

# 1. Introduction

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It is vital for the future of humankind that we maintain and enhance the health of the world's ecosystems and their ability to support the human population. Preventing and reversing the devastating loss of biodiversity arising from human activity is an essential objective and one that has been accepted by the governments of the world. Yet we are not being very successful at meeting this goal. This assessment was confirmed in *Global Biodiversity Outlook 3*,<sup>1</sup> prepared in 2010 under the auspices of the Convention on Biological Diversity:<sup>2</sup>

The target agreed by the world's Governments in 2002, 'to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth', has not been met. There are multiple indications of continuing decline in biodiversity.

This gloomy conclusion of international experts reveals the need to do better. Since then, a new set of objectives has been agreed, again calling for reductions in the rate of habitat loss and extinctions and for states to ensure that concern for biodiversity is integrated into their strategies and planning processes.<sup>3</sup> Yet, although there are some signs of hope,<sup>4</sup> the overall picture remains unpromising. The latest *Global Biodiversity Outlook 4* in 2014 shows progress with regard to formulating conservation and policies and designating protected sites, but inadequate, if any,

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<sup>1</sup> Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 3* (Montreal, 2010) 9.

<sup>2</sup> Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79.

<sup>3</sup> The Aichi Biodiversity Targets for 2011–20, within the Strategic Plan for Biodiversity 2011–20 agreed at the Conference of the Parties under the Convention on Biological Diversity in 2010: COP 10 Decision X/2.

<sup>4</sup> E.g. the biodiversity indicators for the United Kingdom do show areas where there has been positive progress in recent years (albeit in many cases not yet making up for losses in past decades), as well as others where a negative trend is continuing; Joint Nature Conservation Committee, *UK Biodiversity Indicators 2014* (JNCC, 2014).

progress in crucial areas such as using natural resources within ecological limits, preventing habitat loss, fragmentation and degradation, and preventing extinctions.<sup>5</sup>

Against this background it is inevitable that there should be some reassessment of how we go about trying to halt the loss of biodiversity. Achieving the goals that have been set will require enhancing the legal tools that can assist the conservation of habitats and species. Much could be achieved by a strengthening of the established approaches, which rely heavily on direct ‘command and control’ regulation to prevent harmful activities. Thus stronger laws could be introduced (and enforced) to prevent the disturbance of protected species, to create and protect nature reserves and to require landowners to manage their land with a view to ensuring that habitats for flora and fauna are maintained in, or restored to, a healthy condition. There is, though, growing interest in a wider range of mechanisms that utilise different approaches to support conservation. These can be grouped under the heading the ‘privatisation of biodiversity’, because although they may not involve a wholesale transfer of property or control into private hands (converting public goods into private goods), they do not rely on direct regulation by the state but rather make use of private rights and market devices to achieve their goals. Such approaches, as a supplement or alternative to direct regulation, are already a feature of the legal response to other environmental problems, such as the emissions trading schemes developed in response to climate change,<sup>6</sup> and their expansion to biodiversity issues creates both opportunities and risks.<sup>7</sup>

The mechanisms discussed under this broad heading of ‘privatisation’ are diverse, with greater or lesser elements of a genuine market-based approach,<sup>8</sup> but they share an emphasis on private law frameworks, private choice, private initiative and private funding as opposed to conservation being overwhelmingly an enterprise directed and controlled by public

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<sup>5</sup> Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 4* (Montreal, 2014); see also Derek P. Tittensor and others, ‘A mid-term analysis of progress toward international biodiversity targets’ (2014) 346 *Science* 241.

<sup>6</sup> Scott D. Deatherage, *Carbon Trading Law and Practice* (OUP, 2012).

<sup>7</sup> Colin T. Reid, ‘Between priceless and worthless: challenges in using market mechanisms for conserving biodiversity’ (2013) 2 *Transnational Environmental Law* 217.

<sup>8</sup> Romain Pirard, ‘Market-based instruments for biodiversity and ecosystem services: a lexicon’ (2012) 19–20 *Environmental Science and Policy* 59; see section 1.6 below.

authorities. At the core of consideration lies payment for ecosystem services (PES) and the use of biodiversity offsets and conservation covenants (see Box 1.1), but other devices are also considered, such as use of the tax system. Covenants are based on private law obligations in relation to land ownership and may or may not operate in conjunction with other techniques such as offsetting and PES where the underlying concept firmly has its roots in market-based thinking. Such mechanisms are not wholly novel and are in use to some extent in various jurisdictions around the world. Learning from that experience is important, but lessons must be drawn with care since the differences in the physical, legal, regulatory, financial and cultural contexts across different countries mean that the scope for particular mechanisms to operate successfully in new settings varies greatly.

#### BOX 1.1 DEFINITIONS

- Payment for ecosystem services (see Chapter 3)  
Land managers receive payments to reflect the benefits that their land is providing to the wider environment and community, for example, water management or habitat for pollinating insects, thereby creating an incentive for them to maintain or enhance these services whilst those who benefit contribute to the cost.
- Biodiversity offsetting (see Chapter 4)  
Development causing a loss to biodiversity in one place is allowed to proceed so long as ecological gains are achieved elsewhere, thereby ensuring no net loss to biodiversity.
- Conservation covenants (see Chapter 5)  
(Also known as conservation easements or burdens or servitudes.)  
Landowners, freely or in exchange for payment, make long-term agreements which control the future use and management of the land, by them and by their successors in title, either as a conservation tool in its own right or as the legal basis for delivering an offset or payment scheme.

This chapter provides a brief introduction to the terminology of biodiversity and ecosystem services before examining the ways in which the law has traditionally dealt with flora and fauna and the more recent emergence of specific laws designed to conserve nature. Wider trends in environmental law and regulation are then discussed, with specific reference to the use of market-based instruments and the debates over commodification that they inspire.

## 1.1 BIODIVERSITY

In recent years, nature conservation has been dominated by the term 'biodiversity'. It owes its prominence to the Convention on Biological Diversity agreed at the 'Earth Summit' in Rio de Janeiro in 1992,<sup>9</sup> but some care must be taken in its use. The Convention provides the following definition:

'Biological diversity' means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.<sup>10</sup>

The power of the definition is that it covers several different but interconnected forms of diversity, all of which must be considered if the natural heritage of the earth is to be passed down to future generations. Diversity between species, that is, the presence of a number of distinct sorts of plant or animal, is perhaps the simplest aspect of this and is what drives the concern to prevent the extinction of endangered plants and animals. Diversity within species reflects the extent of genetic variation within each species, and the fact that local populations may have traits different from those in other areas, traits that may prove essential to the long-term survival or value of the species (such as disease resistance or adaptation to climate variations) and in some cases may eventually lead to differentiation as a separate species. Diversity of ecosystems is the basis for the conservation of different habitat types, whilst diversity within ecosystems is often a measure of the health of a habitat and the absence of human interference. Nature conservation must take account of all of these aspects of our biological heritage.

Yet there is a danger that diversity by itself becomes the sole yardstick for measuring the health and value of a habitat or ecosystem. This would lead to those habitats with comparatively little diversity being undervalued, prioritising wetlands and rainforests over deserts and polar regions. Indeed, habitats with less diversity may require extra attention since they may be more vulnerable than those with greater diversity and hence greater resilience. In habitats of low species richness there is a greater risk that disruption to one species will cause the whole ecosystem to become dysfunctional, whereas where there is high species richness there is likely to be some duplication of ecological functions and hence a

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<sup>9</sup> See Convention on Biological Diversity (n. 2).

<sup>10</sup> *Ibid.* Art. 9.

greater ability to maintain the ecosystem in the face of disturbance.<sup>11</sup> Moreover, taken to an extreme, a focus on numerical diversity alone may lead to surprising results. Given the diversity that can be found in suburban gardens as a result of the variety of plants and habitats that are introduced,<sup>12</sup> converting native grassland or many other habitats to suburban development may well increase the biodiversity of the area if all that is considered is the number of species present.

Biodiversity, however, is often used not as a strict technical term but as a catch-all phrase for 'nature'. Terminology here is difficult<sup>13</sup> since on close examination most common and convenient words have difficulties and reflect deeper inconsistency in our attitudes. Even in the most intensive man-made agricultural systems there are still 'natural' processes going on and some species (beyond those being deliberately cultivated) will benefit from the new ecosystem that has been created. We want to distinguish between what humans have created and the 'natural world', but that phrase itself ignores the fact that most parts of the world have been heavily affected by human intervention over centuries, if not millennia. There are very few truly 'natural' habitats left and many environments created by humans are now valued for their contribution to the beauty and diversity of fauna, flora and landscapes, and require active management to maintain their current features.<sup>14</sup> The term 'flora and fauna' again fails to distinguish between the 'naturally' occurring species and those introduced or promoted by humans. A further possibility is to speak of conserving<sup>15</sup> 'wildlife' but this ignores the geological and physiographical features that are also part of ecosystems (and many

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<sup>11</sup> Rick D. Stuart-Smith and others, 'Integrating abundance and functional traits reveals new global hotspots of fish diversity' (2013) 501 *Nature* 539.

<sup>12</sup> A detailed study over 15 years has recorded 1,782 species of animal and 42 species of plant in one suburban garden in Leicester (Jennifer Owen, *The Ecology of a Garden: The First Fifteen Years* (CUP, 1991)), whilst over a similar period a less intensive study of a garden in Dundee has led to the recording of seven species of bumblebee, 52 hoverflies and 174 moths (data from Anne Reid; personal communication, 25 October 2015).

<sup>13</sup> This is a pervasive issue and it is instructive that the EU No Net Loss Working Group produced a glossary of almost 40 pages to define and explain key terms in their deliberations; see [http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/NNL\\_Glossary.pdf](http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/NNL_Glossary.pdf).

<sup>14</sup> E.g. ensuring the continuing grazing of flower- and insect-rich meadows to prevent them being taken over by scrub.

<sup>15</sup> There is a separate terminological issue here over the evolution from the purely defensive 'protection' or 'preservation' of nature to the more positive task of 'conservation' and now even 'enhancement'.

people in thinking of the ‘wildlife’ of an area have in mind only its animals, not its plants, far less the microbial and bacterial elements which are also essential parts of any ecosystem). ‘Natural heritage’ is another term that is used<sup>16</sup> but does not have such wide recognition and can be seen as carrying specific legal connotations.<sup>17</sup> Despite such difficulties, most of the time it is clear enough what is being talked about and the marginal difficulties in priorities and scope arising from the use of specific terms can be left to be discussed in the specific contexts where they arise. Accordingly this book follows the general usage of what can strictly be viewed as loose terminology, except where specific points are to be made.

## 1.2 ECOSYSTEM SERVICES

Further terms which are important to the issues covered in this book are ‘ecosystems’ and ‘ecosystem services’. Conservation today is increasingly adopting an ecosystem approach rather than focusing narrowly on particular species or habitats. This approach involves ‘a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way’, with a priority being the ‘conservation of ecosystem structure and functioning, in order to maintain ecosystem services’.<sup>18</sup> The focus is thus shifting from a concentration on individual sites and species to a concern for the health of wider ecosystems, requiring attention to the more diffuse impacts on the wider landscape and environment rather than concentrating on the establishment and protection of discrete citadels for designated forms of wildlife.

The various elements of an ecosystem operate in ways that contribute to the health of the environment as a whole, but the valuable services that are being provided for humanity have generally been overlooked in the past. As well as efforts to increase our understanding of the working of ecosystems generally, attention is being paid to identifying and seeking recognition for

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<sup>16</sup> E.g. Natural Heritage (Scotland) Act 1991, where it is provided that “the natural heritage of Scotland” includes the flora and fauna of Scotland, its geological and physiographical features, its natural beauty and amenity’ (s. 1(3)).

<sup>17</sup> Cf. the use of the concept ‘common heritage of mankind’ in the United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3, and the discussion on the status of water in Chapter 8, section 8.3.

<sup>18</sup> Fifth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, 15–26 May 2000, Nairobi, Kenya (CBD-COP 5), Decision V/6, para. 5, Principle 5.

the ways in which the natural environment contributes to human well-being. This is not a wholly uncontroversial exercise,<sup>19</sup> but such efforts reveal that land left in its ‘natural’ condition is not actually unproductive, as it is often perceived, but is providing a range of services of great practical, economic and spiritual value to society. Studies at an international level have identified many such contributions: regulating services (including filtration of pollutants by wetlands, climate regulation through carbon storage, pollination and protection from disasters); cultural services (including recreation, spiritual and aesthetic values); provisioning services (including wild foods, crops, fresh water and plant-derived medicines); and supporting services (including soil formation and nutrient cycling).<sup>20</sup>

### BOX 1.2 ECOSYSTEM SERVICES

Ecosystem services are the benefits people obtain from ecosystems. These include provisioning, regulating and cultural services that directly affect people and supporting services needed to maintain the other services.

<p><b>Provisioning services</b> <i>Products obtained from ecosystems</i></p> <ul style="list-style-type: none"> <li>● food;</li> <li>● fresh water;</li> <li>● fuelwood;</li> <li>● fibre;</li> <li>● biochemicals;</li> <li>● genetic resources.</li> </ul>	<p><b>Cultural services</b> <i>Non-material benefits obtained from ecosystems</i></p> <ul style="list-style-type: none"> <li>● spiritual and religious;</li> <li>● recreation and ecotourism;</li> <li>● aesthetic;</li> <li>● inspirational;</li> <li>● educational;</li> <li>● sense of place;</li> <li>● cultural heritage.</li> </ul>
<p><b>Regulating services</b> <i>Benefits obtained from regulation of ecosystem processes</i></p> <ul style="list-style-type: none"> <li>● climate regulation;</li> <li>● disease regulation;</li> <li>● water regulation;</li> <li>● water purification;</li> <li>● pollination.</li> </ul>	<p><b>Supporting services</b> <i>Services necessary for the production of all other ecosystem services</i></p> <ul style="list-style-type: none"> <li>● soil formation;</li> <li>● nutrient cycling;</li> <li>● primary production.</li> </ul>

Source: Reformatted from UNEP Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Synthesis* (Island Press, 2005) 57.

<sup>19</sup> Matthias Schröter and others, ‘Ecosystem services as a contested concept: a synthesis of critique and counter-arguments’ (2014) 7 *Conservation Letters* 514.

<sup>20</sup> The Economics of Ecosystems and Biodiversity (TEEB), *Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB* (2010) 7, Annex 2, and the sources referred to there. See generally the website of the TEEB project, <http://teebweb.org>.

Identifying these services and those who provide and benefit from them, lies at the heart of many of the economic approaches discussed later in this book. This can be a challenging task, especially since the services are often overlapping and hard to disentangle; maintaining a healthy peat bog provides benefits for both biodiversity and carbon storage, whilst contributing with many other elements in the wider catchment to the health and quantity of water resources. Giving the services a value, especially in monetary terms, both emphasises their importance and provides a basis for creating mechanisms for attributing costs and benefits between parties in a way that goes beyond the prevalent regulatory approaches. The basic concept, though, rests on showing how humanity benefits from nature. There is plenty of scope for disagreement over what should be included, depending on how immediate or indirect the links with human benefits can be,<sup>21</sup> and a consequence may be that the same habitat is valued very differently depending on its location: a water meadow that absorbs flood water may have more or less value depending on whether it is upstream or downstream of a town. Moreover the focus on the provisions of services to humankind leaves this approach open to criticisms of anthropocentricity as discussed in Chapter 8, further downgrading the non-economic arguments for conservation.<sup>22</sup>

### 1.3 LAW AND NATURE

The law has been involved with the natural world since the earliest times<sup>23</sup> and many of the key elements of the treatment of nature in western legal systems can be traced back to Roman law. Every legal system has its own detailed rules, but the general approach of modern western systems has been to treat nature simply through the application of the rules of property. Land, plants and animals are regarded not as part of an integrated ecosystem but as individual items of property held by

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<sup>21</sup> E.g. it can be argued that as well as considering the ecosystem services being delivered today there should also be consideration of 'ecosystem services', placing a focus on maintaining the long-term health of ecosystems so that they can continue to evolve to provide services in the future; Daniel P. Faith and others, 'Ecosystem services: an evolutionary perspective on the links between biodiversity and human well-being' (2009–10) 2 *Current Opinion in Environmental Sustainability* 66.

<sup>22</sup> Kent H. Redford and William M. Adams, 'Payment for ecosystem services and the challenge of saving nature' (2009) 23 *Conservation Biology* 785.

<sup>23</sup> G.R. Driver and John C. Miles, *The Babylonian Laws* (OUP, 1952) vol. I, 150–54.

and wholly at the disposal of their owner, with no regard for their wider environment, except to the extent that there might be interference with equivalent legal rights held by other people. Where things are not the subject of property rights, they fall outwith legal consideration altogether.

For land this means that the landscape has been fragmented into different plots which are treated quite separately, ignoring their role as part of an integrated ecosystem. Land is divided into units on the basis of boundaries which usually have no link to natural features. Even where such features are used, they are as likely to split ecosystems (for example, by using a river as a boundary) as to respect them (by using a watershed). Each unit can be managed individually with no regard for the consequences on the natural world beyond its boundaries, except to the extent that there is an infringement of property rights held by others. Although now almost invariably overlain by at least some statutory limitations imposed for a range of social goals,<sup>24</sup> the starting point is that the landowners are free to do what they wish with their land, so long as they do not cause a nuisance to or otherwise interfere with the rights of their neighbours.

Plants are also treated simply as pieces of property. As accretions to the soil,<sup>25</sup> they belong to the owners of the land<sup>26</sup> who are therefore (in the absence of other restrictions) entitled to exploit or destroy them as they wish. For animals, there is a distinction between domesticated and wild animals,<sup>27</sup> the former being wholly items of private property throughout their lives, the latter being owned by nobody unless and until killed or captured.<sup>28</sup> Game and fishing rights may give their holders some legal interest in the species covered, entitling them to prevent others harming these interests, but otherwise wild animals may fall wholly outwith the law's attention, except to the extent that the state asserts a general right in them.<sup>29</sup>

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<sup>24</sup> Such as to limit pollution.

<sup>25</sup> *Digest*, 41.1.7.13, 41.1.9.pr.

<sup>26</sup> There may be special rules to deal with the ownership of crops between landlord and tenant or when properties are sold, as illustrated in *Boskabelle Ltd v. Laird* [2006] CSOH 173, 2006 SLT 1079.

<sup>27</sup> The distinction between domesticated and wild animals includes rules of long-standing that recognise the ownership of animals such as bees which are free to roam but consistently return to their owner's premises; *Digest* 41.1.5, *Kearry v. Pattinson* [1939] 1 KB 471.

<sup>28</sup> There may be some exceptions, e.g. the rules in England conferring on the Crown rights in swans, sturgeon and whales; *Case of Swans* (1592) 7 Co. Rep. 15b, Blackstone, *Commentaries* (1783) i 223.

<sup>29</sup> See the discussion in Australia in *Yanner v. Eaton* [1999] HCA 53, [1999] 201 CLR 351; for the position in the United States see O. Houck, 'Why do we

This legal approach has several consequences. Any measures introduced to conserve or enhance habitat will amount to an interference with the rights of the owner of the land concerned and thus need specific legal authorisation. Moreover, since the right to property is often protected as a constitutional or human right, such interference must satisfy the standards set for justifying such action. Thus in the United Kingdom, the Human Rights Act 1998 gives effect to the European Convention on Human Rights which in Article 1 of Protocol 1 includes the right to the 'peaceful enjoyment of ... possessions'. This has been used by landowners to challenge the legitimacy, in the absence of compensation, of the imposition of habitat conservation measures which they claimed adversely affected their property rights. Environmental protection, including nature conservation, has been accepted by the European Court of Human Rights as one of the grounds on which the owners' rights can legally be restricted<sup>30</sup> and the English courts held that the measures in question fell far short of the point where there was a disproportionate and thus unlawful interference with the owners' rights.<sup>31</sup> In other jurisdictions that boundary may be set at a different point, and in the United States, the concept of 'regulatory takings' is likely to permit the state much less freedom of action. The law in the United States operates on the basis that the government can deprive owners of their property not just by direct expropriation but also by intrusive regulation which removes the owners' freedom to use the property as they wish and thus its effective value.<sup>32</sup> Expropriation by the state is lawful only if compensation is provided,<sup>33</sup> and in the argument over the point at which mere regulation (for conservation or other purposes) becomes a 'taking' (and therefore

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protect endangered species, and what does that say about whether restrictions on private property to protect them constitute takings' (1994–95) 80 *Iowa Law Review* 297 and the recently reinvigorated debates about the public trust doctrine (see Chapter 2, section 2.9).

<sup>30</sup> *Fredin v. Sweden* (1991) 13 EHRR 784.

<sup>31</sup> *R (Trailer and Marina (Leven) Ltd) v. Secretary of State for the Environment, Food and Rural Affairs* [2004] EWCA Civ 1580, [2005] 1 WLR 1267.

<sup>32</sup> There is a substantial, if not always straightforward, volume of case law on when regulation of property amounts to its 'taking', e.g. *Penn Central Transportation Co. v. New York City*, 438 US 104 (1978); *Lucas v. South Carolina Coastal Council*, 505 US 1003 (1992); *Koontz v. St Johns River Water Management District*, (Docket no. 11-1447) 570 US \_ (2013), 133 S Ct 2586 (2013).

<sup>33</sup> US Constitution, Fifth Amendment.

unlawful unless compensation is provided),<sup>34</sup> the threshold is set more in the owners' favour than is the case in some other countries, such as the United Kingdom.

The recognition of ownership of plants and animals gives the owners a clear entitlement to take steps to protect their property against external threats. This enables them to take measures against the actions of others, and also against natural processes, which risk damaging or destroying that property, but does not require them to respond to take any protective action – indeed allowing, or even causing, the destruction of one's own property is one of the most significant rights that an owner has. At the same time, though, this ownership excludes other parties from having any legal interest in the condition, or even survival, of the property owned by another person. For wild animals that are not owned, the fact that nobody has a legally recognised interest in them further restricts the extent to which any concern for them can be reflected in the law. Game or fishing rights, held along with or separate from ownership of land, do create a limited legal interest in the condition of certain species, but clearly this will be of limited application.<sup>35</sup> Generally, therefore, unless they fall within the scope of property rights which the owner chooses to protect, the welfare of the environment and of its wildlife are not matters of legal concern. It is against this legal background that legislative intervention to support biodiversity has had to operate.

## 1.4 NATURE CONSERVATION LAW

Legal measures to protect elements of the natural environment have existed for centuries and the nineteenth century saw the start of a shift in focus from simply ensuring the sustainability of natural resources to be exploited in future (as in the mediaeval game and hunting laws),<sup>36</sup>

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<sup>34</sup> For an argument that there should be compensation for landowners affected by the Endangered Species Act, see N. Scott Arnold, 'The Endangered Species Act, regulatory takings, and public goods' (2009) 26 *Social Philosophy and Policy* 353.

<sup>35</sup> See Chapter 7, section 7.3.

<sup>36</sup> John M. Gilbert, *Hunting and Hunting Reserves in Medieval Scotland* (John Donald, 1979); Colin T. Reid, 'Environmental legislation of the Scottish Parliament' in Hector L. McQueen (ed.), *Stair Society: Miscellany Six* (Stair Society, 2009) 65–9.

towards providing for protection against cruelty and the wanton destruction of wildlife (as in the Sea Birds Preservation Act 1869 and its successors in the United Kingdom),<sup>37</sup> and for the preservation of exceptional areas of natural beauty (as in the recognition of what were to become the National Parks in the United States).<sup>38</sup> The modern law of nature conservation has taken shape during the last few decades of the twentieth century, with a wealth of international and national legislative initiatives.

The law has gradually become stricter and more far-reaching, offering more effective protection to a wider range of biodiversity,<sup>39</sup> but remains dominated by measures aimed to prevent harm to particular species and habitats. In both cases the basis is that the state identifies features that are considered valuable and then imposes restrictions on activities that might harm them. For species, the approach has been to identify a number of animals (including birds, fish and invertebrates) which are to be protected and then make it a criminal offence to kill or capture them or to harm them in other ways. For habitats, again the starting point has been to identify and designate the areas of land deserving protection and then to seek their conservation. Initially, this again involved creating criminal offences prohibiting any direct harm to the sites, but more recently these provisions have been accompanied by measures to support the positive conservation and enhancement of the designated areas. The details of the law will vary between jurisdictions in the number and variety of species and habitats protected, the scope of the protection offered<sup>40</sup> and the ancillary measures adopted to support and enforce the main provisions (for example, offences of selling or simply possessing specimens of

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<sup>37</sup> There were 12 statutes passed in the United Kingdom in relation to wild birds between 1869 and 1908.

<sup>38</sup> An Act to set apart a certain Tract of Land lying near Head-waters of the Yellowstone River as a public Park; 1872 ch. 24 (*US Statutes at Large*, vol. 17, 32).

<sup>39</sup> For a discussion of the evolution of the law in one jurisdiction see Colin T. Reid, 'Towards a biodiversity law: the changing nature of wildlife law in Scotland' (2012) 15 *Journal of International Wildlife Law and Policy* 202.

<sup>40</sup> The categories of protected areas recognised by the IUCN is one illustration of the different levels of and objectives for habitat protection; see Alexander Gillespie, *Protected Areas and International Environmental Law* (Martinus Nijhoff, 2007) ch. 2.

protected species), but these key features lie at the core of international,<sup>41</sup> regional<sup>42</sup> and national<sup>43</sup> conservation law.

Thus in Scotland,<sup>44</sup> it is an offence intentionally or recklessly to kill, injure or take any wild bird, or to take eggs or destroy nests, whilst for certain species the offences include causing disturbance while nesting. Well over 100 species of wild animals (including fish and invertebrates) are similarly protected and it is an offence intentionally or recklessly to pick, uproot or destroy any of over 200 species of plants (including mosses and liverworts), or to pick or destroy their seeds or spores. The possession or sale of specimens of the protected species is also an offence. There are several designations of habitat, attracting different levels of protection, but for those designated as European Sites or Sites of Special Scientific Interest<sup>45</sup> it is an offence for anyone intentionally or recklessly to damage any of the natural features which have led to the site's designation, whilst an individually determined list of activities likely to damage the site is prohibited without express permission from the statutory nature conservation body. For European Sites, any plan or project which may have an adverse impact on the integrity of the site must be prevented unless certain very strict criteria are met and compensatory action taken. Throughout, there are detailed exceptions and provision for licences to be granted to permit otherwise prohibited

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<sup>41</sup> E.g. the protection of migratory species under the Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 June 1979, entered into force 1 November 1983) 1651 UNTS 333, and of world heritage sites under the UNESCO Convention Concerning the Protection of World Natural and Cultural Heritage (adopted 16 November 1972, entered into force 17 December 1975) 1037 UNTS 151.

<sup>42</sup> E.g. within the European Union in the Birds and the Habitats Directives: European Parliament and Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (codifying the amendments to Directive 79/409/EEC), [2010] OJ L20/7 and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, [1992] OJ L206/7.

<sup>43</sup> For the law in the United Kingdom see Colin T. Reid, *Nature Conservation Law* (3rd edn, W. Green, 2009) and Christopher P. Rodgers, *The Law of Nature Conservation: Property, Environment and the Limits of Law* (OUP, 2013).

<sup>44</sup> This is, of course, only a partial and greatly oversimplified account of a mass of detailed legislation. For more detail see Reid, 'Towards a biodiversity law' (n. 39) and *Nature Conservation Law* (n. 43) and Colin T. Reid, 'Nature conservation' in Frank McManus (ed.), *Environmental Law in Scotland* (W. Green, 2010).

<sup>45</sup> These are the main designations of protected habitat under EU and British legislation.

activities. A number of measures to support the maintenance and enhancement of habitat also exist, such as management agreements which can include payments to landowners for work that they carry out to benefit biodiversity; in practice these are the preferred method of intervention, but against a background of stricter legal controls. A statutory body, Scottish Natural Heritage, is entrusted with major powers in relation to the designation of sites and species and the enforcement of the law.

The core of the law is thus based on the traditional approach of identifying harms to be avoided and following the classic model of 'command and control' regulation: 'That is, legislatures have proscribed certain behaviour and set up a regulatory agency to monitor and police compliance with legal standards'.<sup>46</sup> With stricter controls being imposed as time has progressed, both helping to shape as well as reflecting changes in social attitudes, this approach has achieved some notable successes. In Great Britain, the collecting of eggs from birds' nests has been transformed from an acceptable hobby into behaviour that attracts a prison sentence and public opprobrium. Yet biodiversity continues to suffer. There is no doubt that prohibitions supported by the criminal law will continue to play a major part in conservation law, but there is growing interest in a wider role for new mechanisms.

Referring to the mechanisms and approaches discussed in this book as 'new' is a useful short-hand but not wholly accurate. As is made clear throughout this book, around the world there are many schemes currently in operation that apply the methods explored below. Many areas dedicated to conservation are in private ownership and conservation is supported through a range of schemes.<sup>47</sup> The management agreements which play an important part in looking after habitat in the United Kingdom are a form of payment for ecosystem services (based on something akin to a short-term conservation covenant); biodiversity offsetting and bio-banking schemes are established in Australia and the United States and conservation easements are used across the United States.<sup>48</sup> Nevertheless, even in such contexts, such mechanisms are a more recent addition to the more traditional 'command and control' approach. It is the contrasts between that traditional approach and the

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<sup>46</sup> Neil Gunningham and Peter Grabosky, *Smart Regulation: Designing Environmental Policy* (OUP, 1998) 5, see also 38–50.

<sup>47</sup> Jeffrey A. Langholz and Wolf Krug, 'New forms of biodiversity governance: non-state actors and the Private Protected Area Action Plan' (2004) 7 *Journal of International Wildlife Law and Policy* 9.

<sup>48</sup> See Chapters 3, 4 and 5, respectively.

'new' one, and the scope for the latter to move from the margins to take a more central role in conservation law, that are at the heart of the analysis here.

The desire to explore such newer mechanisms and examine whether they can play a larger role is part of a wider movement in environmental regulation towards a more mixed 'toolkit'. To some extent this has been driven by ideological considerations as discussed below, but there is also a recognition of the limitations of the established approach. In the western world, laws such as those described above have been reasonably effective in achieving protection against direct harm for the elements of biodiversity singled out for attention, but this leaves major gaps. Species are protected once they are recognised as rare or endangered, but little may be done during the early slide from abundance to rarity, whilst areas of protected habitat risk becoming isolated citadels of biodiversity sitting in an increasingly degraded and hostile countryside. Flora and fauna suffer huge losses not as the result of any specific actions directed against them but because of the steady loss of land to intensive agriculture and development and through the cumulative effects of diffuse pollution of many sorts. The potential of new approaches to extend the impact of conservation law to address the continual erosion of biodiversity in such ways needs to be considered alongside the re-evaluation of current approaches from the perspective of regulatory theory.

## 1.5 ENVIRONMENTAL REGULATION

Across environmental issues a regulatory approach based on 'command and control' as described above was the dominant one as societies began to take environmental concerns seriously in the latter half of the twentieth century,<sup>49</sup> but it has come under significant challenge. As Hawkins wrote in 1998:

Twenty or thirty years ago we were secure in our assumption that the most appropriate legislative response to the undesirable consequences of industrialised life for the natural environment was the use of legal regulation backed by the criminal sanction. This reliance upon command and control regulation

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<sup>49</sup> Environmental laws are, of course, much older but initially tended to have a narrower focus on local and public health issues; Stuart Bell, Donald McGillivray and Ole W. Pedersen, *Environmental Law* (8th edn, OUP, 2013) 18–24.

was, however, soon to be threatened by a growing belief that it was both ineffective and inefficient.<sup>50</sup>

In its place has come a range of new approaches, many building on economic analyses of the position.<sup>51</sup> As discussed below, there are significant differences between biodiversity and the greenhouse gases which are the subject of the most strongly market-based mechanisms such as emissions trading or offsetting, but it is inevitable that attention should turn to applying the innovative techniques used for other environmental problems to biodiversity, especially since the existing approach is not achieving its goals.

The evolution of environmental regulation is a vast topic in itself,<sup>52</sup> but two strands have lain at the heart of recent developments. The first has been criticism of the rigid, bureaucratic and inefficient nature of ‘command and control’ regulation, which is seen as imposing excessive regulatory burdens on economic activity and personal freedom. Some of this criticism has been misplaced since it has targeted a stereotyped view of traditional regulation without reflecting the variety and innovation which can make this approach much more responsive. Nevertheless, there remain concerns based on the aspects just mentioned as well as the lack of incentives for going beyond the strict regulatory requirements, the adversarial nature of much enforcement action and the fact that the system operates on the basis that ‘the regulator knows best’, even in complex areas where information is scattered and interpretations and priorities vary.<sup>53</sup>

The second element has been the wider ideological tide towards deregulation and market-based approaches. The neo-classical economic analysis of environmental problems as a result of market failures has led to responses based not on direct regulatory intervention but on solutions that are themselves market-based. Strengthening private property rights so that resources are cherished, as propounded in Hardin’s famous work on ‘The Tragedy of the Commons’,<sup>54</sup> is seen as the way of preventing the

<sup>50</sup> Keith Hawkins, ‘General Editor’s Introduction’ to Gunningham and Grabosky, *Smart Regulation* (n. 46) vii.

<sup>51</sup> Neil Gunningham, ‘Environment law, regulation and governance: shifting architectures’ (2009) 21 *Journal of Environmental Law* 179.

<sup>52</sup> See e.g., the text and works extracted in Elizabeth Fisher, Bettina Lange and Eloise Scotford, *Environmental Law: Text, Cases, and Materials* (OUP, 2013) ch. 12.

<sup>53</sup> For a summary of strengths and weaknesses of different regulatory mechanisms see Gunningham and Grabosky, *Smart Regulation* (n. 46) ch. 2.

<sup>54</sup> Garrett Hardin, ‘The tragedy of the commons’ (1968) 162 *Science* 1243.

degradation of shared resources, whilst reducing the role of the state<sup>55</sup> has been at the heart of conservative political thinking, especially in the United Kingdom and United States. This has led to a preference for relying on mechanisms other than direct regulation to achieve policy goals. Taxonomies and labels vary and categories overlap,<sup>56</sup> but in addition to direct regulation the instruments used have included self-regulation, educational and information strategies and especially economic instruments and free market initiatives.<sup>57</sup> The initial diversification has been in pollution control and examples abound of voluntary schemes, educational programmes aimed at changing environmentally harmful practices, environmental taxes, emissions trading and offsetting schemes. Not all such innovations have been successful and the failures offer lessons to be taken into account in designing further schemes.<sup>58</sup> Inevitably, though, the question of expanding the reach of such approaches to include biodiversity has been raised, especially in relation to market-based instruments.<sup>59</sup>

## 1.6 MARKET-BASED INSTRUMENTS

In the same way as the term ‘biodiversity’ is ubiquitous in discussion about conserving ecosystems but can be used to cover different concepts, the term ‘market-based instruments’ also appears throughout discussion of regulatory styles, but with a range of meanings. As Pirard notes:

[T]he instruments presented in the literature as ‘market-based instruments’ (MBIs) constitute an extremely heterogeneous group with loose and contrasted links to markets as defined by economic theory ... In fact, the market

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<sup>55</sup> Underestimating, at times, the major role that the state must play in shaping the market in areas where commerce has not naturally developed.

<sup>56</sup> ‘[I]t is better to think of the following instrument categories as points on a compass rather than discrete or absolute policy units.’ Gunningham and Grabosky, *Smart Regulation* (n. 46) 38

<sup>57</sup> OECD, *Environmental Policy: How to Apply Economic Instruments* (OECD, 1991).

<sup>58</sup> See the examples given in Robert L. Glicksman and Thoko Kaime, ‘A comparative analysis of accountability mechanisms for ecosystem services markets in the United States and the European Union’ (2012) 2 *Transnational Environmental Law* 259, 266–70.

<sup>59</sup> OECD, *Harnessing Markets for Biodiversity: Towards Conservation and Sustainable Use* (OECD, 2003).

terminology seems to have been adopted by default, as a way of differentiating these instruments from all other approaches that do not have a pricing element.<sup>60</sup>

The uncertainty over terminology is exacerbated by the fact that there can be many variations of the different mechanisms, involving different levels of 'true' market elements. For example, at its extremes a biodiversity offsetting scheme can involve no market or trading element, requiring developers themselves directly to provide habitat equivalent to that being lost, or can merge into a bio-banking scheme based on credits which are freely traded on a market basis.<sup>61</sup> Agonising over the precise taxonomy can be a distraction from considering the practical benefits and dangers of the various mechanisms and how they can be used. Nevertheless, the different categories of instrument do embody different relationships between parties and serve different goals, so that appreciating the variety can be significant in structural discussions.

Before considering this, though, it is useful to identify the advantages claimed in the conservation context for the approaches included under the extensive heading 'market-based instruments'.<sup>62</sup> Three main arguments are the correction of market failures, the provision of incentives and the provision of funding beyond that otherwise available for conservation purposes.<sup>63</sup> At its simplest, the idea of market failure centres on the recognition that the existing relationships between parties do not recognise adequately, if at all, the costs and benefits arising from various interactions. The market prices for goods or services do not recognise the externalities involved in various processes. For example when manufacturers can freely discharge polluted water into a river there is no financial cost to them and so no impact on the prices they charge to consumers,

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<sup>60</sup> Romain Pirard, 'Market based instruments' (n. 8) 19–20 *Environmental Science and Policy* 59, 66; see also Erik Gómez-Baggethun and others, 'The history of ecosystem services in economic theory and practice: from early notions to markets and payment schemes' (2010) 69 *Ecological Economics* 1209.

<sup>61</sup> Biodiversity offsetting is discussed in Chapter 4.

<sup>62</sup> 'Applying economic thinking to the use of biodiversity and ecosystem services can help clarify ... why successful environmental protection needs to be grounded in sound economics, including explicit recognition, efficient allocation, and fair distribution of the costs and benefits of conservation and sustainable use of natural resources': TEEB, *Mainstreaming the Economics of Nature* (n. 20) 3; see generally <http://teebweb.org>.

<sup>63</sup> Pirard, 'Market based instruments' (n. 8); Romain Pirard and Renaud Lapeyre, 'Classifying market-based instruments for ecosystem services: a guide to the literature jungle' (2014) 9 *Ecosystem Services* 106.

yet very real disadvantages are borne by those who use in various ways the rivers which now suffer poorer water quality. Market instruments can be used to ensure that the burdens currently borne by others are in fact attributed to and carried by those whose activities create them, that 'the polluter pays'. Similarly, the externality can be a positive one, where individuals remain unrewarded for services they are providing and from which other members of society benefit, such as when a derelict eyesore in a suburban area is renovated, generating aesthetic benefits and increased house prices for neighbours.

The spread of such thinking into the area of biodiversity has been aided by the development of the notion of ecosystem services. The many benefits that society gains from 'undeveloped' land have been recognised, but also the absence in most cases of any means by which the suppliers of these services are rewarded by the beneficiaries. Providing these services entails costs, whether management expenses or income foregone by not converting land to uses which are more directly rewarded, and it is unfair that the beneficiaries do not contribute to these. Market correction, or rather market creation, can provide mechanisms for such a contribution to be made, supplying an incentive to maintain or enhance the provision of the service, as opposed to the present position where the incentives are to maximise the conventionally profitable uses of land, at the expense of ecosystem services.

The second argument is also about incentives, but concentrates on a general criticism of 'command and control' regulations that, while they can succeed in stopping people from doing the specific bad things which a policy wishes to eliminate, they do nothing to encourage them to do more of the good things which should be promoted. Thus, for factory operators a rational response to pollution regulations which set a maximum allowable level of certain emissions is simply to ensure that their emissions are just below that level. There is no incentive for them to make further reductions, even though emissions below the standard set are still damaging to the environment. Similarly in a biodiversity context, although designated sites and species will benefit from general compliance with the prohibitions introduced to prevent the most obvious direct harm to them, eliminating such directly harmful activity falls well short of guaranteeing the sympathetic environment in which all elements of biodiversity can thrive.

Economic instruments can provide incentives to do more of the 'good things', whilst leaving individuals free to determine for themselves exactly how far they should go. They are thus particularly well suited to dealing with more diffuse problems, where environmental harm is the result of the cumulative impact of many individual actions. Whereas

specific permits setting an annual maximum for greenhouse gas emissions might work for major site-specific installations, such an approach is less likely to be practicable in tackling the emissions caused by the millions of motor vehicles in a country, used in different ways and to different extents by millions of individuals. On the other hand, an environmental tax on petrol provides an incentive for everyone to drive less or to use a more fuel-efficient vehicle, achieving the goal of an overall reduction in emissions. In the same way, a requirement to offset any harm to biodiversity caused by development provides an incentive to avoid or limit the harm being done, providing benefits for biodiversity beyond what can be achieved by prohibitions on activity that harms the most valuable sites designated for protection.

The third argument for using market-based instruments is the potential they provide for attracting a new source of income to pay for conservation work, whether management and enhancement of existing habitat, the restoration or (re-)creation of habitat that has been degraded or the monitoring and enforcement to support measures aimed at preventing further harm.<sup>64</sup> The conventional pattern of regulation is based on public authorities taking the lead in identifying and supporting the features to be protected, paying (directly or through assistance to landowners) for management and enhancement and bearing all the administrative and enforcement costs. Market-based instruments can spread this cost, so that the polluter or beneficiary, not the state, is paying. At a time when the need for greater conservation efforts coincides with austerity affecting the public sector in so many countries, this may be a particularly attractive aspect when greater use of market-based instruments is considered (see Table 1.1).

The range of instruments is extensive and can be categorised in various ways. Pirard presents a 'theory-based lexicon',<sup>65</sup> but since, as noted above, many of the schemes in use or under consideration can display characteristics of different classes of instrument, the discussion that follows is organised on the basis of how mechanisms present themselves in the policy-maker's toolkit rather than under the sophisticated analysis of an economic theoretician. Nevertheless, being aware of the conceptual

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<sup>64</sup> Emma Comerford, Dominic Molloy and Paul Morling, *Financing Nature in an Age of Austerity* (RSPB, 2010); etec, *Innovative Use of Financial Instruments and Approaches to Enhance Private Sector Finance of Biodiversity, Final Summary Report to European Commission Directorate-General Environment*, 070307/2010/581922/ETU/F1 (2012).

<sup>65</sup> Pirard, 'Market based instruments' (n. 8).

Table 1.1 *Market-based instruments*

<i>Category</i>	<i>Exclusive characteristics</i>
Direct markets	A market where an environmental product can be directly traded between producers and consumers (or processors).
Tradable permits	An ad-hoc market where users of an environmental resource need to purchase 'permits' that can be further exchanged among resource users, thereby creating artificial scarcity.
Reverse auctions	A mechanism whereby candidates to service provision set the level of payment (if accepted) in response to a call by public authorities to remunerate landholders.
Coasean-type agreements	Ideally spontaneous transactions (free of public intervention) for an exchange of rights in response to a common interest of the beneficiary and the provider.
Regulatory price changes	Consists in regulatory measures that lead to higher or lower relative prices.
Voluntary price signals	Consists in schemes whereby producers send a signal to consumers that environmental impacts are positive (in relative terms) and consequently gain a premium on the market price.

*Source:* Romain Pirard and Renaud Lapeyre, 'Classifying market-based instruments for ecosystem services: a guide to the literature jungle' (2014) 9 *Ecosystem Services* 106, 109.

and structural underpinnings is valuable. In particular, some reflection on what is needed to make an effective market helps in assessing the appropriateness of a market-based approach for various ways of treating biodiversity. In so doing, the continuing role of the state in providing the conditions within which a market can operate must be appreciated, from ensuring the basic background of respect for the rule of law to the establishment of new forms of rights. This emphasises that a shift from 'command and control' to market-based instruments entails a change in the nature of the state's role in regulating an activity rather than its withdrawal from it.<sup>66</sup>

<sup>66</sup> OECD, *Handbook of Market Creation for Biodiversity: Issues in Implementation* (OECD, 2004).

The elements of a market-based system can be set out differently, but when one looks at the five requirements for 'a workable platform for markets' identified by McMillan,<sup>67</sup> all of them present challenges when dealing with biodiversity as opposed to established commercial goods. The requirement that 'information flows smoothly' requires, first, that the information exists, whereas in many cases we do not really understand the state and workings of our environment. For most species we lack data on population size and distribution and have limited knowledge of the nature and significance of all the interactions between the elements within an ecosystem. There is then the further issue of who holds the information.<sup>68</sup> The occupiers of the land will have detailed local knowledge of conditions and probably some awareness of the macro-flora and fauna. Conservation bodies may have specialist scientific knowledge at a general level but less site-specific knowledge. Meanwhile, none of this information is readily available to would-be market entrants. This lack of knowledge makes it difficult to ensure a second requirement, that 'side effects on third parties are curtailed', quite apart from the risk of unforeseen consequences as wholly new incentives are created to influence land managers and others. Such risks are illustrated by the belated realisation that moves to increase the use of biofuels were actually having negative social and environmental impacts by encouraging intensive cultivation of source plants in place of food production or more biodiversity-friendly land uses.<sup>69</sup>

McMillan's third requirement that 'property rights are protected' requires the identification of distinct rights, which in this context requires the creation of novel rights which can be legally recognised since, as noted above, biodiversity is not well served by traditional legal structures. Moreover these rights have to be defined<sup>70</sup> and allocated in a way that allows for them to be traded and for mechanisms to be developed for their protection. This task is linked to the fourth requirement, that 'people can be trusted to live up to their promises', something which depends not

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<sup>67</sup> John McMillan, *Reinventing the Bazaar: A Natural History of Markets* (Norton, 2002) ix.

<sup>68</sup> See Chapter 2, section 2.11.

<sup>69</sup> A. Webb and D. Coates, *Biofuels and Biodiversity*, Technical Series No. 65 (Secretariat of the Convention on Biological Diversity, 2012).

<sup>70</sup> Callon and Muniesa analyse markets as 'calculative collective devices' and identify the need to detach distinct entities to be manipulated, far from straightforward in the inter-related world of biodiversity; Michael Callon and Fabian Muniesa, 'Peripheral vision: economic markets as calculative collective devices' (2005) 29 *Organization Studies* 1229.

just on bare trust but on the existence of mechanisms to guarantee and enforce the rights created and traded. The challenges here include the inherent artificiality of rights such as biodiversity credits, the long-term nature of any obligations to create or maintain habitat and the dynamic nature of the environment, especially in an age of climate change, which may render futile even the most carefully thought out and implemented scheme to achieve particular biodiversity goals. McMillan's final requirement, that 'competition is fostered,' calls attention to the need to limit transaction costs if any market is to succeed. It is too often forgotten that Coase's seminal article 'The Problem of Social Cost' stresses the vital importance of transaction costs, noting both that his initial analysis of the merits of using markets to rearrange rights to increase the value of production rests on the 'very unrealistic assumption' that there 'were no costs involved in carrying out market transactions' and that such costs may mean that the optimal arrangement of rights is never achieved.<sup>71</sup> In tackling transaction costs, thought has to be given to ways of stimulating a large enough market to achieve efficiencies of scale and those arising from repeat dealings, whilst the potential role of brokers and other intermediaries and the means of improving information flows are further aspects to be considered.

There are, therefore, challenges to be faced in designing an effective means of implementing a market-based approach, as well as the need to match the mechanism to the objective. To take the simple example of an environmental tax, if the goal is to discourage the undesirable activity, then a high tax rate should be set in order to provide a strong disincentive. On the other hand, if the goal is to raise revenue to be used for environmental (or other) purposes, the tax rate should be set at a lower level so that the taxable activity continues but the optimal revenue is raised. Given the multi-faceted nature of much environmental policy, and its interactions with social and economic concerns, there is rarely such a simple goal to be followed, quite apart from the uncertainties of exactly how any market-based instrument will operate in practice.

## 1.7 COMMODIFICATION

The technical challenges involved in designing effective market-based schemes and ensuring their implementation are not the only ones faced by such an approach. There is a much more fundamental one that

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<sup>71</sup> Ronald Coase, 'The problem of social costs' (1960) 3 *Journal of Law and Economics* 1, 15–16.

questions the legitimacy of this approach at a basic ethical level. The selection of regulatory mechanisms is not value-free<sup>72</sup> and opting for a market-based approach involves accepting certain views about the human relationship with nature. The underlying notion that elements of biodiversity can be traded as commodities, given a monetary value, or even be subject to the standard rules of private property, are abhorrent from some perspectives. From such viewpoints, humans are not distinct from the rest of nature but part of the one 'Earth Community'<sup>73</sup> and market-based mechanisms such as biodiversity offsetting are 'anathema to the notion that nature is diverse, complex, varied and multiform and that has [*sic*] the power to participate in its own creation and recreation'.<sup>74</sup> These issues are discussed more fully in Chapter 8. Criticisms of market-based approaches derive from a variety of perspectives, some stemming from an instrumental concern over the distorting effects and limits of markets, whereas others rest on concepts of what should be seen as the common heritage of humankind, and some derive from a more spiritual concern for the Earth Community as a whole.

What these perspectives share is the view that biodiversity should not be regarded as a commodity.<sup>75</sup> From this viewpoint, elements of biodiversity are not interchangeable and their value cannot be captured wholly in monetary terms. Biodiversity is not something to be destroyed, replaced or created by human hands. Therefore, legal approaches which rest on valuation, exchangeability and making nature the subject of transactions are misconceived. As Sagoff has noted in a US context, 'To notice that the Endangered Species Act is not cost-beneficial is to recognize the obvious. That is the point of the Act, and of much of our environmental legislation.'<sup>76</sup>

At another level, there is a further mismatch between treating biodiversity in a market-based way and concentrating on what is appropriate

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<sup>72</sup> Jerneja Penca, 'Marketing the market: the ideology of market mechanisms for biodiversity conservation' (2013) 2 *Transnational Environmental Law* 235.

<sup>73</sup> Cormac Cullinan, *Wild Law: A Manifesto for Earth Justice* (2nd edn, Green Books, 2011) 147–8.

<sup>74</sup> Brendan Grigg, 'Biodiversity offsets: a dangerous trade in wildlife?' in Michelle Maloney and Peter Burdon (eds), *Wild Law: In Practice* (GlassHouse, 2014) 226.

<sup>75</sup> For a fuller consideration of the implications of viewing something as a 'commodity' and difficulties in applying this to biodiversity see Nicolás Kosoy and Esteve Corbera, 'Payments for ecosystem services as commodity fetishism' (2010) 69 *Ecological Economics* 1228.

<sup>76</sup> Mark Sagoff, 'Economics and environmental law' (1980–81) 79 *Michigan Law Review* 1393, 1411.

for its well-being. The traditional property-based legal treatment of land and nature does not match the ecosystem approach that is now accepted as necessary for effective conservation. The Convention on Biological Diversity defines an ‘ecosystem’ as ‘a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit’<sup>77</sup> and the ecosystem approach calls for ‘adaptive management to deal with the complex and dynamic nature of ecosystems’,<sup>78</sup> noting that this requires attention to ecosystems at all scales, ‘a grain of soil, a pond, a forest, a biome or the entire biosphere’.<sup>79</sup> The natural world, however, has been fragmented by the law into different elements which are treated quite separately, ignoring their role as part of an integrated ecosystem. Land is divided into units on the basis of boundaries which are usually not based on natural features. Each unit is managed in isolation, without regard to the implications for the wider ecosystem, or even other properties, unless other property rights are going to be affected.<sup>80</sup> The extension of property-based concepts to other elements of biodiversity, it might be argued, will only exacerbate the mismatch between the atomised approach based on private rights and the holistic view needed to reverse the loss of biodiversity.

## 1.8 OVERVIEW

The fact that the current legal approaches are not delivering the benefits for biodiversity that are required to secure the survival of a healthy and resilient environment means that attention is being paid to new ways of addressing the issue. The alternative mechanisms being considered present challenges at various levels. For instance, any scheme based on balancing or trading biodiversity units is making major assumptions both about the equivalence of ‘units’, which is not beyond question on ethical grounds, and about our ability to measure their value, which is not beyond question on scientific grounds. Such questions are explored more

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<sup>77</sup> Convention on Biological Diversity, Art. 2.

<sup>78</sup> Convention on Biological Diversity COP 5 Decision V/6 (2000) (n. 18) para. 3.

<sup>79</sup> *Ibid.*

<sup>80</sup> The need to overcome this underpins the emerging concept of connectivity conservation; B. Lausche and others, *The Legal Aspects of Connectivity Conservation: A Concept Paper* (IUCN, 2013). This is also an area where greater legal recognition of ecosystem services might benefit conservation, recognising activities diminishing ecosystem services as a form of damage to the property that would benefit.

fully in the following chapters. Yet this is not to say that an offsetting scheme or any of the other new approaches should not proceed; the fact that they fall short of perfection is not a reason for refusing to contemplate their adoption. There may be very real gains to be made over the current position, but progress should be made with an explicit recognition of the ethical choices involved and of the limitations in assessing value and equivalence and with regard to the risks as well as the benefits of employing new techniques. Such recognition of both the potential and the peril of innovations has been a feature of recent debate about proposals in England to introduce biodiversity offsetting and conservation covenants, with stakeholders on all sides expressing the view that such a scheme might improve the present situation, but only so long as the details are right (although not necessarily agreeing on what the right details are).<sup>81</sup>

This conditional acceptance of the legal mechanisms discussed in this book places a particular onus both on the detailed working through of particular schemes and on finding the place for each technique within the variety of regulatory mechanisms which will have to be deployed together in any credible and effective set of biodiversity laws. The following chapters examine the specifics of different mechanisms, and the variations within each, looking at payment for ecosystem services, biodiversity offsetting, conservation covenants, taxation, transferable development permits, quotas and impact fees. Within each instance and between them, the aim is to identify not a single favoured solution, but the questions which have to be answered in designing a scheme that will meet the needs of the specific policy goals and the legal and physical context in which the mechanism is to be deployed. Before that, though, consideration is given to a number of pervasive issues which arise, in different forms and with varying intensity, across all of these mechanisms. The book ends with a more thorough consideration of the ethical questions raised by a 'privatised' approach to biodiversity, before trying to draw some brief conclusions.

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<sup>81</sup> The authors have observed this first-hand at a range of workshops and conferences related to both the Government's proposals on biodiversity offsetting and the Law Commission's on conservation covenants (discussed in Chapters 4 and 5).