity offset pilots, beginning in Spring 2012, which would be overseen by Natural England for quality assurance. Local testing would be carried out with a view to a full rollout of consistent, national policy, posited as a strategy which could make managing the effects of development both simple and cost effective through planning, while at the same time helping to expand and restore England's ecological network in line with Lawton's recommendations.

Before proceeding, **Table 6** provides an overview of the regulatory and legislative landscape with respect to biodiversity in England around 2012, emanating from laws and policies operating at different geographical scales, which would require compliance or consideration in planning.

Table 6: Major nature conservation laws, policies and strategies relevant to the English planning system in April 2012

Scale	**Convention, legislation or policy framework**	**Notes**
International conventions	Convention on Biological Diversity (CBD) (1992)	▪ Framework for UK Biodiversity Action Plan (1994) and local BAPs, and later *Conserving Biodiversity – the UK Approach* (2007) ▪ Aichi Targets adopted at Nagoya 2010, aim to halt global biodiversity loss by 2020 – embedded in EU Biodiversity Strategy; UK/England through Natural Environment White Paper and *Biodiversity 2020*
	Ramsar (1971)	▪ Protecting internationally important wetlands, ratified by UK in 1976 ▪ Usually designated as SSSIs under Wildlife and Countryside Act 1981 (as amended)
	Bonn (1979)	▪ Convention on the Conservation of Migratory Species of Wild Animals, ratified by UK in 1982 ▪ Strict species protections legislated under Wildlife and Countryside Act 1981 (as amended)
	Bern (1979)	▪ The Convention on the Conservation of European Wildlife and Natural Habitats, UK ratified in 1982 ▪ Basis for EU Habitats and Birds Directives ▪ Legal obligations transposed onto Wildlife and Countryside Act 1981 (as amended)
European legislation	EC Habitats (1992) and Wild Birds (1979) Directives	▪ Twin directives enacting Bern Convention into European law – requiring UK as member state to implement ▪ Basis for Natura 2000 network of highly protected Special Areas of Conservation and Special Protection Areas respectively ▪ Transposed into UK law as The Conservation (Natural Habitats, &c.) Regulations 1994; later Conservation of Habitats and Species Regulations 2010
	EU Water Framework Directive (2000)	▪ Protection of rivers, lakes and estuaries and their ecosystems, required to be meeting 'good status' by 2015 ▪ In UK law as The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003
	EU Marine Strategy Framework Directive (2008)	▪ Outline legislative framework for taking ecosystem approach aims to achieve 'Good Environmental Status' of marine environments by 2020 ▪ Has led to publication of UK Marine Strategy Part One (2012)

	Environmental Impact Assessment Directive (1985)	▪ Mandatory EIA applies to various public and private development projects screened as having significant environmental effects; discretionary below certain impact thresholds; legislation instructs observance of mitigation hierarchy ▪ Legal status in UK under Town and Country Planning (Environmental Impact Assessment) Regulations 2011
	Strategic Environmental Assessment Directive (2001)	▪ Requires all plan-making (e.g. local plans) to undertake SEA – assesses and consult relevant bodies on likely environmental impact of strategic plan-making; obliging use of mitigation hierarchy at strategic plan-making stage ▪ Passed into UK law as Environmental Assessment of Plans and Programmes Regulations 2004
	Environmental Liability Directive (2004)	▪ Aims to make those causing damage to environment (including nature) legally and financially responsible for that damage – includes adherence to mitigation hierarchy ▪ Transposed into UK law as Environmental Damage Regulations, Preventing and Remedying Environmental Damage 2009
European biodiversity strategies	EU Biodiversity Strategy (2011)	▪ EU strategy for meeting Aichi targets of halting biodiversity loss by 2020 ▪ Feeds into UK/English biodiversity strategies
UK legislation	Wildlife and Countryside Act (1981)	▪ Puts into UK law major international conventions and European legislation – periodically amended, updated and consolidated ▪ Establishes designation and protection of Sites of Special Scientific Interest, limestone pavements, national nature reserves, marine nature reserves, national parks and countryside; contains most protected species and habitat designation
	Natural Environment and Rural Communities Act (2006)	▪ Amended Wildlife and Countryside Act ▪ Includes Biodiversity Duty as statutory obligation on all public bodies, initially established in Countryside and Rights of Way Act (2000), which also amended Wildlife and Countryside Act
UK/English biodiversity strategies	Natural Environment White Paper (2011)	▪ National strategy for England for implementing UK and EU international commitments relating to natural environment ▪ Informed by National Ecosystem Assessment and Lawton review
	Biodiversity 2020 (2011)	▪ National strategy for England specifically relating to biodiversity in deliver Aichi targets by 2020 ▪ Part of UK Post-2010 Biodiversity Framework, which replaced UK BAP (1994)
English planning policy and guidance	National Planning Policy Framework (2012)	▪ Sets framework for local planning policy ▪ Replaces PPS9 as guidance on how local planning documents and functions should implement and give consideration to national environmental laws and policies
Local planning documents	Local plans	▪ Local authorities' strategic planning documents, based on framework set by NPPF, and complying with all above national environmental laws and planning duties, as well as demonstrating conformity with various directives, frameworks and strategies ▪ Document designating local site allocation; basis for determination of planning applications and development control procedures

Sources: www.jncc.defra.gov.uk; www.gov.uk; www.planningguidance.communities.gov.uk; www.ec.europa.eu

2: Biodiversity offsetting in context: the green economy, deregulation and fiscal austerity in England

Before continuing with the story, some more context is necessary with respect to the particular historical juncture in which biodiversity offsetting emerged, in the form it did. This part of the chapter therefore elaborates on the government's wider nature conservation strategy, and its intersection with other policies in a time of turbulent political economic uncertainty and change. It looks first at how offsetting was positioned as a key policy mechanism within a broader ecosystem services framework, which was orientated heavily towards valuation of nature and growing a national green economy. Second, it concentrates on how this changing ecological regime was situated in, and conditioned by, the government's political agenda in the aftermath of the global financial crisis, bank bailouts and recession – the stated objectives of which revolved largely around cutting the state's budget deficit through rounds of deep fiscal austerity, while pursuing economic growth through a strategy of deregulation, including significant reform and liberalisation of the land use planning system.

2.1: An ecosystem approach and growing the green economy

In her introductory remarks, Spelman wrote that the White Paper was a new, 50-year natural environment strategy, which placed "the value of nature at the centre of the choices our nation must make: to enhance our environment, economic growth and personal well-being" (Defra, 2011a, p. 2). Underpinning this statement was the conceptual framework of ecosystem services, which, since the publication of the Millennium Ecosystem Assessment (MEA, 2005), had grown to become the dominant nature conservation paradigm in international and domestic arenas, in conjunction with the increasingly synonymous association of sustainable development with the green economy. The novelty of the NEWP, the first of its kind since 1990 in the UK, was using this approach as the foundation for an entire integrated natural environment strategy, foregrounding a number of core concepts in its opening pages: ecosystem services (Defra, 2011a, p. 8); the role of biodiversity (p. 9); natural capital (p. 11); and market failure (p. 11).

The White Paper drew on a substantial evidence base animated by this conceptual framework (see Defra, 2011d). While heavily referencing the high profile international studies, the MEA and The Economics of Ecosystems and Biodiversity (TEEB, 2010b), its national premise rested on the findings of the Lawton review and NEA – which, as discussed, preceded the coalition government. Each of these studies had deployed an ecosystem approach, and made recommendations on the basis of reversing the decline of natural capital and ecosystem services (for discussion, see Lawton & Rudd, 2013). Lawton's report, titled *Making Space for Nature: A review of England's Wildlife Sites and Ecological Network*, had analysed the state of the country's natural environment and its ecological functioning in the face of pressures such as demographic change, economic growth, regulatory shifts, and climate change. It argued nature in England had become highly fragmented, and needed rebuilding if the provision of ecosystem services vital to social and economic life was to be maintained. Its core recommendations centred on the (re)construction of a resilient ecological network, delivered by strategic conservation planning at a landscape scale (Lawton et al., 2010). The report discussed

a range of possible policy mechanisms, including biodiversity offsetting and payment for ecosystem services (both explicitly market-orientated), as well as other incentive schemes, rewilding, and the creation of large-scale Ecological Restoration Zones, all designed to contribute to a 'bigger, better and more joined up' ecological network. According to the study, achieving this goal would require between £600m and £1.2bn of investment per year.

The NEA meanwhile found over 30 percent of ecosystem services provided by the UK's natural environment were in decline. It expected such trends to continue if unchecked, citing similar drivers to Lawton, while identifying land-use change as one of the major causes of biodiversity loss. Bringing together 500 natural scientists, social scientists and economists, the critical contention of the NEA was that the UK's natural environment was systemically under-valued in measures of national wealth. Specifically, economic invisibility was postulated as a central cause of degradation, since its economic cost of lost ecosystem services was not accounted for in decision-making processes:

> The values of most ecosystem services are currently omitted from national economic frameworks and local decision making. Failure to include the valuation of non-market goods in decision making results in a less efficient resource allocation (UK NEA, 2011, p. 13).

These economic norms, it was argued, were detrimental to the generation and maintenance of societal wealth and human well-being. Though it did not attempt any kind of economic valuation itself, the NEA made strong recommendations that policies should be orientated towards embedding such an approach across the whole of social life.

In terms of content, the White Paper was divided into four themes, through which the government would aim to "mainstream" the value of nature across society (Defra, 2011a, p. 3). The first, 'Protecting and improving our natural environment', focused primarily on conservation and the state of England's ecosystems. It set out the government's ambition by 2020, following commitments made through the Nagoya Protocol[37], to "halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people" (p. 17)[38]. *Biodiversity 2020*, a strategic vision for achieving this goal, was to be published two months later (see Defra, 2011h), while the NEWP described the policy mechanisms it would use to build a resilient ecological network, through ecologically coherent planning at a landscape scale. Institutionally, this would mean the creation of Local Nature Partnerships (LNPs), populated by people from business, the public sector and civil society, to provide leadership and influence an ecosystem approach to local governance at a strategic scale[39]. 12 initial Nature Improvement Areas (NIAs) were also to be identified for piloting through a competitive bidding process, which would be expected to operate as analogous to Lawton's Ecological Restoration

[37] The Nagoya Protocol was an international agreement signed at the 10th conference of the parties meeting of the CBD, which took place in Nagoya, Japan, in 2010.
[38] It should be noted that this was not any kind of legally binding commitment, but rather a policy objective, with significant caveats.
[39] The idea of LNPs was that they embody the government's 'localism agenda', discussed in the next subsection.

Zones. A pot of £1m would be accessible for establishing the 50 intended LNPs, while £7.5m was to be extended to the NIAs over the next five years[40]. On top of these institutions, the government's planning reforms, including the testing of biodiversity offsets, were touted as the most important lever for protecting 'natural value' and meeting the stated objective of no net loss of biodiversity. Significantly, encouraging innovative green design and ecologically coherent planning was said to be primarily dependent on making planning and decision-making more flexible, in contrast to the existing state of overly centralised and bureaucratic procedures (Defra, 2011a, pp. 21–2).

The second, most eye-catching theme, was titled 'Growing a green economy'. It set out the government's ambition to fuel growth in the green economy, particularly through exploiting the business opportunities present in the UK's natural capital and ecosystem services. Taking its lead from TEEB and the NEA, this section was built on the conviction that economic growth and sustainability were mutually compatible and dependent, rather than in opposition, and that ecosystem services are fundamental to any sustainable economy. The corollary case made was that maintaining sustainable growth is only feasible if the economic system could properly capture the value of the "stocks and flows of natural capital" (Defra, 2011a, p. 34). In practical terms, a number of measures and policy instruments were promised, along with new public-private sector initiatives. An independent Natural Capital Committee would be inaugurated to advise government on the state of the nation's natural capital, and recommend evidence-based priorities for its protection and enhancement in relation to economic planning. The Office for National Statistics would also be instructed to "fully include natural capital in the UK Environmental Accounts" over the next few years, in order, ultimately, to "move from measuring the value of the physical stocks to systematically valuing the services they provide" (Defra, 2011a, p. 36). Much of the green economy theme was devoted to the establishment and expansion of new markets, highlighting the supposedly vast business opportunities available in economically valuable natural capital. For instance, the further trialling and expansion of PES schemes announced as another green market with great potential. However, though the state would play an important enabling role, and be central to developing new modes of environmental audit and performance indicators, it was made clear green growth was expected to be largely driven and financed by private enterprise. Of particular relevance on the topic of biodiversity offsetting, it would later turn out, was the establishment of an independent, business-led Ecosystem Markets Task Force (EMTF): "to review the opportunities for UK business from expanding green goods, services, products, investment vehicles and markets which value and protect nature's services" (Defra, 2011a, p. 40).

The third theme, 'Reconnecting people with nature', promoted the mutually beneficial relationship between a high-quality natural environment, public health and social cohesion, suggesting action which is good for nature is good for people. Though less directly relevant to the topic of the thesis, this section was largely framed in terms of people's consumptive relationship with the natural

[40] This was all the new money to be made available by the government before 2015.

environment, and the benefits for personal well-being. It described how government policy could facilitate 'access to nature' through various policy levers, and encourage voluntary activity among the population, tied in with its localism agenda, to achieve the objectives of the overall strategy. The final theme, headed 'International and EU leadership', highlighted how the White Paper was constructed in relation to nature conservation regimes and institutions at higher scales. This included the government's commitments to the CBD, its role in pushing the green economy agenda at 'Rio+20', the UN Conference on Sustainable Development, and the government's connected work in the sphere of international development. The last section also covered the UK's place in the EU, and the government's part in developing European-wide strategies for biodiversity conservation, resource-efficient growth and becoming the world's largest green economy and market.

2.2: Austerity, planning reform and environmental deregulation post-2008

2.2.1 Austerity and state restructuring

The articulation of a market-orientated ecosystem services policy framework for conservation in England, and biodiversity offsetting's place within it, was constituted at a particular historical moment which is crucial for unravelling much of what happened over the next four years. The Conservative-led coalition came to power after 13 years of Labour rule in the wake of the global financial crisis of 2008, the bailing out of British banks by the government, and the deepest domestic recession since the Second World War. Though the UK economy appeared to be growing steadily by the time of the General Election of 2010, the Conservative party won the largest share of the vote, on a platform of tackling the state's growing budget deficit and rebalancing the economy. Led by Cameron, they were largely successful in painting the country's ongoing problems as the result of years of profligate public spending under the premierships of Tony Blair and Gordon Brown. Fiscal austerity was subsequently the centrepiece of economic planning for the new government, with substantial cuts implemented across nearly all aspects of state expenditure.

Ecological regulation and nature conservation were heavily impacted by these cuts. Resources were withdrawn from central government departments and attached state agencies, while block grants to local authorities, which accounted for approximately three quarters of municipal expenditure, were considerably reduced too. These were the key centres of policymaking and regulatory oversight at different scales, as well as institutions which allocated funds for non-state actors engaging in conservation activities. The limited availability of public money was one major attraction to offsetting, since it would ostensibly be financed by private means. Furthermore, in the so-called 'bonfire of the quangos', a number of other government-funded environmental and advisory bodies were abolished, including the independent Sustainable Development Commission (Vaughan, 2010). While the extent of public spending cuts in general was substantial, the environmental components of state capacities were hit particularly hard. Over the course of the 2010-15 parliament, spending at Defra was to be reduced by around 30 percent, the highest of any government department (Marshall, 2013c; Jowit,

2010)[41]. These cuts extended to all of the state regulatory agencies under Defra's remit, most significantly Natural England and the Environment Agency (Marshall, 2013b; ENDS Report, 2011a; McCarthy, 2010). Between them, Defra and the agencies were expected to lose a comparable proportion of jobs, with up to 8,000 of a total 30,000 staff to be made redundant (Jowit, 2010).

In terms of subnational regulation, some estimates put central government cuts to local authority budgets at equally high levels as those at Defra (Johnstone, 2014). The majority were overseen by the Department of Communities and Local Government (DCLG), and were implemented unevenly both between and within local authorities. While the poorer areas of the country were hit by the largest cuts (Cadman, 2015), planning departments and their environmental units, where offsetting would be largely administered and overseen, were disproportionately impacted upon (interviews). According to data collected by the Association of Local Government Ecologists (ALGE), 10 of 13 areas of local biodiversity work were undergoing "at least a 60% budget cut" in 2011/12 (EFRA Committee, 2012a, p. 116). Like Defra and its agencies, local planning authorities underwent restructuring aimed at saving money. While some local government ecologists were laid off, others were moved into external trusts, run on a commercial basis through service level agreements (interview 2a; see also e.g. Local Government Association & English Heritage, 2013).

The overall effect on capacity was to put considerable strain on the delivery of core obligations of planning and ecological regulation, while Defra recorded some of the lowest levels of staff morale and confidence in departmental leadership across government (Kaminski, 2015c; Marshall, 2014). Locally, understaffing was reportedly slowing down the processing of planning applications in general (Carpenter, 2015), and environmental functions appeared to be at the sharp end. As part of a public inquiry into the prospects for the White Paper strategy soon after publication, ALGE expressed concern:

> over the apparent 'mis-match' between the aspirations and expectation expressed in the Natural Environment White Paper, when weighed against diminishing availability of resources within local government to actually engage with and undertake the sorts of biodiversity initiatives outlined (EFRA Committee, 2012b, p. 116).

This was seen as potentially aggravating a state of affairs where biodiversity was already critically undervalued in planning. ALGE's figures from 2004 had shown only 35 percent of local authorities employed an in-house ecologist, while a more recent survey found 74 percent of planners had only a basic understanding of the mitigation hierarchy. ALGE concluded many planning authorities:

> do not currently have either the capacity or the competence to undertake the effective, and in some cases necessarily lawful, assessment of planning applications where biodiversity is a material condition (Oxford, 2013, p. ii).

[41] A further 30 percent agreed for the 2015-20 period (Howard, 2015), under a new majority Conservative government elected in May 2015. However, following the resignation of David Cameron after the EU referendum of June 2016, and the sacking of his chancellor, George Osborne, by new Conservative Prime Minister Theresa May, the fate of these plans was somewhat uncertain at the time of writing.

Local Planning Authorities (LPAs) frequently relied on the state agencies for expert advice on planning applications, but cuts to the Environment Agency meant it was forced to stop commenting on biodiversity matters altogether in 2014, and Natural England was unable to pick up the slack (Branson, 2014) – though it purportedly did improve the speed at which it responded to requests (Donnelly, 2014).

2.2.2: Environmental deregulation

In a period of economic uncertainty and fiscal contraction, the UK government embarked on a national growth strategy centred on deregulation, arguing that private sector investment was being hamstrung by overbearing and costly bureaucracy (e.g. Wheeler, 2011; Cameron, 2010b). In April 2011, the government launched the Red Tape Challenge (RTC). Jointly led by the Cabinet Office and the Better Regulation Executive within the Department for Business, Innovation and Skills (BIS), the purpose of the RTC was to reduce excessive regulatory burden on business, and fast-track mechanisms to do so[42]. This led to a number of deregulatory obligations on all government department. Concretely, according to the government's Principles of Regulation, all domestic policy measures introduced from January 2011 were subject to a 'one-in, one-out', and from January 2013 a 'one-in, two-out' rule, which stated:

> Any measure which regulates or deregulates business and is expected to result in a direct net cost to business must be offset by measures that deregulate business and provide savings to business of at least double that amount (BIS, 2013, p. 40).

Compliance would be overseen by the recently formed and independent Regulatory Policy Committee (RPC), which would rule whether measures were 'fit for purpose', based on evidence submitted in an impact assessment using a specifically designed cost-benefit analysis (see Gibbons & Parker, 2012). Defra's biodiversity offsetting proposals would ultimately have to undergo this process, and would fail.

Environmental regulation was a key target of the deregulatory drive, despite Cameron's earlier pronouncement of his being the 'greenest government ever'. At the Tory party conference in October 2011, Chancellor George Osborne made a speech in which he said: "We're not going to save the planet by putting our country out of business", referring to the UK's ambitious carbon emissions reduction targets (Murray, 2011). Later in the year he would attack green policies, and especially those planning laws emanating from EU directives, as a "burden" and "ridiculous cost" on business (Harvey, 2011; see also Stratton, 2011). The findings of a review of the Habitats and Birds Directives carried out on Osborne's instructions, published in March the next year, strongly rejected his claims (see Defra, 2012a; also BBC, 2012). However, at a moment when the UK was slipping back into recession, Cameron had already backed his chancellor's assertion that 'gold-plated' environmental

[42] The RTC was superseded by Cutting Red Tape after the General Election of 2015, to be operated along similar lines (cutting-red-tape.cabinetoffice.gov.uk).

and planning regulations were blocking economic growth, and needed to be tackled (Carrington, 2012a; Watt, 2012).

Even after growth returned to the UK, the perceived antagonism towards environmental protections did not die down. In 2013 for instance, Cameron was alleged to have been repeatedly telling colleagues: "We have to get rid of all this green crap", when discussing energy policy (Mason, 2013). In the eyes of critics, this increasingly hostile narrative was mirrored by key appointments at Defra and its agencies. Most notably this included Spelman's replacement, Owen Paterson, who was viewed as being on the hard right of the Conservative party with deep antipathy for environmental concerns and their advocates (Cusick, 2013; Carrington, 2012c). The government courted controversy on a number of other occasions with regard to its environmental record, notably in relation to its aborted sell-off of a large portion of England's public forests, which ultimately cost Spelman her job; ongoing plans to build HS2, an expensive and contentious high-speed rail project which proposes to cut through large swathes of the countryside and remaining ancient woodland; an unpopular and unsuccessful badger cull, against scientific advice, in an effort to curb the spread of bovine tuberculosis; and the continued pursuit of shale gas exploration and 'fracking' in the face of widespread public opposition and resistance from local communities (Carter & Clements, 2015).

Defra, meanwhile, was at the forefront of efforts to implement the government's deregulatory agenda (Kaminski, 2015a). In response to the RTC, it began its own Smarter Environmental Regulation Review (SERR) (Defra, 2013a; see also ENDS Report, 2012b), convened by a business-led panel, before developing strategic plan of action. Though environmental laws themselves looked like they would be left mostly intact (ENDS Report, 2012a), at the end of the first phase of SERR the following May Defra announced plans for a 'radical overhaul' of environmental guidance and reporting (Kaminski, 2013). The second phase was launched in April 2014 (Kaminski, 2014b; see also Mathiesen, 2014), under the auspices of Defra Better for Business (Defra, 2014a). Soon after Defra could point to the results of the government's Business Perceptions Survey (NAO & BIS, 2014) to justify their approach, through which private sectors leaders identified environmental regulation as the most burdensome they faced – though the evidence for this was refuted from various quarters (Kaminski, 2015a, 2015b, 2016b, 2016a; Dechezleprêtre & Sato, 2014; New Economics Foundation, 2014; ENDS Report, 2011c).

The deregulatory drive continued towards the end of the government's parliamentary term[43]. In August 2014 for example, to some criticism, Defra indicated it would be raising the area threshold at which EIAs would be required as part of planning applications (Geoghegan, 2014). The measures, mooted as removing unnecessary bureaucracy, were confirmed in January (Sell, 2015). One of the most significant developments was the passing of the Deregulation Act of 2015, which put various elements of the RTC and related policy goals into legislation (Kaminski, 2014a, 2015a). In terms of

[43] It would extend beyond the coalition government too into the Conservative majority administration beginning in May 2015 (Kaminski, 2015d)

its impact on environmental policy, this new law imposed a 'growth duty' on all government regulators. This meant Natural England and the Environment Agency would now be legally obliged to give due consideration to economic growth objectives while carrying out their regulatory functions.

Though this section has covered many of the key moments of the national deregulation agenda in England and the UK, it should also be briefly noted that a concurrent process was unfolding at the EU level, where large parts of UK legislation originated. Under the so-called REFIT platform begun in late 2010, the European Commission (n.d.) was at the forefront of moves to make EU law 'lighter, simpler and less costly', and with leading officials later looking to the UK's 'one-in, two-out' model as a potential blueprint for their own reforms (Kaminski, 2014c). As this progressed, the Habitats and Birds Directives underwent a controversial 'fitness check'. This was widely seen in consultation as an attempt to water down these strong protections (e.g. Mazza, 2015). The evidence gathered suggested the laws remained well-designed and appropriate, while environmental organisations argued their main concerns were with poor levels of implementation and enforcement. This was crucial context to the Commission's efforts to construct an EU No Net Loss Strategy, together with consultation on biodiversity offsetting, which would play out alongside the development of the English proposals (**Table 7** below).

Table 7: EU No Net Loss Initiative and biodiversity offsetting proposals (2010-15)

Date	Key developments
May 2011	European Commission (2011a) publishes *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, in line with CBD commitments setting EU target of halting the loss of biodiversity by 2020 ▪ Action 7 is to ensure no net loss of biodiversity of ecosystem services, aimed at sites not covered by existing EU nature legislation – includes proposal for "an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes)" by 2015 (European Commission, 2011a, p. 12) ▪ Reiterated in 50-year *Roadmap to a Resource Efficient Europe* (European Commission, 2011b)
April 2012	Resolution by European Parliament for Commission to "develop an effective regulatory framework based on the 'No Net Loss' initiative, taking into account the past experience of the Member States while also utilizing the standards applied by the Business and Biodiversity Offsets Programme" (European Parliament, 2013, p. 10) ▪ Also supported by the European Council of Ministers, in conclusions reached in June 2011 and December 2011
July 2013	Final meeting of the Working Group on No Net Loss of Ecosystems and their Services (2013b, 2013a) adopts two major documents on scope and objectives and operational principles of initiative
January 2014	Policy options for the EU No Net Loss Initiative published, with biodiversity offsetting as central policy mechanism (Tucker et al., 2013) ▪ One of a series of major reports commissioned on the No Net Loss Initiative and biodiversity offsetting (ICF Consulting & IEEP, 2014; e.g. Conway et al., 2013)
June 2014	Beginning of a European-wide consultation on the proposals for the EU No Net Loss Initiative, to run until October 2015 ▪ Proposals prove controversial, with lines of dispute following similar themes to those which emerged in England
January 2015	Results of the European Commission's (2015) consultation are released, with little identifiable common ground ▪ No further major developments, initiative appears to have stalled

2.2.3: Planning reform

A substantial part of this deregulatory drive was aimed squarely at supporting economic growth through land development, and facilitating major infrastructure projects and housing. Since long before the coalition government had come to power, there had been a broad consensus across all the major political parties that the UK suffered from a chronic shortage of (affordable) housing, though the picture had always been geographically uneven (Tait & Inch, 2016; Cochrane et al., 2015). Housebuilding had not kept up with the demands of a growing population and other demographic shifts, especially in London and south east England, since the 1970s, when the UK's political economy began to be dramatically restructured along neoliberal lines, resulting in, among other things, the virtual secession of the construction of council housing.

The popular narrative subscribed to by successive governments centred firmly on the planning system, widely seen as one of the last vestiges of the post-war social democratic settlement. Acquiescing to the critique promulgated by many right-leaning groups and influential think tanks, planning came to be viewed as another form of centralised command-and-control, responsible for stymying economic growth and housing affordability (Haughton & Allmendinger, 2016). Planning itself became viewed primarily as a burden, with planners either seen as imposing damaging costs on businesses, or, alternatively, as being complicit in the restriction of supply to the benefit of large developers and landowners, intentionally or otherwise (Cochrane et al., 2015; Haughton & Allmendinger, 2013). Liberalisation was always presented as the solution, and the Labour governments between 1997 and 2010 were particularly active in planning reform in this direction (Lord & Tewdwr-Jones, 2014). Their recalibration of the traditional land-use planning system, towards one undergirded by spatial planning (Allmendinger & Haughton, 2012), was deemed necessary for nurturing a 'competitive' economy, particularly by the powerful Treasury department (Tait & Inch, 2016; Lord & Tewdwr-Jones, 2014; Cowell, 2013).

When the coalition government came to power, planning reform was high on the agenda once again, and a new programme of reform was set in motion immediately. Its rationale rested largely on the perceived failure of spatial planning under Labour to speed up permitting procedures and deliver growth (Tait & Inch, 2016; Lord & Tewdwr-Jones, 2014). Environmental regulations such as the Habitats Directive and EIA, meanwhile, were presented as particular obstacles to development. Moves to further liberalise and deregulate were widely seen as influenced by Policy Exchange and its chief planning commentator Alex Morton (e.g. 2010, 2011), who would later become an advisor to Cameron on planning and housing (Haughton & Allmendinger, 2016). The prominent think tank, set up by future Conservative planning minister Nick Boles, would also produce an important report in favour of biodiversity offsetting in the early years of the parliament (Newey, 2012).

In July 2010, two months after taking office, the new government announced the abolition of the regional development agencies (RDAs) and regional spatial strategies (RSSs), which had been introduced by Labour in 1999 as an additional layer of subnational governance, aimed in part to act

as conduits through which geographical inequalities in England could be addressed[44]. Among other things, the RSSs had been central to determining housing allocation across the English regions, and setting targets for local housing supply, as well as acting as key nodes for strategic conservation planning at the subnational level. Under what became known as the coalition's 'localism agenda', the RDAs were the first casualties of purported efforts to empower local people, communities and businesses, by radically decentralising and liberalising planning processes (Tait & Inch, 2016; Cowell, 2013). This was all framed as the antidote to the problems of New Labour's predilections with centralised, top-down target-setting, likened in public to Stalinist central planning (Lord & Tewdwr-Jones, 2014; Haughton & Allmendinger, 2013).

Alongside a legislative programme passed through the Localism Act of 2011, the new government began developing a new National Planning Policy Framework (NPPF) in December 2010 (Tait & Inch, 2016). The NPPF was pitched primarily as a streamlining exercise (Cowell, 2013), which would eventually replace thousands of pages of planning policy and guidance down to a 65-page document, with supplementary online guidance. A draft version of the framework (DCLG, 2011) was put out to consultation in July 2011 just after the NEWP was published. It stoked considerable controversy with respect to its clear orientation towards development and growth (Tait & Inch, 2016). At the centre of this was the phrase 'presumption in favour of sustainable development', which ministers suggested meant the default answer to any planning application should be 'yes'. On a more general level, the wording of the draft NPPF appeared to significantly demote sustainability and conservation duties relative to the imperative to deliver growth-as-development[45]. Though international and European sites were still well protected, environmental principles were more heavily qualified by concerns with project 'viability', while rejected applications would require overwhelming proof that loss of environmental values outweighed the presumed public good of development (Cowell, 2013). The deregulatory message was heavily criticised by green groups in particular, but also by core suburban and rural conservative constituencies, backed by the staunchly partisan *Daily Telegraph*, who saw the reforms as a threat to the countryside and green belt designation which partially held back urban sprawl (Tait & Inch, 2016).

By the time the NPPF (DCLG, 2012) was finalised in March 2012, some modifications had been made. Further details regarding the definition of 'sustainable development' had been put in place to placate these interests, in consultation with the National Trust and Campaign for the Protection of Rural England (CPRE) (Tait & Inch, 2016). The strong pro-growth mantra of the framework remained non-negotiable, however, and alongside this uneasy compromise significant control was maintained by the central state, especially with regard to national infrastructure planning, which was deemed vital

[44] The inauguration of regional planning was meant in part as a step towards regional government, but this move proved unpopular and was quickly abandoned following a heavy defeat in a referendum on the issue in the north east.

[45] There was also a concern among environmental NGOs, who had managed to access and lever some influence over the RSSs, that they would be spread too thinly to intervene and provide oversight and expertise in the more local decisions engendered by the NPPF (Cowell, 2013).

enough in the realm of national competitiveness to necessitate special fast-tracked planning procedures put in place by Labour (Cowell, 2013). The localism agenda had been initiated on the premise that planning was a barrier which needed to be removed to free growth. However, over the course of the parliament, the tension between decentralised power and the coalition's growth imperative was increasingly resolved by a more 'muscular' approach by central government, much of it enabled through the Growth and Infrastructure Act of 2013 (Tait & Inch, 2016). Localism's controversies and fragile coherence meant it gradually became a less pronounced part of the government's core programme, and the central state assumed a more coercive and controlling demeanour over planning authorities viewed as failing to deliver, in spite of incentive schemes such as the New Homes Bonus (Tait & Inch, 2016; Cowell, 2013). One of the more consequential aspects of the whole raft of reforms, relating to the biodiversity compensation regime, was the transfer of responsibility of housing supply. This passed to LPAs, who would need to demonstrate how they would meet future housing need in their area over five-year periods of 'local plans', reconstituted as the core strategic planning documents determining local land-use. If they were judged unable to do this by the national Planning Inspectorate, an outcome which was highly plausible given existing economic and housing market conditions in England, development permission could be granted from above, outside the areas and conditions set out in local plans. LPAs could effectively lose their powers of development control.

Returning to the substance of the compensation regime, and to move the story of biodiversity offsetting's passage forward, it is important to note that the NPPF replaced PPS9 and existing guidance. Protections relating to international and European sites remained unchanged, as did those of SSSIs. For lower or undesignated sites, the use of offsetting was still not mentioned explicitly, as it had yet to be tested[46]. The NPPF did however make reference to the government's targets of halting overall biodiversity loss by 2020, while its definition of sustainable development included "moving from a net loss of bio-diversity to achieving net gains for nature" (DCLG, 2012, p. 3). Specifically, in relation to determining planning applications, it stated that LPAs "should aim to conserve and enhance biodiversity", observing several principles, including application of the mitigation hierarchy:

> if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused (DCLG, 2012, p. 27).

As isolated statements, little had been changed with respect to compensation requirements in planning. Rather, it was the surrounding context of planning reform and apparent moves to loosen environmental regulation, and especially the increased weighting given to economic growth in key documents and legislation, which would shape how wider use of biodiversity offsets was be interpreted in theory and practice.

[46] However, in March 2014 the online guidance was updated to reflect a decision by the Planning Inspectorate, which deemed biodiversity offsetting, as defined by Defra, to be an appropriate method for delivering compensation, and therefore a legitimate option available to LPAs and developers to comply with the NPPF.

3: Policymaking and national developments before the pilots 2011-12

The pilots were launched nine months after the White Paper and soon after the NPPF was finalised, in April 2012. The first impact assessment, which accompanied the NEWP proposals, made an optimistic economic case for the policy (Defra, 2011b). Based on figures estimating the ecosystem service value of delivering the UK BAP (from Christie et al., 2011) and data from the initial costing exercise (Rayment et al., 2011), it suggested that the overall social benefits of an offset programme to society (i.e. the value of benefits flowing from the investment in conservation via the imposition of compensation measures, assuming none was being levied at the time) would outweigh the costs to developers if no net loss became the normal requirement.

On the assumption that a national programme could potentially deliver this outcome, Defra had also published two preliminary documents, laying out the parameters for local trials, such that they could operate in the context of the imminent draft NPPF and *Biodiversity 2020*. The first of these was a set of guiding principles, which built on the earlier phase of consultation, emphasising that offsetting was not intended to undercut existing protections. It affirmed the basic principles of measurable outcomes, adherence to the mitigation hierarchy and additionality, acknowledging that some habitats are technically irreplaceable and non-offsetable, while reiterating the importance of simplicity and value for money (Defra, 2011f). Further detail as to the institutional architecture was given too, partly in response to the Lawton review's specific recommendations on offsets. Banking was mooted as a possible longer term option, but simple offsetting would need to come first. Offsetting would be as local as possible within a national framework, with LPAs responsible for designing local offset strategies, in line with and integrated into local planning policy. If the policy were to be rolled out nationally after piloting, it was agreed a national regulatory authority would be required, but that that would be a question for a later date. With these principles in place, Defra made a call for expressions of interest from LPAs to become pilot areas.

The second document was a technical paper, where the first iteration of the metric was released, to calculate the compensation requirements of a development (Defra, 2011g). The Defra metric was modelled on one developed by Jo Treweek and colleagues (Treweek et al., 2010; Treweek, 2009), based on the Australian 'habitat hectares' approach (see Chapter 4, Section 1.2; and Parkes et al., 2003), whereby the biodiversity value of a site was calculated by multiplying habitat type, by condition, by area in hectares. Habitat types would be classified and scored according to their level of distinctiveness: low (2), such as intensive agricultural land; medium (4), mostly semi-natural habitats; and high (6), which included all BAP habitats, and a subcategory of 'very high' distinctiveness BAP habitats, which should only be traded in specific circumstances at the discretion of the LPA. These scores would be multiplied against habitat condition, set initially at four levels: poor (1); moderate (2); good (3); and optimum (4). This would create the matrix below to ascertain the biodiversity units lost from a site, when multiplied by the area of impact (**Table 8**).

Table 8: Defra Biodiversity scoring matrix version 1

Habitat distinctiveness				
Habitat condition		Low (2)	Medium (4)	High (6)
	Optimum (4)	8	16	24
	Good (3)	6	12	18
	Moderate (2)	4	8	12
	Poor (1)	2	4	6

Source: Defra (2011g, p. 6)

To calculate the compensation requirement in units, the impact would also be subject to several risk-related multipliers. These pivoted on the risk of failure, according to the supposed difficulty of restoration or recreation of the habitat type (**Table 9**); spatial risk, defined in relation to whether an offset was to be located within or linked to a strategic area identified in the local offsetting strategy (**Table 10**); and the expected time lag between impact and reaching of the offset's target condition (**Table 11**). In terms of trading, the metric allowed for out-of-kind exchanges except in the case of high distinctiveness habitats, while 'trading down' was prohibited. Trading up would be required for low band distinctiveness habitats, and encouraged for medium distinctiveness habitats (**Table 12**). Hedgerows were afforded special status as high distinctiveness linear habitats, which could not be meaningfully measured by area. Instead, they would need to be offset in like-for-like trades according to length in metres. The technical paper also proposed a system of insurance developers would need to pay for in case of offset failure[47].

Table 9: Restoration risk multipliers

Difficulty of restoration/recreation	Multiplier
Very high	10
High	3.0
Medium	1.5
Low	1.0

Source: Defra (2011g, p. 10)

Table 10: Suggested locational risk multipliers

Locational parameters	Suggested multiplier
Offset is directly contributing to a spatially identified (in the offsetting strategy) target or objective for the habitat in question	1:1
Offset is buffering, linking, restoring or expanding a habitat outside an area identified in the offsetting strategy	1:2
Offset is not making a contribution to the offsetting strategy	1:3

Source: Defra (2011g, p. 11)

[47] Chapters 6 and 7 will look at the metric and its use in more detail.

Table 11: Time lag multipliers

Years to target condition	Multiplier
5	1.2
10	1.4
15	1.7
20	2.0
25	2.4
30	2.8
32	3.0

Source: Defra (2011g, p. 12)

Table 12: Habitat type bands and trading rules

Habitat type band	Distinctiveness	Type of habitat	Type of offset
Very high	High	BAP with 'no loss' target	Bespoke; LPA discretion as to whether the offsetting mechanism can be used
High	High	Rest of BAP habitats	Like for like
Medium	Medium	Semi-natural non-BAP	Within band type or trade up
Low	Low	Intensive agriculture	Trade up

Source: Defra (2011g, p. 4)

Between July 2011 and April 2012, however, progress on the policy remained low key. As previously noted, Spelman did not view offsetting as a major priority. Despite the positive tenor of the impact assessment, Defra remained cautious as to what was achievable in the context of the government's overriding commitments to deregulatory economic growth. The intervening period, during which concrete proposals were gradually assembled, was marked more prominently by the government's increasing hostility to environmental regulation and the planning system. Defra erred against advice urging for a mandatory system, opting for offsets as voluntary for both LPAs and developers.

The policy did receive a boost, however, from part of the business community, in the form of the Aldersgate Group, an active lobby group and coalition of green-minded corporates, environmental professionals and NGOs, and whose chair, Peter Young, sat on both Defra's 'Smarter Regulation' committee and the government-convened EMTF. The group's report, *Pricing the Priceless: The business case for action on biodiversity* (Aldersgate Group, 2011), followed familiar tropes to those espoused by BBOP, spelling out the virtues of strong regulation and the establishment of green markets for both economy and environment. The Environment Bank, meanwhile, launched its own trading platform with US firm Mission Markets, on which offset receptor sites could be registered in the UK, in anticipation of an uptake in interest.

In March 2012, when the NPPF was finalised, offsetting's supporters were given further encouragement, with the publication of some more in-depth research commissioned by Defra. The study, undertaken by David Tyldesley and Associates (2012a), called into question the effectiveness of existing planning processes at protecting biodiversity, especially with regard to smaller scale

developments and non-designated sites[48]. It found that offsite compensation (as opposed to onsite mitigation measures) was rarely required on successful planning applications (findings later backed up, see CEP & IEEP, 2013; Newey, 2012), and that biodiversity as material consideration was consistently undervalued, sometimes ignored or at least given less weight than economic and socially-orientated planning objectives during development control. Though poor practice was given as one minor factor, the report suggested there were regulatory and legal barriers to stronger implementation of the principles of PPS9. It also highlighted the unevenness of the problems found, reflecting interconnected issues such as differential levels of ecological expertise in LPAs and lack of local guidance and data.

In April, Defra announced the six official pilot schemes, out of 12 applications. They would be Devon, Doncaster, Greater Norwich, Nottinghamshire, Essex and the combined areas of Warwickshire, Coventry and Solihull. In addition, a number of supplementary projects would feed into the process, which were already involved in compensation and offset-related activities[49]. Defra published guidance for local authorities (2012b), developers (2012c) and offset providers (2012d), as well as a second technical paper on the metric (Defra, 2012e), containing some extra information and a few modifications. Significantly, the 'optimum' condition level was removed (**Table 13**), while the 'very high' subcategory of distinctiveness was no longer differentiated from other BAP habitats (**Table 14**). The trials were launched immediately, and would run until April 2014.

Table 13: Updated biodiversity matrix

		Habitat distinctiveness		
Habitat condition		Low (2)	Medium (4)	High (6)
	Good (3)	6	12	18
	Moderate (2)	4	8	12
	Poor (1)	2	4	6

Source: Defra (2012e, p. 7)

[48] In the large sample of planning applications reviewed, the study found biodiversity issues were "recognised as material considerations in less than 1% (90 out of 10,235) of all types of planning applications determined by local planning authorities", but 29% of 570 statutorily defined 'major' planning applications. 8% of those 570 were deemed to have overlooked or insufficiently addressed biodiversity issues, while biodiversity was a reason for refusal of planning permission in 21 of 136 cases (David Tyldesley and Associates, 2012a, p. i).

[49] These were to include Atkins, Aggregates Industries, Balfour Beatty, Eco Bos and Code 7 consulting, Golder Associates, Doncaster Metropolitan Borough Council and the Yorkshire Wildlife Trust, The Somerset Biodiversity Partnership and Worcestershire County Council.

Table 14: Updated habitat type bands and trading rules

Habitat type band	Distinctiveness	Broad habitat type covered	Type of offset
High	High	Priority habitat, as defined in Section 41 of the NERC Act	Same band type, and ideally like for like
Medium	Medium	Semi-natural	Within band type or trade up
Low	Low	e.g. Intensive agriculture – but may still form an important part of the ecological network in an area	Trade up

Source: Defra (2012e, p. 5)

4: The local pilots 2012-14

The guidance provided for local authorities participating in the pilots was relatively non-prescriptive, other than the use of offsets would be strictly voluntary for LPAs and developers (Defra, 2012b). It pointed to relevant national policy, guidance and legislation to be considered and adhered to, especially relating to conservation and development control, and the legal methods through which offsets could reasonably be secured[50]. The most significant requirement would be for all pilot areas to produce a local offsetting strategy, to be developed with local partners. These should set out local priority habitats and target areas for offset providers, in line with the goals of the NEWP and Lawton, and established local conservation strategies. Within this framework there was significant flexibility, and pilot leaders were encouraged, if appropriate, to adapt Defra's metric (e.g. move a particular habitat into a higher band) to better reflect local context and priorities. The pilots would furthermore be required to participate in an ongoing evaluation process commissioned to independent consultants, led by Collingwood Environmental Planning (CEP). Natural England would provide technical advice to LPAs when needed on the use of offsets locally.

The six pilots chosen varied substantially, ecologically and according to specific local development pressures, and with respect to the institutional and governance arrangements of the localities[51] (CEP & IEEP, 2014b). The Environment Bank was an official partner in two areas, and other partners included state agencies (Natural England and the Environment Agency), LNPs, NGOs and land groups, and private sector businesses and associations. Each pilot took a different approach in relating offsetting to local planning policy and guidance, though this mostly came in the form of additional notes rather than integration into core statements (CEP & IEEP, 2014c). Local offsetting strategies meanwhile were developed, with guidance for developers, providers and planning officers, such that offsets could be targeted to help realise local objectives, including green infrastructure strategies, local BAPs and the maintenance and expansion of local networks of designated sites. As

[50] The potential tools were Section 106 planning obligations or planning conditions under the Town and Country Planning Act (1990), or the Community Infrastructure Levy established by the Planning Act (2008).

[51] The pilots were made up of a number of different types of local planning authority, including upper tier county councils, lower tier district councils and metropolitan borough councils, unitary city councils and national park authorities. Most were led and coordinated by county councils, and crossed jurisdictional boundaries between lower tier authorities, covering whole or parts of different districts, boroughs and national parks.

expressed in Defra's (2012b) guidance, the use of offsetting was not designed to significantly alter local priorities or strategies, but rather to complement and streamline their delivery.

Setting up the trials involved considerable work at the local level, and there was little to report for some time. However, by the midway point, a year into the testing period, problems began to surface (Evans, 2013a). Just as developments on the national level of policymaking began to accelerate, it became clear the pilots were only going to provide very limited data to analyse (CEP, 2013). As many had warned, two years was too short to generate significant evidence of the effectiveness of offsets, given the long timescales involved in the English planning system. The planning application process frequently takes many years for large and complex projects, while planning permissions last three years before they expire. As a result, developers were cautious, given that by the time they commenced their project offsets might no longer be relevant in the planning system. Since offsetting was voluntary, most simply opted out. Additionally, in a period of economic slowdown, the level of construction was very low, and so few planning applications were being made. Together, these factors contributed to there being no agreed offsets in any of the pilot areas halfway through the test period (CEP, 2013). At the same time, a degree of frustration was reported among several pilot leaders, who complained at lack of extra resources and support from Defra (Evans, 2013a). Under difficult economic and political conditions, LPAs found the voluntary nature of offset gave them insufficient leverage to extract additional compensation, though many agreed that the metric was proving useful as a simple communicative device, when negotiating with developers and talking to non-experts. Nevertheless, during the second half of the two-year trials, several pilot leaders decided to give less priority to offsets, and redirected their limited resources to other activities.

The pilots officially ended in April 2014, by which point they had largely been branded as a failure (Salvidge, 2016, 2014). Very few offsets had been agreed, and the metric had only been deployed on less than a dozen occasions in each area, other than one, where some significant progress had been made (CEP & IEEP, 2014b). The Warwickshire, Coventry and Solihull pilot was considered to have been a success, at least in developing and implementing a comprehensive local approach, which they planned to continue with and was lauded by many of the policy's supporters. No offset schemes had been implemented in the Warwickshire pilot, but several planning applications with agreements in place had been finalised, and use of the metric had been recorded on 63 separate planning applications. However, the fact that significant but limited progress had only been made in one case, led by an LPA widely acknowledged as atypical, meant the evidence sought to inform a national programme was ultimately inadequate (see also Connor, 2016; Defra, 2016; CEP & IEEP, 2014d). The supplementary projects, meanwhile, had also produced negligible extra evidence, and only four of the original eight were covered in the evaluation reports (CEP & IEEP, 2014e). Though the final evaluation highlighted useful and positive lessons about the metric, assessing biodiversity impact and quantifying loss, and some evidence as to how offsetting could be institutionally operationalised in the planning system, very little could be learned about the processes, experience and ecological effectiveness of offset provision and delivery (Salvidge, 2016; CEP & IEEP, 2014f).

On top of the challenges surrounding the pilots' voluntary nature, the evaluation concluded that lack of information and certainty on all sides prohibited more meaningful engagement and buy-in. Paucity of resources and expertise available in LPAs, together with ambiguous policy and guidance, were also reported to have been undermined planners' ability to implement the mechanism more effectively (CEP & IEEP, 2014d).

5: The rise and demise of the mooted national programme 2012-15

Throughout the piloting period of the programme, developments on a national level followed their own trajectory, which I have split into four phases. The first lasted from April to September 2012, during which time little happened, and public discussion remained largely muted under Spelman's continued leadership at Defra. The second began after Spelman was replaced, and saw a rapid intensification of activity within Defra, driven by new Secretary of State Owen Paterson, who was keen to see a national programme operationalised as soon as possible. This culminated in the publication of a Green Paper in September 2013, kick-starting a third phase, during which the supposedly imminent policy rollout became the topic of significant public debate and media interest, as well as controversy. This 'high point' in the story ebbed away quickly after July 2014, when Paterson was sacked and the programme was seemingly de-prioritised by the government and Paterson's successor, Liz Truss. By May 2015, the time of the General Election and the end of this fourth and final phase, it was clear that plans for a national biodiversity offsetting policy had been dropped altogether.

5.1: From Spelman to Paterson

The launching of the local pilots marked an important milestone in the prospective policy's passage to implementation, but for the next six months there were few notable signs of movement at the national level. With limited impetus coming from the leadership, Defra officials were happy to let the trials run their course, and revisit the issue once a full evaluation had been written up, and other research had been completed. While a final report commissioned to the David Tyldesley consultants was completed, which had retrospectively tested Defra's metric on past planning applications (David Tyldesley and Associates, 2012b), the most significant moment for the policy's advocates was support emerging from Policy Exchange.

The think tank's report, *Nurturing Nature* (Newey, 2012), came out strongly in favour of introducing a mandatory biodiversity offsetting mechanism into the planning system. It criticised the prevailing conservation regime for failing to value nature economically, for poorly designed and implemented regulation, and for not harnessing the potential of MBIs to support both conservation and development. Its recommendations revolved largely around making the compensation regime more straightforward and competitive, in a bid to generate transparent information about biodiversity value and the cost of compensation, to incentivise more efficient decisions and outcomes. Among other observations, it cautioned how lack of ecological expertise in LPAs presented a particular challenge, which was highlighted again with some concern by various groups during the EFRA Committee's

(2012b, 2012a) public inquiry into the implementation of the White Paper. This inquiry, which took place over the first six months of 2012, put the government's offsetting proposals under the most scrutiny to date. Nevertheless, while the early lines of cleavage which had emerged in 2010 remained, the debates at the time reflected the limited detail Defra had put on their proposals to date.

As noted in the introduction to this section, this period of the policymaking process was largely quiet. The real turning point occurred in September 2012. In Cameron's first major cabinet reshuffle since coming to power, Spelman was the most high-profile member of the government's front bench to lose their job. Her leadership was widely understood to have been cut short in light of the embarrassing climb-down Defra had been forced to make the previous spring, on the back of a vociferous public campaign opposing the government's plans to privatise much of England's public forest estate (Murray, 2012; Carrington, 2012b). In her place came Owen Paterson, whose appointment significantly changed the tenor of debate around biodiversity offsetting, which soon moved to the centre of Defra's policy programme.

5.2: Offsetting moves forward

Paterson was a controversial choice, particularly for his political associations and stance on green issues. According to the liberal *Independent* newspaper, in a critical profile a little over a year into his tenure:

> [T]he Environment Secretary, regarded as part of the Tory's hard-right countryside squirearchy, is linked to an alternative network of leading climate change sceptics that include Margaret Thatcher's former chancellor, Nigel Lawson, his controversial Global Warming Policy Foundation, and arch-sceptic Matt Ridley, the nephew of Lord Lawson's former cabinet colleague, Nicolas Ridley. Matt Ridley also happens to be Paterson's brother-in-law (Cusick, 2013).

At the time, the move was seen as part of an effort to placate the right and Euro-sceptic wing of the Tory voter base, which was under growing pressure from the hard-right UK Independence Party. It was also received as something of a deliberate attempt to antagonise and confront green groups, and another example of the government's increasingly belligerent attitude towards the environment (Carrington, 2012c)[52].

Crucially, with regard to offsetting, Paterson arrived with a strong growth mandate from the prime minister (interviews 1a; 1b), at a moment when the UK's post-crisis recovery was under serious threat, and the economy was on the edge of a second recession. Not long into the job, the new Secretary of State became a vocal supporter of the policy, making it one of his top priorities, under the firm belief that it provided a unique opportunity to 'unblock' the planning system and reconcile development with conservation. In particular, he appeared to be influenced by Policy Exchange, who he later claimed

[52] During his time in charge at Defra, Paterson gained notoriety for his views and leadership on climate change (Carrington, 2014a; Syal, 2013), an unsuccessful and unpopular badger culling trial aimed at tackling the spread of bovine tuberculosis (Carrington, 2014c; BBC, 2014), his apparent lack of deference to official advice and scientific evidence (Cusick, 2013), and for the department's heavily criticised preparation for and response to severe flooding in the winter of 2013/14 (Carrington, 2014b; Channel 4 News, 2014).

had “put offsetting on the map” (Paterson, 2013). He was further encouraged by subsequent reports from the Ecosystem Markets Task Force, who made the immediate establishment of a national offsets programme their primary recommendation, out of 22 ‘business opportunities’ for UK firms in the green economy which the government should pursue (Defra, 2013c; EMTF, 2013, 2012).

Under Paterson’s direction, activity around offsetting was accelerated and intensified within Defra, while interest from external stakeholders increased in turn (e.g. Cook & Clay, 2013; Evans, 2013b; ICE [Institution of Civil Engineers], 2013; Tew, 2013; RGS [Royal Geographical Society], n.d.). In April 2013, soon after the publication of the Task Force’s final report, the Environment Secretary and a team of officials travelled to Australia to observe the system in place in the states of Victoria and New South Wales. At a biodiversity offsetting summit hosted by Defra the next month, which consisted of a high-profile panel and was attended by over 100 delegates, Paterson expressed his growing enthusiasm for the policy, and the positive mark the Australian trip had left on him (BES [British Ecological Society], 2013).

As Defra’s increasingly growth-oriented plans gathered pace, existing points of friction became more visible (Marshall, 2013a; Pearce, 2013; King, 2013a; Monbiot, 2012). One year in, the voluntary pilots made little progress and had produced nothing meaningful to evaluate (CEP [Collingwood Environmental Planning], 2013; Evans, 2013), yet Defra was pushing forward regardless. Defra’s chief scientist, Ian Boyd, had reportedly been unimpressed with what they had seen in Australia, while Dieter Helm, chair of the government’s Natural Capital Committee, had urged caution in proceeding before a clear framework and strong evidence of success were in place (BES, 2013a; Evans, 2013c). In a public open letter addressed to Paterson meanwhile, representatives of three of the largest green professional bodies had also called for Defra to resist the ‘massively premature’ recommendations of the EMTF, reflecting rising anxieties among many environmental specialists (Hayns et al., 2013). In it, they expressed concerns that ecologists’ and conservationists’ worries had yet to be addressed, a growing fear that plans were being rushed forward at the behest of the business and development lobby, and doubts that the pilots could provide adequate evidence within their short timeframe to move forward with any confidence.

Despite these warnings, Paterson ordered his officials to press ahead and draw up a draft policy framework as soon as possible. Though delayed until after the summer (McGrath, 2013), an outline Green Paper was published at the beginning of September (Defra, 2013d). Though it had initially been billed as a White Paper, due to Paterson’s confidence that the policy would be seen as beneficial by all, it was later downgraded to a Green Paper on the insistence of his Cabinet colleagues, who rightly guessed it would be controversial (interview 5c). The Green Paper therefore was also intended as a public consultation document, and started a nine-week period, during which responses could be submitted. A more concrete policy document was promised for the New Year, but ultimately never materialised. Instead, the months following the release of the Green Paper were marked by heightened levels of contention, public debate and polarisation, which would only settle after Paterson’s eventual dismissal in July 2014.

5.3: The Green Paper and increasing polarisation of debate

The 2013 Green Paper laid out Defra's furthermost and detailed plans to date. Just as importantly, its overall tenor underscored the government's position regarding offsets, which would elicit as much reaction as the fine detail of the proposals over the next six months. Invoking the mantra of the UK's need to compete in the 'global race', Paterson's foreword very much set the tone: "Our economy cannot afford planning processes that deal with biodiversity expensively and inefficiently or block the housing and infrastructure our economy needs to grow" (Defra, 2013d, p. 1). The introductory pages laid out the parameters offsetting would need to operate in, making clear that no programme would be rolled out unless it was demonstrably "quicker, cheaper and more certain for developers", and in line with the RTC (p. 8). While the conventional environmental goals and criteria of biodiversity offsets were present in the text, the whole framework was caveated by this non-negotiable commitment to accelerate land development without additional costs being imposed on developers. To ensure this, the Green Paper also made clear the government remained in favour of a voluntary system, so that regulatory burden could not be imposed on businesses.

In terms of topics for consultation, the government's questions were wide-ranging, tackling many of the challenges described in Chapter 4, and presenting possible options on almost every aspect of the proposals. They covered technical components, such as Defra's metric, spatial and temporal factors, risk, and how offsets could be integrated into the planning system, as well as more detailed considerations regarding the scope and scale of the policy, and kinds of trades to be permitted. Institutional and governance arrangements were examined, including how to secure long-term management and protection of offsets, the distribution of implementation and oversight duties between different actors and bodies, and how to engender consistent application of appropriate standards while accounting for geographical variation of needs across the country.

On top of the actual options exhibited in the Green Paper, Defra (2013b) published a second impact assessment, for submission to the Regulatory Policy Committee. On Paterson's instruction, the economic constraints placed on the proposals had been substantially modified (interview 1a). Rather than a relatively simple calculation comparing the cost to business against the overall benefits to society, the Secretary of State demanded that both sides of the equation come out positive – i.e. offsets would have to save developers money, relative to current outlays on compensation. In October, the impact assessment was rejected by the RPC (2013) as 'not fit for purpose', citing lack of evidence for Defra's claims, and a judgement that even a fully voluntary scheme would incur administrative costs for developers getting to know the new system, meaning it would be subject to the 'one-in, two-out' rule of the Red Tape Challenge.

In public, meanwhile, reactions to the Green Paper were mixed. Developers and landowner groups welcomed the proposals with some caution, but were concerned about the system being overly complex, costly and restrictive (e.g. CLA, 2013b; HBF, 2013a). Others were openly hostile, accusing the government of efforts to privatise and 'put a price on nature', while giving developers a 'license to trash' (Carrington, 2013; Rincon, 2013). Following a first meeting of the Nature Not for Sale group,

convened in opposition to the first World Forum on Natural Capital held in Edinburgh, biodiversity offsetting was denounced in a statement signed by 140 local and international NGOs (Dearden, 2013; Mowat, 2013). Even the mainstream environmental sector, and professional ecologist groups who were broadly supportive of biodiversity offsets in principle, expressed a degree of alarm at the pro-development tone of the Green Paper, the speed with which Defra was now moving, and the department's apparent disregard for its own pilots (e.g. CIEEM, 2013; RSPB, 2013; TWT, 2013). Some were also concerned by the apparent influence of the Environment Bank, as a vested interest, in the policymaking process (Salvidge, 2014; Marshall, 2013a).

Over the coming weeks and months, a high volume of material was produced on the proposals, including technical and position papers (e.g. BES, 2013c; Howard et al., 2013), articles and blogposts (e.g. Avery, 2014; Mathiesen, 2013; Brennan, 2013; Howarth, 2013; Hill, 2013; Pape & Tyldesley, 2013), online petitions and so on, while expert debate took place in a variety of public forums (e.g. The Royal Society, 2013). Defra held roundtable discussions at its headquarters (interviews). In November in Parliament, the All-party Parliamentary Group on Biodiversity (APPGB) dedicated a session to offsets (King, 2013b), while the Environmental Audit Committee held a public inquiry (EAC, 2013b), inviting witnesses and written evidence on the issue at the same time as the Defra consultation. Speaking before the committee, Paterson reaffirmed his commitments to have concrete plans written up by the end of 2013, with necessary legislation in place before the next General Election. However, in reflecting on the findings of the inquiry, the EAC warned that the policy appeared open to abuse, that the metric was too simple, and that the government should wait until the pilots had been evaluated before making its next move. At the end of the year, the EFRA Committee (2013) added its voice to those calling for a slowdown and further deliberation on certain elements of the proposals. In part, this reflected growing worries about the impacts cuts were having on central and local government's biodiversity functions, as raised in ALGE's report on capacity and competencies in local authorities (Oxford, 2013; see also Early, 2013). As time went on, the debate failed to die down (e.g. Betts, 2014; Everard, 2014; Monbiot, 2014; Mowat & Anderson, 2014; Newey, 2014). By the end of the nine weeks, the consultation had garnered an unprecedented 500 submissions, highly unusual for a topic so highly technical, located in a somewhat obscure corner of land-use planning. It was clear at the time, and later confirmed in Defra's (2016) summary, that there was very little consensus, either at the level of broad objectives or fine-grain detail.

Apart from the problem of polarising disagreements between key stakeholders the government needed on board, Paterson was facing rising levels of criticism over his leadership as major flooding hit England (Carrington, 2014b) and low staff morale continued at Defra (EFRA Committee, 2013). Many of offsetting's advocates privately thought the Environment Minister a liability to the cause given his reputation and hostility to green groups. Specifically regarding offsets, Paterson had been attacked for appointing Andrew Sells, a former housebuilder, treasurer of Policy Exchange and strong supporter of offsetting as the new chair of Natural England, despite having no professional experience in the environmental sector (Monbiot, 2013; King, 2013c). In January 2014, he faced heavy criticism

after allegedly suggesting, in an interview with *The Times*, that ancient woodland could be offset using very high multipliers, despite Defra's own documents putting the habitat off limits as technically irreplaceable (Jivanda, 2014; see also Juniper, 2014). Meanwhile a steady trickle of controversial local cases, where developers had mooted use of offsets in their planning applications, had begun making their way into the national press, including the tabloids (Spencer, 2014; Marshall, 2013a).

By the start of 2014, there was no sign of the next stage of proposals promised in the Green Paper. The release of the results of the consultation was delayed too, which Defra said was due to the unexpectedly high volume of responses. Though the public debate and engagement went on, very few announcements came out of Defra on the topic, and it was not until March that an official response was made to the EAC inquiry (see EAC, 2014). While rejecting most of the committee's criticisms, Defra conceded that it should await the full evaluation of the pilots before taking any further steps (Evans, 2014). At the time, the policy was still widely anticipated to go ahead. At the CIEEM (2014) spring conference on offsetting for instance, a divided crowd of 200 practitioners from around the country gathered to consider the implications and challenges of the impending new system, where worries about regulatory capacity and expertise dominated discussions (PO2). The next month, the pilots officially came to an end, though nearly all had been recognised as failures long before (Salvidge, 2016). In May 2014, the evaluation was supposed to be published, but was then delayed (Salvidge, 2014).

5.4: The abandonment of the national level policy framework

At the beginning of June 2014, Defra hosted, together with the London Zoological Society, BBOP's 'To No Net Loss and Beyond' summit. Celebrating 10 years since the organisation's birth, the two-day event brought together 300 high-profile delegates from around the world (Vidal, 2014; BBOP, 2014), and coincided with the release of the European Commission's own biodiversity offsetting consultation. Holding the main event in London was partly meant to showcase the UK government's plans and commitment to developing a state-of-the-art offsetting system, with Paterson billed to give a keynote speech. Questions remained around both English and EU policies however, and over the longer-term prospects for offsetting worldwide, given the limited success evidenced on the ground (PO4). The event was preceded by a second 'Nature Not for Sale' counter-summit, bringing together local and international campaigners, activists and academics (PO3; and see FERN, 2014; Bell, 2014). On the first day of the BBOP conference, it was announced the Environment Secretary would be unable to attend (PO4). The next month Paterson was acrimoniously removed from his role in another cabinet reshuffle (Sparrow, 2014). Following his dismissal, the now former Secretary of State wrote a widely-read piece in the *Daily Telegraph*, in which he attacked what he called the self-serving and bureaucratic 'green blob', a "mutually supportive network of environmental pressure groups, renewable energy companies and some public officials" he claimed had undermined his leadership

at every turn and destroyed his reputation, for standing up to them in his efforts to improve the natural environment and grow the rural economy (Paterson, 2014)[53].

Activity on biodiversity offsetting had already slowed down considerably, and with Paterson gone rumours began circulating that the policy had been blocked by the Conservative party leadership and the Treasury, and unofficially shelved (Carrington, 2014d). In her early speeches, Liz Truss, the third and final Environment Secretary under the coalition government, offsets were never mentioned. The publication of the results of the Green Paper consultation and evaluation of the pilots remained on hold. Defra's only public engagement on the subject came in the form of a response to the EU consultation in December, which warned against any kind of standardised European approach, noted the technical and governance challenges of offsetting, and reiterated the UK government's concerns about regulatory burden on businesses (Defra, 2014b).

Questioned on the slow progress of the proposals by the EFRA Committee (2015) in the same month of December 2014, Truss said she was still waiting for the final evaluation of the pilots. The report had in fact been finalised by June (CEP & IEEP, 2014d), but was only eventually released in February 2016, along with a summary of the Green Paper consultation (Defra, 2016) and several other pieces of Defra-commissioned research completed by early 2014 (Duke & ten Kate, 2014; CEP & IEEP, 2013, 2014a). With the General Election of May 2015 fast approaching, it became clear that offsetting had been dropped altogether as a national policy (Bawden, 2015). As expected, biodiversity offsets were not part of the Conservative party's election manifesto, and the policy was not reignited following their somewhat unexpected return to power as a majority government.

As a final note on the policymaking history of offsets, it should be reiterated that although the rolling out of a national policy was abandoned in 2015, it did not mean the end of biodiversity offsetting in England. Biodiversity offsetting, as developed by Defra and the local pilots, was officially confirmed by the Planning Inspectorate as an appropriate tool of planning in 2014, consistent with national law and policy. As a result, the framework remains in online guidance attached to the NPPF, which means it can be written into local policy by LPAs, so long as it is interpreted to be in line with national documents, and used voluntarily by planning authorities and developers. Several of the pilot areas continue to use offsets as an option, and many others have since made moves to develop their own local programmes similar to the ongoing Warwickshire model (Environment Bank, 2016).

6: Themes of the policymaking history

In moving the thesis onwards to the in-depth analysis, it is necessary to highlight some key themes, moments and context which animate the case study, and mediate the dilemmas and tensions explored hereafter. The first is that the coalition government's moves to introduce offsetting were

[53] Paterson's removal was met with anger by many from the Conservative's traditional rural base (Cash, 2014; e.g. Booker, 2014).

overlaid onto a complex regulatory landscape of laws, policies and institutions at multiple scales. At the same time, that landscape was shifting. Under the previous Labour government, Defra was already firmly in the process of institutionalising an ecosystem approach into its policies and activities. The UK was widely recognised as a leading example of efforts to reconfigure nature conservation in this way, which emphasised the use of economic valuation and MBIs to meet ecological challenges. The attempted formalisation of an offsetting programme and broader natural capital agenda pursued by the subsequent Conservative-led government should be understood in this context, and seen as an acceleration of this process, under changing political and economic conditions.

Secondly, the narratives and rationales which emerged in favour of offsets by the Conservative party from 2009 resonated with many of those explored in Chapter 3. The attacks on the inefficiencies of a command-and-control planning system and overly bureaucratic environmental protections as impeding economic recovery and social prosperity, propagated by right-leaning think tanks and commentators, mirrored the right-leaning environmental backlash in the US during the 1980s. Similarly, the mobilisation of offsets as flexible solutions to these problems by proponents, with the promise of win-win market efficiencies in a time of squeezed public resources was crucial, while evidence of the compliance failures of the prevailing regime provided the environmental rationale for the policy proposals.

Thirdly, it is important to carry forward the implications of the combined programmes of planning reform, spending cuts and environmental deregulation as context for offsetting's development. The avidly pro-development tone of shifts in policy and guidance, together with the additional leverage given to developers, and retained by DCLG, over planning authorities, heavily conditioned what offsets could realistically achieve in practice. In particular, it is worth highlighting that the concept of no net loss would not easily translate into a requirement of planning consent, where competing obligations and duties would constrain what might be ruled as 'reasonable' in planning terms. Finally, Paterson's role should be emphasised, since it was his growth mandate, mediated by the strong arm of the Treasury in constraining the parameters of environmental policy, which accelerated and sharpened the underlying tensions and frictions of the policy, generating increasing levels of controversy and opposition from civil society.

Chapter 8: The policymaking landscape and appeal of offsets

Introduction

This chapter lays out the policymaking terrain and conditional consensus on which the UK government tried to establish its proposed biodiversity offsetting system in England. The government had, in a broad sense, some clear objectives it believed to be realisable. Its position was that a formalised offsetting programme could reconcile the demands of land development with nature conservation, by setting up a market in offsets. By bringing market forces to bear on mitigation and compensation for environmental harm, it was seen as plausible that efficiencies and absolute benefits could be generated in both domains simultaneously: accelerated land development combined with the delivery of more, higher quality conservation. By promising multiple benefits over simple trade-offs, the government was able to contingently attract interest from multiple, usually conflicting quarters. In constructing this win-win narrative, championed most enthusiastically by Paterson, the government was also able to draw active support from the business-led green economy lobby, together with other influential business-oriented groups keen to materially influence the creation of green markets and increased use of environmental economics in public policy.

To stimulate such a market, various options were open to the government. For offsetting's more conversant advocates, and in line with most of the policy literature reviewed in Chapter 4, the case for a strongly regulated compulsory system was compelling, as the most straightforward route to promulgating demand, simplifying enforcement of effective compliance, and ensuring consistency. However, the strictly discretionary approach taken by Defra reflected the government's unwillingness to regulate, as well as its distrustful attitude towards planning authorities. As shown in Chapter 7, the government was extremely reticent about imposing a mandatory system on developers, or to afford local authorities additional regulatory power over land use, on the basis that both were unacceptable burdens on business and impediments to economic growth. Given the parameters of the government's chosen path, and its determination to avoid giving too much control to local planning authorities, it needed to enrol and encourage meaningful participation from a range of groups with divergent interests. From the policymaking history constructed in Chapter 7, it was clear that the most important groups needed to operationalise offsetting were developers, landowners, conservation NGOs and professional ecologists.

The purpose of this short chapter is to give a broad picture of the positions these different groups occupied in relation to offsetting at the outset, as well as those of the government, the green business sector and local government planners and ecologists. This is done schematically through the table presented in Section 1, which attempts to synthesise, as far as possible, the roles and complex positions of the most important actors. It should be seen as a reference point for the deeper analysis of the subsequent chapters. Section 2 highlights some of the important overlaps evident from the table, as the basis for certain alliances to be formed, and the general – if fragile – agreement that developing a national programme was desirable in principle. Chapter 9 and 10 then provides in-depth

analysis of how this consensus fractured as the policymaking process progressed, revealing major fault-lines which ultimately proved irresolvable.

1: Hopes and fears in the nascent policymaking landscape

As illustrated by the 500 responses to the government's Green Paper consultation, a very wide range of groups engaged with the mooted introduction of offsetting, inputting in one way or another. A full overview is clearly impossible, and not necessarily helpful in distilling the reasons for the policy's demise. Focus instead is warranted on those groups the government moved to actively enrol, for the purposes of operationalising a national but voluntary system. The rough synthesis of these group's positions is laid out in **Table 15**, which draws from the various data detailed in Chapter 6. Each group is of course internally heterogeneous, and their positions complex and frequently rife with internal tensions and differences, some of which are noted in the third column. However, the overview below is an important starting point from which to analyse the areas of overlapping objectives and scope for policy articulation, on which implementation rested.

Table 15: Synthesised positions of core groups needed to implement the English biodiversity offsetting system

Group	Synthesised position on biodiversity offsets	Internal tensions, contingencies and differentiation
Central government	<u>Role and interests in design and implementation</u> Driving force behind national level proposals, with ability to make policy, pass legislation and impose regulation upon English planning system (though constrained by European and international laws as explained in Chapter 7) Led by Defra, but formally a government initiative, with significant input came from DCLG (housing); the Department for Transport and Department for Energy and Climate Change (infrastructure); the Treasury (economy); the Department of Business, Innovation and Skills (business regulation); and the Cabinet Office (government leadership) <u>Overall position</u> Biodiversity offsetting an opportunity to reconcile economic growth with environmental law in the arena of land use planning, conventionally seen as trade-off between land development and nature conservation Accelerating land development by simplifying, speeding up and reducing costs of negotiation and compliance, as well as increasing net developable	Proposals pulled in different directions by competing objectives and priorities of interested government departments Natural England another arm of central government with a core interest in offsetting, as state regulator responsible for nature conservation – able to push different position due to semi-autonomous status, publicly in favour of a mandatory system with increased resources for expert oversight in public bodies Position given political impetus and presented most forcefully during Paterson's tenure as Secretary of State at Defra

	area and unlocking land for much-needed housing and infrastructure development Meeting internationally agreed targets and national policy to halt biodiversity loss, by levering private finance for conservation activities and allocating resources strategically and effectively Economic growth as non-negotiable, and policy must categorically not impose additional costs or 'regulatory burden' on developers; biodiversity offsets will be voluntary Nevertheless, both economic and ecological objectives can be simultaneously achieved as a win-win by mobilising market efficiencies – as evidenced by established systems in US and Australia Offsetting constitutes one component of a 'natural capital agenda', led by Defra to mainstream nature's value at all levels of decision-making, aimed at making environmental policy more economically relevant and legible in economic appraisals, impact assessments and so on	
Green business lobby and think tanks	<u>Role and interests in design and implementation</u> Business-orientated lobby group providing intellectual and evidential support for government policymaking, influential as advisors presenting the 'business case' for biodiversity offsetting Material interests (commercial and political) in 'green economy' and wider use of environmental economics in public policy; influential but minority fraction of business sector <u>Overall position</u> Biodiversity offsetting significant opportunity for 'green economy' imagined in NEWP, and part of wider and transformative TEEB-inspired agenda to mainstream sustainability across all aspects of social and economic life and decision-making Offsets one of several financial mechanisms key to leveraging private investment for nature conservation, needed to meet biodiversity targets Failure of planning system partially result of overly complex rules and rigid bureaucracy; biodiversity loss also example of market failure – not valued because no price attached Offsetting an effective economic instrument for changing behaviour, by making nature's value visible and sending price signals to developers and businesses; flexibility enabled by MBI can accelerate economic development, increase net developable area and stimulate commercial activity	Includes lobby organisations, think tanks and policy consultants, with differing opinions on strictness of rules and necessary level of planning and regulatory oversight, and degree to which market needs to be shaped/restricted Largely populated by corporate and small-scale businesspeople, policy consultants, environmental economists, qualified ecologists; includes many former NGO officers and economists – many overlaps and partnerships with NGO and professional bodies

	in the countryside and green economy; additional cost of immediate compliance difficult to avoid, but not enough to affect level of development activity	
	Audit and use of hard numbers will create much more transparent system, enabling more straightforward monitoring, evaluation and auditing, even in context of strained regulatory capacity	
	Mandatory programme necessary to generate demand and supply for sizeable regulatory market and achieve benefits; simplicity, flexibility and right incentives key to efficient outcomes over strict or complex rules; certainty/risk most important aspect for businesses over immediate costs, clear objectives and level playing field created by regulation crucial for stimulating competition and innovation	
	Construct offsetting as significant opportunity for win-win outcome through efficiency of MBIs and mainstreaming 'nature's value' in decision-making; yet critical of government's 'growth at all costs' stance and narrow methods of economic appraisal; frame position as enlightened consensus view of environmentally-minded actors across civil society (business, NGOs, professional associations, individuals)	
Local planning authorities	<u>Role and interests in design and implementation</u>	
	Downscale from national policymaking, responsibility for local development and frontline implementation of offsetting; local government ecologists members of planning teams with main remit overseeing offsets, with requisite expertise and previous experience implementing PPS9 regime, though non-expert planners would also need to know the system	Includes all LPAs in England which offsetting would apply to, consisting of single tier and two-tier authorities, national park authorities, etc.
	Writing offset policies into local plans, consistent with NPPF and local conservation priorities, and in line with any national rules and guidance; creating strategic local offset plans; determination of planning applications through development control, where offsets would be negotiated and agreed; ultimate responsibility for monitoring and enforcing compliance	Views across LPAs far from uniform, contingent on various factors such as local priorities, uneven institutional make-up and access to ecological expertise and resources, biophysical and environmental contexts, etc.
	<u>Overall position</u>	Trained ecologists with very good technical knowledge; other planners lack basic understanding of mitigation policy
	Possibility of leveraging additional private finance to fill gaps in funding for existing and future local nature conservation strategies and activities, especially in moment of severe resource constraints and budgetary cuts	Most see merits in offsetting in principle, but many opposed to government's specific proposals; divergent views on degree of simplicity most appropriate; internal tensions around proximity of offsets to impact
	Chance to consolidate and simplify bureaucratic processes relating to mitigation and compensation,	

	through use of consistent and objective (i.e. quantitative) methods of impact assessment, allowing for streamlined auditing procedures Opportunity to reassert some control over local land use through ecological regulation, in context of planning reform and environmental deregulation programme, weakening bargaining power in relation to developers, and pressures from central government to deliver housing, infrastructure and growth Highlight bureaucratic strain offsetting would put on LPAs, in light of uneven levels of technical expertise and wider capacity problems; also stress complexity of articulating offsets with various and often competing economic, social and environmental policies, priorities and laws; potential misuse as 'license to trash' Effective system would need to be compulsory, adequately resourced at local level, with clear national rules, safeguards and guidance; offsetting should be plan-led, with local flexibility allowing for configuration to local context Offsetting constructed less as potential win-win, but as one regulatory tool which could tackle developers 'getting away with' insufficient mitigation measures; yet constrained by overriding economic development imperatives and need for balancing with other planning duties	
Developers	<u>Role and interests in design and implementation</u> Subject of any formal regime as potential buyers of offsets, legally responsible for impact on biodiversity through land development Commercially interested and politically powerful group, exerting influence over DCLG and the Treasury, particularly through the Home Builders Federation and other trade associations; respective though less prominent lobbying of DfT and DECC by transport and energy infrastructure developers <u>Overall position</u> Biodiversity offsetting as opportunity in some circumstances to increase speed and certainty of planning consent, enabling acceleration of development projects and realisation of development value Main concerns with current regime costly delays due to bureaucracy of compliance with European legislation, particularly protected species, and uncertainty over decisions; also inflexible command-	Includes a variety of developers, but most prominent in debates were large-scale housebuilders, energy and utilities companies, and mining and quarrying firms, with sector-specific positions on detail of offsetting system Variation of views among developers, some opposed altogether Most with very limited technical understanding of ecology or offsetting, tend to have no in-house expertise – offsetting viewed as very marginal issue relative to other areas of development compliance Mining and quarrying industry (represented by the Mineral Products Association) had unique outlier position, as more

	and-control approach taken by LPAs and Natural England Cautiously in favour of an optional and flexible system, to be used if and when offsetting could be cost effective and/or accelerate planning consents Worried about additional (and existing) bureaucracy, regulatory burden and cost without addressing main planning issues – offsets giving LPAs another tool to 'hold over' developers during planning process to dictate terms and extract planning gain or tax Construct offsetting as potentially useful tool to streamline land development, but with limited potential; possible burden on overly regulated development industry needed to deliver housing and infrastructure for society, whose commercial interests are to reduce and mitigate impact and improve green space onsite since it adds value to development	stringently regulated sector with respect to environmental impact of 'temporary' development – viewed themselves as potentially exempt, and/or as possible offset providers as owners of rehabilitated and enhanced former extraction sites
Landowners and farmers	<u>Role and interests in design and implementation</u> Needed as the primary suppliers in an offset market, providing receptor sites for ecological recreation, restoration and long-term management, for sale as credits to developers; experience with conservation activities on land through agri-environment schemes (yet very limited technical knowledge of offsetting) Principally large private landowners and farmers, but also including public (e.g. Crown Estate) and third sector landowners; politically represented most prominently through powerful landowning and farming lobby (Country Land and Business Association and National Farmers Union) with strong connections to Conservative party and considerable influence over Defra <u>Overall position</u> Biodiversity offsets as a significant opportunity for additional land-based income stream, potentially on marginal land alongside other farming and business activities Generation of private finance specific opening for conservation in period of fiscal austerity to replace declining levels of state funding Primary concerns regard private property rights, longevity of offsets and legal arrangements; also level of income and commercial viability of offsets; overly complex conservation work and bureaucracy of schemes, and articulation of offsets with existing agri-environment schemes	Extremely variegated opinions among landowners, with large proportion uninterested or opposed to offsetting – position here those of major representative bodies lobbying for a system which would appeal to relatively small section of membership Divided opinion between CLA and NFU whether offsetting should be compulsory – both opposed to additional regulation and cost, but CLA position that mandatory system necessary to create demand Conservation NGOs not included in this group, though some major landowners themselves

	Wary and divided over whether offsetting should be mandatory, but strongly opposed to any compulsion on landowners to become providers Rhetorically highly in favour of environmental markets and commercialisation of conservation, presenting landowners as willing private providers of public goods by improving countryside, but in need of compensation and incentives to absorb opportunity costs	
Environmental NGOS	<u>Role and interests in design and implementation</u> Multiple roles: Large non-profit membership groups, centred on general and specific environmental (and social) objectives; many conservation NGOs potential providers of high quality offsets as large landowners and managers with substantial conservation interests, expertise and experience; also key stakeholders commenting on planning applications with impact on natural environment, and in local partnerships involved in conservation planning Lack insider political influence on national level, but wield influence as 'environmental voice', expert stakeholders and government partners in nature conservation, and through public campaigning and lobbying, with implications for policy credibility and legitimacy; also partners in various green economy and green business coalitions <u>Overall position</u> Biodiversity offsets could help meet material organisational interests in funding for core environmental work during difficult economic period and declining state subsidies and spending for conservation Well implemented system could improve biodiversity outcomes of badly failing regime, through formalisation and standardisation of processes; metric could capture low level harm currently ignored Reservations over government intentions, regulatory capacity and effects of planning/environmental reforms, and declining sectoral influence in planning; technical limitations of tools also major concern Clear risks and limitations with offsetting, yet cautious support for strong mandatory system with strong standards and safeguards, based on strategic planning; but voluntary offsetting potentially disastrous in eroding existing protections Present NGOs as supportive of sustainable and appropriate development to meet social need, not	Varied opinions among environmental NGOs – most conservation NGOs in favour, some with less direct material interests more suspicious and opposed in principle to government proposals, painting offsetting more squarely as 'license to trash' or 'putting a price on nature'; yet acquiescence and participation of landowning/managing NGOs more important to government Some differentiation clear within large conservation NGOs (including membership) over principles and details of biodiversity offsetting proposals NGOs frequently interested in pulling metric in different directions, to more comprehensively account for specific aspects of biodiversity (e.g. particular species, transient populations, woodlands, brownfield habitat, insects, etc.)

	‘anti-development’; offsetting framed less as win-win, but regulatory tool with some limited potential, where design choices have significant trade-offs and risks, and process complex and full of dilemmas	
Professional ecologists	<u>Role and interests in design and implementation</u> Technical operators of offsets, undertaking biodiversity assessments, using the metric and carrying out environmental restoration and management; professionals working commercially as contracted consultants, ecologists working in-house for large construction/engineering firms, government departments and agencies, local government or third sector NGOs; academic researchers and natural scientists Not politically influential, but perspective represented and pushed by professional bodies (e.g. CIEEM and IEMA); also important for credibility of policy as technical experts and stakeholders with experience necessary for implementation; constrained by commercial interests and relationships with clients in many cases, with work dependent on construction activity <u>Overall position</u> Well-designed system could make contribution to addressing long-term biodiversity loss and habitat fragmentation – opportunity for standardisation and improvement of existing practices and assessment tools around impact mitigation and compensation Emphasise complexity of offsetting and need for ecological science to be at centre of policy design, and careful development of sophisticated tools and methods for counteracting uncertainties and risks; concerned about issues of technical feasibility of offsets and scientific, evidence-based integrity of any formalised programme, especially regarding uncertainties and limitations of restoration ecology and measuring biodiversity value (metric) Monitoring and enforcement crucial to address, connected to problem of limited institutional capacity and expertise; must be fully costed and resourced, impartially regulated with aid of trained ecologists and be based on rigorous assessments Some suspicion over government rhetoric around ease, effectiveness and speed of progress; reservations relating to past experiences of poor policy implementation Support a mandatory system, with strict rules, safeguards and consistent standards developed in collaboration with ecologists; suggest offsetting will	Wide range of opinion across sector for and against offsetting, with significant cleavages over technical feasibility (some see deep conceptual flaws), effective safeguards and trust in government intentions Ecologists working for developers most important, but differing experiences from professionals working with or for other stakeholder groups (central government, local government, landowners, and NGOs) Many connected to parts of green business lobby, mediated by professional bodies

	require iterative improvement over time, but environmental outcomes must be priority; voluntary system extremely risky and open to exploitation	
	Constructed as potentially useful technical and procedural device for mitigating environmental impact; framed as highly risky, with main focus on scientific integrity and precautionary approach over economic efficacy, and trade-offs likely over win-win results	

Sources: documentary, interview and participant observation data overviewed in Chapter 6

2: Overlap, potential alliances and a fragile consensus

2.1: Overlapping interests and the promise of win-win

Having surveyed the policymaking landscape outlined above, it is clear that there were considerable overlaps in the interests and goals of all main players needed to implement the policy, and scope for practical alliance-building in favour of offsets. For instance, the government's aim for offsetting to accelerate development was consistent with core objectives of developers and green economy advocates, constituting a potentially strong coalition from different and influential elements of the business community. There was also substantial agreement between green economy advocates, the professional ecologist bodies and many NGOs. These groups, already well networked through existing partnerships, were of the view that done well, a formal offsetting system could potentially improve the environmental outcomes of a mitigation regime which was evidently failing. The generation of finance meanwhile appealed to NGOs and landowners seeking sources of income for conservation work, as well as to local government, in the context of constrained or declining state (and private) spending at different scales. On this basis, the government had some confidence that it could articulate a broad consensus around the desirability of implementing offsetting, through which it could enrol the relevant market actors, technical expertise and the participation of conservation organisations. The active presence of these latter groups would furnish the programme with both quality assurance and legitimacy, and help neutralise their reservations and possible opposition. In doing so, it hoped a functioning market could be established in which all the major groups had a stake – a formalised system which would benefit from an incentive-based structure and flexibility, while effectively devolving responsibility away from national and local government.

If the government was willing to simply impose a new system, with rules it deemed sufficient and appropriate to meet its aims, operationalising offsetting could have been relatively straightforward. The necessary market actors, technicians and regulators could be enrolled through a mixture of placation and coercion. However, since there was an acute reluctance to regulate business or devolve more power to local authorities, persuasion and a considerable level of consent would be required to articulate the system in practice:

> The system must improve the process of considering biodiversity and be attractive to developers and offset providers so they are encouraged to participate. At the same it must be easy for the public to understand so that they have confidence it is protecting biodiversity (Defra, 2013d, p. 8).

While recognising potential costs of entry and setup, Defra hoped to stimulate a sufficiently sized market to "encourage competition and bring in offset providers which would be expected to drive down costs" (p. 14). In creating the necessary incentives, the government relied heavily on the idea, backed by its business-orientated allies (see for instance Environment Bank, 2013a; Newey, 2012; Caldecott & Dickie, 2010), that conventional trade-offs could be reconciled through market efficiencies. As one representative put it: "we've got all this fuss about not building enough houses. The *biggest* economic benefit is that actually, there will be more people building houses as a result of this policy" (interview 6b). The EMTF were among the most influential:

> We need a system in which unavoidable net impacts on biodiversity of new development are more than compensated by restored and created habitats elsewhere through an efficient market. Designed correctly, a nationwide system of biodiversity offsetting would save developers time and money through reduced risk and uncertainty and a more streamlined planning approval process, as well as offering reputational benefits and more efficient and valuable net developable areas (2013, p. 10).

The Aldersgate Group struck a similar note:

> The proposed system of offsets can increase the value of land use in the UK in two ways. Firstly by ensuring the biodiversity costs of land use are taken into account it can encourage more efficient use of land and avoid damage to more precious natural environmental features; and secondly, through offsets that increase the biodiversity value of the land used to compensate for the residual damage. The end result will be higher-value uses of land (per ha) for development, and higher value to society from remaining areas of natural habitats (2011, p. 15).

According to one official, when offsetting was advanced under Paterson from late 2012, it was on this terrain that offsets were positioned:

> He saw offsets as a potential instrument in that space, in that if offsetting could help planning decisions around biodiversity happen more efficiently and more quickly, then you might be able to bring development forward more quickly, but also get an environmental gain. … [O]ur reports from America say [offsite compensation] tends to be of higher quality, better managed, better connected as well, because you're not just devoting a small corner of a developed site to compensation. It looked like, to him at least, a potential win-win (interview 1a).

When Defra released the Green Paper, the government's ambition in this regard was laid out according to strict criteria offsetting would demonstrably have to meet. While claiming in the foreword that use of the instrument "guarantees" no net loss of biodiversity (Defra, 2013d, p. 1), it was clearly stated the proposals would not go ahead unless compliance was made "quicker, cheaper and more certain for developers", in line with the government's commitments "not to increase net burdens on housing developers over the Spending Review 2010 period; and to one-in, two-out on all regulatory burdens" (p. 8). It was under these stipulations that Defra had to either create the incentives, or hard sell the idea that with stakeholder acquiescence and active participation, biodiversity offsetting could

enable more, cheaper and faster land development on the one hand, and generate more, higher quality compensation on the other. Though sceptical the necessary economies of scale would be possible through a voluntary approach, offsetting's business supporters were confident the advantages would nonetheless soon become tangible once a consistent and accepted framework was in place, leading to a material convergence of interests on which a stronger system could be built (interviews 6a; 6a).

Yet the question remained whether such an accepted framework could be constructed on a voluntary basis, and configured in such a way to induce a critical mass of active participation to test whether the presumed benefits would emerge.

2.2: Benefits for all?

Of the major groups detailed in the table, it is clear that there was little opposition, in principle, to a national offsetting programme. Among those who would be required to implement and participate in any reconfigured compliance regime, each viewed offsets as a tool which could be mobilised to meet certain sectoral objectives, and was willing to engage in the policymaking process for one reason or another. As explained in the previous chapter, the CLA (2009) had, on an organisational level, already demonstrated enthusiasm for the wider use of environmental markets, including offsets, as an income stream for the provision of public goods on private land, in a context of constrained public resources:

> Even if the budget for the new CAP is only marginally less than the current one, it is unlikely that there will be sufficient public funds to meet all of society's aspirations in the long term. One of the most straightforward ways of levering in more funding is through ecosystems markets by which those who benefit from the provision of environmental services contribute to the costs (CLA, 2013a, p. 1).

Farmers and landowners had some experience with receiving money for conservation through agri-environment programmes, and were open to other income-generating schemes if they were equally or more attractive from a commercial perspective, and would not involve large opportunity costs (interview 8a). NGOs and local government were enticed to varying degrees by the prospect of new income and funding streams, frequently citing ongoing pressures on public, but also private, sources of conservation finance:

> my view is very much that biodiversity currently is not treated well, and if there was an opportunity to get money from developers which we currently haven't got, it is something that should be considered (interview 2c).

Offsetting's more ardent advocates pushed the point forcefully with regard to national conservation commitments:

> If you look at the work from the Lawton report, all the *Biodiversity 2020* targets, we need £600m a year just to deliver those; a *year*. And actually, to go *beyond* that, you know, stitching the countryside back together, you need about £1.2bn. Offsetting is the *only financial opportunity to do that* (interview 6a).

The EMTF argued offsetting would:

> revolutionise conservation in England by delivering restoration, creation and long-term management, of in excess of 300,000 hectares of habitat over 20 years; … [and] stimulate the competitive growth of businesses, especially rural SMEs, in delivering and restoring natural habitats; and also of various intermediary services, estimated to be worth at least £500m p.a. (2013, p. 10).

Though views in the sector differed, conservation NGOs had been constructively involved in talks with Conservative shadow ministers since 2009. Some saw offsets as one possible mechanism for filling existing and future resource gaps, as illustrated in the RSPB's (2010) *Financing nature in an age of austerity* report, published soon after the new government took power. Together, there seemed ample scope for enrolling groups who would offer receptor sites or actively facilitate the process.

For many local government ecologists, consultant ecologists and conservationists, concerned with environmental outcomes but whose experience of the existing compliance regime was of persistent failure and dysfunctionality, the promise of standardised procedures and assessment methods, and simplified audit was enough. One pro-offsetting ecologist typified the appeal to many across these groups:

> in the absence of [my dream outcome] at least if you have a requirement for certain developments to use a metric to show what you've done and so on, that brings some transparency in (interview 4a).

An NGO officer explained their view that: "if we got the structures in place, we would protect a lot of other things [currently ignored]. Without those structures, some of these really bad decisions will keep going" (interview 5c). The benefits of quantification, with which transparency was generally associated, appeared to be the feature of offsets seen from across the spectrum as offering a concrete improvement on the *status quo* (see also CEP & IEEP, 2014d). The establishment of new standards of measurement had considerable pull for local government ecologists, ecological practitioners and conservationists, to both support offsetting politically and involve themselves in helping the government refine the mechanism's design and calibration.

Among actors more sceptical or resistant – primarily developers but a significant portion of other stakeholders too – there was a wide expectation that some kind of formalised offsetting system would be rolled out regardless of their objections. They therefore felt either the need or obligation to influence the process with their own interests and goals in mind. Developers wanted to minimise offsetting's regulatory impact on their projects and push the government to "do it in a way that doesn't inhibit the supply of housing" (interview 7d), but also saw in offsetting an opening to push for reform of protected species regulation and environmental assessment more widely (interviews 7a; 7c). Some conservationists initially viewed their participation in part as necessary damage limitation, both in the system's design and implementation (interviews 5c; 5d). For ecologists, according to a senior officer of one of the major professional bodies:

> I think the mood of our members and profession is: 'Well, if it's going to work, surely we're the best placed to make it work'. And it's no good really just saying we don't like it, so we're not going to be involved in the debate. We really need to be in there, influencing (interview 4b).

Once the programme was established, consultant ecologists would in any case face substantial commercial pressure to offer offsetting services, while local authorities would be compelled to put policy or guidance in place. Regardless of their motivations, actors in almost every group perceived some kind of pressure to engage in the policymaking process, such that implementation would not cause them more problems or lost opportunities in the future.

2.3: Divisions and fault-lines

Though the various factors outlined above offered extensive scope to enrol different groups, the challenge the government faced was building a broad consensus among them. Despite a seeming willingness, if not enthusiasm, of all the main parties to be involved, there were also significant cleavages under the surface, clearly shown in **Table 15**, surrounding questions of scope and strictness, the longevity of offsets, its cost to developers, the need to invest in regulatory capacity, and so on. It was clear different stakeholders held quite entrenched views on certain aspects of biodiversity offsets, which if unaddressed, would fatally compromise the stated goals and appeal of the policy from their perspective. In addition, there were significant internal frictions and tensions to play out, and a wider set of perspectives and forces to account for. It is worth noting too that there was active opposition to the policy from different quarters at a relatively early stage. This came from many developers who were hostile to what they saw as the inevitable costs of additional compliance requirements (interview 7d), as well as some environmental interests disputing the principle and/or technical feasibility of 'trading' biodiversity (Betts, 2014; FERN, 2013; King, 2013a). Though not an immediate problem for the government in terms of progressing the policy's design, these contrasting positions would come to frame an increasingly polarised public discourse around offsetting, increasing the risk of reputational damage for those participating, and shifting the dynamics of the policymaking landscape. Friends of the Earth was the most high-profile NGO opposed to the government's proposals (FoE, 2014), but it was clear through attendance of policy-focused events (PO1; PO2; PO3; PO4) conservationists and trained ecologists were deeply divided on the issue. At the 2014 CIEEM spring conference for instance, a show of hands split those present in half, between those for and against offsetting. By delving further into the detail of these differences, as they unfolded in certain moments of contention in the policymaking process, the next two chapters reveal the depth and growing entrenchment of these fault lines. The final chapter then reflects more deeply and theoretically on why these disputes proved so hard to resolve.

Chapter 9: Political calculations – valuing biodiversity and determining equivalent gain under the English offsetting proposals

Introduction

This chapter provides an in-depth analysis of the debates which animated efforts to construct appropriate technical instruments for use in the government's proposed system. As shown in Chapter 4's literature review, a variety of technical questions have frequently been at the centre of conceptual debates about biodiversity offsetting, with much contestation over the merits and limitations of particular forms of measurement, and the feasibility of delivering and demonstrating equivalence of loss and gain. The issues discussed in that chapter were ever-present in the English case. So were familiar tropes regarding the virtues and difficulties of quantification, as well as the dangers of commodification. As shown in Chapter 8, the promise of a consistent system of quantifying biodiversity impacts was the single most unifying component of a formalised offsetting programme among core stakeholders. However, as explored in this chapter, deliberations over the precise technical aspects of offsets revealed deeper fault-lines and dilemmas under this discursive optimism. Even if quantification was viewed as desirable, exactly what should be counted, and by which methods, were considerably trickier subjects. Political questions always bubbled under the surface, since it was recognised that what was measured would necessarily mediate whose interests were served. As will be shown too, design-stage disputes over what would be ecologically and economically feasible in terms of conservation gain demonstrated the role of power even more starkly, in arbitrating whether no net loss was a reasonable or realistic objective for offsetting.

Chapter 9 proceeds in three parts. Section 1 explores debates around the metric Defra created for the pilots, later approved by the planning inspectorate as an appropriate tool under NPPF. It looks at how certain interests pushed for other aspects of biodiversity to be measured as the government tried to secure consent, various complaints over the metric's crudeness, and the pushback from the government and its green business allies against measures which might undermine market liquidity. Section 2 follows on by considering calls from ecological experts for the standardisation of more precise assessment techniques, to improve the accuracy of information underpinning the metric's calculations, and the government's reticence to impose methods which might prove costly to operate. Section 3 then examines how conservationists and ecologists in particular pressed, with little success, for a more precautionary approach to offsetting, fearing that the government was being overly optimistic about the ease with which restoration could deliver equivalent ecological gains. Section 4 then concludes the chapter, highlighting how the more-than-technical dilemmas over design, and tensions between ecological and economic concerns, were deeply entwined with questions of power, and could only be resolved through political and institutional means. Chapter 10 then considers the institutional and political economic challenges which would mediate these trade-offs through planning.

1: The metric and measuring biodiversity

1.1: The power of numbers: communication and simplicity

The centrepiece on which Defra's proposals turned was the creation of a standardised metric for measuring biodiversity value. For some, it was quantified measurement which fundamentally defined offsets and made the policy worth pursuing, far more importantly than any market element the government hoped to operationalise. Even if it was just a single component, it was widely recognised that without a metric "that everyone would agree to gather around … it would be really hard to get anything off the ground" (interview 4a). It would also be essential for market functionality, as highlighted in a report produced by eftec and Climate Change Capital:

> The creation of a common unit of account or 'currency', with established equivalences or 'exchange rates', for biodiversity credits will be essential for attracting investment by creating a deeper and more liquid market than would otherwise have been in the case (Caldecott & Dickie, 2010, p. 6).

Helpfully for those in favour of offsets, quantification, as enabled by the metric, was viewed across the spectrum as a positive innovation. Interestingly, few saw the metric as an uncontroversial and complete measure of biodiversity value, but rather an improvement on the *status quo*. The Environment Bank's chief executive Tom Tew, for instance, questioned as part of the EAC (2013a) public inquiry, explained his organisation's position:

> no one is making even the crudest value judgments at the moment, and that is where the system is failing. Much of our environment's death by a thousand cuts is happening because planners do not have the tools to make even simple value judgments. The offsetting metrics are simply a tool to allow planners to do that (p. 17; see also Hill, 2013).

This of course spoke to the environmental rationale of offsets, with the metric enabling low level biodiversity loss to be counted. In terms of conservation, one of the major benefits regularly identified with consistent quantification was in providing "a basis for monitoring follow-up, which might be quite difficult to define otherwise" (interview 4a). Going forward, a standard metric was envisaged as "allow[ing] offset schemes across the country to be compared and evaluated, and improvements made to the offsetting metric over time" (BES, 2013b, p. 2). Typically, pilot leaders saw quantification as aiding their negotiating position with developers:

> the metric is quite simplistic and mechanistic, but it allows you, in black and white, to plug some numbers in at the start and get a figure out at the end, which should hopefully remove [some of the] uncertainty and the subjectivity. … [I]n terms of being able to say, 'Well the habitat and site is worth this, and your mitigation is worth this, and therefore there's a shortfall of that, which you therefore have to provide compensation for,' potentially through offsetting, I think would be very useful (interview 2b).

The metric gave something consistent, but equally appealing was the communicative power of numbers: "You can't design a perfect metric, but at least you will have *something* that will mean a clearer part of the discussion" (interview 10a). Another LGE drew similar benefits:

> because we had the *option* of offsetting, we *could* run the metric. I think what it gave us, was that we could *show* developers what impacts their masterplans might have on biodiversity. I think that *did* in some case mean that the applicant – the developer – did change what they were doing onsite. They did change their masterplans to reduce the impact on biodiversity. I think that was actually a useful outcome of being part of the pilot (interview 2c).

Though it was widely agreed that the metric was superior to the highly subjective qualitative environmental statements of the prevailing system, the advantage from quantification tended to be viewed in terms of the simplicity of numbers over their precision. Defra's hope was that the metric would provide "a framework nonexperts can use" (2013d, p. 3), and was one of the things the evaluation concluded had been successful during the pilots (CEP & IEEP, 2014d).

As explained in the previous chapter, the presumed benefits of quantification were a crucial point of consensus, where both development and conservation interests appeared to cohere. For the government, development and green business interests, who wanted to accelerate and reduce transaction costs during the planning process, clarity and consistency were key, and the supposition was that quantification would engender a more objective, and therefore quicker and smoother, negotiation process. The government hoped the metric could make compliance procedures "less of an administrative burden" (interview 1a), since it would allow "the compensation requirement to be quickly calculated, rather than expensively negotiated on a case-by-case basis" (Defra, 2013d, p. 3; see also EMTF, 2013, p. 10). John Slaughter, a senior officer at the Home Builders Federation (HBF), explained that developers saw potentially how:

> an agreed national approach and metric that all parties can use where relevant would actually bring real advantages in terms of clarity. … We are looking very much at the potential for this both to add consistency and to speed up the process, which would bring cost benefits for the industry if we can achieve that (EAC, 2013a, p. 4).

Whether this was a reasonable assumption was another matter, and the experience of the pilots suggested that the metric itself had no noticeable effect on the speed of planning consents (CEP & IEEP, 2014d).

1.2: Too crude?

Despite the common ground, the design of the metric did prove contentious. As outlined in Chapter 7, Defra (2012e) opted for a metric modelled on the habitat hectares methodology used in the state of Victoria, Australia, using a matrix which involved multiplying habitat distinctiveness by condition by area to calculate a site's value. As shown in Chapter 4, the choice of currency necessarily excludes certain aspects of biodiversity, and the metric's simplicity was heavily criticised in subsequent discussions. At one end of the spectrum, some viewed the metric as fundamentally flawed. One critical consultant ecologist was far from untypical in warning:

> [W]hen I see something that is *inherently complex*, being reduced to something … [that] simple, I get very worried. Because *inherent* complexity means that really if you start making it simple, you're going to take important pieces out of the whole model (interview 4d).

While sceptical ecologists were joined by NGOs opposed to offsetting in general arguing for instance that: “the current metric would undervalue important sites or allow inappropriate trading of habitats” (FoE, 2013, p. 5; see also FERN, 2013), the substance of their criticism was widespread even among supportive groups. It was also borne out in practice. One pilot leader, whose initial attraction to the scheme had been partly motivated by local development pressure on arable land on the urban fringe, quickly became aware that: “While [the metric] works in some areas and some habitats, it *doesn't* work terribly well for farmland species and habitats, which was an issue for us” (interview 2c; also 2b; 2e). There was broad agreement among groups with ecological expertise that the metric required considerable refinement, if it was to avoid certain perverse outcomes and controversies when implemented. CIEEM identified several limitations in their consultation response:

> In particular we would be keen to see the metric take account of: mosaic habitats that are valuable because of the heterogeneity that they provide; habitat connectivity; and ecosystem services including … social and cultural aspects (2013, pp. 4–5).

Recognising that offsetting would only value what it measured, different actors attempted to pull the metric in different directions to meet particular interests or challenges they considered important.

The absence of a way to account for species animated many of the debates. Developers for instance were insistent that this needed to be addressed. One industry representative explained how part of the impetus behind offsetting come from various developers “bending the Treasury’s ear”, and Osborne’s subsequent intervention into the implementation of the Habitats Regulations (interview 7e). As one housebuilder put it, if the policy’s purpose was to accelerate land development, there was no point to it unless it put a clear value on protected species such as newts, bats and badgers: “everything else is secondary” (interview 7a). Apparently at the behest of Paterson (interview 9c), Defra obliged:

> Developers often face particular challenges in dealing with protected species especially when they are found unexpectedly on a site late in the development process, often leading to long and expensive delays. … The Government therefore intends to apply offsetting to protected species as part of any wider biodiversity offsetting system (2013d, p. 18).

Though the move piqued the interest of developers (interview 1a), the manner it was framed to tackle specific species, which developers found troublesome in moving their projects forward, such as great-crested newts, proved extremely divisive (interview 9c). Nevertheless, while several ecologists expressed scepticism about the scope for practical incorporation of species in the metric (interviews 4a; 4c), other environmental interests did see the habitat-based metric as inadequate:

> What people term as habitat – and basically by that they mean vegetation cover – is a proxy. It's a sort of indicator for a lot of species … but it doesn't embody everything. … I'm convinced there do need to be some additional safeguards for species … and it's a question of looking for the species which aren't going to be safeguarded by the habitat, and working out what you'll do with them. So it is essential that it's done (interview 4e).

The RSPB (2013) was particularly robust in its response on the issue of species, as were other NGOs such as Buglife, which emphasised its worries regarding invertebrates:

> species require specific and particular habitat conditions, often at a very fine scale. These can be created though aspect, geographical location, soil biology, past uses of the site etc. For some species, such as invertebrates, a formula based simply on habitats will not automatically assess the original habitat's complexity or structure and translate it into the new area of habitat (2013, para. 5.1).

For conservation NGOs in particular, the integration of species was not about making offsets more fungible, but rather more complex. If the government and developers wanted to incorporate protected species, they were only likely to receive consent from environmental interests if the metric was made far more sensitive and detailed, such as the use of habitat suitability assessments (see Howard et al., 2013).

The case of species was illustrative, but several other debates around the metric's design followed similar patterns. Its inability to measure and protect very high 'potential value', related to complex hydrology or soil composition, was criticised (interview 5d; see also BES, 2013c). The matter of ecosystem services was regularly raised, though they were widely regarded as impractical to incorporate, at least in the medium term. Yet it did raise questions over how social considerations, values and equity would be dealt with under the proposed system, including locational proximity of offsets to impact and access to nature for local communities. However, by dismissing these challenges from discussions about the metric's design on the basis of simplicity, they were simply displaced to the realm of planning, which the government wanted to avoid as far as possible. Ecological concerns were also raised over the metric's lack of sensitivity to context. While the government claimed 'net gain' could be achieved through consolidated offsets adding to the ecological network (Defra, 2013d, p. 3), LGEs noted the metric had no way of measuring the fragmenting effects of development impact on the connectivity of existing networks, which would ultimately lead to cumulative losses (interviews 2b; 2c). As one ecologist explained:

> The other thing that's missing from the metric – and they know this perfectly well – is that spatial configuration is really important. Things like hedgerows, or whether your nice chalk-land field is next to another one, or just surrounded in a sea of arable, is going to make a big difference to how important somewhere is for biodiversity. So you've got to somehow factor in those spatial aspects, which currently the metric doesn't do. You could quantify it and put it in a metric, but probably you would just set conditions around what constitutes a suitable context based on the context that's been lost. So it would be a step in the logic and the decision-making, and around the design of the offset (interview 4a).

Comments like these highlighted the need for either more complex metrics, or at least for its validation to be mediated by more proactive ecological planning on a larger spatial scale, with comprehensive data about the surrounding area.

The dilemma for policymakers in moving the proposals forward was apparent in the findings of the Environmental Audit Committee's in late 2013. One of its main recommendations was that the metric needed to more adequately reflect ecological complexity (EAC, 2013b), based on the evidence it had gathered from key stakeholders through its public inquiry. For offsetting to do what developers wanted, they said the metric needed to be simple and understandable, but also to produce "unambiguous results" (interview 7a):

> We support the use of a metric in principle, but cannot accept the proposed Defra metric and procedures until they have been tested more thoroughly in the pilot projects. We consider it likely that the pilot metric is overly simplistic for the determination of no net loss (Energy UK, 2013, p. 2).

Given the difficulties of quantifying ecological value uncontroversially, this presented a considerable challenge. While the government wanted the metric to be kept as simple as possible, it was clear there was substantial disagreement over the appropriateness of its detailed features. Without widespread consent, its validity was likely to be challenged in practice, whenever its design limitations produced results unacceptable to one group or another. Since its publication in guidance, and despite its infrequent use, the metric proved controversial on a number of occasions and resulted in disputes in practice as well as theory (see for instance the case study in Carver, 2015). One housebuilder found their one experience with the metric particularly egregious. Having been told they would need to pay for offsite compensation for one development, they claimed that despite proving the initial calculation had been incorrect, when it was rerun the numbers were changed to produce the same result:

> the credits were open to manipulation, and the whole thing felt very sour to us … we walked away feeling that the money was pre-decided, to pay a private company to do work on land we had no control of, and calculation was manipulative (interview 7c).

Across the spectrum, interviewees seemed to suggest that the metric actually concealed the subjectivity of underlying data, which did not provide enough precision to significantly reduce the risk of frequent poor judgements and disagreements in planning. In the end, Defra largely dismissed the committee's suggestion, defending the metric's integrity (see EAC, 2014). Yet its reluctance to 'overcomplicate' was heavily mediated by its desire for the metric to facilitate trading to realise efficiency goals:

> [Biodiversity] is not so readily tradable and exchangeable, so you need to have slightly arbitrary rules where you decide what's comparable in biodiversity terms, to try and keep your market as simple as fluid as possible. … The less fungible you make your credits the tighter your market becomes, and the more risky your market becomes, because there's greater chance that it won't be able to meet demand (interview 1a).

This revealed a further cleavage between different groups' understanding of the purpose of quantification and simplicity. While nearly all the main groups agreed that quantification was a useful tool for translating and communicating value, environmental interests tended to be more sceptical of its mobilisation as a device which showed the underlying commensurability of different habitats, and enabled out-of-kind trading. Such reservations were only heightened by the government's apparent overriding objective of lubricating the planning system through offsetting first, and much more hands-off attitude to addressing environmental challenges in the medium to long-term, once the market was established.

2: Ecological assessment and data

2.1: Outdated assessment techniques and poor quality data

Many of those with ecological expertise who had doubts over the robustness of the metric were informed too by their experience, either as consultants, in local authorities or as third party stakeholders working on planning applications. They suggested that more attention needed to be given to the quality of information inputted into Defra's calculative matrix, which at present remained highly subjective, because of the imprecision and subjectivity of assessment methods used in practice. One pilot leader described some of the problems encountered in practice in generating and validating objective data about a site:

> it's sometimes surprisingly difficult to categorically state what an area of habitat is and what condition it's in, especially if it's sort of a mosaic of habitats, which is often the case on a development sites where perhaps it's a piece of land which has effectively been abandoned for the last ten years. … [Y]ou can't just say it's a piece of meadow, because it's scrubbed over in places, and perhaps there's some damp depressions in other places and that sort of thing, so it's not always black and white (interview 2b).

The metric's condition assessments were even more problematic:

> we're using the Higher Level Stewardship … Farming Environment Handbook, which is obviously related to agri-environment schemes. It allows the assessment of condition for habitats which you would expect to find on farmland, but, for example, it doesn't cover things like open mosaic habitat on previously developed land, which is a UK BAP habitat … and obviously post-industrial habitat tends to be under quite a lot of pressure from development. … I would hope if offsetting is rolled out more widely, they will develop a bespoke condition assessment tool for *all* the habitats you might expect to come across in a development context (interview 2b).

Several ecologists talked about the limitations of outdated yet prevailing methods of data collection methods. One consultant went into detail about the ambiguities of the entire process, which could easily lead to inaccurate valuation:

> [I]n principle, it still comes down to a basic formula, which is, you know, area of habitat *x* is considered to be distinctiveness *y*, times by condition *z*, gives you your habitat hectares … and you can fiddle with it, or if you can't fiddle with it, you can make those numbers fit what you want. The way that we record habitat condition is very woolly, and you end up with three grades or whatever it might be. Well, *one* grade on habitat condition, if it's not very rigorously recorded, can make an enormous difference to how much you recreate. And it's the same with area. Habitat *areas* are quite difficult. I mean, an area is an area. It's what it is on the map, but actually the boundaries of individual habitats are very woolly. And some of the systems we use for habitat classification are *really* flaky, past their best. So Phase 1, the sort of basic standard of habitat survey that we use, developed by JNCC in the 80s, early 90s maybe; you're meant to go around colouring bits in with your pencils, and you overlay scrub with bits of grassland... and anyway, it just doesn't *work* now. To my mind it just isn't fit for purpose for offsetting, because it's just not accurate enough. You can end up with about six different types of grassland, with a different person on a different day. If it's windy and rainy in October, you go to a really nice grassland and only record five species of grass, and end up demoting it from something really quite good, to something quite poor. The same ecologist, on the same patch of ground, on a different day, might record it as a completely different habitat. So that's where... I suppose it's *unfair* to say that you would fiddle with the numbers in a kind of... it's not cheating necessarily. I don't mean directly manipulating the figures to suit what you need. I mean more that the systems we have for recording habitats

> and habitat condition are *so* subjective, that that subjectivity means that you *can* end up with a lot of error. In theory you're meant to account for that by being precautionary. As in, if you have subjectivity in your approach, or your baseline surveys are constrained in any way, then you're meant to overcompensate, but there's kind of no mechanism for overcompensating. It's not in a developer's interest to overcompensate for something (interview 4c).

While some LGEs interviewed (2a; 2c; 2e) had access to good quality and regularly updated local environmental records, they all noted this was highly unusual in England. The vast majority of planning authorities would mostly have to rely on data provided by developers and their consultants. The quality of this data was frequently noted as poor by LGEs and conservationists involved in planning, and consultants themselves admitted how commonly they were under direct or indirect pressure (for instance through restricted access or time) from clients to minimise the magnitude of likely impact in their reports (interviews 4a; 4b; 4c). Even if there was widespread agreement that quantification was a good thing, it did not translate to consensus over what was needed to generate credible and unambiguous numbers.

2.2: Standardising advanced assessment methods?

The adequacy of survey methods remained on the fringes of the public debate around offsetting. Yet it was clear that in many ecological experts' minds, the issue influenced a lack of confidence in the robustness of the metric, since the entry of subjective, possibly skewed data into a crude metric would be to amplify inaccuracies. To tackle the ambiguities underlying the metric's quantitative calculation, there was some consensus among these groups that more advanced assessments and complex analysis of sites would be necessary. This, they said, would better reflect ecological complexity, while reducing the subjectivity and variation of assessment data, and therefore, scope for disputes and poor decisions:

> It's the in and out stuff. What I was really keen to see was the subjective nature of some of the quality assessments getting removed. Because it is too subjective. Again, years of experience … [y]our condition analysis is not my condition analysis. … [W]e could reduce the level of subjectivity that goes in, by making it a more complex analysis, rather than going in and doing a Phase 1 survey. A lot of EIAs do Phase 1s *only*, rather than doing Enhanced Phase 1, Phase 2 or really proper NVC [National Vegetation Classification] (interview 5c).

Many possible methods, both existing and emerging, were suggested by interviewees, which were said to be more detailed, precise and appropriate than Phase 1 surveys and the HLS condition assessments[54]. CIEEM (2013, pp. 12–13) expressed its desire to be actively involved in establishing more rigorous and standardised tools for offsetting, and there was ongoing discussion on the pages of its in-house magazine *In Practice* over the development of new instruments for offsets (Edmonds et al., 2015; Temple et al., 2010). This intersected with a wider conversation about adapting the

[54] Other possible options mentioned by interviewees, as well as those quoted above, included the Broad Habitat Classification for UK BAP and the European EUNIS system, as well as the Integrated Habitat System, which could translate between some different types of assessment. The RSPB called for the SSSI Common Standards Monitoring methods to be used, which they considered "a more appropriate base from which to build the actual criteria for [condition] assessment" than the HLS handbook (2013, para. 29), while others talked about favourable condition assessments for European sites.

techniques of ecological assessment and management in line with the new British Standard *Biodiversity - Code of practice for planning and development* (see British Standards Institution, 2013), and growing demands for methods which would readily conform to the increasingly quantitative frameworks underpinning nature conservation policy.

Despite much intellectual work, there was not an automatically straightforward choice to be made and pushed for. Different assessment tools would do different things, and the data generated by each would not necessarily be useful, or be straightforwardly comparable and translatable. One academic researcher working on knowledge exchange for offsetting explained:

> Biodiversity offsetting will have *particular* needs. It will need to be informed by science in particular ways, but the scientific research machine is going on for other reasons, to fulfil other people's agendas, and it's evolved over many decades … when you suddenly put out these questions to do with offsetting, that big machine, it's not very nimble. You look into this resource of environmental data and expertise, and it's often not *quite what you want* (interview 4e).

Yet reaching consensus among ecological experts on this issue was not the substantial obstacle to progress on this front. While it was accepted that more appropriate condition assessments would probably be necessary, the more significant problem from the government's perspective was that advanced assessment techniques would be substantially more involved and complex. As one ecologist explained with regard to NVC methods:

> [It] is very detailed; you've got to know constituent species of all the different types, and they can vary quite slightly, depending on soil type, wetness, where they are, what part of the country they're in, what species you'd expect. A good botanist will probably be able to assign a vegetation type to the NVC. But what should be happening is a little bit more investigation into species composition and structure, processes and spatial configuration, and packaging all that up into the metric (interview 4a).

It was this call for added complexity which revealed a serious tension, between reducing the costs of compliance for developers, and ensuring assessment was robust enough to ensure confidence that valuation was comprehensive.

When expressing their concerns about the potential business costs of offsets, developers pointed to environmental assessments as a major factor, explaining that the more complex or sophisticated they were, the more expensive compliance would be "at a time when we're trying to keep a lid on the affordability" (interview 7e; also 7c). They had the backing of landowner groups too on this issue, mindful of the possible knock on costs as suppliers:

> we are very conscious of the need to avoid placing additional burdens on developers. The amount of information a developer is obliged to supply in support of an application is already excessive. As such, we suggest a short statement for consideration by the planning authority, setting out how he has complied with the hierarchy should be sufficient. If a developer is required to spend time and money in obtaining consultants reports it will defeat one of the main objectives of offsetting (CLA, 2013a, p. 3).

The government was equally cognizant of this, given its extremely strict criteria to have "no net impact on business" (interview 1a). Under the subtitle 'Potential savings', it noted in the Green Paper how

the “Australian experience suggests assessments alone can be half the cost under an offsetting system”, immediately followed by: “It has been suggested the pilot metric can be applied to a site in as little as 20 minutes” (Defra, 2013d, p. 14). This rather ambiguous statement caused some controversy, and though in reality it was probably down to poor wording, Defra failed to ever clarify what was meant. Some took it as a sign that the government saw comprehensive assessments as essentially superfluous under their proposals, and another opportunity to save developers’ money. The chair of the EAC for instance called it “little more than a 20-minute box-ticking exercise” (quoted in Evans, 2013d), while the committee’s report criticised the claim, saying: “The speed with which the metric can be applied to sites … should not be a priority. The priority should be ensuring rigorous protection of the environment” (EAC, 2013b, p. 9). Those attracted to the policy for its potential to deliver better conservation outcomes were concerned that the metric and underlying assessments needed to be as ecologically robust as possible, to counteract the inherent and well-recognised risks of undervaluing sites. However, the government’s non-negotiable position on imposing any measures or standards which might not prove cost effective for developers increasingly generated unease among environmental groups. They felt a growing sense that the government was largely unconcerned with the ecological integrity of its new policy, and was rushing its proposals through without serious thought being put into the detail of how environmental objectives were going to be achieved (e.g. National Trust, 2013; Hayns et al., 2013).

3: Delivering equivalent ecological gain

The other main area of technical debate concerned conservation gain at the other end of offset transactions. What types of offsets would count as delivering a gain? What criteria would need to be met to demonstrate equivalence? Most importantly, how would the limitations and uncertainties of restoration ecology be accounted for and risks alleviated?

3.1: Avoided loss offsets

In principle, many ecologists and conservationists were wary of avoided loss offsets being used as credits to compensate for development impact. The question marks over counterfactuals and demonstrating additionality, as explained in Chapter 4, were recognised as carrying risks to the legitimacy of the system and its ecological outcomes. CIEEM noted:

> Funding is certainly needed to maintain environmental gains, however we do not see this as counting as an offset. There should be more habitat creation rather than recycling of existing ones for different reasons. Maintaining an environmental gain for another development is effectively an environmental loss and would mean that no new funding is being put into reaching our 2020 biodiversity targets (2013, p. 12).

Nevertheless, some also accepted that closing off this avenue could lead to some perverse outcomes, and were not necessarily dismissive of situations like the one raised by this landowner in relation to an HLS scheme on their land:

> Nothing happened for 15-18 years. The grass was topped once a year. Then not quite overnight, but over three or four years, they've developed the most wonderful display of orchids. … And now the orchids and the other wildflower are now going really well. That's all part of an HLS scheme for which I am paid. … [which] runs out in seven years. If there is an alternative HLS scheme, then that's fine. … But if there isn't, what I've got are some orchid banks which are unfunded and unprotected. Now, what I could do is plough them up and say I've got this land available for offsetting. I know that it will produce orchids in due course, we can plant some more grass on it and let the orchids come up again. My view is that that is really stupid. What you've done is forced me to destroy the wildlife habitat, before trying to recreate it (interview 8a).

Questions of additionality in cases such as this would be quite complex to determine, and The Wildlife Trusts were typical in erring against these kinds of avoided loss offsets, identifying the risks of introducing "a 'what-if' option into a framework which is striving to be solid, quantified and certain and as such could be open to unsanctioned abuse" (TWT, 2013, p. 33). As a result, most of the focus of debate remained on restoration offsets, and their potential pitfalls – though avoided loss was not ruled out.

3.2: Restoration offsets

As explained in Chapter 4, there are all kinds of well-recognised challenges and limitations successful habitat restoration. As the policymaking process gathered pace in 2013 however, there was much criticism that Defra appeared overconfident in the scope for restoration to straightforwardly achieve equivalent gains – though the government did restrict marine offsetting from its proposals partly on those grounds (Defra, 2013d, p. 11; see also Dickie et al., 2013). Highlighting the lack of attention to science in the public debate, the British Ecological Society emphasised significant gaps in knowledge in the field of restoration ecology. In an intervention soon after the Green Paper was released, they pointed to complex soil structure and hydrology as presenting specific challenges for restoration work (BES, 2013c). Such concerns were similarly evident in the interviews:

> There was concern I think around the fact [the proposals] that seemed to suggest that actually creating new habitat elsewhere is easy. It isn't. We actually don't know very much about how to successfully create and restore natural habitat. We're *learning* all the time. You can often get a good result quickly, … but 10 years later, for reasons we don't perhaps understand, and despite what you think the best management for it, it's not doing so well. ... You [might] see what's on the surface, but the *soils* have taken *hundreds* if not *thousands* of years to form; the hydrological regime [too]. Those are much, much harder to recreate, which is why you might get good results quickly, but actually in the long term it's not worked (interview 4b).

Those with experience in the UK gave examples of the difficulties they had faced. One ecologist spoke of the failure of an ongoing project they were part of:

> the no net loss for the project relies on propagation of plants and their reintroduction into the wild. The decision's been made and the development's started on the assumption that it will be possible, but it's actually it's not proving possible. That *could* be for soil mycorrhizal reasons – [as in] there are associations in the soil that are missing. Who knows? It's often not easy to put things back in the wild (interview 4a).

Conservationists expressed their reservations over how widely applicable the practice could be:

> If it always worked, there wouldn't really be a problem in doing it, … [but] ecology is very complicated, and creating habitats is very complicated, even if you do the best job possible. We have *massively struggled* to do heathland restoration on our own headquarters – and we're [a major conservation NGO]. We keep getting things wrong, and things go wrong and it's just an indication of how hard it is (interview 5d).

In light of these kinds of problems, ecologists and conservationists tended to be very cautious about what realistic environmental outcomes could be expected from any new system.

Different groups responded to this predicament in various ways. The most common position of conservation NGOs and professional bodies was critical of the government's apparent over-optimism. They argued that uncertainty needed to be addressed more convincingly, by putting appropriate safeguards and standards in place, in line with best practice and sound science, and pushed for the adoption of more strongly worded precautionary principles in future policy documents, especially in relation to the mitigation hierarchy. Otherwise they surmised offsetting would fail badly to meet its environmental objectives, and would not be credible in their view, delivering absolute losses for uncertain gains (e.g. CIEEM, 2013; RSPB, 2013; TWT, 2013). The challenges were partly institutional, relating to how offsets would be secured, managed and monitored, and by whom – challenges explored in Chapter 10. Yet they were clearly technical issues too, and concerned which types of habitat should be considered irreplaceable and therefore off-limits, though as one pilot leader explained:

> We are asking people to define that. Defra didn't define, but I don't think Defra ever will. They may give a lot of wording to *suggest* certain habitats would be irreplaceable, but they don't like nailing their colours to the mast, unless it's obvious like ancient woodland (interview 2a).

Ancient woodland and limestone pavement were suggested as irreplaceable by the Green Paper, since recreation was impossible in realistic timeframes. Various actors argued that many others should be included too, with many arguing out-of-kind trading could not deliver equivalence, which the metric allowed (Defra, 2016, p. 17). For conservationists, the other problematic issue around equivalence concerned timescales. If restoration offsets were supposed to deliver no net loss in perpetuity, Defra's costing estimates were seen as extremely questionable:

> An offset, for a medium to large housing development, the idea that £15,000 per hectare would be sufficient to support loss of habitat in perpetuity [as cited in the Green Paper's impact assessment], is not really feasible for us. … We just don't think that is anywhere near – based on our experience of managing places – a realistic figure. It might be in some circumstances, but the idea that you can just kind of make a statement like that … [about all kinds of habitats] doesn't seem [plausible]. … I think it's based on the Environmental Stewardship payments, through the HLS scheme, and we don't think that's an acceptable comparison. I think that's because probably because HLS is about something over a set timeframe; it's not about securing something in perpetuity. … [W]hat you might get in layman's language is cowboy offset providers, say: 'Oh yeah, I can provide those 2.9 units, and it'll only cost me £6,000 to do it'. Whereas [we] will build in all the long-term costs, maybe, and say: 'That will cost £162,000 or £500,000', or whatever. But we think we would have a much greater likelihood of being able to deliver it, because we're being realistic about the costs. But if it is up to a developer to choose a scheme, then they're going to choose the one which is most likely, unless they're very scrupulous, they're going to choose the one that ticks the box and say: 'Oh yeah we've provided our offset', but there's no guarantee that that offset will be provided in the long-term (interview 5a).

The ramifications of this particular criticism, and the deep divisions over the appropriate longevity of offsets, are explored in the next chapter. It highlighted another area where environmental interests expressed serious reservations about the evidence underpinning Defra's policy proposals, which they felt were being fast-tracked at the behest of business interests (e.g. Hayns et al., 2013; interviews 4a; 4b; 5d; 9c, 11a).

Others took what they framed as a more pragmatic perspective. While safeguards were critical, they made the point that the proposals were not a radical departure from the *status quo*, and that the challenges of restoration already existed, in a system where compensation was routinely not even being asked for. Against this backdrop, offsetting was an opportunity to "claw something back" (interview 4a), and success need not be absolute to be legitimate (interview 4c). Pro-offsetting groups from the green economy camp however tended to reject the pessimism of the environmental organisations:

> Certainly talking to some of the Americans, they seem to say it can be made to work. I think that the naysayers are probably the ones who don't want offsetting, and will always point to the fact that something doesn't work. Well you can *make* it work. … I think one of the big problems is we've never been realistic about cost (interview 6a).

Moreover, a formal and consistent system offered some structure, it was argued, through which market forces and adjustments would produce innovation and iterative improvements to practice over time, driving up standards and the quality of offsets (interview 6b). The government was largely in agreement, and expressed frustration with what they thought were conservationists' unrealistic demands for a "perfect system" in one step (interview 1b).

If these divergent viewpoints were a source of some tension, this was exacerbated by the criticism of more entrenched oppositional voices, deeply troubled by the notion of nature being 'replaceable' and 'tradeable':

> It is intrinsically problematic to assume that 'biodiversity' can be moved around (offset) from one place to another – such an assumption is erroneous biologically (indeed, since restoration ecology is very much in its infancy, there is little evidence that ecosystems can ever be recreated to a specific state) (FERN, 2013, p. 2).

By constructing biodiversity as replicable and fungible, they held the view that the government's proposals set a dangerous precedent. Combined with the supposed over-simplification embodied in the metric, they considered the mechanism as a whole to be an anti-ecological techno-fix based on false equivalence. Such an approach they argued, was at least unwise and likely to exacerbate biodiversity loss, if not made in bad faith to erode environmental protections to facilitate development (interviews 4d; 4f; 5e; 5f). While the pragmatist position certainly held sway over some, many conservationists and ecologists were equally being pulled in the other direction, by those for whom the technical limits of restoration were viewed as a fundamental flaw in the government's policy:

> In the Green Paper there's this kind of amazing claim that offsetting will 'guarantee' no net loss, and yet I'm not aware of any academic paper or report from any other country with offsetting which can state that. … It seemed to be the only example the Secretary of State and the officials at the Environmental Audit Committee … could draw on was their own trip

> to Australia. It seemed almost as though they were basing a whole policy on a trip to Australia where they were told it was working well! (interview 5e).

As the government showed continued unwillingness to address more supportive environmental groups' concerns over time, and other debates became more fractious, these oppositional views found increasing resonance in the wider public discourse (e.g. Mathiesen, 2013; Howarth, 2013).

4: Complexity and ecological integrity versus simplicity and cost effectiveness

The government faced a series of dilemmas as it tried to reach a consensus around the definition of the commodity around which a market could cohere. As has been shown, disputes erupted over the comprehensiveness and objectivity of the methods of measurement, and the ecological integrity or feasibility of what offsetting proffered as equivalent gain. Addressing these questions was not only technically complex, but politically so too. Underlying the dilemmas encountered were tensions common to all offsetting market systems, reviewed in Chapter 4. Adding further complexity, precision and restrictions to the metric would have undermined the fungibility of offsets, which the government and its business allies saw as necessary to establish a fluid market capable of generating win-win benefits. Most importantly for the government and developers was that offsets be liquid enough to lubricate the planning system to accelerate development. Yet by rejecting the imposition of more complicated forms of measurement, the widespread consent needed to stabilise the commodity and reduce disputes in practice was weakened. Furthermore, the government's reluctance to impose stricter standards or rules which might affect the cost effectiveness of either applying the metric or delivering offsets starkly revealed the political constraints on environmental outcomes. The openly pro-development attitude of the government only fed the far more critical narrative that offsetting was designed to facilitate the bulldozing of biodiversity to make way to profitable development.

None of this is to say that the technical complexities themselves were fatal for the policy, but that they were deeply entwined with political questions over how they could be effectively and satisfactorily resolved. Social and ecological issues were inseparable and co-constitutive. This mattered, because if offsetting was to truly get off the ground as Defra hoped, its use would need to be taken up widely and voluntarily. As the tenor of these criticisms rose, those groups the government needed to enrol became increasingly wary of putting their reputations on the line for offsets. Moreover, quantification was not the straightforward solution some had hoped. No net loss was more of a symbolic goal than an absolute condition, and what would be measured, lost and gained under its auspices would be contingent on what was considered 'reasonable' in planning. As environmental groups were all too aware, what really mattered was the strength of policy, institutions and the balance of power in the planning system. The metric was roundly accepted as a superior way of measuring what was being lost than what came before (see CEP & IEEP, 2014d, pp. 32–6), yet most acknowledged that to seriously start redressing biodiversity loss through land development, it would require planning

authorities being able to mobilise the metric in a context of strengthened powers of ecological regulation. As Chapter 7 showed, the shifting political terrain and its material implications did not favour their calls for the more intensive and extensive intervention they believed necessary. In planning terms, project viability was far less negotiable than no net loss of biodiversity, and the unwillingness to countenance deeper levels of intervention to achieve those outcomes reflected this. What Chapter 10 now goes on to show is that not only were meaningful environmental outcomes unlikely through the government's proposals, but that the combined technical and institutional tensions were so sharp that the system looked largely unworkable – so heavily was planning stacked in developers' favour, backed by government policy.

Chapter 10: Regulating offsets – tensions, disputes, and the fracturing of consensus

Introduction

This final empirical chapter considers the institutional and regulatory questions which emerged and became hotly debated during the policymaking process. Many of the themes discussed in Chapter 4 were present, including the challenges of effective regulatory oversight, proper adherence to the mitigation hierarchy, dilemmas over how far to restrict the types and location of offsets, issues around supply and long-term monitoring and management, and of course whether offsetting would be compulsory. In addition, given the government's reluctance to impose extra burdens on business, there were disputes over the scope of offsets, and when use of the metric could be triggered. Chapter 10 also reveals more about the particular limits of offsetting as an instrument of planning in England, overlaid onto a complex social and regulatory landscape of competing concerns and objectives, many of which would override biodiversity considerations in practice.

The chapter is split into four sections. The first looks in detail at tensions and divisions which arose around the mooted regulatory rules and scope of the policy, including the strength of the mitigation hierarchy, locational and other restrictions on suitable offsets, the level at which planning applications should be screened before becoming subject to the mitigation hierarchy and offsets, and issues around longevity and the supply and costs of offset credits. Section 2 analyses the institutional architecture and possible roles of different groups would undertake in the governance and oversight of offsets. In particular, it focuses on the problem of regulatory capacity and ecological expertise in local authorities, and the pressures local government ecologists and planners would likely face trying to implement offsetting in the context of severe resource constraints, exacerbated by the government's austerity measures. It also considers offsetting's mobilisation as a techno-managerial and economic instrument, seen by some groups as a way to partially circumvent the problems of understaffing in planning authorities. Section 3 then examines the most fractious of all the disputes around the government's proposed system: whether offsetting would be a voluntary or compulsory instrument to be used as part of development control – the issue which ultimately shattered the fragile consensus described in Chapter 8. Section 4 then reflects on the findings of Chapter 10, identifying the deep fault-lines tensions which prevented the possibility of the policy's national implementation.

1: Regulatory rules and scope

Debates over technical matters always necessarily spilled over into discussion about the institutional framework of rules in which the metric needed to be embedded. Chapters 3 and 4 made clear how offsetting policies or markets depend heavily on a complex architecture of regulation for their application, coherence and legitimacy. It was these debates which revealed some of the deeper political fault-lines which needed to be bridged in England, and the challenges faced by the

government as it attempted to enrol the core stakeholders needed to operationalise its preferred, voluntary system. This first section examines four of the more contentious examples, beginning with questions about the strictness of the mitigation hierarchy and possible restrictions on the type and location of offsets permitted. It then moves onto some of the most divisive debates over the scope of offsets, and what circumstances they would be applicable to, in terms of the size of development and significance of environmental harm. It also deals with the length of time offsets would need to be secured and managed. These were issues which threatened to derail the policy, with developers and landowners respectively, resisting the imposition of what they argued to be unjustified regulation and intervention over land use, which environmental interests deemed necessary if no net loss was to be meaningful.

1.1: The mitigation hierarchy

1.1.1: Strong policy?

The beginning of Chapter 3 explained how important adherence to the mitigation hierarchy is deemed to be in definitions and standards for biodiversity offsetting, with compensation or offsets only defensible as a last resort. Across the spectrum, conservationists, consultant and local government ecologists and green business groups were agreed on this basic principle (e.g. Nottinghamshire County Council, 2013; Aldersgate Group, 2013; CIEEM, 2013; TWT, 2013). Heeding such a precautionary approach was largely based on the technical challenges identified in Chapter 9. Developers, though critical of rigid rules, often explained their desire to meet all their compliance conditions onsite, because they argued green and open space added value to their developments (interviews 7a; 7b; 7d). However, this was partly down to a doubtful claim, given the evidence, that they only very rarely caused residual damage to biodiversity, and that the imposition of the final stage of compensation or offsets would be unfair and additional. Government officials, for their part, argued that observance of the mitigation hierarchy was clearly stated in their proposals and part of policy in the NPPF, and therefore did not require further elaboration.

To a large extent, the point of tension here was about the strength of policy, rather than the principle itself. While the government contended that the rules were sufficiently clear to proceed, other groups argued faith in existing policy and guidance was demonstrably misplaced. As shown in Chapter 7 and Section 2 of this chapter, the mitigation hierarchy was not well understood and poorly implemented, considered “a far more serious problem for biodiversity than the poor implementation of any necessary compensation” (RSPB, 2013, para. 25) for conservationists; while professional ecologist bodies too noted:

> There should not be a reliance on current practice being sufficient to guard against this (i.e. in relation to the mitigation hierarchy). The development of any biodiversity offsetting scheme or requirement will necessitate a renewed focus on the mitigation hierarchy (itself overdue) (IEMA, 2013, p. 10).

One industry representative heavily involved in discussions at a national level made the point in detail:

> *generally* the mitigation hierarchy only applies to SSSIs and above. It doesn't necessarily apply to BAP habitat, and doesn't necessarily apply to low value habitat. Now Defra … said [to us] compensation is required as a matter of course for loss of biodiversity. And we said: 'No it isn't'. They said: 'Well it is, because national policy requires it', and we asked what they meant by that. They said the NPPF. What the NPPF says is we should move from net loss to net gain. It doesn't say no net loss. There should be a move from *net* loss to net gain. 'Should', you know, strengthen ecological networks, delivering biodiversity enhancement. It doesn't talk about no net loss; it doesn't talk about offsetting. And as I thought, that isn't being applied to require compensation for non-designated habitats generally. Planning authorities aren't doing that. … So, you've been losing biodiversity – low value, low grade, low quality, condition and distinctiveness biodiversity – and no one's accounting for that. What the metric is starting to do is to account for it, and where possible … replace *some* of that loss. Not necessarily through offsetting; not necessarily 100 percent compensation. It's not necessarily net gain or no net loss. But it's lessening the loss that would have occurred otherwise. … The mitigation hierarchy is being applied, but it kicks in when you get SSSIs or protected species. It doesn't *generally* apply for low value habitats (interview 7b).

It was clear too, from statements made by actors across the spectrum, that the steps of the mitigation hierarchy were not well defined, and open to considerably different interpretations. The 'fuzziness' of key terms was highlighted in commissioned research into existing practice (CEP & IEEP, 2013, pp. 13–18). In addition to the resourcing issues, which are discussed in Section 2, the RSPB was far from alone in making the case that: "LPAs need better guidance on how to avoid and mitigate harm, and it is crucial that a single guidance document covering each stage of the mitigation hierarchy is published" (2013, para. 26). To their frustration however, and as pointed out by LGEs, the government was resistant to providing such comprehensive guidance, which it saw as overly rigid and bureaucratic. As explained in Chapter 7, reducing the volume of guidance was central to the ongoing programme of planning and regulatory reform. Instead, strength of policy and guidance would depend on the wording of local plans, where offsetting would theoretically get adopted. Contingent on a whole host of local political, institutional and geographical factors, this would necessarily lead to a highly uneven regulatory landscape, as was clear from the way the pilot authorities approached offsets (CEP & IEEP, 2014c, 2014b).

1.1.2: Offsets as last resort of first option?

The second concern around the implementation of the mitigation hierarchy, in the context of ambiguities in practice, was about the implications of a perceived overemphasis on offsets. One pilot leader foresaw a "temptation that you jump straight to the compensation stage, because it's there as a tool to be used" (interview 2b). This was one reason professional ecologists were so split over their support for offsetting:

> the concern that people had … was: we *have* a mitigation hierarchy. Is this effectively saying, as an *alternative* to the mitigation hierarchy, you can offset your impacts, so the mitigation hierarchy would not be followed? … [T]here needs to be a lot more reassurance from the government, and from the *policy* (interview 4b).

Conservationists shared similar worries:

> They're not putting in place any measures or any proposals to get local authorities to avoid harm more, to mitigate harm more. *All* the focus is on offsetting. That's where you focus people's minds, that's where you're likely to end up. I think there's a real danger … it becomes

> a default option rather than the last option. … Even if they don't mean to do that, you've got to think ultimately decisions are made by people, and it will influence the kind of prism through which they look at proposals (interview 5d).

Though the government denied the claim, there was a widespread feeling that the proposals were actually designed to short-circuit the mitigation hierarchy, which, in the words of the RSPB, was "undermined and contradicted [in the Green Paper] by the explicit desire for offsetting to free up more land on site for development (because mitigation will no longer be necessary)" (2013, para. 24). Again, the drive towards creating an offset market was deemed problematic and in tension with precautionary conservation principles:

> We are concerned … it would make compensation for damage much more the norm. Some of the language in the consultation is … that for it to *work*, we need to create an adequate market; … it actually talks about it in terms of generating a lot of offsetting opportunities. It just seems to me that that's a total contradiction with it being a last resort. … Colleagues in Germany have said that, … even though there's a much more robust system in place there for no net loss, there is still a concern that that's what developers now do. They kind of skip the avoidance … and go straight to thinking: 'We've got this offsetting system in place, therefore we go straight to that' (interview 5e).

IEMA warned if the mitigation hierarchy was not followed strictly, there was a danger offsets would be "a perceived easy option, with risks of misselling [sic] and concerns of developers being potentially fast tracked to an offset solution" (2013, p. 3). This intersected with the worries covered in Chapter 9 about the government's perceived over-optimism in ecological restoration. The policy's more enthusiastic supporters certainly did little to dispel these kinds of apprehensions, with their own views on how strictly the hierarchy should be implemented:

> obviously avoidance is the key, and then mitigating onsite what you can. But I've seen so much mitigation onsite that's such a total waste of time and money. … I want to see a lot of that moved, because I just think it's a waste of time. It's no good for biodiversity (interview 6a).

As will be explained in Section 2, many saw the mechanism as an economic instrument where the pricing of compensation, generated by the market, was crucial to its utility: "offsets are a regulated market that *reveal* value … the price signals currently aren't there, and that's what offsets can change, and that's sort of the biggest potential influence" (interview 9a). For them, the focus on offsets was therefore entirely warranted, in providing the incentives for better and more flexible decision-making.

1.1.3: Strategic planning and early intervention

For others, this logic was upside down. Instead of thinking of offsets as a financial disincentive, some saw the mechanism and the application of the mitigation hierarchy as inseparable from strategic planning, based on countywide data mapping:

> I firmly believe that biodiversity should be planned, like transport … so you avoid sites that are more sensitive in the first place, thereby reducing the need for biodiversity offsetting.… There seems to be a development control emphasis on it. ... I've had several cases in the past where we'd get a site coming forward which shouldn't be coming forward … and you end up compromising. … You can apply the mitigation hierarchy at the pre-application stage, before the site allocation document comes out. You can do it at that stage, but by the time of

> a planning application comes around you can't really do it. … [O]n the bigger sites … we look at it at the pre-application stage, so we're using it to inform the master-planning of a site, so that we get enough mitigation built into the design of the site. … [Otherwise] it's too late basically (interview 2e).

This LGE had unusual conviction in this interpretation of offsets, yet the desire to root the policy firmly in this kind of strategic approach was strong among planners, LGEs and conservationists. One leading planner, whose knowledge of offsetting was limited, nevertheless made a pointed critique of its framing as mitigation for harm through "private transactions" agreed in development control, as opposed to a strategic, deliberative and plan-led view of space, biodiversity and public good (interview 3a; see also Town and Country Planning Association, 2004). It was also reflected in a common aversion to introducing the possibility of offsets too early. The Woodland Trust argued a biodiversity assessment should always be included as part of a planning application, providing all necessary information to determine fulfilment of the mitigation hierarchy, but "should not include proposals for offsetting; when a planning authority is balancing the benefits of a development against the dis-benefits … offsetting should not be part of the decision-making process" (2013, p. 7). However, such early interventionist approaches clashed with developers' ideas about what would make the application process more certain and therefore less costly for them, one of whom talked about their efforts to lobby government for the removal of pre-application environmental assessments (interview 7c).

1.2: Locational and other restrictions on offsets

The more explicit desire from some quarters for offsetting to be subordinated to strategic ecological planning on a local scale dovetailed with another of the more contentious debates: that of the location and proximity of offsets relative to development impact. When the government released its most concrete proposals in the Green Paper, the ambition was for trades to have as few restrictions as possible, so that land would be more efficiently allocated from an economic perspective. It suggested that:

> letting offsets be provided anywhere in England might lead to a loss in some areas of the country (e.g. where there is greatest value in development) with net gain elsewhere (e.g. areas where offsets can be secured most cheaply). This would be both economically and environmentally beneficial (Defra, 2013d, p. 16).

The hope was that offsets would be delivered on cheap, marginal agricultural land, while freeing up more valuable locations for development (interview 1a) – though this was tempered by spatial multipliers integrated into the metric to incentivise offsets in strategically designated parts of the local area. This generated some pushback, especially from local planners and conservationists (e.g. Nottinghamshire County Council, 2013; FoE, 2013). While spatial context entered some of the technical debates about the ecological equivalence of offsets, this was a comparatively marginal issue. What concerned local government ecologists and planners was that local people would not accept the loss of biodiversity on their doorstep, whether it was the amenity space they valued or the closeness of 'nature':

> It relates to what value local communities place on an area of green space, and they're not going to be very happy if an area they value is suddenly replaced by one 15 miles away, because it's going to have no use for them there. That's a bit of a thorny issue (interview 2b).

This frequently became mixed up with debates about local ecosystem services, but the salient point for planners was that they should have the tools to require compensation for loss to be as local as possible:

> Pilot hosts noted that this proximity preference was very strong and it was felt that elected members were very unlikely to support biodiversity offsetting if it resulted in the loss of biodiversity (and potential income from developments) from their LPA. The importance of this issue was supported from discussions with two non-pilot LPAs (Rushcliffe and Southend) who said that they did not join the pilot programme because of this concern (CEP & IEEP, 2014d, p. 29).

Though there was less consensus among conservationists, many made similar arguments, stressing the importance, from a conservation perspective, of people's access to nature, for both wellbeing and nurturing a culture of care and understanding for the natural environment:

> it's not amenity green space, that's not what we're trying to create, but it's that feeling of walking through a flowery grassland situation, which will have birds coming in, which is what the locals really appreciate. … [I]f we don't take the people with us, we're preserving this little bit of green space somewhere for those few members of the NGOs who actually understand it, not for the general people who walk through and would love to see an interpretation board that says what it is and why it is, and see a name on the bottom and perhaps get involved. And the only way – and this is a bigger, broader issue – the only way we're going to save biodiversity in the UK is if we get everybody involved. If we stick with it with just those NGO members who understand, we'll just end up with a few little jewels across the country, and the rest will go (interview 5c).

Rather than simply a question of economic efficiency, both groups recognised the socio-spatial effects offsets would have if not properly regulated, and possible unintended consequences.

The proximity question became quite heated at times. While the government appeared willing to listen to these concerns, Paterson antagonised critics in early 2014 when speaking to *The Times* newspaper. In what several interviewees referred to as a disastrous interview from a public relations perspective, at moment when the public debate was already deeply polarised, he stated his view that an offset would be acceptable if it was "within an hour's drive" of the loss of a local nature site (The Guardian, 2014). As mentioned above, even the conservation NGOs found it impossible to come to a common position on the issue (interview 5c). While many pushed the access to nature agenda, others thought this a less serious issue, and thought offsets should only contribute to high value reserves, where public access could be restricted to minimise human disturbances. According to one consultant, Natural England appeared to share this view, since they were most interested in leveraging funding for SSSIs they were responsible for (interview 9c). As one ecologist observed, the stated ambition for offsets to contribute to the Lawton vision suggested consolidation of existing designated sites was the priority over an approach aimed at weaving human and natural spaces together (interview 4a). Disagreements over location reflected the quite different values attached to biodiversity and views over what should be protected, mediated by different conceptions about

people's relationship with wildlife and nature, and its relevance to other ideas of place and justice. These tensions suggested offsetting was not the easy technocratic fix some seemed to imagine, but something that required deep deliberation, compromise and trade-offs. The dilemmas were certainly recognised, especially by some conservationists, LGEs and developers (HBF, 2013b; RSPB, 2013).

The disputes on location were certainly not fatal for the policy. Nonetheless, though Defra seemed to acknowledge the concerns arising over location, its *laissez faire* attitude to such matters was part of a more damaging pattern of non-interventionism, which left complex questions unaddressed and a perceived lack of necessary strategic vision. As with restrictions of out-of-kind offsets, the government proved continually reticent about putting constraints on the liquidity of offset credits. This caution was frequently justified by the government, developers, and farming and landowner groups in terms of market functionality, and ensuring sufficient supply of allowable receptor sites, to avoid blockages in the system and the risk of 'ransom'. The National Farmers Union expressed members' reservations about prescriptive trades: "Requiring 'like for like' or 'trading up' makes the market more complex and, therefore, delivery more costly. This complexity should be avoided" (NFU, 2013, p. 16). Putting more restrictions in place would inhibit supply and risked making the programme uncompetitive, on which so much of the Defra's cost-saving hopes rested:

> A prescriptive metric would reduce choice, add to the costs of offsets for developers and could lead to developers being ransom stripped where offset options are limited. Ransom stripping would also be a particular risk if offset options were restricted to a small local area. This would evidently drive up costs and the render many sites unviable (HBF, 2013b, p. 3).

Green business actors made similar statements, in this case on the specific issue of location:

> Everyone will say we want the offset habitat next to the development site, or as close as possible. Well, that's important, but maybe you want to set a radius of 10 kilometres or 10 miles, because … if a landowner or farmer knows a developer needs his patch of land suddenly the price goes right up, so you need to build choice in. But the *market* can do all that, once you've got the principle of having an offsetting mechanism there (interview 6a).

Yet this faith in the market arguments failed to convince conservationists and LGEs, whose view was that offsets were first and foremost being designed to enable development, and that other social and ecological concerns were deemed secondary add-ons.

Apart from well-recognised pro-development tenor of the Green Paper, highly publicised events on the ground, as well as government actions and statements, seemed to add weight to the view that developers and government were willing to disregard any restrictions in their application of offsets if it suited their interests (Barkham, 2014; FERN & FoE, 2014; Marshall, 2013a). The Department for Transport for instance adapted Defra's metric to 'offset' ancient woodland in the line of the planned HS2 route. As Chapter 9 explained, ancient woodland had been categorised as irreplaceable in the metric's technical guide and Green Paper, and therefore off-limits:

> they'd basically misrepresented the DEFRA metrics; they'd done it wrong. That was the fundamental thing that people were getting upset about. They'd made a few methodological errors. … [W]hat they'd done is changed it to include what we call critical habitat – ancient woodlands – and they'd just put them into the metric. And the reason why I'm saying they'd

> made a methodological error there is you're not allowed – offsetting doesn't allow – to offset habitats that are *not* offsettable. You just have to exclude them; you have to just say it can't be done (interview 4c).

Yet other developers too put in speculative applications claiming they would offset their unavoidable damage to ancient woodland, which were controversial enough to make the tabloid press (Spencer, 2014). Paterson, in the same interview with *The Times* mentioned above, also stated he thought ancient woodland could be offset with "very high multipliers". All these cases generated substantial public opposition, and anger among conservationists and ecologists supportive of offsetting in principle (e.g. Juniper, 2014). For cautious supporters and critics alike, the government was allowing inappropriate precedent to be set in practice, whereby offsets were being constructed as a malleable development tool rather than credible conservation mechanism, the precautionary principles of which could be quickly overridden to enable large-scale projects or permit them to circumvent tricky environmental regulations:

> there's just political motivation isn't there? They might have big infrastructure developments that they want to see fast-tracked, that might rely on an offset being in place. … I am nervous about the way it looks like it's headed at the moment, unless there's a bit of willingness to sort it out properly. The annoying thing is that we have people in this country who know enough, and have access to the right international expertise to be able to do a really good job of it. The frustration is the lack of willingness really. … They're trying to do a sort of fast-tracked, possibly disingenuous version of it. That could be very counter-productive. (interview 4a).

These were important moments of fracture in the consensus on the desirability of offsets, and signs of a rapidly polarising debate.

1.3: Development thresholds and determining significant harm

An analogous debate occurred at the other end of the spectrum, concerning the scope of offsets to account for low level harm. As explained in Chapters 7 and 8, those groups cohering and forming alliances from an environmental viewpoint saw this as a core attraction and opportunity of a formalised system. Yet the government's position was more ambiguous, as noted by one NGO officer:

> from our perspective, what we would want a new system to do is to capture the stuff that's currently not avoided. So, it's *turning approvals of low-level harm* into offsets, yeah? Because that's not happening at the moment, which would be brilliant. Clearly where government are coming from, is that they want to... there's a *danger* that government are trying to turn *refusals* of high harm into offsets. So they're very different things, and we're coming at it from very, very different angles (interview 5d).

While the metric had been configured to capture and quantify all impact on biodiversity, its use in practice would depend on applicability in the planning system. Screening remained an open question, posed in the Green Paper, on the issues of thresholds for offsetting and the definition of 'significant' harm. The first asked whether developments should be of a certain size before becoming subject to the offsetting process. Other than no threshold, the numbers suggested by Defra were for planning applications for 10, 25 or 200 housing units. Yet even at the lowest threshold of 10 units, an estimated 29 per cent of housing development, by area, would be left untouched (Defra, 2013d, p. 15). As was

to be expected, developers argued that the threshold should be set high enough to avoid disproportionate burden, especially on small-scale developers (e.g. HBF, 2013b). Groups with ecological expertise however reacted strongly against the use of thresholds:

> There should not be a threshold. Biodiversity offsetting should be applied in adherence with the mitigation hierarchy. With a threshold we would continue to lose small sites and the result would be a slow attrition (i.e. death by a thousand cuts) of biodiversity (CIEEM, 2013, p. 6).

Several noted that size was not a useful way of determining likely ecological impact:

> Habitats and species of importance may occur at any scale, for example, bat roosts and the only known breeding site for Jennings Proboscis-worm (which has no statutory protection) occur at very small scale. The number of houses is not necessarily related or comparable to the ecological impact, because a well located major development may have few impacts, indeed it could have potential advantages for wildlife. A small development on a wildlife rich site could be disastrous for wildlife but below the threshold (TWT, 2013, p. 15).

The overall consensus among environmental interests was that developments of all sizes should be covered by the metric. Some suggested a tiered or hybrid system, which would allow some smaller developments to make simple payments into a pooled conservation fund rather than require the administration of many very small offsets (interview 4a).

The question of significant impact was more complex, and referred to a judgement to be made in planning, according to NPPF (DCLG, 2012, para. 118), where the mitigation hierarchy should come into effect, subject to the appeal system. On this second question, the government asked whether a national approach should be specified – including "excluding low-distinctiveness, low-quality habitats" or using a threshold approach "where harm is only considered significant if more than a specified number of biodiversity units are lost" – or whether it should be left up to LPAs to interpret on a case-by-case in line with existing norms (Defra, 2013d, pp. 24–5). Defra had long been unwilling to define the term, instead leaving it to be determined locally:

> it is up to planning authorities on a case-by-case basis to decide what is significant. So, if they decide that actually, the loss of some woods is not significant, they are complying with the mitigation hierarchy as it is set out in our planning guidance. And we, as central government, have never provided guidance as to what we think significance means, or where that threshold kicks in (interview 1b).

Local discretion was widely supported among many groups, since geographical difference meant that ecological significance tended to be context-specific (Defra, 2016). At the same time, judging ecological significance would require substantial expertise. Moreover, decision-making on this matter would also be conditioned by a host of other local political and institutional pressures, which, given the issues highlighted in Chapter 7, and covered in more detail in Section 2, would mean considerable unevenness across the country, and likely poor implementation in many areas. Local variation in general unsettled landowners and rural businesses, envisaged as the primary sources of offset provision, who viewed:

> a single consistent national system … [to be] essential. To work, offsetting will require a nationwide market and that in turn requires one nationwide system. There are already a mass of local schemes out there, each with their own exponents. It will make developers and

> landowners lives difficult if everyone has to get their minds around different schemes in every part of the country (CLA, 2013a, p. 5).

This created another dilemma, because while developers were keen to keep any imposition of offsets to a minimum, they were equally pushing for a system which was consistent and easy to predict, something the case-by-case approach the government favoured was unlikely to deliver.

On top of this, it should be reiterated that addressing the repeatedly evidenced inconsistency and poor performance of the prevailing regime was central to the environmental case for offsets:

> We would consider the failure of LPAs to avoid and mitigate significant harm from development to be a far more serious problem for biodiversity than the poor implementation of any necessary compensation. This is largely due to a culture of not valuing biodiversity and not giving due weight to policies concerned with biodiversity – a point supported by Defra commissioned research into the implementation of PPS9. If the introduction of an offsets system, intentionally or otherwise, further encourages a culture of not avoiding or mitigating significant harm, it would be a far greater problem for biodiversity than the existing problem of poorly implemented compensation (RSPB, 2013, paras 24–5).

The point being made was that the policy needed to be rolled out in a way which would address the problem of biodiversity loss which was getting ignored by the planning system, causing cumulative ecological degradation through 'death by a thousand cuts'. In short, if offsets did not capture and compensate for low level residual harm, conservationists asked, what was the point? Yet Defra again appeared somewhat ambivalent on the issue:

> I think one of the attractions was that you'd certainly capture more of that, and I think there's a question of how far down. … I think one of the things I probably found a little bit frustrating in the process is that everyone wanted us to go from where we are now – which is a planning system which isn't very efficient at thinking about these things, but also isn't necessarily very effective at capturing those environmental externalities – to one which is all singing and all dancing, and kind of captures everything. And I think actually, probably, what we were thinking about in the Green Paper was probably a little bit too ambitious in how far it went (interview 1b).

However, the reservations coming from conservationists and others were not about perfection. Rather, their concerns were about the context – of planning reforms, rhetorical attacks on environmental protections as blockages to growth, and very material actions in constricting the scope of ecological regulation – in which offsetting was being put forward. As one campaign officer put it: "this government seems to have gone through a process of dismantling the planning system bit by bit", and that:

> The message LPAs are getting is build more housing at all costs. Even though the right words might be in NPPF, that's not the message the LPAs are actually getting through guidance, or the imperative they're being given to provide more housing, without balancing that against other issues. We think if you introduce offsetting in that kind of political context, that's where we fear it will become a license to trash (interview 5e).

Whether or not it would constitute a license to trash, pilot leaders certainly recognised the constraints they were under in this regard:

> in lots of cases up until the current time is that developers have effectively got away with perhaps not providing sufficient mitigation and compensation, and the reason for that is there

> is a perceived need for housing and employment land and so on. That always takes a higher precedent, and local authorities are under a lot of pressure to deliver housing targets and that sort of thing. … My concern is that if offsetting is rolled out and becomes mandatory in one form or another, even though it's not really asking them to do anything more than they should be doing already, because they're not doing it already, it is basically an additional, I suppose, burden on them because they've not done it in the past. … And when they're already saying they haven't got enough money to provide affordable houses, school spaces provision and that sort of thing, I do worry how additional money is suddenly going to be found to provide essential compensation (interview 2b).

The view was far from untypical, and illustrated how consciously their approach to offsetting was mediated by the possibility of getting challenged:

> We're planning ecologists; we apply planning law and planning policy. … We don't want to impinge, or be branded as holding up developments, or being unreasonable in planning terms, and I believe that's where it's probably going to get challenged if it goes to public inquiries. On that level of significance and reasonability – planning law not biodiversity philosophy if you get my meaning (interview 2a).

Furthermore, during the piloting phase of offsetting, developers had successfully challenged offset-related planning conditions as unreasonable, on the grounds that they constituted additional burden which they not previously been subject to (e.g. BSG Ecology, n.d.). Rather than the win-win scenarios touted by government officials, politicians and green businesspeople, it appeared offsetting's eventual implementation would play out through a series of conventional trade-offs, with a great deal of variation. In a context of severe resource constraints, the financial costs of losing appeals, and the levers available to developers, LPAs were likely to take a conservative approach to imposing mitigation requirements (interviews 4f; 5d). Given the power relations at play, capacity in LPAs, pro-growth conditions imposed at various levels of decision-making, and the unwillingness to provide strong policy, guidance and restrictions on offsets, critics' view that these trade-offs would ultimately be settled in favour of development interests seemed more than warranted.

1.4: Longevity, offset supply and costs

Though the majority of debates around the policy had revolved around the regulation of development impact, and the pilots delivered no offsets by the time of their conclusion, one of the most fractious concerned the other end of the offsetting process – the long-term securing of conservation gain. As covered in Chapter 4's review of technical debates, the gain created through an offset should match the duration of development impact for no net loss to be ecologically meaningful. Given that the UK government's programme was primarily aimed at major infrastructure and housing development, damage was effectively expected to be permanent, suggesting offsets would need to be maintained in perpetuity. In the Green Paper, Defra referred to the development of conservation covenants by the UK Law Commission (2013), as a possible mechanism for securing offsets over the long-term, which would:

> place conditions on how the land could be used and could require it to be managed in certain ways for the benefit of biodiversity. Most importantly the covenant would be binding on whoever owns the land so the biodiversity benefit would be maintained even if it changed hands. This would ensure the land was managed for biodiversity gain (Defra, 2013d, p. 22).

Though the mechanism was welcomed by environmental groups, a number of conservationists, LGEs and other ecologists spoke of their unease at a possible loophole attached to the use of conservation covenants, which said the protection could be overridden if there was an overwhelming case for development:

> We are deeply concerned by the suggestion that the covenant could be released if the offset land was considered developable. This introduces insecurity into the system and will lead to a lack of commitment in adhering to any management obligations. It is imperative that covenants or other legal mechanisms are used to manage habitats and species in perpetuity (Cornwall County Council, 2013, p. 11).

It was, however, the definition of 'in perpetuity' which proved most divisive, seriously threatening the viability of the entire policy. In particular, a major cleavage quickly emerged between the two groups the government expected to be the main suppliers of offsets: conservation NGOs on the one hand, and private landowners and farmers on the other. Pointing to the well-documented technical limitations and uncertainties of restoration offsets, as well as the likely permanence of biodiversity loss from development, the conservation sector was largely united in arguing that equivalence demanded offsets too be permanent "if offsetting is to have a meaningful role in biodiversity conservation" (Bat Conservation Trust, 2013, p. 8).

> It is imperative that the covenants are funded and managed in perpetuity if habitats and species are even to be conserved at current levels. Biodiversity Offsetting should result in the permanent re-establishment of biodiversity-rich habitats which support the greatest diversity of species expected by the given habitat, appropriate to the local geology and climate (TWT, 2013, p. 26).

This, they contended, would mean putting in place legal measures, such as conservation covenants, to stop offset land's return to agricultural use or development.

Developers were certainly worried about the cost implications, and lobbied for perpetuity to be defined at the lower end of the scale, but more vociferous opposition came from private sector landowners and farmers, overlapping groups represented by the CLA and NFU respectively. The CLA in particular had been heavily in favour of a biodiversity offsetting programme in principle, and at the forefront of early lobbying efforts, as detailed in Chapter 7 and exemplified in its *Private Solutions for Public Problems* report. However, by the time of detailed policymaking consultation and the demands of NGOs, both groups voiced strong opposition to the notion of legal constraints on land use:

> The presumption that offsets should be secured in perpetuity has been a particular cause for concern. We think it fundamentally wrong to dictate the use of a particular piece of land for ever. … Moreover, we suspect that many landowners will see little that is attractive about dedicating land in perpetuity. They might as well sell it (CLA, 2013a, p. 7).

The NFU made the point repeatedly throughout its consultation response: "We do not believe that agreements should automatically exist 'in perpetuity' and bind successors in title, as proposed in the Law Commission's recent consultation paper" (NFU, 2013, p. 1). These traditionally conservative rural groups built their argument on a narrative of private property rights (NFU, 2013; CLA, 2013b; interview 8a). Though used to conservation work through agri-environment schemes, which tended

to last around 15 years, the idea of restrictions of land use change for upwards of 25 years caused serious pushback. The NFU made the point forcefully:

> it is difficult to see why a farmer would want to enter into a conservation covenant in the format proposed (i.e. that would bind successors in title, that would exist in perpetuity, and that would be very restrictive in terms of potential future use of land) (2013, p. 13).

The issue created a major obstacle for government if it wanted enough receptor sites to be offered to generate competition. The Environment Bank, which had developed strong links with landowners, warned of the risk in its consultation response:

> Blanket enforcement of in perpetuity offset provision will limit land supply – in the Victorian system in Australia, the permanent covenant has been a very significant disincentive to the majority of landowners (2013c, p. 5).

Of central consideration, according to one landowning representative and farmer, were the implications for intergenerational rural businesses, which were often passed on to younger members of the family:

> If you're saying to me like they do in Victoria and New South Wales, you've got to do it in perpetuity and we're going to pay you handsomely for the first ten, but nothing after that, then I'm not sure I dislike my son and heir enough to lumber him with that. I take the money for it for the next ten years, then leave him with all the costs of maintaining it? I think you've really got to dislike your successors to lumber them with that (interview 8a).

Added to this was the matter of how much payment they would receive:

> Landowners generally take a long-term view, and get enormous pleasure out of improving … their little environment, wherever they are. They've got to do that of course in the context of paying today's bills. … It depends how much money is on offer. I can't get away from the grubby business of money. If that works and it's what you want to do, then you've got a sporting chance of putting it into operation. If either of those are wrong or don't work, then simply nothing's going to happen (interview 8a).

The NFU too noted how: “Members we have spoken to indicate they would not participate if the payments only reflected income forgone” (NFU, 2013, p. 9). Given the government’s non-negotiable position on additional costs on developers, and the figures cited from research commissioned by Defra, they anticipated the money they would receive as likely to be far too low to compensate for lost income on food production or other commercial activities, especially if offsets were going to be legally imposed long-term. The organisation remained deeply unconvinced by the figures used in the government’s documentation, expressing concern that initial costing projections did “not reflect commercial scenarios that face farmers” (2013, p. 9), and that therefore “the actual costs to developers will be misleading” (p. 3) in Defra’s analysis. One green business leader expressed their agreement and frustration:

> One of the *problems* is that The Wildlife Trusts often undersell the costs of doing conservation work. So, they'll often take £5,000 from a developer to, you know, do a bit of habitat on the back of a development going forward. They've been doing that for years, and then wonder why they can't get it to work. Well the reason is it's probably costing you £50,000-£500,000. That's why (interview 6a).

Yet basing the policy on these kinds of cost projections, rather than the much more conservative numbers Defra was working with (see Rayment et al., 2011), would most likely have compromised any chance of getting offsetting past the Treasury or Regulatory Policy Committee.

These two opposed and entrenched positions were highly problematic for the government, as it tried to enrol both groups simultaneously. Offsetting's core proponents recognised that the dispute threatened to unravel the process completely:

> I think the 'in perpetuity' thing had the potential some time ago to derail the whole offsetting thing. I think now people have become more realistic. So, in Warwickshire I think they say 'in perpetuity' means 30 years. The RSPB, in some cases wanted 999 years. Well you know, it's King Canute time and going back to the Doomsday Book! I don't think we could actually orchestrate land management on that timeframe. And 99 years frankly is a bit daft. If you're wanting to engage *farmers*, ... they can just about deal with 25 years, because the generational thing. … Maybe 50 years in some exceptional circumstances, but they'd have to pay more, because of the cost of a 50-year scheme is much more than that of a 25-year scheme (interview 6a).

Defra officials were frustrated by the demands made by conservation organisations, while the government's political leaders were keen not to alienate landowning interests. Paterson's own appointment as Secretary of State had widely been perceived as a move to appease this constituency, given his popularity with traditional rural Conservatives. Moreover, private landowners and farmers were envisaged as vital participants if the policy was to get off the ground. As Henry Robinson, the then president of the CLA, pointedly told an audience at the BBOP summit in June 2014, his members owned half of the English countryside, so offsetting needed to work for them (PO4). By this point in the policy's development, it appeared some compromise had been reached around the definition of perpetuity. According to policymakers and green business groups, 30 years was the maximum length of time landowners would acquiesce to in principle, and claimed the NGOs had broadly agreed this to be realistic (interviews 1b; 6a; 6b; 8a).

Nevertheless, the government still largely failed to persuade a significant portion of private landowners of the merits of becoming offset providers. Other than the exceptional case of Warwickshire, all the pilots experienced extreme difficulty in generating any sustained interest among local landowners and farmers (CEP & IEEP, 2014d; interview 2b; 2c; 2d; see also Watts, 2014). The most commonly cited reasons included the risks of signing up to long-term agreements under a policy with a very uncertain future, the conditions likely to be attached to agreements or contracts, and most important of all, lack of demand – which is returned to in Section 3.The dispute also contributed to disaffection among many NGOs, who were the other potentially large-scale providers of offsets. Yet they did face something of a dilemma. Apart from the possibility of income that still attracted some (interviews 5a; 5b), a significant pull factor was a fear that other suppliers would do a bad job, especially in a context where they agreed with private sector groups' claim that Defra's costings were far too conservative:

> where we for example take money from government to do stuff that they're obliged to do, the chances of it working are pretty high, because we're doing it. But that's not going to be the case in most of these applications. You're going to have basically businesses who are not

> motivated by the compensation, they'll be motivated by profit which lies elsewhere. They will at every stage try to cut corners. … They won't have the expertise, and they won't put the amount of money in that they need to, and the success rate will be much smaller. … They'd have to be monitored a lot, they'd have to be enforced – all the things [LPAs] don't have to do if we're doing it, because we'll do it (interview 5d).

In the end, however, the terms on which the policy was being constructed looked to most as ever more risky, and unlikely to result in meaningful environmental outcomes:

> I don't know under what circumstances we would actually do offsets. It is possible that in the long term we might do. I'm not ruling it out. But nothing we've looked at so far would meet our requirements for it (interview 5c).

Many of the NGOs effectively walked away. Several disengaged from the pilots, while willingness to proactively engage in the national policy process waned or became increasingly critical (interview 9c). While the government clearly viewed private landowners as more important for the system's implementation, having the NGOs on board was nevertheless necessary. If the government seriously hoped to use the mechanism to trade up and fund high value conservation projects, the NGOs' expertise, experience and support would be vital.

2: Institutional architecture and regulatory capacity for effective implementation

Of the challenges facing the government in operationalising offsets, reaching consensus over the articulation of roles and responsibilities appeared relatively straightforward. Many of the key features of a reconfigured system were largely agreed upon. For instance, a nationally consistent framework was broadly seen as essential to most actors' purported goals, though conservationists and ecologists favoured a degree of local flexibility as well, so that local policy could be aligned with specific local ecologies. There was general consensus on the need for management agreements for the delivery of offsets by providers, and a national register of schemes, together with some kind of insurance mechanism against offset or provider failure, even if their characteristics needed further specification (see Defra, 2016). It was largely unquestioned that local offsetting policy would be developed and implemented by LPAs, and offset requirements negotiated through development control, as with the pilots. While it was assumed much could simply be overlaid onto the processes of the prevailing compliance regime, issues did arise in relation to two aspects of the policy's implementation: regulatory oversight and quality assurance of both assessments and offset provision. For example, who would bear responsibility for adherence to the mitigation hierarchy? How would consistent application of the metric be ensured, and disputes arbitrated? Who would ultimately be responsible for guaranteeing quality and standards? The importance of these issues was heightened because, as shown in Chapter 9, ecological uncertainty and limitations of measurement meant application was likely to be far from straightforward, and the appropriateness of decisions open to interpretation. Since the outcomes would not be neutral, settling questions over how a new permitting regime would be governed, and by whom, was always necessarily political. Balancing the power of – and satisfying –

different interests was therefore regarded as crucial to the system's integrity and legitimacy among the core groups the government needed to enrol.

2.1: Impartial operators and overseers?

Recognition of these issues was illustrated in debates about the independence, objectivity and competence of consultant ecologists, brokers, and state bodies. While LPAs would be required to sign off on offset proposals and agreements, the government's stated proviso was that ensuring robust use of the metric should not "create unnecessary or expensive red tape", and was "attracted … in principle" to relying primarily on accredited assessors (Defra, 2013d, p. 29). This was an option also favoured by many developers. Even with accreditation however, many were sceptical consultant ecologists could fulfil this role in a neutral way. Given the nature of their (dependent) relationships as contractors to developers, many saw consultants' interests as too deeply entwined with those of their clients to act impartially. LGEs, local NGO officers and consultants all highlighted the variable quality of assessments submitted with planning applications. Drawing on their experience dealing with planning applications, some alluded to an occasionally active and commercially motivated bias in favour of developers among consultants (interviews 4f; 11a). A more frequently cited problem though was the power dynamic consultants needed to navigate with their clients. As one ecologist explained, they are often viewed as:

> the bringer of bad news, and the environment and ecologist's role is seen as a *problem*, that has to be coped with, managed, got around. … Every delay costs money. Every proposal to mitigate or avoid is potentially going to cost money. So, you can come under a lot of pressure not to see things, not to find things, perhaps not to do such a thorough job with your survey as you should, or not to include it in your report (interview 4b).

While stopping short of claiming widespread manipulation by developers, several ecologists indicated that, under the direct and indirect pressures and constraints of their work, the ambiguities of ecological data commonly end up being interpreted in the developers' favour, leading to impacts frequently being downplayed in environmental reports (interviews 4a; 4b; 4c). Even more worrying was lack of industry standards. As one LGE noted: "they vary massively. Some are brilliant, and some aren't, and this is something that CIEEM are trying to sort out, but there's a long, long, long way to go, in making sure that consultants are competent" (interview 2d). A sector representative explained in more detail:

> it's not a protected profession in any way. If someone wanted to do a bat survey because they wanted to do a loft conversion, you could go along tomorrow and do it for them. There's nothing to stop you. You may do it very well. You may not do it very well. But there's nothing to stop you, and as far as the client is concerned, they may not know that you haven't done it very well, or they may know and not care. Consequently, one thing that we're seeing is a lot of, if you like, other professions, are carrying out, I'd say low-grade or low-level – I don't mean that in a derogatory way – but I guess lower value work, that should really be done by somebody that's trained to carry out those kinds of surveys and ecological work. And they'll often do them very cheap, because you'll turn up and say you'll do a bat survey and do it for £50. That's become an *increasing* problem within the profession (interview 4b).

As a result of these well-recognised concerns, some kind of independent oversight was favoured by many other stakeholder groups, and the professional bodies representing ecologists themselves.

The use of brokers was another possibility, as independent intermediaries between developers and offset providers. However, the only established broker in the UK was the Environment Bank, whose prominent lobbying role in favour of biodiversity offsetting proved controversial, especially given that David Hill, its founder and chairman, simultaneously occupied the position of deputy chair at Natural England. Though the Bank's role was seen in a positive light by some, widespread discomfort and suspicion at the organisation's apparent influence over policymaking was more common across the spectrum. One conservationist noted the Bank's interest in "as much offsetting as possible" (interview 5e), while another summed up the concerns of many when stating:

> We can be very clear that they are in no way independent in any of this. They have a commercial interest in this happening and they should never be considered to be independent. They cannot replace or be a substitute for local authorities in any way. That's a concern, that they've somehow positioned themselves as being independent and impartial in this, which they are not at all (interview 5d).

Following on from this widely held opinion, Hill's position on the government regulator's board was frequently referred to as a troubling conflict of interest. The main cause of apprehension for conservationists and some LGEs was brokers' vested interest in high frequency trading, and a resultant perverse incentive to short-circuit the mitigation hierarchy in making recommendations. In relation to this, there was a perception that the Bank seemed to downplay the technical risks of offsets in theory and practice. Others highlighted the lack of a strategic planning orientation for brokers, and how commercial confidentiality would undermine the transparency of the process, at least until decisions had been made and objections were moot.

In light of lack of confidence in consultant ecologists and commercial brokers, the regulatory oversight and strategic planning role of local government, and support from state agencies, came to be seen as of increased importance, especially for conservationists and ecological regulatory interests:

> The integrity of, and public faith in, the planning system depends on independent arbitration. The decision to approve an application may hinge on matters relating to biodiversity and it would be unacceptable for a local planning authority to have to simply accept the developer's recommendation on offsetting – even if the report is written by an 'accredited' expert. Accredited or otherwise, a consultant is ultimately being paid by a developer, who will have a clear vested interest in obtaining planning permission. Likewise, we would not consider a broker to be independent, as they would also have vested commercial interests in a development proceeding (WCL, 2013, p. 9).

With regard to monitoring and enforcement of offset providers, one NGO officer and former local planner explained:

> In most cases someone has to be making them do it, they have to be checking them. … Mostly it will be farmers who've been approached by the Environment Bank and they create whatever it is they have to do. They'll get their money and they'll do it, but the developer will negotiate the least they can get away with, the farmer will do the least they can get away with for the money they've been given. It's this constant siphoning off, and that's how it will work, that's how business works. … You have to have legislation which makes local authorities do the enforcement, the monitoring, to *reduce* that risk. You need to reduce the risk, but the risk is very much there, and difficult to remove (interview 5d).

This is not to say LPAs were viewed as necessarily neutral. As many interviewees pointed out, complex planning applications were decided by planning committees made up of local councillors, who might be influenced by a host of factors. Planning officers could only advise these elected politicians in line with statutory requirements and local policy. Moreover, pilot leaders themselves highlighted the considerable constraints they were operating under due to economic and political pressures, especially since the advent of the NPPF:

> at the moment, that developers hold all the cards. Local authorities are struggling to get even things like social housing and affordable homes included in schemes now, because the developers say if they have to deliver those, the scheme's just not viable. … Trying to do extra things for biodiversity in that economic climate was very hard, and still is hard. Local authorities are also shackled by the five-year housing supply. It means effectively if they can't deliver sufficient houses within that five-year period, developers can come forward on other sites outside of Local Plans. [They're] obviously very wary of that, and keen to do deals with developers to deliver the necessary housing. All of which means that developers pretty much are in the ascendency at the moment (interview 2c).

Referring to how their decisions were affected by viability assessments in strictly applying no net loss to planning applications, another pilot area LGE was careful to indicate the judgements LPAs would need to make:

> I need to ensure that the applicant isn't paying too much, or too little. Usually it's the other way around actually, paying too much, because I need to work for economic growth in this area as well, and therefore I don't want to, again, be charged with being unreasonable (interview 2a).

Attention was drawn too to the difficulties for LPAs in rejecting applications in circumstances where resources had been substantially squeezed, with planners seeing the financial cost of losing increasingly unfavourable appeal and planning inquiry procedures as too great (interviews 4f; 5d).

2.2: Offsets as opportunity to consolidate: strengthening and extending local ecological regulation of land

Nevertheless, for conservation groups, LGEs and professional ecologist bodies, the moment of regulatory oversight in the planning system would be critical to the success of biodiversity offsetting. In line with the policy literature reviewed in Chapter 4, many saw noncompliance as one of the major threats, as exemplified in the Woodland Trust's response to the Green Paper:

> The biggest single source of failure for offsetting schemes around the world is the lack of monitoring, evaluation and enforcement. Any offset would require robust long-term monitoring to ensure that biodiversity aims are being met, backed up by clear legal and financial arrangements and a transparent enforcement regime (2013, pp. 16–17).

Most worrying, for those hoping offsets could deliver positive biodiversity outcomes, was the lack of ecological advice available to non-experts in LPAs, to inform their recommendations and decision-making. As many groups noted, planners' understanding of their biodiversity duties was far from adequate to oversee something like offsets, pointing to ALGE research (Oxford, 2013) showing less than one quarter had anything beyond a basic understanding of the mitigation hierarchy, while only a third of local authorities had an in-house ecologist (see also Newey, 2012) – a state of affairs the

report claimed was seriously threatening local government's ability to carry out its statutory biodiversity duties. In reference to application of the mitigation hierarchy, one pilot leader described part of the issue:

> I'm not clear, given that a lot of local authorities don't have access to ecological advice, how they are going to [validate appropriate application by developers]. … The worry will be that those authorities which don't … will have to take the metric calculations, etcetera, that have been done by the consultant working on behalf of the developer at face value, and accept them as they are (interview 2b).

Another put in more starkly: "It does vary, but capacity is a *massive* issue. Most districts in [our county] don't have ecologists … [and] if you go to another LA who don't have an ecologist there's no chance that that will ever happen" (interview 2d). Given the strains on their resources, most pilot leaders said they simply did not have the time to administer the trials properly. In fact, since they were offered no additional material or financial support from central government for trialling offsets, several soon decided their time could better be used elsewhere. In a context where ecological expertise was so uneven across the country, they all argued that creating a nationally consistent system with the appropriate safeguards would be impossible. Improving this situation by addressing the shortage of regulatory capacity and ecological expertise in local government was seen as vital if planning decisions involving offsets were to be credible and appropriate:

> I spent *hours* discussing how it could work and how it could sit with protected species issues and European site issues, and it is all quite complicated. … It's all that legal stuff as well. … That all just needs to be set out in quite a simple way. But it isn't simple. It takes time. Which is why it's not dealt with very well at the moment I guess, because it always just falls off the edge, because it's about the capacity of planners to think about and deal with it. … But without extra capacity it's quite hard to set up a system which will make life easy (interview 2d).

Whether through state expenditure or the recovery of costs from developers, this became a central demand made by environmental and ecologist groups going forward, if they were to support the government's proposals (e.g. ALGE, 2013; CIEEM, 2013; National Trust, 2013; RSPB, 2013; WCL, 2013).

The resulting impasse relating to this demand shed light on one of the major fault lines in the establishment of offsets in England. The seriousness with which this issue was treated by a large portion of stakeholders, and ambivalence by others, revealed quite divergent understandings of what offsets were expected to do, and how they might reconfigure ecological regulation of land use in England. The call for improving regulatory capacity and local government expertise was based on fairly straightforward logic. The environmental rationale behind a formalised offsetting programme was that biodiversity was systemically undervalued within the planning system, and statutory duties unfulfilled as a consequence:

> We've aspirational targets around 2020, … but protecting [biodiversity] and ensuring no further loss is a legislative requirement. It's difficult to see how that can happen, if you don't have … people with the sufficient expertise and experience and knowledge, to be able to determine whether proposals, for safeguarding biodiversity are realistic, achievable, sufficient and so on. If you don't have that expertise, what you *risk* is breaking the law, quite frankly. And the research which you may well have seen that was done by ALGE about LPAs and

> their level of *confidence* and *competence* to make those kinds of assessments, was really quite worrying, in terms of the *lack* of confidence, and the *lack* of competence, of *planners*, to make informed decisions about biodiversity-related proposals – mitigation proposals and so on – but that is increasingly what they're being asked to do. So it's an area of huge concern (interview 4b).

This failure of planning to properly value biodiversity, as evidenced primarily in two reports (Oxford, 2013; David Tyldesley and Associates, 2012a) and recognised too through experience, was viewed to be both caused and expressed by the chronic underfunding and marginalisation of the ecological regulatory functions of the local and national state.One LGE explained how this played out in practice:

> I suppose it isn't seen as essential. A lot of local authorities don't have ecologists; don't have good ways of dealing with this. So again it just isn't dealt with as well as it should be. … [And] local authorities are being cut. They look at what is statutory, and so biodiversity and environmental stuff is something that, you know, can be cut. [With] ecology, there *are* statutory responsibilities, *but*, they say, maybe we can buy that in or whatever. *Really* though, local authorities need someone in-house to be able to advise on a day-to-day basis, on planning applications and strategic planning and other issues (interview 2d).

Others agreed, and also highlighted the negative implications of the juniority of the post in the planning team (if it existed), and excessively high workloads due to under-capacity (interviews 2d; 4f).

These conditions, they argued, had played out in the prevailing mitigation and compensation regime in terms of poor implementation, bad decisions and lack of follow-up and enforcement, all of which provided substantial explanation for the failure of PPS9. For the RSPB, this reflected “a culture of not valuing biodiversity and not giving due weight to policies concerned with biodiversity” (2013, para. 25). CIEEM argued: “Biodiversity offsetting will fail if it is not primed and maintained with the appropriate resources, and charged with a measure of impartiality by close involvement of ecologists within the public sector” (2013, p. 3), going on to explain:

> local authorities need to be adequately resourced and have access to appropriate ecological expertise in order to discharge … [responsibility for the mitigation hierarchy]. There is strong evidence to suggest that this is not the case and this is another significant area of risk to successful implementation of an offsetting tool. Without access to ecological expertise local planning authorities may not be able to make sound decisions, identify opportunities for enhancement and may be risk adverse (p. 5).

For these actors, if offsetting was a genuine attempt to improve outcomes for nature conservation through formalisation, it would need to go beyond the deployment of more consistent and sophisticated calculative devices, though these were seen as useful tools. It needed to be seen too as an opportunity to consolidate, strengthen and extend the scope of mitigation and the wider regime of ecological regulation, using strong policy to redress a growing imbalance between development and environmental interests. Such objectives could not be met in concrete terms, they surmised, unless the government was willing to give planners the material, regulatory resources they needed to intervene more strongly in the development process. Many argued that comprehensive local datasets would be essential too, for effective and early-stage strategic conservation planning (interviews 2a; 2c; 2e; 11a). As with ecological expertise, this was something significantly under-

resourced, with only some local areas able to maintain them. Though usually not explicitly framed as such, these were unquestionably political positions, especially in the context of the government's austerity programme and commitment to deregulation, explained in Chapter 7.

2.3: Offsets as economic instrument and techno-managerial fix?

There were others, however, who were far less concerned with the issue of regulatory capacity in LPAs. Some took this position on the grounds that it was a political battle which could not be won, accepting that efforts to sufficiently resource and empower ecological regulators was a lost cause:

> [For 20 years we've been saying] that EIA, until it has a requirement to do mitigation, and somebody checks and there's monitoring and follow-up, it will never deliver for biodiversity. Well, what's new? We know that, but no one wants to change it. A lot of people say 'Oh no it's just a license to trash and they won't use it properly, and people should conserve biodiversity, and local authorities should have ecologists'. Yes, I know that's absolutely true, but … for as long as I can remember it *has not happened*. So what are we going to do to change? Because it's not happening. It's no use comparing offsetting to this ideal notion of how things should be, because it's *never* going to happen. … But *maybe* offsetting could, and this is why I'm actually pro, because it *does* introduce some explicit accountability. … It gives you a basis for monitoring follow-up, which might be quite difficult to define otherwise (interview 4a)

While some saw this as a failure of political will, others, especially those from green business and development communities argued the problem of implementation rested on environmental legislation being overly complicated and bureaucratic:

> The problem at the moment is that the environment is seen as a blocker. When a developer spots a newt wandering across the site, his heart sinks, because the perception is, 'Here we go. We've got six months of surveys, and the thing will be delayed by a year'. It is not a constructive engagement with the environment. We do not want to create another massively complicated bureaucratic system. We want to give John [Slaughter of the HBF] his streamlined, effective system that allows them to get permission efficiently, at the same time as taking on their environmental obligations (Tom Tew in EAC, 2013a, p. 20).

For both these groups, offsetting's appeal from an environmental perspective was premised on an acceptance that the state would or could never intervene effectively in the traditional regulatory manner: "Biodiversity offsetting is a new opportunity to make a difference to environmental conservation, and as such should not be designed with old fashioned and restrictive mindsets" (Environment Bank, 2013b, p. 5). Instead, the policy was constructed as an opportunity to bypass the state's intrinsic inability to meaningfully implement regulation, through a simplified quantification device.

This narrative relied on several techno-managerial qualities of offsets which would supposedly ease the need for capacity building for heavily involved oversight, and resonated with the case for offsets outlined in Chapter 3, most strongly associated with BBOP. The quantitative dimension was crucial, as explained in Chapter 8. Firstly, building on arguments about the advantages of quantified measurement, the case was also made that the metric, if operated by suitably certified ecologists using standardised and more precise assessment methods, would substantially reduce the level of subjectivity and room for ambiguity so often exploited by vested interests in the existing system.

Secondly, much credence was placed in the communicative character of the metric. Procedurally, offsets provided a simplified expression of biodiversity value, in a language of hard numbers which non-experts, including developers, planners and local councillors could "get their head around" (interview 1b), requiring little translation. Such a claim resonated strongly with the experience of the pilots, despite their other failings (CEP & IEEP, 2014d, see 2014b). As a result, various interviewees claimed, decision-making and reporting would also be made significantly more transparent, open to audit and public scrutiny (if public registers were to feature), which would incentivise better compliance and outcomes (interviews 4c; 6a; 10a).

Another element of the case was the presumed entry of third party suppliers. According to business-oriented groups, a sufficiently sized market could be stimulated, competition should regulate standards to an extent, encouraging:

> innovation from landowners, farmers, NGOs and others to provide offsets. … Competition ought to help the best quality and value offset providers win out, achieving greatest amount of biodiversity protection for a particular sum of money (Newey, 2012, p. 54).

Dedicated independent providers would have significantly more incentive than developers themselves to meet compliance standards, as they would be contractually monitored and enforced, perhaps via intermediaries (Duke et al., 2012). For some, the hope was that conservation NGOs would fill this role, since they had the most organisational motivation and expertise to ensure high quality compensation schemes were delivered. The argument for mobilising market efficiencies was predominantly presented by the green economy lobby, as part of a narrative of necessary modernisation of environmental policymaking (EMTF, 2013; Aldersgate Group, 2011), and an "appreciation that traditional regulatory approaches do often lack flexibility" (interview 9a). Nevertheless, even if they did so reluctantly, many pro-offsetting ecologists and some conservationists acquiesced to this more business-led conservation paradigm. This bled into the construction of offsetting as more of a transformative economic instrument, aimed at changing behaviour, than the consolidation of the prevailing regime. There was far more deference instead to the role of price signals here in incentivising avoidance and mitigation, as illustrated by one consultant ecologist:

> it's not properly costed out. I think that's what it comes down to. Developers are simple beings, what they care about is the money. If you were to go back to a developer and say it's going to cost you *x* thousand pounds per hectare, for 50 years to compensate for that field, to build some houses on it, they would be like: 'oh, okay, then maybe I'll only build half the number of houses on it, and enhance the rest of it, in order that I only have to pay half as much, otherwise my profit all goes out of the window'. And they just have to do those sums … and offsetting is much *better* at putting costs on the compensation side that you would have to offer, and maybe *then* they're more likely to go down the road of avoidance (interview 4c).

The key was viewed as unequivocal and consistent no net less policy (i.e. the state imposing a 'cap'), which was simple to audit and enforce in legal terms, but not prescriptive over how such outcomes should be achieved:

> Once you create a bit of space for people to innovate; my experience through the environmental policy side has been *fantastic*. You know, people do it *far* better. … You want this step back, which says, you know, we want a net gain here, you've got amphibians, you need to have a better environment for amphibians at the end; *don't care how you do it*. You can do it onsite or offsite, you know? It's a completely different question (interview 6b).

Flexibility was central to the case that offsets would incentivise more efficient outcomes without need for additional bureaucratic oversight.

The more techno-managerial vision clearly chimed with the government's (and developers') dislike of command and control structures, and desire to devolve responsibility for ecological regulation away from local authorities and state agencies. One passage in the Green Paper was particularly illuminating with regard to the government's aim of depoliticising decision-making, resonant with Paterson's repeated desire to overcome the "sterile, lengthy and very costly legal battles" (EAC, 2013a, p. 35) between development and environmental regulation which permeated the planning system:

> a simple, standard framework for evaluating the impacts of development on biodiversity can speed up assessment. Allowing any required compensation to be bought 'off-the-shelf' from a market removes the need for negotiation on what will be provided (Defra, 2013d, p. 5).

Importantly however, this approach also presupposed strong government intervention, by creating strong no net loss policy on land development, especially if a market capable of sending price signals was to be generated. Even if that did not require increasing capacity and expertise in LPAs, it would mean giving them unambiguous policy instruments and guidance with which to refuse planning consent on ecological grounds. This was something the government appeared unwilling to countenance, as many observers noted, and government officials admitted.

2.4: Irresolvable non-interventionism

The landscape was of course somewhat more nuanced than the two positions presented above. Most conservationists for instance were not dismissive of the use of economic instruments or markets *per se*. One was broadly typical in describing their organisation as "agnostic" (interview 5b) on the issue, even if they found talk of commodification and trading 'biodiversity' much more worrying. Nor were they confident that what they saw as a long-term trajectory of state disinvestment and retreat from direct forms of ecological regulation could be undone, even if their demands frequently pushed for it. The same conservationist, reflecting on the Warwickshire pilot's model of implementation argued: "it's entirely doable; it's about priorities … [and] shuffling resources around" in LPAs (interview 5b). Moreover, though conflicted, many ecologists and conservationists admitted they did feel a degree of compulsion and responsibility to participate, as highlighted in Chapter 8. This was not just for fiduciary reasons, but to mediate some of the greater environmental risks they thought would be realised without them. Correspondingly, those pursuing the establishment of a more techno-managerial instrument were not averse to regulation as such. As the next section shows, offsetting was very well understood as a regulatory market, where the strength of market signals, economic incentives and so on all depended on the imposition of strong, clear policy around a strict baseline.

The baseline itself would also need to be measured, according to standardised rules set out in strong policy. Many believed access to ecological expertise in LPAs was still a vital issue, but not necessarily an immediate deal-breaking priority. In this light, the two positions were not immovable or irreconcilable. However, the problems which emerged revealed a deeper fault line between the government and the array of environmental interests they hoped to assemble to operationalise the system, around the issue of intervention in land use for the purposes of nature conservation.

Developers and landowners did not have too many problems with the institutional arrangements proposed in the Green Paper. Yet the government was unable to escape the widespread view among many planners, conservationists and ecologists that the undervaluing of biodiversity in planning was materially bound up with politically mediated disinvestment in the ecological regulatory functions of the state. Its intransigence over reversing that trend exacerbated concerns that the policy's implementation would be woefully under-resourced and risky. That the government was also unwilling to compromise on its non-interventionist attitude to create economic incentives through strong policy was equally damaging, adding to the perception that the stated conservation objectives were ill thought out at best, if not set up as a deliberate smokescreen to erode environmental protections. Support from the green business community remained resolute, rooted in a strong faith in strength of concept. However, as the more cynical and pessimistic view found growing public expression, conservationists became increasingly wary of engaging with policy proposals which had become so controversial. The final part of the chapter explores the most contentious decision: whether offsets would be mandatory or voluntary for developers.

3: Voluntary versus mandatory offsetting

The most intractable disagreement over the design and implementation of a new formalised system was over whether offsetting should be voluntary or mandatory. To restate the terms of this dispute, a mandatory or compulsory system would mean every planning application within the scope of the policy would be subject to the entire offsetting process, as set out by Defra and written into local policy documents. In essence, this would mean that each planning application would be required to use the metric to calculate impact, follow the steps of the mitigation hierarchy, and arrange a suitable offset if there would be residual loss of biodiversity. Under this scenario, planning consent should be refused if no net loss could not be satisfactorily demonstrated and agreed by the planning authority. Though there was some purview for negotiation over scope, the precise meaning of no net loss, and caveats for exceptional circumstances, making offsets compulsory was the most vital element of the policy for conservation NGOs, professional ecology groups, and LPAs, if offsetting was to produce any meaningful environmental outcomes. This too was the view of most policy specialists and consultants, though green business groups were willing to be more flexible. They also joined the pro-offsetting wing of the landowner groups who argued a mandatory system was needed to stimulate demand and a functioning market which could create certainty and incentives for market participants.

The government's non-negotiable position, however, backed by the vast majority of developers, was for a voluntary or discretionary use of offsetting. Under the government's prospective system, as tested in the pilot areas, it would be up to LPAs to request use of the mechanism, or for developers to propose and make use of it as they saw fit. Ultimately though, there would be no requirement for developers to use offsets, or necessarily conform to national standards, since no measurable definition of no net loss would carry any statutory weight. There were variations and several 'in between' ideas, but this was the basic dividing line between mandatory and voluntary offsetting which prevailed between 2010 and 2015.

3.1: The need for compulsory offsetting

The reasons put forward for a mandatory system were numerous. Critical supporters of offsetting in principle were strongly of the opinion compulsory offsets were necessary for the policy to meet any of its institutional challenges. To repeat a point made several times, the main environmental rationale for a formal offset programme had been the evidence of non-compliance with the existing mitigation regime (David Tyldesley and Associates, 2012a). Further research had showed that compensation for biodiversity loss occurred in an infinitesimally small number of cases (CEP & IEEP, 2013). How, detractors asked, would a voluntary system help address this issue? There was little evidence to suggest environmental protections were significantly impeding land development (Defra, 2012a), and there had been minimal take-up by developers in the voluntary-based pilot areas, since they had little incentive to do so (CEP & IEEP, 2014d, 2014b). As one pilot leader noted: "I've yet to come across any developer who has sort of come forward and voluntarily said: 'I want to use biodiversity offsetting'" (interview 2b), while another explained why:

> developers recognised quite quickly that because we were asking for something new, it was likely to be more expensive for them. Some developers – we had some very good developers – who we had long discussions with, in the end, several who had expressed interest at the start, choose not to do it (interview 2c).

In this context, what incentives would developers have to offer or use offsets? For conservationists and other critical environmental interests, the answer was clear:

> If you bring it in as voluntary or enhanced voluntary, if somebody's going to offer compensation or offsetting, they're going to be bumped up the system. … So, if when people come in like with [this one case] and they're saying: 'look, offsetting, offsetting, offsetting', thinking that that's going to win them friends, and it *would* have, with the council, if we hadn't waded in and gone, you know, they've lied about the … designation (interview 5c).

This fear was widespread and borne of experience, that a voluntary system would be exploited by developers if and when it saved them money, sped up or helped them gain difficult planning consents.

In a voluntary scenario, critics foresaw several possible negative outcomes. Firstly, the very notion of offsets being voluntary would muddy the waters of whether compliance with mitigation requirements was optional, rather than a statutory obligation:

> the whole notion of them being voluntary is very damaging. It set up all the wrong messages, because the way that's been interpreted was that offsetting itself – or the need to compensate

> for harm – is somehow voluntary, and it's not voluntary at all. They *have* to do it, or their application should be refused. If you can't avoid harm and can't compensate for it, you should be refused (interview 5d).

Secondly, the offer of an offset could be perceived as a bribe to the local authority, to either fast-track an application or influence the decision over consent, as mentioned above. This would exacerbate the risk of offsetting being used as an actual or perceived 'license to trash' (interview 2b). As a number of interviewees pointed out, there were several cases from around the country which could be perceived in this way (interviews 4f; 5e; 5f; 11a; 11b; 11c; see also FERN & FoE, 2014). Thirdly, developers would gain a tremendous amount of power in the negotiating process, to reduce the level of mitigation or compensation. As explained in Section 1, since offsets would carry far less weight in planning than other statutory duties, it would be easy for developers to challenge any insistence as additional burden, and therefore unreasonable – and there were cases where developers had appealed planning decisions on these grounds during piloting. Finally, a voluntary approach would lead to inconsistent and uneven application, which developers would further be able to exploit. In these circumstances, many argued offsets would not only fail to improve environmental compliance and outcomes, they seriously risked eroding what weak protections already existed.

The other thematic critique of the government's voluntary approach was that it would seriously hamper efforts to stimulate a market in offset credits. This criticism was made by a broad cross-section of interests, including many conservationists, ecologists and planners, but most notably by the government's green business allies and policy consultants. Framing their position in terms of realising the promised economic efficiencies they associated with a market-based system, they insisted that if the policy failed to generate demand, supply would be stifled too:

> The pilots haven't actually gone forward on any scale that makes them workable and actually helps to secure those benefits … [because] to bring forward a supply, there needs to be a demand. Obviously there are some uncertainties with the current situation – whether there will be, or what will be the extent of regulatory demand. … These are long-term projects obviously. There's a fair amount of risk, and at the moment quite a lot of uncertainty over what the market might be, restricting supply. Clearly if there was a clear regulatory framework and a recognised demand going forward that would help to bring forward supply (interview 9b).

Only a compulsory system could create that necessary demand, they argued, a point also made by landowner groups. Without certainty about demand, offset providers would not have the confidence in the system to come forward and enter the market (Environment Bank, 2013c; CLA, 2013a). This had been demonstrated in the pilots, which many pointed to as strong evidence that a voluntary system was effectively useless:

> the learning through the Defra pilots, which has shown that – apart from Warwickshire – it's a complete waste of time if you just make a sort of little quiet ask, because the development community will just carry on in the way. It says if you *make me* do things, I'll do them, but it you just ask me I won't bother. … [Some developers have] really got quite an appetite for it, but what they *can't* do is compete in a marketplace where others are being allowed to *trash* nature, to an acceptable degree.…*That's* why we would agree with the EMTF that ultimately some sort of mandatory scheme is needed, and it's all about having a level playing field (interview 6b).

In short, pro-offsetting consultants, economists and business leaders contended that the 'fully permissive' (Defra, 2013d, p. 17) programme the government favoured was never going to achieve the objectives set out. The theoretical premise of offsetting, which promised quick and easy compliance, competition which would raise quality while reducing costs, economies of scale and price signals, was entirely contingent of a market of sizeable scale and liquidity (interviews 6a; 6b; 9a; 9b; 10a). In making this case, the government's green business allies were clear that the state had to take a far more proactive and interventionist role than it was willing to, if it was serious about redirecting growth onto a more sustainable path using economic instruments.

3.2: Against additional regulatory burden

On the opposite side of the debate was the development sector, which was strongly against a mandatory system:

> Planning guidance must also make it quite clear that it is not permissible for local authorities to require offsetting or particular offsetting solutions. This approach would be entirely consistent with that proposed (and which we support) for offsite mitigation under the zero carbon homes policy (Allowable Solutions) – which would leave the choice of mechanism or option for realising such mitigation entirely to the developer without any interference from local planning authorities (HBF, 2013b, p. 3).

They made their case on several grounds. They argued that a mandatory approach would clearly constitute an inflexible and additional regulatory burden: "it's another thing LAs can hold over us, another box to tick, and that comes at a business cost and a capital cost" (interview 7d). As one energy sector representative put it: "most developers looking for 'light touch' approach, which is simple and quick. They don't want to do more than necessary, like putting back twice as much as is impacted" (interview 7e). This of course chimed with the government's rhetorical attacks on the planning system and environmental protection in general, and the aims of reforms and programme of deregulation overviewed in Chapter 7. Many backed their claims up with reference to instances during the piloting phase (interviews 7a; 7c). In addition, most developers claimed that they were already fully complying with mitigation conditions, and very rarely had any residual impact after onsite work (interviews 7c; 7d). This was evidently inaccurate, but they contended nevertheless that imposing offsets were "being leveraged as planning gain [by local authorities] post-Section 106 – straight off the bottom line. … [I]f it's mandatory, it's basically just a tax, like CIL [the Community Infrastructure Levy] or something" (interview 7c). If an offsetting scheme was to offer the benefits the government promised, in terms of speeding up planning consent and developable area, they argued the only way forward was a voluntary system, which would give developers more flexibility in meeting mitigation requirements. As noted on several occasions, developers showed willingness to challenge offset conditions on these grounds, and, given the increasing weight given to housing, infrastructure and growth in general in the planning system, and LGEs were openly wary of losing. By imposing extra costs, developers argued, offsetting would threaten the viability of projects, therefore inhibiting the supply of affordable housing, jobs and so on (interviews 7a; 7c; 7d). Compulsory offsets would

act as additional burden on development activity and economic growth, which the government was publicly and officially trying to reduce:

> it's the position of the Treasury, which is the main principle why they're blocking biodiversity offsetting. You've got a climate against red tape, and you've also got a Treasury position, which is you *can't* put a cost burden on business (interview 6b).

As previously mentioned, the development sector was a highly influential and well-resourced political force. Developers themselves said they were individually and collectively lobbying ministers at Defra. Other insiders explained how developers were also bypassing Defra and making their case to more powerful government actors as DCLG, and, most importantly, the Treasury, where concerns about economic growth were taken even more seriously:

> that's certainly some of the politics that's playing out … we don't want to add anything to the burden of housebuilding at all. And developers have come in and said: 'this offsetting malarkey is going to push up the cost of every site by 4%, 5%, you'll get less homes built'. And the fact is that it probably is going to push up the cost of some of this stuff, and so if you're always thinking how can we reduce the regulation; if your argument is what are the things getting in the way of housebuilding it's regulation – whether it's affordable homes mandate or Section 106 or biodiversity offsetting – the attitude is always make that simpler, make that simpler, make that simpler. And the idea of introducing anything new is very difficult. So, the politics make the policy very hard. … [T]he Treasury and DCLG are nervous about it … and you know, those two departments are more powerful than Defra when it comes down to it. So, that's where we are (interview 10a).

Ultimately, the government agreed with developers, which was easy to discern in the official policy documents, the narratives ministers chose to mobilise in favour of the system, and the red lines they imposed on its implementation.

3.3: Irresolvable tensions

The cleavage between mandatory and voluntary approaches was severe, with the two camps deeply entrenched. If the government was willing to impose compulsory offsetting, there was a possibility that the multiplicity of other tensions described in this chapter could be overcome, at least as far as operationalising the programme was concerned. Yet the government was unwilling to yield on this issue. There was, however, a group of green economy advocates, self-identifying green business champions, who saw themselves in the role of bridging that gap in one way or another. These actors were aware of the political barriers to such an interventionist approach, and that theirs was a minority view in the wider business community, not shared by the vast majority of developers. Nevertheless, they remained confident that developers could be brought around by the promise of consistency and certainty, and would in any case quickly accept and adapt to a new system. In terms of the government, it was widely known, and confirmed by insiders, that the Treasury was the main barrier to the policy being implemented in any form, let alone as a mandatory system. For green economy advocates, it was the narrow methods of the government's impact assessments which made the full economic case difficult to put forward and make stick:

> At the moment, government parcels up decisions, does impact assessments, does regulatory impact assessments. And very often, it leads to the conclusion that things that bring an

> environmental gain are an additional cost, and are discounted, whereas if you take this step *back*, and say, actually, there's a different way of doing things – you're thinking sustainably from the outset – actually there isn't that cost. But most of government's analysis at the moment is unable to take that into account. … And it's as much around the inability of our current financial systems to deal with long-term challenges like climate change and resource depletion as it is around individual officials saying you can't do that. I think the example around impact assessments and the narrowness is the best exemplar of that. It's just if you talk to those people, they're bright people in the Treasury, and they get it, but at the end of the day, when they put on their jacket and go into that building, they know what the rules are they play, and they are *not able* to (interview 6b).

This, they reflected, was unlikely to change under a Conservative-led government, though some held out hopes that a Labour administration might see things differently if they won the next election (interviews 6a; 6b; 10a). Nevertheless, offsetting's most ardent proponents still believed that an offsetting system could be pushed through. One avenue was to make the case that the costs of offsets need not mean additional costs for developers – the most serious concern for government and developers. This was actually seen as relatively straightforward to solve, by shifting the cost of offsets onto landowners, where they could be absorbed by the windfall profits made when planning permission was given (interviews 6a; 6b). This line of thought appealed to officials in Defra too (interview 1a), but the idea got very little, if any, airing by political leaders or in official documents, an omission which was telling.

Some sections of the green business lobby were keen to see a voluntary system officially rolled out. Conceding that the proposals had hit an impasse in terms of any compulsory option, they still saw the implementation of discretionary instrument as an important first step, which could be experimented with, developed iteratively and later consolidated: "I think at the moment the thing which will tip the balance most quickly is a clear steer from the government to do things the Warwickshire way, because … I think it's the learning by doing" (interview 6b). They also noted the importance of the natural capital agenda, which the government appeared to be committed to more broadly, in laying the groundwork for policies like offsetting to become mainstream in the coming years. Moreover, there was a belief that LPAs would gravitate towards it, once the principle had been properly established and its benefits demonstrated in practice: "I think that's the way it will go. I think people with any sense will look at Warwickshire and think: 'What is that they've got to make it work?'" (interview 6a). The same logic was offered for encouraging developers:

> If you've got a good intermediary, the developer is *in practice* more likely to come along and say: 'Oh that's unhelpful, I haven't done anything about that. How do we do it? I just want to get on with it'. Well, you know, talk to this broker they can tell you about sites … [and] immediately I think that will mean that the outcome will be better for all the reasons I've described (interview 6b).

Both these green business leaders put much store in the success of the Warwickshire pilot, which they believed could be championed as a model from which to work. Though they had not been able to make no net loss mandatory, the county council had managed to get offsetting written and adopted in many local plans in the county, such that it had significant weight in policy, and was used routinely in development control throughout and after the piloting phase, without significant resistance from

developers (interviews 6a; 6b; see also CEP & IEEP, 2014b). Many offsets were agreed during this time as part of planning consents, though at the time of writing, the author is only aware of one where development work has begun, with payment being made for the commencement of conservation activity. There are important caveats to make with this case too. Warwickshire was widely acknowledged to be a unique outlier, a county council with 11 staff in its well-resourced ecology team, and some of the best and regularly updated habitat datasets in the country. No other local authority in England has this combination of access to ecological expertise and data. The interpretation of the NPPF which made its way into several of Warwickshire's local plans, pushed by the enthusiastic principal ecologist David Lowe, was also exceptional. It was clear from interviews with other LGEs, planners and consultants that other planning authorities had not or would not be willing to make such a bold move. As explained in Chapter 7, there were substantial risks involved in being found in breach of NPPF, and developers had gained considerable leverage, via DCLG, over LPAs through the government planning reforms.

All these factors, in the institutional and political settings they took place, meant effectively replicating the Warwickshire model widely appeared far-fetched. At best, it would seem likely to lead to further uneven regulatory development and outcomes, most of which would be weaker than Warwickshire itself. The other problem which these proponents did not seem to take account of was that the policy had become so controversial by mid-2014 that most of those needed to operationalise offsetting had effectively walked away. Not only had the myriad problems discussed throughout this chapter not been resolved, developers and conservation NGOs had long viewed participation as a growing reputational risk:

> They basically massively oversold it. Developers were saying: 'How can it give those guys so much money, without costing me loads more money?' The conservationists said: 'Well how can it make it so much quicker and easier for them, if it's not a license to trash?' And then the Secretary of State starts talking about newt credits and ancient woodland being offset, and the slightly anxious peace was shattered. We saw NGOs, who had previously been quite engaged, just walk away. There were these complementary projects, who were basically private consultancies or utilities companies doing their own thing. We spoke to people there, after this George Monbiot article had come out, and they'd had more meetings on the back of that, saying: 'We need to get out of this. This is going to be a PR disaster'. So halfway through the pilots, everyone just splintered into groups, and those groups still exist. You can see them in the consultation response to the European No Net Loss policy. And you can see in the way that the Treasury and DCLG haven't really engaged with it, because developers and the HBF got a bit nervous and got cold feet. And because they've got such huge political strength, well, that's the show over really (interview 9c).

As David Hill admitted at a public event in early 2016, biodiversity offsetting had become 'toxic' in the UK, which he blamed on a relatively small group of naysayers (Scott-Campbell, 2016). Most important of all however, the Treasury had ultimately blocked the policy altogether, even in a voluntary form, as a potentially intolerable additional burden on developers. Paterson's dismissal in July 2014 marked the endpoint for any kind of national framework for offsetting, and the policy dropped off the political airwaves very shortly afterwards.

4: Offsetting unravels

This final empirical chapter revealed some of the deepest fault-lines which ultimately caused the initial consensus around biodiversity offsetting to collapse. Disputes around the rules and scope of the policy demonstrated how the government's non-negotiable position over additional burdens and costs on developers seriously compromised the possibility of meaningful outcomes for environmental interests and regulators. Their attraction had largely centred on its potential to capture and compensate for low-level harm unaccounted for in the prevailing system, but since developers and the government insisted that the rollout of offsetting must make compliance cheaper, it was clear that any promised gains were highly unlikely to materialise. This tension between the ecological credibility of offsets and cost effectiveness proved even more fractious on the question of longevity, which led to a complete impasse over potential offset providers, with neither landowning and farming groups or NGOs satisfied by the terms being presented. Opposing views on the most appropriate form and purpose of regulatory oversight meanwhile animated debates on institutional roles governing offsets. Ecologists and conservationists were adamant that any kind of nationwide implementation would be impossible if understaffed and under-resourced local authorities lacked in-house ecological expertise to oversee offsetting. Their predicament demonstrated how heavily existing policy failures had been mediated by chronic underinvestment and the way biodiversity was materially undervalued in planning. Others thought offsetting's qualities as a techno-managerial and economic instrument could help alleviate those problems, and allow more flexible and efficient forms of compliance. Yet even that possible compromise would require strong policy instruments and a mandatory programme, capable of generating market activity, price signals and economic incentives. As the final part of the chapter showed, even this was not possible, and without compulsion the chances of resolving the myriad other tensions became completely implausible for every group the government needed to enrol.

Chapter 11: Why biodiversity offsetting was abandoned

Introduction

This last chapter of the thesis constitutes a final discussion on the findings of the research, reflecting on how and why the UK government's proposed biodiversity offsetting policy fell apart, and the broader implications which can be drawn from the case study. It aims to link theoretical work from the opening four chapters with the empirical study, considering the insights it offers while probing at its limitations in explaining the English experience.

Chapter 11 proceeds as follows. Section 1 recapitulates the major fault-lines identified and explored in Chapters 9 and 10, distilling and highlighting the underlying tensions which proved difficult for the government to resolve. Section 2 retells the story of Chapter 7, using the analysis from Chapters 8-10 to explain how and why the policymaking process unravelled. It more explicitly reconstructs the picture of how the political economic conditions, narratives, through which offsetting gained appeal in England, ultimately undermined its implementation. The third section reconsiders the UK government's aborted plans as an example of the neoliberalisation of nature, as reviewed in Chapters 2 and 4, asking how useful different 'neoliberal' framings are in understanding the complex story of this case study. While helpful for thinking through certain logics, processes and effects which animated tensions in England, I argue the existing literature lacks some explanatory power as to how and why governments might fail to establish market-based policies for nature altogether, as in the case studied. Section 4 then builds on this argument, reflecting on the possible implications of the findings, both for biodiversity offsetting as a policy and the critical literature which engages it.

1: Fault-lines and contradictions in the policymaking process

The table below provides an overview of the tensions, dilemmas and disputes which punctuated the government's efforts to develop its offsetting proposals and were analysed in detail in Chapters 9 and 10. It is intended to be read partly as a counterpoint to **Table 15**, to demonstrate how the fragile consensus presented in Chapter 8 was fractured along several fault-lines, entrenching divides between different groups the government needed to enrol to implement offsets.

Table 16: Tensions, dilemmas and fault-lines in the policymaking process

Debate	**Dilemmas and fault-lines**	**Relevant groups**	**Implications for policy operationalisation**
Metric and measurement	**Complexity and precision of measurement**: necessary for ecological coherence and integrity of equivalent trades; crude metric open to manipulation and error	Conservation NGOs and ecologists	▪ Government declined to require more costly/complex forms of assessment and valuation ▪ Lack of species inclusion in metric threatened developer participation
	Simplicity of measurement: needed for market functionality and	Government, developers	

	fluidity; and to keep assessment costs down for developers	and green business	▪ Not fatal, but simple metrics undermined ecological credibility and likelihood of consistent standards for environmental interests; stoked fear that ascendant developer interests would exploit ambiguities
Ecological restoration and gain	**Precautionary and risk averse approach**: necessary to hedge against ecological uncertainty and restoration failure, to ensure equivalent gain and no net loss	NGOs and ecologists	▪ Contributed to view among environmental interests that government approach was reckless ▪ Not fatal, but government reticence undermined confidence (especially among NGOs) that offsets would be ecologically meaningful – likely to result in net loss outcomes
	Economic and political pragmatism: to ensure participation from developers and landowners; avoid overly prescriptive measures for providers; avoid unreasonable or unrealistic costs on developers	Government, developers and landowners	
Mitigation hierarchy	**Strong policy and guidance**: necessary to ensure consistency of application and standards; ensure important avoidance step adhered to over more risky compensation	LGEs and NGOs	▪ Government's lack of willingness to provide strong policy tools for regulators to use undermined credibility for environmental interests and planners, increased likelihood of uneven and inconsistent application ▪ Added to concern that risky offsets would frequently be considered first option rather than last resort, compromising crucial avoidance stage of hierarchy ▪ Ambiguous policy would favour ascendant and well-resourced development interests, especially in context of growth-orientated planning reforms
	Flexibility: needed to counteract inefficiencies of overly prescriptive bureaucracy, and allow for innovation	Government, developers and green business	
	Strategic regulatory planning: scope needed for early-stage application of mitigation hierarchy in local plans as prime mechanism to identify no-go areas and inform appropriate land use before planning applications get submitted; strategic planning needed to maintain and shape coherent ecological networks	LGEs, planners and NGOs	▪ Government's hostility to planning led to concern that intervention at development control phase would be too late to effectively achieve regulatory and no net loss objectives, or deliver landscape-level conservation goals
	Techno-managerial economic instrument: economic incentives and market forces need to be mobilised to deliver more efficient allocations of land and resources; flexible approach more conducive to business innovation than prescriptive bureaucratic measures	Government and green business	

Location and other restrictions on offsets	**Planning for multiple values and needs**: needed for consideration of complex social and environmental trade-offs, to deliver competing planning objectives	LGEs, planners and some NGOs	▪ Apparent disregard for other planning outcomes undermined confidence among planners that offsets could be easily operationalised with local consent – application would be contested and slow ▪ Threatened participation of some NGOs as providers, worried about reputational implications of receiving money for unpopular system
	Non-restrictive simplicity: necessary to avoid risks of insufficient supply which would undermine competitiveness and market efficiencies; market forces more efficient at responding to different preferences and needs over time	Government, green business, developers and landowners, some NGOs	
Thresholds and significant impact	**Low-level screening**: needed to capture biodiversity loss currently uncounted which constitutes 'death by a thousand cuts'	NGOs, ecologists and some LGEs	▪ Government reluctance to require developers to address low-level loss generated fear offsets would instead be used to erode protections of high value sites to free up land for development, leading to greater biodiversity loss overall ▪ Threatened participation of conservation NGOs, contributing to many walking away from pilots
	Reasonable and pragmatic screening levels for offsets: necessary to avoid additional burden and cost on development and growth, and to ensure participation from developers under voluntary system	Government, developers and some LGEs	
Longevity of offsets	**Very long-term securement of offsets**: only realistic option to achieve equivalent ecological gain to compensate for permanent loss through development impact	Conservation NGOs	▪ Largely unresolved issue threatened crucial participation from both landowners and conservation NGOs as potential offset providers ▪ Suggested loophole in conservation covenants undermined credibility of equivalent gain 'in perpetuity' for environmental interests
	Pragmatic timeframes: necessary to ensure supply of offsets from landowners worried about property rights; avoid very high costs for developers; ensure possibility of flexible and adaptive management in response to future social and environmental pressures	Landowners, developers, government and green business	
Regulatory oversight	**Strengthen regulatory capacity, resources and expertise**: necessary to evaluate proposals and ensure timely, informed and appropriate decisions in development control, as well as compliance, monitoring and enforcement of offset conditions; needed for provision of competent local design of offset strategies at plan stage	LGEs and planners, NGOs and ecologists	▪ Government refusal to resource planning authorities raised serious concern from environmental and planning interests that offsets would be implemented unevenly and exploited by developers – undermined confidence the existing failures would be addressed without improved oversight ▪ Undermined credibility of government's environmental objectives
	Offsetting as techno-managerial instrument based on economic incentives: required to address problem of uneven and limited resources and inefficiencies inherent in planning system; standards more realistic than regulation	Government, green business and some ecologists	

Mandatory or voluntary offsetting	**Compulsory offsetting**: vital to ensure consistent compliance from developers and avoid risk of 'license to trash'/offsets being used as bribes; needed to stimulate market of sufficient size to realise efficiencies	NGOs, LGEs, ecologists, green business and landowners	▪ Government insistence on voluntary system severely undermined confidence in credibility of system, suggested mitigation was ultimately not mandatory, but could be used to accelerate or buy planning consent ▪ Threatened participation of all potential buyers and sellers of offsets in market, as evidenced in pilots
	Voluntary offsetting: necessary to avoid additional costs on developers; reduce risk of planning authorities using offset requirements to block land development or extract unfair planning gain; ensure flexible rather than inefficient, prescriptive ways for developers to comply with mitigation requirements	Government and developers	

There are two major issues to highlight before moving into the deeper discussion of the findings outlined above. The first is that some tensions were sharper than others, and more consequential for the demise of offsetting as a national programme. At the same time, the many dilemmas encountered were deeply interrelated and interpenetrated one another, with knock-on and cumulative effects for the system's credibility among key actors, and its viability as a coherent regulatory regime. How and why the policy proposals eventually fell apart is explained in the next section. The second is the consistency of some underlying and crosscutting themes through which the disputes played out, of which four are identified and laid out in the **Table 17** below.

Table 17: Thematic tensions of policymaking disputes in the development of offsetting

TENSION	UNDERLYING THEMES
COMPLEXITY VS SIMPLICITY	Emanating from the technical debates, this tension surrounded debates about the extent to which biodiversity could be meaningfully constructed as commensurable and tradeable: ▪ Based on ecological science, ecologists and conservationists saw forms of measurement and valuation needing to reflect the underlying complexity of biodiversity and ecological processes, and use tools with as much precision and data collection as possible, capable of capturing the full, context-specific and interdependent range of values ▪ Government and green business groups maintained that the multiple benefits of offsetting were dependent on the economic efficiencies of markets, and therefore simplicity was crucial to enable a sufficiently fluid market to realise the advantages of competition and flexibility
ECOLOGICAL ROBUSTNESS VS POLITICAL/ ECONOMIC PRAGMATISM	The second tension revolved around disputes over what was necessary and feasible as pertained to achieving the stated environmental objectives: ▪ Conservationists and ecologists saw any meaningful offsetting system, through which no net loss of biodiversity was a realistic outcome, as necessitating a fully costed and precautionary approach, with strict and robust safeguards and standards in place to address ecological uncertainty, practical limitations of restoration, and risk of offset failure ▪ Government, in concert with developers, saw cost effectiveness as a prime objective, and were unwilling to entertain an offsetting framework which would

	lead additional compliance costs or regulatory burden on land development than the present system, since this might compromise the viability of development projects, impede growth and undermine the government's overarching and non-negotiable economic strategy and objectives for the policy
STRICT RULES AND STRONG POLICY VS FLEXIBLE COMPLIANCE	This tension reflected a division between different interpretations of the failures of the prevailing mitigation regime: ▪ Planners and conservationists viewed uneven and inconsistent implementation to be largely the result of ambiguous policy and guidance, and lack of clearly enforceable regulatory standards ▪ Government, developers and green business proponents painted overly bureaucratic regulation and inflexibility of planning processes as the cause of inefficiencies and poor outcomes, in need of liberalisation to create room for private enterprise to innovate
STRATEGIC PLANNING VS ECONOMIC INCENTIVES	Connected to the third tension, this issue concerned different views on the most effective and appropriate approach to delivering economic and environmental outcomes through offsetting: ▪ Planners and conservationists insisted offsetting needed to be primarily plan-led, exercised by well-resourced, expert-informed planning authorities, as the most effective method for shaping strategic and landscape-level decision-making which could take account of multiple social, economic and ecological values and needs ▪ Government and green economy advocates wanted to move towards the use of MBIs, price signals and other economic incentives, as far more efficient techno-managerial tools with which to mediate the allocation of limited resources and land across space, especially in a context of strained public finances

In highlighting these deep fault-lines, the purpose is not to construct overly simplistic dichotomies. As the analysis of the previous three chapters showed, there was considerable nuance in the various positionalities of different groups and actors. Furthermore, there were no simple solutions to the dilemmas confronted. Though certain groups believed the instruments and mechanisms could be finetuned in a coherent manner, most of the potential resolutions put forward contained their own complexities, contradictions and constraints. Rather, the implication of these divisions was that determining the system's design features and institutional architecture was a matter of trade-offs, with largely zero-sum outcomes for the policy's (narrowly defined) economic and environmental goals. Moreover, as was repeatedly demonstrated as the policymaking process unfolded, the government's unwillingness to overtly acknowledge the necessity of trade-offs, and countenance state intervention to satisfactorily settle them, only exacerbated the fractures. As will now be examined in concluding the analysis, it was the government's unwillingness or inability to accept and provide this regulatory scaffolding which ultimately made it difficult to proceed with the whole policy.

2: How and why offsetting unravelled

Retelling the policymaking history from Chapter 7, in light of the analysis presented in the subsequent chapters, gives invaluable insight into how and why national implementation was abandoned by the

end of 2014. The first topic to dwell on was the positive narrative constructed by the government and its green business allies. Drawing heavily on the tropes reviewed in Chapter 3, it was proposed that market efficiencies could generate absolute benefits, rather than conventional trade-offs, between development and conservation, economic and environmental outcomes. By appealing to these different interests, it was possible to build some consensus around the desirability, in principle, of a formal biodiversity offsetting system, as outlined in Chapter 8. However, it is crucial to understand the government's market exuberance as structurally entwined with a deep political animosity towards command-and-control regulation and planning, a backlash against environmental protections, and a programme of cutting down a supposedly bloated public sector system of bureaucracy and regulation, all presented as barriers to growth and development. These were the precise political conditions which gave a market-orientated offsetting system its appeal to Conservative party leaders from 2009, and mediated the conditions of possibility for the playing out of the national and local policymaking process.

As the analysis chapters demonstrated, there were considerable technical and institutional complexities in establishing a coherent set of tools, rules and regulatory architecture necessary to operationalise such a programme, overlaid onto the existing regime of ecological regulation of land use. Configuring the policy in such a way that was coherent and satisfactory to all parties proved far from straightforward, and as the literature reviewed in Chapter 4 suggested, solving common problems and tensions which afflict offsetting systems tends to require significant reregulation and state intervention of various kinds. This was not necessarily impossible within the parameters the government had set. However, as soon became apparent, addressing the many dilemmas encountered would involve politically mediating trade-offs. This was clearly evidenced throughout Chapters 9 and 10, on issues such as the final features of the metric and assessment standards, while screening for significant impact and determining the longevity of offsets provided two particularly stark examples. How the government chose to settle these matters would undoubtedly favour some interests over others, and reduce the incentives for those who lost out to participate in and legitimate the system.

In nearly all cases, the UK government maintained something of a *laissez faire* attitude, mobilising arguments around the need for flexibility and the inefficiencies of centralised control and complex rules. At the same time, Defra maintained a strong line that nothing would be imposed which would risk additional regulatory burden on businesses, while developers pushed back against such measures proposed by others, both publicly and behind the scenes. In practice, the UK government appeared willing to simply allow offsetting to play out locally, effectively deferring to planning norms. As explored in Chapter 7, the government's wider programme of reform and deregulation meant that the planning system was increasingly tipped in favour of developers, through new duties and mechanisms within the NPPF, various pieces of legislation and policy, and the gutting of local authority and regulator capacity.

Though this approach allowed Defra to keep offsetting within the broader parameters of the government's economic imperatives, what remained underspecified was exactly how the overall system was expected to cohere and meet its environmental objectives, given the presence of so many unresolved issues. As explained in Chapters 9 and 10, environmental interests questioned the contribution of offsetting if the technical instruments, policy mechanisms and regulatory safeguards were not strong enough to redress the (widening) imbalances in planning, which allowed developers to 'get away with' noncompliance under the prevailing mitigation regime. It was anticipated that the plethora of inadequately addressed challenges, evidenced in the empirical chapters, would institutionalise a meaningless definition of no net loss, and risk reinforcing poor standards and outcomes. While the government preached win-win, a deeply contradictory logic permeated every dispute in the policymaking process: offsetting must demonstrably cost developers less than the existing system, where compensation (let alone no net loss) was not happening at all to all intents and purposes. The government's policy proposals were viewed as badly thought through at best, and likely to lead to uneven implementation with potential for exploitation by unscrupulous developers. Even among those initially supportive, many came to see the policy as a cynical ploy of a much stronger pro-development agenda. This latter position was always the viewpoint of more critical voices in the debate, which, as it grew in prominence, put further pressure on more conservative NGOs to withdraw their support for the policy for the sake of their reputations. As David Hill regretfully put it in early 2016, biodiversity offsetting had become 'toxic' in the UK (Scott-Campbell, 2016).

Many of these concerns could probably have been addressed by a government willing to extend the regulatory power of planning authorities, by intervening and setting strong national policy and guidance around a mandatory offsetting system – though the problems of offset supply remained. Though conservationists, ecologists and LGEs all pushed for an offsetting system which was as technically and institutionally robust as possible, their organisational aims were, on balance, somewhat limited and pragmatic. They saw offsetting as an opportunity to consolidate the current system and improve environmental outcomes, through quantification, standardised practices and consistent application – not a panacea, but an improvement. The problem they had with the actual direction of the official proposals were that they risked eroding what was already in place. Specifically, they perceived the voluntary nature of the government's proposed system to imply that compliance with mitigation 'requirements' was in fact optional. Under such a system, offsets would become a way to sway planning consents – in short, a 'license to trash' for developers.

The more direct issue with the government's unwillingness to impose compulsory offsetting was of course incentivising participation. Given that developers were not paying for compensation under the existing system, nor were they being significantly held up by mitigation compliance, they had little incentive to offer offsets voluntarily. Moreover, the growing unpopularity and suspicion around the policy meant that the supposed reputational benefits – the 'license to operate' argument in Chapter 3 – looked more like reputational risks. Without forcing developers to offset residual biodiversity loss, which they lobbied strongly against, there was little chance of stimulating any demand. Without

certainty of demand, landowners and farmers could not be induced to offer receptor sites on a scale which would enable choice and competition. The potential buyers and sellers had effectively walked away. Though some pro-offsetting groups believed that a voluntary offsetting system could be operationalised by local authorities, the creation of a market and its slated efficiencies looked increasingly unviable by early 2014. Consequently, the win-win promise around which the proposals had been built fell apart. By this point too, the UK economy had returned to what looked like sustained growth. The Treasury and government leadership eventually blocked the policy altogether. The policy was seen as too publicly controversial, including among the Conservatives' core rural constituency, in the run-up to the General Election of 2015. Biodiversity offsetting was quietly and unofficially dropped in July 2014, with Paterson's dismissal from Defra.

3: Biodiversity offsetting in England – neoliberalising nature?

The opening chapters of the thesis explicitly orientated the study around literature on the neoliberalisation of nature and conservation. As explained in the Introduction, this was because the core characteristics of biodiversity offsetting look very much like they fit this mould. Offsetting is typically thought of as a market-orientated policy or market-based instrument. Those advocating its use typically mobilise particular economic narratives and arguments around such notions as valuation, efficiency and flexibility. It is usually presented as an antidote to the supposedly stultifying and ineffectual consequences of command-and-control regulation, originating from the pre-neoliberal era, designed to tackle environmental degradation. The literature was also offered as a source of critical tools, with which to analyse the theoretical application and real world examples of these types of policy, as a set of geographically variegated, hybridised and contradictory practices. This penultimate section of Chapter 11 returns to this literature, with the intention of asking how useful it is in explaining what transpired in England, as analysed over the last four chapters. Chapter 4 ended with three possible frames with which to think through biodiversity offsetting from the neoliberal natures perspective. Each of these are now taken in turn, and brought to bear on the empirical case study and analysis. Section 3 ends with some reflection on the ways the existing literature, while helpful, falls short in telling to the whole story, and requires some further synthesis.

3.1: Offsetting as accumulation strategy

As explained in Chapter 4, Section 3.4.1, 'offsetting as accumulation strategy' frames the policy as a project of capital accumulation, either direct or indirect. For the former, it asks whether offsetting can be considered as a state or capital led process of commodification, through which wealth is accumulated by capitalisation or privatisation of biodiversity. In the case of the proposed system in England, this played a part in the story. Defra's White Paper of 2011, where the trialling of offsetting was first announced, made much of the government's intention to grow a green economy, by mobilising the methods of economic valuation developed by national and international studies to generate new green markets. Following on from this part of the NEWP, one of the more significant

outcomes was the creation of the Ecosystem Markets Task Force, set up with the express intention of exploring opportunities in this area which UK businesses could exploit. In turn, the EMTF's final report made the immediate establishment of a national biodiversity offsetting programme its priority recommendation for government, stating it to be worth an estimated £500 million per year in new business activity.

The Task Force, made up of ten leading green business leaders, was widely recognised as influential in accelerating the government's plans. Similarly motivated and overlapping green business interests, such as the Environment Bank and Aldersgate Group, were equally invested in the notion that conservation be made a profitable enterprise through constructing regulatory markets, and were crucial government allies in the development of policy proposals. Some of the criticism levelled against the Environment Bank was certainly directed at (the perception that) their openly admitted profit-making goals compromised their environmental credibility. Meanwhile, the benefits of generating a large-scale offsetting market were frequently framed as opportunities to grow rural economies, as much as meeting environmental objectives. This came from some local government ecologists, but most prominently from the CLA, who were interested in turning biodiversity on their land into financial assets which could be sold, or more accurately, rented for profit. On the other hand, criticisms of offsetting on grounds akin to 'green grabbing' found in the neoliberal conservation literature featured very little in the data. Organisations and individuals were far more concerned with the development end of the process. Direct accumulation of wealth through offsets clearly motivated some green business groups. Yet they were minor players in the wider context, and this was not the primary goal of the policy. When examining the detail of the proposals and talking to government officials, offsetting on the register of green accumulation rarely moved beyond rhetoric found in various policy documents, as well as Paterson's statements.

The second, indirect strand of 'offsetting as accumulation strategy' appears to have more purchase on the English case study. The government's overall objectives for its policy was less concerned with stimulating an offsets market for its own sake, than it was with using offsets to lubricate the planning system. As many recognised, the potential value of offsets nationally was dwarfed by the value of development activity, so central to the UK economy. By establishing a quick, simple and cheap mechanism for allowing developers to meet their environmental compliance requirements, freeing up land and accelerating land development was the true prize the government hoped offsetting would unlock in a stagnating economy. Returning to the literature, this resonates most strongly with Hackett's (2016) work on voluntary offsets in Alberta. Maintaining or maximising environmental value was not the primary concern of the policy. Rather, lubricating the planning system by allowing developers to circumvent environmental constraints, and facilitating growth in the important infrastructure and real estate sectors was the overriding goal. The important features of offsets, therefore, were that they were simple, fluid and cheap, so the landscape could be spatially reordered such that biodiversity was not an impediment to the creation and realisation of economic value in prime development locations. This could be seen in the government's desire to create a system where

developers could buy credits ‘off the shelf’, and its strong opposition to any measures or restrictions which might hinder progress towards this ideal. It also helps explain the commitment the government showed in defying calls for offsets which would impose greater costs on developers, and might threaten project viability. Aimed partly at reducing transaction costs on development, more ecologically meaningful offsets would have required a distribution of surplus-value to land-based interests, through rent, which developers opposed as illegitimate planning gain.

3.2: Offsetting as environmental market-making

Contemplating the issues explored in critical studies of nature commodification and environmental markets gives other insights into the problems encountered in England. In the first instance, it helps explain the technical complexities of designing the calculative devices and attempted processes of commensuration, and why disputes emerged around the metric and definitions of no net loss. It is worth highlighting the well-versed epistemological and ontological instabilities of biodiversity, the resultant difficulties and contradictions of abstraction, quantification and equivalence-making in the face of imprecise and contested scientific knowledge, and the uncertainties of deeply unpredictable and relational ecological processes. The academic literature strongly suggests that, though market-orientated, uncertainty and non-equivalence mean offsetting policies require strong reregulation and restrictions to manage risks and protect against failure. Moreover, they must strike some kind of socially acceptable and technically feasible balance between simplicity and complexity. These dilemmas played out in the scientifically framed, but politically mediated wrangling over the features of the metric, the adequacy of restoration ecology to deliver sufficient and equivalent gains, questions over longevity, restrictions and so on. The UK government’s apparent ‘techno-optimism’ (Moreno-Mateos, Maris, et al., 2015) and unwillingness to intervene and meaningfully stabilise these tensions undermined both the legitimacy of the biodiversity valuation procedure, and the consent of those needed to operationalise it. Robertson’s (2006a) observation, meanwhile, that ‘more science’ cannot necessarily solve these kinds of contradictions partly explains the government’s reluctance to compromise the metric’s simplicity, and its concerns over requiring more involved forms of assessment.

Drawing on other parts of the marketisation literature, it is possible too to question whether Defra’s proposals constituted moves towards commodification of biodiversity. More accurately, while the metric played a performative role in constructing value relativity between habitats, through quantified measures of distinctiveness and condition, monetary valuation was not part of the process. Rather, the price of offset credits was envisaged as a projection of likely replacement cost, certified as appropriate to meet negotiated planning conditions. Biodiversity itself was not to be bought or sold as a commodity, only legal certificates, the purchase of which would fulfil mitigation requirements. If anything, they would be fictitious commodities – rent enforced by the state to redistribute surplus-value, an unavoidably politicised response to the second contradiction (Felli, 2016). Their price would not represent underlying biodiversity value, but rather the materialised regulatory risk – or ‘compensation liabilities’ (Caldecott & Dickie, 2010) – of noncompliance (Dempsey, 2013). Crucially,

it was the lack of credibility behind this regulatory risk which made the market so difficult to operationalise, given the government's deep antipathy towards command-and-control regulation and state intervention. The part of the literature which stresses institutional heterogeneity and hybridity in 'actually existing' offsetting regimes is useful here, in highlighting how important regulatory intervention has been in operationalising offsetting elsewhere.

As Robertson (2006a, 2007) says, offsets are necessarily regulatory markets, where capitalisation requires the state to socially determine and enforce ecological value through law, but in such a way that is legible to capital, and legitimated by the natural sciences across epistemological boundaries. In the English case study, it appeared that this careful articulation – and subsequent enrolment of key groups – was made exceedingly difficult by the government's unwillingness to intervene or extend the necessary regulatory powers to planning authorities. At the same time, it heavily favoured economic legibility in its decision-making over ecological coherence or precision, in a bid to enable market liquidity, but to the detriment of its efforts to enrol groups with ecological expertise – professional ecologists and natural scientists, as well as conservationists.

3.3: Offsetting as the economisation of nature

Leaving aside the question of whether the government's plans would have constituted commodification or market creation in any strict sense, and their overlay onto a complex regulatory landscape, it is important to stress the role of marketisation at the discursive level of policymaking. The UK government, and groups such as the Environment Bank, the EMTF, Policy Exchange and eftec consistently mobilised ideas and arguments associated with market environmentalism. Competitiveness, price discovery, and optimal resource allocation were some of the more common market-efficient tropes underlying the promised reconciliation of competing demands, and the delivery of optimal, win-win outcomes. Interestingly though, while these were used to try to appeal to a range of key stakeholders, arguments around market efficiencies made little impact beyond market-oriented green economy advocates. Regulatory and technical detail, where trade-offs quickly became apparent, was of far greater significance to developers, planners, ecologists and conservationists, and most did not buy into the market logic, either because they saw it as not credible or relevant in the circumstances, or because they perceived calls for market liquidity to be in tension with the policy's ecological integrity, and something to be restrained.

Often more prominent than the benefits of marketisation *per se*, were narratives which constructed offsets as economic instruments. Efficiency still lay at the heart of this framing of the proposals, but more emphasis was put on notions of flexibility, transparency and the power of numbers, and the role of price signals and economic incentives. The analysis showed how recurrently developers and green business interests drew on the supposed flexibility of offsets, and how they could induce innovative compliance practices. This was usually constructed in opposition to the inflexibilities of command-and-control planning, regulation and state management. Transparent audit procedures were also frequently invoked by think tankers, policy consultants and green business representatives, as well as some of the more pro-offsetting professional ecologists. This intersected with the more techno-

managerial approach espoused by some groups, as smart solutions to the regulatory problems faced by the prevailing regime. On one level, this techno-managerial theme reflected a widespread repudiation of the traditional regulatory techniques and cultures as out of date and ineffectual. On another it was pitched as a pragmatic path in the face of inevitable state retreat from direct intervention, in the face of a changing structural realities and everyday expectations.

On its own, framing economisation in this way does little to reveal why the government's plans fell apart, though it helps explain some of the quite different subjectivities and inconsistencies on display within certain groups. More useful perhaps, is framing offsetting as the economisation of nature with respect to Davies' (2014) concept of neoliberalism as 'the disenchantment of politics by economics', and the predominance of economic logic in shaping the government's policy. It enables some understanding of the processes at work, in the clearly expressed hope – most notably articulated by Paterson, but also to be found in documentation coming out of Defra – that the use of a market-based instrument could depoliticise the planning process. Returning to the literature, Felli's (2015) analysis of environmental markets is helpful in explaining the government's motivations here, linking it back to depoliticising the notion of environmental limits in general, in the service of capital accumulation – in this case, offsetting as an instrument to facilitate accumulation elsewhere. As has been shown, this patently did not work, and the proposals became irretrievably politicised.

There is more however to take from the economisation frame, in explaining the structural problems the government faced from the start. Defra's embrace of the ecosystem approach, and what became known as its natural capital agenda under the coalition government, was a deliberate attempt to mainstream environmental policy across government. By marshalling techniques to 'value nature' – of which biodiversity offsetting was intended as a key policy mechanism – it was designed to make environmental policy more economically relevant and palatable, especially to the gaze of the Treasury. As was clear from the policymaking history, the Treasury's influence was hugely significant, most obviously through its final quashing of Defra's proposals. It was illustrated too by the unprecedented intervention by the Chancellor, in ordering a review into the national implementation of the Habitats and Birds Directives, on grounds of regulatory burden and the government's economic imperatives, which heavily shaped the direction of offsetting. It was in allowing offsets to be subsumed under the Treasury-led economic strategy, based on fiscal austerity and the dismantling of regulatory barriers to growth, which exacerbated the offsetting's internal tensions beyond credible resolution.

3.4: Failing to 'neoliberalise' nature

The three frames drawn from the literature reviewed in Chapters 2 and 4 each help make sense of the findings of the thesis. Offsetting as accumulation strategy gives some useful insights into some of the core motivations underpinning offsetting in England for the state and capital, and direction it took. In terms of explaining why the move was unsuccessful, it is more limited, though it partially clarifies why governmental and environmental interests became so irreconcilable. Offsetting as environmental market-making certainly has explanatory power with respect to why the government was unable to resolve offsetting's technical and institutional complexities, given the voluntary and

non-interventionist approach, and its implications for the policy's credibility and implementation. It gives a solid basis for apprehending what the government got wrong, and why decisions made exacerbated rather than resolved offsetting's internal tensions and contradictions. The question remains however, why such seemingly elementary mistakes were made. Offsetting as economisation of nature shines light on the role of economic rationality which underpinned so many of the policymaking debates, and how this shaped perceptions and expectations of offsetting. In the end, by subordinating the case for offsets so firmly to economic imperatives, it was unable to escape their quite specific constraints, which ultimately compromised the policy's viability. The third frame is useful in situating the first two, and helps comprehension of the more structural conditions which mediated the government's decisions and actions. In bringing the discussion and thesis to a conclusion, the chapter now offers some final synthesis and reflections on the case study, and wider implications for biodiversity offsetting.

4: Synthesised findings, implications and final reflections on the case study

This final part of the discussion chapter and thesis attempts to theorise and synthesise the thesis findings, presenting a fuller picture of why the introduction of biodiversity offsetting was stymied in England. In doing so, it draws on the frames from Section 3, yet goes further. It not only shows how the pieces fit together, but how they helped constitute and shape one another, mediated through the interlinking tensions summarised in **Tables 16** and **17**, in a particular historical and geographical moment. Having made this case, the section turns to the implications of these findings, for the study and application of offsetting more generally.

4.1: A synthesised theoretical analysis of the failed English biodiversity offsetting policy

The government's policy proposals were built on an optimistic rhetorical foundation of win-win outcomes for land development and nature conservation. It drew on a well-established policy discourse around biodiversity offsets, reviewed in Chapter 3, grounded on ideas of the efficiency and flexibility of market-based instruments, as well as international examples. This relied for legitimacy not just on a global milieu of organisations, networks and institutions, where offsetting had been conceived as one mechanism for a necessary shift towards an economically-orientated ecosystem approach to conservation, but also on a domestic coalition of actors, comprised of a green fraction of the business sector and various policy consultants, advocating for a concerted governmental action towards the development of a green economy and greater use of environmental economics in public policy. Situated in this wider ideational landscape, offsetting was envisaged as one component of the government's natural capital agenda, which undergirded the Natural Environment White Paper. This provided a framework for the roll out of novel economic and market-based instruments, designed to mainstream nature's (economic) value across governmental and societal decision-making. Underpinning this approach was the theoretical argument that making environmental policymaking

economically legible was the key to managing environmental and economic objectives in the most efficient way.

In the case study, this framework was crucial for several reasons. It theoretically allowed conservation goals to be met without compromising overriding economic imperatives. This was particularly important in the moment offsetting emerged in England, since environmental laws had been constructed by the new government – and especially the Treasury – as an obstacle to a sustained economic recovery in the turbulent years following the financial crash of 2008. New housebuilding, commercial property and infrastructure were central to the UK economy, while affordable housing remained a prominent political issue which demanded some kind of action. Yet since the government was bound by international conventions and agreements, dismantling environmental regulations was neither legally nor politically feasible. Offsetting looked as if it would offer a way of resolving this problem, freeing up land for development and accelerating planning consents. At the same time, offsetting appeared to speak to a host of governmental concerns and preoccupations, including hostility to command-and-control regulation, in need of flexible solutions, and a core role for private enterprise in meeting social and environmental challenges. In addition, offsetting was proffered as a mechanism which could lever much needed private finance for underfunded conservation, in a time of severely constrained and diminishing public spending under austerity. This element of the win-win narrative was vital for engaging environmental interests, who also saw scope for using a formal offsetting programme to modernise, consolidate and standardise the prevailing mitigation regime, which was widely recognised as seriously failing due to a variety of factors. Taken together, the win-win promises of offsets offered solutions to multiple challenges with quite specifically neoliberal characteristics, in a particular historical moment of neoliberal crisis.

However, while offsetting worked on a symbolic level, and offered a plausible theoretical story, the political economic moment which gave rise to its specific appeal in the UK post-2008 were also the structural conditions which sharpened its internal tensions and contradictions – particular to these kinds of environmental markets – and constrained regulatory and institutional actions capable of resolving them. On one level, this played out in disputes over the technical design, where the ecological complexity and the limitations of restoration proved difficult to reconcile with demands for both market functionality and cost effectiveness. Even more problematically, offsetting did not offer any answers itself to the manner in which nature had been structurally and materially devalued in the socialised and political world of planning, where economic and ecological objectives were supposed to be resolved through implementation. Firstly, planning authorities' capacity to strategically plan and integrate offsetting into local policy was constrained by limited ecological expertise, data and financial resources, a situation which was being eroded further by austerity measures. Not only would this affect strategic planning, but also their ability to effectively discharge their planning duties in the moment of development control and negotiation, and to monitor and enforce compliance. Secondly, in coming to balanced, appropriate and reasonable decisions in planning terms, the scope to enforce strict interpretations of no net loss was mediated by the weighting of economic objectives, relative to

more ambiguously worded conservation duties in policy and guidance. Local authorities were facing overwhelming pressure to deliver housing and growth, while both developers and DCLG had various mechanisms and special measures at their disposal, such as viability assessments and five-year housing supply obligations, which could be used to discipline planning authorities deemed to be imposing additional burden or blocking development. In these circumstances, planning authorities were wary of the costs – financial and political – of stipulating what could be considered 'unreasonable' demands through offsetting. Combined with the voluntary nature of offsets, this put developers in a particularly strong position when negotiating planning permission. These political dynamics permeated every critical moment of the proposed design features of an offsetting process. Consequently, it became impossible to defend its ecological integrity or regulatory credibility. With little to be meaningfully gained – and much to lose reputationally – through participation, the majority of actors walked away. Without the possibility of a sizeable and competitive offset market, the win-win argument collapsed, together with cross-departmental agreement in central government that the policy was worth pursuing.

The final analysis of the case study is therefore as follows. Many interviewees reflected that it had been the wrong time for offsetting in England, at a juncture where national and local government had been particularly ill-equipped to initiate a programme so complex and likely to be controversial without careful handling. Others highlighted the government's recklessness in promising more than offsetting could feasibly deliver for both land development and conservation. However, the interplay between these seemingly contingent factors was far from coincidental. Discursively, offsetting was firmly situated in that same set of neoliberal social and economic arrangements which reproduced those very conditions. Those leading the calls for offsetting first and foremost made their argument based on an economic rationale and business case, which said offsets offered a market-based and flexible win-win solution to the failures and inefficiencies of command-and-control regulation. Constructed in this way, offsetting was mobilised by the government as part and parcel of a wider programme of environmental deregulation and liberalisation, which was nevertheless constricted by legal commitments to international conventions. The promise of offsets was consciously framed in this way as addressing these specifically neoliberal concerns, as a coherent neoliberal, techno-optimistic fix, which would facilitate rather than compromise growth. Even though considerable market reregulation was understood to be necessary by its business-led advocates, this was rhetorically downplayed for political buy-in. Later, when the detail had to be worked through, this made it impossible to argue for the kinds of interventions and regulatory measures, on a necessary scale, required to meaningfully resolve offsetting's inherent tensions to almost anyone's satisfaction. In a similar register, offsetting's premise largely accepted – reinforced even – a sense in the inevitability of the continuing contraction of public resources dedicated to ecological regulation, instead foregrounding the role of private enterprise and markets as the solution to deepening economic and ecological crises. This left little recourse to tackle those institutional factors which had long materially undervalued biodiversity in the planning system, had no simple technical fix, but were desperately needed to implement the system effectively.

4.2: Contemporary developments and implications for the future of biodiversity offsetting in England

Towards the end of the coalition government's parliamentary term in late 2014 and early 2015, when it had become clear that the national policy had been abandoned, some advocates put hope for the policy in the return of a Labour government, who they believed were considering the introduction of mandatory offsetting. However, in the General Election of May 2015, Cameron led his party to something of a surprise victory which allowed the Conservatives to form a majority government. Biodiversity offsetting has not been revisited since, save in February 2016, with the long-awaited release of the 2013 consultation results, the evaluation of the pilots, and some other commissioned research completed two years before. The government's response was largely non-committal, and it was clear that there would be no further work on the policy. The new secretary of state at BIS, Sajid Javid (now at DCLG), promised a deregulatory drive even deeper than the coalition's, while the Red Tape Challenge was relaunched as 'Cutting Red Tape', through which 'one-in, two-out' was replaced with a 'one-in, three-out' rule, despite continuing criticism of the policy's ineffectiveness.

In terms of offsetting, what remained was the loose voluntary framework established through the pilots and subsequent national planning guidance. The controversial HS2 project has gradually moved forward with its plans to offset damage to ancient woodland on the route, which continues to be disputed (Natural England, 2016c). Offsetting policies have continued locally, most notably in the Warwickshire area, with tentative moves from other local authorities to develop similar approaches, though these remain largely *ad hoc* (Environment Bank, 2016). Pro-offsetting green economy advocates and others have persisted in promoting the policy too (e.g. Francis et al., 2016; Homfray & Webb, 2016), and have put some hope in Defra's delayed 25-year natural capital strategy. Natural England (2016a) meanwhile held a consultation in early 2016 to reform its protected species licensing regime, with something much like offsetting under consideration. No decisions have yet been made, but the plans are apparently informed by major restructuring of the agency, through which it is expected to retreat from its traditional regulatory approach to small sites, and pursue 'enabling' policies for landscape level conservation through local partnerships (Natural England, 2016b).

However, the most consequential moment since the policy was dropped in 2014 was the referendum held in June 2016, when the UK voted to leave the European Union, on the back of a campaign led by the right wing of the Conservative party and UKIP. Cameron resigned as prime minister the next day, having called and lost the vote as a result of serious political miscalculation, through which he hoped to defeat his rivals. Theresa May won the subsequent leadership election to take over the government, and is expected to trigger the UK's exit from the EU in spring 2017. While the future is extremely uncertain, leaving the Union will mean the UK is no longer bound by the European Habitats and Birds Directives, the source of the country's strongest conservation laws. Though environmental legislation played little role in the Leave campaign, right-wing anti-EU sentiment has long constructed European laws as illegitimate interference with national sovereignty, under the auspices of unaccountable bureaucrats. Since offsetting's original appeal was largely shaped by the constrictions of EU laws on economic growth and land development, a far deeper round of deregulation, supported

by developers, is likely over the next few years – especially if the expected economic slowdown following 'Brexit' occurs, under a government considered even more hostile to environmental concerns than Cameron's. In this context, and given the problems which beset the coalition's policy, the possibility of offsetting re-emerging on the national level seems very unlikely.

4.3: Implications for biodiversity offsetting globally

The literature reviewed in Chapters 2 and 4 strongly suggests that neoliberal environmental policies are deeply variegated and context-specific, at the same time as demonstrating common characteristics. The thesis has shown how important historical and geographical particularities shaped the English experience. The case study was unusual in showing an example of biodiversity offsetting completely unravelling before it was even implemented. Nevertheless, there do seem to be wider implications, in light of the final synthetic analysis, which posits the deeply intertwined nature of political economic conditions which gave rise to the policy's appeal, and the ensuing breakdown of the policymaking process. The question for the study of other nascent offsetting programmes is whether the UK should be seen as anomalous. In the stagnating economic landscape of the post-2008 world, the stalled process at the EU level briefly reviewed in Chapter 7 indicates that perhaps it is not. Initiated by the European Commission, offsetting here was firmly situated and justified in a deregulatory climate, where environmental protections were under attack for undermining business competitiveness and economic recovery, in a context where many member states were undergoing deep austerity measures to reduce public deficits. The proposals also coincided with a major review of the Habitat and Birds Directives on similar grounds, and exploration of replicating the UK's Red Tape Challenge in Europe. While a law establishing conservation banking was passed in Spain in late 2013 (Álvarez García, 2014), there has been no reporting of activity since. Meanwhile, offsetting has become increasingly contentious and its credibility disputed in other parts of the industrialised world, most notably in Australia (Slezak, 2016) and Niagara, Canada (Walter, 2016). These examples of course merit further study and critical analysis. Yet returning quickly to literature reviewed at the end of Chapter 4, some authors note that using realistically large multipliers to mitigate restoration failure rates would be 'an insurmountable institutional challenge' (Curran et al., 2013, p. 628) or 'politically and economically unacceptable' (Maron et al., 2012, p. 145). The English experience appears to support these claims, and its implications raise questions over suitable conditions for offsetting's meaningful application anywhere at the current juncture. If advanced industrialised nations face such difficulties, offsetting's potential in poorer parts of the world with even lower institutional and regulatory capacity seems even more doubtful.

Leaving aside political economic conditions, the attraction of biodiversity offsets has nonetheless grown in recent years at the international scale. What is perhaps most important to highlight here is how offsetting has been fully integrated into the now dominant green economy paradigm. More than ever before, standards, expectations and narratives around biodiversity offsetting, explored in Chapter 3, are being mediated at a high scale by a global network of powerful elite actors, including large corporate entities, banks, multilateral bodies and development agencies, NGOs and so on.

Through this formation, the promise of win-win outcomes have become ever more prominent, resting on the business case of offsets, that their wide adoption will accelerate capital accumulation. Offsets are increasingly identified primarily as a business-led, market-based instrument, speaking directly to neoliberal concerns. To paraphrase Carton (2014, p. 1012), who makes the comment with respect to carbon trading, biodiversity offsets have fully internalised the economic imperatives of market society. However, relying so heavily on the business case has caused frictions like those in England. These problems were clearly on display at the BBOP summit in London, held in June 2014 to celebrate the organisation's tenth birthday. In her opening address, Kerry ten Kate admitted instances of confirmed success were few and far between, and countless business leaders, ecologists, conservationists, consultants and policymakers expressed their frustrations with offsetting in practice. Among other issues, attendees highlighted unrealistic expectations, overly complex instruments and language, lack of political will, difficulties in generating 'investable' returns, and enduring challenges of translating biodiversity value into financial costs (PO4). The UK government's aborted policy was a blow, and several sources have made unconfirmed claims that BBOP is being restructured by its parent organisation, Forest Trends, in light of its limited success over a decade into its existence. As noted by Benabou (2014), many multinationals have left the coalition in recent years.

Yet events of geopolitical importance could easily overtake offsetting's troubled transnational normalisation. In the weeks before this thesis was completed, Donald Trump was elected as the new US president. The environmental backlash may be severe, with federal laws and the EPA already being targeted. US environmental policy under Trump will have global implications too, for the future of multilateralism. The incoming administration initially said it would withdraw from the UNFCCC, though Trump has since backpedalled on his previous claim that climate change is a 'Chinese hoax'. While the new government's attitude towards the CBD remains unclear for now, its own status would appear equally precarious. Many other high-scale bodies which have become central to the governance of nature conservation and offsetting standards, such as the World Bank, are also likely to affected. With elections across Europe in 2017, far-right and anti-EU parties look set to make substantial gains following both Brexit and Trump's win, putting the European project itself under increasing strain.

Much of this is of course highly speculative, but at the same time the direction of travel points away from conditions suitable for further spread of biodiversity offsets across the globe. Environmentalism has been very much on the back foot since 2008, in the context of continuing social and economic crisis, and ever greater challenges to protect public goods in general. The weakness of the environmental movement leaves the multi-scalar architecture of institutions which govern nature conservation open to attack, in the face of an increasingly prevalent revanchist nationalism, hostile to environmental concerns and liberal internationalism. Biodiversity offsetting, it should be remembered, is largely constituted as an attempt to reconcile economic growth with the constraints of – and costs of transgressing – laws, policies, standards and norms emanating from this regime. If this component of offsetting's rationale is weakened, through which the mechanism is constructed as

a necessary compromise, the increasingly prominent business case will likely fade, as it did in England. Given the considerable strain on offsetting's articulation which is already apparent, and meaningful application under existing conditions has proven so difficult, the mechanism's consolidation as a popular conservation tool faces serious obstacles. To return one final time to the neoliberalisation of nature literature, this thesis may act as something of a provocation to think further about the internal limits of environmental markets in this time of converging crises.

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