Online ISSN: 2588-3526

Journal of Wildlife and Biodiversity

Volume 7 (4): 17-35 (2023) (http://www.wildlife-biodiversity.com/)

Scientific Report

Inconsistency between international nature conservation law and adaptation of biodiversity to climate change

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Received: 15 March 2023// Revised: 25 June 2023 / Accepted: 04 July 2023/ Published online: 04 July. Ministry of Sciences, Research, and Technology, Arak University, Iran.

How to cite: Zia-ud-Din, M., Ed Daran, D., Ajlani, R.A., Elhajraoui, F.E. (2023). Inconsistency between international nature conservation law and adaptation of biodiversity to climate change, Journal of Wildlife and Biodiversity, 7(4), 17-35. **DOI**: https://doi.org/10.5281/zenodo.8123981

Abstract

Climate change has been predicted to place more pressure on biological variety throughout the planet. The movement of species and ecosystems, even across international borders, necessitates international collaboration between governments. However, existing international conservation laws do not consider climate change and are thus not expected to provide sufficient support for species and ecosystem adaptation. This research delves into the difficulty of making international nature conservation legislation resilient to climate change and the corresponding mismatch.
Keywords: Biodiversity, Climate Change, Nature Conservation, International Law

Introduction

Recent years have seen an explosion of research documenting the repercussions of climate change on species and ecosystems. Scientists anticipate that these effects will only grow in significance as time goes on (Keenan, 2015). Organisms are feeling changes in temperature, humidity, and weather patterns, and the increased frequency of severe weather events linked to climate change is also significant. At typical rates of up to 15 meters per day, it is predicted that many species and

ecosystems would (try to) move their ranges to higher latitudes and altitudes. While habitat fragmentation and other issues strain many species and ecosystems, history shows that nature can and will adapt to climate change similarly. Climate change is expected to have serious, negative repercussions for biodiversity or the variety of life on Earth (Pecl, et al., 2017).

There must be more international collaboration to help species and ecosystems adapt to climate change so that losses may be minimal. This leads us to wonder whether "International Environment Law (IEL)" right now can handle such a massive undertaking, and if not, how this gap may be closed. In this context, "international law for nature conservation" refers to any values of general international law that govern the administration, use, or protection of ecosystems and species. While conservation-focused instruments make up the bulk of this set, fisheries instruments and portions of instruments addressing water or air pollution also make an appearance. The answers are not easy to come by and go beyond the scope of a single research report. This article tries to explain some of the pieces of the jigsaw by offering a preliminary evaluation of the existing capacity of IEL to aid the version of species and ecosystems to climate change and by delineation obstacles to strengthen this ability. This article aims to help fill a need in international law scholarship on the adaptation of natural systems to climate change, mainly focusing on climate change mitigation and human system adaptation (Robinson, 2020). Although this research is restricted to international law issues, some of its conclusions will likely be relevant to analogous debates on a national level (Chadwick, 2020).

This article is organized as follows. The development of international law about protecting natural resources and environments is outlined in Section 2. In Section 3, we explore how species and ecosystems are affected by climate change and what is needed to help them adapt to the new conditions. In Section 4, we pull everything together and evaluate how well international law and the need for adaptation alignment are. In Section 5, we briefly consider the challenges that international conservation policy may face in the future as a result of the effects of climate change. The last section, 6, gives some final thoughts.

The Convention on Biological Diversity

International Law and the Biodiversity Crisis

The so-called biodiversity catastrophe is high on the list of issues facing the worldwide community of nations right now. Most scientists agree that the current extinction rate for animal and plant species is between 100 and 1,000 times greater than the average extermination rate since life on

Earth began (Pimm, & Joppa, 2015). Recent mass extinctions have been caused mainly by a handful of well-documented human activities. First is introducing foreign species; second is overexploitation; third is habitat destruction or degradation; and fourth is pollution (Bonebrake, et al., 2019).

For ethical and economic considerations alike, there is widespread consensus that the current pace of biodiversity loss is cause for serious alarm. Thus, protecting biodiversity was designated a "common concern of humanity" in 1992 (Bowling, Pierson, & Ratté, 2016). It wasn't until the World Summit on Sustainable Development (WSSD) in Johannesburg ten years later that governments agreed to 'the accomplishment by 2010 of a considerable decrease in the current pace of loss of biological variety (Dodds, Donoghue, & Roesch, 2016). This "2010 Biodiversity Target" was reaffirmed at the "UN World Summit in New York in 2005" and other international and regional gatherings. Predictably, however, as 2010 drew nearer, so did the voices of skepticism over whether or not the goal would be met. As a result of the "importance of the 2010 aim," the ministers environment at the latest G8/G20 summit in Syracuse advocated for "an ambitious and practical post-2010 biodiversity common framework, [...] based on lessons gained from the 2010 target" (Trouwborst, 2009).

States have long acknowledged species' dangers and the advantages of protecting them as having a partially international or global reach. Species that are shared by the whole planet, such as fish in international waters or creatures that migrate across state borders, especially need international collaboration. For this reason, international treaties have been enacted to safeguard migratory birds' breeding, stopping, and wintering grounds, which may be spread over several countries. Regulation of exploitation or commerce is another everyday duty imposed by nature protection treaties. Treaties often include lists of protected species and ecosystems. Over a century has passed since the first legally binding international protection agreements were signed, marking the start of a multiplying that has resulted in the vast quantity of agreements currently in existence that seeks to conserve a range of species belonging to the "wildlife" "wildlife" class, plant and animal life; also known as biological natural resources; sometimes known as physical resources; and, most recently, biodiversity. Depending on the agreement's scope, it may cover a specific species, like polar bears or tuna, a geographic area, or the whole planet. The latter group, known as the "Big Five," is comprised of the "Big Four" *"Conventions signed in the 1970s (the Ramsar Convention on Wetlands, the World Heritage Convention, and CITES), the "five agreements" (the Convention*

*on Biological Diversity) agreed in 1992 and the Bonn Convention on Migratory Species (CMS)" (*Lyster, 1985).

Shifting From Last-Hour Care to Preventative and Holistic Measures

There has been a growing consensus that worldwide conservation law must evolve from reactive, ad hoc measures to proactive, all-encompassing laws that address. The precautionary principle and ecosystem approach are the primary tools for changing the related regulations. It seems fitting to provide a little more background.

By concentrating on already endangered species, many conservation regimes have traditionally been reactive, a problem that is compounded by the fact that governments often do not take any action until the endangered status of a species is proven by science. Until recently, international nature conservation legislation constituted a patchwork, ad hoc approach since it focused on controlling certain activities harming certain species or places. Together, these two factors provide a barrier to conservation over the long run. While species rely on broader ecosystems, international systems frequently only offer palliative or "end-of-life care" until population numbers drop to unsafe levels. This realization resulted in increased advocacy for legislative change to enable more comprehensive and preventative environmental protection methods.

Fundamental developments in worldwide conservation law were first acknowledged at the intergovernmental level during the *"1992 United Nations Conference on Environment and Development (UNCED)"*. The “Convention on Biological Diversity” and other accords implemented during the United Nations Conference on Environment and Development demonstrate that proactive global conservation and sustainable use of biodiversity have replaced reactive attempts to conserve endangered species. In a formal declaration, states reiterated the idea that species and their habitats constitute complex ecosystems that are, in turn, interlinked throughout the world.

Two relatively recent ideas depart from 'deathbed conservation': the precautionary principle and the ecological approach. The precautionary principle (or practice) seeks to avoid permanently damaging the natural world. It requires responding swiftly and decisively to emerging environmental risks, especially in the face of scientific uncertainty. The precautionary principle states that if there is any question, nature should benefit from it. Given the complexity of ecosystems, the resultant unforeseen influence of potentially dangerous human actions on

ecosystems, and the catastrophic and irrevocable nature of species extinctions, this idea is a significant reaction to the inadequacy of reactive conservation planning.

On the other hand, the ecosystem approach is the antithesis of ad hoc strategies, (or) just as prudence is to reactive strategy. It represents the "whole picture," or holism. The ecosystem approach safeguards species by prioritizing 'healthy' ecosystems or 'ecosystem integrity.' In particular, it entails managing human activities to ensure human needs are met without jeopardizing the ecosystem's health, all while using our current knowledge of the ecosystem's components, structure, and dynamics. There is no difference between the words "ecosystem management," "ecosystem-based management," and "ecosystem factors in management".

The intricacy and relevance of both the precautionary principle and the ecological approach have made them topical debates. States and academics continue to argue about the finer points of their definitions, position, and significance under international law and their connection (Fine, 1999). It wasn't until the *"United Nations Conference on Environment and Development"* in the early 1990s that the precautionary principle and the ecosystem concept were substantially incorporated into international conservation policy. These two new ways of thinking have now been integrated into established regimes like the 'big four' and incorporated into freshly negotiated instruments to varied degrees. In response to these global trends, nations have adopted the precautionary principle and the ecosystem approach as part of domestic legislation and policy. Even if a legal change is in the works, others wonder whether it will be fast enough and thorough enough to address the urgent need for a preventative and systemic approach to environmental protection (Zhao et al., 2020). Adaptation of biodiversity to climate change is a pressing issue, and the following section will show that precautionary and ecological methods are particularly relevant to addressing this problem.

Adaptation to Climate Change

The Dynamic Nature

The four conventional causes of biodiversity loss described above need to be updated to include the effect of climate change. The impact of climate change on species and ecosystems is not to be underestimated. Convincing data suggests widespread effects are already happening and likely to grow (Steinbauer, et el., 2018). Wide-ranging and convoluted repercussions are possible. Many species' ranges, populations, and migratory routes might be affected by shifts in average air and

sea temperatures and precipitation patterns. Droughts, floods, and storms will become more common, each with consequences.

Species and ecosystems will likely experience varying levels of impact, with factors such as latitude, elevation, and ecological adaptability all playing a role. In general, however, we may anticipate a movement of species and ecosystems to more northern and mountainous climes. Some of the most vulnerable ecosystems include coral reefs (because of rising sea levels), low-lying tropical island ecosystems (because of changing weather patterns), migratory biomes (because of shifting climate patterns), and species that have nowhere to go. The latter is shown by the fact that the Scottish beaks would have their backs against the sea in the extreme north of Scotland if the southern border of their range pushed north as projected (Clark, et al., 2012). Predicted ice melt Arctic ecosystems are vulnerable to the wide-scale alteration that may occur in biomes like the tundra and the boreal forest (Niittynen, Heikkinen, & Luoto, 2020). Even in the seas, little changes in water temperature may have large-scale effects on things like seabird range, population size, and food.

Throughout Earth's history, varying degrees of heat and cold have forced many species and ecosystems to relocate. However, there are two significant ways in which the current situation is different. First, the warming trend seems unparalleled during the last 2.5 million years. Because of human activity, most of the world's biodiversity is now limited to protected zones in what would otherwise be inhospitable environments. Overall, large species extinctions are expected to occur, while accurate forecasts cannot be given (Change, I. P. O. C., 2007).

Necessary Measures for Adaptation

However, worldwide nature conservation regimes might adapt to climate change easier by addressing the other stresses on biodiversity. Promoting resistance to change (or decreasing susceptibility to change) and accommodating change are both aspects of adaptation. The relevant literature on conservation biology and numerous policy studies have discovered or advocated a broad range of adaptation methods (Rudd, et al., 2011). Overall, it seems that there is agreement that adaptation activity must at least (1) expand habitat, (2) facilitate species dispersion, and (3) lessen stresses that are unrelated to climate change.

Facilitating migration between (present and potential) habitats is one way to encourage dispersion. One approach is creating a matrix of PAs accommodating the current and future requirements of the most significant number of species. Corridors or "stepping stones" that are conducive to

wildlife and run perpendicular to environmental gradients, like a north-south axis, are another option. Some species may need human assistance in relocation to new places; for example, the Scottish crossbills cited above were relocated to Iceland since it was determined that the birds could not successfully cross the Atlantic Ocean on their own. Increasing the overall quantity of accessible habitat, especially by conserving and restoring vast, un-fragmented regions, improves species' and ecosystems' capacity to tolerate and recover from harsh weather. Flexibility increases when climate change is addressed but it also benefits when other stressors are mitigated. For instance, when negative fishing impacts, including overfishing and habitat degradation, are mitigated, marine ecosystems are better equipped to adjust to climate change.

Adaptation's effectiveness heavily depends on local and regional circumstances and species and ecosystem specifics, making protected area rules vital. The effects of climate change were anticipated to "overshadow everything else in protected area management planning" in the 21st century, and this prediction was made a long time ago. For instance, there seems to be widespread contracts in the systematic works that developing and managing networks of protected areas that are as large as feasible, with large core regions and sufficient connectivity, is crucial for biodiversity's ability to adapt to climate change (Trouwborst, 2009). These networks will offer a cautious model approach to enable as much biodiversity as possible to survive and flourish in the face of the enormous indecision regarding detailed future responses of individual species and ecosystems to climate change. Finally, climate change is already impacting biodiversity, and since it might take decades to develop new habitats, it is generally advised that adaptation measures be put into place right once (Stein, et al., 2013).

Adaptation in International Law: Evaluating the Gap

These and other adaptive measures are urgently needed and add a new measurement to the essential for international collaboration in environmental protection, which was already apparent. In addition, climate change is putting pressure on global nature conservation legislation that is both unprecedented and far greater in scope than the pressures that led to the negotiation of most conservation treaties in the first place. In contrast to the small number of migratory species, many non-migratory ones, for example, reptiles and even whole ecosystems, will (attempt to) move regardless of the presence of political borders.

Jackson has explained that even though "biodiversity protection and climate change cannot be addressed independently anymore" (Jackson, 2011). There is no advice on the question of

biodiversity adaptation in the international accords that are primarily concerned with climate change. Article 34 of UNFCCC broadly calls for "preventive measures" to reduce risks associated with climate change, along with the creation and implementation of programs at the national and regional levels and "measures to promote appropriate adaptation to climate change" (Bodansky, 1993). Therefore, parties cannot depend on the autonomous adaptation of systems since the UNFCCC includes an "obligation to undertake anticipatory, planned adaptation measures," as argued by Verheyen. However, Articles 36 and 37 of the "UNFCCC and the Kyoto Protocol" do not deal with species and ecological adaptations. This looks unlikely to alter significantly under any follow-up UNFCCC regime, at least based on the negotiation language from the existing climate conference in Bonn and the different ideas for "post-Kyoto" instruments made by nations. In light of this, it is worth considering what other international regimes may do to aid in adapting species and ecosystems to climate change, which will be discussed in the following paragraphs. Several instruments, including trade treaties of endangered species, dangerous chemicals, and fisheries, apply to this problem. Taking measures to alleviate pressures unrelated to climate change is the third sort of adaptation activity indicated above, which is very important to keep in mind. When it comes to these, figuring out how much relief from the forces involved would be enough to encourage adaptation appropriately is an apparent concern. The following discussion is limited to the most pertinent global nature conservation instruments, including the “Ramsar Convention, the World Heritage Convention, the Convention on Biological Diversity (CBD), and the Convention on Migratory Species (CMS)”, as well as a regional level example, the European Union's (EU) nature conservation regime.

Ramsar Convention

Wetlands like rivers are crucial to ecological connectedness, and protecting them helps spread species. Accordingly, the "protection and intelligent use of wetlands helps creatures to adapt to climate change by providing connections, corridors, and flyways along which they may migrate," as stated at the most recent *"10th Conference of the Parties (COP) to the Ramsar Convention"*. The resilience of linked species and ecosystems may also be increased by preserving significant, undisturbed wetlands. These characteristics suggest that the Ramsar Convention might be necessary for aiding biodiversity's resilience to climate change. The potential for "significant and irreversible damage" to certain wetland types, such as "reefs, atolls, mangroves, and those in prairies, tropical and boreal forests, and arctic (including permafrost) and alpine ecosystems," was

brought up by parties at the 8th COP in 2002. Ramsar parties are encouraged to reduce "the multiple pressures they face" to "manage wetlands to increase their resilience to climate change and extreme climatic events" (Trouwborst, 2009).

However, the Ramsar Convention itself defines legal obligation despite the COP's non-binding decisions and the extensive "Ramsar Manual on Wise Use of Wetlands" that has been prepared under the Convention's auspices, in which additional relevant guidance has been included. This is because the Convention's 159 parties are relatively weak, the Convention is generically formulated, and the Convention itself was developed in 1971, making it unsuitable for climate change. Member states must "formulate and implement their planning to promote the conservation of the wetlands included in the List, and as far as possible, the wise use of wetlands in their territory" (McInnes, 2013). The List of Wetlands of International Importance, to which this page refers, includes more than 18,000 wetland areas with a combined area of more than 173 million hectares (County, I. B. H. W. 2004). Also, whether or not a wetland is on the List, Parties must "promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands" (Ibid). Furthermore, parties must engage with one another about the Convention's implementation, particularly regarding transboundary wetlands. In a less crucial but still interesting provision, each party agrees to promptly inform the Ramsar Secretariat "if the ecological character of any wetland in its territory and included in the List has changed, is changing, or is likely to change as a result of technological developments, pollution, or other human interference" (Ibid: Art. 3(2)).

The Convention on the Protection of the World's Cultural and Natural Heritage

Many of the most biologically significant places on Earth are recognized as 'natural heritage' under the "World Heritage Convention" and a selection of them are placed on the "World Heritage List". Each of the 186 signatory states has pledged to do everything it can to "identify, protect, conserve, present, and transmit to future generations" the natural heritage found on their territory (Forrest, 2019). Also, each party shall "shall endeavor, in so far as possible and as appropriate for each country," to "integrate the protection of that heritage into comprehensive planning programmes" and "take the appropriate legal, scientific, technical, administrative, and financial measures necessary for the identification, protection, conservation, presentation, and rehabilitation o" the sites in question (Trouwborst, 2009). Specifically, the World Heritage Committee urged Convention parties to "seriously consider the potential impacts of climate change within their

management planning" and "take early action in response to these potential impacts" in 2005 (Shearing, 2008).

One way in which local species and ecosystems may become more resistant to the effects of climate change is if a great and comparatively pristine area, such as the “Great Barrier Reef” gets added to the World Heritage List. The “Canadian Rockies and the Volcanoes of Kamchatka” are both on the World Heritage List, which may facilitate their spread. However, the World Heritage Convention focuses on maintaining the status quo; therefore, it is unlikely to play a significant role in easing the poleward and upward migration of species and habitats. The "World Heritage Convention" regime can theoretically respond to climate-induced changes in species and ecosystems by, for example, adding sites to the World Heritage List when new threatened species appear or removing spots from the list when the species or ecosystems for which they were designated become extinct. Further, the 'List of World Heritage in Danger' might include locations in jeopardy due to climate change, such as Kilimanjaro and the Great Barrier Reef (Shackleton, et al., 2020). Despite their potential, these solutions fall well short of what is needed to actively and broadly encourage adaptation to biodiversity.

The Migratory Species Convention

Currently, the CMS has 133 signatories, it was signed in 1979 to give migrating animal species a "good conservation status" (Testa, G. (2022). The CMS was made before climate change, and this is shown by the fact that, according to the Convention, a migratory species is in a good conservation state when, among other things, its range comes close to its "historic coverage". The CMS wants species on its "Endangered Migratory Species" (Appendix I) list to get instant and tight protection (Cimadori, 2020). The required protection includes things like preserving and, "where possible and appropriate," restoring "those habitats of the species that are important for saving the species from extinction," also getting rid of "activities or obstacles that seriously hinder or stop the migration of the species". This Appendix has a list of migrating species with a lousy conservation state and a list of other species that would benefit a lot from specific deals being made. A final rule worth noticing, if only because it is "precautionary" before the word was even invented, is the general understanding of "the need to take action to prevent any migratory species from becoming endangered" (UNESCO World Heritage Centre, Paris 2007). Adapting to climate change is not something the parties to the CMS have not considered. At the COP 8th which was held in 2005, it was agreed that climate change "may change the ecological character of migratory

species' habitats and have a big effect on how, where, and how many migratory species there are" (Ibid).

Range countries of Appendix I species were asked to "implement, as appropriate, adaptation measures that would help reduce the likely effects of climate change" on the species in question. In 2008, at the 9th COP, people talked more about how worried they were that climate change "is already known to be affecting the habitat, behavior, distribution, and abundance" of CMS-listed species (Trouwborst, 2012). After warning parties that they shouldn't wait to act "despite the fact that we still don't know the full extent of how climate change will affect migratory species". The Resolution in enquiry desires member countries to "identify which migratory species are most likely to be directly or indirectly threatened or affected by climate change," to "design and implement adaptation strategies" for these species, and to make sure that "climate change impacts and related risks are taken into account" in their plans (Trouwborst, 2009).

The Convention's Parties were urged to take climate change-related action to safeguard waterbirds during the Convention's Fourth Meeting of the Parties (MOP) in 2008. It was further discussed to "designate and establish comprehensive and coherent networks of adequately managed protected sites and other adequately managed sites, to accommodate range-shifts and make it easier for waterbirds to move" (MOP Resolution, 2008). Also, the resolution in enquiry tells members states to "as much as possible, maintain the ecological character of the sites important for waterbird populations under changing climate conditions through appropriate management measures" and to "provide wider habitat protection for species with dispersed breeding ranges, migration routes, or winter ranges where the site conservation approach would have little effect, especially under climate change conditions" (Ibid). Lastly, the MOP asked the "AEWA Technical Committee" to "assess whether the existing international networks of sites are enough to protect migratory waterbirds, taking into account the predicted effects of climate change," and if not, to suggest what other steps should be taken. Under the direction of AEWA, one set of protection rules on how to help waterbirds adapt has already been written (Pavon-Jordan, et al., 2020).

The Convention on Biological Diversity

The Convention on Biological Diversity (CBD), 1992 seems to cover much ground, emphasizing biodiversity in the broadest sense and its near-universal involvement. Furthermore, the Convention was drafted with an increased focus on climate change. While not explicitly addressing the topic of climate change adaptation, Article 8's emphasis on in-situ protection of biodiversity is pertinent:

To the extent practicable and appropriate, each Contracting Party shall:

(a) "Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;

(b) Develop, where necessary, guidelines for the selection, establishment, and management of protected areas or areas where special measures need to be taken to conserve biological diversity;

(c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;

(d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;

(e) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;

(f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies" (CBD, 1992).

The need to produce a strategic plan on national biodiversity and to include biodiversity protection in other “relevant sectoral or cross-sectoral plans, programmes, and policies” is also significant law (Ibid). Because of the far-reaching effects that infrastructure and agricultural policies may have on a species' ability to spread, the latter requirement — often supplemented by the standard wording "as far as possible and as appropriate" — must be regarded to extend to these areas.

Adaptation to climate change and networks of protected areas are two examples of how the Convention's mandates have been supplemented and informed by voluntary commitments and recommendations approved by the CBD. The Conference of the Parties urged countries to "promote the incorporation of climate change considerations related to biodiversity into their implementation of the Convention," such as by including these deliberations in national biodiversity policies, and to "take appropriate actions to address" the impact of climate change on biodiversity (Korn, Bockmühl, & Schliep, 2011). In this regard, the COP has consistently emphasized the significance of ecological and protective approaches. Further, "integrate climate change adaptation measures in protected area planning, management strategies, and in the design

of protected area systems" has been urged of all stakeholders to "take measures to manage ecosystems to maintain their resilience to extreme climate events and to help mitigate and adapt to climate change" (Statement of Intent); and to "cooperate regionally in activities aimed at enhancing habitat connectivity across ecological gradients, to enhance ecosystem resilience and to facilitate the migration and dispersal of species with limited tolerance to altered climatic conditions" (Sgrò, Lowe, & Hoffmann, 2011).

The functional responsibilities under the CBD are pretty broad and substantially qualified, which is a disadvantage. Adaptation to climate change is not directly addressed in the Convention. In particular, there aren't any hard and fast rules outlining the creation of networks of protected areas that are big and well-connected enough to reflect the region.

The European Union (EU)

Although regional intergovernmental cooperation plays a crucial role in the current setting, a thorough evaluation of the various regional environmental conservation regimes is beyond the scope of this study. However, the system established by the European Union's Birds and Habitats Directives is dissected as an instructive case study (Angelstam, et al., 2017). These are picked out because they are often regarded as the most cutting-edge and efficient tools for protecting local ecosystems.

The Natura 2000 network of protected areas is one way the Directives hope to preserve biodiversity throughout Europe (Lawrence, Friedrich, & Beierkuhnlein, 2021). To protect the birds on Annex I and (other) migratory birds that frequently pass through their territories, EU member states are required to establish Special Protection Areas (SPAs) under the Birds Directive of 1979 (Romano, et al., 2021). In particular, the SPA will be located in the "most favorable region in number and size" for all these species. The Habitats Directive requires parallel action for the habitat categories specified in Annex I and the species listed in Annex II (Trouwborst, 2014). Essential locations for these ecosystems and species will be classified as SACs through a multi-step process. The Birds and Habitats Directives require member states to use exclusively ecological factors when selecting and delimiting sites. According to the ECJ's case law, it is evident those economic factors and foreseen managerial challenges have no place in the decision-making process. The aforementioned protected area network, Natura 2000, will comprise SPAs and SACs working together (Christopoulou, et al., 2021).

Member countries from European Union (EU) are obligated to implement "the necessary conservation measures" concerning specific locations as long as they "correspond to the ecological requirements" of the ecosystems and species in question. Furthermore, states 'shall take adequate actions to prevent, in the special areas of protection, and the degradation of natural ecosystems' (Cliquet, 2014). There is an additional, overarching need to "take the necessary measures to preserve, maintain, or re-establish a sufficient diversity and area of habitats" for all species of wild birds, within and outside of SPAs. This clause seems to be viewed by the ECJ as a duty of outcome, and it also reads like one. While the Birds and Habitats Directives do not directly address climate change, the legal criteria listed here have essential consequences for the adaptation dilemma, especially regarding building resilience. The European Court of Justice (ECJ) has guided how to meet these standards, stating that "it may be necessary to adopt both measures intended to avoid external man-caused impairment and disturbance and measures to prevent natural developments that may cause the conservation status of species and habitats in SACs to deteriorate" ("*Commission v United Kingdom,* 2005 ECR I-9017"). As climate change progresses, there may be an increase in the frequency with which member states should designate or propose areas that (newly) qualify for inclusion in Natura 2000.

However, from the standpoint of environmental protection in general and adaptation to climate change, the regime formed by the "Birds and Habitats Directives" has no exclusion of liabilities. First, although the Birds Directive protects a wide variety of species, the Habitats Directive does not protect nearly as many, especially those that live in the ocean (Evans, 2012). Second, member states are not required to work together globally to coordinate the implementation of any Directive. Such cooperation is desirable to aid in biodiversity's adaptation to climate change, as it has always been when dealing with migratory species and transboundary areas. Finally, the regime's vulnerability to climate change impacts connection and, by extension, dispersion, which is a significant drawback. This fundamental issue is primarily left up to the discretion of individual member states under the relevant sections of the Habitats Directive (Delbosc, et al., 2021):

Where they consider it necessary, Member States shall endeavour to improve the ecological coherence of Natura 2000 by maintaining, and where appropriate developing, features of the landscape which are of major importance for wild fauna and flora.

Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

Regarding habitats, the impact of climate change must also be factored into the management of Natura 2000 to ensure the diversity of and connectivity between natural areas and to allow for species migration and survival when climate conditions change. In the future, it may be necessary to consider establishing a permeable landscape to enhance the interconnectivity of natural areas.

A Climate-Safe Legal Framework in the Future

By increasing resilience and, to a lesser degree, promoting dispersion, the global nature conservation regimes outlined above seem to aid in mitigating the adaptation of species and ecosystems to climate change. Existing legal systems do not sufficiently address connectivity requirements and international cooperation adapting to climate change. There is zero discussion of the problem of active translocation. The fact that the EU Birds and Habitats Directives, a relatively sophisticated regional environmental protection scheme, displays such substantial inadequacies is ominous (Long, 2011). Notable gaps in species coverage are another constraint of breadth. The necessary all-encompassing regimes are not in place anywhere in the world. In general, current international nature conservation legislation looks inadequate to support biodiversity's efforts to adapt to climate change. The investigated legal systems were developed when climate change's consequences for species and ecosystems were not given much thought. Therefore, it is to be approximately anticipated that they do not adequately account for these changes.

The adverse effects of climate change on biodiversity must be mitigated, and adaptation must be facilitated, and this requires substantial international collaboration, which is becoming more apparent to nations. The following are examples of commitments made during the G8/G20 Siracusa summit to which reference was made earlier: Because "spontaneous adaptation is not expected to be sufficient to reduce the impacts on biodiversity at all levels, or on vulnerable ecosystems," it is essential to "proactively put in place actions for climate change adaptation of natural and managed ecosystems" (MÁCHA, 2019). To prevent 'deathbed conservation' in isolated protected areas and attain a cautious and comprehensive approach to climate change adaptation, governments increasingly recognize, according to the different policy declarations

discussed above, that legislative reform is essential.

International nature conservation legislation, which has hitherto been laser-focused on protecting species and habitats in their native ranges, must evolve into a "moving company," following species and ecosystems as they seek out new, more favorable climes. The goal of conservation efforts, especially in protected areas, is no longer to maintain the status quo but rather to pave the way for the extinction of certain species and the introduction of others. The global and all-encompassing strategy needed to do this is, without a doubt, a "major challenge for the future" (Holmes, 2013). This paper's focus on flexibility to encourage biodiversity protection with regard to climate change stands in fascinating contrast to more typical talks about the need for greater flexibility, such as the "EU's Birds and Habitats Directive". Second, adaptability is often taken to mean reducing safeguards for natural areas and endangered species in favor of commercial growth.

The scope of this paper does not let us identify and evaluate alternatives for the legislation change that is so obviously needed. However, taking a little peek into the future at this juncture in the essay may be satisfactory. Given the Convention on Biological Diversity's lofty objectives and the Conference of the Parties' focus on adaptation and the expansion of protected areas, negotiating a CBD Protocol on Climate Change Adaptation for Biodiversity seems to institute an option that can enhance international law in future ad-hoc analysis. Criteria for the reform or, if necessary, the development of regional nature conservation regimes might be included in such a pact.

Conclusion

To sufficiently assist biodiversity's resilience to climate change, current international nature protection legislation looks to fall short. This mismatch must be fixed if we are to put an end to the biodiversity catastrophe and effectively use the protective principle and the ecological method. There needs to be more research on how current international conservation law aids species and ecosystems in adapting to climate change. Whether more legal change is required to make it fully competent should be the primary focus of future study. Understanding the scope of the issue is the starting point for any solution. The next, more difficult step is finding the best path(s) toward worldwide environmental conservation regimes that are resilient to climate change.

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