ADAPTATION TO CLIMATE CHANGE TO SAVE BIODIVERSITY: LESSONS LEARNT FROM AFRICAN AND EUROPEAN EXPERIENCES

Presentation at the IUCN Academy of Environmental Law conference
"Climate Law in Developing Countries post-2012: North and South Perspectives"
Ottawa, September 2008

Kees Bastmeijer, Saja Erens and Jonathan Verschuuren

Abstract

1. Introduction

Climate change is increasing the pressure on the dwindling biodiversity of the Earth. In 2004, the Conference of the Parties to the Convention on Biological Diversity (CBD) requested all Parties to "integrate climate change adaptation measures in protected area planning, management strategies, and in the design of protected area systems."[1] IUCN experts have explained that certain organisms "will move along altitudinal gradients in response to climate change" and that establishing networks of protected areas may in most parts of the world be crucial for species of plants and animals to adapt to climate change.[2]

This paper focuses on the experiences with the creation of large and robust natural areas and ecological networks Africa and Europe, particularly in relation to a worldwide changing climate. In discussing this issue, the authors will take a legal approach: the central question is whether the role of law in respect of the establishment and protection of large natural areas and networks should be strengthened to enable species of plants and animals, habitats and ecosystems to adapt to climate change. While recognizing the importance and urgent need to designate and protect marine areas to conserve marine biodiversity, this contribution will focus on the terrestrial environment.

The aim of comparing African and European experiences is not to decide which continent is doing 'the best job'. This would require the development of an objective framework to make judgements, but this is not what is emphasized. Furthermore, such an approach is likely to disrespect the various differences between both regions of the worlds, for instance in respect of the ecological values and climate change sensitivity or the intensity and characteristics of human activities. Therefore, the aim is limited to discuss the African experiences with creating huge transboundary protected areas (sometimes covering areas in three different countries) and the initiatives in Europe, such as the EU-policy to create an ecological network throughout the 27 EU Member States ('Natura 2000'), with particular interest for the above formulated central question on the role of law. Without value judgement it is hoped that the experiences in Africa may inspire policy makers and others in Europa and *vice versa*.

Before discussing the experiences in Europe and Africa, the next section will first consider the challenges for biodiversity due to a changing climate in general and

[1] *See* CBD-Decision VII/28, para.1.4.5.
[2] Briefing Paper 'Implications of Climate Change for Species Conservation', IUCN workshop 2001.

the importance of large natural areas and ecological networks in particular. This discussion is primarily based on judgements made by ecological experts. Next, attention will be focused on experiences in international law (Section 3), on Europe (Section 4) and followed by discussions on Africa (Section 5). The main conclusions are included in Section 6.

2. Biodiversity and Adaptation to Climate Change: Size and Connectivity of Natural Areas

Worldwide, the potential consequences of climate change for biodiversity are receiving increasing attention. Changing temperatures but also the related changes such as decreasing availably of fresh water in certain areas and changing weather patterns[3] pose challenges to species of animals and plants and types of habitats.

Research provides increasing information on these challenges, but there are still many gaps in our knowledge. What is certain is that the challenges for biodiversity are diverse. For instance, climate change may influence the habitat conditions (e.g., available fresh water) in such a way that the area is no longer a suitable habitat for certain species. Climate change may also influence the 'biorhythm' of plants and animals; plants may flower earlier in the year and animals may start to migrate earlier or later than they used to do. This may cause problems in the food chain. Balance in nature may also be disturbed by overpopulation of a particular species, caused by a warmer climate. For instance, milder winters in Alaska helped the spruce bark beetle to build up large populations, which affected millions of acres of forest in south-central Alaska.[4] A warmer climate may also support alien species to survive in areas that were previously simply too cold for them. For instance, due to climate change and increasing human visitation, the introduction and spread of invasive species is one of the main biodiversity conservation challenges in the Antarctic: "While Antarctica has in general been protected from such species and invasions (from natural or anthropogenic sources) by its remoteness, it now faces the twin challenges of environmental change, which reduces the hurdles to be overcome during colonisation and establishment, and deliberate and accidental human import of non-indigenous species."[5] Climate change may also have very specific influences for certain species; for instance, "[s]ome reptile species exhibit temperature-dependent sex determination during egg incubation that could be influenced by changes and variability in global climates."[6]

In policy documents as well as the literature[7] it is stressed that the response should be twofold: a) limiting the human causes of climate change as much as possible and as soon as possible and b) taking management measures to help species, habitats and ecosystems to adapt to climate change. This last category of responses is possibly even more complex than the first one. The diversity of influences in combination with gaps in knowledge makes it difficult to determine which measures

[3] *See* Biodiversity in a Changing Climate, at 264.
[4] "recent warming in Alaska appears to have removed the environmental limitation that prevented outbreaks of spruce budworm in the far north.", see: Glenn P. Juday, 'Spruce Beetles, Budworms, and Climate Warming', *available at* http://www.cgc.uaf.edu/Newsletter/gg6_1/beetles.html.
[5] *See* Peter Convey, 'Antarctic Terrestrial Ecosystems: Responses to Environmental Change', *Polarforschung* 75 (2–3), 101 – 111, 2005, http://epic.awi.de/Publications/Polarforsch2005_2-3_5.pdf at 108.
[6] *See* Amy J. Lind, 'Climate Change Resource Centre', US Forest Service, at http://www.fs.fed.us/ccrc/topics/amphibians-reptiles.shtml.
[7] *See*, e.g., Biodiversity in a Changing Climate, at 264.

should best be taken and which problems should be addressed most urgently: each situation needs 'tailor work' based on the best knowledge available. However, from the literature one conclusion may clearly be drawn: (further) fragmentation of habitats enlarges the problems for many species to adapt to climate change, or in other words, the conservation or establishment of large natural areas and ecological networks is of great importance to enable certain species and types of habitat to address the challenges of climate change. As has been stressed in the literature and various policy documents, the above discussed or other climate change-related challenges may require plants and animal species to 'migrate' to other areas; however, if there are barriers that block species to find their new 'climate space', populations or even species may become extinct.[8]

In view of the gaps in knowledge, it might be best just to conserve large areas in their natural condition and stop the continuing process of building roads, expanding cities, etc. This could be done by designating certain areas and protect these areas in accordance with a strict wilderness protection policy. Experiences with this approach are available in various countries (e.g., USA, Finland)[9] and for many regions in the world (particularly the Polar Regions), this approach is – at least in theory – still an option. However, this approach may not always be feasible and from a biodiversity conservation point of view, it has been stated that an 'ecosystem approach', in which ecological, social and economical interests are balanced, may be sufficient. From this perspective, the term 'network' does not necessarily refer to the direct interconnection of 'core areas' (e.g., protected areas that have been designated for the prime purpose of nature protection). This is reflected in the Millennium Ecosystem Assessment:

> "[c]orridors and other habitat design aspects to give flexibility to protected areas are effective precautionary strategies. Improved management of habitat corridors and production ecosystems between protected areas will help biodiversity adapt to changing conditions."[10]

For the purpose of this contribution, the conservation of large natural areas as well as 'ecological networks' ('core areas' that are 'ecologically connected' by landscape design or corridors) will receive attention.

---

[8] *See* the European Union's Biodiversity Action Plan, 'Halting the loss of biodiversity by 2010 – and beyond', Objective 9, European Commission, Brussels, 2008.

[9] *See* for an overview of existing wilderness legislation, Cyril F. Kormos (ed.), *A Handbook on International Wilderness Law and Policy*, Fulcrum Publishing , Golden, Colorado, USA, 2008.

[10] *See* Millennium Ecosystem Assessment, 'Ecosystems and Human Well-being, Biodiversity Synthesis', World Resources Institute, Washington DC 2005, *available at* http://www.millenniumassessment.org/documents/document.354.aspx.pdf, at 70.
In respect of the ecosystem approach, the MEA states: "PA systems are most successful if they are designed and managed in the context of an ecosystem approach, with due regard to the importance of corridors and interconnectivity of PAs and to external threats such as pollution, climate change, and invasive species."

3. Large Natural Areas and Ecological Networks and Global Nature Conservation Agreements

The concept of ecological networks is relatively new. Previously, the focus was much more on protecting certain areas. From the 1980's on, this gradually shifted, up to the point that ecological networks became in use as a practical conservation tool.[11] In national and international policy and law the concept of ecological networks is becoming settled.

3.1 Convention on Biological Diversity

A widely ratified international convention approaching the global protection of the earth's biodiversity is the Convention on Biological Diversity (CBD).[12] One of the main goals of the CBD is "to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source"[13]. The CBD is seen as a 'framework convention' offering 'guiding principles' to support parties during their efforts to implement national law and policy concerning biodiversity matters.[14] Parties of the Convention "*shall* cooperate in the formulation and adoption of protocols to this Convention" (Art. 28 CBD). The Conference of the Parties (CoP), as the legislative organ, takes decisions and votes on amendments and protocols. This has resulted in only one legally binding protocol (on biosafety) and a jumble of decisions, colouring and completing the framework character of the Convention which is sometimes broad and vague of character as a product of negotiations. This makes the CBD a framework convention with relatively weak power, although it is a hard law instrument. This framework character is seen as its strength by some and as its weakness by others.[15]

An example of this filling in process is the embracing of the 'ecosystem approach', in the first place in the convention itself where a definition is formulated. [16] This approach is based on the awareness that for the long-term preservation of

---

[11] *See* Bischoff, N.T. & Jongman, R.H.G., *Development of Rural Areas in Europe: The Claim for Nature, Preliminary and background studies*, Netherlands Scientific Council for Government Policy, V79/1993, at 25, available at http://www.wrr.nl. And *see* Bennet, G. & Mulongoy, K. J., *Review of Experience with Ecological Networks*, Corridors and Buffer Zones, CBD Technical Series No. 23, 2006.

[12] *See* 1992 Convention on Biological Diversity, 31 I.L.M. 818 (1992).

[13] *See* Preamble CBD.

[14] *See* Birnie, P.W. & Boyle, A.E., *International Law & The Environment*, Oxford, 2002, at 571.

[15] On the one hand it offers the opportunity to a filling in with further going measures as soon as international politics are ready for it. On the other hand, the generality of the obligations, the qualified and bland language, the overlapping provisions and the many ambiguities and omissions are seen as its weaknesses, resulting in more of a paper document than an action-convention. *See* , P.W. & Boyle, A.E., *International Law & The Environment*, Oxford, 2002, at 569 and *see* Lakshman Guruswamy, International Environmental Law in a Nutshell, Thomson 2007, at 163.

[16] *See* CBD Article 2: *"Ecosystem" means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.* And *see* CBD CoP 5, 2000, Decision V/6, A. 3: *"This definition does not specify any particular spatial unit or scale, in contrast to the Convention definition of "habitat". Thus, the term "ecosystem" does not, necessarily, correspond to the terms "biome" or "ecological zone", but can refer to any functioning unit at any scale. Indeed, the scale of analysis and action should be determined by the problem being addressed. It could, for example, be a grain of soil, a pond, a forest, a biome or the entire biosphere."* About the legal status, the CoP-decision is clear: "Implementation of the ecosystem approach and all principles need to be considered as voluntary instruments and should be adapted to local conditions and implemented in accordance with national legislation".

biological diversity the simple protection of species is not enough.[17] Besides, the CoP declared the ecosystem approach to be "the primary framework for action under the Convention"[18]. An adaptive management strategy is proposed with a strong focus on integrating other management and conservation approaches (such as Biosphere Reserves, protected areas, single-species conservation programmes) to be able to better deal with complex situations.[19] During the latest CoP 9 in Bonn further decisions were adopted towards a more full integration of the ecosystem approach to achieve climate-change adaptation and mitigation activities.[20] The ecosystem approach is also seen as "a tool that contributes to the implementation of various issues addressed under the Convention, including the work on, inter alia, protected areas and ecological networks."[21]

CBD and protected areas

In article 8, one of the CBDs weighty tools, the in-situ conservation of ecosystems can be found.[22] Article 7 obliges each contracting party (as far as possible and appropriate) to establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity. The wide scope of this obligation is interesting to name. What is promoted is the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings. The focus is not only on the protected areas themselves but also on the adjacent areas. Biological resources that are important for the conservation of biological diversity have to be regulated or managed within or outside protected areas to ensure their conservation. Besides, degraded ecosystems have to be rehabilitated and restored and threatened species recovery has to be promoted. One of the tools mentioned for the protection of threatened species and populations is the development and maintenance of legislations and/or other regulatory provisions.

CBD and ecological networks

Besides on the (in situ) protection of areas, the focus of the CBD is thus also on the interconnecting of areas. CoP 7 adopted a 'Programme of Work on Protected Areas' (PoWPA)[23] in which one of the targets is that: "By 2015, all protected areas and

[17] The interaction of processes within, among and between species and their abiotic environment, which is the basis for a functioning and resilient ecosystem, has to be conserved. *See* CBD CoP 5, 2000, Decision V/6, B (principle 5).

[18] The CoP worked out the ecosystem approach in its fifth and seventh meeting in the form of recommendations, operational guidances. *See* CBD CoP 5, 2000, Decision V/6 and *see* CBD CoP 7, 2004, Decision VII/11. In the decision resulting from CoP 5 twelve principles of the ecosystem approach were stated. Besides, the CoP is giving priority to facilitating the implementation of the ecosystem approach. On the website of the CBD, a section on the ecosystem approach can be found, including case studies, guidances and sourcebooks, *see* http://www.cbd.int/ecosystem.

[19] *See* CBD CoP 5, 2000, Decision V/6, A, 4-5.

[20] *See* CBD CoP 9, Decision IX/7, 2.a. and 4. *See* also CBD CoP 5, 2000, Decision V/6, B, Principle 11, 12.

[21] *See* CBD CoP 7, 2004, Decision VII/28, 4. Ecological networks is here applied as "a generic term used in some countries and regions, as appropriate, to encompass the application of the ecosystem approach that integrates protected areas into the broader land- and/or seascapes for effective conservation of biodiversity and sustainable use".

[22] In-situ conservation is defined in article 2 of the CBD as *"the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties"*.

[23] *See* CBD CoP 7, 2004, Annex, Programme of Work on Protected Areas: The central goal is: "the establishment and maintenance of comprehensive, effectively managed, and ecologically representative

protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks."[24] To achieve this, the CoP suggested the following activities. The first action sees on 'integration' of network systems and the 'establishing' and 'managing' of network (aspects):

> "Integrate regional, national and sub-national systems of protected areas into broader land- and seascape, *inter alia* by establishing and managing ecological networks, ecological corridors[25] and/or buffer zones, where appropriate, to maintain ecological processes and also taking into account the needs of migratory species."[26]

The second action mentioned aims at active 'development' to reach connectivity:

> "Develop tools of ecological connectivity, such as ecological corridors, linking together protected areas where necessary or beneficial as determined by national priorities for the conservation of biodiversity."[27]

The third action suggested activity with regardto 'rehabilitation' and 'restoration' to (re)shape an ecological network:

> "Rehabilitate and restore habitats and degraded ecosystems, as appropriate, as a contribution to building ecological networks, ecological corridors and/or buffer zones."[28]

A Working Group on Protected Areas got the task to further work out tool kits related to the goals mentioned above.[29] This resulted among other things in a study with a 'Review of Experiences with Ecological Networks, Corridors and Buffer Zones'[30]. Looking at the goals mentioned above, the CBD seems to support the maintenance of "the structural and functional viability of ecosystems"[31] and thus aims at "ecological design and physical planning that facilitates interaction with other types of land use"[32] (really linking habitats). This was confirmed during the recent CoP in Bonn (2008) where Parties are invited to "promote the application of appropriate tools and policy measures including, as appropriate, integrated spatial planning in order to better integrate protected areas into broader land and seascapes and relevant sectors and plans, including aiming at poverty eradication."[33] In the same decision concrete tools are proposed to bring into practice the PoWA, and the establishment of transboundary protected areas and ecological networks. The main tools mentioned, briefly come

---

national and regional systems of protected areas by 2010 for terrestrial and by 2012 for marine areas." And *see* Programme of Work on Protected Areas, Introduction 6: "The overall purpose of the programme of work on protected areas is to support the establishment and maintenance by 2010 for terrestrial and by 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas that collectively, inter alia through a global network contribute to achieving the three objectives of the Convention and the 2010 target to significantly reduce the current rate of biodiversity loss at the global, regional, national and sub-national levels and contribute to poverty reduction and the pursuit of sustainable development, thereby supporting the objectives of the Strategic Plan of the Convention, the World Summit on Sustainable Development Plan of Implementation and the Millennium Development Goals." Available at http://www.cbd.int/protected/pow.shtml and *see also* http://www.protectedareas.org.

[24] *See* CBD CoP 7, 2004, Decision VII, Annex: Programme of work on Protected Areas, II, Goal 1.2.

[25] *See* CBD CoP 7, 2004, Decision VII/28: "Ecological corridors may not be applicable to all Parties".

[26] *See* CBD CoP 7, 2004, Decision VII/28, Annex: Programme of work on Protected Areas, 1.2.3.

[27] *See* CBD CoP 7, 2004, Decision VII/28, Annex: Programme of work on Protected Areas, 1.2.4.

[28] *See* CBD CoP 7, 2004, Decision VII/28, Annex: Programme of work on Protected Areas, 1.2.5.

[29] As a result of CBD CoP 7, 2004, Decision VII/28.

[30] *See* Bennett, G. & Kalemani, J. M., *Review of Experience with Ecological Networks, Corridors and Buffer Zones*, CBD Technical Series No. 23, March 2006.

[31] *See* Bennett, G. & Kalemani, J. M., 2006, p. iii.

[32] *See* Bennett, G. & Kalemani, J. M., 2006, p. iii.

[33] *See* CBD, CoP 9, 2008, Decision IX/18, A. 4. a.

down to: the establishment of regional and subregional forums, the exchange of regional lessons, the coordination of implementation of regional capacity building plans, the set up of networks of specialists per thematic area and the convening of donor roundtables with donors and multilateral agencies.[34]

The Secretariat of the CBD is urging on a further development of the ecological network approach.[35] With an eye on Africa, it is interesting to mention here that in one of the decisions of CoP 8 a lack of implementation as well as capacity building constraints in developing countries are noticed regarding, among other things, integrating protected areas into wider landscapes and seascapes, evaluating the effectiveness of protected areas management and with regard to large intact unfragmented areas. Parties are urged to address those gaps and constraints (as a matter of priority).[36]

CBD and cross-border focus

In the CBD itself no explicit reference can be found to the transboundary aspects of conservation. The transboundary dimension is referred to for the first time in the PoWPA. Goal 1.3 in the PoWPA is "to establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries."[37] Suggested activities of the Parties to realise this goal are, among other things, sought in the sphere of 'collaboration' and 'coordination' concerning the establishment and management of regional networks.[38] Besides it is suggested to establish new TBPAs with adjacent Parties and countries, to strengthen effective collaborative management of TBPAs, and the collaboration between protected areas across national boundaries is promoted.[39]

In the PoWPA also supporting activities of the Executive Secretary are suggested, like activities concerning the development of guidelines for establishing transboundary protected areas and collaborative management[40] and the compilations and dissemination of information on regional networks of protected areas and transboundary protected areas.[41] Besides is mentioned to "review the potential for regional cooperation under the Convention on Migratory Species with a view to linking of protected area networks across international boundaries and potentially

---

[34] *See* CBD CoP 9, 2008, Decision IX/18, A. 4.6 f.

[35] Already this year research had to be developed on "tools, methodologies and approaches for integrating protected areas into wider land and sea scapes including best practices and lessons learned and practical suggestion on implementing ecological networks", see: Consultancy of the secretariat of the CBD about the preparation of a background document.

[36] *See* CBD CoP 8, 2006, Decision VIII/24, 9.

[37] *See* CBD CoP 7, 2004, Decision VII, Annex: Programme of work on Protected Areas, II, Goal 1.3.

[38] "Collaborate with other parties and relevant partners to establish effective regional networks of protected areas, particularly in areas identified as common conservation priorities (e.g. barrier reef systems, large scale river basins, mountain systems, large remaining forest areas and critical habitat for endangered species), and establish multi country coordination mechanisms as appropriate to support the establishment and effective long term management of such networks. (1.3.1)"

[39] *See* CBD CoP 7, 2004, Decision VII, Annex: Programme of work on Protected Areas, II, 1.3.3 and 1.3.4.

[40] *See* CBD CoP 7, 2004, Decision VII, Annex: Programme of work on Protected Areas, II, 1.3.5 Collaborate and consult with relevant organizations and bodies for developing guidelines for establishing transboundary protected areas and collaborative management approaches, as appropriate, for dissemination to Parties.

[41] *See* CBD CoP 7, 2004, Decision VII, Annex: Programme of work on Protected Areas, II 1.3.6: "Compile and disseminate information on regional networks of protected areas and transboundary protected areas, including, as far as possible, their geographical distribution, their historical background, their role and the partners involved".

beyond national jurisdiction through the establishment of migratory corridors for key species."[42] Notwithstanding the fact that the CBD lacks an explicit focus on borders, the approach is without doubts transborder.

There is explicit attention for the Southern states. The latest CoP-decision "*invites* Parties, other Governments, regional and international organizations to support South-South Cooperation by facilitating projects and programmes aimed at joint conservation and sustainable use of cross border ecosystems to further contribute towards halting biodiversity loss"[43].

CBD and Climate Change

Under the CBD a strong awareness is growing for the link between climate change and biodiversity.[44] To strengthen the resilience of ecosystems, the integration of biodiversity considerations into climate change mitigation and adaptation plans is proposed.[45] One of the activities mentioned is the establishment of networks of terrestrial, freshwater and marine protected areas that take into account projected changes in climate.[46] In a technical research report the linking of currently fragmented reserves and landscapes through corridors or habitat matrices is put forward as an option to provide the potential for migration.[47] A 'corridor' is cautiously *("may simply be")* defined as "habitat areas sufficiently close to each other (i.e. functionally linked) to enable dispersal"[48]. The report underlines the value of corridors for animals but stresses that the utility for plants or entire vegetation types is less certain and that in some cases (ecotones) corridors will not be enough to meet climate change impacts, which makes other adaptation measures necessary.[49] Parties and other governments are encouraged "to cooperate regionally in activities aimed at enhancing habitat connectivity across ecological gradients, with the aim of enhancing ecosystem

[42] *See* CoP 7, Decision VII, Annex: Programme of work on Protected Areas, II, 1.3.7

[43] *See* CoP 9 Decision IX/25, Bonn, 19 - 30 May 2008, 5 South-South cooperation on biodiversity for development.

[44] During CoP5 serious attention is addressed on the risks of climate change on certain vulnerable ecosystems, *see* CBD CoP 5, 2000, Decision V/3, Progress report on the implementation of the programme of work on marine and coastal biological diversity (implementation of decision IV/5). And *see* CBD CoP 5, 2000, Decision V/4, Progress report on the implementation of the programme of work for forest biological diversity. S*ee* also: *Interlinkages between biological diversity and climate change. Advice on the integration of biodiversity considerations into the implementation of the United Nations Framework Convention on Climate Change and its Kyoto protocol*, Secretariat of the Convention on Biological Diversity, CBD Technical Series no. 10, Montreal 2003, at 154, *available at* http://www.cbd.int/doc/publications/cbd-ts-10.pdf. *See* CBD CoP 5, 2000, Decision VII/15, 14 and *see: Guidance for Promoting Synergy Among Activities Addressing Biological Diversity, Desertification, Land Degradation and Climate Change*, Secretariat of the Convention on Biological Diversity, Technical Series no. 25, Montreal 2006. And *see* CBD CoP 2006 Decision VIII/30, Biodiversity and climate change: guidance to promote synergy among activities for biodiversity conservation, mitigating or adapting to climate change and combating land degradation**.**

[45] *See* http://www.cbd.int/climate/done.shtml.

[46] Besides is mentioned: maintaining and restoring native ecosystems, protecting and enhancing ecosystem services, managing habitats for endangered species, creating refuges and buffer zones, *see* http://www.cbd.int/climate/done.shtml.

[47] *See: Interlinkages between biological diversity and climate change. Advice on the integration of biodiversity considerations into the implementation of the United Nations Framework Convention on Climate Change and its Kyoto protocol*, Secretariat of the Convention on Biological Diversity, CBD Technical Series no. 10, Montreal 2003, at 77, *available at* http://www.cbd.int/doc/publications/cbd-ts-10.pdf.

[48] *See Id.*

[49] *See Id.*

resilience and to facilitate the migration and dispersal of species with limited tolerance to altered climatic conditions"[50].

The current connecting thread of the CBD is to encourage the Parties to take management measures to make ecosystems capable of coping with extreme climate impacts[51], to promote the integration of these considerations into the national policies, programmes and plans[52], and to fine tune the activities for biodiversity conservation, mitigation or adaptation to climate change and combating land degradation conducted by the secretariats of the three Rio Conventions (UNFCCC, UNCCD, and CBD), parties and relevant organizations.[53]

Besides, the Parties are encouraged and relevant organizations invited to "enhance research and awareness of the role that protected areas and the connectivity of networks of protected areas play in addressing climate change"[54]. Attention is paid to the making available of fundings, especially for developing countries (like those in Africa), to allow the establishment of ecological networks, to improve management of existing protected areas, co-managed protected areas, private protected areas and indigenous and local community conserved areas.[55]

3.2 Other global international conventions

In several other international conventions attention is paid to the designation of transboundary protected areas and/or the creation of ecological networks. The *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (the Ramsar Convention), signed in Ramsar, Iran on February 2, 1971, is an example.[56] For transboundary wetlands ('shared wetlands' or 'international wetlands'), the Convention provides that parties must consult with each other about implementing obligations arising from the Convention, as well as endeavor to coordinate and support present and future policies and regulations concerning the preservation of wetlands and their flora and fauna.[57]

A vast quantity of resolutions, handbooks, and guidelines have been adopted since 1971 that further define the provisions of the convention. The so-called "Ramsar Toolkit" is a set of no less than seventeen Handbooks about the wise use of wetlands, including one on transboundary wetlands.[58] This Handbook gives more detailed advice on how to pursue international cooperation on the management of such areas. Referring to the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes,[59] the Handbook indicates that multi-state management commissions should be established to promote international

[50] *See* CBD CoP 8, 2006, Decision VIII/30, 4.
[51] *See* CBD CoP 7, 2004, Decision VII/15.
[52] *See* CBD CoP 8, 2006, Decision VIII/30.
[53] Other CBD CoP Decisions related to Climate Change are: CBD CoP 5, 2000, Decision V/5 and V/23; CBD CoP 6, 2002, Decision VI/22; CBD CoP 7, 2004, Decision VII/4, VII/5 and VII/27; CBD CoP 8, 2006, Decision VIII/2 and VIII/1.
[54] *See* CBD CoP 9, 2008, Decision IX/18, A. 23.
[55] *See* CBD CoP 9, Decision IX/18, B. 6 a. *See* also art. 8, m CBD.
[56] 11 I.L.M. 963 (1972).
[57] Art. 5(1).
[58] *See* Ramsar Convention Secretariat, *Ramsar Handbooks for the Wise Use of Wetlands*, Handbooks 1-17 (3d ed, 2007).
[59] 31 I.L.M. 1312 (1992).

cooperation,[60] and urge states to harmonize wetland management with the obligations arising from watercourse agreements.[61] [JV: 17 of 1 boek?]

More generally, it can be observed that over the last few years, wetland management has been integrated into river basin management, recognizing the fact that wetlands usually are only a part of a bigger catchment area and, for their conservation, largely depend on the quality of the entire catchment.[62] To achieve this integration, the Ramsar Convention Bureau and the Secretariat of the Convention on Biodiversity have joined hands in a River Basin Initiative.[63] In 2005, the 9th COP adopted a resolution that laid down practical guidelines for the integration of wetland management into river basin management.[64] The guidelines focus, for example, upon upgrading wetlands management to the river basin level.[65]

The *Convention on Migratory Species of Wild Animals*[66] (hereinafter: CMS), because of the nature of the subject of migratory species, very much focuses on establishing international networks to conserve migratory routes. The convention aims at international cooperation to protect animals that cross one or more national jurisdictional boundaries while migrating. For species listed in Appendix I, states, among other things, have to prevent, remove, compensate for or minimize the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species, and they have to conserve and restore those habitats of the species which are of importance in removing the species from danger of extinction (Art. III(4)(a) and (b)). For species listed in Appendix II, the range states of migratory species have to conclude specific agreements that provides for a whole range of things, such as:

> "maintenance of a network of suitable habitats appropriately disposed in relation to the migration routes;" (Art. V(5)(f)).

A whole series of Agreements has been concluded, and some of these actually aim at the creation of a network. In the next section, we will give some examples when dealing with some specific CMS Agreements that are concluded by African states.

4. Large Natural Areas and Ecological Networks in Europe

Recent studies show that Europe's most vulnerable ecosystems to climate change are the European arctic (including parts of Greenland and Scandinavia), mountain regions, coastal wetlands (across Europe, especially the Baltic area) and ecosystems in the Mediterranean region.[67] Ecological network initiatives in Europe can be found on different scales, local, regional, continental, and supra-continental, within different countries, different international bodies, different scientific schools, different

---

[60] *See* Ramsar Convention Secretariat, *Ramsar Handbooks for the Wise Use of Wetlands*, Handbook 7: River basin management (3d ed. 2007), p. 12, 13.
[61] *See id.* at 13.
[62] *See* Resolution VII.18, *reprinted* in Ramsar Convention Secretariat, *Ramsar Handbooks for the Wise Use of Wetlands*, Handbook 7: River basin management (3d ed. 2007).
[63] *See* River Basin Initiative Portal, http://www.riverbasin.org (last visited March 9, 2007).
[64] *See* Ramsar Convention, *supra* note 1, Resolution IX.1, Annex C i (2005) River basin management: additional guidance and a framework for the analysis of case studies.
[65] *Id.*
[66] 19 I.L.M. 15 (1980).
[67] *See*: *Vulnerability and adaptation to climate change in Europe*, EEA Technical report, N7/2005. And *see*: *Climate Protection Strategies for the 21st Century: Kyoto and beyond*, special Report WBG, Berlin 2003.

traditions et cetera.[68] An ecological network can serve several goals: to protect the most important European habitats and species, to develop a coherent structure of habitats across Europe, to make migration of species possible and to prevent further demise of habitats and species.[69] It is estimated that worldwide more than 150 ecological network programmes have been launched, 50 of which in Europe.[70] Although this does not mean that all these networks already actually exist. We will outline the headlines of the most important European initiatives that wider the scope from in situ conservation to thinking in terms of networks.

Bern Convention – Emerald Network

The first interesting legal initiative to mention is the 1979 Convention of European Wildlife and Natural Habitats (Bern Convention)[71]. A regional convention of which among others the European Union is a Party as well as some (North-)African states (Burkina Faso, Marocco, Tunisia, Senegal and Algerian, Cape Verde and Mauretinia as Observer States) and other European States. The involvement of the African countries is important given that the continent hosts migratory species of European importance.

The Bern Convention aims to preserve species of great importance for the biological diversity of both Europe and the countries involved. The Convention stimulates attention for the conservation of natural habitats in frontier areas as a whole.[72] It also stresses the importance of specific measures for migratory species that cross political boundaries.[73] In 1989 a new instrument was launched by the Council of Europe under the Bern Convention, the Emerald Network.[74] It was presented as an ecological network to conserve wild flora and fauna and their natural habitats in Europe. Parties under the Convention have to set up such a network by creating "Areas of Special Conservation Interest (ASCIs)".

---

[68] *See* Kalev Sepp & Are Kaasik (Ed.), 2002. Development of National Ecological Networks in the Baltic Countries in the framework of the Pan-European Ecological Network. IUCN Poland European Programme. at 53 and further. And *see* Bennet, G. & Wit, P., 2001. *The Development and Application of Ecological Networks*, A Review of Proposals, Plans and Programmes, AIDEnvironment, IUCN. *See* Tyteca, D., Hermy, M., Mahy, G., Vanthournout, E., Haumont, F., 2005. *Feasibility of Ecological Networks: Ecological, Economic, Social and Legal Aspects (ECONET)*, SPSD II/MA01, Final Report, at 9-38. *See* Jongman, R. H.G., Bouwma, I.M. & Van Doorn, A, 2006. *The indicative map of the Pan-European Ecological Network in Western Europe.* Technical Background Report. Wageningen, Alterra, Alterra-report 1429 at 21 and further. *See* Bennet, G. & Mulongoy, K. J., 2006 *Review of Experience with Ecological Networks*, Corridors and Buffer Zones, CBD Technical Series No. 23.

[69] *See* Bischoff, N.T. & Jongman, R.H.G., 1993. *Development of Rural Areas in Europe: The Claim for Nature, Preliminary and background studies*, Netherlands Scientific Council for Government Policy, V79/1993, at 25, available at http://www.wrr.nl.

[70] *See* Presentation Mihály Végh, Ecological Networks in Europe – an overview. ECNC, 31/03/2008.

[71] *See* 1979 Convention on the Conservation of European Wildlife and Natural Habitats, 1992 Europ> T.S. No. 104, signed by 46 members.

[72] *See* Article 4 sub 4 Convention of Bern: *"The Contracting Parties undertake to co ordinate as appropriate their efforts for the protection of the natural habitats referred to in this article when these are situated in frontier areas."*

[73] *See* Article 4 sub 3 Convention of Bern: *"The Contracting Parties undertake to give special attention to the protection of areas that are of importance for the migratory species specified in Appendices II and III and which are appropriately situated in relation to migration routes, as wintering, staging, feeding, breeding or moulting areas."*

[74] *See* Decisions of the Standing Committee: Recommendation No. 16(1989) and Resolution No.3 (1996). Rules for the network can be found in Resolution No. 5 (1996) (Appendix I) of the Standing Committee. The legal basis of the Emerald Network is: Bern Convention Articles 1, 2, 3, 4, 6b and 9; and Recommendation (nos. 14, 15 and 16 (1989);

Since the setting up of the Emerald Network is introduced by recommendation under the Convention, it is optional soft law, but the obligations under the Convention itself have a hard international law status. The European Community implemented the Bern Convention by means of the Habitats Directive and the Natura 2000 network, as we will discuss in the next sections. Under the Convention is decided that "for Contracting Parties which are Member States of the European Union, Emerald Network sites are those of the Natura 2000-network"[75]. The Emerald Network can be seen as a joint effort, the EU is responsible for the sites in EU Member States and the Council of Europe for the sites outside the EU.[76]

The establishment of the Emerald Network is still in its implementation phase (identification of species and habitats, collecting data, selection of potential ASCIs, building up databases, designation of lists), afterwards the real work will come (proper management, maintenance and restoration of what is concerned). The participation of non-European Parties (and Observer) to the Emerald Network is unclear.[77] For the African area three pilot projects[78] are running (Burkina Faso, Senegal). The extension of the Emerald Network methodology to any African countries which so wish, was considered by the Standing Committee of the Bern Convention in 2007,[79] because this would allow a broader protection of species, also the one relevant for African countries which are member of the Bern Convention and since it would contribute to the Johannesburg commitments to reduce biodiversity loss by 2010 and to set up global networks of protected areas.

The areas belonging to the Emerald Network (included Natura 2000 sites as an implementation) are considered as core areas of the Pan-European Ecological Network (PEEN), which we will expound now.

PEBLDS - PEEN

In 1994 the Council of Europe, in close cooperation with governmental, non-governmental and national as well as international organisations launched the first steps to a Pan-European approach on continental biodiversity matters. In the Maastricht Declaration 'Conserving Europe's Natural Heritage' (1993) the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) was proposed

[75] *See* Resolution No. 5 (1998).

[76] *See* Resolution (98) 5. Besides, the European Environment Agency plays an important role as partner for both. The idea is to reach ecological consistency and similar data examination and system and fine tuning with the European Commission's Habitats Committee and European Thematic Centre for Nature Conservation and Biodiversity.

[77] Recommendation No. 14 (1989) does not exclude such participation, Resolution No, 3 (1996) is specifically addressed to European states.

[78] Part of the pilot is the set up of databases (data gathering, field study, drawing maps as well as the technical process of data processing) and set up of project teams and training. Related to Africa: "The Delegates of Burkina Faso and Senegal had reported on a number of difficulties encountered and delays in implementing this project, which stemmed mainly from under funding or administrative reorganisations."
See: Strasbourg, T-PVS/Emerald (2007) 13; [T-PVS Emerald 13e.07], CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS, Group of Experts for the setting up of the Emerald Network of Areas of Special Conservation Interest Joint meeting of the Ecological Networks of the Council of Europe Strasbourg (France), 18-19 October 2007, Extract from the report of the 26th meeting of the Standing Committee of the Bern Convention, Strasbourg, 27 - 30 November 2006.

[79] *See id.*.
There is planned a *Euro-African regional seminar on the subject in 2008, with the co-operation of RAC/SPA.*

which became endorsed by the European environment ministers in 1995 during the Environment for Europe (EfE)[80] Conference in Sofia.

The PEBLDS aims at offering a framework to unite forces and initiatives on the field of biological and landscape diversity issues in Europe and to coordinate those. It is by no mains a new judicial instrument or policy programme but more a strategy of integration, participation and unification, over borders, between sectors and among different parties and stakeholders.[81] It can be seen as the policy framework for cooperation in the field of environmental protection and as a means to effectuate the application of the CBD and the Bern Convention by involving all sectoral policies.[82]

Thus, notwithstanding the lack of legal force on its own merits, actions under the Strategy can find a legal basis in international treaties like the CBD, the Bern Convention, the Bonn Convention, the Ramsar Convention, the EU Habitats and Birds Directives and the European Landscape Convention. One of the Action Themes promoted in the First Action Plan under the Strategy was the establishment of PEEN, a Pan-European Ecological Network within 20 years. Rhe Strategy calls for "the promotion of nature protection, both inside and outside protected areas, by implementing the European Ecological Network, a physical network of core areas and other appropriate measures, linked by corridors, and supported by buffer zones, thus facilitating the dispersal and migration of species."[83] The aims of PEEN are to ensure that "a full range of ecosystems, habitats, species and landscapes of European importance is conserved, habitats are large enough to place species in a favourable conservation status, there are sufficient opportunities for the dispersal and migration of species, damaged parts of the key environmental systems are restored, the key environmental systems are buffered from potential threats."[84]

PEEN can be seen as an overarching framework of ecological networks in Europe.[85] "It acted as both a physical network through which ecosystems, habitats, species, landscapes and other natural features of European importance are conserved, and a co-ordinating mechanism through which the partners in the Strategy could develop and implement co-operative actions."[86] PEEN incorporates different networks of protected areas, besides Natura 2000 and Emerald, the UNESCO World Network of Biosphere Reserves[87], the European network of Biogenetic Reserves,

---

[80] The EfE is a process in which environment ministers, delegations of countries in the UNECE region and representatives of the European Commission come together on a regular base to form a "forum for tackling our environmental challenges, and promoting broad horizontal environmental cooperation, as a pillar of sustainable development in the region". *See* Belgrade Environment for Europe Ministerial Declaration 2007 and <http://www.environmentforeurope.org/home.html>.

[81] *See: The Pan-European Ecological Network: taking stock, Nature and Environment*, Council of Europe, No 146 at 10 : "The Pan-European Ecological Network should not be seen as another policy instrument, law or directive and was never intended as such. With PEEN, the Ministers endorsed a framework for integrating existing agreements, programmes and initiatives in the field of nature conservation, land use planning and rural and urban development."

[82] There is a close cooperation with the Secretariat of the CBD concerning the Strategy which is embedded within the spirit of the CBD. Strategy Text point 1.3 and See website: http://www.peblds.org/index.php?ido=2056496&lang=eng. For example, national reporting on the PEBLDS is sometimes done in the context of reporting under the CBD (CBD art. 20), or can be indirectly found in National Biodiversity Action Plans (as an elaboration of Article 6 CBD).

[83] PEBLDS Strategy text, <http://www.peblds.org/index.php?ido=20514351&lang=eng>

[84] *See: The Pan-European Ecological Network: taking stock, Nature and Environment*, Council of Europe, No 146 at 10.

[85] *See Id.* at 21.

[86] *See Id.* at 10.

[87] *See* 1971 Man and Biosphere (MAB) Programme

Ramsar sites[88], UNESCO World Heritage Sites[89], protected areas under Europarc Federation management, European Diploma of protected areas, the Bonn Convention and regional and national networks.[90]

Under the Kyiv Conference (2003) PEEN was reinforced with at least two targets[91]: identification of all core areas, restoration areas, corridors and buffer zones and the interactive mapping of them by 2006, and the adequate conservation of all core areas by 2008. Besides, PEEN is portrayed as the guiding mechanism to all major national, regional and international land use and planning policies. In an Annex to the Kyiv Resolution the implementation of transboundary networks is encouraged, as well as the synergising with the Emerald Network and Natura 2000. Both are considered as contributing to the main core areas of the PEEN.

Interesting to mention is the crucial role that stakeholders have in the design and implementation of PEEN. The implementation of PEEN is to be a combination of top-down and bottom-up approaches. The idea is to stimulate initiatives at all levels, to encourage cross-boundary collaboration and to reach cohesion and coherence by synergising views (which is by its nature a matter offor a top-down approach). The practical implementation itself can only take place on the local and limited scale, thus buttom-up. Spread over Europe, different network initiatives are fostered for an important part by non-governmental organisations and local as well as transboundary initiatives. PEEN encourages this involvement of NGOs, not only in the practical field but also at the negotiation table, as members in the Strategy Council, in meetings and in the rolling work plans.

Law and Policy development in the European Union: Natura 2000

The two focal points of EU nature protection are the Birds Directive and the Habitats Directive. The Birds Directive, aiming at protecting the wild birds in Europe, stems from 1979.[92] Although this Directive illustrates the tendency at that time to protect 'one issue', it shows cross-border awareness related to the subject of conservation of birds migrating over borders.[93] The 1992 Habitats Directive, aiming at conserving natural habitats and wild fauna and flora, took things a step further and introduced the idea of cross-border conservation by proposing a European ecological network: Natura 2000.[94]

---

[88] *See* 1971 Ramsar Convention.

[89] *See* 1972 World Heritage Convention.

[90] For example the Russian Federation implements PEEN by means of RUSECONET and supports the Emerald Network as an Observer State under the Bern Convention.

[91] *See* 2003 Kyiv, Fifth Ministerial Conference 'An Environment for Europe', Resolution on Biodiversity, paragraphs 4 and 5. And *see* PEEN Statement annexed to the Resolution on Biodiversity (Annex 3), PEEN Action Plan.

[92] *See* Council Directive 79/409/EEC, On the Conservation of Wild Birds, 1979 O.J. (L 103) 1 [hereinafter Wild Birds Directive].

[93] In the Considerations of the Birds Directive is stated that *"effective bird protection is typically a trans-frontier environment problem entailing common responsibilities"*. In Article 4 sub 3 of the Birds Directive, the need for a coherence approach is further worked out: *"Member States shall send the Commission all relevant information so that it may take appropriate initiatives with a view to the coordination necessary to ensure that the areas provided for in paragraphs 1 and 2 above form a coherent whole which meets the protection requirements of these species in the geographical sea and land area where this Directive applies."*

[94] *See* Council Directive 92/43/EEC, On the Conservation of Natural Habitats and of Wild Fauna and Flora, 1992 O.J. (L 206) 7 [hereinafter Habitats Directive].

Natura 2000 is a network of protected areas across the EU, consisting of Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive on the basis of species and habitats of community importance (as listed in the Annexes of both Directives). The effectuation of the Natura 2000-network is one of the main purposes of the Habitats Directive. Natura 2000 is the major instrument for reaching the European 2010 biodiversity targets.[95] The aim of the Natura 2000-network is to ensure that fauna and flora of Community interest receive adequate protection to warrant their long-term viability. Besides, it is seen as *the* measure in EU nature conservation legislation to maintain and restore ecological connectivity. Nearly 20 percent of the EU territory belongs to Natura 2000.[96] This idea of establishing an ecological network and the Habitats Directive as a whole were influenced by the Convention of Bern[97] and the Emerald Network. Natura 2000 areas will become areas of the Emerald Network. The Habitats Directive implements the Convention of Bern in the European Community[98].

First of all, it must be made clear that the Habitats Directive is not a static directive. It must continually be monitored whether (newly) qualified areas have to be designated. Besides, in Article 6, the Habitats Directive provides a protection-, management-, and development-regime for these designated areas. The overarching aim is to acquire favourable conservation status for the habitats and species listed in the Annexes of both Directives. It is striking that in this whole process, from site selection in the different Member States to the management of the sites, a lack of cross-border awareness can be noticed. In practice, this results in little to no fine-tuning and cooperation during the designation of adjacent areas between Member States. Besides, the management regime of Article 6 lacks any cross-border focus whatsoever. Article 6(1) for example, makes no reference to coming to a joint conservation plan in cross-border areas. It only mentions that "appropriate management plans specifically designed for the sites" should be drawn up. This illustrates the freedom of obligations in the Directive's provisions with regard to cross-border issues. The fact that the term 'border' is only mentioned once in the Habitats Directive already betrays the limited focus of the Directive on borders and cross-border areas.

In several provisions, the Habitats Directive speaks of establishing a 'coherent ecological network'.[99] Article 3 puts forward the network as a way to maintain and

[95] Decision taken at the meeting of the European Council in Göteburg, Sweden in June 2001 to halt biodiversity decline within the EU by 2010. Nature conservation must be integrated into other sectoral areas. The Habitats Directive is one of the initiatives to meet the EU's commitments under the Biodiversity Convention signed in Rio. *See also* 2003 Kyiv Fifth Ministerial Conference 'An Environment for Europe'; 2004 Ireland Stakeholders Message from Malahide; CBD CoP 7, 2004, PoWPA.

[96] Natura 2000 covers over 26,000 protected areas and covers a total area of around 850.000 km2, *see* http://ec.europa.eu/environment/nature/index_en.htm .

[97] *See* Council of Europe. Document prepared by the Standing Committee for the Convention on the Conservation of European Wildlife and Natural Habitats, Strasbourg, 7 January 1997, T-PVS (96) 75 revised.

[98] There is some discussion going on about the sufficiency of this implementation but this will be passed over here.

[99] The terminology used in the Directives is very confusing: *'coherent ecological network', 'Natura 2000 network', 'overall coherence', 'the ecological coherence of the Natura 2000 network'*. References can be found in the Preambule (paragraph 10), Articles 3, 4 and 10, and in Annex III (stage 2) of the Habitats Directive. In the Birds Directive, references can be found in the preamuble (paragraph 9), and in Article 4 paragraph 3.

restore the favourable conservation status of sites hosting listed habitats and species in their natural range.[100] Besides, maintaining and developing features of the landscape which are of major importance for wild fauna and flora is proposed as a possible way to improve the ecological coherence of Natura 2000. This wider landscape approach is worked out in Article 10 Habitats Directive:

> "Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view *to improving the ecological coherence af the Natura 2000 network*, to encourage the management of *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."[101]

Article 10 seems to open the door to the maintenance of various ecosystem features instead of only in situ conservation. The terminology of Article 10 leaves it up to the Member States to decide whether they find improvement of the ecological coherence necessary. A more obligatory design could be seen as a possible gateway to the application of climate change adaptation instruments. Climate change became a big issue only after the drawing of the Habitats Directive. Maybe that is why it is totally not incorporated into the Directive. This is a big lack, since biodiversity conservation and climate change can not be regarded separately anymore.

Articles 3 and 10 Habitats Directive leave a lot of questions unanswered. Both speak of 'ecological coherence', without however defining what this encompasses. The only indication that can be derived from them is that 'coherence' has to be understood in an ecological sense. The European Commission came with a guidance document on Article 10 of the Habitats Directive which, although not legally binding[102], aims to "help develop and implement integrated ecological connectivity related measures"[103] to maintain and restore connectivity and to meet the impacts of climate change. The acknowledging of climate change is a big step forward. Especially in view of the awareness that is shown for the fact that climate change requires flexibility in protected area management instead of only preservation within specific fixed locations.[104] The Guidance gives an interesting state of the art overview concerning diverse topics related to networks and landscape connectivity, but does not really provide 'guidance'

---

[100] *See* Article 3 Habitats Directive: *"1. A coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000. This network, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall 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. […] 3. 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, as referred to in Article 10."*

[101] *See* Article 10 Habitats Directive. Our italicisation.

[102] *See* Kettunen, M., Terry, A., Tucker, G., & Jones, A. *Guidance on the maintenance of landscape features of major importance for wild flora and fauna – Guidance on the implementation of Article 3 of the Birds Directive (79/409/EEC) and Article 10 of the Habitats Directive (92/43/EEC).* Institute for European Environmental Policy (IEEP), Brussels, 2007. [hereinafter Guidance Doc. 2007].
The contents and views contained are those of the authors, and do not necessarily represent those of the European Commission. The Guidance claims to fit into and to be faithful to both the Birds and the Habitats Directive, the principles of EU environmental law, and to be in line with other EU documents in this field, *see at* 10.

[103] *See* Guidance Doc. 2007 at 10.

[104] *See* Guidance Doc. 2007 at 47 and further.

to the interpretation of Article 10. It only provides recommendations to the Member States for the implementation of Article 10, which is discretional.

The Guidance offers as a definition for the ecological coherence of the Natura 2000-network: *"a sufficient representation (patch quality, total patch area, patch configuration, landscape permeability) of habitats/species to ensure favourable conservation status of habitats and species across their whole natural range"*[105]. Further on in the Guidance it is stated that "the starting point for establishing connectivity amongst protected areas within a network should be based on functional, rather than structural connections between individual habitat patches. Consequently, the purpose of connectivity conservation measures (such as ecological networks) should not necessarily be to link individual patches with physical structures (such as corridors and similar habitat) but to ensure the existence of required functional connections."[106]

Ecological networks typically have the same basic structure: core areas, corridors, buffer zones.[107] However, although the Habitats Directive promotes the Natura 2000-network as the main instrument to reach its goals, the Directive does not make the distinction between core, corridor and buffer, but seems to stick to the idea of 'just' having protected (core) areas.[108] In the Guidance Document on the other hand, references to this basic structure can be found. It recommends to give a high priority to reducing impact on Natura 2000-sites, also by reducing impacts from surrounding areas;[109] to contribute to the conservation of habitats and species populations in the wider environment (i.e. outside Natura 2000-sites);[110] to aim to maintain and where necessary increase functional connectivity (and not necessarily just structural connectivity);[111] to consider all options for increasing connectivity by selecting the most effective and efficient means with no exclusive focus on physically connecting habitats, but also on improving the size and quality of core habitats, the creation of new habitat patches as stepping stones and increasing the permeability of the landscape matrix;[112] to indicate priorities for actions such as habitat corridor creation measures, which go beyond existing legal obligations (e.g., protection of Natura 2000-sites).[113]

This does not mean that the Guidance embraces these recommendations without reservation. It is not a matter of 'the more connectivity, the merrier' – there are ecological risks to connecting habitats which have to be taken into account[114], and species differ in the way they make (or don't make) use of connective structures – nor is 'connectivity' in itself a panacea. Therefore, "an alternative, or complementary

[105] This definition is developed by an expert workshop, *see* COM. 2005. Note to the Scientific Working Group: Conclusions of workshop 'Ecological Networks and Coherence According to Article 10 of the Habitats Directive', Vilm, Germany, 2005 and *see* Guidance Doc.2007 at 15.
[106] *See* Guidance Doc. 2007 at 15.
[107] *See* Guidance Doc. 2007 at 49.
[108] Although, admittedly, the outcome of an Article 6(3) procedure "might point towards the establishment of buffer zone around a Natura 2000 site in order to protect the site from disturbances caused by planned activities" *see* Guidance Doc. 2007 at 61. And Articles 3 and 10 of the Habitats Directive seem to hint towards measures to upgrade the connectivity of the Natura 2000 network, *see* Guidance Doc. 2007 at 62.
[109] *See* Guidance Doc. 2007 at 57.
[110] *See* Guidance Doc. 2007 at.57.
[111] *See* Guidance Doc. 2007 at 56.
[112] *See* Guidance Doc. 2007 at 57.
[113] *See* Guidance Doc. 2007 at 57.
[114] *See* Guidance Doc., 2007 at 39-40.

approach to increasing connectivity, is to implement measures that improve the general ecological quality of the overall landscape."[115] Focusing on this wider 'habitat matrix' "is likely to improve the ability of species[116] to adapt to shifting conditions"[117] due to climate change, and therefore "the potential for using habitat matrix management to improve functional connectivity should be further explored within Europe"[118].

There is a growing consensus that Article 10 should be read in the light of broader developments in the field of networks. One of the recommendations of an expert workshop on Article 10 Habitats Directive is that "*there should be a greater harmonisation between the different ecological networks, such as e.g. Natura 2000, PEEN or national ecological networks, in order to achieve maximum synergies.*"[119] Besides, it was recommended that the European Commission is "*to take action in checking the transboundary coherence of the Natura 2000 network*"[120], and that "*the Member States should consider the effect of existing or planned manmade barriers within and outside Natura 2000 sites (including those that were in place before the implementation of the Habitats Directive, and thus have not undergone an Art. 6-assessment), especially if they lead to a high mortality of species. Their effects should be mitigated if necessary.*"[121]

The use of fuzzy terminology and vague concepts illustrates the smell of compromise that surrounded the design of the Habitats Directive. When the Habitats Directive was designed, it was considered a far-reaching intervention in matters of national territory. However, by now it should be clear that the Directive focuses on nature, not on authority over territories. It seems a right moment to specify the fuzzy, broad concepts in order to realise a more adequate nature protection and to work out the provisions concerning ecological coherence as a way to strengthen the resilience of ecosystems to climate change. In the Guidance on Article 10, research is announced on the potential effects of climate change on the Natura 2000-network (by the European Environment Agency), with the particular aim to investigate the Natura 2000-network's connectivity and fragmentation via the wider landscape and to identify habitats and species most likely to be effected by climate change impacts in specific regions.[122] A first step in the right direction.

Water Framework Directive

In the EU Guidance on Article 10 Habitats Directive, it is brought to the attention of the Member States that the European Water Framework Directive[123] (henceforth:

[115] *See* Guidance Doc., 2007 at 58.
[116] Albeit not all species, *see* Guidance Doc. 2007 at 59.
[117] *See* Guidance Doc. 2007 at 59.
[118] *See* Guidance Doc. 2007 at 59 and for more explicit recommendations at 60.
[119] *See* COM. 2005. Note to the Scientific Working Group: Conclusions of workshop 'Ecological Networks and Coherence According to Article 10 of the Habitats Directive', Vilm, Germany, 2005 at 6.
[120] *See id.* at 7.
[121] *See id*. at 7.
[122] *See* Guidance Doc. 2007 at 97.
[123] *See* European Union, Directive of the European Parliament and the Council Establishing a Framework for Community Action in the Field of Water Policy, Oct. 23, 2000, 2000/60/EC, OJ L 327/1 (establishing a framework for Community action in the field of water policy)) [hereinafter EU Water Framework Directive].

WFD) "provides a good opportunity to manage river basins at transnational scale"[124]. Goal of the framework is to prevent the European waters (and their ecosystems) from (further) deterioration ('good status' must be reached by 2015) and to promote sustainable water use. A further goal is to soften the effects of floods and droughts.[125]

In order to reach this, Member States are obliged to designate river basin districts. For each of these basins, a River Basin Management Plan (RBMP) has to drawn up that encompasses the measures which have to maintain (or reach) the 'good status' of the body of water involved.[126] Where necessary, basins have to be designated internationally. Under article 3(4) WFD, Member States are to ensure coordination of these international river basins *together*. In this respect, the WFD calls for transboundary cooperation.

The EU Guidance sheds some light onto the relationship between the WFD and the Habitats Directive. Although the WFD does not explicitly mention obligations to implement the provisions of the Habitats Directive, it "has been seen to provide important support to the management and monitoring of the Natura 2000 network in the future"[127] Since river basins often cross borders, Member States should try to find out how to use "the framework provided by the WFD to prevent fragmentation and enhance connectivity between Member States".[128] If issues concerning connectivity are integrated into the RBMP (as the Guidance advises), a further integration between the WFD and the Habitats Directive could be reached. The WFD itself does not mention climate change. In the Guidance however, the issue of climate change is discussed with regard to the WFD. Since the WFD is still in the stage of being implemented, Member States are advised to "actively support capacity building in relation to the importance and value of inland water ecosystem biodiversity, including issues related to the maintenance of ecosystems services *and climate change*".[129]

Joint Initiatives by EU Member States: the Danube River basin

We will now turn to the case of the Danube River basin. It is not meant to be a comprehensive case study. It does however provide a good example of an area covered in a patchwork of legal nature protection regimes and cross-border cooperation. By flowing through ten countries[130], the Danube crosses actual and mental borders. The floodplains at the upper part of the river could be called (semi-) cultivated, while the floodplains downstream are largely untouched and of high environmental value.[131] The well is in former Western-Germany, while the estuary in the Black Sea is surrounded by former Eastern Block countries. Countries such as Germany and Austria are among the richest in Europe, while Moldova and Romania are relatively poor. Among the ten Danube countries, some are 'old' EU-members, some are 'new', and some are not a member of the EU at all. Along the approximately

[124] *See* Guidance Doc.2007 at 83.
[125] *See* Water Framework Directive, Article 1 (e).
[126] *See* Water Framework Directive, Article 4 (1).
[127] *See* Guidance Doc. 2007 at 82.
[128] *See* Guidance Doc. 2007 at 83.
[129] *See* Guidance Doc. 2007 at 83, our italicization.
[130] Germany, Austria, Slovakia, Hungaria, Croatia, Serbia, Bulgaria, Romania, Moldova, and Ukraine.
[131] *See* Factsheet WWF, 2004 at http://www.panda.org/about_wwf/where_we_work/europe/where/romania/news/index.cfm?uNewsID=13930 (last visited Sept. 1, 2008). S*ee* http://www.undp-drp.org/drp/en/danube_danube_network.html (last visited Sept. 1, 2008) and *see* http://www.icpdr.org/icpdr-pages/nature_protection.htm (last visited Sept.1, 2008).

2800 kilometres[132] long stretch of the Danube, national parks, Ramsar sites, UNESCO World Heritage Sites and Biosphere Reserves, and (potential) Natura 2000-sites can be found[133]. Many protection initiatives involve cross-border cooperation, certainly since the fall of the Iron Curtain[134], but not many involve the entire course of the second longest river in Europe.

Some of the patches

In 1994, eleven countries and the European Community signed the Danube River Convention.[135] Through this convention (ratified in 1998), Parties strived "at a lasting improvement and protection of Danube River and of the waters within its catchment area in particular in the transboundary context and at sustainable water management taking duly into account the interests of the Danubian States in the field of water use and at the same time contributing to the protection of the marine environment of the Black Sea".[136] They explicitly agreed to cooperate in this field and to take "all appropriate legal, administrative and technical measures"[137] to reach the Convention's goals and to prevent or limit transboundary impacts on water.[138] In this respect, the Convention is seen as the overall legal instrument for co-operation and transboundary water management. Although it mentions nature protection as one of the directions sustainable use should take, it is by no means about nature protection alone, and does not mention widely used instruments such as the designation of protected areas. 'Sustainable water use' is interpreted in a broad sense, also striving for, e.g., decreasing pollution in the Black Sea stemming from the Danube basin and to control the negative impacts of floods. Although climate change is not literally mentioned (it was hardly an issue at that time), it can be said that commitments such as this last one, anticipated that currently so hotly debated topic.

Things are somewhat different with the Declaration On the Cooperation for the Creation of a Lower Danube Green Corridor (LDGC)[139], that was signed in 2000 by Romania, Bulgaria, Ukraine, and Moldova. In contrast to the Danube River Convention, the LDGC starts by mentioning the natural and ecological uniqueness of the Lower Danube basin, with the usefulness for man (healthy floodplains and wetlands help to maintain water quality and provide economic opportunities) coming in second place. The LDGC is quite clear about how to reach its goals. A 'green corridor' is to be established, consisting of over 770.000 ha. of existing protected areas. Furthermore, over 160.000 ha of new protected areas are proposed as well as

[132] The exact length differs from source to source, since it not universally agreed on where exactly the river starts.
[133] *See* Factsheet WWF, 2004.
[134] *See*, e.g., Turnock, D. (2001), Cross-border conservation in East Central Europe: The Danube-Carpathian complex and the contribution of the WorldWide Fund for Nature, in: *GeoJournal* 54, at 655–681, especially at 659-660.
[135] *See* 1998 Convention on Co-operation for the Protection and Sustainable use of the Danube River (Danube River Protection Convention), International Commission for the Protection of the Danube River [hereinafter DRPC].
[136] DRPC, preamble.
[137] DRPC, art. 2(2).
[138] *See* also Turnock (2001): "The DRPC provided a framework for more integrated river basin management: it followed increasing concern over transboundary pollution and the need for sustainable and equitable water management, with a better supply of information (including closer monitoring of polluters) and joint emergency plans. Wetland rehabilitation was also accepted." at 658
[139] *See* Declaration on the Cooperation for the Creation of a Lower Danube Green Corridor, Ministries of Environment of Romania, Bulgaria, Moldova and Ukraine, Bucharest, Romania, signed at 5 June 2000 [hereinafter LDGC].

over 223.000 ha. of natural floodplain areas that should be restored. The LDGC emphasises flexibility, since it consists of three types of areas: those with a strict protection regime, buffer zones (in which human activity is possible under circumstances and in which degraded areas are restored), and areas in which there is room for "sustainable economic activities"[140]. Although the LDGC does not explicitly mention cross-border activities, it seems logical (given the international character of the Danube basin) that these were at least assumed. Other indications in that direction might be the commitment to exchange information[141] and the explicit mentioning of "the principle of joint action from Danube River countries to protect and restore the water quality and environmental conditions of the Danube River ecosystem"[142] under the DRPC. Some hints in the direction of the importance of 'connectivity' might be found in the use of the word 'corridor'. Legally, the LDGC parties recognise their obligations under the Ramsar (1971) and Bern (1979) Conventions, as well as their commitment to the PELBDS and their national commitments to the protection of biodiversity, while the Danube River Convention (1994) is 'taken into account'. Striking is the emphasis put on the role of cooperation with both local, national and international partners and governments and "the crucial role of environmental Non-Governmental Organisations"[143] as the mouthpiece of public interests and ideas as well as their role in decision making processes.

A good example of this role of NGOs can be found in the work of the World Wildlife Fund (WWF), which is quite active along the Danube.[144] It recently issued a report that "shows that practical adaptations to climate change impacts on freshwaters may have immediate benefits for peoples' livelihoods and to conserve ecosystems" [145]. In the case of the Lower Danube River basin, this means, e.g., that by dismissing dykes and polders and restoring floodplains and wetlands, the capacity of the river basin to cope with floods would be enhanced, economic activity (e.g., tourism and fishery) would grow, and biodiversity conservation would get a boost (as was shown by growing numbers of (breeding) bird species in pilot projects).[146] Even though climate change might not always be mentioned explicitly, work on waterways that starts with a different motivation might also be beneficial to issues concerning climate change.

Of a very substantive nature is the European Green Belt initiative, formed in 2004. This joint venture of government agencies, NGOs and other stakeholders, that emerged from the German Green Belt initiative[147], strives to create an ecological network that, like a European 'backbone', runs from the Barents Sea to the Black Sea. The Green Belt follows the trail of the former Iron Curtain and therefore also partly the course of the Danube. With its route having been left in 'peace' for over forty years, this corridor through Europe developed into a truly 'wild' piece of nature. It is

[140] *See* Art. 2 LDGC.
[141] *See* Art. 5 LDGC.
[142] *See* Considerations LDGC.
[143] *See* Art. 5 LDGC.
[144] *See*, e.g., Turnock (2001).
[145] *See* WWF (2008), Water for life: Lessons for climate change adaptation from better management of rivers for people and nature. Goldalming: WWF-UK.
http://www.sosflorestas.com.br/about_wwf/where_we_work/europe/what_we_do/danube_carpathian/index.cfm?uNewsID=143901.
[146] *See id.*, at 12-14.
[147] *See* Geidezis, L. and Kreutz, M. (2004) Green Belt Europe – Nature knows no boundaries. From »Iron Curtain« to Europe's lifeline, in: *Urbani Izziv, Urban planning institute of the Republic of Slovenia*, 15(2) at 135-138.

the goal of the Green Belt to conserve not only this corridor with its ecological richness, but also areas within a distinct range of the corridor, thus adding ribs to the backbone.

The Green Belt strives to connect these areas, which fall under various protection regimes[148], as well as areas that are not yet protected. Thus, it takes an explicit crossborder stance[149], as it runs along state borders and connects areas on both sides. The Green Belt could be of help in realising international ecological networks such as the Emerald Network, the Natura-2000-network, and PEEN/PEBLDS. Furthermore, the initiative tries to harmonise protection measures in transboundary areas. Amazingly enough, this relatively new initiative makes no direct or indirect references to climate change.

Finally, a somewhat different approach is taken by the Council of Europe's Landscape Convention[150]. The Convention calls for *landscape* protection, management, and planning, which means that it encompasses cultural as well as natural elements. Another distinguishing element is the scale on which this treaty is active. While for instance EU-directives apply to the European Union as a whole, the Landscape Convention is linked to the principle of subsidiarity (in the explanatory report[151]) and calls for transboundary cooperation on a local and regional level, where possible.[152] Since the EU as a whole is not a partner in the Convention, not all Member States have to take part in it. Two of the ten Danube countries (Germany and Austria) did not sign the Convention, while one of the non-EU Member States (Serbia) did not yet ratify the Convention.[153] With the Convention having entered into force only very recently in the remaining seven Danube countries,[154] it seems too early to make general comments on the actions under the Convention.

[Danube en de Waterrichtlijn + afsluiting]

5. Large Natural Areas and Ecological Networks in Africa

Establishing Large Natural Areas and Ecological Networks in Africa: An Overview

The global initiatives that are dealt with in section 3 also apply to the African continent. As a matter of fact, the African continent has many transboundary

[148] *See id.* at 136.

[149] *See id.* at 137: "It could become the first trans-boundary habitat network through Europe. The core areas will be big cross-border National Parks and conservation areas of international interest like (...) the river-landscapes and floodplains of Danube (...). The Danube-March-floodplains (Austria/Slovakia) are the largest pristine floodplains in Central Europe and a conservation area according to the Ramsar Convention on Wetlands. (...) Moreover, there are many important areas for migrating birds and it is a retreat for numerous endangered species (...). One of the visions is, that one day these great carnivores could use the Green Belt as a route for migration." and *see id.* at 138: "It should fulfil the functions of an ecological corridor and thus, contribute to the conservation of biodiversity."

[150] *See* European Landscape Convention, ETS No. 176. It entered into force in 2004.

[151] *See* Council of Europe – Explanatory report on the European Landscape Convention (ETS no. 176), consideration 34. http://conventions.coe.int/Treaty/en/Reports/Html/176.htm.

[152] *See* Art. 9 European Landscape Convention.

[153] *See* http://conventions.coe.int/Treaty/Commun/ChercheSig.asp?NT=176&CM=8&DF=&CL=ENG (last visited Sept. 1, 2008).

[154] The Convention entered into force in Croatia, Romania and Moldova in 2004, in Bulgaria and Slovakia in 2005, in Ukraine in 2006 and in Hungaria in 2008. *See* http://conventions.coe.int/Treaty/Commun/ChercheSig.asp?NT=176&CM=8&DF=&CL=ENG (last visited Sept. 1, 2008).

protected areas, for instance transboundary wetlands that have been designated under the Ramsar Convention. The CMS has already been dealt with in the previous section. Within the framework of this convention several agreements for the African continent have been concluded. Relevant for the protection of international wetlands is the *African-Eurasian Waterbird Agreement* (AEWA), concluded in 1995. In general terms, the Agreement requires the parties to take measures to protect migratory water birds. 36 Eurasian and 24 African states have signed this Agreement, especially focusing on migratory water birds that breed in Europe and Asia, and winter in Africa.[155] The Parties to the AEWA have to

> "coordinate their efforts to ensure that a network of suitable habitats is maintained or, where appropriate, re-established throughout the entire range of each migratory waterbird species concerned, in particular where wetlands extend over the area of more than one Party to [the] Agreement".[156]

Another agreement under the CMS is the *Agreement on the Conservation of Gorillas and their Habitat* (Gorilla Agreement).[157] A similar provision is included in this agreement, as Parties have to

> "coordinate their efforts to ensure that a network of suitable habitats is maintained or re-established throughout the entire range of all species and sub-species, in particular where habitats extend over the area of more than one Party to [the] Agreement".[158]

For elephants in West Africa there is a, less legally binding, *Memorandum of Understanding concerning Conservation Measures for the West African Populations of the African Elephant*[159] that does not have the same strong wording as the Gorilla Agreement, nor does it in any way reflect the need to establish a network of protected areas across the region for this highly migratory species. Although the preamble states that the signatories 'understand' that

> "this species is essentially migratory, which makes the survival of the individuals dependent upon the conservation of habitats, including corridors for movements between or among Range States",

the text of the MoU itself only generally requires the states involved to "take steps to conserve and, when and where appropriate, to strictly protect the African Elephant and to conserve and sustainably use the habitats essential for its survival."[160] However, several transboundary migration corridors for elephants currently are being established, two in Burkina Faso and Ghana (a western and an eastern corridor), and one in Guinea and Liberia.[161]

---

[155] 6 YRBK INT'L ENVTL L. 306 (1995).
[156] Art. III(2)(d).
[157] Signed in Paris, 26 October 2007, available at the Bonn Convention's website, <http://www.cms.int/species/gorillas/> (last visited 30 July 2008).
[158] Article III(2)(c).
[159] Signed ....., available at the CMS website, http://www.cms.int/species/elephants/ (last visited July 30, 2008).
[160] No. 1.
[161] Information provided by the CMS website, at http://www.cms.int/species/elephants/ (last visited July 30, 2008).

The 2003 (revised) *African Convention on the Conservation of Nature and Natural Resources*[162] pays attention to transboundary cooperation with regard to protected areas. Article XXII(2)(e) states:

> "whenever a natural resource or an ecosystem is transboundary, the Parties concerned shall undertake to cooperate in the conservation, development and management of such resource or ecosystem and if the need arises, set up interstate commissions for their conservation and sustainable use".

Article XII gives rules regarding conservation areas that have to be established, maintained and extended in order to ensure the long term conservation of biological diversity. In particular should these areas:

- conserve those ecosystems which are most representative of and peculiar to areas under the jurisdiction of that state or are characterized by a high degree of biological diversity,
- ensure the conservation of all species and the habitats that are critical to their survival, particularly those species which are only represented in areas under the jurisdiction of that state, or which are threatened or of special scientific or aesthetic value.

Article XII(4) has the duty to also establish buffer zones around the borders of the Conservation Areas in order to control activities outside these areas that are detrimental to the achievement of the conservation goals of the protected areas.

The African Convention pays specific attention to transboundary wetlands. Article VII(3) states:

> "Where surface or underground water resources and related ecosystems, including wetlands, are transboundary to two or more of the parties, the latter shall act in consultation, and if the need arises, set up inter-State Commissions for their rational management and equitable utilization and to resolve disputes arising of these resources, and for the cooperative development, management and conservation thereof."[163]

Law and Policy development in the SADC

For the southern African region, harmonization of laws is rapidly evolving within the Southern African Development Community (hereafter: SADC). As in the EU, harmonization efforts within SADC are being made in the field of nature conservation. The *Protocol on Wildlife Conservation and Law Enforcement*[164] obliges the Member States to establish management programs for the conservation and sustainable use of wildlife, to integrate such programs into national development plans,[165] and to assess and control activities which may significantly affect the conservation and sustainable use of wildlife so as to avoid or minimize negative impacts.[166] For shared wildlife resources and wildlife habitats across international borders, co-operative management must be promoted.[167] Transfrontier conservation and management programmes have to be developed,[168] of which one specific form

[162] Signed in Maputo, Mozambique, June 11, 2003, text *available at* the African Union's website, <http://www.africa-union.org> (last visited July 30, 2009). This Convention will enter into force once it is ratified by 15 states. By July 2008, only eight countries had ratified it.
[163] Art. XXII(2)(e) stipulates more or less the same.
[164] Signed in Maputo on August 18, 1999. This Protocol entered into force on November 30, 2003.
[165] Art. 7(1).
[166] Art. 7(2).
[167] Art. 7(5)(a).
[168] Art. 7(9).

has been explicitly regulated in the protocol: the establishment of Transfrontier Conservation Areas (hereafter: TFCAs).[169]

In 2006, the SADC TFCA Office was established in Gaborone, Botswana.[170] This office promotes the establishment and development of TFCAs in the SADC region and, more in general, promotes conservation and sustainable management of ecosystems that transcend international boundaries within the SADC region. It also develops and facilitates the implementation of guidelines, standards and best practices for the establishment and development of TFCAs, and maintains a networking with other TFCA practitioners working in the SADC region.

TFCAs are also known as peace parks, as the idea to create transboundary protected areas for conservation and tourism purposes originally came from WWF South Africa. Since 1997, there is a Peace Parks Foundation that facilitates the process of TFCA establishment and funding.[171] It currently co-funds conservation measures in seven TFCAs.[172]

TFCAs are not automatically protected in the countries involved. for instance in South Africa, an TFCA has to be designated under one of the categories of protected areas according to the Protected Areas Act.[173] We will come back to this below.

Within SADC, there also exists a Shared Watercourse Systems Protocol,[174] which is based upon both the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes[175] and the UN Convention on the Law of the Non-navigational Uses of International Watercourses.[176] This is an important instrument in regard to the topic of this paper, as the protection of watercourses usually is essential for biodiversity conservation. Large wetlands, like river estuaries, that often are located in more than one country, as well as international watercourses, are the lifeline of many species. As these international watercourses and shared wetlands thus are of vital interest to any biodiversity network, we briefly mention this protocol here as well. The Shared Watercourse Systems Protocol requires the parties to the Protocol to enter into consultations on the management of a shared watercourse, which may include the establishment of a joint management mechanism, if one of the states so requests. A shared watercourse agreement in which the establishment of a shared watercourse institution, such as a shared water commission, is provided for, will be the likely outcome of such consultations.[177]

Law and Policy development in other African region

[169] Art. 4(2)(f).
[170] Information available at the SADC website, http://www.sadc.int/fanr/naturalresources/transfrontier (last visited July 30, 2008).
[171] S*ee* the foundation's website, <http://www.peaceparks.org> (last visited July 31, 2008).
[172] S*ee* the foundation's website, <http://www.peaceparks.org> (last visited July 31, 2008).
[173] A TFCA is usually designated as a national park. *See* Randy J. Tanner, Perry Brown, Wayne Freimund, Kimber Haddix McKay et al., *Transfrontier Conservation Areas of Southern Africa and International Law in the context of Indigenous Community Involvement*, 11 SOUTH AFR. J. ENVTL L. & POL'Y 169 (2004), and Sist J. Mramba, *The Peace Parks Initiative: A Breakthrough towards Sustainable Natural Resource Management in Southern Africa?* 11 SOUTH AFR. J. ENVTL L. & POL'Y 214-215 (2004).
[174] Signed in Windhoek on August 7, 2000. This Protocol replaces the 1995 version. It entered into force on September 22, 2003.
[175] 31 I.L.M. 1312 (1992).
[176] 36 I.L.M. 700 (1997).
[177] Art. 5(3) and Art. 6.

In other regions in Africa, there are regional initiatives to create a network of protected areas as well, although usually these initiatives have not been as far developed as within the SADC region. The East African Community (hereinafter: EAC) has, in its Treaty, several provisions that promote co-ordination, the adoption of common policies, and the harmonisation of policies and regulations concerning shared natural resources and ecosystems.[178] In addition, it is stated that the Partner States "(...) develop common management plans for trans-border protected areas".[179] There are no explicit references to the creation of ecological networks, nor in this Treaty nor in other legal documents of the EAC. In the North and West African regions there is an initiative to create a network of wetlands.[180] However, there are no legally binding documents to support this initiative, except for the general provision on international cooperation of the Ramsar Convention. Another example can be found in the Treaty establishing the East African Community. In this Treaty is stated that the Partner States "encourage the joint use of training and research facilities and develop common management plans for trans-border protected areas".[181]

Joint Initiatives in Southern Africa

By 2008, 18 TFCAs either had been established through signing a bi- or multilateral agreement, or are being established. Once an agreement has been signed, an MoU is drafted on the basis of which joint management decisions are made by the respective authorities in the area, and a joint management plan is drafted.[182]

Examples of multilateral agreements on the establishment of a TFCA are the agreements signed by Mozambique, South Africa and Zimbabwe on the Great Limpopo Transfrontier Park, and the agreement on the Kavango Zambezi TFCA signed by Angola, Botswana, Namibia, Zambia and Zimbabwe, for which also an MoU was signed (in 2006). The latter area is a huge area, situated in the Okavango and Zambezi river basins, covering parts of five countries, and a total area of 287.132 km² (more than 28 million hectares). This entire area does not have a similar conservation status on all spots. It consists of 36 national parks, game reserves, community conservancies and game management areas, for each of which specific conservation requirements have been set in national law.[183] Another example of a TFCA is the |Ai-|Ais/Richtersveld TP in South Africa and Namibia. This TFCA is connected by the Orange river to a transboundary wetland designated under the Ramsar convention by both countries, the Orange River Mouth Ramsar site. There are plans to extend the current |Ai-|Ais/Richtersveld TP further northbound into Namibia and Angola, bringing it to a total protected area of more than 19 million hectares.[184]

The fact that so many huge areas have been designated a TFCA in a relatively short span of time must be considered as a big success. The key reason for this

---

[178] *See* Art. 112(2)(j), Art. 114(1)(c), Art. 114(2)(b)(ii) of the Treaty of 30 November 1999 establishing the East African Community [add source of the Treaty]

[179] Art. 116(d).

[180] NEPAD's Action Plan for the Environment Initiative, October 2003, p.48-49. NEPAD (New Partnership for Africa's Development) is an AU programme. See NEPAD's website for the Action Plan, at http://www.nepad.org (last visited 31 July 2008).

[181] Art. 116(d) of the Treaty of 30 November 1999 [add source of the Treaty]

[182] For an analysis of the content of these documents in the case of the Botswana-South African Kgalagadi TFCA, *see* Mramba, *supra* note xx at 216-225.

[183] *See* press release of the Peace Parks Foundation at its website at http://www.peaceparks.org/news.php?mid=664&pid=669 (last visited July 30, 2008).

[184] Information provided at the Peace Parks website http://www.peaceparks.org/story.php?mid=107&pid=88&m=1_1_5 (last visited July 30, 2008).

success is considered to be the broad political support that this initiative gained throughout the region. Political leaders in the region all embraced the idea of creating transfrontier protected areas as a means of peaceful cooperation with the neighbouring countries. The fact that the areas are considered to be a potential source of revenue for the tourist industry also helped to create political momentum for the establishment of TFCAs.[185]

Compared to the European Natura 2000-network discussed above, the TFCAs in the southern African region seem to be better suited to help biodiversity cope with the effects of climate change because of the fact that these areas are much bigger and are more focused at covering integrated ecosystems, rather than at one protected area within national boundaries as seems to be more the case in Europe.

A big difference with the European Natura 2000 network, however, is the harmonisation of national laws, which is much more limited in the southern African region. This is considered to be one of the shortcomings of the TFCA agreements. Although they should be aimed at harmonization of law, thus facilitating transfrontier conservation, the agreements are rather vague and abstract and do not add much to the texts of international law documents, such as the SADC Protocol.[186] Instruments to facilitate transfrontier biodiversity conservation are basically lacking; the actual conservation measures that legally are to be taken, largely depend on the existing national legal frameworks of the countries involved.[187] Colonialism and state sovereignty are considered to be the reasons for such a fragmented and nationally oriented approach towards transfrontier biodiversity conservation.[188] Constant resources and capacity constraints further aggravate this situation.[189]

It must be observed, though, that for some transboundary areas, cooperative management plans are being drafted and a cooperative governance approach in which all stakeholders from the various countries are involved is being pursued. Sometimes, international NGOs, like the Peace Parks Foundation, the WWF, or Wetlands International, do provide the resources for conservation projects in a specific area. These are all relevant factors for the conservation of transboundary protected areas. In other words: despite the absence of a solid legal framework, local governance initiatives can be very succesful.[190]

As to waterbasin management, throughout Africa, there are many bi- or multilateral management systems in place on joint watercourses. An example of a multilateral agreement on the management of a transboundary river basin in southern Africa is the 2000 treaty through which all Orange River riparian states (Botswana, Lesotho, Namibia and South Africa) established the Orange-Senqu River Commission (ORASECOM).[191] The Council of this Commission serves as a technical advisor to

---

[185] Information obtained in interviews, Sept. 2008, with: Louis Kotze, North West University (South Africa), Alexander Paterson, University op Cape Town (South Africa).

[186] Willem D. Lubbe, 'Straddling Borders and Legal Regimes: The Case for Cooperative Transfrontier Biodiversity Conservation in the Southern African Development Community, draft article accepted for publication' *Yearbook of International Environmental Law* p. 14 (article received from author August 2008). [final version]

[187] *Id.*

[188] *Id.* at p. 16-18.

[189] Information obtained in interviews, Sept. 2008, with: Louis Kotze, North West University (South Africa), Alexander Paterson, University op Cape Town (South Africa).

[190] *See* Jonathan Verschuuren, The Case of Transboundary Wetlands under the Ramsar Convention: Keep the Lawyers Out! (19) *Colorado Journal of International Environmental Law and Policy* No. 1 (Winter 2008), pp. 49-127.

[191] Agreement on the Establishment of the Orange-Senqu River Commission, signed in Windhoek on November 3, 2000.

the authorities of the states involved on matters relating to the development, utilization and conservation of the water resources of the river system.[192] The Parties to this agreement, that was not only based on the SADC Protocol, that had not been ratified at the time, but also on the UN Convention on the Law of the Non-Navigational Uses of International Watercourses, agreed to (inter alia): "(...) Individually and jointly take all measures necessary to protect and preserve the river system from its sources and headwaters to its common terminus,[193] including the estuary of the river system and the marine environment taking into account generally accepted international rules and standards,[194] (...)". However, the vastness of this river basin, makes it difficult, if not impossible, to develop a sharp and effective policy on common management of the entire area. Again, research shows that local governance initiatives are more successful.[195]

6. Conclusions and Recommendations

Parallel to worldwide efforts to limit greenhouse gas emissions, measures to support species of animals and plants and habitats to adapt to climate change are crucial for the conservation of the world's biodiversity. Climate change causes a variety of threats to biodiversity. As the character and seriousness of these threats strongly differ between, for instance, species and geographical locations, solutions require 'tailor work'. However, there is consensus among ecological experts that – among other measures (e.g., the prevention of introduction and spread of alien invasive species) – large natural areas and ecological networks should be conserved or established. Although the importance of this has been underlined in documents adopted in the framework of the CBD and other international conventions (e.g., the Ramsar Convention), at the global level such networks or the connectivity of natural areas are not the subject of clear 'hard law' obligations for state governments.

It is clear from this contribution that at the regional level the issue of establishing and conserving ecological networks has received increasing attention. Particularly in Africa the issue is part of various international agreements. Furthermore, in both regions examples exist of concrete projects aiming at the establishment of large (often transboundary) conservation areas or the improvement of the connectivity between 'core natural areas'. Generally, the relevant agreements, European Directives or bilateral or multilateral cooperation initiatives, do not refer explicitly to climate change, simply because most of them were adopted or initiated at a time that climate change was not yet acknowledged as an important issue.

Basically, the acknowledgement of the importance of ecological networks is inherent to biodiversity protection. For instance, species such as elephants and gorillas in Africa and bears and wolves in Europe simply need space. Also for many other species the ecological connectivity of natural areas is important, for instance to enable migration. The examples discussed also show that other interests than ecological interests may benefit from the protection of ecological networks (e.g., stimulating cooperation between states, regions and communities, improving the water quality of rivers, limiting the vulnerability of the land for floods, etc.).

---

[192] Art. 4.
[193] Art. 7(12).
[194] Art. 7(14). The latter part may refer to the Ramsar Convention, since the Orange River estuary is a Ramsar site, but there is no explicit mentioning of the Convention in the Agreement.
[195] Verschuuren, supra note xx.

However, the discussions in this chapter do not support the conclusion that the issue is sufficiently dealt with. Based on the study of developing ecological networks in both regions, we conclude that the actual establishment and protection of ecological networks must be strengthened. In Europe, the aim of establishing of ecological networks may be found in the documents of many governance frameworks; however, most of these documents do not have the status of 'hard law'. And if they have (e.g., Art. 10 of the Habitats Directive), the language is vague and much discretionary power is left to the State Parties or Member States. 'Hard law' on the establishment of ecological networks in Africa is more developed than in Europe. However, it has been questioned in the literature whether these relevant agreements receive substantial attention in practice. Furthermore, in both regions the numbers of agreements or systems regarding ecological networks are quite substantive, while the interrelationships between the various networks are unclear.

The seriousness of climate change challenges for biodiversity, the gaps in knowledge, and the continuing pressure of human development upon natural areas clearly indicate that improvements are needed. Although further research is needed, actions may include the following:

- Stricter control and responsibility at the regional (e.g., SADC, EU) level. Currently, the establishment of ecological networks depends too much on individual initiatives at state level. As in both regions the networks that are needed will cross the borders of states, stricter control at the regional level to support and direct the establishment of the networks is needed. For the European Union, for instance, Article 10 of the Habitats Directive provides the Member States with too much discretionary power to implement this Article;
- In establishing networks, more explicit attention must be given to the issue of adaptation of biodiversity to climate change. The establishment of ecological networks, particularly the 'design' of such networks, should preferably be based on scientific knowledge on the key species and habitats and the potential influences of climate change on these species and habitats. Therefore, in shaping and implementing ecological networks, policy makers should involve the best ecological knowledge available and stimulate further research, e.g. on the possible future scenario's in respect of climate change and related challenges for biodiversity;
- In view of the various gaps of knowledge, the precautionary principle would guide us probably towards a 'robust' approach: designate and legally protect large areas and ensure connectivity between those areas. However, there is a risk that the establishment of networks in practice is blocked due to tensions between ecological, social and economical interests. These tensions appear to be more substantial if the attention is limited to the role of core natural reserves. Therefore, the discussion on ecological networks in relation to climate change and biodiversity should not only focus on designating and enlarging core natural reserves. As has been stressed by the Millennium Ecosystem Assessment and other publications, ecological connectivity between natural areas (core areas) may also be ensured by landscape policy:

> "We can state with *high confidence*, based on 150 studies on large scale, regional planning for conservation linking networks of protected areas with other land uses (Bennett and Wit 2001), that a ''landscape approach'' that, for example, manages neighbouring production forests as buffer zones and integrates protected areas with broader regional spatial planning,

> helps overcome stated limitations of protected areas on their own. Successful landscape approaches."[196]

- In both regions, the substantial numbers of different ecological network agreements or systems raise the question whether these systems strengthen or weaken each other. Therefore, further research on the interrelationship between these agreements and systems regarding networks appears to be desirable.

It is hoped that the above discussions contribute to the worldwide debate on how to support biodiversity in adapting to climate change. It is also hoped that this contribution may stimulate more detailed research, not only in Africa and Europe, but also in respect of how to strengthen the conservation and establishment of ecological networks in other parts of the world.

* * *

[196] *See* Millennium Ecosystem Assessment, Chapter 5 'Biodiversity', *available at* http://www.millenniumassessment.org/documents/document.310.aspx.pdf at 145.