

COMMENTARY

Protected areas and climate change
Reflections from a practitioner's perspective

Andrew Dodd, Alice Hardiman, Kate Jennings & Gwyn Williams*

1. Introduction

Cliquet *et al.*¹ provide a thought-provoking analysis of the challenges posed to the EU's protected areas by climate change. This paper seeks to build on some of the perspectives they brought to what is a highly challenging area of nature conservation law, policy and practice. While there is much to support in their analysis of the relationships between protected areas and climate change, there are two key strands we seek to develop further, based on the RSPB's experience of this area of nature conservation policy and practice: first, is the ecological model for adapting to climate change and second, the legal framework provided by the Birds² and Habitats³ Directives (the Nature Directives) as it relates to the delivery of such adaptive actions.

As an organisation, the RSPB is deeply involved in nature conservation legislative practice and development, as well as practical land management through nature reserve holdings comprising 206 reserves on 142,044 hectares, 112 of which overlap wholly or partially with Special Protection Areas⁴ (SPAs) under the Birds Directive. Across this broad area of work, we are already facing many of the practical, policy and legal challenges outlined by Cliquet *et al.* We agree with the authors that climate change demands a more flexible approach to the application of the Nature Directives, but diverge from their conclusion that portrays the Directives as static, through concentrating on protecting the 'existing values' of protected areas.⁵

In this paper, we seek to develop some of the ideas in Cliquet *et al.* by considering climate change adaptation in the context of the requirements of the Nature Directives as a whole. First,

* Andrew Dodd, Head of Site Conservation Policy, The Royal Society for the Protection of Birds (RSPB), Sandy (UK). Alice Hardiman, Future Land Use Policy Officer, RSPB, Sandy (UK). Kate Jennings, Site Policy Officer, RSPB, Sandy (UK). Gwyn Williams, Head of Reserves and Protected Areas, RSPB, Sandy (UK). Corresponding author: Andrew Dodd, email andrew.dodd@rspb.org.uk, tel. 0044 1767 693188.

1 A. Cliquet, C. Backes, J. Harris & P. Howsam, 'Adaptation to climate change. Legal Challenges for protected areas', 2009 *Utrecht Law Review* 5, no. 1, pp. 158-175.

2 Council Directive 79/409/EEC on the Conservation of Wild Birds, *OJL* 103, 25.4.1979 (hereafter: the Birds Directive); for the text of the Directive, with later amendments, see <http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm>.

3 Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, *OJ L* 206, 22.7.1992 (hereafter: the Habitats Directive); for the text of the Directive with later amendments, see <http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm>.

4 Established under the Birds Directive (*supra* note 2) Art. 4(1) for species listed on Annex 1 and Art. 4(2) for regularly occurring migratory species.

5 Cliquet *et al.*, *supra* note 1, p. 163.

we summarise the ecological responses necessary to ensure Europe's wildlife can adapt to climate change and the role of protected areas within that response. Then we seek to summarise why we believe the Nature Directives can already facilitate the positive, dynamic approach needed to address climate change.

2. Protected areas: Sustaining ecological functions in the face of climate change

Protected areas work. Recent work⁶ looking at population trends for all wild birds in Europe since 1970 has shown how important the Birds Directive has been for these birds, especially those on Annex I. The rate of recovery of Annex I species has been significantly greater inside the EU than outside, and within the EU has been greater for Annex I species than species not listed on the Annex. The role of protected areas in this recovery is critical. The greater the area of SPAs, the stronger the recovery, especially for the rare and vulnerable species on Annex I. This was borne out by evidence that these trends were more positive in those countries that designated larger areas of SPAs.

Cliquet *et al.* rightly identify geographical shifts in suitable climate conditions as perhaps the most noticeable of the climate change impacts on wildlife and the one with greatest implications for protected areas.⁷ For example, the modelling of the impacts of climate change on birds by Huntley *et al.* has predicted that, by the end of the century, the majority of European breeding bird species' ranges are likely to have shifted towards the north and north-east by around 500-1,000 kilometres, but with wide variation between species:⁸ three quarters are likely to suffer declines in range.

It is this 'spatial response' by species that has led some commentators to question the validity of protected areas in society's response to climate change, suggesting that they are in the wrong places, deemed too static to cope with species shifts. This is sometimes accompanied by calls for their abandonment and/or wholesale movement. This overlooks several key roles that protected areas play in society's response to the geographical shifts in suitable climate conditions for species, which we outline below.

2.1. Protected areas – building resilience and accommodation

Tomorrow's biodiversity can only come from today's, and so building resilience into remaining populations is a vital first step in enabling adaptation. Protected areas will be a key mechanism, as demonstrated by Donald *et al.* through their role in aiding population recovery.⁹

The objectives of protected areas are to remove current land use pressures (*e.g.* from agriculture or built development), and to bring sites into a favourable condition. Both objectives will enhance resilience to climate change. However, we must also seek to accommodate change as species respond to the changing climate. For some taxa, providing suitable micro-climates within a protected area may be sufficient. Others will need to move between protected areas in order to find suitable climate and habitat. As the wider countryside fails to provide habitat for many species, protected areas will play an important role in enabling them to 'track' suitable climate conditions. The suite of species present at a given site will thereby change over time, and site management will need to change to accommodate this.

6 P.F. Donald *et al.*, 'International conservation policy delivers benefits for birds in Europe', 2007 *Science* 317, no. 5839, pp. 810-813.

7 See note 1, *supra*, p. 160.

8 B. Huntley *et al.*, *A climatic atlas of European breeding birds*, 2007.

9 See note 6, *supra*.

2.2. Protected areas – managing for changing objectives

Nature conservation can accommodate species' spatial responses without the need to relocate protected areas. The conservation objectives of such sites must take account of species' spatial response to climate change. This will be an important component in supporting adaptation within the site network. Changes in site objectives will need to occur at different temporal and spatial scales for different species. In all cases, these must take account of a species' wider conservation status and distribution.

Dynamic site management has already begun. On its own suite of over 200 nature reserves, the RSPB has started to trial a new approach to conservation management planning.¹⁰ This makes use of all available information about future climate conditions and possible species' responses in determining both site objectives and site management. Inevitably, it will be subject to periodic review as our knowledge and understanding of species' responses improves. Similar approaches are equally relevant to the Natura 2000 network. There is, as Cliquet *et al.* highlight, a tension between providing certainty to land managers and decision-makers and the ability to respond dynamically to climate change.

2.3. Protected areas – habitat creation to support adaptation

Making existing protected areas larger through habitat creation is important for building resilience (by buffering sites from external pressures) and accommodating change (by providing the space to allow for diverse site management). For example, where existing sites are being lost to coastal erosion, habitat creation plays an important role in providing replacement habitat for vulnerable populations.

In some circumstances, habitat creation has an important role to play in accommodating change by providing new sites. Habitat creation is most successful for relatively simple plagioclimax habitats, such as reedbed and heathland, in which the structural components of the habitat are short-lived. However, many habitats, especially those that are older and more biologically specialised, such as ancient woodland, are difficult if not impossible to replace, so this is not a total solution.

2.4. Protected areas – sustaining ecological functions

Protected areas are not just important for the species that reside within them, but also the underpinning environmental conditions or site function many of which have taken decades, if not centuries, to develop. Key environmental conditions such as low-nutrient soils, high water quality, particular geologies and topographies are now rare in the wider landscape, but well represented in the protected area portfolio. Conditions like these are the foundation of diverse ecological communities. They will go on being so, regardless of the species that make up those communities. Both species shifting their distribution within Member States, and those extending their distribution into Member States, will be seeking these basic environmental conditions.

In situ conservation through protected areas is key to sustaining these ecological functions. Once lost, most of these environmental conditions and site functions can never be recovered.¹¹ Where recovery can be attempted, the timescales are long, and the cost often prohibitive. Therefore, safeguarding the inherent ecological conditions provided by protected areas will be

¹⁰ See for example: RSPB, *RSPB Reserves 2007*, p. 54 and *RSPB Reserves 2008*, p. 86.

¹¹ See for example: R.K.A. Morris *et al.*, 'The creation of compensatory habitat – can it secure sustainable development?', 2006 *Journal for Nature Conservation* 14, no. 2, pp. 106-116.

vital in ensuring those species shifting distribution can discover the basic ecological ‘infrastructure’ they require.

2.5. An integrated, dynamic approach

Taken together, these approaches to protected area management should place the Natura 2000 network at the hub of a more integrated, dynamic and responsive approach to biodiversity conservation, helping wildlife adapt to a changing climate.

3. How do the Nature Directives meet the ecological challenges?

In our view, Cliquet *et al.* took a relatively narrow reading of the Nature Directives that placed great emphasis on the site-protection elements of both Directives. We outline below why we believe a fuller reading results in different conclusions being drawn about the flexibility of the Nature Directives. Their focus on the site protection elements of the Directives is understandable given that Member States have themselves placed such great emphasis on protected area provision – almost to the exclusion of everything else.

3.1. Brief résumé of the habitat conservation provisions of the Nature Directives

Both the Birds and Habitats Directives adopt a twin-track approach to biodiversity conservation. They use a combination of habitat conservation and species conservation measures to attain the goal of favourable conservation status (FCS).¹² Habitat conservation lies at the heart of both Directives, with great emphasis given to the establishment of the Natura 2000 network.¹³ However, it is our view that there has been a general failure to consider protected areas as part of an integrated package of measures that the Nature Directives require to deliver this overarching objective.

Below we outline the overarching purpose of the Nature Directives, highlight the relevant provisions in each Directive and summarise how they can combine to address the ecological challenges outlined in Section 2.

3.1.1. Overarching purpose of the Nature Directives

The overall purpose of the Nature Directives is straightforward: to maintain species and habitats at a level where they are not regarded as threatened, that is at ‘favourable conservation status’. The EC’s own guidance¹⁴ to Member States describes FCS in plain language: it [FCS] is reached when a habitat or species is prospering, with good prospects of doing so in the future. Article 2 in both the Birds and Habitats Directives sets out these requirements in general terms. The different language used to describe it reflects the fact they were drafted 13 years apart. However,

12 Art. 2(2) Habitats Directive, *supra* note 3. Favourable conservation status does not appear on the face of the Birds Directive. However, the EC has argued the obligation extends to the Birds Directive (*supra* note 2) and is implicit in its Art. 2 – see CEC, *Guidance Document on Hunting under Council Directive 79/409/EEC on the Conservation of Wild Birds: the Birds Directive*, 2004, European Commission, Brussels. Given this, for the remainder of the paper we use ‘favourable conservation status’ as shorthand for the Art. 2 requirements of both the Habitats and Birds Directives.

13 Art. 3(1) of the Habitats Directive (*supra* note 3) requires the establishment of a coherent network of protected areas, known as Natura 2000, to ‘enable the natural habitat types and the species’ habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range’. The construction of Art. 3(1) appears to restrict this objective for Natura 2000 to habitats and species listed on Annexes I and II of the Habitats Directive. However, the European Commission has recognised the relevance of the favourable conservation status objective to the Birds Directive (see note 12, *supra*).

14 European Commission, *Assessment, Monitoring and Reporting under Article 17 of the Habitats Directive: Explanatory Notes and Guidelines. Final Draft. October 2006*, 2006, European Commission, Brussels.

both are driven by the ecological requirements of the species and habitats concerned and both build in flexibility to deal with changing environmental circumstances such as climate change:

- the Habitats Directive explicitly defines FCS by reference to the long-term needs of the habitat or species concerned (see Article 1(e) and 1(i) respectively);
- the Birds Directive requires the maintenance of populations at levels that correspond in particular to ecological, scientific and cultural requirements. Population levels must be defined by reference to these requirements. Clearly, if any of the requirements change, the population objectives (such as numbers, range, distribution) will need to be adjusted accordingly.

Therefore, the Nature Directives demand a clear understanding of what constitutes FCS for the species and habitats they seek to conserve, including provision to maintain that over the long-term in light of changing circumstances. The Habitats Directive sheds more light on this by referring to the ‘sum of influences’ acting on a species or habitat over the long-term: it makes no distinction between natural or man-made influences. Translating this concept into delivery in practical terms is challenging and demands a careful analysis of the actions needed now to bring habitats and species into a healthy status combined with constant vigilance to maintain that status in the future.

FCS provides the framework that the various measures set out in the Nature Directives are working to attain. Unfortunately, there has been a general failure to look at the Nature Directives through the lens of FCS. This has led to the measures in them being implemented in a less than integrated way. In dealing with climate change or any other pressures, it is important to view the articles of the Nature Directives as a means to deliver FCS. This requires consideration of how the various objectives, duties and powers they contain can be applied to provide a practical and comprehensive response to deliver FCS.

3.1.2. Birds Directive

As outlined above, the Birds Directive requires that all wild bird populations be maintained ‘at levels that correspond in particular to ecological, scientific and cultural requirements’ or the ‘the appropriate population level’.¹⁵ Sutherland *et al.* rightly described this as a strong starting point, because it means that if climate change causes or exacerbates bird population declines through adverse effects on their habitats, then action is required to address this.¹⁶ Articles 3 and 4 of the Birds Directive set out the measures for habitat conservation for all wild bird species: a careful analysis shows that while protected areas are a core element, a wider range of measures is envisaged as contributing to FCS:

- Article 3 focuses on preserving, maintaining or even *re-establishing* a ‘sufficient diversity and area of habitats’ for all wild birds, sufficient to meet the defined population level under Article 2.¹⁷ The measures comprise a number of approaches including the creation of habitats¹⁸ or the re-establishment of destroyed biotopes¹⁹ to replace any that may be lost

¹⁵ Art. 2 Birds Directive.

¹⁶ R. Sutherland *et al.*, ‘Climate Change and the Birds and Habitats Directives: can they work together?’, 2005 *Ecos* 26, no. 3/4, pp. 86-94.

¹⁷ See Case C-355/90, *Santona Marshes*, [1993] ECR I-4221, Advocate General Opinion at Para. 58.

¹⁸ See Art. 3(2)(a) Birds Directive.

¹⁹ See Art. 3(2)(c) Birds Directive.

(provided the creation precedes the loss so as to maintain the diversity and area in question through the change²⁰);

- Article 4 requires special conservation measures for certain species of wild birds²¹ to ensure their survival and reproduction in their area of distribution, with particular reference to the classification of the ‘most suitable territories’ as SPAs. Many Member States have focused all their attention on the designation and protection of the ‘most suitable territories’ as SPAs, to the exclusion of any additional measures needed ‘to ensure [the species] survival and reproduction’. Consequently, these (and Article 3 measures) are significantly underdeveloped, yet they are likely to prove crucial in supporting protected areas as part of the response to climate change.

3.1.3. Habitats Directive

The Habitats Directive imposes obligations to conserve certain listed species of animals, plants and habitat types, including protection from the impacts of climate change. As discussed above, the purpose of this conservation is to maintain or, where necessary, restore those habitats and species to FCS. It is true that there is greater emphasis on the designation, management and protection of protected areas, *i.e.* SACs,²² in comparison to the more comprehensive approach to habitat conservation set out in the Birds Directive. However, the framework provided by the Directive is broader than SACs:

- Article 3(1) sets out a duty to classify SACs, which like that for SPAs, is ongoing;
- Article 6(1) sets out a duty to establish the necessary conservation measures for SACs, with some discretion over the mechanisms used;
- In non-plan or project situations (see Articles 6(3)-(4) below), Article 6(2) protects SACs and SPAs by requiring appropriate steps to *avoid* the deterioration of habitats or habitats of species and significant disturbance to species, in relation to the objectives of the Directive, *i.e.* the achievement of FCS;
- Under Articles 6(3) and 6(4), plans or projects that threaten SPAs or SACs, are given strict protection with derogations in very limited circumstances, with compensation measures required where damage is permitted;
- Article 3(3) and Article 10 of the Habitats Directive stress the importance of protection outside the Natura 2000 network, so that Member States should endeavour to maintain and, where appropriate, develop features of the landscape that are of major importance for wild flora and fauna.

3.1.4. The Nature Directives – meeting the ecological challenges of climate change

The Nature Directives do indeed place an emphasis on protecting today’s wildlife where it is – this is based on a sound ecological approach that *in situ* conservation is more robust and reliable than attempting to create or restore conditions that may have taken centuries to evolve. However, they also possess the tools to ensure a flexible response to the ecological demands imposed by climate change.

Managing and protecting the Natura 2000 network will continue to be central to the EU’s response to dealing with the effects of climate change on biodiversity:

20 See Case C-355/90, *Santona Marshes*, [1993] ECR I-4221, ECJ at Para. 15; Advocate General Opinion at Para. 58, note 17, *supra*.

21 Annex I species (Art. 4(1)) and regularly occurring migratory species (Art. 4(2)).

22 See Habitats Directive Art. 3-5 (designation) and Art. 6 (management and protection).

- *In situ* conservation will remain a priority. Given that the purpose of Natura 2000 sites is to make a significant contribution to the achievement of FCS for relevant species and habitats, then a fundamental requirement today is to ensure each site is managed so that it achieves the favourable condition described in its conservation objectives. This will make the wildlife they protect more able to resist ongoing pressures and therefore withstand the effects of climate change. It will also ensure the species they support are prospering such that they can provide source populations to colonise new areas should their climate space begin to shift;
- Where *in situ* conditions begin to deteriorate due to climate change such that the conservation objectives of a Natura 2000 site cannot be fully met, Article 6(2) of the Habitats Directive provides the trigger to consider the most appropriate response. It will force the consideration of additional management measures within the Natura 2000 site to increase its resilience to climate change. In extremis, where such measures are not practicable then derogation may be justified in very limited circumstances. However, given the overall purposes of the Directives, further measures will be needed to ensure FCS is maintained:
 - for SACs, consideration would need to be given to Article 6(1) to assess whether further ‘conservation measures’ would be necessary to make up for that loss;
 - for SPAs, it is our view that further measures would need to be considered and if necessary taken under Articles 3 and 4 of the Birds Directive to comply with the obligations set out in those articles. We have already seen examples of this approach in the United Kingdom, for example the commitment to provide replacement habitat for the partial loss of breeding and wintering waterbird interests on the Ouse Washes SPA due to increased summer and winter flooding;
- Where plans or projects are being carried out in response to climate change for human safety objectives – for example the construction of new sea defences – Articles 6(3) and 6(4) are relevant, in that appropriate assessment will be required to assess whether there is an adverse effect on Natura 2000 sites. In many cases, such projects are likely to pass the ‘alternative solutions’ and ‘imperative reasons of overriding public interest’ tests and thus compensatory habitat will be required to maintain the functions of the protected area network. In the UK, the loss of SPA reedbeds on the coast of East Anglia to sea level rise and the realignment of sea defences are being compensated for by the creation of new reedbed habitat in sustainable inland locations;
- Classification of new protected areas may be required. Flexibility is inherent in the SPA classification regime. As an ongoing duty, it allows for new classifications from time to time depending on what the conservation of the species requires. If climate change alters the conservation requirements then adjustments to the qualifying interests, site conservation objectives and, where necessary, classifications will have to follow. The ability to classify new SPAs is supported by the seventh recital of the Habitats Directive: ‘Whereas all the areas designated, including those classified now [*i.e.* meaning 1992] or in the future as [SPAs] (...) will have to be incorporated into the coherent European ecological network’.

Outside of protected areas, the Nature Directives provide a number of measures that can help increase resilience and provide accommodation for species and habitats:

- Article 4(4) of the Birds Directive makes clear that outside SPAs Annex I and migratory bird species are subject to a duty on Member States to strive to avoid pollution or deterioration of habitats. This would apply to new habitats colonised by birds moving in response

- to climate change. The European Court of Justice in a recent case ruled that this duty required ‘serious endeavours’ and ‘targeted action’;²³
- Article 3 of the Birds Directive and Article 10 of the Habitats Directive both set out requirements for the creation or restoration of habitat where this will contribute to the conservation of the habitat or species. Both of these duties are obviously flexible enough to apply to ‘moving’ habitats in response to climate change. Article 3 of the Birds Directive is particularly well placed to tackle the problems posed by climate change by helping to build the resilience of existing protected areas, accommodate change and create new habitat through the provision of new sites. It is not appropriate for a Member State to wait until an actual reduction in population occurs or any risk of a protected species becoming extinct materialises before Article 3 kicks in. Such measures must be in place before these things occur.²⁴

Integrating these elements into a package of site protection, habitat creation and management measures for species and habitats will be essential in making sure there is a coherent response. Such an approach has already been proposed in the UK for breeding bittern *Botaurus stellaris*, a rare heron concentrated in a series of SPAs on the Suffolk coast and highly vulnerable to sea level rise, incorporating the compensatory reedbed referred to above.^{25, 26}

4. Conclusion

We believe our analysis supports a general conclusion that climate change adaptation will require the interpretation and implementation of the Nature Directives to be further developed, but that their fundamental construction is as sound today as it was when they were adopted. They can embrace the dynamic response to climate change sought by Cliquet *et al.* and other commentators.

There is a clear risk that the natural environment will lose out through climate change in at least three ways: not only to direct loss through changing climate space, but also indirectly, through competition for scarce resources such as water, and projects undertaken to mitigate or adapt to the effects of climate change such as renewable energy projects, reservoirs and intensification of land use for agricultural and bioenergy crops.

The health of our wildlife in general, and protected areas in particular, is a tangible indicator of the health of the ecosystem functions underlying them. As the UK Sustainable Development Commission noted in its work on tidal energy generation, the Nature Directives represent an ‘enlightened approach to dealing with environmental constraints, and one that is at the heart of sustainable development’.²⁷

23 See Case C-418/04, *Commission v. Ireland*, Para. 190.

24 See Case C-355/90, *Santona Marshes*, [1993] ECR I-4221.

25 A. Dodd, ‘EU nature directives: rights, responsibilities and results – are we striking the right balance?’, 2008 *Environmental Law and Management* 20, no. 5, pp. 237-245.

26 S. Wotton *et al.*, ‘Boom or bust – a sustainable future for reedbeds and Bitterns?’, 2009 *British Wildlife* 20, no. 5, pp. 305-315.

27 Sustainable Development Commission, *Turning the Tide. Tidal Power in the UK*, 2007, p. 143.

Response to 'Protected areas and climate change – Reflections from a practitioner's perspective'

An Cliquet, Jim Harris, Peter Howsam & Chris Backes*

We highly welcome and appreciate the reflections made by Dodd *et al.* on the article published in the Utrecht Law Review on 'Adaptation to climate change. Legal challenges for protected areas' (Cliquet *et al.*, 2009¹). The reflections by Dodd *et al.* emphasize and confirm our main conclusions. After careful reading, even where there seems to be a different viewpoint on some points, there is little which is actually contradictory.

In summary, Cliquet *et al.* point out that in order to face the additional challenges of climate change, more nature conservation efforts will be necessary. Ecosystems must be made more resilient, by enhancing the core areas of the ecological network and increasing efforts at connectivity. This should *inter alia* enable efforts to sustain species that are forced to migrate because of climate change. This requires a certain degree of 'flexibility', in the sense that additional areas will need to be protected, existing areas will have to be enhanced, the coherence between the core areas should be improved and connectivity between protected areas should be substantially increased. It should again be stressed that 'flexibility' means to do more, not less – more sites, bigger areas! The Birds and Habitats Directives provide at least some scope for facing the challenges ahead² (although not as explicitly as would seem ideal from both an ecological and legal-technical point of view). The main problem is that so far the application and interpretation of both Directives have taken place with a rather 'static' approach, which might conflict with the natural or man-made dynamics of nature.

Dodd *et al.* support these findings and confirm the need for a more flexible approach, but disagree with our conclusion that the Directives are static by protecting the 'existing values' of protected areas. Dodd *et al.* see our analysis as a rather narrow reading of the Directives, emphasizing the site-protection elements of both Directives. We did indeed focus mostly on the protected sites, as most efforts so far by Member States have concentrated on the designation of the Natura 2000 sites. We also agree with the point made that existing designations have had a positive impact both for the specific species and habitats, but also as a secondary consequence for the wider ecosystem within or associated with a designated site. We completely agree with the statement by Dodd *et al.* that there has been a general failure to consider protected areas as part of an integrated package of measures that the Nature Directives require to deliver the overarching objective of obtaining a favourable conservation status.

In sum, both articles confirm that the Directives provide possibilities to face the challenges ahead but, so far, implementation has been insufficient. The core question that remains is how do we proceed in the future? Is it sufficient to implement the Directives in a more integrated way

* Prof. Dr An Cliquet, Department of Public International Law, Ghent University, Ghent (Belgium); Prof. Dr Jim Harris, Department of Natural Resources, School of Applied Sciences, Cranfield University, Cranfield (UK); Dr Peter Howsam, Department of Natural Resources, School of Applied Sciences, Cranfield University, Cranfield (UK); Prof. Dr Chris Backes, Department of Public Law, Maastricht University, Maastricht (the Netherlands). Corresponding author: An Cliquet, email An.Cliquet@ugent.be, tel. 0032 92646899, fax. 0032 92646989.

1 A. Cliquet, C. Backes, J. Harris & P. Howsam, 'Adaptation to climate change: legal challenges for protected areas', 2009 *Utrecht Law Review* 5, no. 1, pp. 158-175.

2 Cliquet *et al.*, *supra* note 1, p. 175.

and to implement certain provisions that have so far been neglected (such as Articles 3 and 10 on connectivity)? Or are additional measures required?

We can agree with Dodd *et al.* that the Directives provide us with the necessary tools for the challenges that we face, at least in the short term. Stronger efforts towards a more proactive implementation will be necessary, amongst others a continuous process of designating sites, formulating and readapting conservation objectives, allowing for ecosystem functioning and ecological processes and taking measures aiming at connectivity. It will be the task of the Member States, and of the Commission and Court to supervise this process. Such a proactive implementation is necessary in order to reduce the loss of biodiversity in the short term.

The rigid interpretation that is sometimes given to the Directives is often driven by the need for legal certainty for stakeholders. A proactive implementation of the Directives, through building a more robust and coherent network, as well as proactive species protection, can lead to a more favourable status for conservation. This is also in the interest of stakeholders. Robust networks in which habitats and species have a favourable status of conservation are less vulnerable to human activities.

For the implementation of the existing Directives, we would like to stress two items: firstly, much more effort is needed for ecological restoration,³ both within and outside the Natura 2000 sites, as the status of many habitats and species is unfavourable.⁴ This is also clear from the failure in the EU to halt the loss of biodiversity by 2010. A recent study by Ray Benayas *et al.* (2009) has demonstrated the success of restoration programmes in securing enhanced ecosystem services over their formerly degraded status.⁵ Secondly, more efforts are needed for realizing connectivity (building a ‘green infrastructure’ for Europe⁶). As stated in Cliquet *et al.*, the provisions on connectivity in the Habitats Directive are rather weak. In a first instance the Commission will have to undertake a more stringent approach to supervising implementation by Member States. As Dodd *et al.* point out, obtaining a favourable conservation status is an overarching objective of the Nature Directives. In order to attain this objective, measures outside protected areas are required, such as connectivity measures and overall species protection measures (based on Article 12 of the Habitats Directive).

In the longer term, additional legal instruments might prove useful. The idea of an ‘Ecosystem Services Directive’ was briefly explored in Cliquet *et al.* Rather than replacing the Nature Directives, this could apply horizontally on the whole territory, and not only within the core protected areas, but especially outside those core areas. This could lead to a better legal foundation for *inter alia* connectivity measures and monitoring obligations. Especially areas outside the current protected network, which could be important such as future corridors, receptors for migrating species and producers of ecosystems services could be brought under the protection of such a Directive. As stated in Cliquet *et al.*, more research must be carried out to study in more detail the possible contents as well as the benefits of such a legal instrument, and its relation to the Nature Directives, as well as other instruments such as the Water Framework Directive, but also its relation to policy areas such as agricultural and transport policies.

3 See also J. Verschuuren, *Climate change: rethinking restoration*, presentation at the IUCN conference, Wuhan, November 2009.

4 See Report from the Commission to the Council and the European Parliament, *Composite Report on the Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive*, COM(2009) 0358 final, 13 July 2009; <http://ec.europa.eu/environment/nature/knowledge/rep_habitats/index_en.htm>; European Commission, *Natura 2000 Newsletter*, July 2009.

5 J. Rey Benayas *et al.*, ‘Enhancement of Biodiversity and Ecological Restoration: A Meta-Analysis’, 2009 *Science* 325, pp. 1121-1124.

6 J. Hontelez, *Building green infrastructure for Europe*. Special Report, European Environmental Bureau, December 2008.